

DAEYANG Electric Company

LIGHTING

FOR MARINE USE

Providing "Lighting Architecture" through the reflection of Human factor
based on fundamental skills since 1977

www.daeyang.co.kr



Technology developments and maximizing people's abilities are at the core of our philosophy and vision

We believe the purpose of company's existence is to support its members and society by producing continuous values with help of technology and human resources. Our employees are the best resources we can rely on, so we value the talented upbringing of our workers. Since the foundation of company we have implemented this philosophy and we will continue to put forth all our effort to achieve our goals through expanding technology and maximizing our employees' abilities.

History

- 1977-05** DAEYANG Electric Co., Ltd. founded.
- 1977-12** Designated as manufacturer of marine electric equipment by Ministry of Commerce and Industry.
- 1985-09** Selected as an "Excellent" Exporting Company by the Korea Development Bank.
- 1988-03** Established an affiliated company, DAEYANG Instrument Co., Ltd.
- 1988-12** DAEYANG R&D center founded.
- 1989-01** Established an affiliated company, DAEYANG Electric Supply Co., Ltd.
- 2000-07** Selected by "Small & Medium Business Administration" for "venture company".
- 2001-11** Awarded the "Bronze Tower Order" for contribution to industry by Ministry of Commerce, Industry and Energy. Awarded the "Export Tower" by Ministry of Commerce, Industry and Energy.
- 2003-02** Selected as a "National Manufacture Research center" by Korean Ministry of Commerce, Industry and Energy.
- 2003-09** Completed the development of Goniometer.
- 2004-09** Completed the development WICS (Wireless Interior Communication System).
- 2004-12** Completed the development of IR-Rth electronic reflector.
- 2005-05** Expanded & moved Noksan factory for Fan & Ventilation Division.
- 2006-06** Certified as "TINNO-BIZ" company by SMEA (Small and Medium Business Administration).
- 2010-11** Awarded 30 Million US Dollar Export tower at 47th National Export Day.
- 2011-01** Registered on KHNP's Approved Vendor List for E272A (Incandescent, Sodium Lighting Fixtures & Lamps and E272B (Fluorescent Lighting Fixtures & Lamps, Dimming Control System).
- 2011-07** Fixation on the stock exchange. (Listed on KOSDAQ).
- 2012-01** Acquired KSB (Korea Special Battery).
- 2012-07** Completed development of MDV (Mine Disposal Vehicle) for Korea Navy.
- 2012-11** Expanded & moved R&D Center of Electric & Electronic factory to Noksan factory.
- 2015-07** Selected as a World Class 300.
- 2015-08** KHNP(KOREA HYDRO & NUCLEAR POWER CO., LTD) Approved Vendor (E208) (2210)
- 2015-12** Award 50 Million US Dollar Export Award at 52th Export Day.
- 2016-3** Awarded "Exemplary Taxpayer" of Busan Metropolitan City.
- 2016-3** Expanded Sensor Division.
- 2016-12** Expanded SI Division.

1990

1990-11
Selected as a defense industry company by the Ministry of National Defense.

1992-03
Signed a technical license agreement with WITT & SOHN, Germany.

1995-08
Nominated as one of the most prominent medium-sized enterprises with advanced technologies by ministry of commerce and industry.

2006-11
Co-developed with KORDI an Unmanned Underwater Vehicle (UUV) for deep sea exploration at 6,000m depth in the ocean successfully.

2007-01
Established design research center for interior lighting equipments of cruise in Seoul.

2007-02
Developed of LED flat lighting equipments.

2008-07
Completed the development of new explosion proof lighting equipments for land use.

2009-06
Developed LED lighting for indoor use.

2013-03
Awarded "Industrial Service Medal" on the 47th taxpayer's day.

2013-04
Expanded & moved DAEYANG Instrument Co., Ltd to Noksan factory.

2014-10
Awarded "Industry development of LED & International competitiveness improvement" by minister of ministry of Trade, Industry and Energy.

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Organization

Number of employee (2017) **450**



Daeyang is an industrial leader in marine lightings, communication systems, power systems and nautical instruments. Based on over 40 years of experience in marine and shipbuilding industry, our superior products are acknowledged by various customers throughout the world.

Customer satisfaction is our first and only priority and we put endless effort to meet the highest standard. With heavy investment (10% of annual turnover) on research and development, our R&D center is one of the most famous research centers in the industry for its innovation and capability of product development.

We operate in various sites around Busan, Korea and have oversea liaison offices in Japan, North & South America, Europe, China, South Asia and Australia for immediate response to the customers' demands.



SENSOR DIVISION Incheon, Korea



NOKSAN FACTORY Busan, Korea

Major Products

Lighting

- Indoor Lighting
- Outdoor Lighting
- Navigation Light & Signal Light
- LED Lighting
- Hazardous Area Lighting
- Receptacle & Switch
- Reefer Container Receptacle
- Lighting Architecture

Communication & Navigation

- Integrated Communication System (ICS)
- Refrigerated Container Monitoring System (RCMS)
- Power Cable Transmission System
- Integrated Navigation System (INS)
- Electro-Magnetic Speed Logs (EM-LOG)
- Degaussing/Deforming System
- Ship Shore Communication Link System (SSCLS)

Panel & Switchboard

- Main Switchboard
- Emergency Switchboard
- Power Distribution Panel
- Engine Control Console
- Bridge Control Console
- Switchboard for Train

Underwater Vehicle

- Remotely Operated Vehicle (ROV)
- Autonomous Underwater Vehicle (AUV)
- Deep Sea Unmanned Underwater Vehicle (UUV)
- Mine Disposal Vehicle (MDV)

Nautical Instrument

- Anemometer & Anemoscope
- Rudder Angle Indicator
- Weather Information System (WIS)
- Whistle

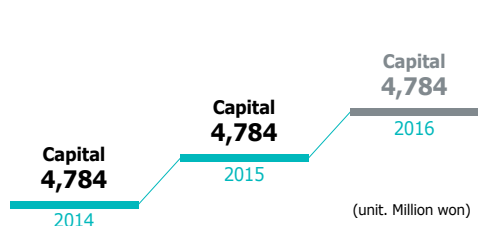
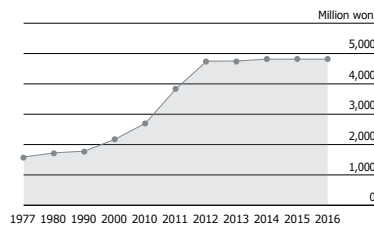
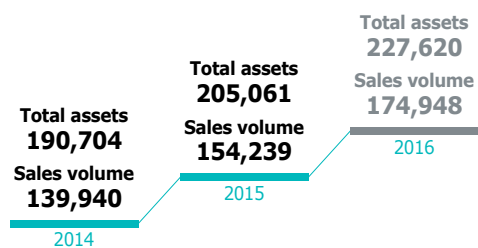
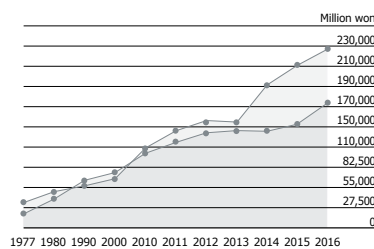
Sensor

- Temperature Sensor
- Pressure Sensor
- Weather sensor



HEAD OFFICE
Busan, Korea

Financial Status April, 2017



(unit. Million won)

Certificate

Quality Management

Daeyang Electric Co., Ltd. is a manufacturer of various equipment for marine and shipbuilding industry. To ensure our promises for best quality to customers, Daeyang has been certified with quality management system for production, inspection and service.



LRQA
ISO 9001:2008



DNV GL
AS 9100 Revision C



SMBA
Single PPM



KMAR
ISO/TS 16949:2009



**Defense Agency for
Technology and Quality**
DQMS (KDS 0050-9000-2)



KGS IECEX
IECEX CoC Certificate
Service Facility



HKMC
SQ
(Supplier quality)



**KHNP (KOREA HYDRO &
NUCLEAR POWER CO.,LTD)**
E272A



TUV Rheinland
ISO 26262:2011



KOLAS
ILAC -MRA
(International laboratory
accreditation corporation)
(for Shock, Vibration, IP, Illuminance, etc.)

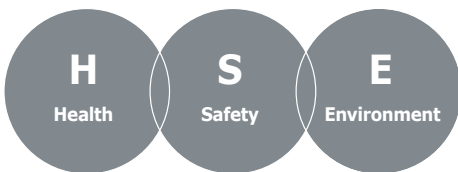


KEPIC
(Korea Electric Power Industry Code)
E208, J210
Renewal Registration of Duration



KHNP
(KOREA HYDRO & NUCLEAR POWER CO.,LTD)
E208, J210 Approved Vendor

HSE Management



Our company concerns the health(H), safety(S) and environment(E) as the most basic factors in our policy.



LRQA
OHSAS 18001:2007
(Occupational Health &
Safety management system)



LRQA
ISO 14001:2004
(Environmental management system)

Assurance

Daeyang products have been guaranteed by cumulating the relevant certificates from various organization including CE, UL, IECEx bodies, ATEX, Classification Society all over the world, and so on.



• Explosion Proof Certificate



CML (ATEX)



UL



Baseefa (ATEX)



LCIE (ATEX)



Sira (ATEX)



KGS



KOSHA



KRH



KTL

• Class Approval



RMRS



ABS



KR



LR



BV



SERCONS



NK



RINA



CCS



DNV



KS



LED

LED LIGHTING

We are endeavouring to lead the lightings industry through the sustained R&D effort in developing up to date lighting technologies. Based on our recent effort on the application of LED as a new lighting source in 2012, the world first full LED lighting ship was built with our LED lightings. We, surely, can supply all sort of LED lightings which could be replacements of traditional lightings including special lightings to meet customers' inquiry.



LED LIGHTING



DAEYANG LED Lighting technologies are as follows.

1. Meet the interference regulations for marine vessels and electronic equipment (EN60945)
2. Robust lighting fixture design for shock and vibration
3. Easy maintenance and safe terminal box & junction box
4. Considered high reliability design of electronic circuit and thermal design
5. Optical design for quality of light
6. Wide operating temperature conditions (-30 °C ~ 45 °C)

—  **LED Lighting**

Indoor Lighting

12

LED Recessed Ceiling Light
LEB407WF / LEB807WF



14

LED Decorative Recessed Ceiling Light
LEB407NF-S / LEB807NF-S



16

LED Recessed Ceiling Light (No Gap Type)
LEB407NF-SN-A / LEB807NF-SN-A



18

LED Surface Ceiling Light
LEB404NS / LEB407NS / LEB804NS / LEB807NS



20

LED Recessed Dampa Ceiling Light
LEB212NF-D / LEB412NF-D



22

LED Recessed Ceiling Light
LEB125NF / LEB225NF



24

LED Decorative Recessed Ceiling Light
LEB407NL / LEB807NL



26

LED Decorative Recessed Ceiling Light
LEB407NT / LEB807NT



28

LED Corner Ceiling Light
LEBN404NS / LEBN804NS



30

LED Desk Light
LEBD107 / LEBD110



32

LED Mirror Light
LEBM107 / LEBM110



34

LED Bed Light
LEBB107 / LEBB110



36

LED Dome Light
LECD09-U



38

LED Down Light
LO12-23W



40

LED Wall Light
LD09-GC



42

LED Down Light
LECO115NF / LECO115WF
LECO118NF / LECO118WF



44

LED Desk Light
EL100



46

LED Chart Table Light
LC09



48

LED Folding Table Light
LT09



50

LED Exit Light
LEXIT-NF



52

LED Exit Light
LEXIT-NS



Outdoor Lighting

54

LED Surface Ceiling Light
LEB125WS / LEB225WS



56

LED Surface Ceiling Light
LEB125WS-U / LEB225WS-U



LED Lighting

58

LED Pendant Light
LP09-23PSCG



60

LED Flood Light
PF30L



62

LED Flood Light
PF50L



64

LED Flood Light
PF125L-550AWCF



66

LED Flood Light
PF250L-550AWCF



68

LED Flood Light
PF400L-550AWCF



Navigation & Signal Light

70

LED Navigation Light
A2L-SM06H / A2L-SP04H /
A2L-ST04H / A2L-SY04H



72

LED Navigation Light
A2L-DM06H / A2L-DP04H /
A2L-DT04H / A2L-DY04H



74

LED Navigation Light
A2L-M1055NVG-I / A2L-P1055NVG-I /
A2L-T1055NVG-I / A2L-Y1055NVG-I



76

LED Signal Light
LS09-23PBCB / LS09-23PBCW / LS09-
23PBCR / LS09-23PBCG



Hazardous Lighting

78

Explosion Proof
LED Ceiling Light
LEAX-405dc / LEAX-805dc



80

Explosion Proof
LED Ceiling Light
EXLED-125ed / EXLED-225ed



82

Explosion Proof
LED Ceiling Light (Battery back-up)
EXLED-125edBu
EXLED-225edBu



84

Explosion Proof
LED Ceiling Light
EXLED-614



86

Explosion Proof
LED Flood Light
EXLED-50nR



Search Light

88

LED Search Light
PS60LL / PS170LL



LED Driver

90

LED driver
for EXIT Light
LPS05L-300SN
LPS05L-300SNB



92

LED driver
for Down Light
DLD-14008-DFDR
DLD-24015-DFD-1, DLD-24015-DFD-2
DLD-24015-DFN



94

LED driver
for Flood Light
DLD-36250-PFN /
DLD-45200-PFN



96

LED driver
for Flood Light
DLD-48030-PFN /
DLD-48050-PFN



98

LED driver
for Explosion Proof Light
EXLED-S30N / EXLED-S60N
EXLED-EMS30 / EXLED-EMS60



LED Lighting

Indoor Lighting

Outdoor Lighting

Navigation & Signal Light

Hazardous Lighting

Search Light

LED Driver

LED Recessed Ceiling Light

LEB407WF / LEB807WF



Application

Galley, laundry

Protection degree IP44

Materials

- Body: Electro zinc coated steel sheet
- Globe: Opal Acryl

Finish

- Body: White epoxy powder coat and stove enameled (Munsell No.N-9.3)

Light Source

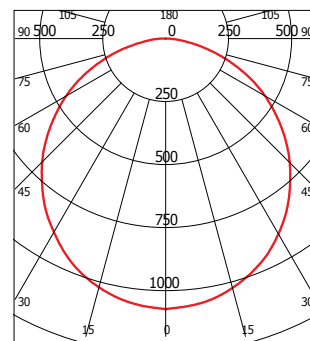
- Top View LED : 28 W / 56 W

Electrical

- AC 100 ~ 240 V, 50/60 Hz
- Ambient Temperature : -30 °C ~ 45 °C
- Lifetime : 5 years

Light Distribution Curve [cd]

LEB807WF



— : 0°

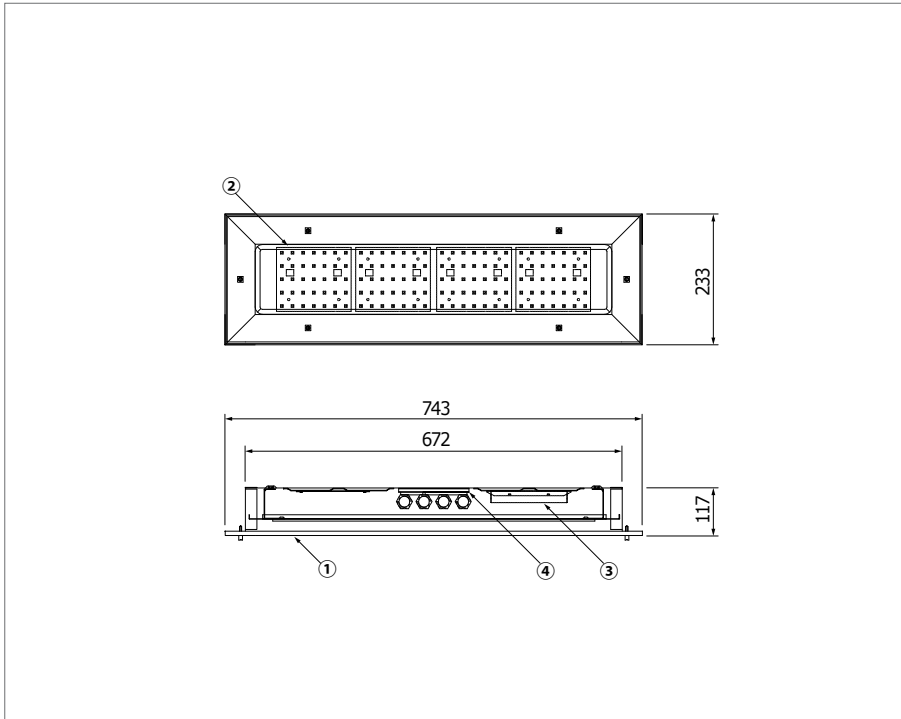
Specification

Model No.	Capacity	L(mm)	W(mm)	H(mm)	Weight(kg)	Remarks
LEB407WF-0550S	28 W	743	233	117	6.80	
	» Equivalent to FL. Lamp (18 W x 2)					
LEB807WF-0550S	56 W	1353	233	117	9.41	
	» Equivalent to FL. lamp (36 W x 2)					



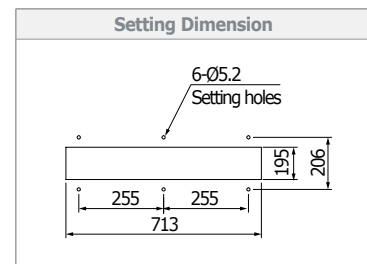
LEB407WF-0550S-WG

Technical Drawing



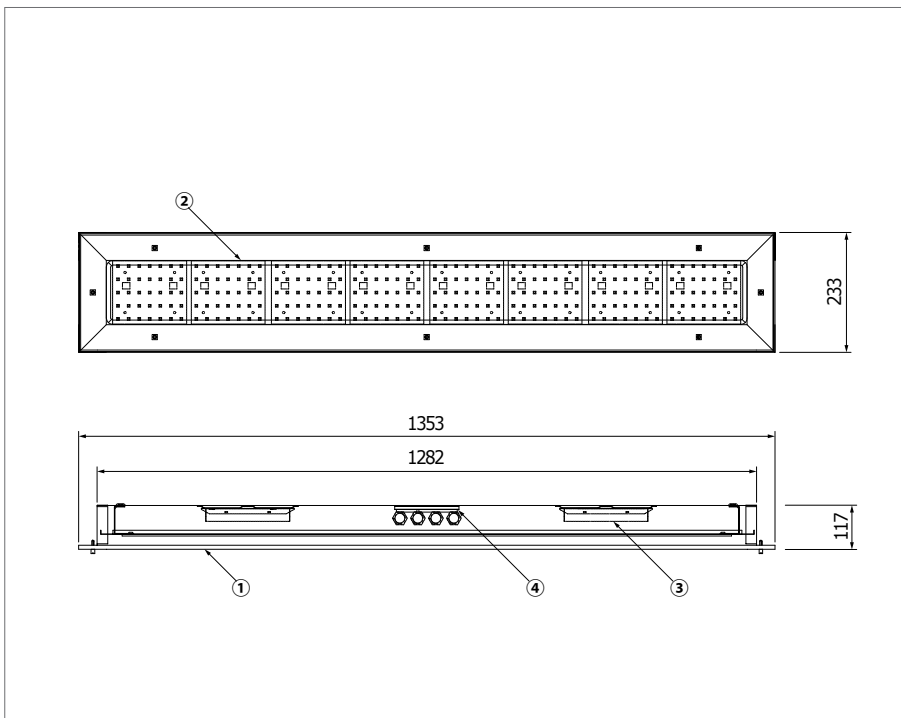
Part List

No	Part Name	Part Number
1	Globe	64607182
2	LED module	60070135
3	LED driver	17061812
4	Terminal Block	18020352



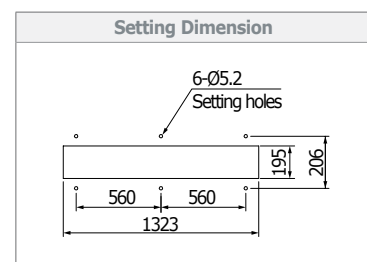
LEB807WF-0550S-WG

Technical Drawing



Part List

No	Part Name	Part Number
1	Globe	64607183
2	LED module	60070135
3	LED driver	17061812
4	Terminal Block	18020352



LED Decorative Recessed Ceiling Light

LEB407NF-S / LEB807NF-S



Application

Accommodation area, saloon, dining hall, passage way

Protection degree IP20

Materials

- Body: Electro zinc coated steel sheet
- Globe: Polycarbonate

Finish

- Body: Epoxy powder coat and stove enameled (Munsell No.N-9.3)

Light Source

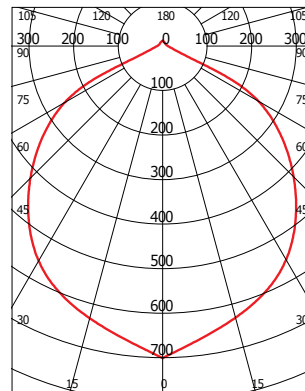
- Top View LED : 28 W / 56 W

Electrical

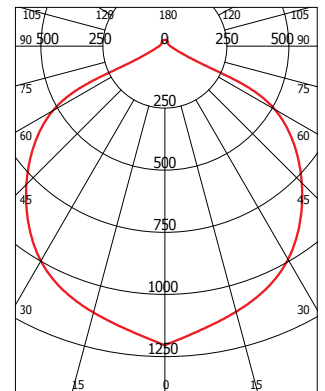
- AC 100 ~ 240 V, 50/60 Hz
- Ambient Temperature : -30 °C ~ 45 °C
- Lifetime : 5 years

Light Distribution Curve [cd]

LEB407NF



LEB807NF



— : 0°

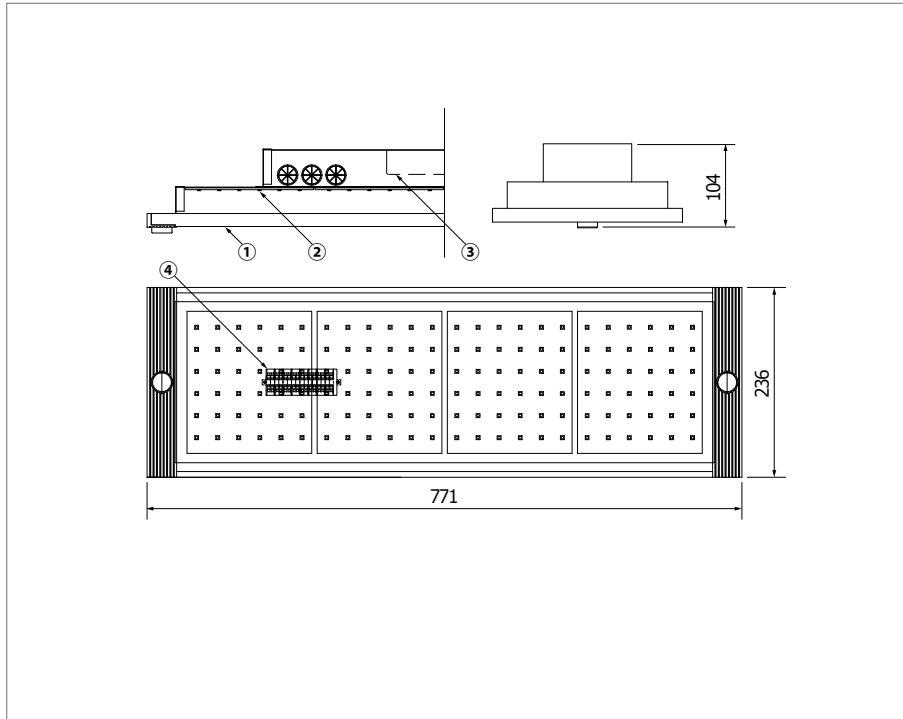
Specification

Model No.	Capacity	L(mm)	W(mm)	H(mm)	Weight(kg)	Remarks
LEB407NF-0550S	28 W	771	236	104	3.6	» Equivalent to FL. Lamp (18 W x 2)
LEB807NF-0550S	56 W	1403	236	104	7.0	» Equivalent to FL. lamp (36 W x 2)



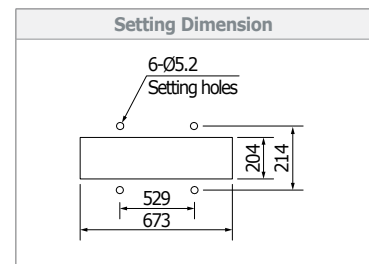
LEB407NF-0550S

Technical Drawing



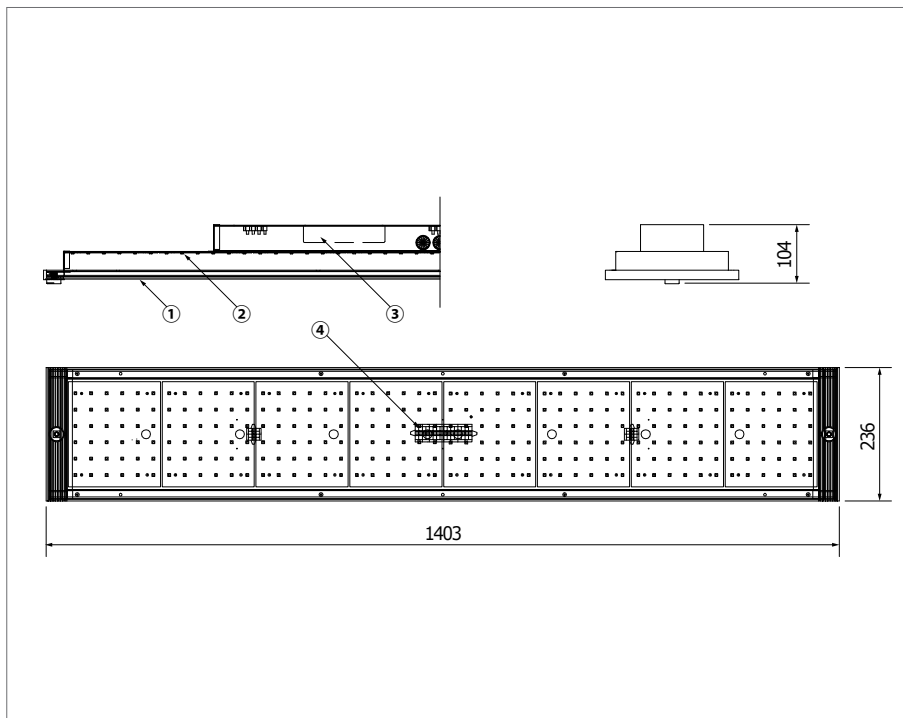
Part List

No	Part Name	Part Number
1	Globe	64320440
2	LED module	96240545
3	LED driver	17061804
4	Terminal Block	18020352



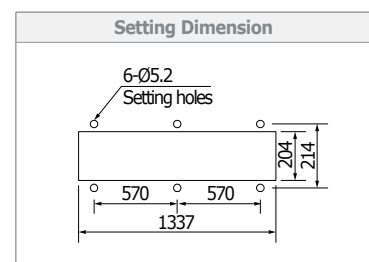
LEB807NF-0550S

Technical Drawing



Part List

No	Part Name	Part Number
1	Globe	64320441
2	LED module	96240545
3	LED driver	17061804
4	Terminal Block	18020352



LED Recessed Ceiling Light (No Gap Type)

LEB407NF-SN-A / LEB807NF-SN-A



Application

Accommodation area, saloon, dining hall, passage way

Protection degree IP20

Materials

- Body: Electro zinc coated steel sheet
- Globe: Polycarbonate

Finish

- Body: Epoxy powder coat and stove enameled (Munsell No.N-9.3)

Light Source

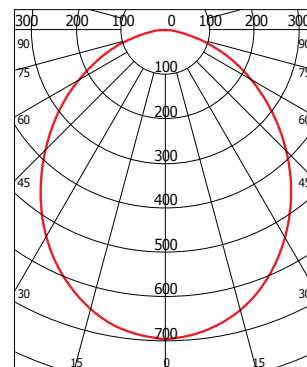
- Top View LED : 28 W / 56 W

Electrical

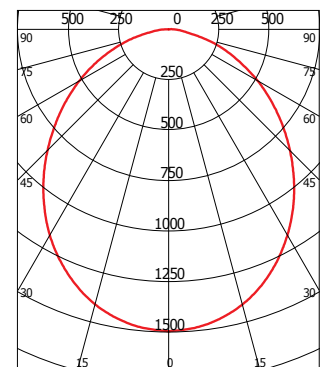
- AC 100 ~ 240 V, 50/60 Hz
- Ambient Temperature : -30 °C ~ 45 °C
- Lifetime : 5 years
- Fire protection degree : B15

Light Distribution Curve [Cd]

LEB407NF



LEB807NF



— : 0°

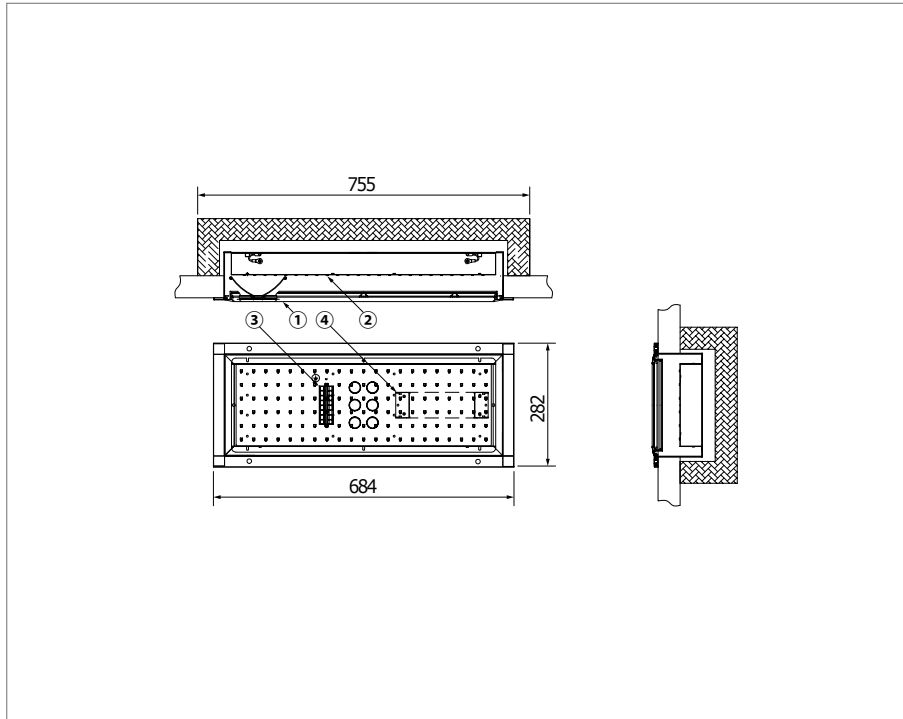
Specification

Model No.	Capacity	L(mm)	W(mm)	H(mm)	Weight(kg)	Remarks
LEB407NF-0550SNC50-B15A	28 W	684	282	100	3.6	
LEB807NF-0550SNC50-B15A	56 W	1294	282	100	7.0	



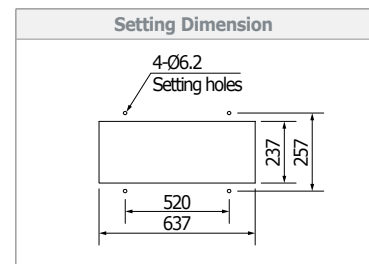
LEB407NF-0550SNC50-B15A

Technical Drawing



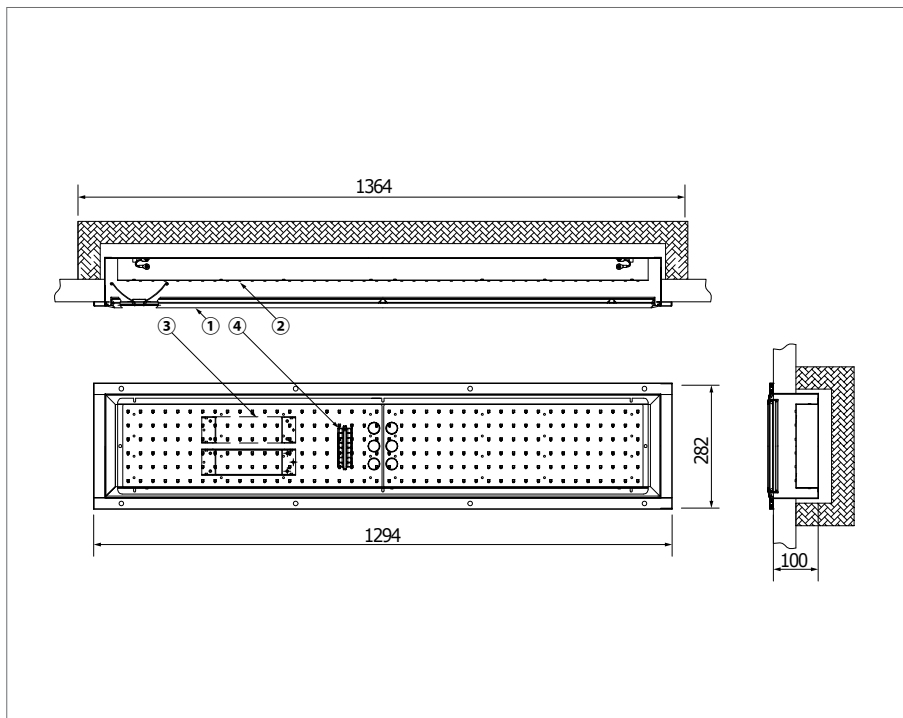
Part List

No	Part Name	Part Number
1	Globe	64320584
2	LED module	60070204
3	LED driver	17061818
4	Terminal Block	18020352



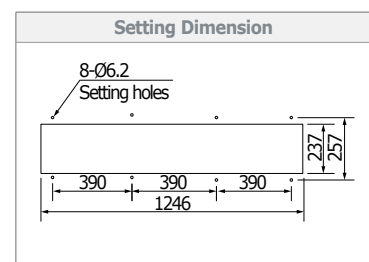
LEB807NF-0550SNC50-B15A

Technical Drawing



Part List

No	Part Name	Part Number
1	Globe	64320585
2	LED module	60070204
3	LED driver	17061818
4	Terminal Block	18020352



LED Surface Ceiling Light

LET211NS / LET219NS



Application

Passage way, corner

Protection degree IP20

Materials

- Body : Electro zinc coated steel sheet
- Globe : Opal acryl

Finish

- Body : White epoxy powder coat and stove enameled (Munsell No.N-9.3)

Light Source

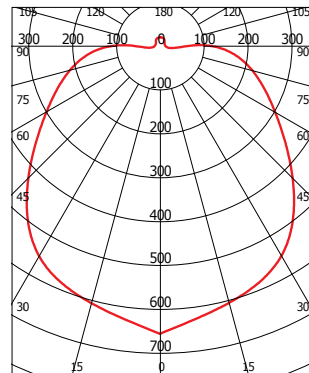
- Tubular LED : 11 W / 19 W

Electrical

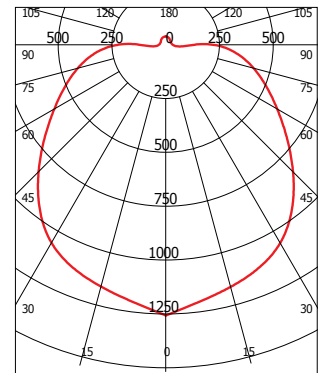
- AC 100 ~ 240 V, 50/60 Hz
- Ambient Temperature : -30 °C ~ 45 °C
- Lifetime : 5 years

Light Distribution Curve [cd]

LET211NS



LET219NS



— : 0°

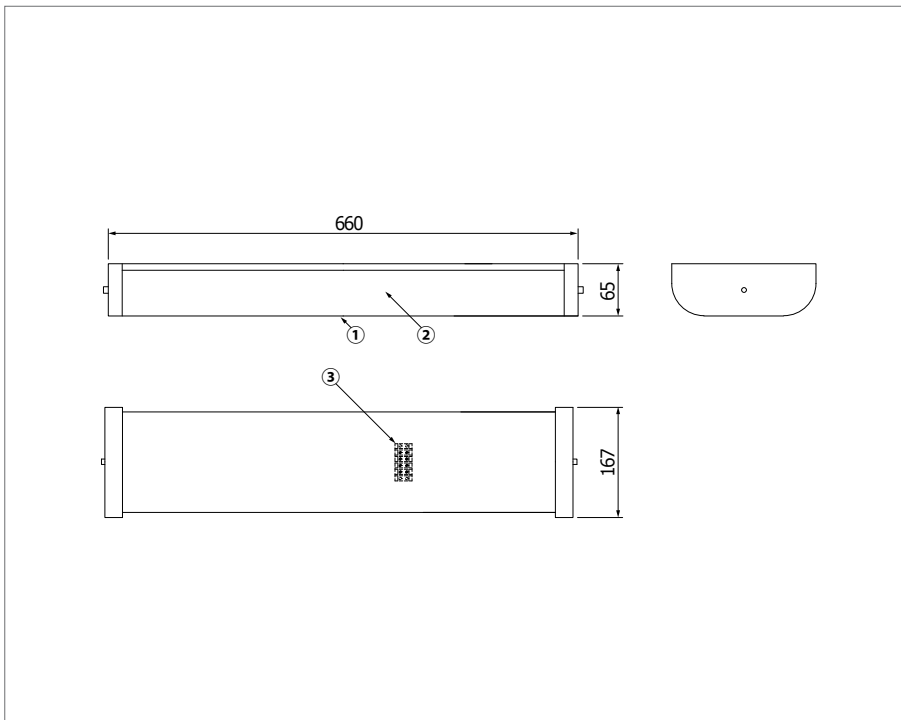
Specification

Model No.	Capacity	L(mm)	W(mm)	H(mm)	Weight(kg)	Remarks
LET211NS-0550S	22 W	660	167	65	4.23	» Equivalent to FL. Lamp (11 W x 2)
LET219NS-0550S	38 W	1280	167	65	7.33	» Equivalent to FL. Lamp (19 W x 2)



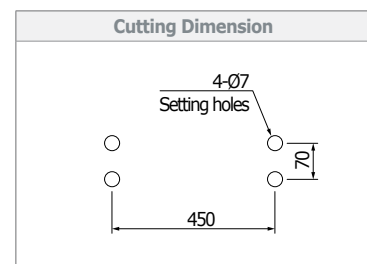
LET211NS-0550S

Technical Drawing



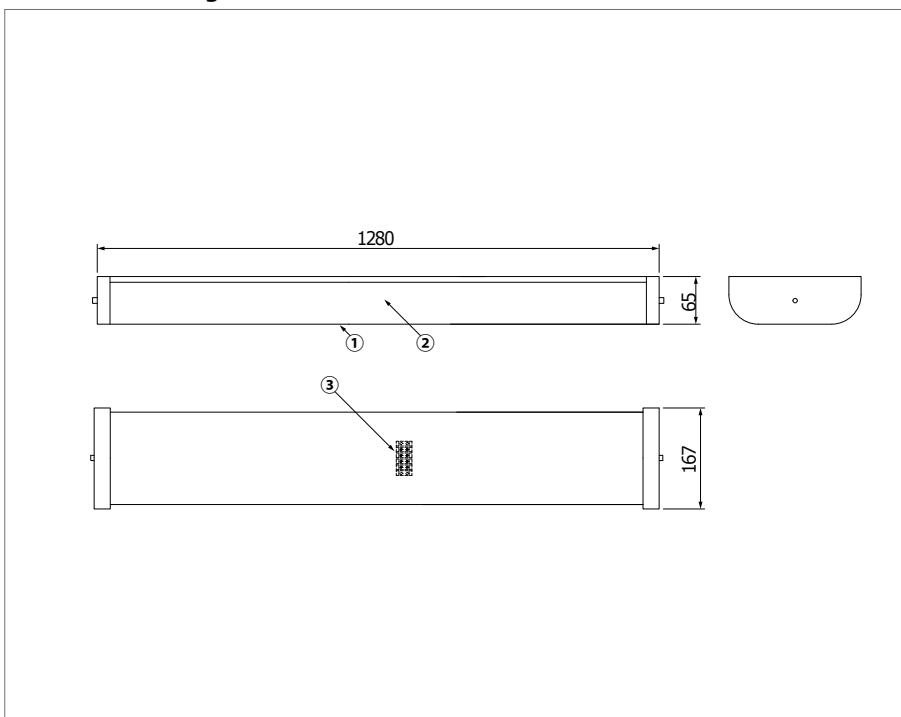
Part List

No	Part Name	Part Number
1	Globe	64600011
2	Tubular LED	.
3	Terminal Block	.



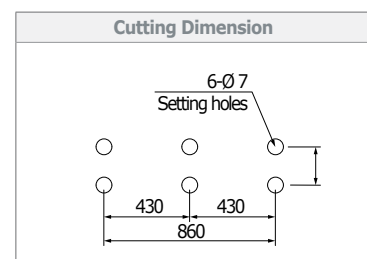
LET219NS-0550S

Technical Drawing



Part List

No	Part Name	Part Number
1	Globe	64600008
2	Tubular LED	.
3	Terminal Block	.



LED Recessed Dampa Ceiling Light

LEB212NF-D / LEB412NF-D



Application

Accommodation area, saloon, dining hall

Protection degree IP20

Materials

- Body & Globe flame: Electro zinc coated steel sheet
- Globe : Opal polycarbonate

Finish

- Body : White epoxy powder coat and stove enameled (Munsell No.N-9.3)

Light Source

- Top View LED : 24 W / 48 W

Electrical

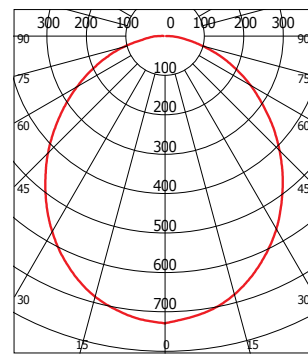
- AC 100 ~ 240 V, 50/60 Hz
- Ambient Temperature : -30 °C ~ 45 °C
- Lifetime : 5 years

Option

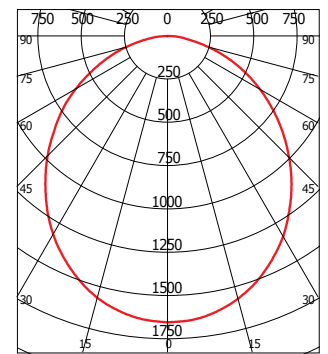
- Emergency : DC 24 V, 5 W or 10 W
- Dimming function

Light Distribution Curve [cd]

LEB 212NF-D



LEB 412NF-D



— : 0°

Specification

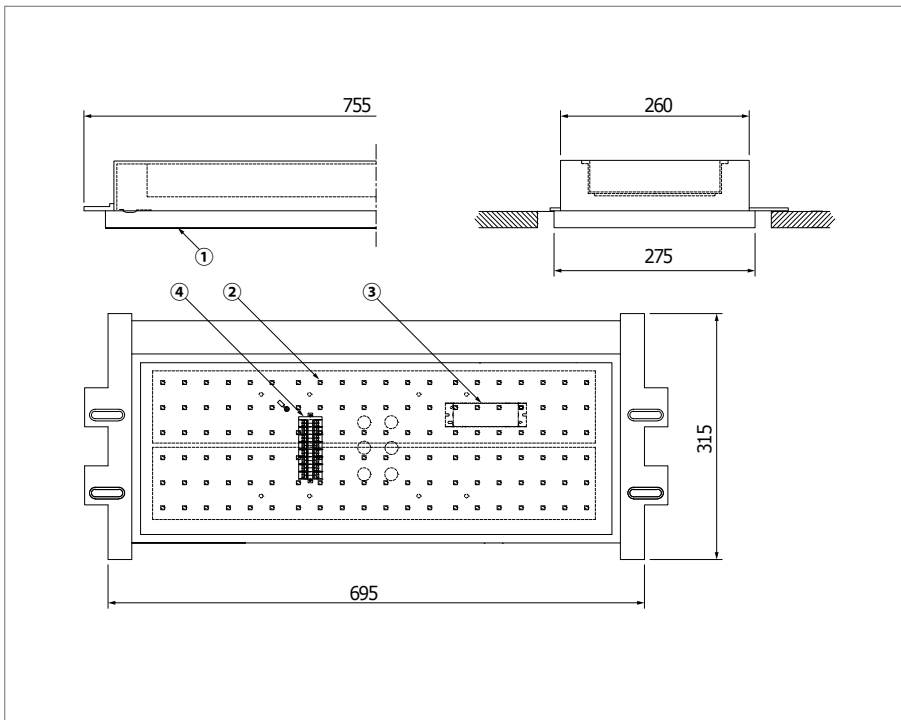
Model No.	Capacity	L(mm)	W(mm)	H(mm)	Weight(kg)	Remarks
LEB212NF-0550D	24 W	755	315	85	6.09	
	» Equivalent to FL. lamp (18 W x 2)					
LEB212NF-5550D	24 W	755	315	85	6.09	Emergency
	» Equivalent to FL. lamp (18 W x 2)					
LEB412NF-0550D	48 W	1380	315	85	8.02	
	» Equivalent to FL. lamp (36 W x 2)					
LEB412NF-1550D	48 W	1380	315	85	8.02	Emergency
	» Equivalent to FL. lamp (36 W x 2)					

Option -----



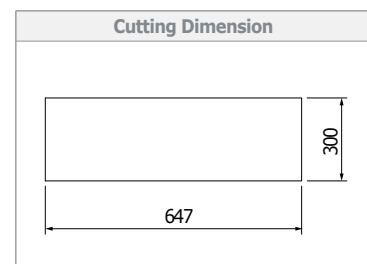
LEB212NF-D

Technical Drawing



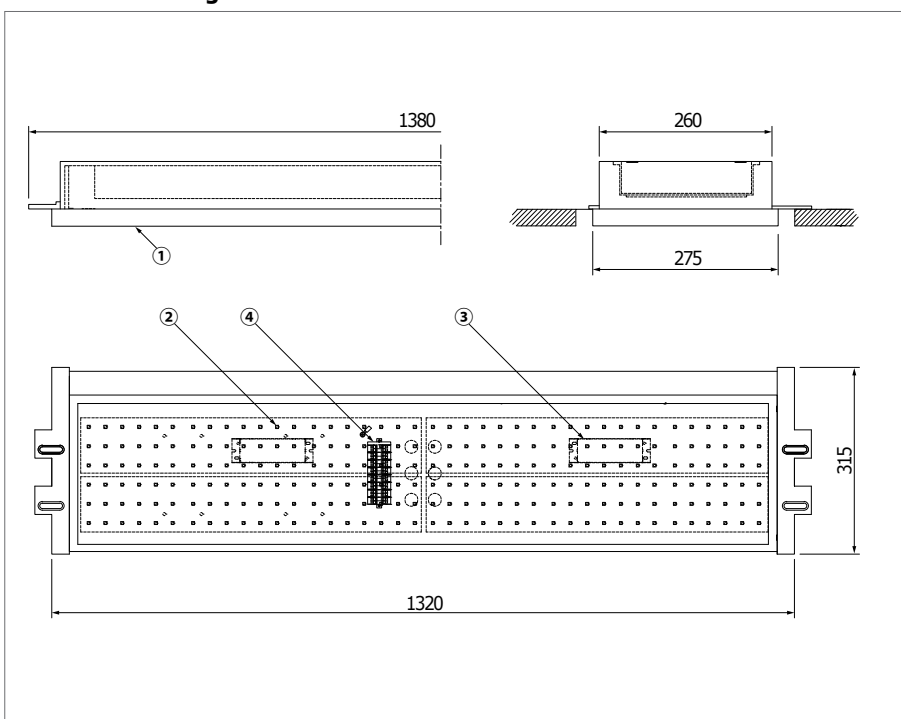
Part List

No	Part Name	Part Number
1	Globe	64607165
2	LED module	60070140
3	LED driver	17061818
4	Terminal Block	18020352



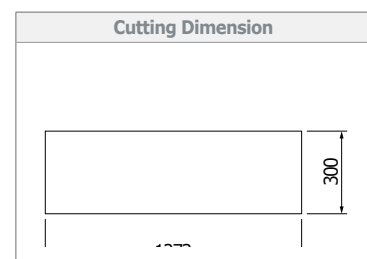
LEB412NF-D

Technical Drawing



Part List

No	Part Name	Part Number
1	Globe	64607164
2	LED module	60070140
3	LED driver	17061818
4	Terminal Block	18020352



LED Recessed Ceiling Light

LEB125NF / LEB225NF



Application

Accommodation area, saloon, dining hall

Protection degree IP20

Materials

- Body : Electro zinc coated steel sheet
- Globe : Opal acryl

Finish

- Body : White epoxy powder coat and stove enameled (Munsell No.N-9.3)

Light Source

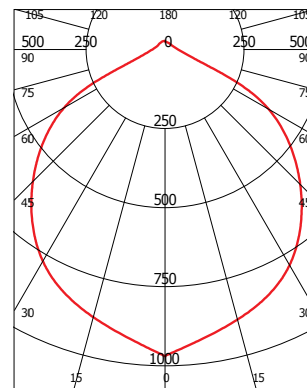
- Top View LED : 25 W / 50 W

Electrical

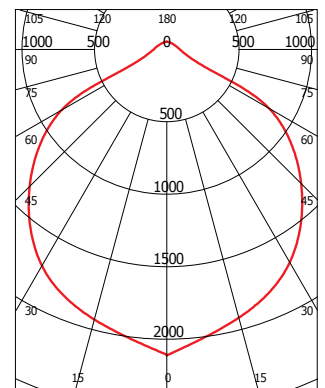
- AC 100 ~ 240 V, 50/60 Hz
- Ambient Temperature : -30 °C ~ 45 °C
- Lifetime : 5 years

Light Distribution Curve [cd]

LEB125NF



LEB225NF



— : 0°

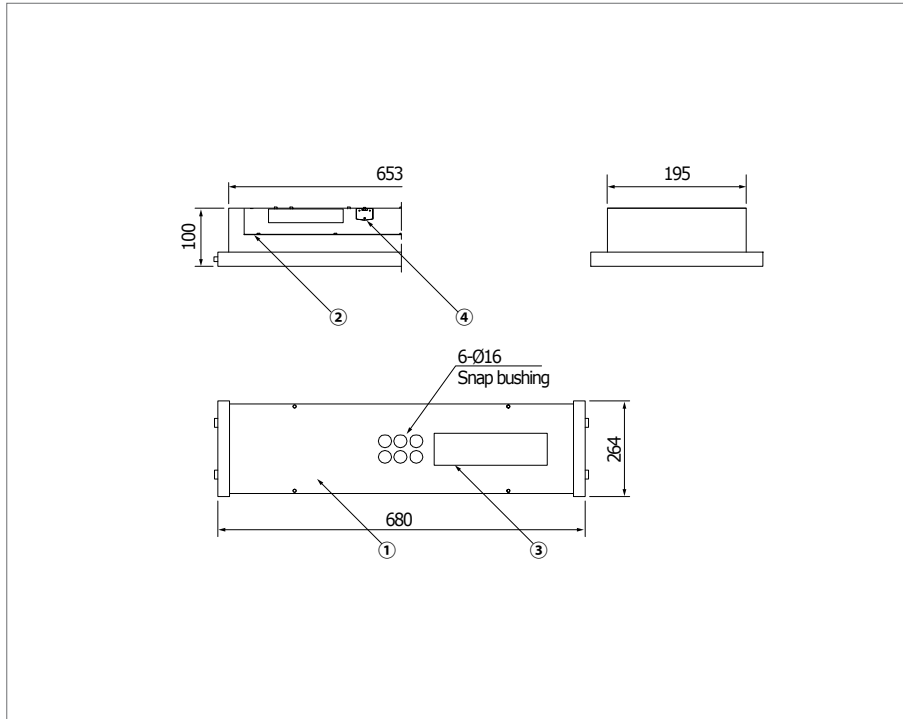
Specification

Model No.	Capacity	L(mm)	W(mm)	H(mm)	Weight(kg)	Remarks
LEB125NF-0550S	25 W	680	264	100	4.5	
	» Equivalent to FL. lamp (18 W x 3)					
LEB225NF-0550S	50 W	1294	264	100	7.5	
	» Equivalent to FL. lamp (36 W x 3)					



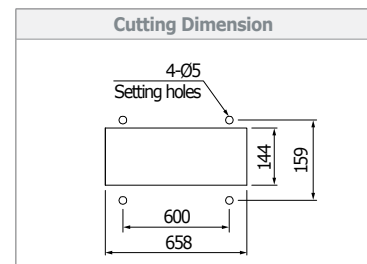
LEB125NF-0550S

Technical Drawing



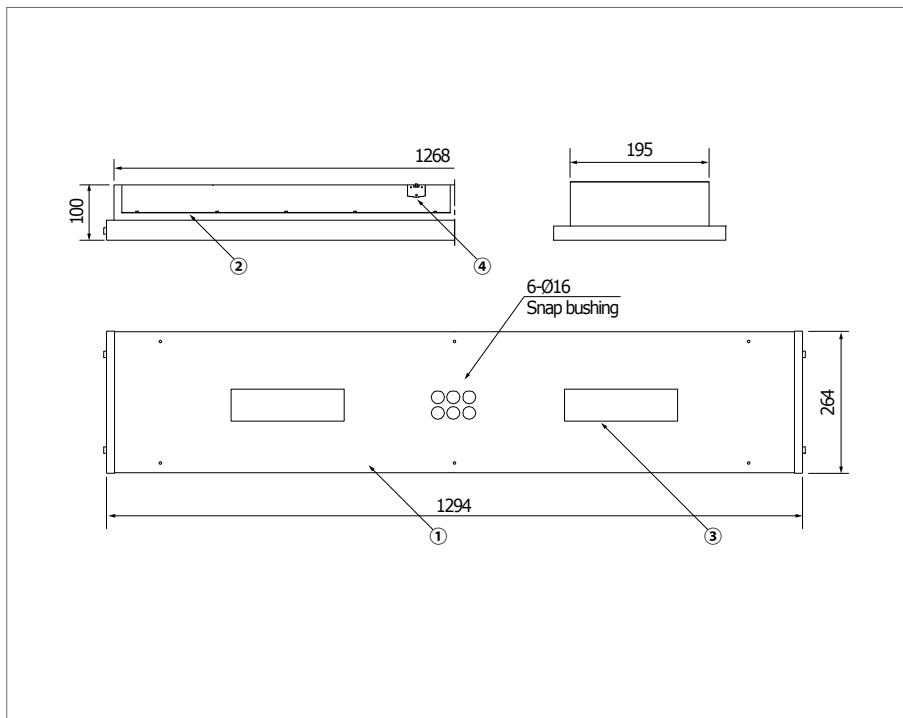
Part List

No	Part Name	Part Number
1	Globe	64320440
2	LED module	96240545
3	LED driver	17061804
4	Terminal Block	18020352



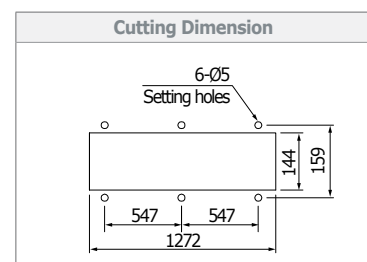
LEB225NF-0550S

Technical Drawing



Part List

No	Part Name	Part Number
1	Globe	64320585
2	LED module	60070204
3	LED driver	17061818
4	Terminal Block	18020352



LED Decorative Recessed Ceiling Light

LEB407NL / LEB807NL



Application

Saloon, dining hall

Protection degree IP20

Materials

- Body & flame : Electro zinc coated steel sheet
- Globe : Louver type (Golden & Silver)

Finish

- Body : White epoxy powder coat and stove enameled (Munsell No.N-9.3)

Light Source

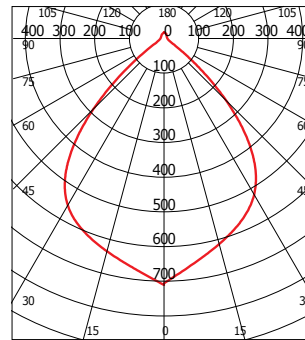
- Top View LED : 28 W / 56 W

Electrical

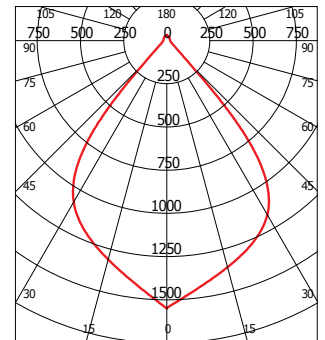
- AC 100 ~ 240 V, 50/60 Hz
- Ambient Temperature : -30 °C ~ 45 °C
- Lifetime : 5 years

Light Distribution Curve [cd]

LEB407NL



LEB807NL



— : 0°

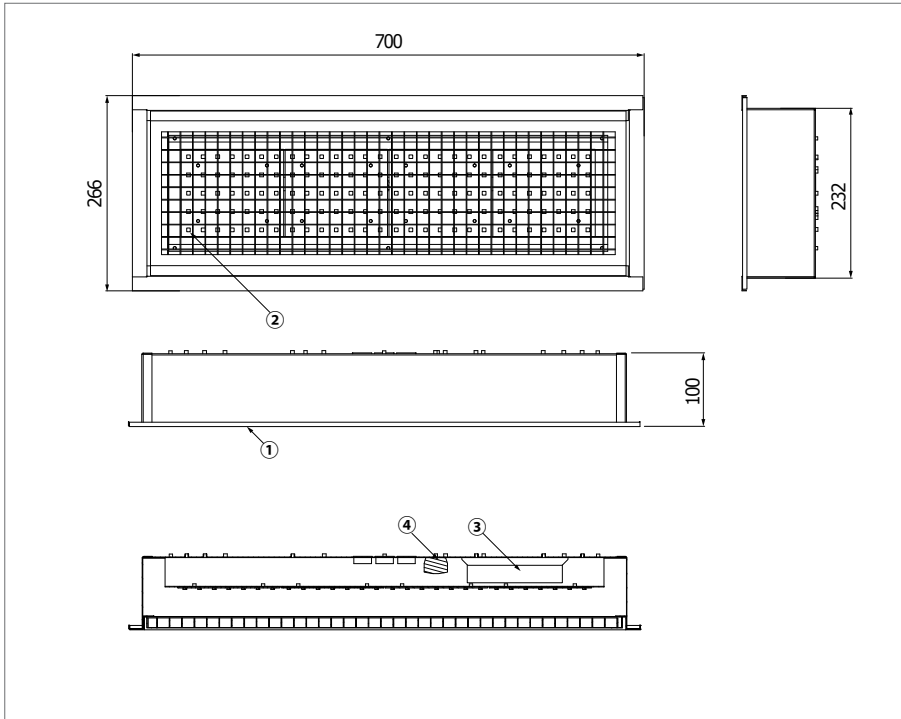
Specification

Model No.	Capacity	L(mm)	W(mm)	H(mm)	Weight(kg)	Remarks
LEB407NL-0550S	28 W	700	266	100	6.88	
	» Equivalent to FL. lamp (18 W x 2)					
LEB807NL-0550S	56 W	1302	266	100	9.49	
	» Equivalent to FL. lamp (36 W x 2)					



LEB407NL

Technical Drawing



Part List

No	Part Name	Part Number
1	Globe	.
2	LED module	96240545
3	LED driver	17061804
4	Terminal Block	18020352

LED Decorative Recessed Ceiling Light



LEB407NT / LEB807NT

Application

Saloon, dining hall

Protection degree IP20

Materials

- Body & flame : Electro zinc coated steel sheet
- Globe : Opal polycarbonate

Finish

- Body : White epoxy powder coat and stove enameled (Munsell No.N-9.3)

Light Source

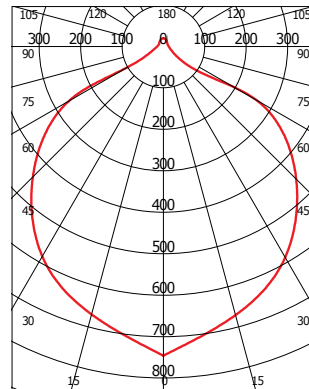
- Top View LED : 28 W / 56 W

Electrical

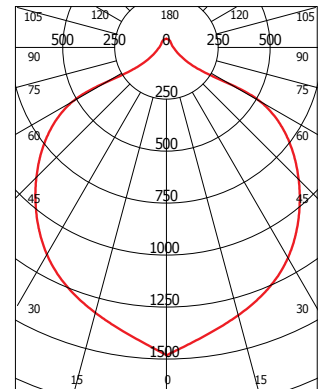
- AC 100 ~ 240 V, 50/60 Hz
- Ambient Temperature : -30 °C ~ 45 °C
- Lifetime : 5 years

Light Distribution Curve [cd]

LEB407NT



LEB807NT



— : 0°

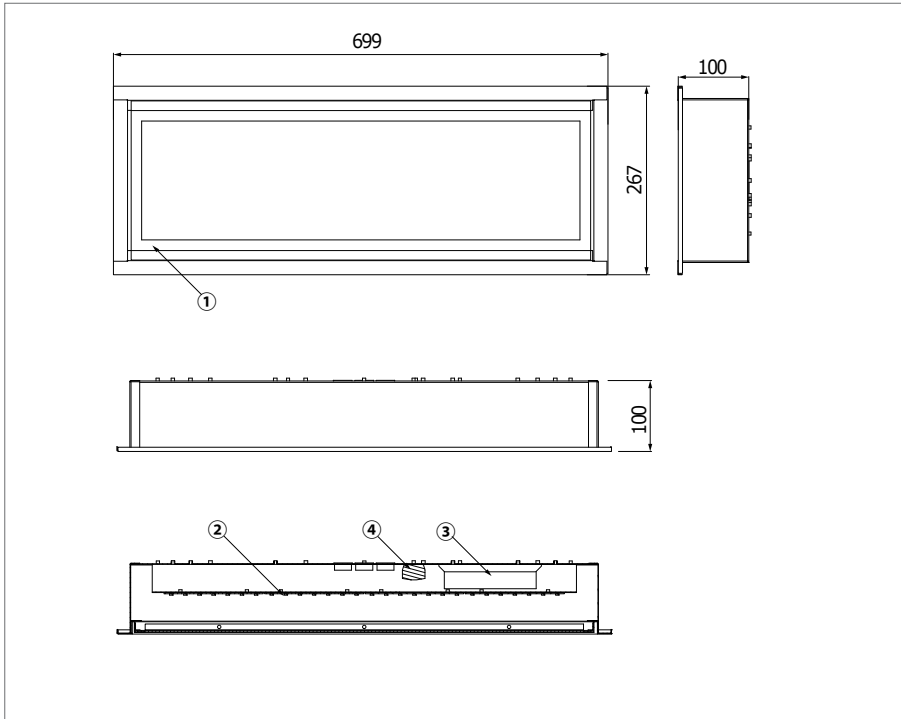
Specification

Model No.	Capacity	L(mm)	W(mm)	H(mm)	Weight(kg)	Remarks
LEB407NT-0550S	28 W	699	267	100	6.88	» Equivalent to FL. lamp (18 W x 2)
LEB807NT-0550S	56 W	1302	267	100	9.49	» Equivalent to FL. lamp (36 W x 2)



LEB407NT

Technical Drawing



Part List

No	Part Name	Part Number
1	Globe	.
2	LED module	96240545
3	LED driver	17061804
4	Terminal Block	18020352

LED Corner Ceiling Light

LEBN404NS / LEBN804NS



Application

Passage way, corner

Protection degree IP20

Materials

- Body : Electro zinc coated steel sheet
- Globe : Opal acryl

Finish

- Body : White epoxy powder coat and stove enameled (Munsell No. N-9.3)

Equipment

- Top View LED : 16 W / 32 W

Electrical

- AC 100 ~ 240 V, 50/60 Hz
- Ambient Temperature : -30 °C ~ 45 °C
- Lifetime : 5 years

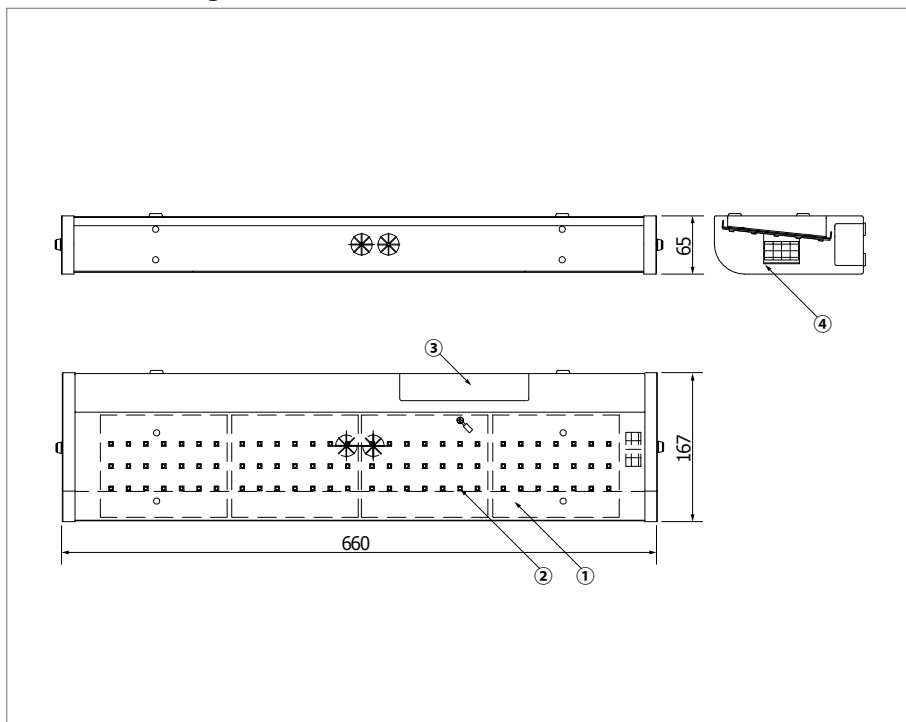
Specification

Model No.	Capacity	L(mm)	W(mm)	H(mm)	Weight(kg)	Remarks
LEBN404NS-0550S	16 W	660	167	65	3.75	
	» Equivalent to FL. lamp (18 W x 1)					
LEBN804NS-0550S	32 W	1278	167	65	5.23	
	» Equivalent to FL. lamp (36 W x 1)					



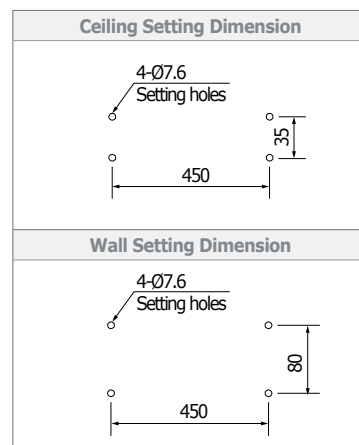
LEBN404NS-0550SC50

Technical Drawing



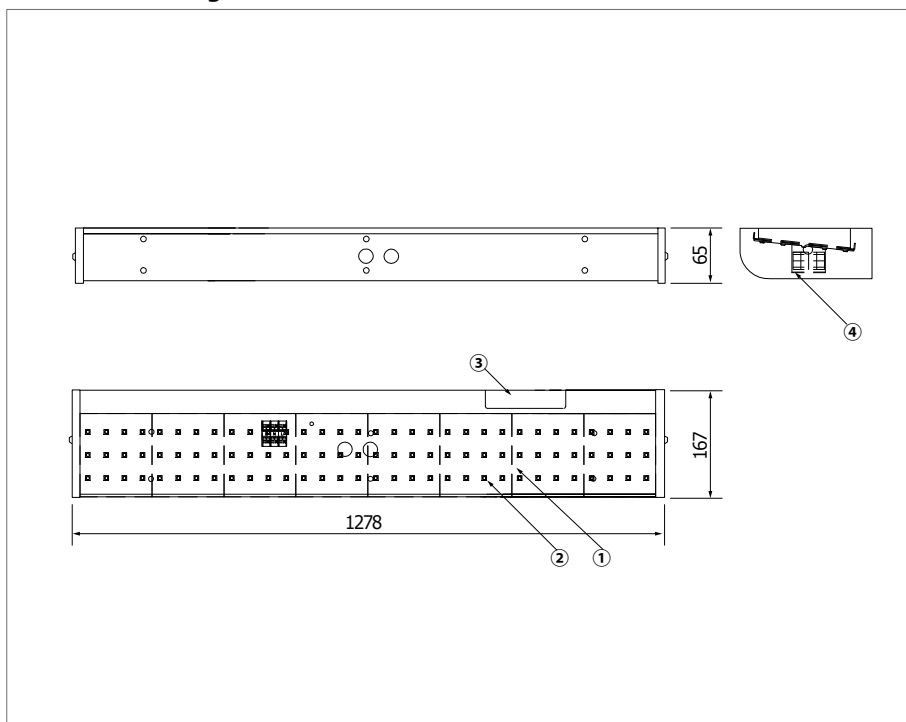
Part List

No	Part Name	Part Number
1	Globe	64600197
2	LED module	96240544
3	LED driver	17061803
4	Terminal Block	18023191



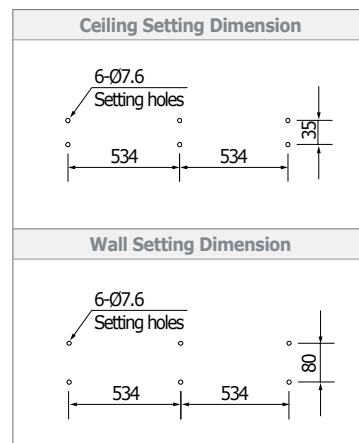
LEBN804NS-0550SC50

Technical Drawing



Part List

No	Part Name	Part Number
1	Globe	64600154
2	LED module	96240544
3	LED driver	17061803
4	Terminal Block	18023191



LED Desk Light

LEBD107 / LEBD110



Application

Accommodation area, indoor

Protection degree IP20

Materials

- Body : Aluminum
- End caps : ABS
- Globe : Opal polycarbonate

Finish

- Body : White epoxy powder coat and stove enameled (Munsell No.N-9.3)
- End caps : White

Light Source

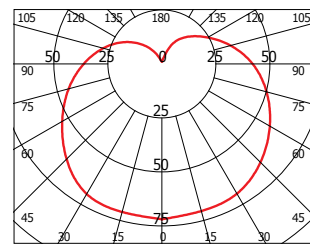
- Top View LED : 7 W / 10 W

Electrical

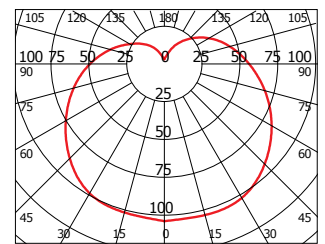
- AC 100 ~ 240 V, 50/60 Hz
- Ambient Temperature : -30 °C ~ 45 °C
- Lifetime : 5 years

Light Distribution Curve [cd]

LEBD107



LEBD110



— : 0°

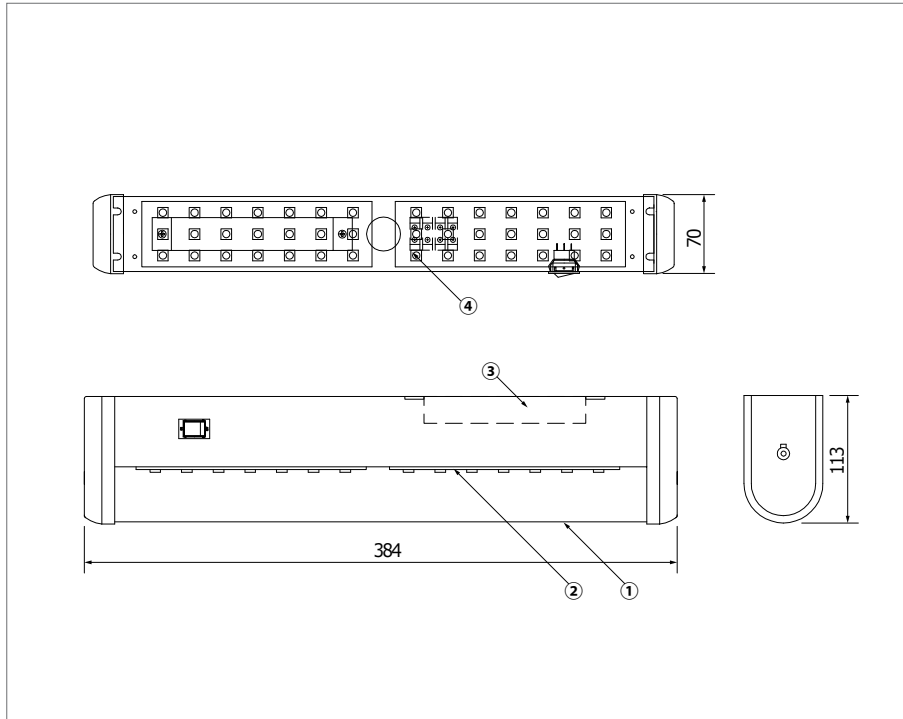
Specification

Model No.	Capacity	L(mm)	W(mm)	H(mm)	Weight(kg)	Remarks
LEBD107-0550S	7 W	384	70	113	1.4	
	» Equivalent to FL. lamp (8 W x 1 / 10 W x 1)					
LEBD110-0550S	10 W	534	70	113	2.2	
	» Equivalent to FL. lamp (15 W x 1 / 18 W x 1)					
LEBD107-W550AN	7 W	.	.	.	.
	»					
LEBD110-W550AN	10 W	.	.	.	.
	»					



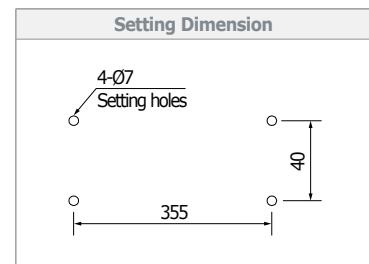
LEBD107NS-W550AN

Technical Drawing



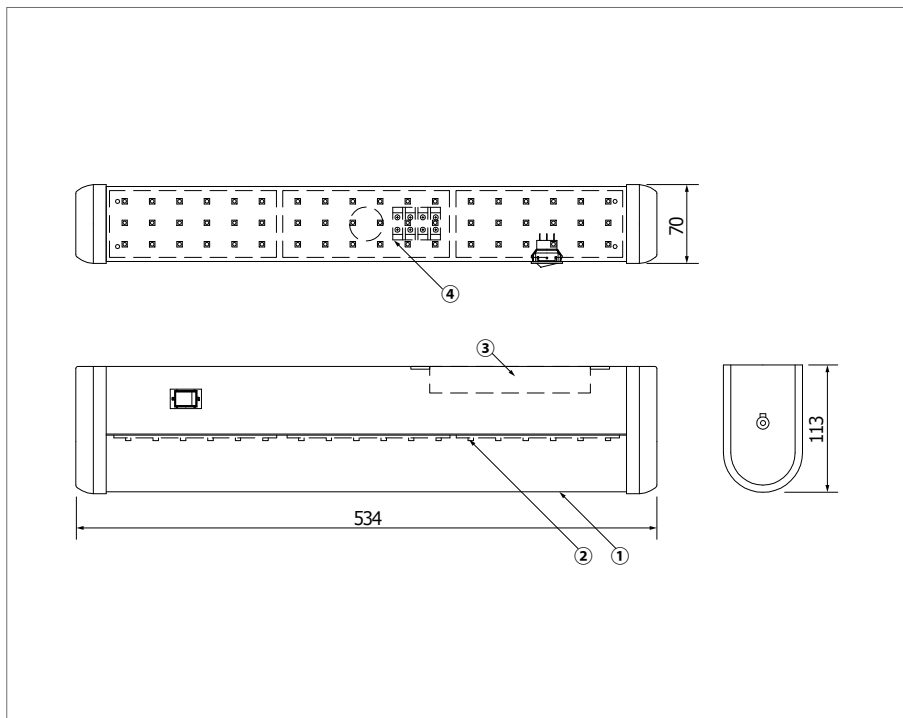
Part List

No	Part Name	Part Number
1	Globe	64600157
2	LED module	96240585
3	LED driver	17061943
4	Terminal Block	18022529



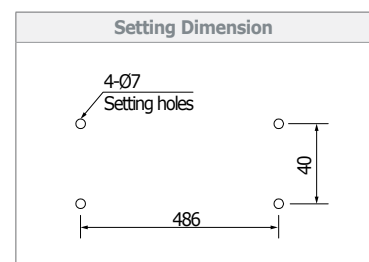
LEBD110NS-W550AN

Technical Drawing



Part List

No	Part Name	Part Number
1	Globe	64600655
2	LED module	96240586
3	LED driver	17061944
4	Terminal Block	18022529



LED Mirror Light

LEBM107 / LEBM110



Application

Indoor, toilet, shower room

Protection degree IP44

Materials

- Body : Aluminum
- End caps : ABS
- Globe : Opal polycarbonate

Finish

- Body : White epoxy powder coat and stove enameled (Munsell No.N-9.3)
- End caps : White

Light Source

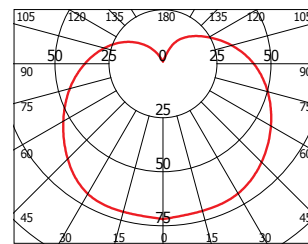
- Top View LED : 7 W / 10 W

Electrical

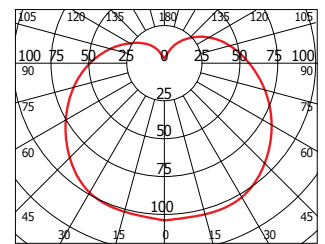
- AC 100 ~ 240 V, 50/60 Hz
- Ambient Temperature : -30 °C ~ 45 °C
- Lifetime : 5 years

Light Distribution Curve [cd]

LEBM107



LEBM110



— : 0°

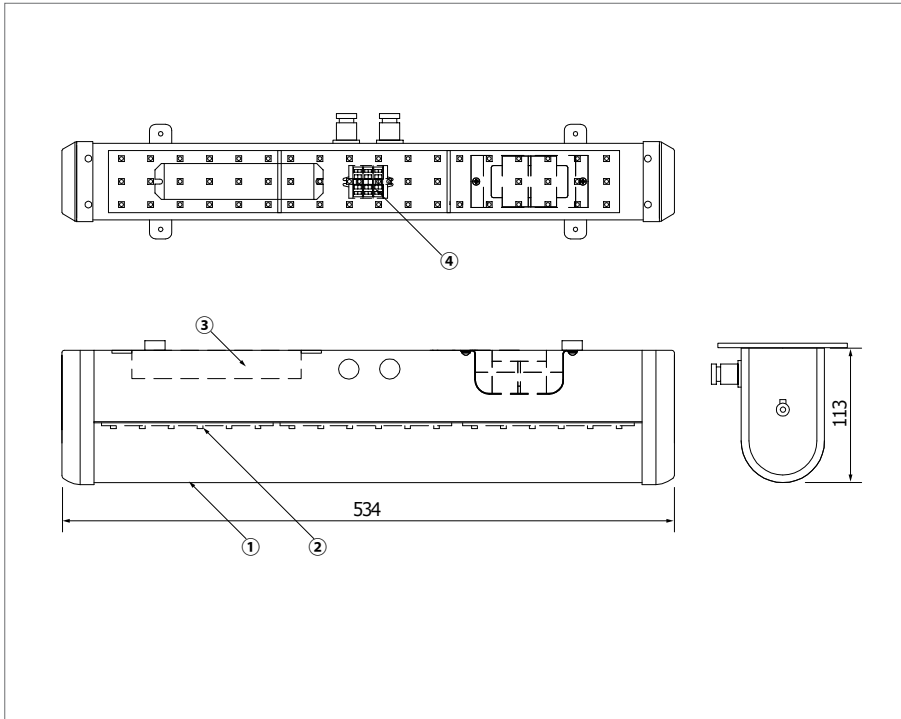
Specification

Model No.	Capacity	L(mm)	W(mm)	H(mm)	Weight(kg)	Remarks
LEBM107-0550S	7 W	384	105	113	1.4	
	» Equivalent to FL. lamp (8 W x 1 / 10 W x 1)					
LEBM110-0550S	10W	534	105	113	2.2	
	» Equivalent to FL. lamp (15 W x 1 / 18 W x 1)					
LEBM107-W550AN	7 W	.	.	.	.
	»					
LEBM110-W550AN	10W	.	.	.	.
	»					



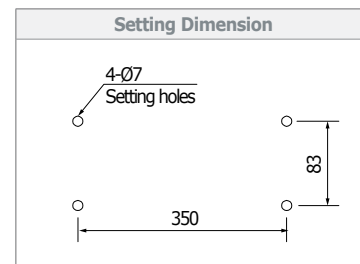
LEBM107SR-T550ANC50-WG

Technical Drawing



Part List

No	Part Name	Part Number
1	Globe	64600655
2	LED module	96240586
3	LED driver	17061944
4	Terminal Block	18020355



LED Bed Light

LEBB107 / LEBB110



Application

Accommodation area, indoor

Protection degree IP20

Materials

- Body : Aluminum
- End caps : ABS
- Globe : Opal polycarbonate

Finish

- Body : White epoxy powder coat and stove enameled (Munsell No.N-9.3)
- End caps : White

Light Source

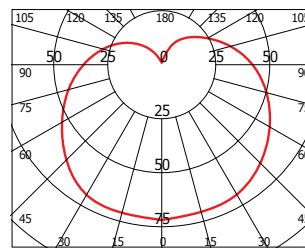
- Top View LED : 7 W / 10 W

Electrical

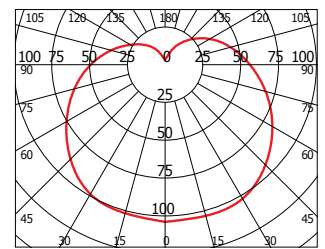
- AC 100 ~ 240 V, 50/60 Hz
- Ambient Temperature : -30 °C ~ 45 °C
- Lifetime : 5 years

Light Distribution Curve [cd]

LEBB107



LEBB110



— : 0°

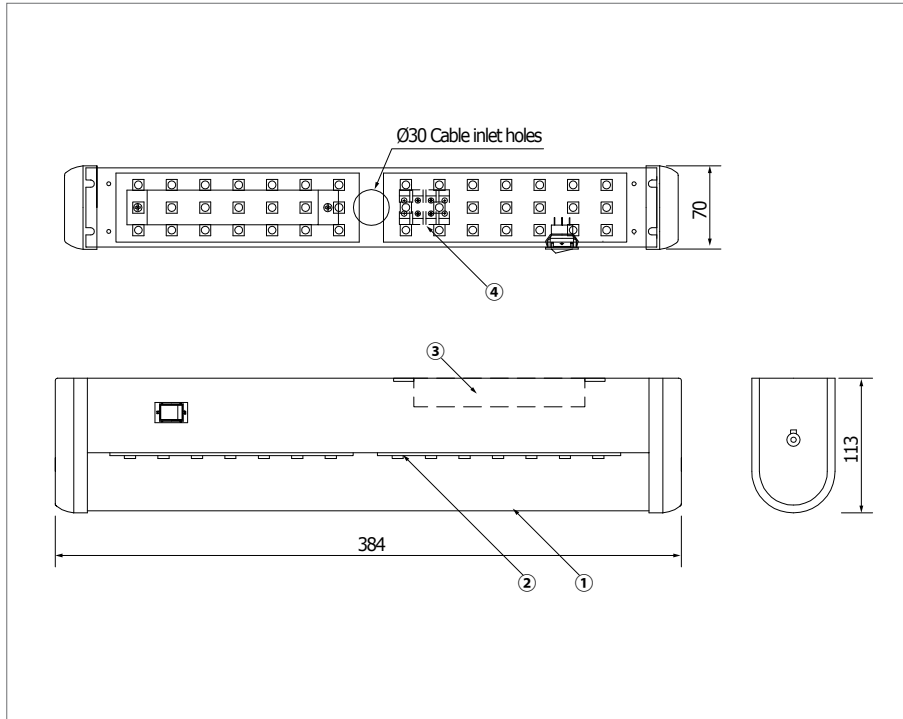
Specification

Model No.	Capacity	L(mm)	W(mm)	H(mm)	Weight(kg)	Remarks
LEBB107-0550S	7 W	384	70	113	1.4	
	» Equivalent to FL. lamp (8 W x 1, 10 W x 1)					
LEBB110-0550S	10 W	534	70	113	2.2	
	» Equivalent to FL. lamp (15 W x 1, 18 W x 1)					



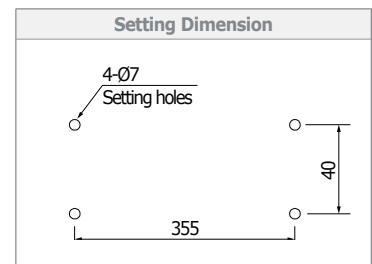
LEBB107NS-W550AN

Technical Drawing



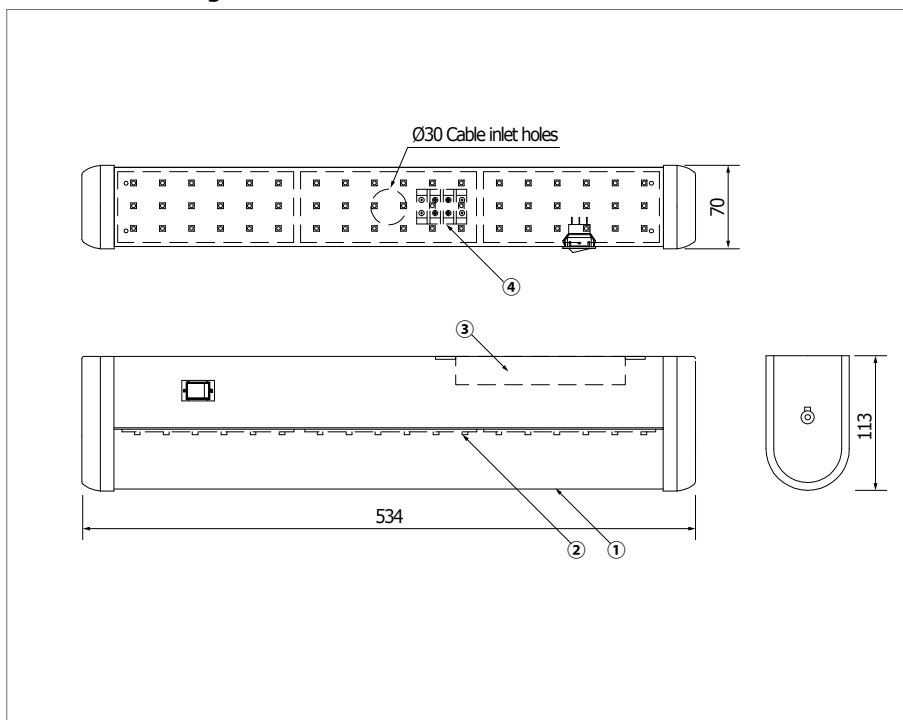
Part List

No	Part Name	Part Number
1	Globe	64600157
2	LED module	96240585
3	LED driver	17061943
4	Terminal Block	18022529



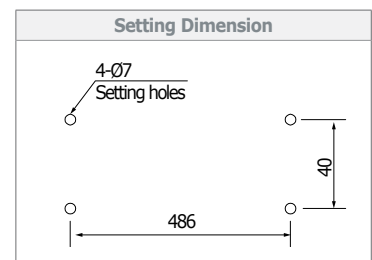
LEBB110NS-W550AN

Technical Drawing



Part List

No	Part Name	Part Number
1	Globe	64600655
2	LED module	96240586
3	LED driver	17061944
4	Terminal Block	18022529



LED Dome Light

LECD09-U



Application

Work shop, refrigeration chamber

Protection degree IP56

Materials

- Body : Stainless steel, deep drawn
- Globe : Clear glass + Globe Polycarbonate

Finish

- Body : White epoxy powder coat and stove enameled (Munsell No. N-9.3)

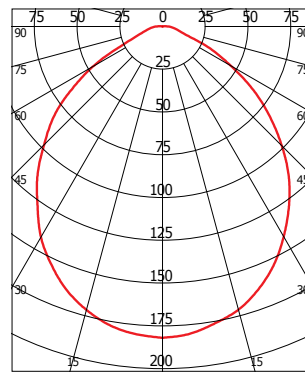
Light Source

- Top View LED : 9 W

Electrical

- AC 100 ~ 240 V, 50/60 Hz
- Ambient Temperature : -30 °C ~ 45 °C
- Lifetime : 5 years

Light Distribution Curve [cd]



— : 0°

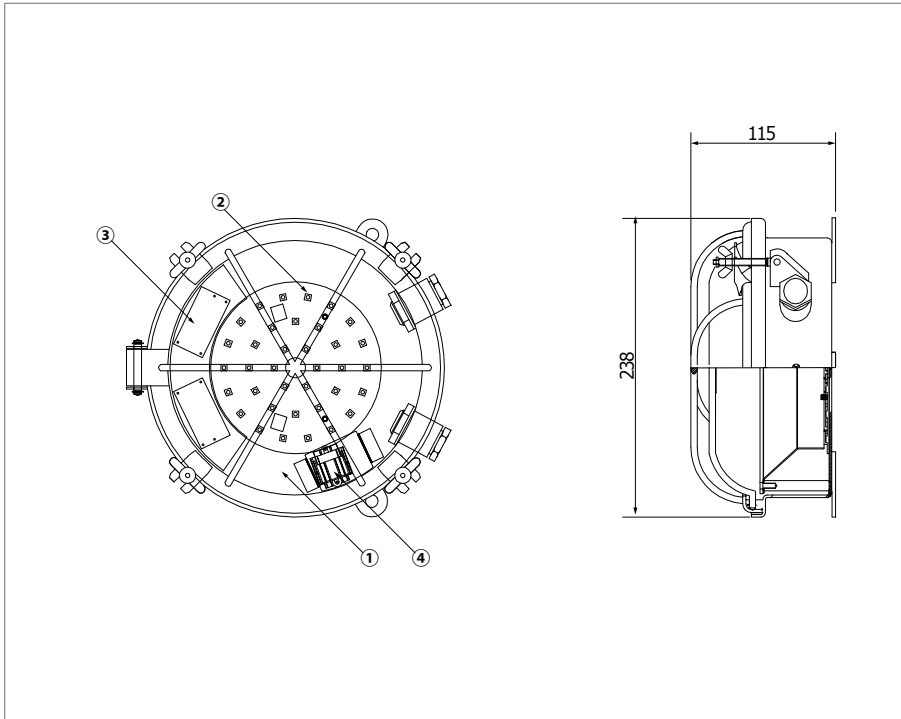
Specification

Model No.	Capacity	L(mm)	W(mm)	H(mm)	Weight(kg)	Remarks
LECD09-0550UWC	9 W	238	238	115	3.3	» Equivalent to Incan. lamp (60 W)



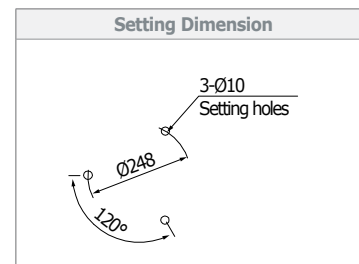
LECD09-55UWC

Technical Drawing



Part List

No	Part Name	Part Number
1	Globe	64320439
2	LED module	96240548
3	LED driver	17061798
4	Terminal Block	18023187



LED Down Light

LO13-20W



Application

Accommodation area, lounge, dining hall

Protection degree IP20

Materials

- Body : Steel sheet, deep drawn
- Frame : Silver & golden color coated

Finish

- Body : White epoxy powder coat and stove enameled (Munsell No. N-9.3)
- Frame : Silver & golden color coated

Light Source

- Base : E26 / E27
- LED Bulb : 9 W / 13 W
- LED CCT range : 2700 K ~ 6500 K
- *CCT : Correlated Color Temperature

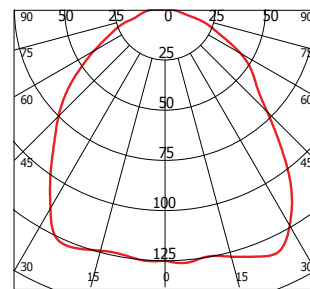
Electrical

- AC 100 ~ 240 V, 50/60 Hz
- Ambient Temperature : -30 °C ~ 45 °C
- Lifetime : 5 years

Option

- Dimming Function

Light Distribution Curve [cd]



— : 0°

Specification

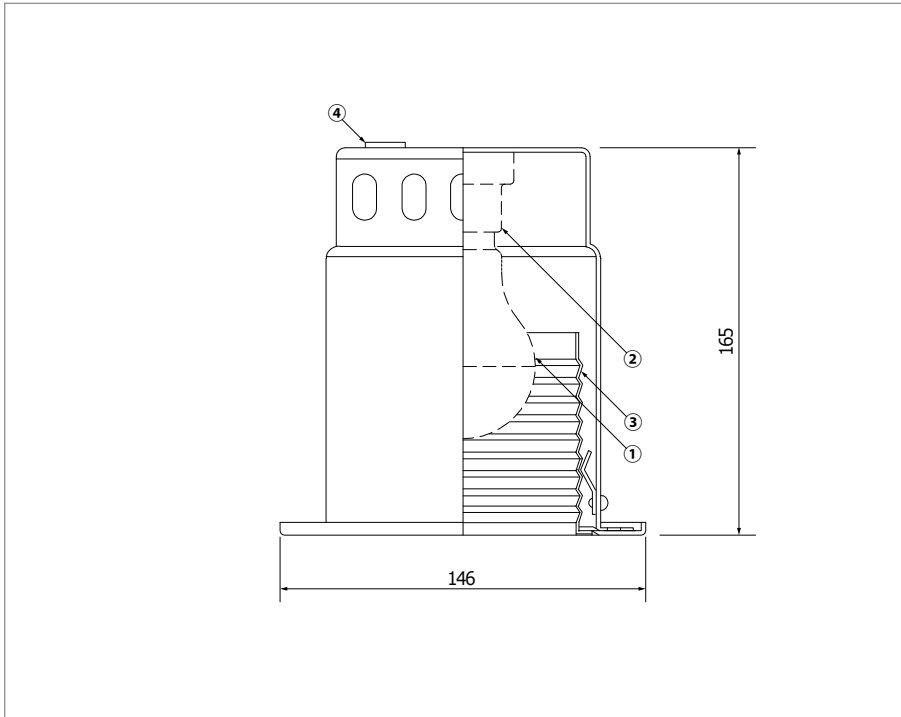
Model No.	Capacity	L(mm)	W(mm)	H(mm)	Weight(kg)	Remarks
LO09-20W	9 W	146	146	165	0.6	
	» Equivalent to Incan. lamp (60 W)					
LO13-20W	13 W	146	146	165	0.6	
	» Equivalent to Incan. lamp (60 W)					

Option ----



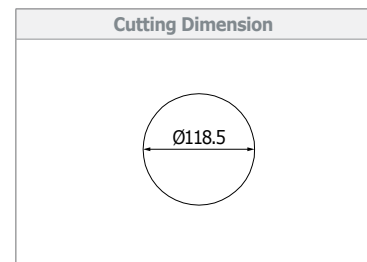
LO13-20W

Technical Drawing



Part List

No	Part Name	Part Number
1	LED Bulb	22872343
2	Lamp Holder	15100056
3	Screen	M100000116
4	Snap Bushing	64700012



LED Wall Light

LD09-GC



Application

Accommodation area, lounge, dining hall

Protection degree IP20

Materials

- Body : Steel sheet
- Shade : Linen

Finish

- Body : Golden color coat
- Shade : Linen

Light Source

- Base : E26 / E27
- LED Bulb : 9 W
- LED CCT range : 2700 K ~ 6500 K
- *CCT : Correlated Color Temperature

Electrical

- AC 100 ~ 240 V, 50/60 Hz
- Ambient Temperature : -30 °C ~ 45 °C
- Lifetime : 5 years

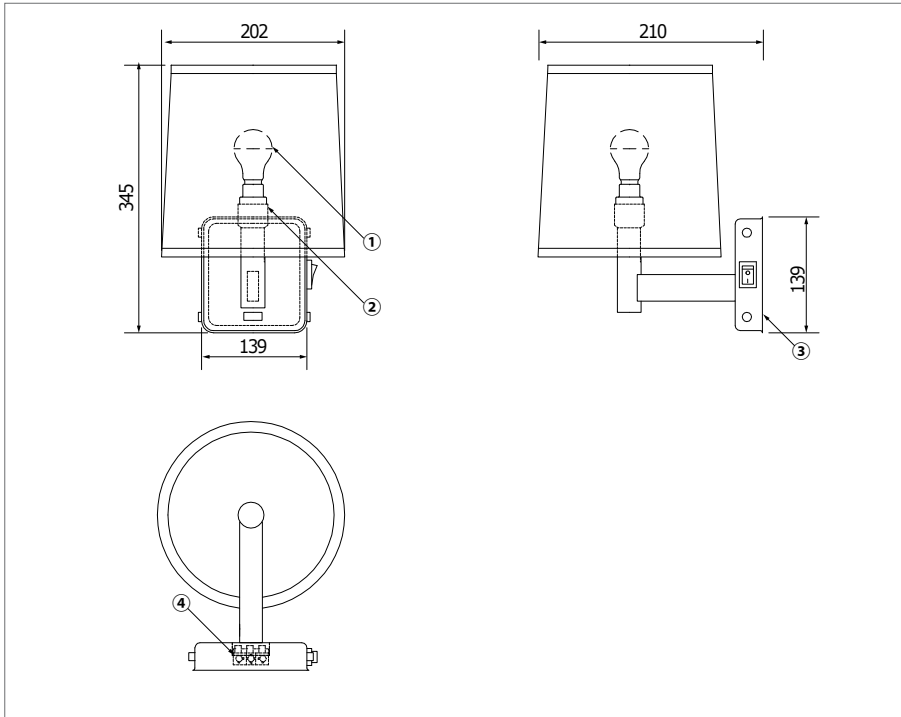
Specification

Model No.	Capacity	L(mm)	W(mm)	H(mm)	Weight(kg)	Remarks
LD09-23GC	9 W	202	210	345	1.8	
	» Equivalent to Incan. lamp (40 W)					



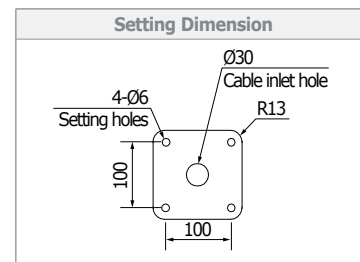
LD09-23GC

Technical Drawing



Part List

No	Part Name	Part Number
1	LED Bulb	22872343
2	Lamp Holder	22250010
3	Switch	Z1309-S001
4	3P Connector	36410121



LED Down Light

LECO115NF / LECO115WF
LECO118NF / LECO118WF



Application

Accommodation area, lounge, dining hall

Protection degree IP20 / IP44

- IP20 : LECO115NF, LECO118NF
- IP44 : LECO115WF, LECO118WF

Materials

- Body : Electro zinc coated steel sheet
- Frame : Electro zinc coated steel sheet deep drawn
- Globe : Polycarbonate

Finish

- Body and Frame : White epoxy powder coat and stove enamelled (Munsell No.N-9.3)
- Frame option : Silver & golden color coated, White epoxy powder coat and stove enamelled (Munsell No.N-9.3)

Light Source

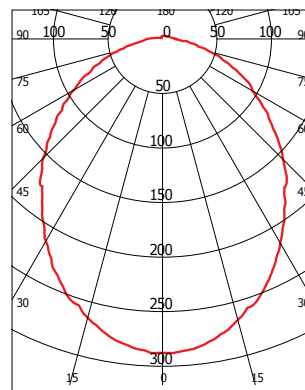
- Top View LED : 15 W

Electrical

- AC 100 ~ 240 V , 50/60 Hz
- Ambient Temperature : -30 °C ~ 45 °C
- Lifetime : 5 years

Light Distribution Curve [cd]

LECO118NF-0550G-B0



— : 0°

Specification

Option - Battery back-up, Dimming

Model No.	Capacity	L(mm)	W(mm)	H(mm)	Weight(kg)	Remarks
LECO115NF-A550WEGPC50	15 W	346	210	131.4	1.5	
	» Equivalent to CFL 18 W X 1					
LECO115NF-A550WEGPDsC50	15 W	346	210	131.4	1.5	Dimming
	» Equivalent to CFL 18 W X 1					
LECO115NF-A550WEGDs2R	15 W	346	210	131.4	1.5	Red Type, Dimming
	» Equivalent to CFL 18 W X 1					



Option - Dimming

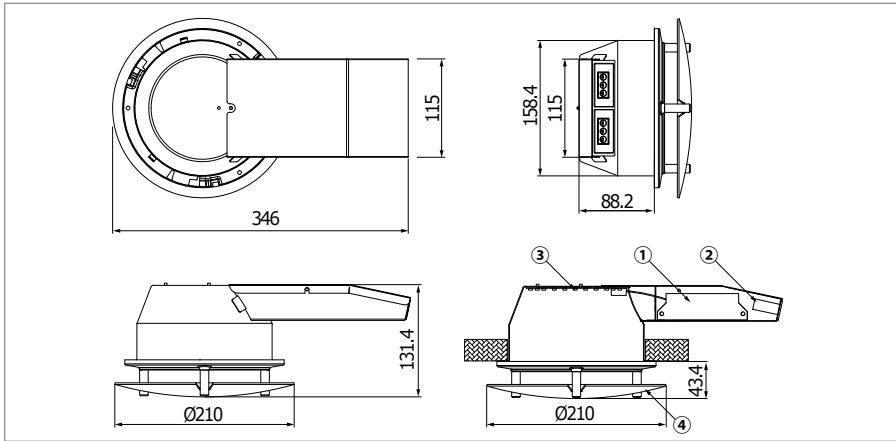
Model No.	Capacity	L(mm)	W(mm)	H(mm)	Weight(kg)	Remarks
LECO118NF-0550-B0A	15 W	346	210	131.4	1.5	
	» Equivalent to CFL 18 W X 1					
LECO118WF-0550G-B0A	15 W	346	210	131.4	1.5	
	» Equivalent to CFL 18 W X 1					
LECO118WF-0550GdR-B0A	15 W	334.2	186.4	100.2	1.5	Red Type, Dimming
	» Equivalent to CFL 18 W X 1					
LECO118WF-0550Gd-B0A	15 W	334.2	186.4	100.2	1.5	Dimming
	» Equivalent to CFL 18 W X 1					



Option -----

LECO118NF-0550-B0A

Technical Drawing



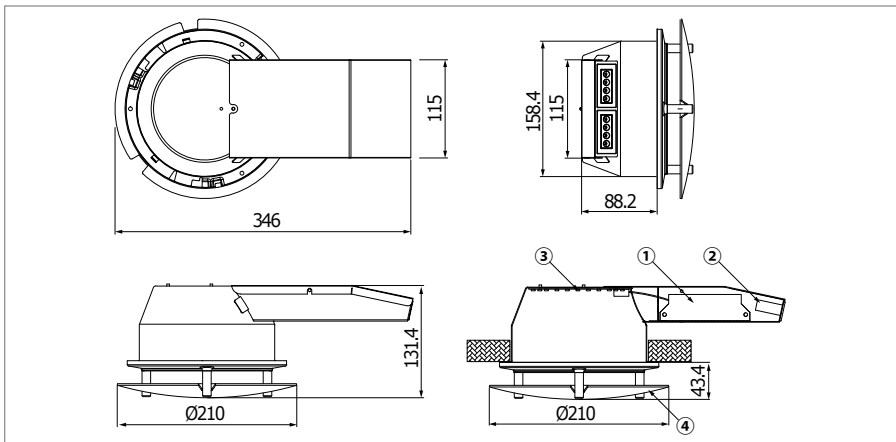
Part List



No	Part Name	Part Number
1	LED driver	96240647
2	3-Pole Connector	36410240 36410241
3	LED module	96240646
4	Globe	64607192

LECO118WF-0550G-B0A

Technical Drawing



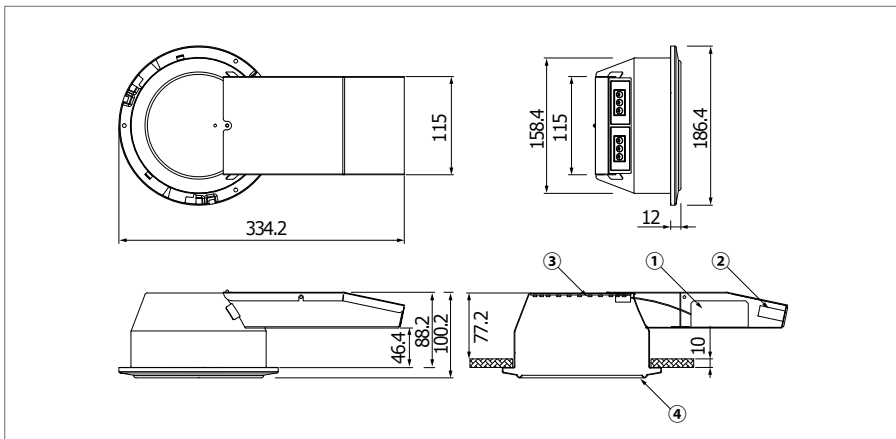
Part List



No	Part Name	Part Number
1	LED driver	96240647
2	4-Pole Connector	36410265 36410271
3	LED module	96240646
4	Globe	64607266

LECO118WF-0550GdR-B0A / LECO118WF-0550Gd-B0A

Technical Drawing



Part List



LECO118WF-0550GdR-B0A

No	Part Name	Part Number
1	LED driver	96240648
2	4-Pole Connector	36410265 36410271
3	LED module	96240648
4	Globe	64607266

LECO118WF-0550Gd-B0A

No	Part Name	Part Number
1	LED driver	17061923
2	4-Pole Connector	36410265 36410271
3	LED module	96240646
4	Globe	64607266

LED Desk Light

EL100

Application

Accommodation area

Protection degree IP20

Materials

• ABS

Finish

• Munsell No.N-9.3

Light Source

• Top View LED : 12 W

Electrical

- AC 100 ~ 240 V, 50/60 Hz
- 1.6m Cable & Plug(DIN)



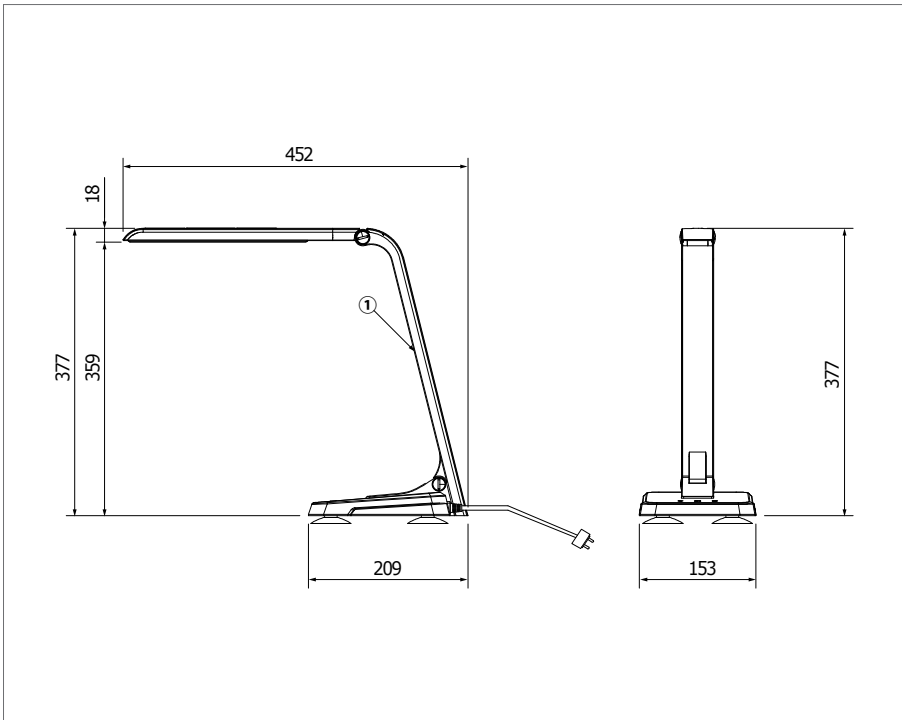
Specification

Model No.	Capacity	L(mm)	W(mm)	H(mm)	Weight(kg)	Remarks
EL100	12 W	41	153	377	1.2	



EL100

Technical Drawing



Part List

No	Part Name	Part Number
1	LED Desk Light	L14240050

LED Chart Table Light

LC09



Application

Wheel house

Protection degree IP20

Materials

- Arm : Steel pipe
- Reflector : Steel sheet
- Terminal box : Cast aluminium

Finish

- Body : White epoxy powder coat and stove enamelled (Munsell No. N-9.3)

Light Source

- Base : TE26 / TE27
- LED Bulb : 10 W
- LED CCT range : 2700 K ~ 6500 K
- *CCT : Correlated Color Temperature

Electrical

- AC 100 ~ 240 V, 50/60 Hz

Option

- Dimming Function



Specification

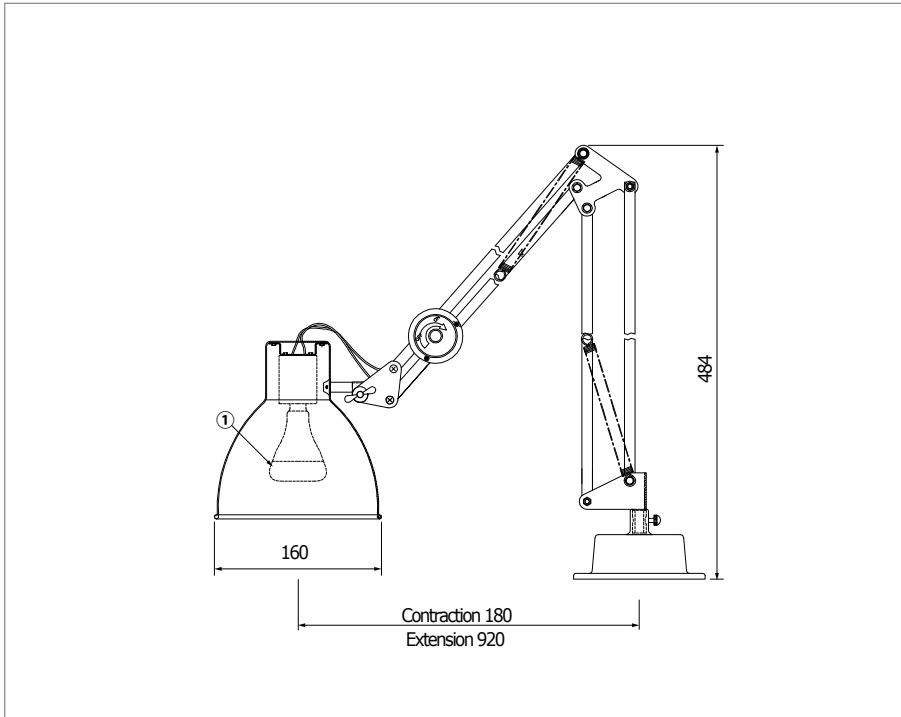
Model No.	Capacity	L(mm)	W(mm)	H(mm)	Weight(kg)	Remarks
LC09-IS	10 W	180	160	484	1.8	Stand
LC09-IW	10 W	180	160	484	1.8	Wall

Option ----



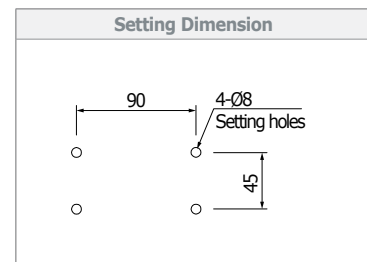
LC09-20IS-N3PD

Technical Drawing



Part List

No	Part Name	Part Number
1	Lamp (9 W)	22872345



LED Folding Table Light

LT09



Application

Wheel house, accommodation cabin

Protection degree IP20

- Available dimming control with adjustable reflector

Materials

- Body & Reflector : Electro zinc coated steel sheet

Finish

- Body : White epoxy powder coat and stove enamelled (Munsell No. N-9.3)

Light Source

- Base : TE26 / TE27
- LED Bulb : 9 W / 13 W
- LED CCT range : 2700 K ~ 6500 K
- *CCT : Correlated Color Temperature

Electrical

- AC 100 ~ 240 V, 50/60 Hz

Option

- Dimming Function

Specification

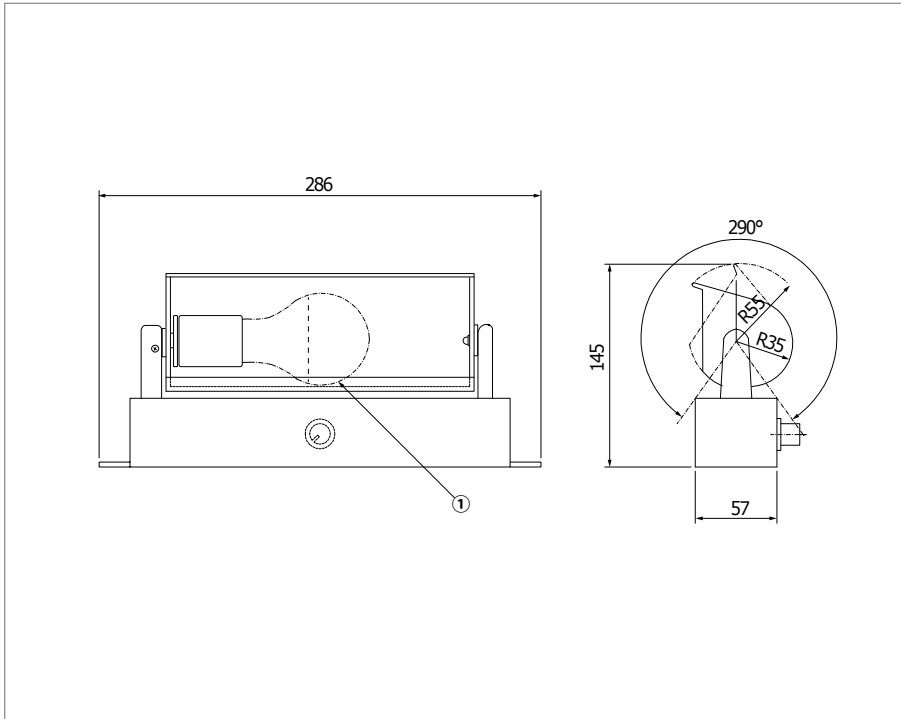
Model No.	Capacity	L(mm)	W(mm)	H(mm)	Weight(kg)	Remarks
LT09-24W	9 W	286	57	145	1	
LT13-24W	13 W	286	57	145	1	

Option ----



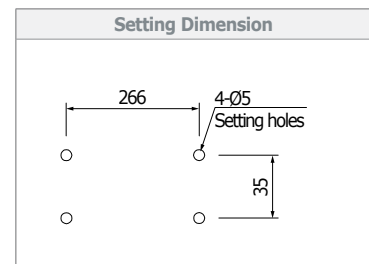
LT09

Technical Drawing



Part List

No	Part Name	Part Number
1	Lamp (9 W)	22872373



LED Exit Light

LEXIT-NF



Application

Escape routes, Directory signage

Protection degree IP20

Materials

- Body & Cover : Electro zine coated steel sheet
- Sign board : Acrylic plates

Finish

- Body : White epoxy powder coat and stove enamelled (Munsell No. N-9.3)

Light source

- Top view LED : 5 W

Electrical

- AC 100~240 V, 50/60 Hz
- Ambient temperature : -30°C ~ 50 °C
- Lifetime : 5 years
- Battery back-up type
- Ni-Cd battery set for 3 hours emergency operation

Signal Graphic Board



Specification

Option - Battery back-up

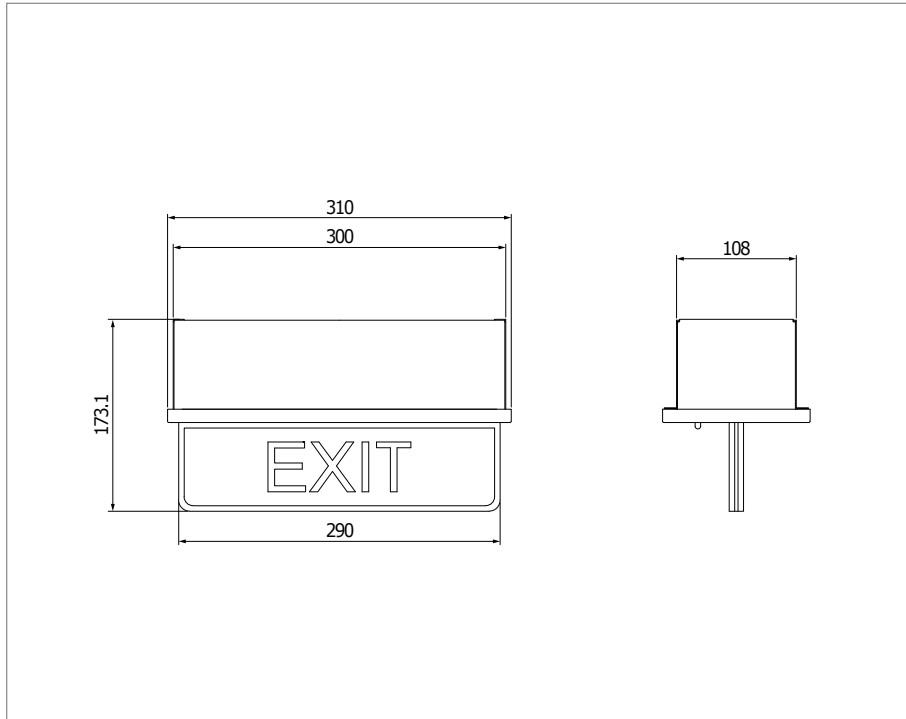
Model No.	Capacity	L(mm)	W(mm)	H(mm)	Weight(kg)	Remarks
LEXIT105NF-0550S	5 W	310	133	173	2.5	
LEXIT105NF-0550SB	5 W	310	133	173	3	Battery back-up

Option ----



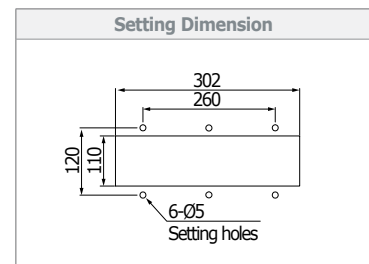
LEXIT105NF-0550S

Technical Drawing



Part List

No	Part Name	Part Number
1	LED module	96240606
2	LED driver	96240664
3	Battery	27200046



LED Exit Light

LEXIT-NS



Application

Escape routes, Directory signage

Protection degree IP44

Materials

- Body : Aluminium
- Sign board : Acrylic plates

Finish

- Body : White epoxy powder coat and stove enamelled (Munsell No. N-9.3)

Light source

- Top view LED : 5 W

Electrical

- AC 100~240 V, 50/60 Hz
- Ambient temperature : -30 °C ~ 50 °C
- Lifetime : 5 years
- Battery back-up type
- Ni-Cd battery set for 3 hours emergency operation

Signal Graphic Board



Specification

Option - Battery back-up

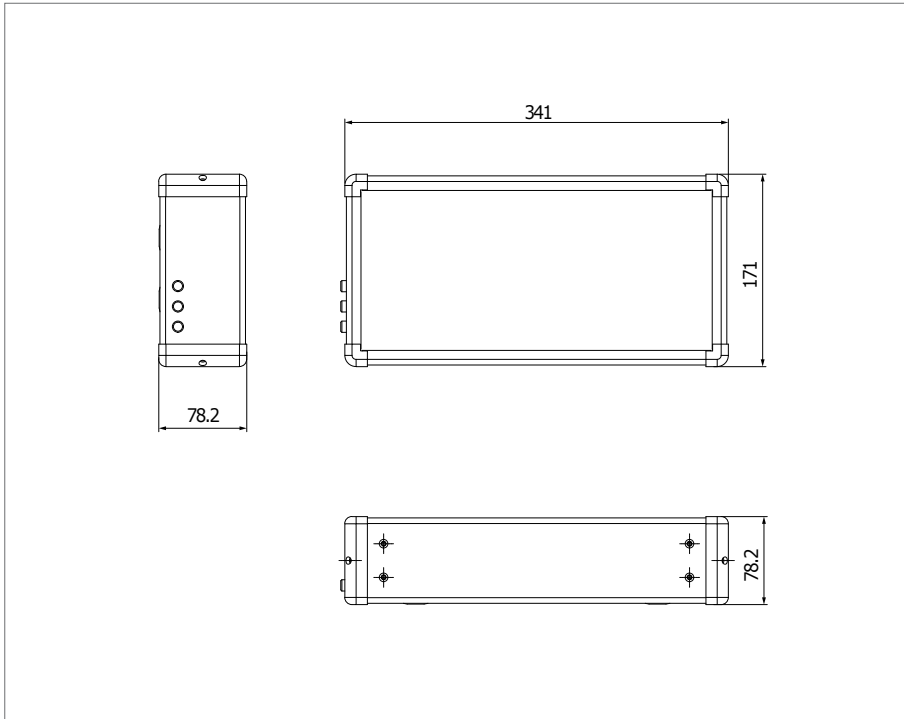
Model No.	Capacity	L(mm)	W(mm)	H(mm)	Weight(kg)	Remarks
LEXIT105NS-0550SB	5 W	341	78.2	171	3	

Option ----



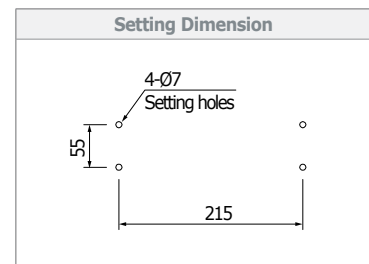
LEXIT-NS

Technical Drawing



Part List

No	Part Name	Part Number
1	LED module	96240665
2	LED driver	96240664
3	Battery	27200046



LED Surface Ceiling Light

LEB125WS /
LEB225WS



Application

Engine room, hold, laundry, store, Industrial areas

Protection degree IP56

Materials

- Body : Electro zinc coated steel sheet deep drawn
- Globe : Globe polycarbonate
- Latch : Stainless steel

Finish

- Body : White epoxy powder coat and Stove enameled (Munsell No.N-9.3)

Light Source

- Top View LED : 25 W / 50 W

Electrical

- AC 100 ~ 240 V, 50/60 Hz
- Ambient Temperature : -30 °C ~ 45 °C
- Lifetime : 5 years

Option

- Emergency : DC 24 V, 5 W
- Battery back-up
- Coaming type (WC)



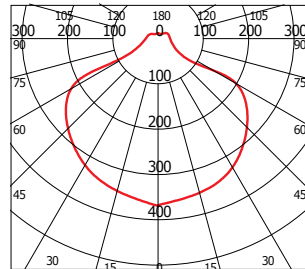
Terminal Box



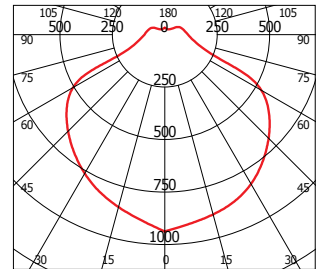
Coaming

Light Distribution Curve [cd]

LEB125WS



LEB225WS



— : 0°

Specification

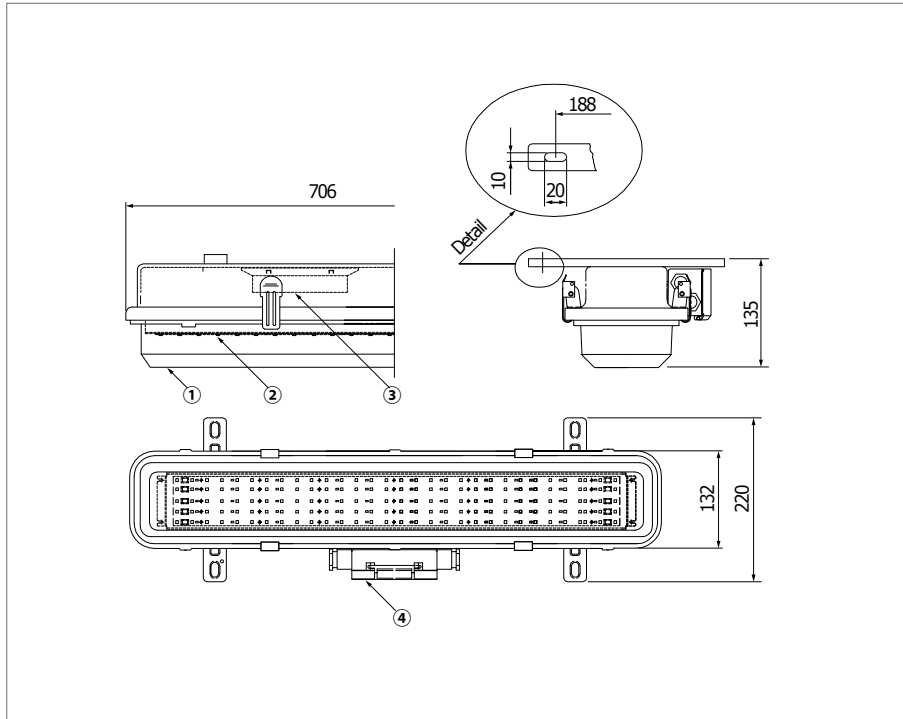
Model No.	Capacity	L(mm)	W(mm)	H(mm)	Weight(kg)	Remarks
LEB125WS-0550S	25 W	706	220	135	5.18	
	» Equivalent to FL. lamp (18 W x 2)					
LEB125WS-1550S	25 W	706	220	135	5.18	Emergency
	» Equivalent to FL. lamp (18 W x 2)					
LEB225WS-0550S	50 W	1312	220	135	7.7	
	» Equivalent to FL lamp (36 W x 2)					
LEB225WS-1550S	50 W	1312	220	135	7.7	Emergency
	» Equivalent to FL. lamp (36 W x 2)					

Option -----



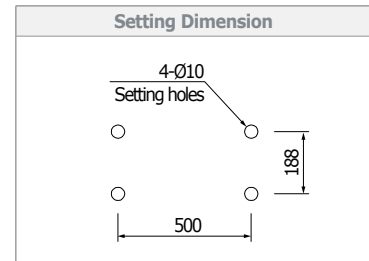
LEB125WS-0550SWNMw15

Technical Drawing



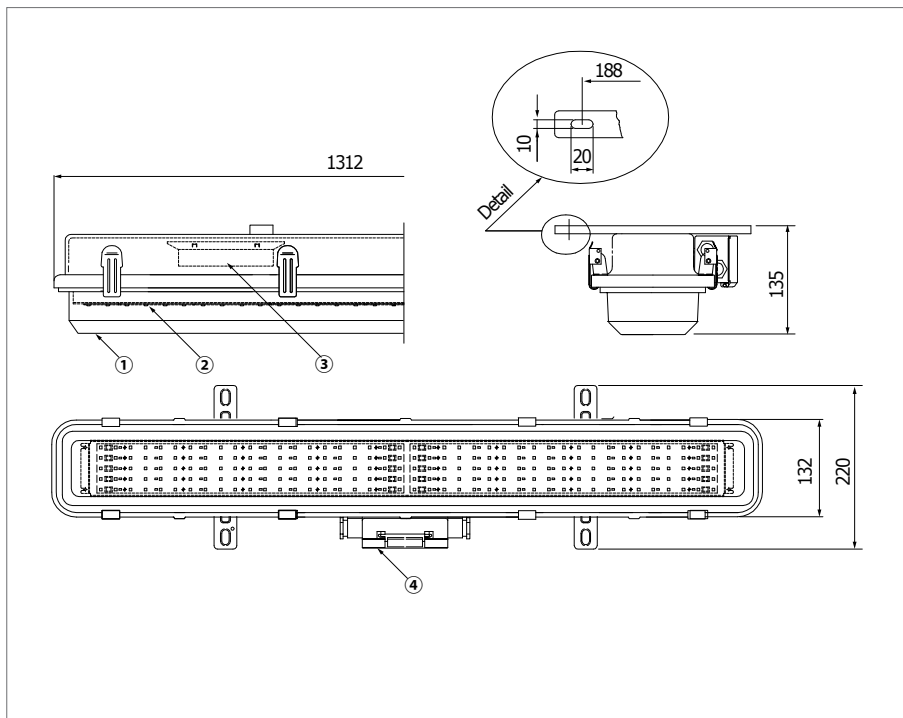
Part List

No	Part Name	Part Number
1	Globe	64607043
2	LED module	60070114
3	LED driver	17061812
4	Terminal Box	64600922



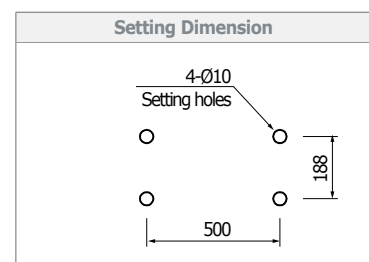
LEB225WS-0550SWNMw15

Technical Drawing



Part List

No	Part Name	Part Number
1	Globe	64607059
2	LED module	60070114
3	LED driver	17061812
4	Terminal Box	64600922



LED Surface Ceiling Light

LEB125WS-U / LEB225WS-U



Application

Engine room, hold, laundry, store
weather deck, outside passage way

Protection degree IP67

Materials

- Body : Stainless steel sheet deep drawn
- Globe : Globe polycarbonate
- Latch : Stainless steel

Finish

- Body : White epoxy powder coat and Stove enameled (Munsell No.N-9.3)

Light Source

- Top View LED : 25 W / 50 W

Electrical

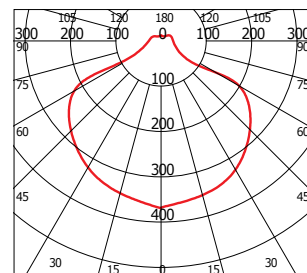
- AC 100 ~ 240 V, 50/60 Hz
- Ambient Temperature : -30 °C ~ 45 °C
- Lifetime : 5 years

Option

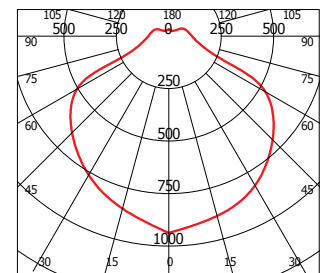
- Emergency : DC 24 V, 5 W
- Battery back-up

Light Distribution Curve [cd]

LEB125WS



LEB225WS



— : 0°

Specification

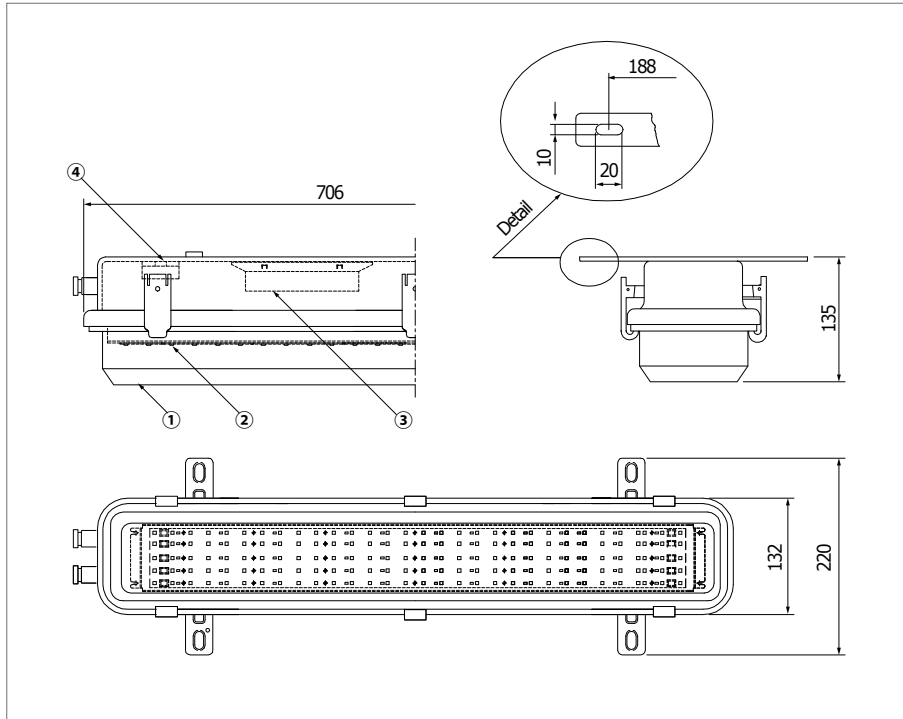
Model No.	Capacity	L(mm)	W(mm)	H(mm)	Weight(kg)	Remarks
LEB125WS-0550U	25 W	706	220	135	4.5	
	» Equivalent to FL. lamp (18 W x 2)					
LEB125WS-1550U	25 W	706	220	135	4.5	Emergency
	» Equivalent to FL. lamp (18 W x 1)					
LEB225WS-0550U	50 W	1312	220	135	7.7	
	» Equivalent to FL. lamp (36 W x 2)					
LEB225WS-1550U	50 W	1312	220	135	7.7	Emergency
	» Equivalent to FL. lamp (36 W x 2)					

Option -----



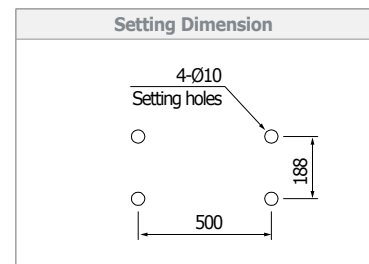
LEB125WS-0550UWNM2w17

Technical Drawing



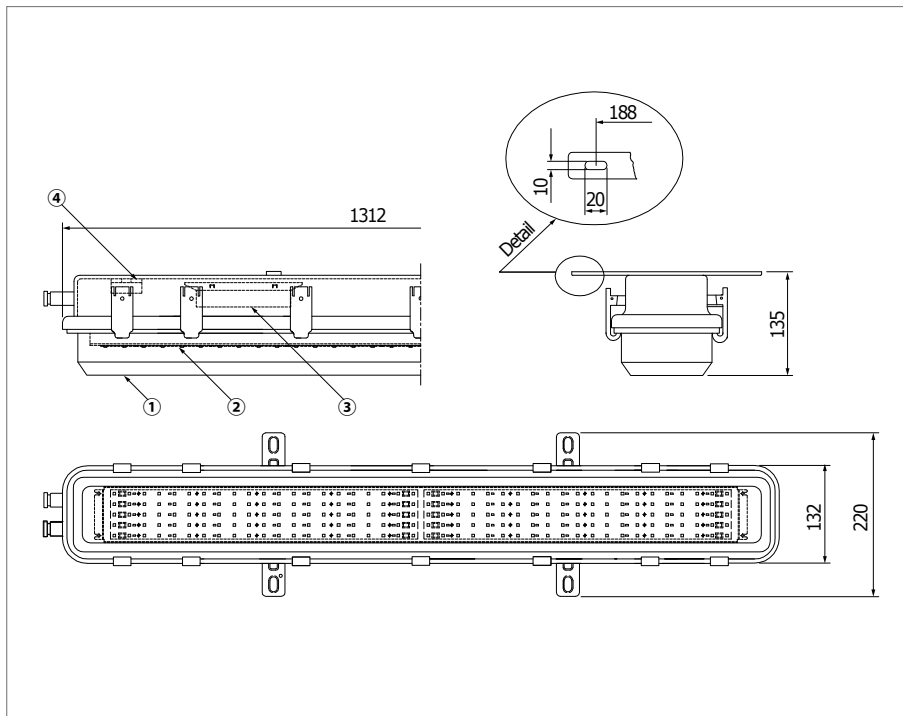
Part List

No	Part Name	Part Number
1	Globe	64607043
2	LED module	60070114
3	LED driver	17061812
4	Terminal Block	18023187



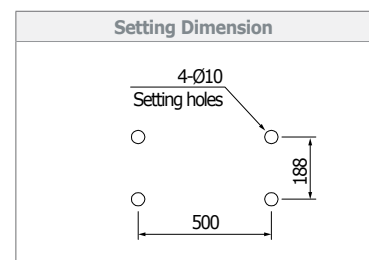
LEB225WS-0550UWNM2w17

Technical Drawing



Part List

No	Part Name	Part Number
1	Globe	64607059
2	LED module	60070114
3	LED driver	17061812
4	Terminal Block	18023187



LED Pendant Light

LP09-23PSCG



Application

Engine room, work shop, Chemical processing and industrial area

Protection degree IP56

Materials

- Body : PBT(Poly Butylene Terephthalate) / Brass
- Globe : Clear Glass

Finish

- Body : Light Green color (Munsell No.7.5BG 7/2) / Brass(natural)

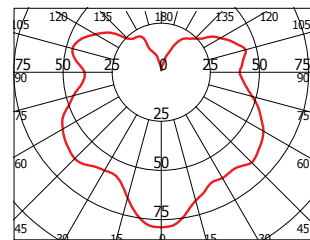
Light Source

- Base : E26 / E27
- LED Bulb : 9 W / 13.5 W
- LED CCT range : 2700 K ~ 6500 K
- *CCT : Correlated Color Temperature

Electrical

- AC 100 ~ 240 V, 50/60 Hz
- Ambient Temperature : -30 °C ~ 45 °C
- Lifetime : 5 years

Light Distribution Curve [cd]



— : 0°

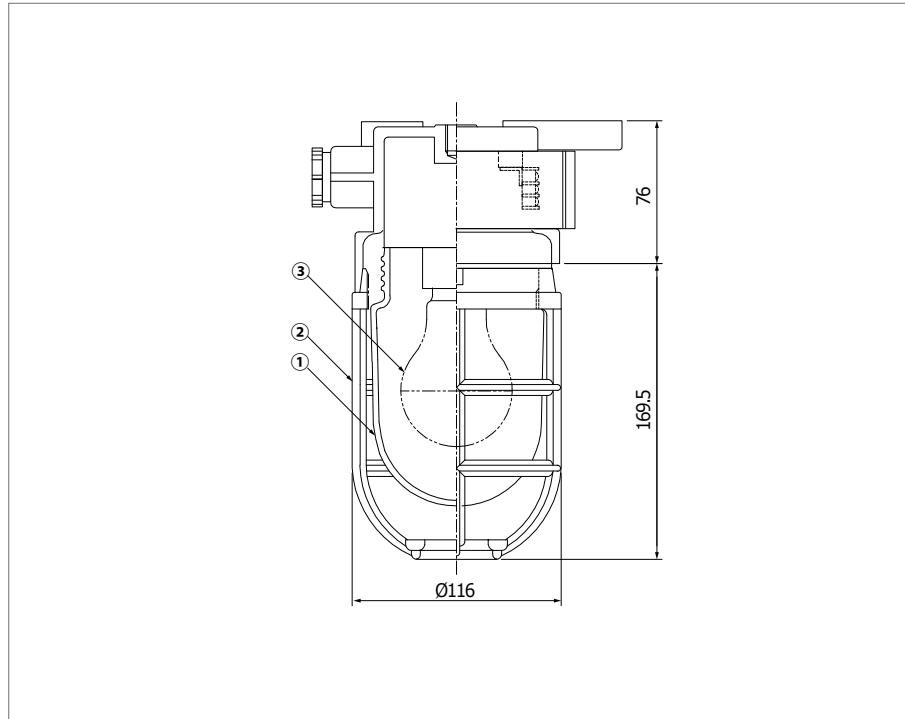
Specification

Model No.	Capacity	L(mm)	W(mm)	H(mm)	Weight(kg)	Remarks
LP09-23PSCG	9 W	140	116	245.5	2.2	
	» Equivalent to Incan. lamp (40 W / 60 W)					
LP13-23PSCG	13 W	140	116	245.5	2.2	
	» Equivalent to Incan. lamp (40 W / 60 W)					



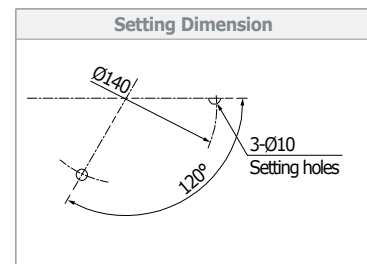
LP09-20PSCG

Technical Drawing



Part List

No	Part Name	Part Number
1	Globe	64620001
2	Guard	64600035
3	LED Bulb (9 W)	22872343
	LED Bulb (13 W)	22872354



LED Flood Light

PF30L



Application

Deck and hold, Industrial areas

Protection degree IP66 / IP67

Materials

- Body : Stainless steel sheet deep drawn
- Front glass : Heat and impact resistant glass
- Latch : Stainless steel

Finish

- Body : White epoxy powder coat and stove enameled (Munsell No. N-9.3)

Light Source

- Power LED : 30 W
- TIR Lens : 60°
- *TIR : Total Internal Reflection

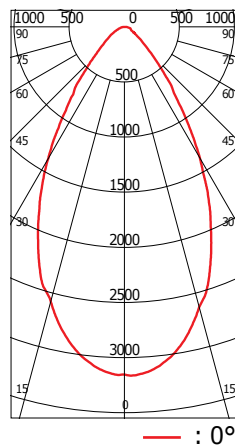
Equipment

- Two Cable glands M24 (Diameter : Max. 17 mm cable)
- Vertical adjust : Up 40°, Down 80°

Electrical

- AC 100 ~ 240 V, 50/60 Hz
- Ambient Temperature : -30 °C ~ 45 °C
- Lifetime : 5 years

Light Distribution Curve [cd]



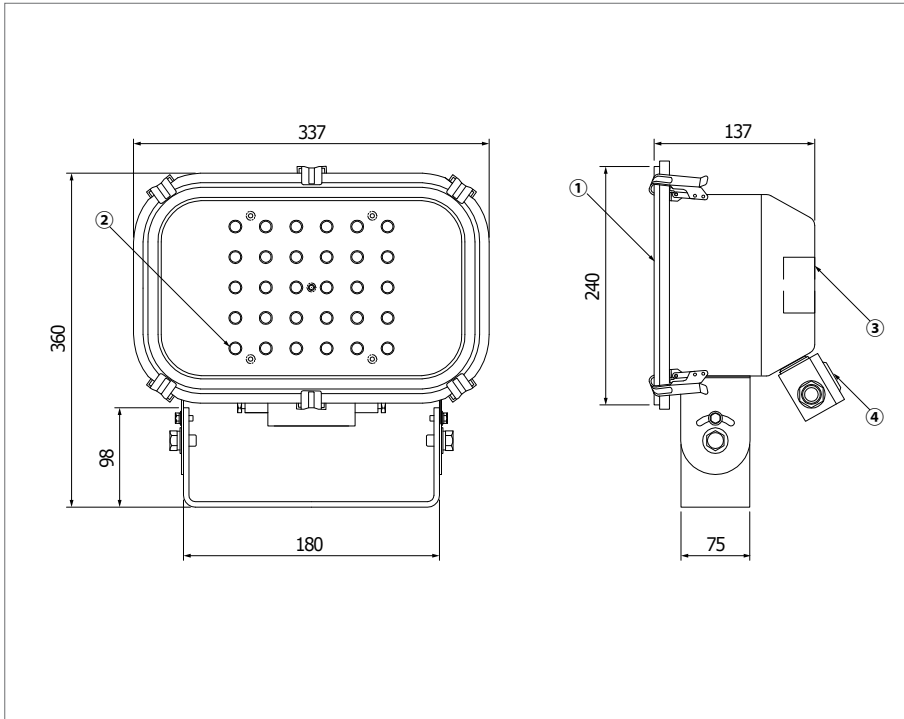
Specification

Model No.	Capacity	L(mm)	L1(mm)	W(mm)	W1(mm)	H(mm)	Weight(kg)	Remarks
PF30L	30 W	137	75	337	180	360	6.1	» Equivalent to 300W halogen flood light



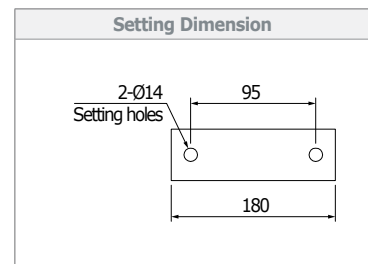
PF30L-550UWCF

Technical Drawing



Part List

No	Part Name	Part Number
1	Glass	64400110
2	LED module	60070150
3	LED driver	17080114
4	Terminal Box	64600920



LED Flood Light

PF50L



Application

Deck and hold, Industrial areas

Protection degree IP66 / IP67

Materials

- Body : Stainless steel sheet deep drawn
- Front glass : Heat and impact resistant glass
- Latch : Stainless steel

Finish

- Body : White epoxy powder coat and stove enameled (Munsell No. N-9.3)

Light Source

- Power LED : 50 W
- TIR Lens : 60°
- *TIR : Total Internal Reflection

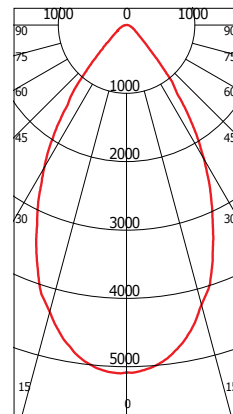
Equipment

- Two Cable glands M24 (Diameter : Max. 17 mm cable)
- Vertical adjust : Up 40°, Down 80°

Electrical

- AC 100 ~ 240 V, 50/60 Hz
- Ambient Temperature : -30 °C ~ 45 °C
- Lifetime : 5 years

Light Distribution Curve [cd]



— : 0°

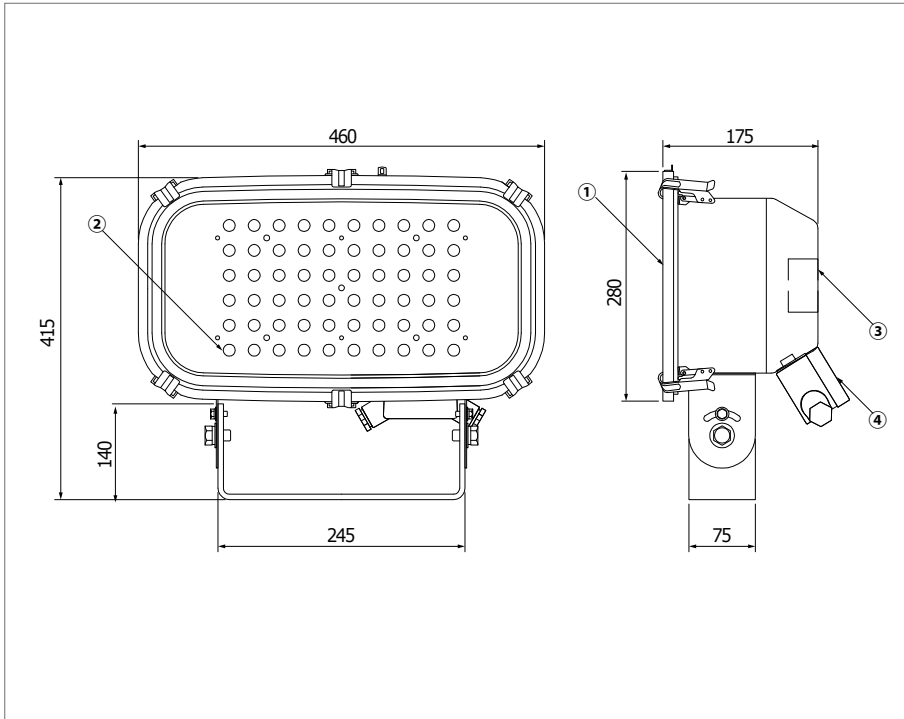
Specification

Model No.	Capacity	L(mm)	L1(mm)	W(mm)	W1(mm)	H(mm)	Weight(kg)	Remarks
PF50L	50 W	175	75	460	248	415	9.1	» Equivalent to 500W halogen flood light



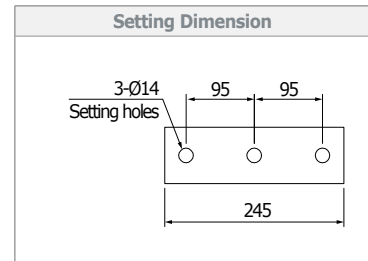
PF50L-550UWCF

Technical Drawing



Part List

No	Part Name	Part Number
1	Glass	64400005
2	LED module	60070151
3	LED driver	17080115
4	Terminal Box	64600920



LED Flood Light

PF125L-550AWCF



Application

Deck and hold, Industrial areas

Protection degree IP66 / IP67

Materials

- Body : Aluminium die casting
- Front glass : Heat and impact resistant glass

Finish

- Body : White epoxy powder coat and stove enamelled (Munsell No. N-9.3)

Light Source

- Power LED : 125 W
- TIR Lens : 60°
- *TIR : Total Internal Reflection

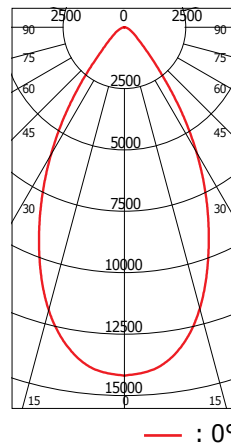
Equipment

- Two Cable glands M24 (Diameter : Max. 17 mm cable)
- Vertical adjust (Up: 40°, Down: 60°)

Electrical

- AC 100 ~ 240 V, 50/60 Hz
- Ambient Temperature : -30 °C ~ 45 °C
- Lifetime : 5 years

Light Distribution Curve [cd]



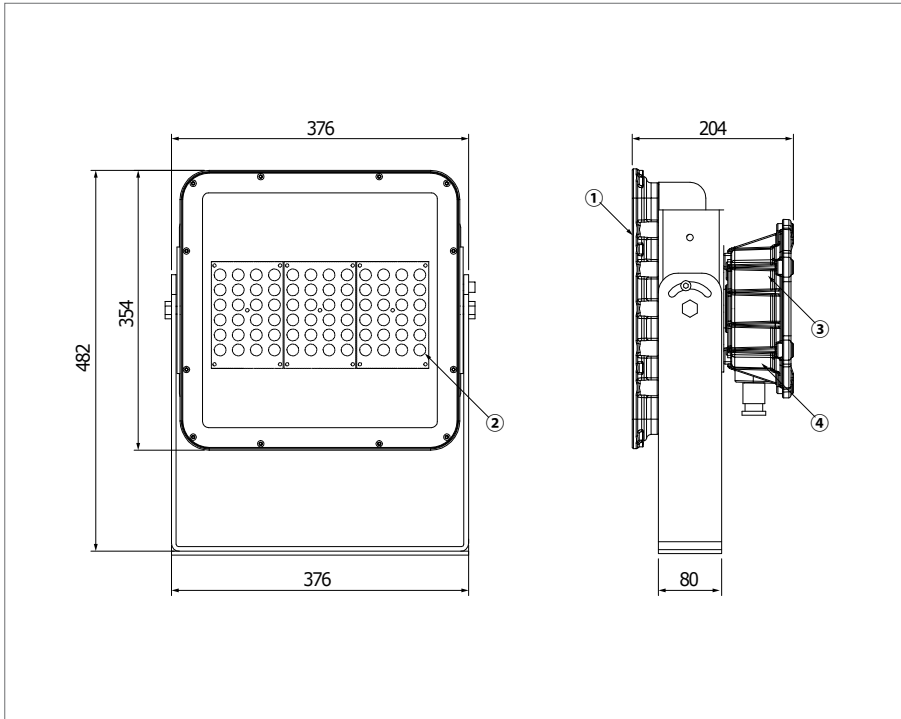
Specification

Model No.	Capacity	L(mm)	W(mm)	H(mm)	Weight(kg)	Remarks
PF125L	125 W	204	376	482	21	
» Equivalent to 250 W sodium flood light						



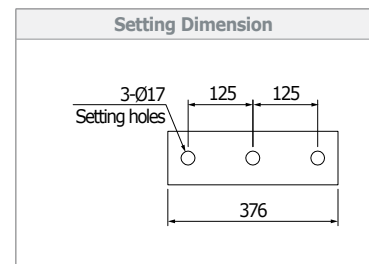
PF125L-550AWCF

Technical Drawing



Part List

No	Part Name	Part Number
1	Front Glass	57011176
2	LED module	96146165
3	LED driver	17061914
4	Terminal Block	18020363



LED Flood Light

PF250L-550AWCF



Application

Deck and hold, Industrial areas

Protection degree IP66 / IP67

Materials

- Body : Aluminium die casting
- Front glass : Heat and impact resistant glass

Finish

- Body : White epoxy powder coat and stove enamelled (Munsell No. N-9.3)

Light Source

- Power LED : 250 W
- TIR Lens : 60°
- *TIR : Total Internal Reflection

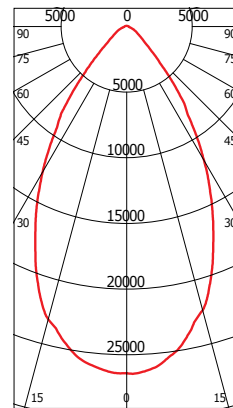
Equipment

- Two Cable glands M24 (Diameter : Max. 17 mm cable)
- Vertical adjust (Up: 40°, Down: 60°)

Electrical

- AC 100 ~ 240 V, 50/60 Hz
- Ambient Temperature : -30 °C ~ 45 °C
- Lifetime : 5 years

Light Distribution Curve [cd]



— : 0°

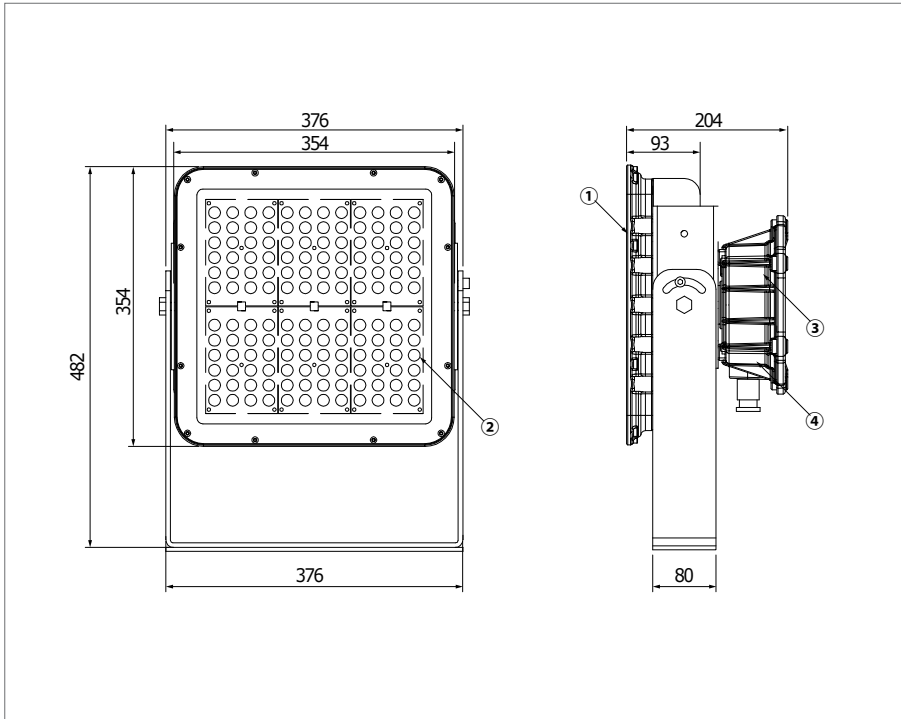
Specification

Model No.	Capacity	L(mm)	W(mm)	H(mm)	Weight(kg)	Remarks
PF250L	250 W	204	376	482	21	» Equivalent to 400 W sodium flood light



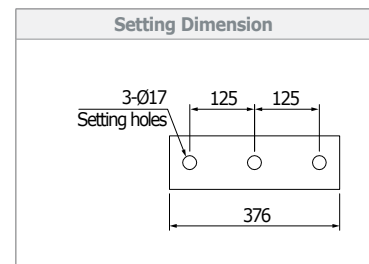
PF250L-550AWCF

Technical Drawing



Part List

No	Part Name	Part Number
1	Front Glass	57011176
2	LED module	96146032
3	LED driver	17061870
4	Terminal Block	18020363



LED Flood Light

PF400L-550AWCF



Application

Deck and hold, Industrial areas

Protection degree IP66 / IP67

Materials

- Body : Aluminium die casting
- Front glass : Heat and impact resistant glass

Finish

- Body : White epoxy powder coat and stove enamelled (Munsell No. N-9.3)

Light Source

- Power LED : 400 W
- TIR Lens : 60°
- *TIR : Total Internal Reflection

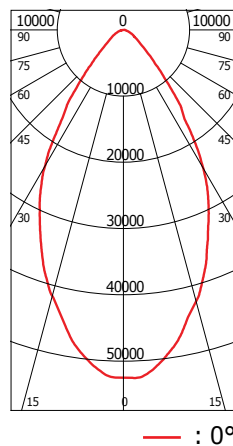
Equipment

- Two Cable glands M24 (Diameter : Max. 17 mm cable)
- Vertical adjust (Up: 40°, Down: 60°)

Electrical

- AC 100 ~ 240 V , 50/60 Hz
- Ambient Temperature : -30 °C ~ 45 °C
- Lifetime : 5 years

Light Distribution Curve [cd]



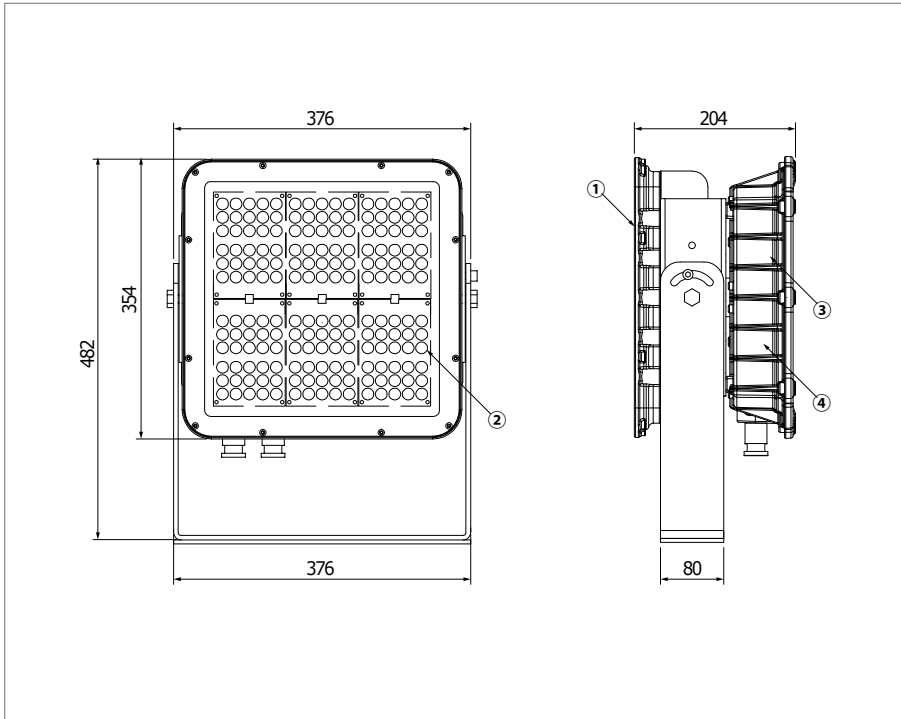
Specification

Model No.	Capacity	L(mm)	W(mm)	H(mm)	Weight(kg)	Remarks
PF400L	400 W	204	376	482	24	» Equivalent to 400 W X2 sodium flood light



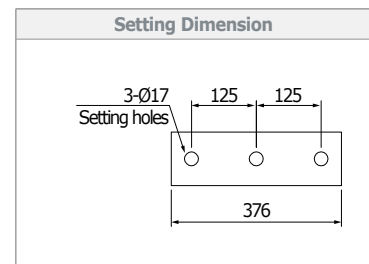
PF400L-550AWCF

Technical Drawing



Part List

No	Part Name	Part Number
1	Front Glass	57011176
2	LED module	96146033
3	LED driver	17061871
4	Terminal Block	18020368



LED Navigation Light

A2L-SM06H / A2L-SP04H /
A2L-ST04H / A2L-SY04H

Application

Vessels of 50M and above in length
in compliance with COLREG1972

Visibility 3 nm / 6 nm

Protection degree IP56

Materials

- Cover & Body : Polycarbonate
- Lens : Polycarbonate

Finish

- Cover & lower body : Mat black
- Lens : Polycarbonate

Equipment

- LED : 4 W / 6 W
 - With function of detecting illuminance drop
 - If Illumination decreased by 30%
LED fail is considered to be the power off.
- *CAUTION
Don't install the navigation lighting upside down.
The air breathing device is installed on the bottom.

Electrical

- AC 100 ~ 240 V, 50/60 Hz
- Ambient Temperature : -30 °C ~ 45 °C
- Lifetime : 5 years



Masthead
A2L-SM06H



Port
A2L-SP04H



Starboard
A2L-ST04H



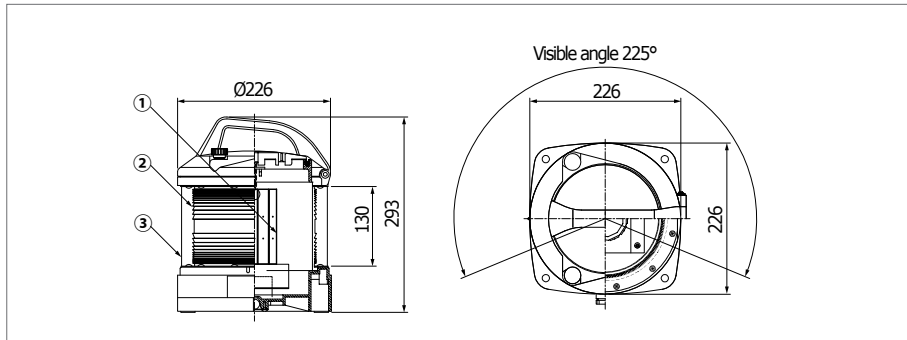
Towing Light
A2L-SY04H

Specification

Model No.	Capacity	L(mm)	W(mm)	H(mm)	Weight(kg)	Remarks	Visibility(nm)
A2L-SM06Hh Masthead	6 W	226	226	293	4.2	Clear (225°)	6
A2L-SP04Hh Port	4 W	226	226	293	4.2	Red (112.5°)	3
A2L-ST04Hh Starboard	4 W	226	226	293	4.2	Green (112.5°)	3
A2L-SS04Hh Stern	4 W	226	226	293	4.2	White (135°)	3
A2L-SW06Hh Anchor	6 W	226	226	293	4.2	White (360°)	3
A2L-SR06Hh N.U.C	6 W	226	226	293	4.2	Red (360°)	3
A2L-SY04Hh Towing	4 W	226	226	293	4.2	Yellow (135°)	3

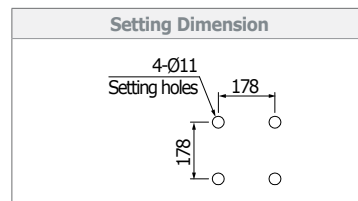


A2L-SM0655Hh / Technical Drawing

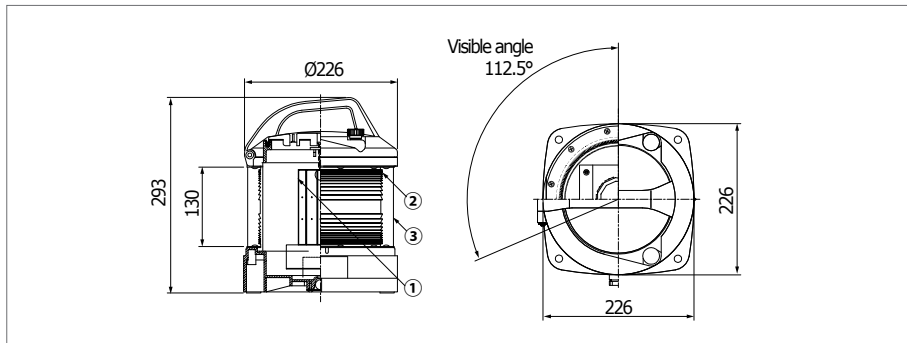


Part List

No	Part Name	Part Number
1	LED Module	96240567
3	Lens (clear)	64607109
3	Screen (Masthead)	P304000015

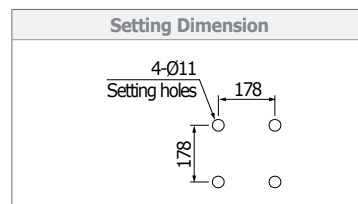


A2L-SP0455Hh / Technical Drawing

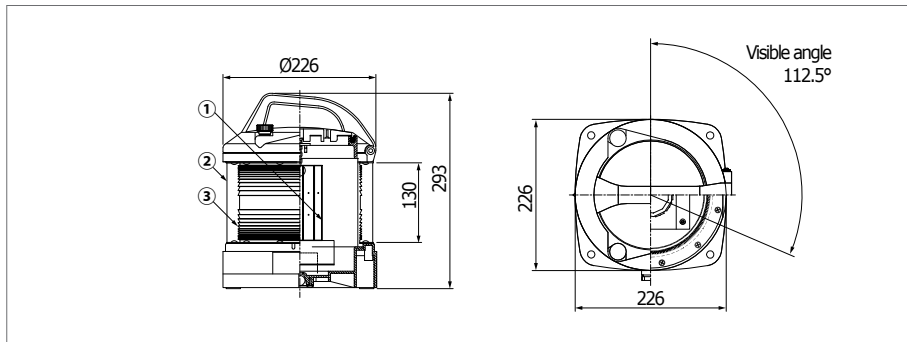


Part List

No	Part Name	Part Number
1	LED Module	96240568
3	Lens (clear)	64607109
3	Screen (Port)	P304000016

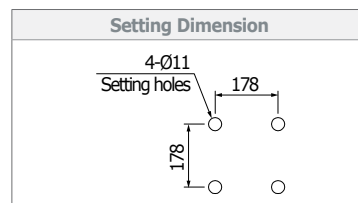


A2L-ST0455Hh / Technical Drawing

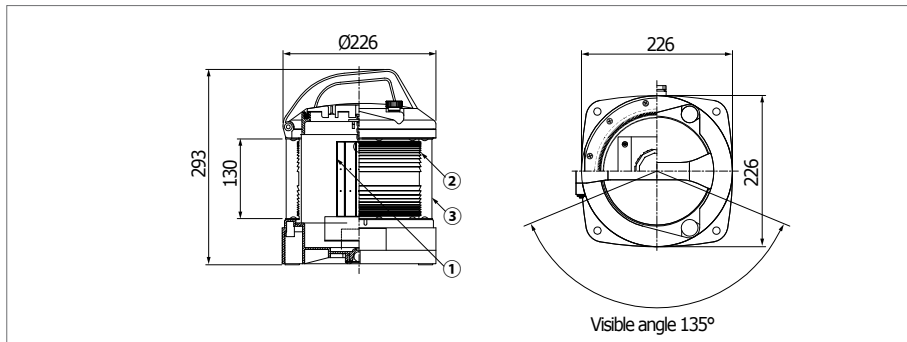


Part List

No	Part Name	Part Number
1	LED Module	96240569
3	Lens (clear)	64607109
3	Screen (Starboard)	P304000017

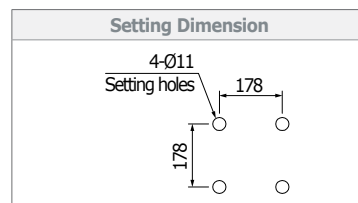


A2L-SS0455Hh / Technical Drawing



Part List

No	Part Name	Part Number
1	LED Module	96240570
3	Lens (clear)	64607109
3	Screen (Stern)	P304000018



LED Navigation Light

A2L-DM06H / A2L-DP04H /
A2L-DT04H / A2L-DY04H

Application

Vessels of 50M and above in length
in compliance with COLREG1972

Visibility 3 nm / 6 nm

Protection degree IP56

Materials

- Cover & Body : Polycarbonate
- Lens : Polycarbonate

Finish

- Cover & lower body : Mat black

Equipment

- LED : 4 W × 2 / 6 W × 2
 - With function of detecting illuminance drop
 - If Illumination decreased by 30%
LED fail is considered to be the power off.
- *CAUTION
Don't install the navigation lighting upside down.
The air breathing device is installed on the bottom.

Electrical

- AC 100 ~ 240 V, 50/60 Hz
- Ambient Temperature : -30 °C ~ 45 °C
- Lifetime : 5 years



Masthead
A2L-DM06H



Port
A2L-DP04H



Starboard
A2L-DT04H



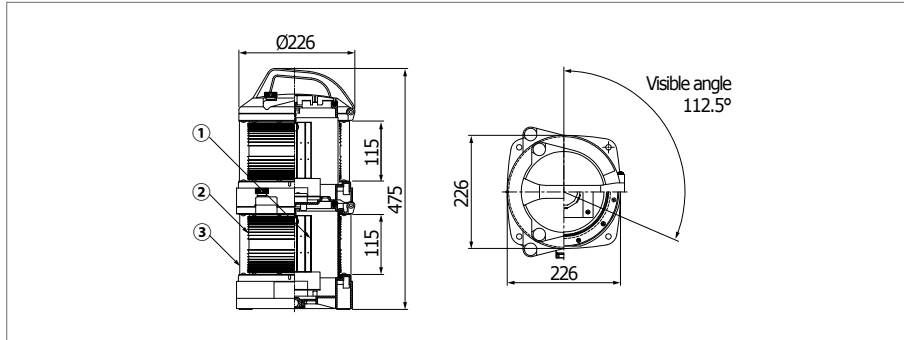
Towing Light
A2L-DY04H

Specification

Model No.	Capacity	L(mm)	W(mm)	H(mm)	Weight(kg)	Remarks	Visibility(nm)
A2L-DM06Hh Masthead	6 W × 2	226	226	475	8.2	White (225°)	6
A2L-DP04Hh Port	4 W × 2	226	226	475	8.2	Red (112.5°)	3
A2L-DT04Hh Starboard	4 W × 2	226	226	475	8.2	Green (112.5°)	3
A2L-DS04Hh Stern	4 W × 2	226	226	475	8.2	White (135°)	3
A2L-DW06Hh Anchor	6 W × 2	226	226	475	8.2	White (360°)	3
A2L-DR06Hh N.U.C	6 W × 2	226	226	475	8.2	Red (360°)	3
A2L-DY04Hh Towing	4 W × 2	226	226	475	8.2	Yellow (135°)	3

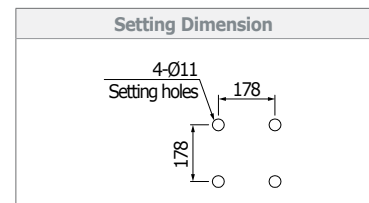


A2L-DT0455Hh / Technical Drawing

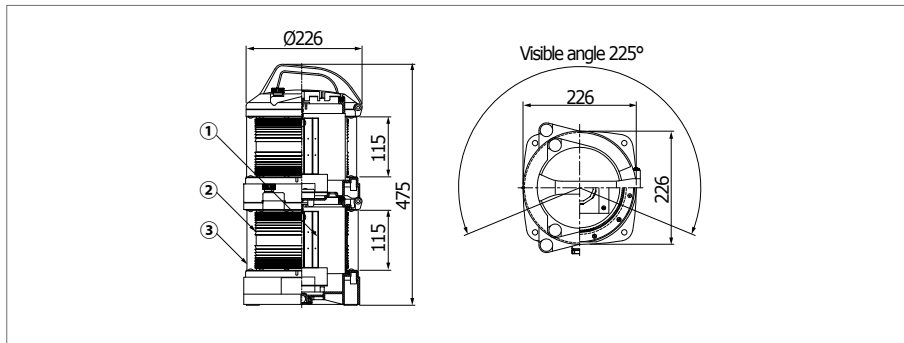


Part List

No	Part Name	Part Number
1	LED Module	96240569
3	Lens (clear)	64607109
3	Screen (Starboard)	P304000017

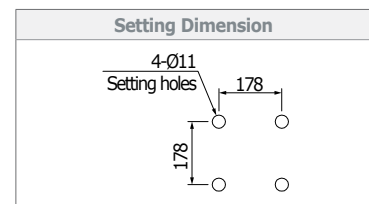


A2L-DM0655Hh / Technical Drawing

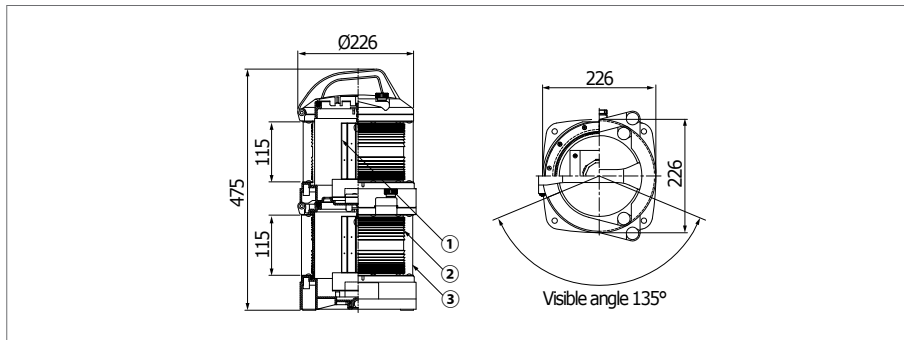


Part List

No	Part Name	Part Number
1	LED Module	96240567
3	Lens (clear)	64607109
3	Screen (Masthead)	P304000015

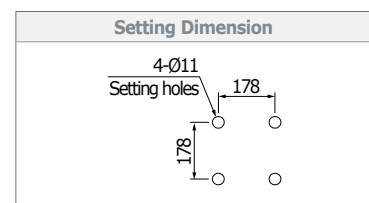


A2L-DS0455Hh / Technical Drawing

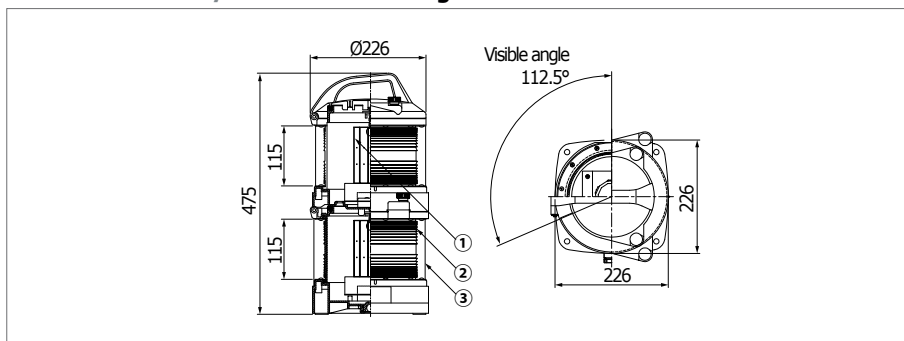


Part List

No	Part Name	Part Number
1	LED Module	96240570
3	Lens (clear)	64607109
3	Screen (Stern)	P304000018

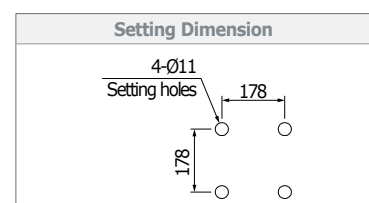


A2L-DP0455Hh / Technical Drawing



Part List

No	Part Name	Part Number
1	LED Module	96240568
3	Lens (clear)	64607109
3	Screen (Port)	P304000016



LED Navigation Light (NVG Compatible, Junction Box Type)

A2L-M1055NVG-I / A2L-P1055NVG-I /
A2L-T1055NVG-I / A2L-Y1055NVG-I

Application

Vessels of 20M and above in length
in compliance with COLREG1972

Protection degree IP66 / IP67

Visibility 6 nm / 3 nm

Materials

- Cover : Aluminum
- Body : Polycarbonate
- Lens : Polycarbonate

Finish

- Cover & lower body : Mat black
- Lens : Clear

Equipment

- LED : 6 W / 10 W
- Cable gland : M24
- 70% Illuminance drop detection

Electrical

- AC 100 ~ 240 V, 50/60 Hz
- Ambient Temperature : -52 °C ~ 45 °C
(applied transparent heater)
- Lifetime : 5 years

Option

- 1) Anti-icing (applied transparent heater)
- 2) NVG compatible
- 3) Self-checking alarm system



Masthead
A2L-M1055NVG-I

Port
A2L-P0655NVG-I



Starboard
A2L-T0655NVG-I

Towing Light
A2L-Y0655NVG-I

Option



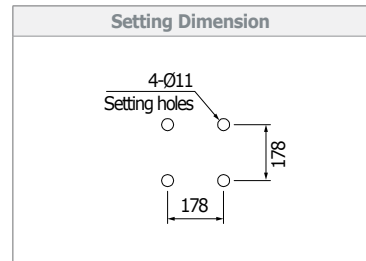
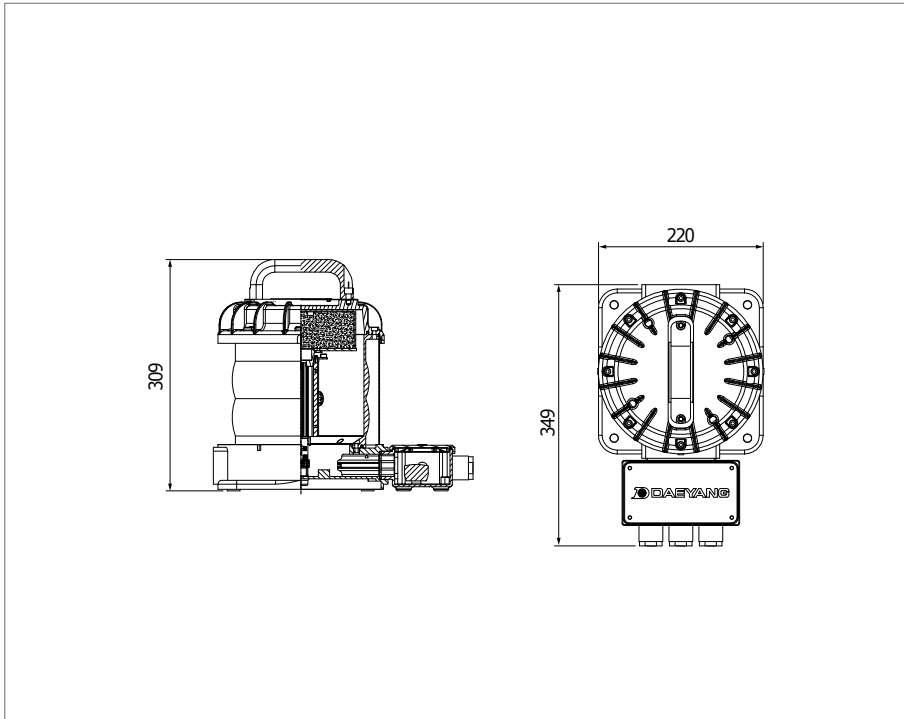
Specification

Model No.	Capacity	L(mm)	W(mm)	H(mm)	Weight(kg)	Remarks	Visibility(nm)
A2L-M1055NVG-I Masthead	10 W	226	226	475	8.2	White (225°)	6
A2L-P1055NVG-I Port	6 W	226	226	475	8.2	Red (112.5°)	3
A2L-T1055NVG-I Starboard	6 W	226	226	475	8.2	Green (112.5°)	3
A2L-S1055NVG-I Stern	6 W	226	226	475	8.2	White (135°)	3
A2L-W1055NVG-I Anchor	6 W	226	226	475	8.2	White (360°)	3
A2L-R1055NVG-I N.U.C	10 W	226	226	475	8.2	Red (360°)	3
A2L-Y1055NVG-I Towing	10 W	226	226	475	8.2	Yellow (135°)	3



A2L-T1055NVG-I

Technical Drawing



LED Signal Light

LS09-23PBCB / LS09-23PBCWP /
LS09-23PBCRP / LS09-23PBCGP



LS09-23PBCB

Application

General warning with different colors Ship's
turn movement for PANAMA / SUEZ canal

Protection degree IP56

Materials

- Body : Polycarbonate / Cast Brass
- Globe : Polycarbonate

Finish

- Body : polycarbonate (Mat black) / Brass (Natural)
- Globe : Colored Globe

Light Source

- LED Bulb : 9 W

Electrical

- AC 100 ~ 120 V / 220 ~ 240 V, 50/60 Hz
- Ambient Temperature : -20 °C ~ 45 °C
- Lifetime : 5 years



LS09-23PBCGP



LS09-23PBCRP



LS09-23PBCWP

LENS COLOR



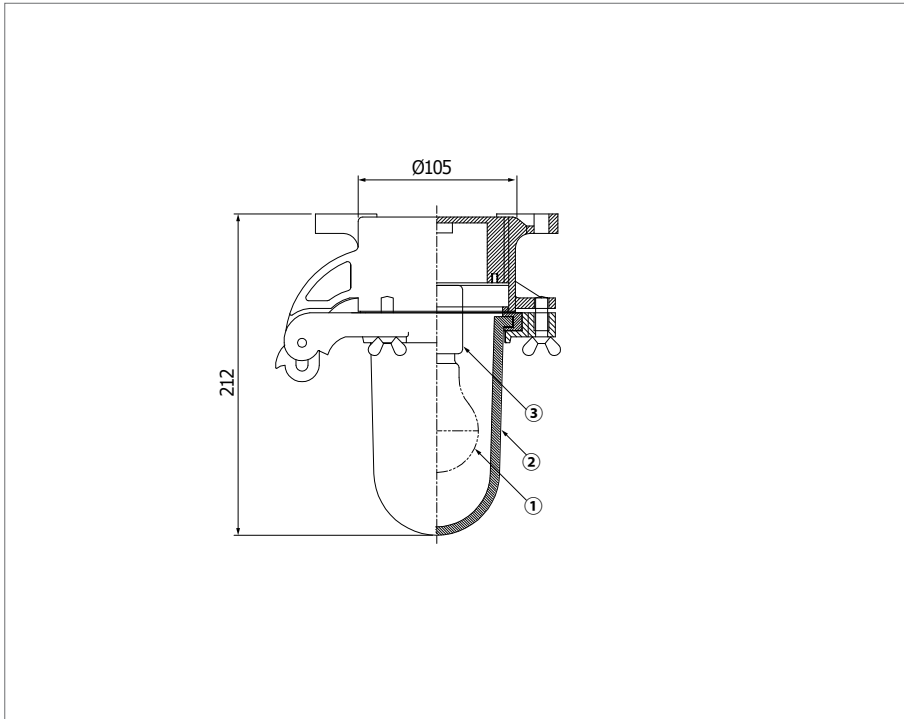
Specification

Model No.	Capacity	L(mm)	W(mm)	H(mm)	Weight(kg)	Visibility(nm)	Color
LS09-20PBCB	9 W	105	105	212	1.4	2	Blue
LS09-20PBCRP	9 W	105	105	212	1.3	2	Red
LS09-20PBCWP	9 W	105	105	212	1.3	2	White
LS09-20PBCGP	9 W	105	105	216.5	1.3	2	Green



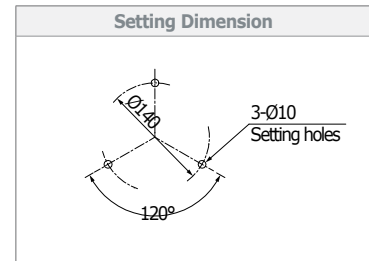
LS09-20PBCRP, LS09-23PBCWP, LS09-20PBCGP

Technical Drawing



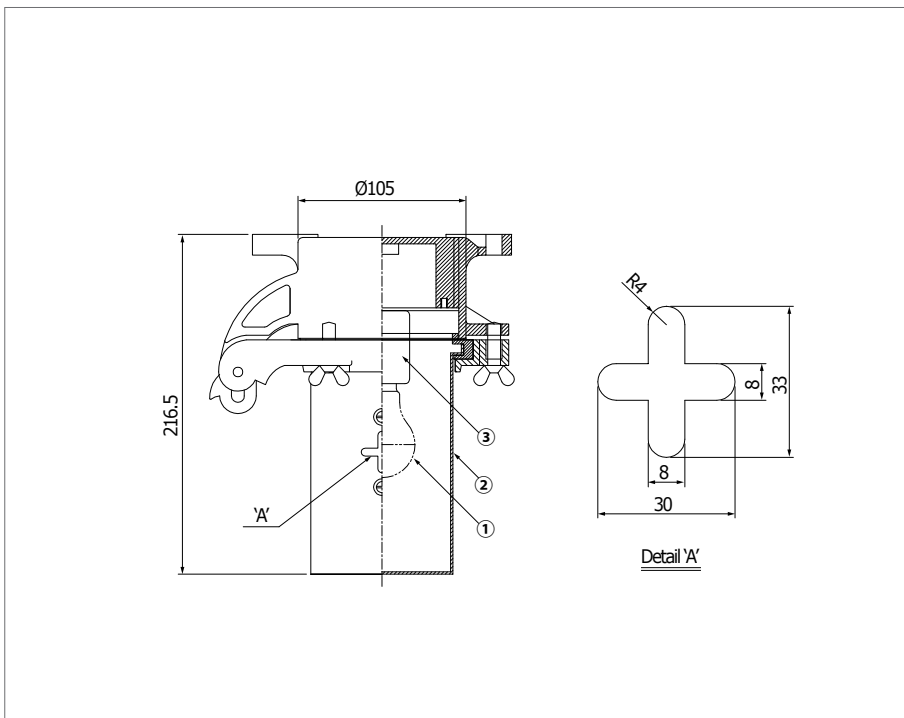
Part List

No	Part Name	Part Number
1	LED Bulb	22872343
	Globe, Clear	64607275
2	Globe, Red	64607276
	Globe, Green	64607277
3	Lamp Holder	15100056



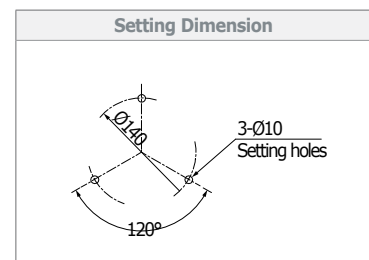
LS09-20PBCB

Technical Drawing



Part List

No	Part Name	Part Number
1	LED Bulb	22872373
2	Globe, Blue	64607275
3	Lamp Holder	15100056



Explosion Proof LED Ceiling Light

LEAX-405dc / LEAX-805dc



Application

Hazardous area

Protection degree IP67

Explosion degree

- Ex d IIC T6 Gb
- Standard : IEC60079-0 / IEC60079-1

Materials

- Body : Aluminum die casting
- Globe : Tempered glass

Finish

- Body : Yellow epoxy powder coat and stove enameled

Light Source

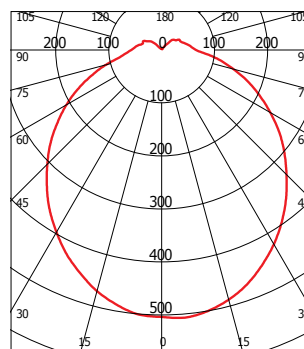
- Top View LED : 20 W / 40 W

Electrical

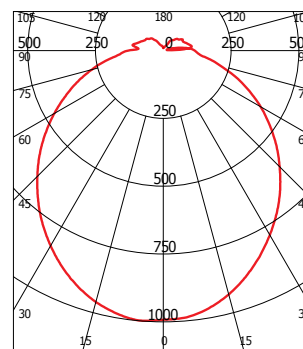
- AC 100 ~ 240 V, 50/60 Hz
- Ambient Temperature : -25 °C ~ 50 °C
- Lifetime : 5 years

Light Distribution Curve [cd]

LEAX-405dc



LEAX-805dc



— : 0°

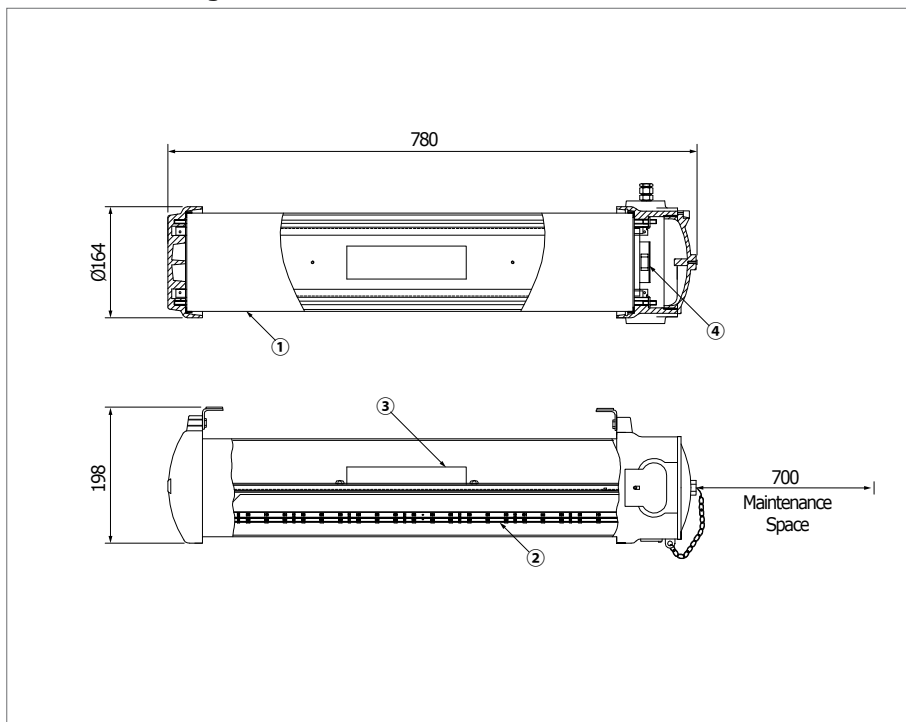
Specification

Model No.	Capacity	L(mm)	W(mm)	H(mm)	Weight(kg)	Remarks
LEAX-405dc	20 W	780	198	164	10.3	
	» Equivalent to FL. lamp (18 W × 2)					
LEAX-805dc	40 W	1395	198	164	15.1	
	» Equivalent to FL. lamp (36 W × 2)					



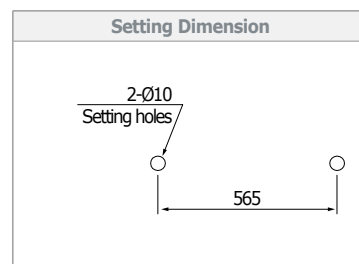
LEAX-405dC550-FG

Technical Drawing



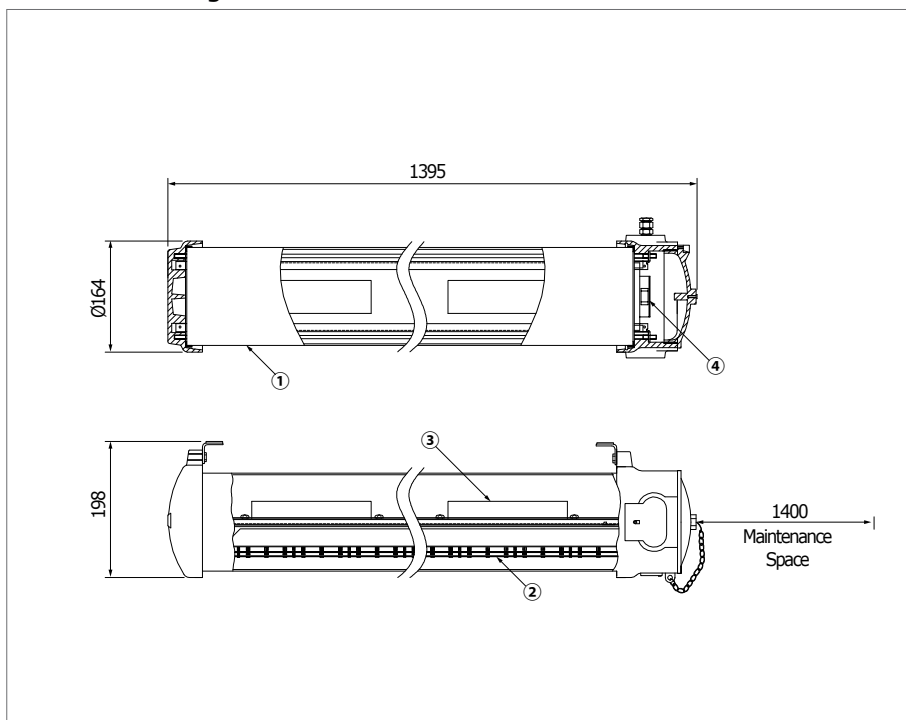
Part List

No	Part Name	Part Number
1	Glass	64620153
2	LED module	96240549
3	LED driver	17061806



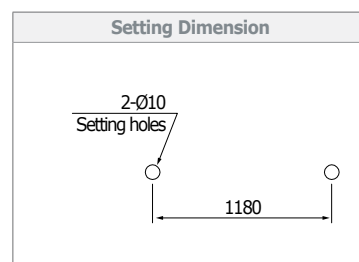
LEAX-805dC550-FG

Technical Drawing



Part List

No	Part Name	Part Number
1	Globe	64607183
2	LED module	60070135
3	LED driver	17061812



Explosion Proof LED Ceiling Light

EXLED-125ed / EXLED-225ed



Application

Hazardous areas where flammable vapor, Corrosive gases or moisture are present

Protection degree IP56 / IP65 / IP66 / IP67

Explosion degree

- Ex de mb IIC T4 Gb (-25 °C ≤ Ta ≤ +50 °C)
- Standard : IEC 60079-0 / IEC 60079-1
IEC 60079-7 / IEC 60079-18

Materials

- Body : Stainless steel
- Globe : Clear polycarbonate

Finish

- Body: White epoxy power coat and stove enamelled (Munsell No. N-9.3)

Light Source

- Top View LED : 25 W / 50 W
- LED module : Silicon Molding Type

Equipment

- Cable gland : M20, M25, NPT1/2", NPT3/4"

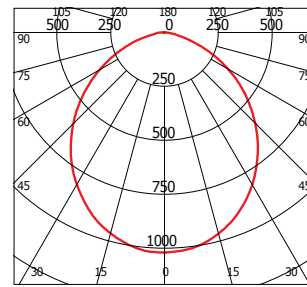
Electrical

- AC 100 ~ 250 V, 50/60 Hz
- Ambient Temperature : -25 °C ~ 50 °C
- Lifetime : 5 years



Explosion proof type LED module & Interlock switch

Light Distribution Curve [cd]



— : 0°

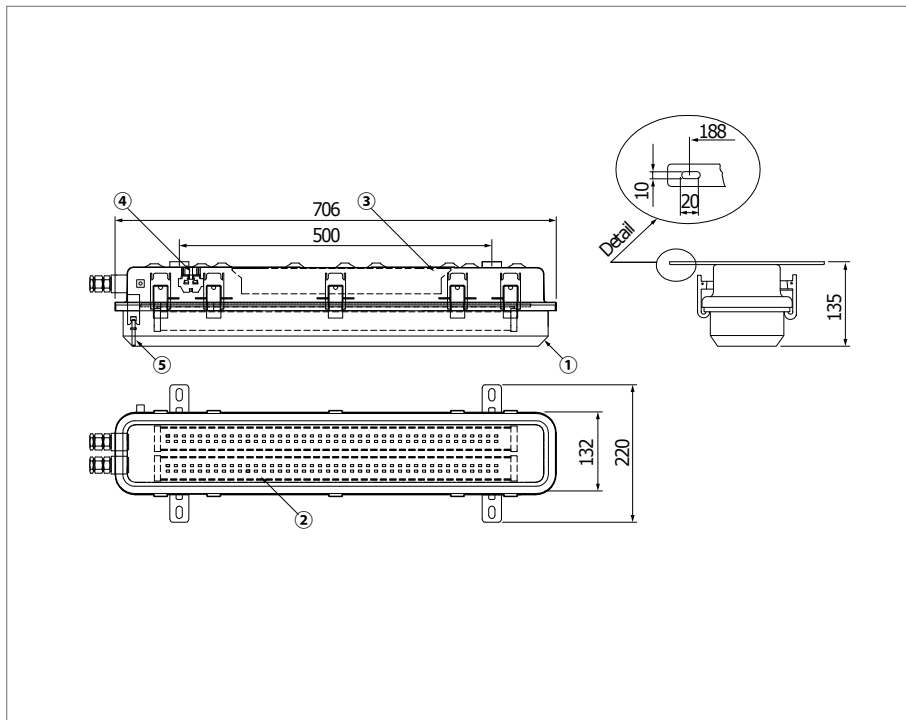
Specification

Model No.	Capacity	L(mm)	W(mm)	H(mm)	Weight(kg)	Remarks
EXLED-125ed	25 W	706	220	135	6.2	
EXLED-225ed	50 W	1312	220	135	9.5	



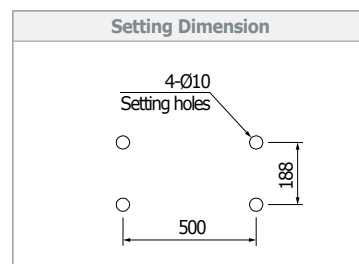
EXLED-125ed

Technical Drawing



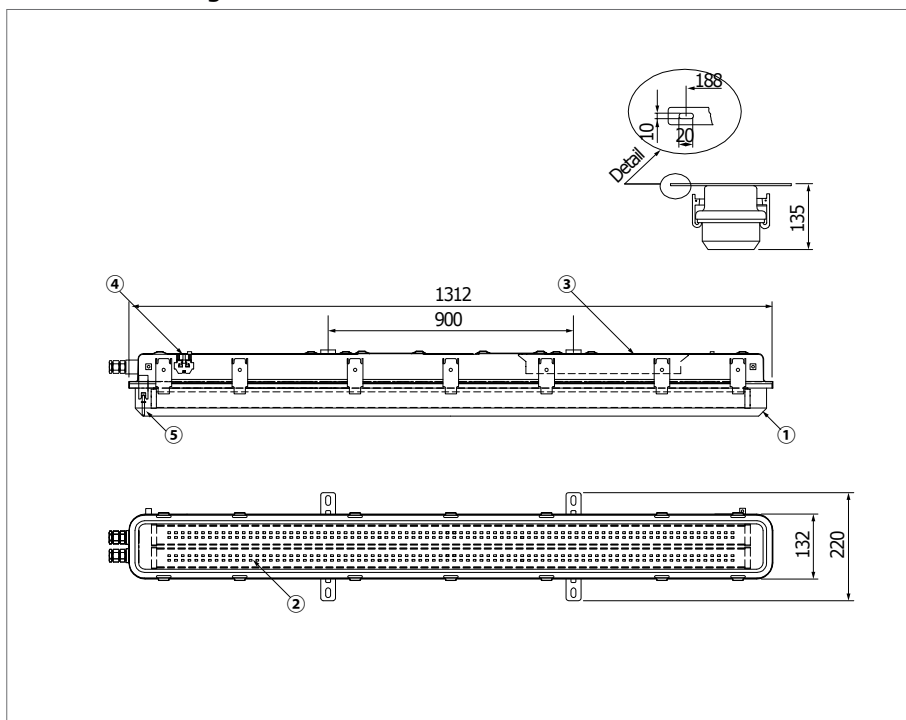
Part List

No	Part Name	Part Number
1	Globe	64606940
2	LED module	Z102-0344
3	LED driver	17061936
4	Terminal Block	18023362
5	Interlock Switch	13140068



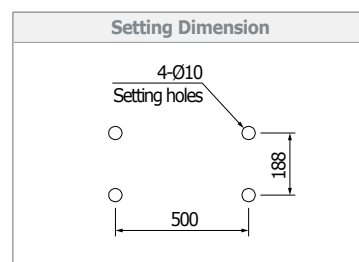
EXLED-225ed

Technical Drawing



Part List

No	Part Name	Part Number
1	Globe	64606941
2	LED module	Z102-0345
3	LED driver	17061937
4	Terminal Block	18023362
5	Interlock Switch	13140068



Explosion Proof LED Ceiling Light (Battery back-up)

EXLED-125edBu

EXLED-225edBu



Application

Hazardous areas where flammable vapor,
Corrosive gases or moisture are present

Protection degree IP56 / IP65 / IP66 / IP67

Explosion degree

- Ex de mb IIC T4 Gb (-25 °C ≤ Ta ≤ +50 °C)
- Standard : IEC 60079-0 / IEC 60079-1
IEC 60079-7 / IEC 60079-18

Materials

- Body : Stainless steel
- Globe : Clear polycarbonate

Finish

- Body : White epoxy power coat and stove enamelled
(Munsell No. N-9.3)

Light Source

- Top View LED : 25 W / 50 W
- LED module : Silicon Molding Type

Equipment

- Cable gland : M20, M25, NPT1/2", NPT3/4"

Electrical

- AC 100 ~ 240 V, 50/60 Hz
- Ambient Temperature : -30 °C ~ 50 °C
- Lifetime : 5 years

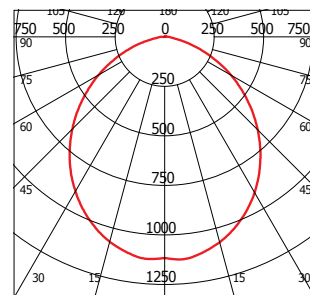
Emergency duration

- Discharging Time : 1.5 h or 3 h



Explosion proof type LED module &
Interlock switch

Light Distribution Curve [cd]



— : 0°

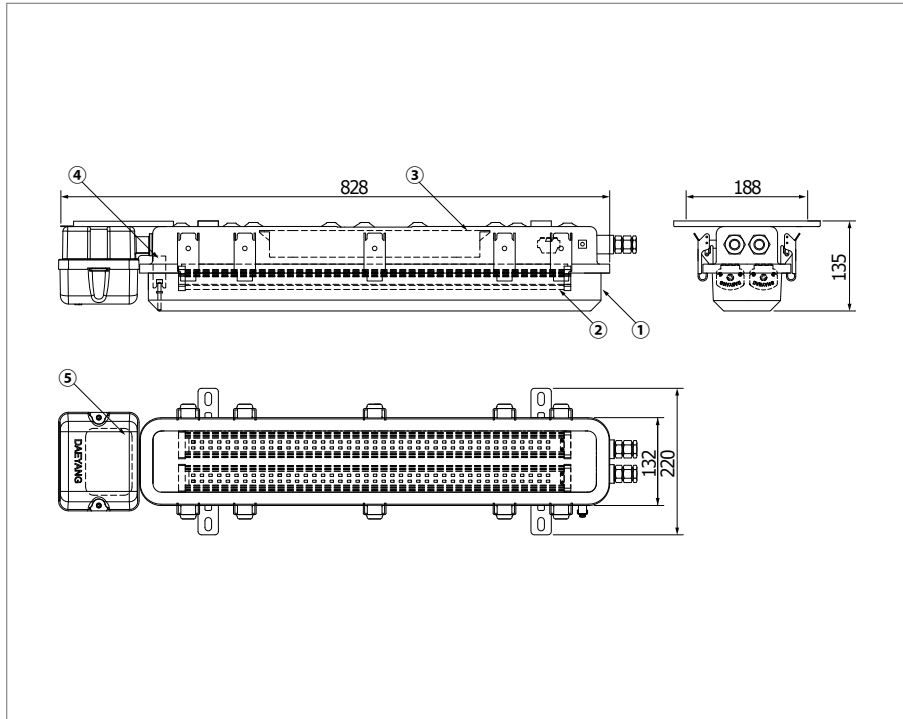
Specification

Model No.	Capacity	L(mm)	W(mm)	H(mm)	Weight(kg)	Remarks
EXLED-125edBu	25 W	828	220	135	7.8	1.5 h or 3 h
EXLED-225edBu	50 W	1435	220	135	11.1	1.5 h or 3 h



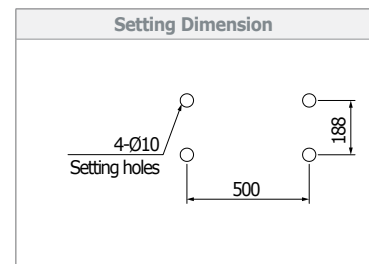
EXLED-125edBu

Technical Drawing



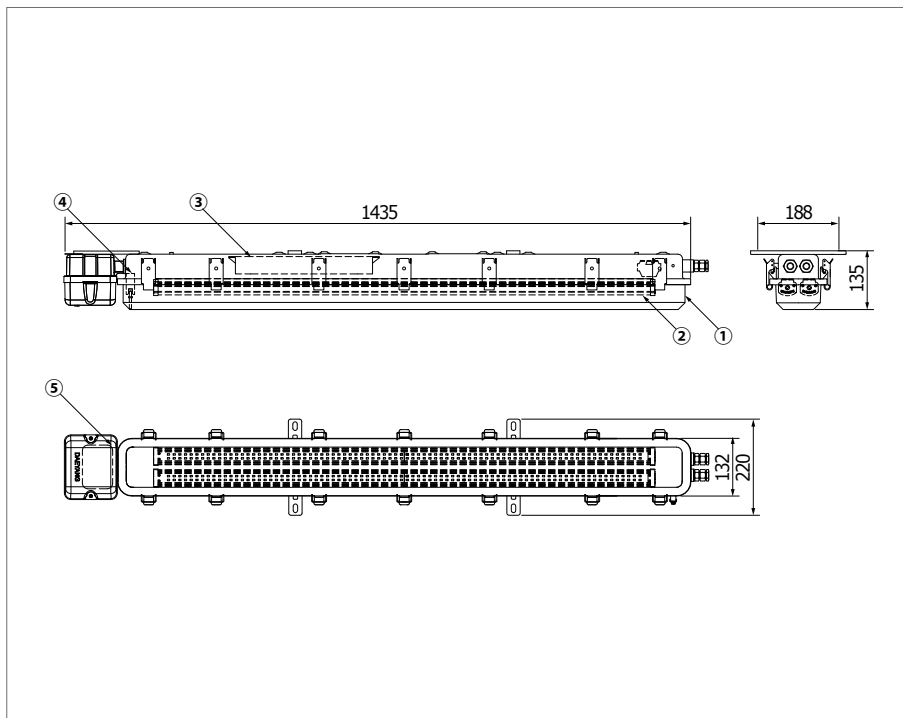
Part List

No	Part Name	Part Number
1	Globe	64606940
2	LED Lamp	Z109-0237
3	LED driver	17061926
4	Interlock Switch	13140068
5	Battery	27200054



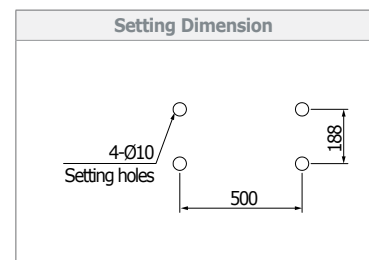
EXLED-225edBu

Technical Drawing



Part List

No	Part Name	Part Number
1	Globe	64606941
2	LED Lamp	Z109-0237
3	LED driver	17061927
4	Interlock Switch	13140069
5	Battery	27200054



Explosion Proof LED Ceiling Light

EXLED-614



Application

Hazardous areas where flammable vapor
corrosive gases or moisture are present

Protection degree IP67

Explosion degree

- Ex d IIC T6 Gb ($-25\text{ }^{\circ}\text{C} \leq T_a \leq 50\text{ }^{\circ}\text{C}$)
- Standard : IEC 60079-0 / IEC 60079-1

Materials

- Body : Cast bronze
- Globe : Heat and impact resistant glass
- Guard : Stainless steel

Finish

- Body & Guard : Natural

Light Source

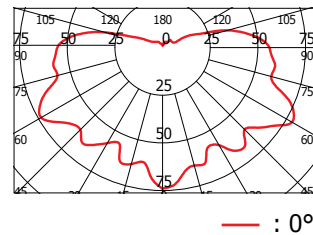
- Base : E26 / E27
- LED Bulb : 8 W / 13 W
- LED CCT range : 2700 K ~ 6500 K
- *CCT : Correlated Color Temperature

Electrical

- AC 100 ~ 240 V, 50/60 Hz
- Ambient Temperature : $-25\text{ }^{\circ}\text{C} \sim 50\text{ }^{\circ}\text{C}$
- Lifetime : 5 years

- One and two cable glands :
M20, M25, NPT1/2", NPT3/4"
- Shock absorbing construction

Light Distribution Curve [cd]



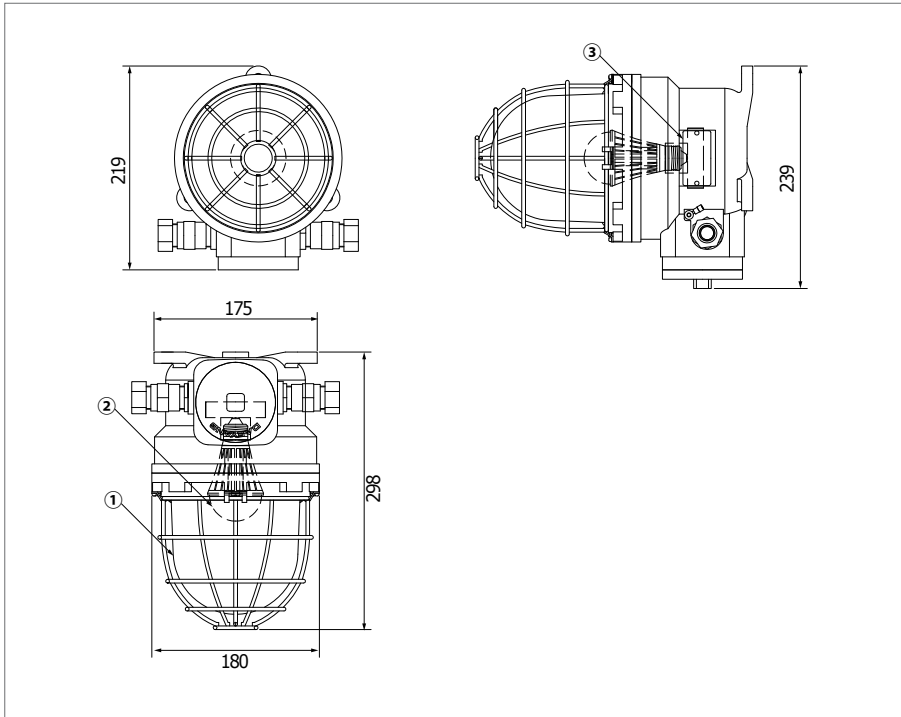
Specification

Model No.	Capacity	L(mm)	W(mm)	H(mm)	Weight(kg)	Remarks
EXLED-614	8 W, 13 W	239	219	298	12.2	» Equivalent to Incan. lamp (40 W, 60 W)



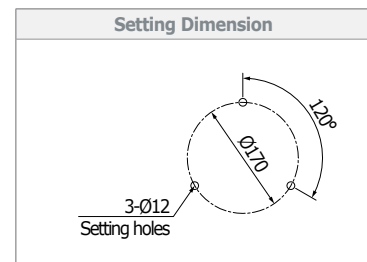
EXLED-614

Technical Drawing



Part List

No	Part Name	Part Number
1	Globe	64620007
2	Lamp	22870011
3	Lamp Holder	15100056



Explosion Proof LED Flood Light

EXLED-50nR



Application

Hazardous areas where flammable vapor,
Corrosive gases or moisture are present

Protection degree IP66 / IP67

Explosion protection

- Ex mc nR IIC Gc T4
- Standard : IEC 60079-0 / IEC 60079-15 / IEC 60079-18

Materials

- Body : Aluminium die casting
- Front Glass : Tempered Glass

Finish

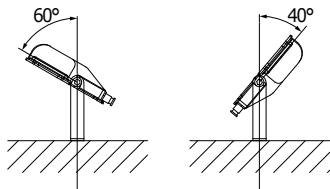
- Body : Yellow epoxy powder coat and stove enamelled

Light Source

- Power LED : 50 W

Equipment

- Cable gland : M20, M25, NPT1/2", NPT3/4"
- Vertical adjust (Up : 40 °, Down : 60°)



Electrical

- AC 100 ~ 240 V, 50/60 Hz
- Ambient Temperature : -25 °C ~ 50 °C
- Lifetime : 5 years

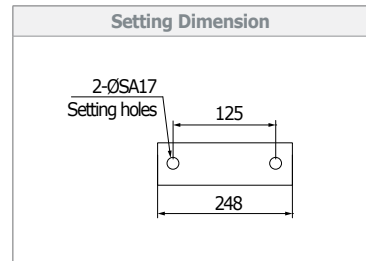
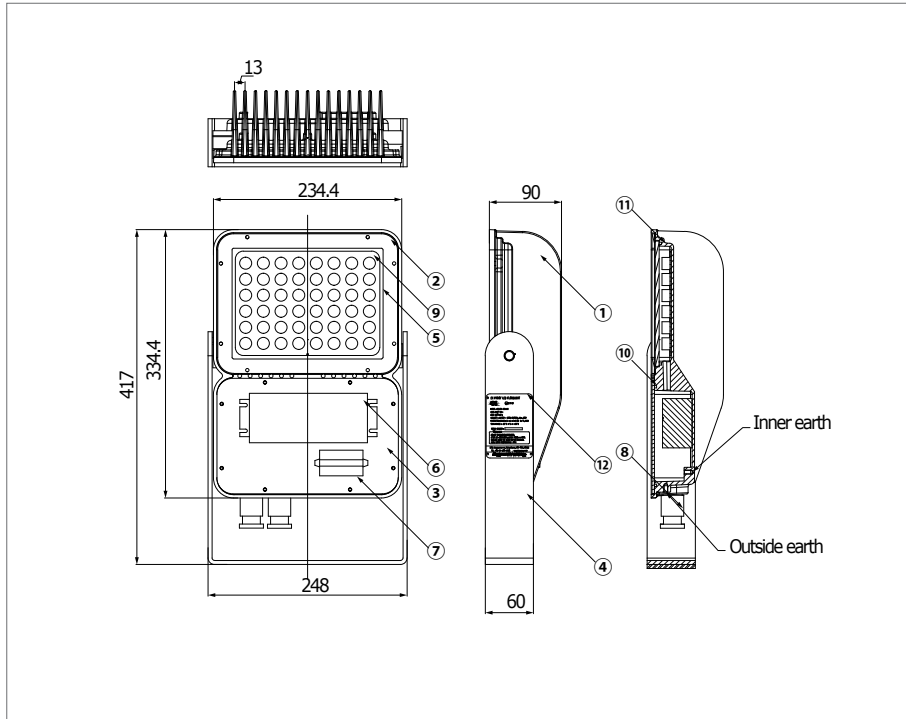
Specification

Model No.	Capacity	L(mm)	W(mm)	H(mm)	Weight(kg)	Remarks
EXLED-50nR	50 W	417	234.4	90	8	



EXLED-50nR

Technical Drawing



LED Search Light

PS60LL / PS170LL

Application

Bridge wing, Industrial areas

Protection degree IP56

Materials

- Body : Stainless steel
- Arm : Stainless steel
- Front glass : Heat and impact resistant glass
- Latch : Stainless steel

Finish

- Body : White epoxy powder coat and stove enameled (Munsell No. N-9.3)

Equipment

- LED : 7 W module × 7ea / 7 W module × 22ea (Indirect method with reflector)
- Cable : One cable gland M24 (Diameter : Max. 17 mm cable)
- Option : Dimming function (0% / 50% / 75% / 100%)

Electrical

- AC 100~240 V , 50/60 Hz
- Operating Temperature Range : -30 °C ~ 45 °C
- Expectancy life time : 50,000 h

Peak intensity

- PS60L-F : 1,040,000 cd / 1 lux at 1,020 m
- PS170L-F : 3,300,000 cd / 1 lux at 1,816 m



PS60LL-550UWCF
(Fixed Type)

PS170LL-550UWCF
(Fixed Type)



PS60LL-550UWCEPJ
(with Remote Control Panel)



PS-K-E
Control panel

Specification

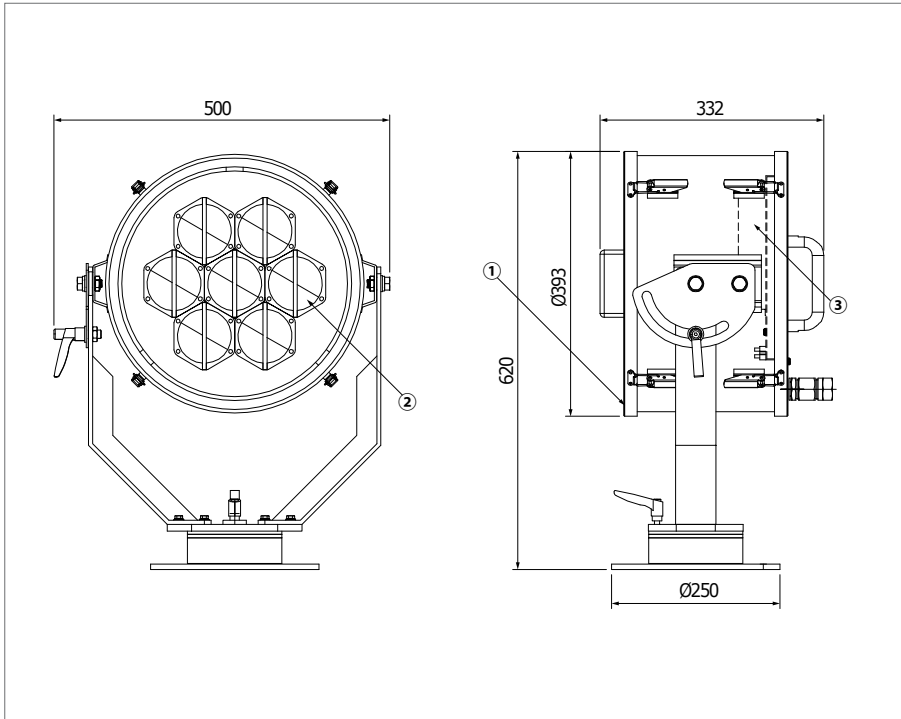
Operation : F(Manual)

Model No.	Capacity	L(mm)	W(mm)	H(mm)	Weight(kg)	Remarks
PS60LL-F	60 W	500	332	620	25	
PS170LL-F	170 W	716	352	916	51	



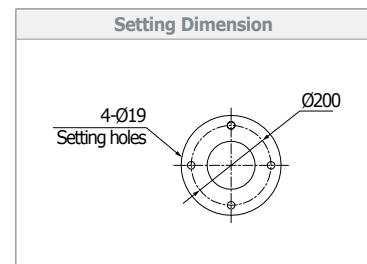
PS60L-F

Technical Drawing



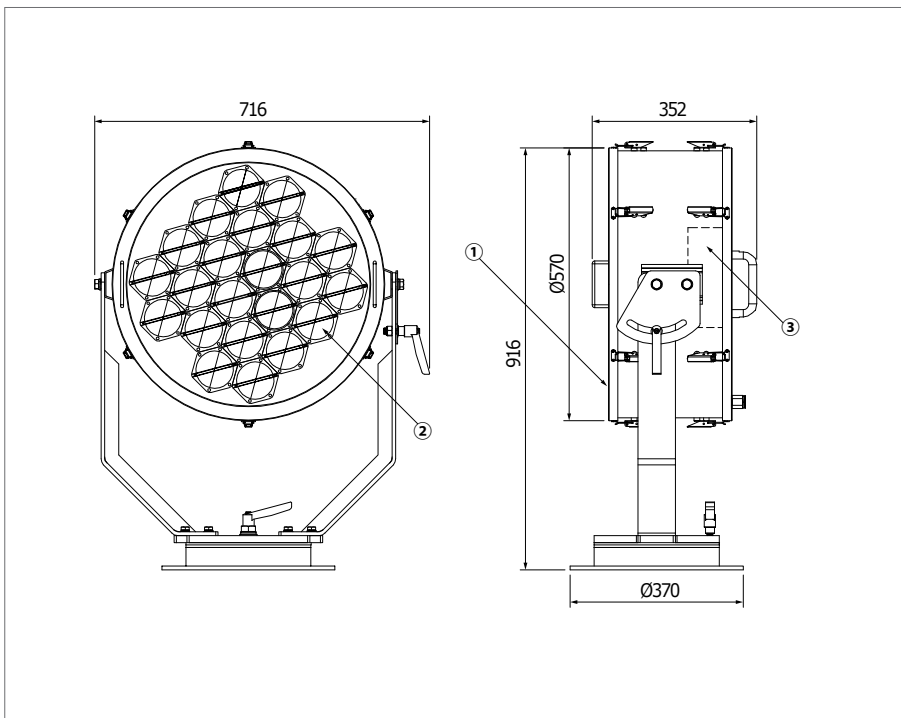
Part List

No	Part Name	Part Number
1	Front cover Assy	Z104-0144
2	LED module	96146029
3	LED driver	17061845



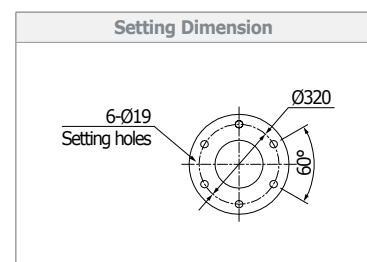
PS170L-F

Technical Drawing



Part List

No	Part Name	Part Number
1	Front cover Assy	Z110-0040
2	LED module	96146029
3	LED driver	17061869



LED driver for EXIT Light

LPS05L-300SN

LPS05L-300SNB (Battery back-up)



Product Description

- Fixed output built-in LED driver
- Constant current LED driver
- Built-in active PFC function
 - *PFC : Power Factor Correction
- Universal AC input / Full range (100 ~ 240 V)
- Power Factor : Min. 0.9
- Applied to Battery back-up Mode

Function

- Short-circuit protection
- Over-temperature protection
- Over-current protection
- Over-voltage protection

Standards

- EN 55015, EN 61000-3-2, EN 61347-2-13, EN 60945

Applied Models







Specification

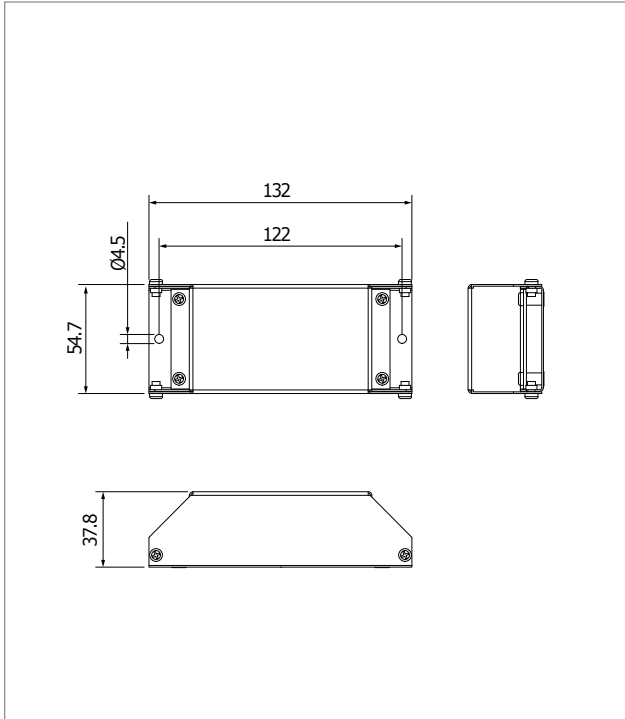
		LPS05L-300SN	LPS05L-300SNB
Input	Voltage Range	100 ~ 240 V	
	Frequency Range	50/60 Hz	
Output	Rated Current	0.34 A	
	Rated Voltage	3V	
	Rated Power	3 W or 5 W (Included Back-up Mode)	
Ambient Temperature t_a		-30 °C to +60 °C	
Max. Casing Temperature t_c		70 °C	
Casing (Color)		Steel (White)	
Weight		0.2 kg	
Function (Emergency duration)		-	Battery back up (3 h)

Specification

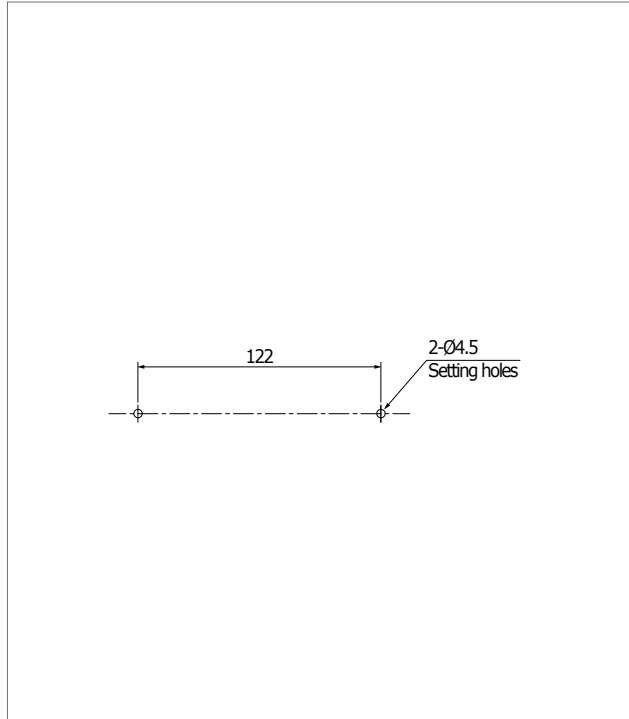
Model No.	Part No.	L(mm)	W(mm)	H(mm)	L1(mm)	P(Ø)
LPS05L-300SN	96240664	132	54.7	37.8	122	4.5
LPS05L-300SNB	96240665	132	54.7	37.8	122	4.5

		IN  100-240V	OUT  3V
---	---	--	---

Technical Drawing

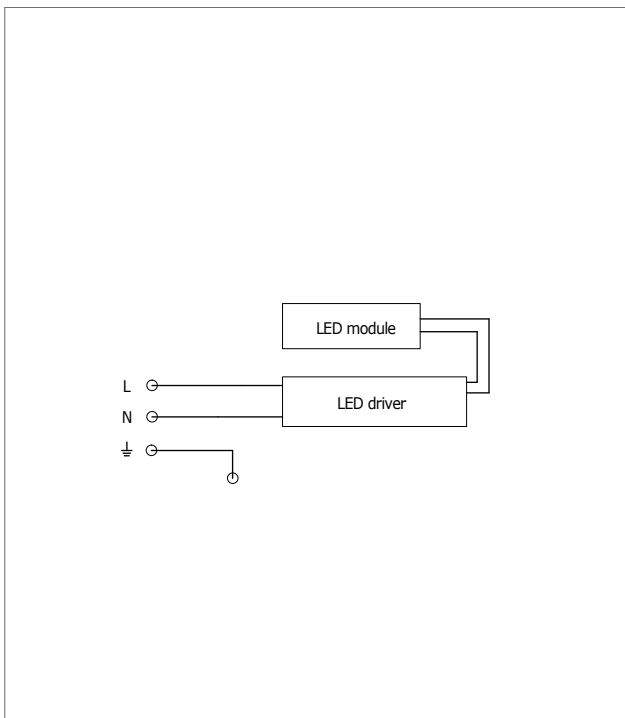


Setting Dimension

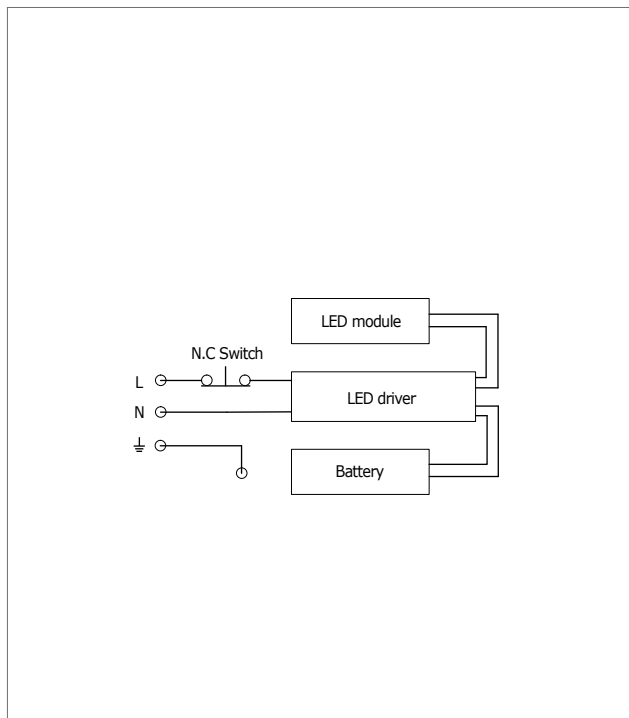


Circuit Diagram

LPS05L-300SN



LPS05L-300SNB (Battery back up)



LED driver for Down Light



DLD-14008-DFDR (Red light / Dimming)

DLD-24015-DFD-1 (1 Button), DLD-24015-DFD-2 (2 Button) (Dimming)

DLD-24015-DFN

Product Description

- Fixed output built-in LED driver
- Constant current LED driver
- Built-in active PFC function
- Universal AC input / Full range (100 ~ 240 V)
- Power Factor : Min. 0.9

Function

- Short-circuit protection
- Over-temperature protection
- Over-current protection
- Over-voltage protection

Standards

- EN 55015, EN 61000-3-2, EN 61347-2-13, EN 60945

Applied Models







Specification

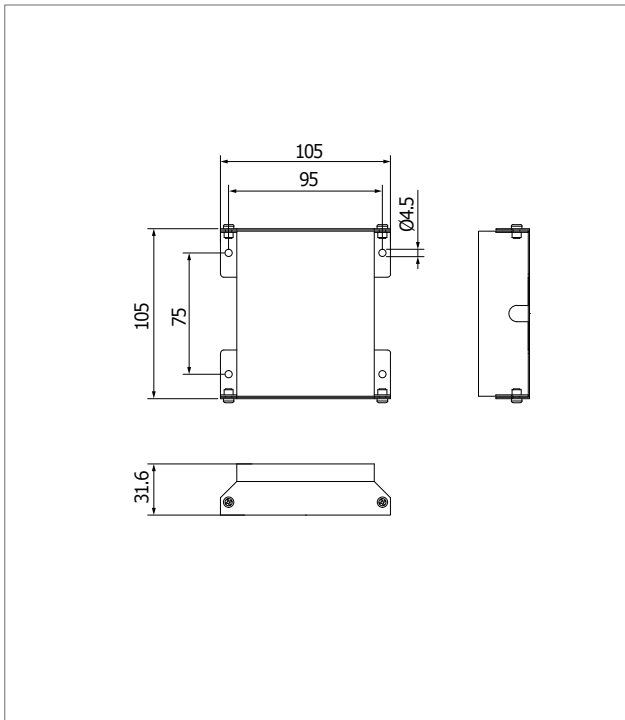
		DLD-14008-DFDR	DLD-24015-DFD	DLD-24015-DFN
Input	Voltage Range	100 ~ 240 V		
	Frequency Range	50/60 Hz		
Output	Rated Current	0.38 A	0.6 A	0.6 A
	Rated Voltage	14 V	24 V	24 V
	Rated Power	8 W	15 W	15 W
Ambient Temperature t_a		-30 °C to +60 °C		
Max. Casing Temperature t_c		75 °C		
Casing (Color)		Steel (Natural)		
Weight		0.2 kg		
Function		Red light / Dimming	Dimming	-

Specification

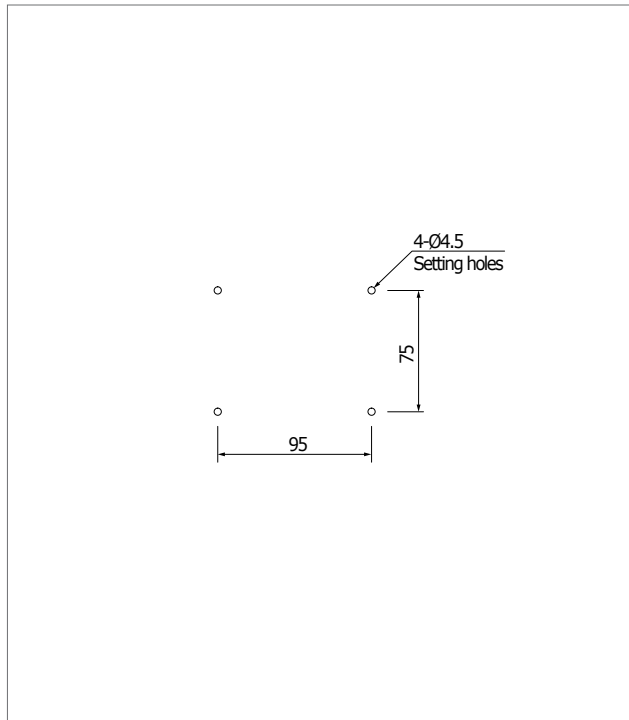
Model No.	Part No.	L(mm)	W(mm)	H(mm)	L1(mm)	W1(mm)	P(Ø)
DLD-14008-DFDR	96240706	105	105	31	95	75	4.5
DLD-24015-DFD	96240648	105	105	31	95	75	4.5
DLD-24015-DFN	96240647	105	105	31	95	75	4.5

		IN  100-240V	OUT  230V
---	---	--	---

Technical Drawing

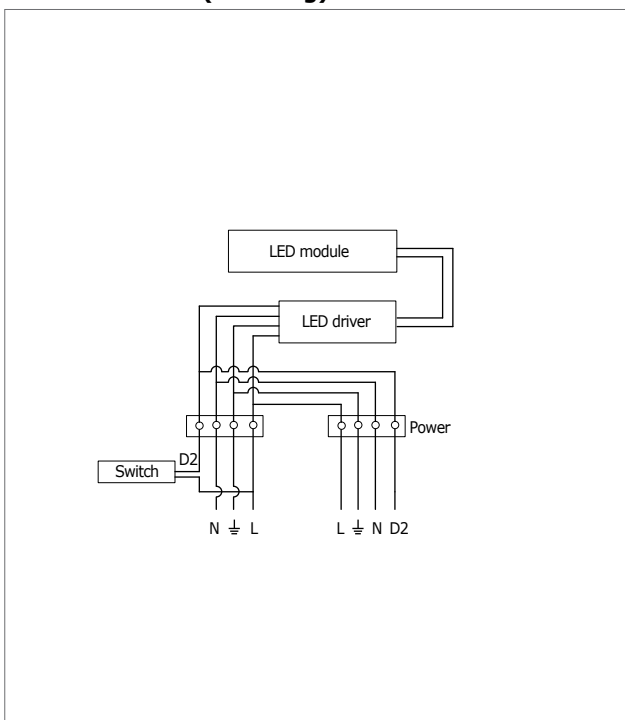


Setting Dimension

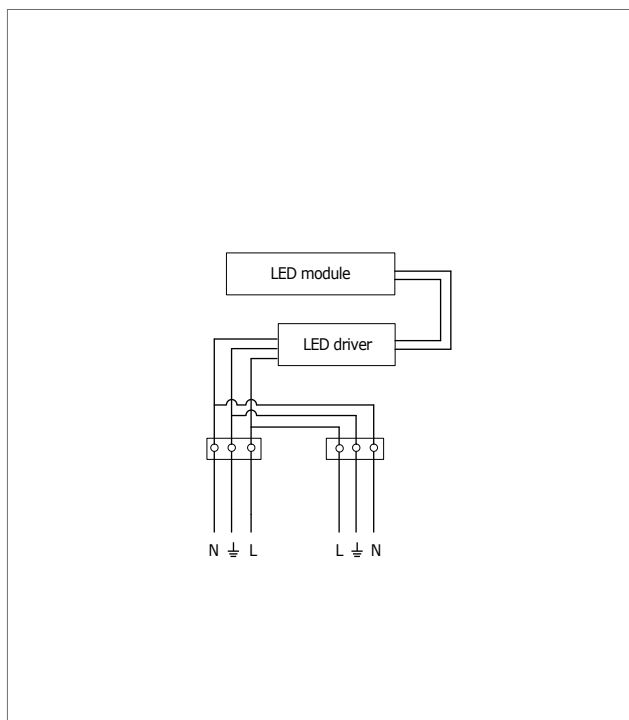


Circuit Diagram

DLD-14008-DFDR (Red light / Dimming)
DLD-24015-DFD (Dimming)



DLD-24015-DFN



LED driver for Flood Light

DLD-36250-PFN / DLD-45200-PFN



Product Description

- Fixed output built-in LED driver
- Constant current LED driver
- Built-in active PFC function
- Universal AC input / Full range (100 ~ 240 V)
- Power Factor : Min. 0.9

Function

- Short-circuit protection
- Over-temperature protection
- Over-current protection
- Over-voltage protection

Standards

- EN 55015, EN 61000-3-2, EN 61347-2-13, EN 60945

Applied Models







Specification

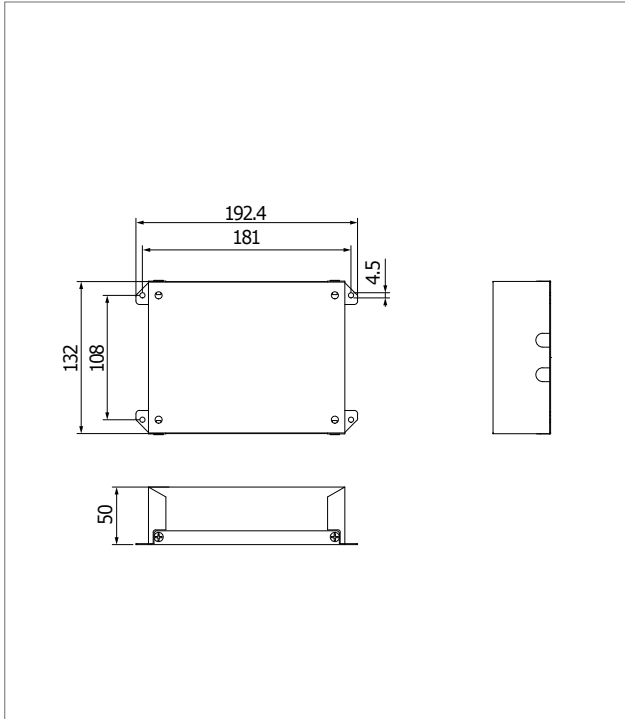
		DLD-36250-PFN	DLD-45200-PFN
Input	Voltage Range	100 ~ 240 V	
	Frequency Range	50/60 Hz	
Output	Rated Current	6.5 A	4.25 A
	Rated Voltage	36 V	45 V
	Rated Power	250 W	200 W
Ambient Temperature t_a		-30 °C to +60 °C	
Max. Casing Temperature t_c		90 °C	
Casing (Color)		Aluminium (White)	
Weight		1.5 kg	
Function		-	-

Specification

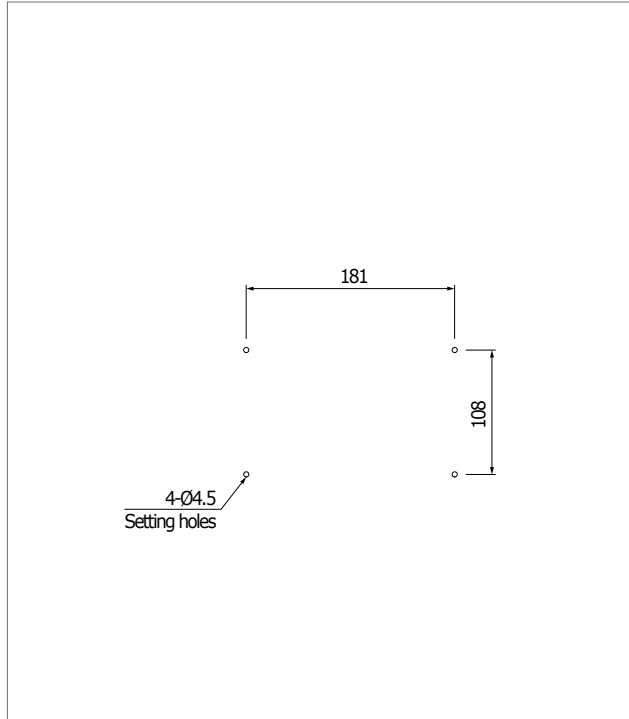
Model No.	Part No.	L(mm)	W(mm)	H(mm)	L1(mm)	W1(mm)	P(Ø)
DLD-36250-PFN	17061870	192.4	132	48.8	181	108	4.5
DLD-45200-PFN	17061871	192.4	132	48.8	181	108	4.5

		IN  100-240V	OUT  36/45V
---	---	--	---

Technical Drawing

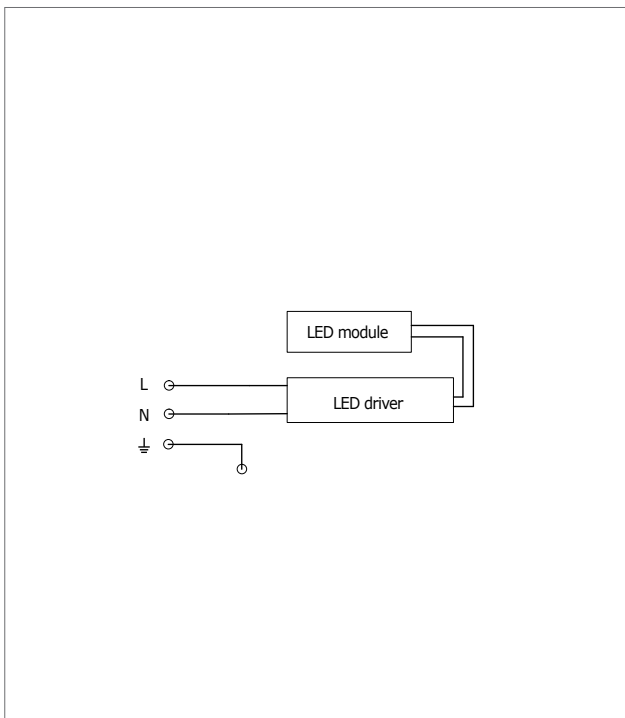


Setting Dimension

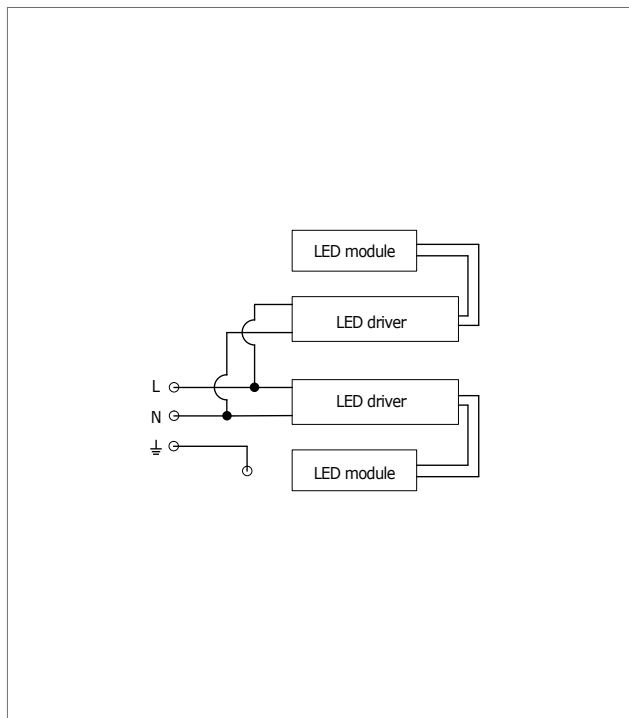


Circuit Diagram

DLD-36250-PFN (for PF250L)



DLD-45200-PFN (for PF400L)



LED driver for Flood Light

DLD-48030-PFN / DLD-48050-PFN



Product Description

- Fixed output built-in LED driver
- Constant current LED driver
- Built-in active PFC function
- Universal AC input / Full range (100 ~ 240 V)
- Power Factor : Min. 0.9

Function

- Short-circuit protection
- Over-temperature protection
- Over-current protection
- Over-voltage protection

Standards

- EN 55015, EN 61000-3-2, EN 61347-2-13, EN 60945

Applied Models

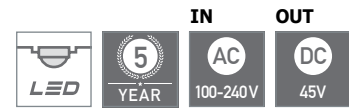


Specification

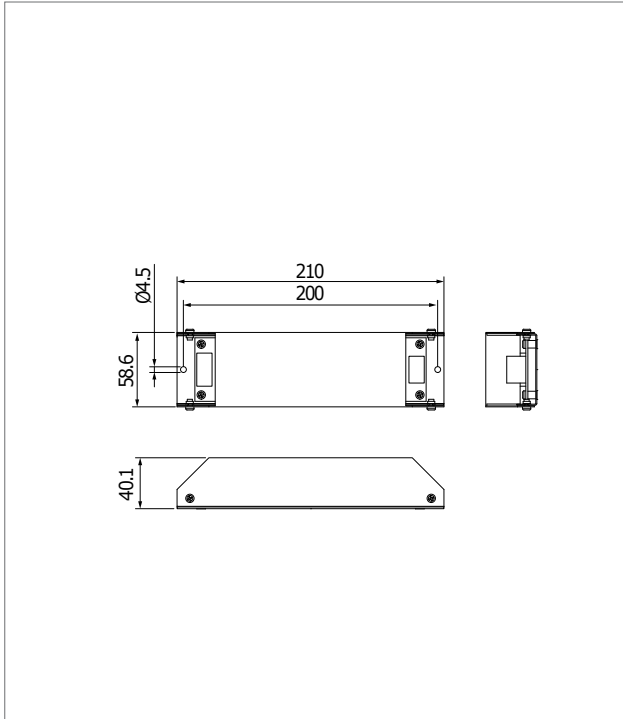
		DLD-48030-PFN	DLD-48050-PFN
Input	Voltage Range	100 ~ 240 V	
	Frequency Range	50/60 Hz	
Output	Rated Current	0.6 A	1 A
	Rated Voltage	48 V	
	Rated Power	30 W	50 W
Ambient Temperature t_a		-30 °C to +60 °C	
Max. Casing Temperature t_c		90 °C	
Casing (Color)		Steel (White)	
Weight		0.5 kg	
Function		-	-

Specification

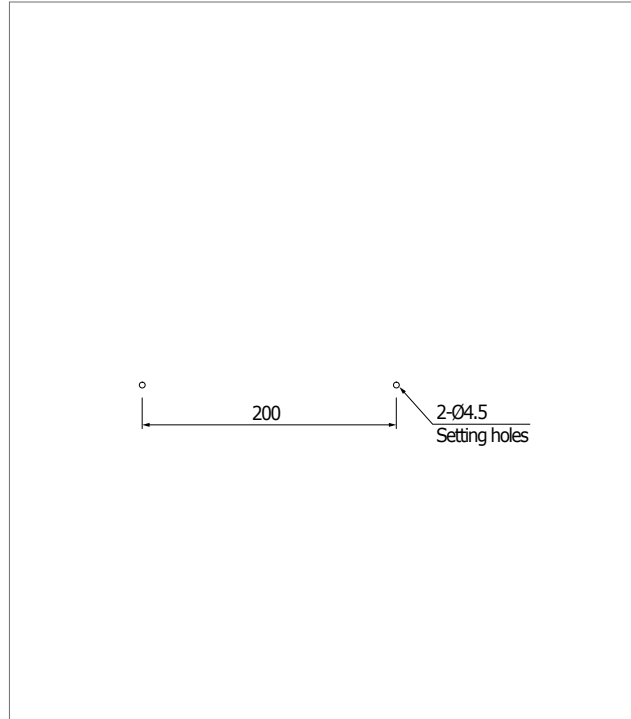
Model No.	Part No.	L(mm)	W(mm)	H(mm)	L1(mm)	P(Ø)
DLD-48030-PFN	17080114	210	58.6	40	200	4.5
DLD-48050-PFN	17080115	210	58.6	40	200	4.5



Technical Drawing

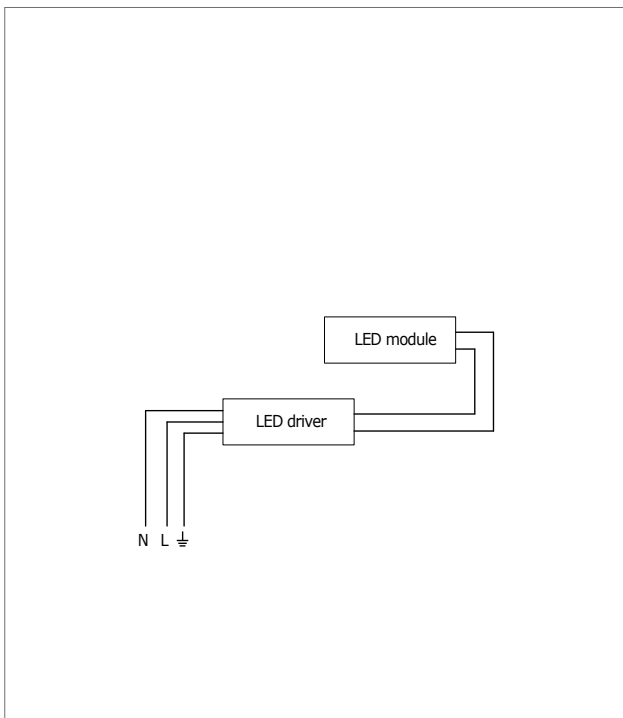


Setting Dimension



Circuit Diagram

DLD-48030-PFN
DLD-48050-PFN



LED driver for Explosion Proof Light

EXLED-S30N / EXLED-S60N
EXLED-EMS30 / EXLED-EMS60 (Battery back-up)



Product Description

- Fixed output built-in LED driver
- Constant current LED driver
- Built-in active PFC function
- Power Factor : Min. 0.9

Function

- Short-circuit protection
- Over-temperature protection
- Over-current protection
- Over-voltage protection

Explosion proof certificate

- Certificate no. : IECEx KGS 14.0006 U
- Protection grade : Ex e mb IIC Gb

Standards

- EN 55015, EN 61000-3-2, EN 61347-2-13, EN 60945,
IEC 60079-0, IEC 60079-7, IEC 60079-18

Applied Models



Specification

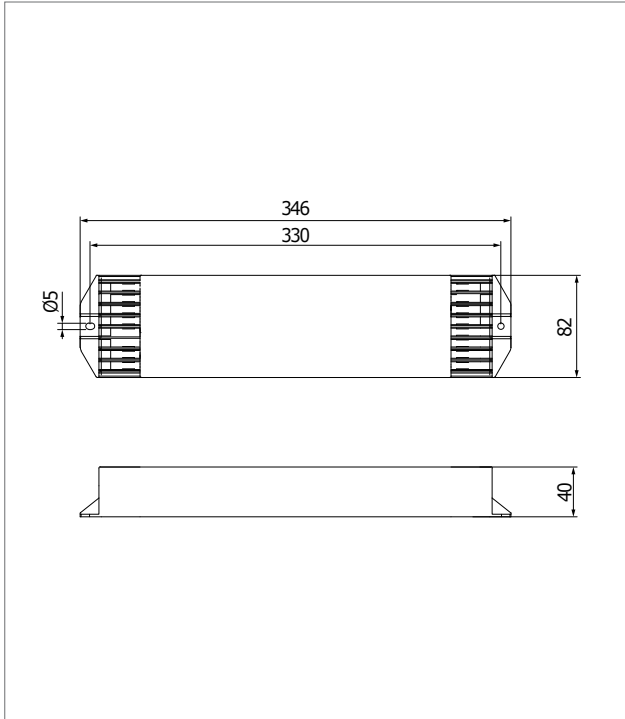
	EXLED-EMS30	EXLED-EMS60	EXLED-S30	EXLED-S60	
Input	Voltage Range AC 100 ~ 250 V				
	Frequency Range 50/60 Hz				
Output	Rated Current	0.58 A	1.16 A	0.58 A	1.16 A
	Rated Voltage	21 V	42 V	21 V	42 V
	Rated Power	25 W	50 W	25 W	50 W
Ambient Temperature t_a		-25 °C to +60 °C			
Max. Casing Temperature t_c		90 °C			
Casing (Color)		Polycarbonate (White)			
Weight		1.8 kg			
Function (Emergency duration)		Battery back up (3 h)	Battery back up (1.5 h)	-	-

Specification

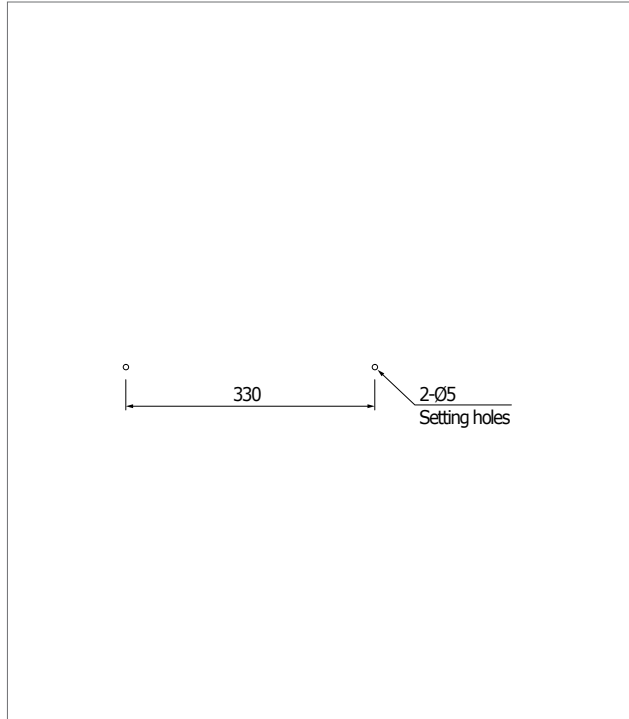
Model No.	Part No.	L(mm)	W(mm)	H(mm)	L1(mm)	P(Ø)
EXLED-EMS30	17061926	346	82	40	300	5
EXLED-EMS60	17061927	346	82	40	300	5
EXLED-S30N	17061936	346	82	40	300	5
EXLED-S60N	17061937	346	82	40	300	5

	5 YEAR	IN AC 120V	OUT DC 21/42V
--	------------------	-------------------------	----------------------------

Technical Drawing

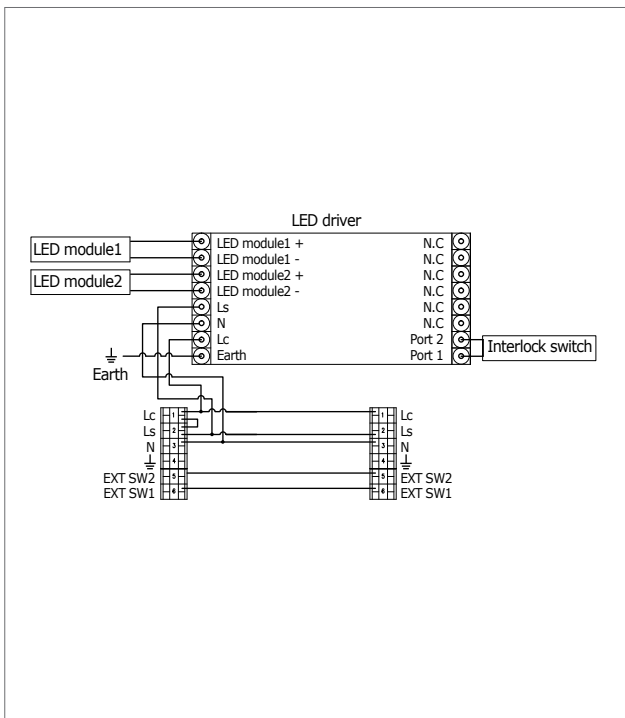


Setting Dimension

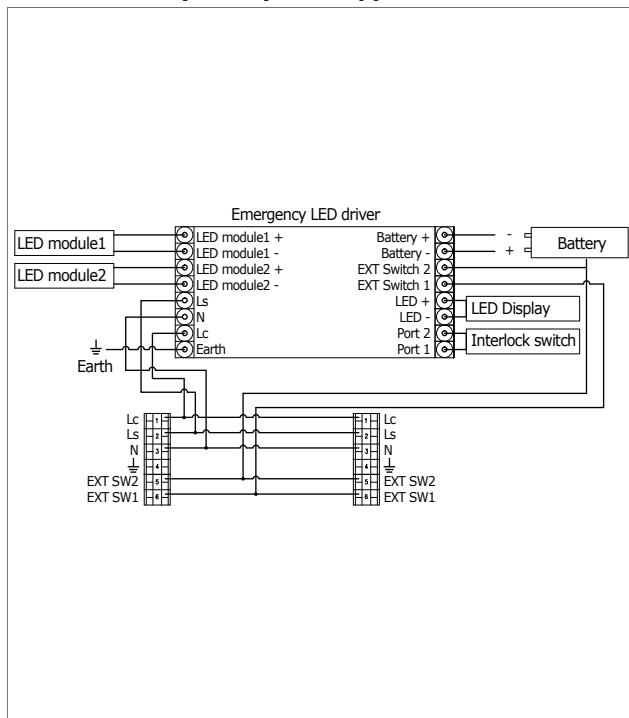


Circuit Diagram

EXLED-S30N
EXLED-S60N



EXLED-EMS30 (Battery back up)
EXLED-EMS60 (Battery back up)



GENERAL INFORMATION

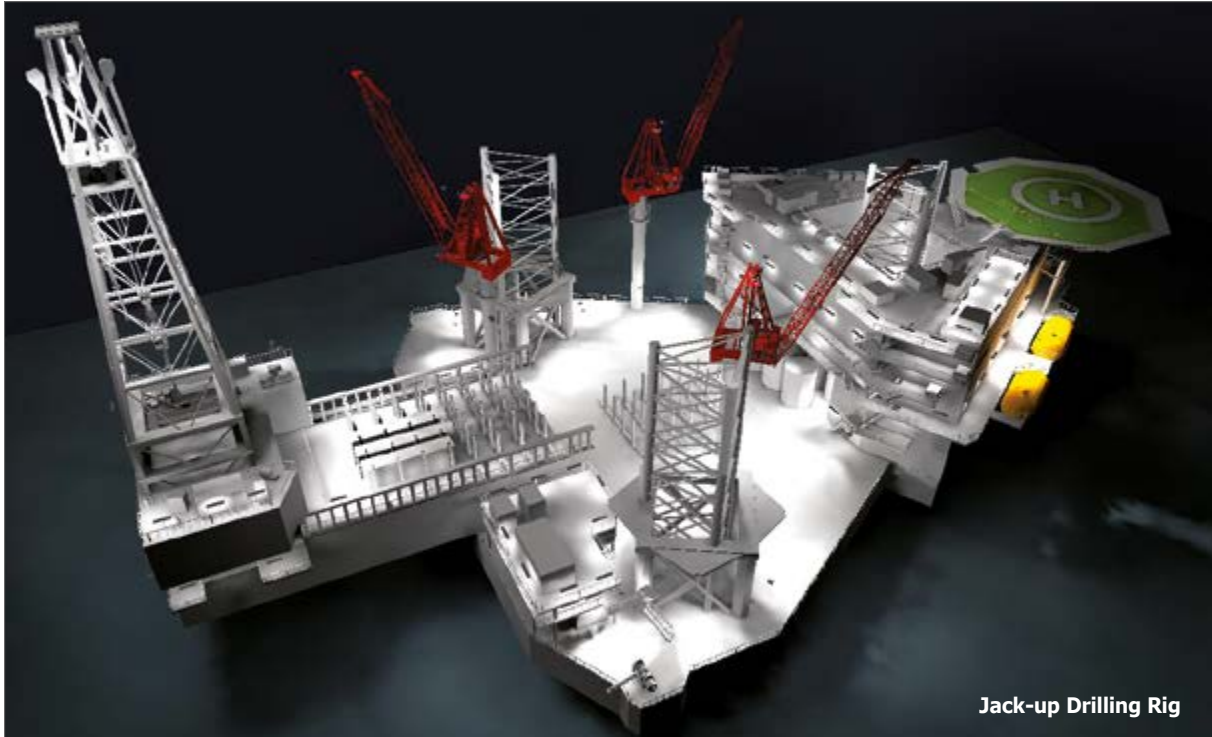
Daeyang is providing a total lighting solution including optimal lighting design and documentation for a number of complex offshore structures, such as Drillships, FPSOs constructed at all major shipbuilding yards. All works on the lighting architecture for offshore structures are implemented on the basis of our cumulated experiences to meet the customers' requirement.



GENERAL INFORMATION

General Information	100
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- Icon description	108
- Hazardous Area	110
- IP and IK Classification	116
- World Plug & Input Voltage Guide	118
- Lamp Data	120

Lighting Architecture



DAEYANG is providing a total lighting solution including optimal lighting design and documentation for a number of complex offshore structures, such as Drillships, FPSOs constructed at all major shipbuilding yards. All works on the lighting architecture for offshore structures are implemented on the basis of our cumulated experiences to meet the customers' requirement.

For designing adequate and relevant lighting architecture, we are performing lighting simulation to find the optimal arrangement of luminaires considering space, power consumption, economics, installation, and maintenance. By a token of our total lighting solution, we can help customers to consider all lighting equipment from drawing level in any design stages, which surely can save time and money of our valuable customers.

Available Performance



01
Lighting Concept, Routine Arr, Coordination



05
Illumination level study
(base on 3D Modeling)



02
Lighting Arrangement



06
Lighting Control System Configuration



03
Lighting Plan Update



07
Single line Connection

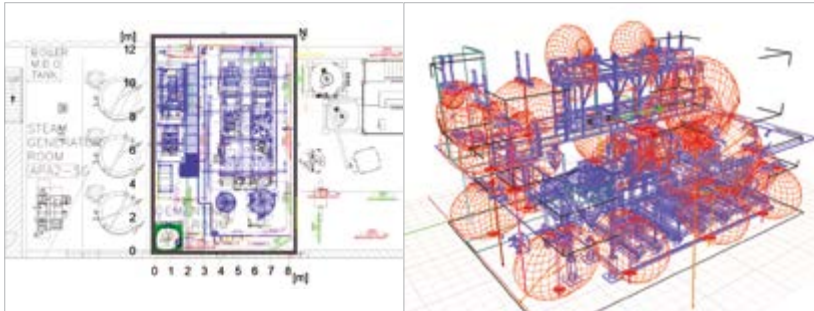


04
Logic diagram



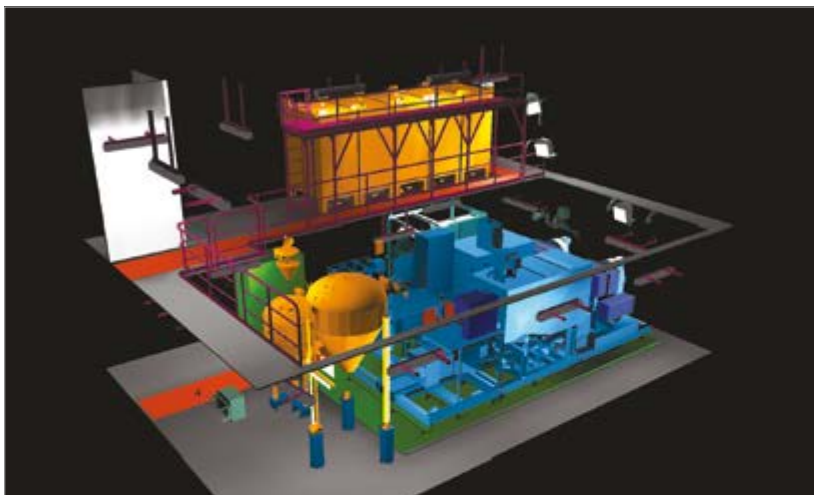
08
Commissioning Procedure

Illumination level study



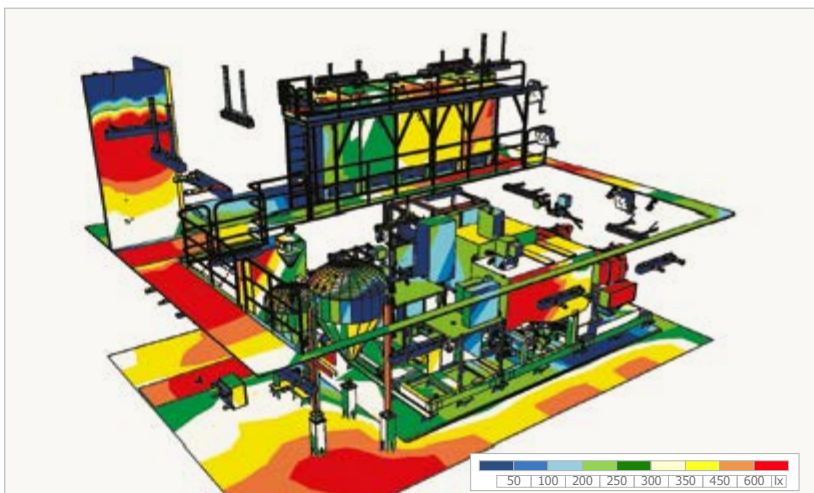
Space Composition & 3D Modeling

- 3D modeling works based on architectural drawings



Illuminance Calculation Area Setting & Lighting Arrangement

- Illuminance arrangement & calculation area setting
- Luminaire selection & luminaire adjusting work



Simulation & Rendering

- Optimization & review
- Illuminance distribution simulation and review

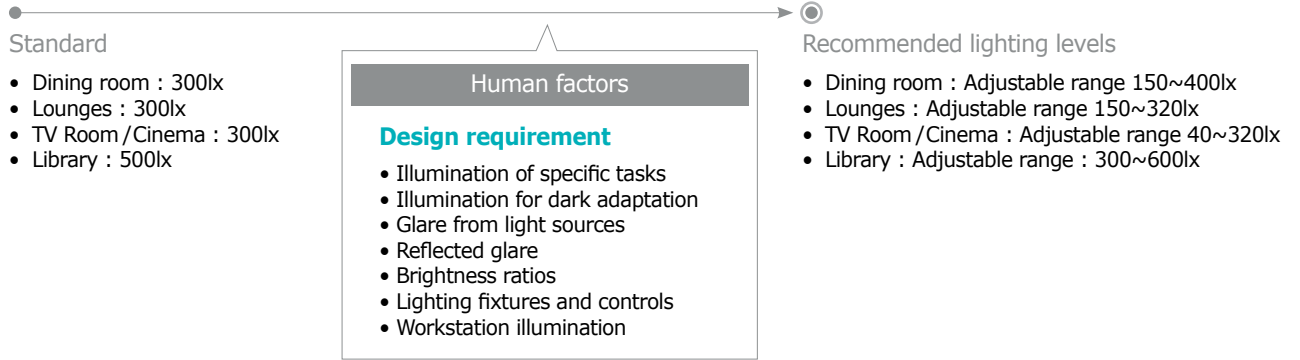


Report

- Illuminance calculation data sheets
- Lighting arrangement drawings
- Illuminance data sheets
- Luminaires specification sheets
- Luminaires specification drawings





Human Factors Design

Human Factors involves the application of knowledge about human characteristics, capabilities, limitations, expectations, and needs to the design and development of equipment, products, plant and systems.



Lighting Control System (Office Messroom in FPSO)

DAEYANG offers consultants, system integrators and electrical installers for a comprehensive product range with DALI & KNX, in order to meet the challenges posed to complex lighting control system.

<p>Scene 1 Dining Mode</p>  <p>Group 1, 2, 3, 4 : 100% Group 5 : ON Group 6 : ON</p>	<p>Scene 2 Dining Preparation Mode</p>  <p>Group 1 : 70% Group 4 : 50% Group 2 : 100% Group 5 : ON Group 3 : 0% Group 6 : OFF</p>
<p>Scene 3 Tea Time Mode</p>  <p>Group 1 : 70% Group 4 : 100% Group 2 : 70% Group 5 : ON Group 3 : 100% Group 6 : OFF</p>	<p>Scene 4 Night Mode</p>  <p>Group 1 : 0% Group 4 : 100% Group 2 : 0% Group 5 : ON Group 3 : 100% Group 6 : OFF</p>



KNX/EIB System Process

The KNX System is the leading intelligent control system for building world-wide. KNX ensures optimum lighting of industrial and ship lighting as well as dwellings. The lighting requirement is monitored and controlled. In addition, sub system (such as for example 1-10V Lighting control, DALI And their interfaces are supported.)

Open Standard

- International Standard (ISO/IEC 14543-3)
- European Standard (CENELEC EN 50090 and CEN EN 13321-1)
- Chinese Standard (GB/Z 20965)

KNX members

- 103 member companies
- Represented in 70 countries
- Over 21,000 ETS users
- 100 training centers
- 40 partners from science and further education

Function - KNX is the foundation for all applications within home automation:



Lighting Control

- Central lighting controlled in the house and garden.
- Choice of different lighting scenarios or individual dimming available.



Audio/Video Control

- Remote control of music from everywhere within the house.
- Remote control for every single room.



Blind and Shutter Control

- Control of blinds and shutters with regards to wind, brightness and rain.
- Put the control of blinds and shutters on a time schedule.



Operation and Visualization

- Presentation and operation of all systems in the house via a wall mounted display.
- Easy Visualization and integration of audio-systems and monitoring cameras.



Heating, Ventilation & Air Conditioning Control

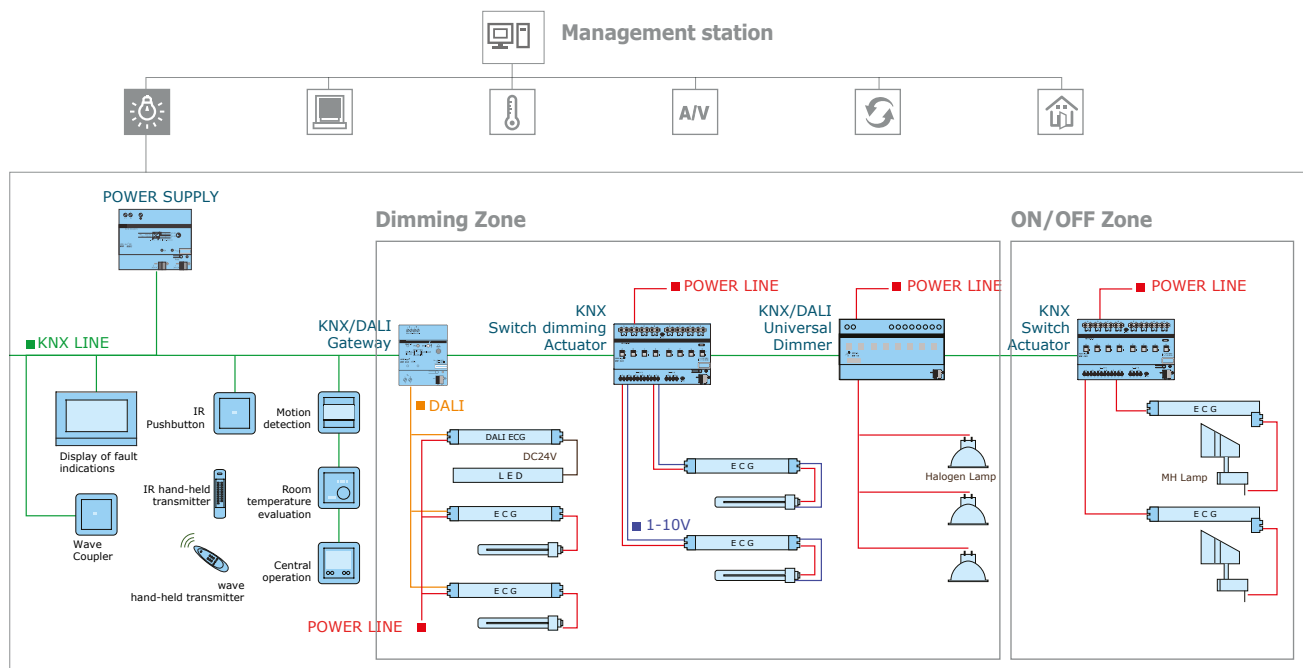
- Automatic and optimized heating control according to room usage or the needs of the inhabitants.
- Windows will be opened according to requirements.
- The ventilation system reacts to the presence of people in the room.



Security and Safety

- Reporting of open or broken windows and doors, smoke emission etc.
- Camera monitoring of the entrance.
- Deterrence of potential break-ins by switching on the entire home lighting system (panic mode).

KNX/EIB System Wiring for Lighting





DALI System Process

DALI stands for "Digital Addressable Lighting Interface" and is an interface protocol for digital communication between electronic lighting equipment (electronic ballasts, transformers, etc.). The detailed specifications of the DALI interface can be found in IEC 62386.

DALI System Control Device

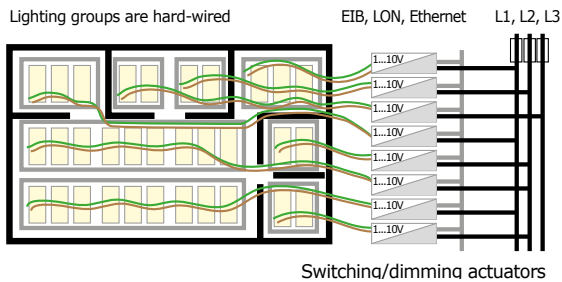
Total intergration of all applications, functions and services within a building via single bus line :

- Efficient energy Management
- Easy control and monitoring
- Easily expandable at all times
- Easily adaptable at all times

Benefits and features for DALI

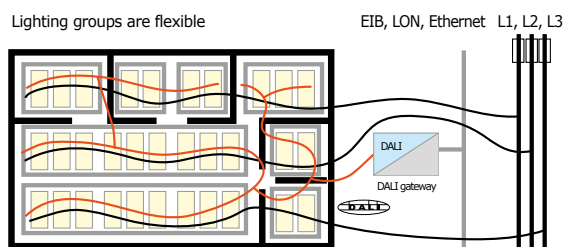
- Easy**
 - No need to worry about the mains voltage phase.
 - No need to worry about polarity +/-.
 - No separate bus line.
 - No external relay, DALI ECG switch themselves on and off.
- Flexible**
 - Each DALI control unit can be addressed individually.
 - No wiring by groups.
- Intelligent**
 - Status messages from DALI ECG(e.g. lamp faults, dimming level).
 - No need for scene memory modules.
 - Synchronized scene transitions.

Comparison 1-10V technic to DALI



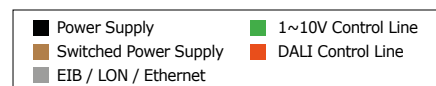
1-10V wiring

- A change in the room layout means the room has to be rewired.



DALI wiring

- A change in the room layout dose not necessitate rewiring.
- Integration of luminaires with DALI ECGs for building-wide lighting management.





Certification
of Approval

1,471
certificates

(up to July 14th, 2016)

DAEYANG Electric Co., Ltd. is a manufacturer of various equipment for marine and shipbuilding industry. To ensure our promises for best quality to customers, DAEYANG has been certified with quality management system for production, inspection and service. DAEYANG products have been guaranteed by cumulating the relevant certificates from various organization including CE, UL, IECEx bodies, ATEX, Classification Society all over the world, and so on.

Icon description

Available choices are marked with different symbols (icons) or optic descriptions. Use of symbols indicates an option within that product group and not that all products have that functionality.

Light sources



LED lamps

With substantial progress of LED technique in the last years today exists new product-specific designed light sources. DAEYANG as a pioneer for innovative light systems starts with the introduction of the new Lighting this LED technique combined with optimized technique.

LED: Light source of the future

A good example of this is our policy for the testing and selection of LED light sources. Light Emitting Diodes are in rapid development, and the lighting industry is disadvantaged by the lack of international standards.

At DAEYANG we aim to produce LED luminaires with single LEDs, LED modules and LED drivers of the best possible quality.

For this purpose our test centers are hard at work identifying the components that will provide the most efficient and reliable over time when included in one of our LED luminaires.



Fluorescent lamps

The powerful, explosion-protected hand and machine lamps with bi-pin fluorescent lamps fulfill the requirements of ATEX directive 94/9/EC. They are generally suited for use in potentially



Incandescent lamps

These lamps offer much light output because of their high efficiency despite of their small dimensions. They are not very sensitive to vibration and have proved as outdoor floodlights on board of ships. You need a ballast and an igniter. The average lifetime is about 6000 hours.



Halogen lamps

Traditional incandescent lamps lose part of their light intensity in the course of time since tungsten evaporates from the filament and condenses on the inside surface of the bulb forming a dark layer. In modern halogen lamps they prevent this effect by adding halogens to the filling gas. Within the so-called halogen cycle the halogens combine with the evaporated tungsten. This gaseous combination drifting with the heat flow towards the hot filament the tungsten will leave the combination and re-join the filament. The released halogens are again available for the cycle.

Further advantages of halogen lamps:

- Equally bright light throughout life time
- Nice, brilliant light for fresh colors and attractive glamour effects
- Increased light output about 25 % compared with traditional incandescent lamps
- Small dimensions



Xenon

Xenon lamps are DC-operated lamps that are especially suited for applications requiring excellent arc stability and a high luminance. Xenon lamps are short arc lamps in which the discharge arc fires in a pure xenon atmosphere under high pressure. Xenon lamps have a very good color rendering and extremely high luminance. For this reason they are often used in light guide systems, e.g. for endoscopy or dental technology. The Xenon lamps are designed for horizontal burning position, and excel with their compact dimensions. The Xenon lamps are designed for horizontal burning position, and excel with their compact dimensions.



Sodium lamps

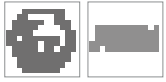
High intensity sodium lamps do not require secondary electrodes. The Xenon gas is ionized with the help of an external starting ignitor that also starts the discharge of sodium vapor. Beyond this starting the operation is as with metal halide lamps.



Metal halide lamps

- Positive Environmental Impact
Since metal halide lamps deliver light more efficiently than incandescent, widespread acceptance of the technology has a positive effect on air quality and the environmental waste stream. Lower electrical power generating requirements means less air pollution. Efficient long-life systems mean less landfill waste.
- Wider Range of Applications
Specifiers can now select from a broad variety of lamp types and wattages to suit almost any application. Metal halide lighting is used today indoors and out, for industrial, commercial, retail and municipal spaces. Popular for sports facilities, and site lighting, it is increasingly found in supermarkets, big box retail, offices and lobbies.

Approval



Ex mark, ATEX

The Ex mark is used in addition to the CE mark to indicate products conform to the EN standards for explosive gas atmospheres.

Certificate Number : This consists of the Certifying body's unique ID code, followed by text "ATEX" followed by a numerical file number



CE mark

The CE mark indicates a product meets all EU directives and conforms to EN standards. This is normally a self certification. Evidenced by a manufacturer's certification of conformity.



IECEX

The objective of the IECEX System is to facilitate international trade in equipment and services for use in explosive atmospheres, while maintaining the required level of safety: reduced testing and certification costs to manufacturer reduced time to market international confidence in the product assessment process one international database listing maintaining International Confidence in equipment and services covered by IECEX Certification



KC Safety Mark

It is a mandatory system to authorize to sell only the products certified by safety certification agency in order to prevent electrical appliances from causing accidents by risk and malfunction such as fire and electric shock.

Standards



Indicates IP rating



Voltage



Temperature Class



Zone System



Recessed Ceiling Type



Ceiling Type



Recessed Wall Type



Wall Type



Stand Type



Dimming



Water Tight



Signal Light



Low Temperature



Battery Backup



Alarm



NVG (Night Vision Goggle)

Hazardous Area

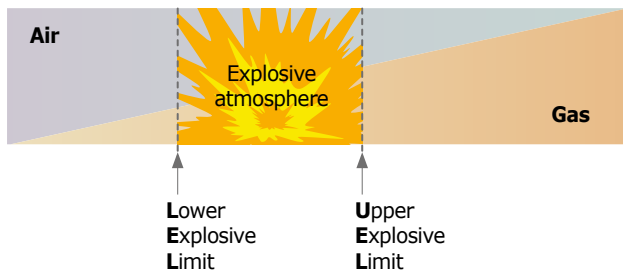
Explosion Factors

An Explosion can only be taken place, when three factors are present simultaneously



Explosion Limits (LEL, UEL)

- Below **Lower Explosive Limit** : Not enough fuel to ignite
- Above **Upper Explosive Limit** : Not enough oxygen
- Between **LEL** and **UEL** : Explosive atmosphere



Gases or Vapors	LEL	UEL
Acetylene	2,3	100
Ethylene	2,4	32,6
Gasoline	~0,6	~8
Methane	4,4	17
Propane	1,7	10,8
Carbon disulphide	0,6	60
Hydrogen	4,0	77

Equipment Grouping

Group I Used in **mines** susceptible to firedamp.

Group II Used in the explosive **gas** atmosphere.

Group III Used in the explosive **dust** atmosphere.

IIC can be used in IIB and IIA area.

IIB can be used in IIA area.

IIIC can be used in IIIB and IIIA area.

IIIB can be used in IIIA area.

Group	Gas or Dust	MESG	MIC	Ignition Energy (μJ)
I	Methane	-	-	260
IIA	Propane	0,9mm ≤ MESG	0,8 < MIC	160
IIB	Ethylene	0,5<MESG<0,9mm	0,45 ≤ MIC ≤ 0,8	80
IIC	Hydrogen, Acetylene	MESG ≤ 0,5mm	MIC < 0,45	20
IIIA	Wood, Paper, Cotton Dust	-	-	
IIIB	Grain Dust	-	-	80
IIIC	Metal, Coal Dust	-	-	

* MESG : Maximum Experimental safe gap

MIC : Minimum Ignition Current Ratio (according to IEC 60079-20-1)

Ignition Energy according to IEC 60079-11. 10.1.5.3



Temperature Class for Group II (Gas or Dust)

Temperature class	Max. surface temperature [°C]	Safety margin [K]
T1	450	10
T2	300	10
T3	200	5
T4	135	5
T5	100	5
T6	85	5

Hazardous Area

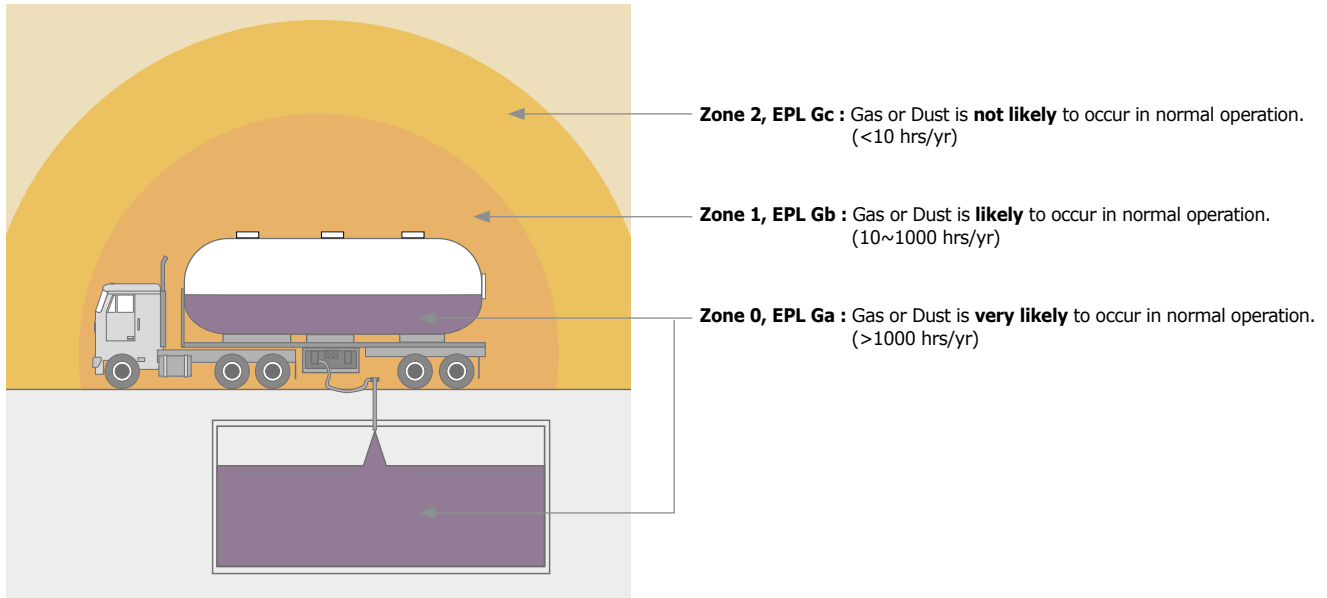
Types of Protection

IEC	Latest Version	Basic Principle	Model (DAEYANG)	Division	ZONE	EPL
60079-0	Ed. 6 (2011)	General requirements This part of IEC 60079 specifies the general requirements for construction, testing and marking of electrical equipment and Ex Components intended for use in explosive atmospheres.				
60079-1	Ed. 7 (2014)	Flameproof enclosures "d" Parts which can ignite a potentially explosive atmosphere are surrounded by an enclosure which withstands the pressure of an explosive mixture exploding inside the enclosure and prevents the transmission of the explosion to the atmosphere surrounding the enclosure.	PF-**SBX2	Ex da	0	Ga
				Ex db	1	Gb
				Ex dc	2	Gc
60079-2	Ed. 6 (2014)	Pressurized enclosures "p" The formation of a potentially explosive atmosphere inside an enclosure is prevented by maintaining a positive internal pressure of protective gas in relation to the surrounding atmosphere and, where necessary, by supplying the inside of the enclosure with a constant flow of protective gas which dilutes any combustible mixtures.	MPS	Ex pxb	1/21	Gb/Db
				Ex pyb	1/21	Gb/Db
				Ex pzc	2/22	Gc/Dc
60079-7	Ed. 5 (2015)	Increased safety "e" Here additional measures are applied to increase the level of safety, thus preventing the possibility of inadmissibly high temperatures and the occurrence of sparks or electric arcs within the enclosure or on exposed parts of electrical equipment, where such ignition sources would not occur in normal service.	EXLED-***ed	Ex eb	1	Gb
				Ex ec	2	Gc
60079-11	Ed. 6 (2011)	Intrinsic safety "i" Equipment that is used in a potentially explosive area only contains intrinsically safe electric circuits. An electric circuit is intrinsically safe if any spark or thermal effect produced under specified test conditions (which include normal operation and specified fault conditions) is not capable of causing ignition of a given explosive atmosphere.	-	Ex ia	0/20	Ga/Da
				Ex ib	1/21	Gb/Db
				Ex ic	2/22	Gc/Dc
60079-15	Ed. 4 (2010)	Type of protection "n" Electrical equipment cannot ignite an explosive atmosphere surrounding it (during normal operation and under defined abnormal operating conditions).	EXLED-***ed	Ex nA	2	Gc
				Ex nR	2	Gc
				Ex nC	2	Gc
60079-18	Ed. 4 (2014)	Encapsulation "m" Parts that are capable of igniting an explosive atmosphere are enclosed in a compound in such a way that ignition of an explosive atmosphere is prevented.	EXLED-EMS**	Ex ma	0/20	Ga/Da
				Ex mb	1/21	Gb/Db
				Ex mc	2/22	Gc/Dc

* EPL Ga can be used in EPL Ga, Gb & Gc ; EPL Gb can be used in EPL Gb & Gc ; EPL Gc can only be used in EPL Gc.
 EPL Da can be used in EPL Da, Db & Dc ; EPL Db can be used in EPL Db & Dc ; EPL Dc can only be used in EPL Dc.

* IEC : International Electrotechnical Commission
 EPL : Equipment Protection Levels

Zone & EPL (Equipment Protection Level)



	Zone	IEC EPL	Definition
Gas	Zone 0	Ga	A place in which an explosive atmosphere consisting of a mixture with air of dangerous substances in the form of gas, vapor or mist is very likely to occur in normal operation. (>1000 h/y)
	Zone 1	Gb	A place in which an explosive atmosphere consisting of a mixture with air of dangerous substances in the form of gas, vapor or mist is likely to occur in normal operation. (10~1000 h/y)
	Zone 2	Gc	A place in which an explosive atmosphere consisting of a mixture with air of dangerous substances in the form of gas, vapor or mist is not likely to occur in normal operation. (<10 h/y)
Dust	Zone 20	Da	A place in which an explosive atmosphere in form of a cloud of combustible dust in air is very likely to occur in normal operation. (>1000 h/y)
	Zone 21	Db	A place in which an explosive atmosphere in form of a cloud of combustible dust in air is likely to occur in normal operation. (10~1000 h/y)
	Zone 22	Dc	A place in which an explosive atmosphere in form of a cloud of combustible dust in air is not likely to occur in normal operation. (<10 h/y)

* IEC : International Electrotechnical Commission
EPL : Equipment Protection Levels

Hazardous Area

IECEX and ATEX

Technically identical standards for electrical equipment since 2006.

For single standards, a single set of tests and assessments can support both IECEX and ATEX.

An ATEX EC-Type Examination Certificate can be based on an IECEX ExTR but ATEX documentation does not necessarily support an IECEX certificate.

The technical requirements of a manufacturer's QA system are effectively the same, both are based on ISO/IEC 80079-34 and an IECEX QAR can support the issue of an ATEX QAN.



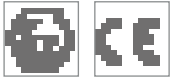
IECEX for the World - Product certification

- Aim : One single certificate for any hazardous area product recognised and accepted throughout the world.
- Already accepted in many countries. Alternatively a single test report(ExTR) can be sent to any member certification body(ExCB) to issue locally accepted certification.
- Currently only electrical equipment to IEC Standards (but IEC Standards for non-electrical equipment are being developed).
- ExCB issues an ExTR(covering the product type) and a quality assessment report(QAR) (covering the related production facility)
- Certificates of conformity created directly on the IECEX website, fully visible for the whole world to read and check states.
- ExCB maintains the status of certificate based on the outcome of future QARs, a minimum of 2 audit visits in a 3years period.



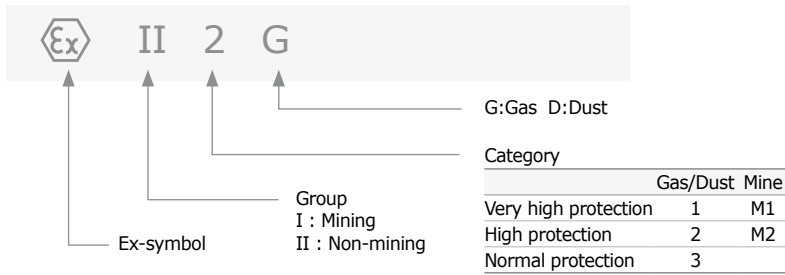
ATEX for Europe - Conformity Assessment

- A common approach to lifting barriers to trade within the European Economic Area(EEA).
- The Directive becomes law on implementation in each member country and compliance is mandatory within the EEA.
- Applicable to non-electrical equipment and protective system as well as electrical equipment.
- Certification from a Notified Body is Mandatory for Category 1 and M1 equipment, protective systems and Category 2 and M2 electrical equipment. Otherwise self declaration of compliance is permitted.
- An EC-Type Examination Certificate and Quality Assessment Notification (QAN) are issued by a Notified Body.
- The manufacturer -alone- is responsible for the Declaration of Conformity which must accompany every product which bears the European(CE) Marking.

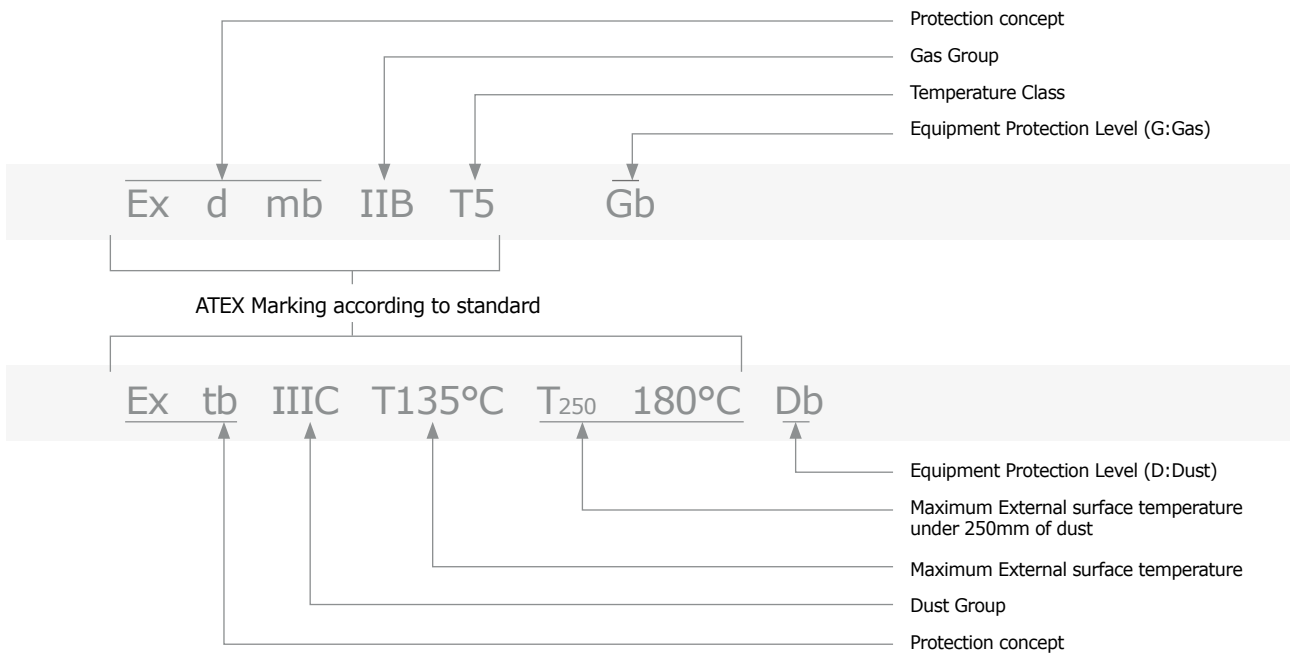


Marking

ATEX Coding



IECEX/ATEX -equipment marking

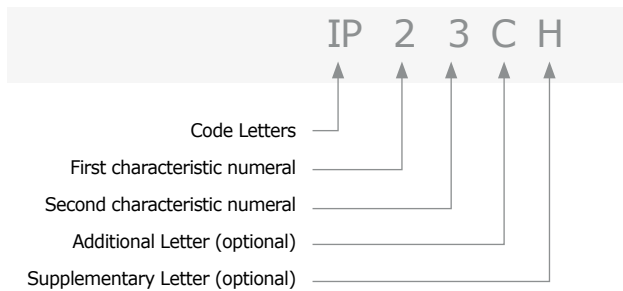


IP and IK Classification



IP CLASS

IP (Ingress Protection) classification tells us the product capability to avoid ingress from water or solid objects. The first number refers to solid objects/dust and the second to water. DAEYANG has laboratories for testing IP classification. Mainly, higher IP-rating means higher dust and watertightness. Please remember the IP66 -rating which also takes in consideration the protection against heavy seas and high pressure water cleaning.



If one or both numerals are stated as "X", the product could not be subjected to the relevant test. The statement "X" cannot, however, be used to signify any random IP rating.










IP protection degrees for enclosures

Degrees of protection against solid foreign objected by the first characteristic numeral.

First characteristic numeral : Protection against solid bodies

IP	Tests	Description	Definition
0		Non-protected	-
1		Protected against solid foreign objects of 50mm diameter and greater (accidental contact with the hand)	The object probe, sphere of 50mm diameter, shall not fully penetrate <small>The full diameter of the object probe shall not pass through an opening of the enclosure.</small>
2		Protected against solid foreign objects of 12.5mm diameter and greater (finger of the hand)	The object probe, sphere of 12.5mm diameter, shall not fully penetrate <small>The full diameter of the object probe shall not pass through an opening of the enclosure.</small>
3		Protected against solid foreign objects of 2.5mm diameter and greater (tools, wires)	The object probe of 2.5mm diameter shall not penetrate at all <small>The full diameter of the object probe shall not pass through an opening of the enclosure.</small>
4		Protected against solid foreign objects of 1mm diameter and greater (fine tools, small wires)	The object probe of 1mm diameter shall not penetrate at all <small>The full diameter of the object probe shall not pass through an opening of the enclosure.</small>
5		Dust-Protected (no harmful deposit)	Ingress of dust is not totally prevented, but dust shall not penetrate in a quantity to interfere with satisfactory operation of the apparatus or to impair safety
6		Dust-tight	No ingress of dust

Second characteristic numeral : Protection against liquids

IP	Tests	Description	Definition
0		Non-protected	-
1		Protected against vertically falling water drops	Vertically falling drops shall have no harmful effects
2		Protected against vertically falling water drops when enclosure tilted up to 15°	Vertically falling drops shall have no harmful effects when the enclosure is tilted at any angle up to 15° on either side of the vertical
3		Protected against spraying water	Water sprayed at an angle up to 60° on either side of the vertical shall have no harmful effects
4		Protected against splashing water	Water splashed against the enclosure from any direction shall have no harmful effects
5		Protected against water jets	Water protected in jets against the enclosure from any direction shall have no harmful effects
6		Protected against power water jets	Water protected in powerful jets against the enclosure from any direction shall have no harmful effects
7		Protected against the effects of temporary immersion in water	Ingress of water in quantities causing harmful effects shall not be possible when the enclosure is temporarily immersed in water under standardized conditions of pressure and time
8		Protected against the effects of temporary immersion in water	Ingress of water in quantities causing harmful effects shall not be possible when the enclosure is temporarily immersed in water under standardized conditions of pressure and time

Cleaning processes carried out by professionals are not covered by the IP rating data. If necessary, manufacturers are advised to provide relevant cleaning process information. This is in accordance with the recommendations on professionally executed cleaning processes as stated in IEC 60529.

IK Number

IK	Impact Energy (joules)	Equivalent Impact
00	Non-protected	No Test
01	0.15	Drop of 200g object from 7.5cm height
02	0.2	Drop of 200g object from 10cm height
03	0.35	Drop of 200g object from 17.5cm height
04	0.5	Drop of 200g object from 25cm height
05	0.7	Drop of 200g object from 35cm height
06	2	Drop of 500g object from 20cm height
07	3	Drop of 500g object from 40cm height
08	5	Drop of 1.7kg object from 29.5cm height
09	10	Drop of 5kg object from 20cm height
10	20	Drop of 5kg object from 40cm height

World Plug & Input Voltage Guide

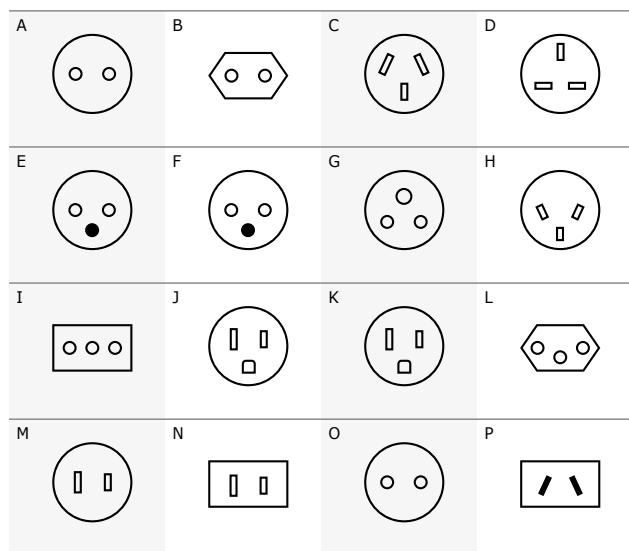
Country	Plug type	Voltage	Hz
Afghanistan	C, D, F	240 V	50 Hz
Albania	C, F	220 V	50 Hz
Algeria	C, F	230 V	50 Hz
American Samoa	A, B, F, I	120 V	60 Hz
Andorra	C, F	220 V	50 Hz
Angola	C	220 V	50 Hz
Anguilla	A, B	110 V	60 Hz
Antigua	A, B	230 V	60 Hz
Argentina	C, I	220 V	50 Hz
Armenia	C, F	220 V	50 Hz
Aruba	A, B, F	127 V	60 Hz
Australia	I	230 V	50 Hz
Austria	C, F	230 V	50 Hz
Azerbaijan	C	220 V	50 Hz
Azores	B, C, F	220 V	50 Hz
Bahamas	A, B	120 V	60 Hz
Bahrain	G	230 V	50 Hz
Balearic Islands	C, F	220 V	50 Hz
Bangladesh	A, C, D, G, K	220 V	50 Hz
Barbados	A, B	115 V	50 Hz
Belarus	C	220 V	50 Hz
Belgium	C, E	230 V	50 Hz
Belize	A, B, G	110/220 V	60 Hz
Benin	C, E	220 V	50 Hz
Bermuda	A, B	120 V	60 Hz
Bhutan	D, F, G, M	230 V	50 Hz
Bolivia	A, C	220 V	50 Hz
Bosnia	C, F	220 V	50 Hz
Botswana	D, G, M	231 V	50 Hz
Brazil	A, B, C, I	110/220 V	60 Hz
Brunei	G	240 V	50 Hz
Bulgaria	C, F	220 V	50 Hz
Burkina Faso	C, E	220 V	50 Hz
Burundi	C, E	220 V	50 Hz
Cambodia	A, C, G	230 V	50 Hz
Cameroon	C, E	220 V	50 Hz
Canada	A, B	120 V	60 Hz
Canary Islands	C, E, L	220 V	50 Hz
Cape Verde	C, F	220 V	50 Hz
Cayman Islands	A, B	120 V	60 Hz
Central African Republic	C, E	220 V	50 Hz
Chad	D, E, F	220 V	50 Hz
Channel Islands	C, G	230 V	50 Hz
Chile	C, L	220 V	50 Hz
China (mainland)	A, C, I	220 V	50 Hz
Colombia	A, B	120 V	60 Hz
Comoros	C, E	220 V	50 Hz
Congo-Brazzaville	C, E	230 V	50 Hz
Congo-Kinshasa	C, D	220 V	50 Hz
Cook Islands	I	240 V	50 Hz
Costa Rica	A, B	120 V	60 Hz
Cote d'Ivoire	C, E	230 V	50 Hz
Croatia	C, F	230 V	50 Hz
Cuba	A, B	110 V	60 Hz
Cyprus	G	240 V	50 Hz
Czech Republic	C, E	230 V	50 Hz
Denmark	C, K, E	230 V	50 Hz
Djibouti	C, E	220 V	50 Hz

Country	Plug type	Voltage	Hz
Dominica	D, G	230 V	50 Hz
Dominican Rep.	A, B	110 V	60 Hz
East Timor	C, E, F, I	220 V	50 Hz
Ecuador	A, B	120 V	60 Hz
Egypt	C	220 V	50 Hz
El Salvador	A, B	115 V	60 Hz
Equatorial Guinea	C, E	220 V	50 Hz
Eritrea	C	230 V	50 Hz
Estonia	C, F	230 V	50 Hz
Ethiopia	C, E, F, L	220 V	50 Hz
Faroe Islands	C, K	220 V	50 Hz
Falkland Islands	G	240 V	50 Hz
Fiji	I	240 V	50 Hz
Finland	C, F	230 V	50 Hz
France	C, E	230 V	50 Hz
French Guiana	C, D, E	220 V	50 Hz
Gaza Strip	C, H, M	230 V	50 Hz
Gabon	C	220 V	50 Hz
Gambia	G	230 V	50 Hz
Germany	C, F	230 V	50 Hz
Ghana	D, G	230 V	50 Hz
Gibraltar	G, K	240 V	50 Hz
Greece	C, F	230 V	50 Hz
Greenland	C, K	220 V	50 Hz
Grenada	G	230 V	50 Hz
Guadeloupe	C, D, E	230 V	50 Hz
Guam	A, B	110 V	60 Hz
Guatemala	A, B	120 V	60 Hz
Guinea	C, F, K	220 V	50 Hz
Guinea-Bissau	C	220 V	50 Hz
Guyana	A, B, D, G	240 V	60 Hz
Haiti	A, B	110 V	60 Hz
Honduras	A, B	110 V	60 Hz
Hong Kong	G, M	220 V	50 Hz
Hungary	C, F	230 V	50 Hz
Iceland	C, F	230 V	50 Hz
India	C, D, M	230 V	50 Hz
Indonesia	C, F, G	127/230 V	50 Hz
Iran	C, F	220 V	50 Hz
Iraq	C, F, G	230 V	50 Hz
Ireland	G	230 V	50 Hz
Isle of Man	C, G	240 V	50 Hz
Israel	C, H, M	230 V	50 Hz
Italy	C, F, L	230 V	50 Hz
Japan	A, B	100 V	50/60Hz
Jordan	B, C, D, F, G, J	230 V	50 Hz
Kazakhstan	C, E, F	220 V	50 Hz
Kenya	G	240 V	50 Hz
Kiribati	I	240 V	50 Hz
Korea, North	C	220 V	50 Hz
Korea, South	A, B, C, F	220 V	60 Hz
Kuwait	C, G	240 V	50 Hz
Laos	A, B, C, E, F	230 V	50 Hz
Latvia	C, F	220 V	50 Hz
Lebanon	A, B, C, D, G	110/200 V	50 Hz
Lesotho	M	220 V	50 Hz
Liberia	A, B, C, E, F	120/240 V	50 Hz
Libya	D, L	127 V	50 Hz
Lithuania	C, F	230 V	50 Hz








Country	Plug type	Voltage	Hz
Liechtenstein	C, J	230 V	50 Hz
Luxembourg	C, F	230 V	50 Hz
Macau S.A.R. of China	D, M, G, F	220 V	50 Hz
Madagascar	C, D, E, J, K	127/220 V	50 Hz
Madeira	C, F	220 V	50 Hz
Malawi	G	230 V	50 Hz
Malaysia	G, M	240 V	50 Hz
Maldives	A, D, G, J, K, L	230 V	50 Hz
Mali	C, E	220 V	50 Hz
Malta	G	230 V	50 Hz
Martinique	C, D, E	220 V	50 Hz
Mauritania	C	220 V	50 Hz
Monaco	C, D, E, F	120/220 V	50 Hz
Mongolia	C, E	230 V	50 Hz
Montenegro	C, F	220 V	50 Hz
Montserrat	A, B	230 V	60 Hz
Morocco	C, E	120/220 V	50 Hz
Mozambique	C, F, M	220 V	50 Hz
Myanmar/Burma	C, D, F, G	230 V	50 Hz
Namibia	D, M	220 V	50 Hz
Nauru	I	240 V	50 Hz
Nepal	C, D, M	230 V	50 Hz
Netherlands	C, F	230 V	50 Hz
Netherlands Antilles	A, B, F	120/220 V	50 Hz
New Calcedonia	F	220 V	50 Hz
Nicaragua	A, B	120 V	60 Hz
Niger	A, B, C, D, E, F	220 V	50 Hz
Nigeria	D, G	240 V	50 Hz
Norway	C, F	230 V	50 Hz
Okinawa	A, B	100 V	60 Hz
Oman	C, G	240 V	50 Hz
Pakistan	C, D, M, G	230 V	50 Hz
Panama	A, B	110 V	60 Hz
Papua New Guinea	I	240 V	50 Hz
Paraguay	C	220 V	50 Hz
Peru	A, B, C	220 V	60 Hz
Philippines	A, B	220 V	60 Hz
Poland	C, E	230 V	50 Hz
Portugal	C, F	220 V	50 Hz
Puerto Rico	A, B	120 V	60 Hz
Qatar	D, G	240 V	50 Hz
Reunion	E	220 V	50 Hz
Romania	C, F	230 V	50 Hz
Romania	C, F	230 V	50 Hz
Russian Federation	C, F	220 V	50 Hz
Rwanda	C, J	230 V	50 Hz
St. Kitts/Nevis	D, G	230 V	60 Hz
St. Lucia	G	240 V	50 Hz
St. Vincent	A, C, E, G, I, K	230 V	50 Hz
Saudi Arabia	A, B, F, G	127/230 V	60 Hz
Senegal	C, D, E, K	230 V	50 Hz
Sierra Leone	D, G	230 V	50 Hz
Singapore	G, M	230 V	50 Hz
Slovakia	C, E	230 V	50 Hz
Slovenia	C, F	230 V	50 Hz
Somalia	C	220 V	50 Hz
South Africa	M	220 V	50 Hz

Country	Plug type	Voltage	Hz
Spain	C, F	230 V	50 Hz
Sri Lanka	D, M, G	230 V	50 Hz
Sudan	C, D	230 V	50 Hz
Suriname	C, F	127 V	60 Hz
Swaziland	M	230 V	50 Hz
Sweden	C, F	230 V	50 Hz
Switzerland	C, J	230 V	50 Hz
Syria	C, E, L	220 V	50 Hz
Tahiti	A, B, E	110/220 V	60 Hz
Taiwan	A, B	110/220 V	60 Hz
Tanzania	D, G	230 V	50 Hz
Thailand	A, B, C	220 V	50 Hz
Togo	C	220 V	50 Hz
Tonga	I	240 V	50 Hz
Trinidad & Tobago	A, B	115 V	60 Hz
Tunisia	C, E	230 V	50 Hz
Turkey	C, F	230 V	50 Hz
Turkmenistan	B, F	220 V	50 Hz
Uganda	G	240 V	50 Hz
Ukraine	C, F	220 V	50 Hz
United Arab Emirates	C, D, G	220 V	50 Hz
United Kingdom	G	230 V	50 Hz
United States	A, B	120 V	60 Hz
Uruguay	C, F, I, L	230 V	50 Hz
Uzbekistan	C, I	220 V	50 Hz
Vanuatu	I	230 V	50 Hz
Venezuela	A, B	120 V	60 Hz
Vietnam	A, C	220 V	50 Hz
Virgin Islands	A, B	110 V	60 Hz
Western Samoa	I	230 V	50 Hz
Yemen	A, D, G	230 V	50 Hz
Zambia	C, D, G	230 V	50 Hz
Zimbabwe	D, G	220 V	50 Hz


Plug type








Lamp Data







Type	Symbol	Voltage	Wattage	Lamp Holder	Luminous Flux(lm) Luminous Intensity(cd)	Color Temperature (K)	PHILIPS Description	OSRAM Description	G.E Description	SYLVANIA Description	
Incandescent Lamp											
A60		230V	60W	E-27	710 lm	2,800 K	CLASSICTONE Standard	CLASSIC	GLS	GLS	
			100W		1,340 lm	2,800 K	CLASSICTONE Standard	CLASSIC	GLS	GLS	
			60W								
			100W								
			60W								
A60		230V	60W	E-27	760 lm	2,800 K	CLASSICTONE Superlux	KRYTON	KRYTON	GLS KRYTON	
			75W		1,000 lm	2,800 K	CLASSICTONE Superlux	KRYTON	KRYTON	GLS KRYTON	
			100W		1,420 lm	2,800 K	CLASSICTONE Superlux	KRYTON	KRYTON	GLS KRYTON	
Compact Fluorescent Lamp											
TC-S			9W	G23	600 lm	2,700 K	PL-S/2P	DULUX-S	Biax™ S-2P	Lynx-S	
					600 lm	3,000 K	PL-S/2P	DULUX-S	Biax™ S-2P	Lynx-S	
					600 lm	4,000 K	PL-S/2P	DULUX-S	Biax™ S-2P	Lynx-S	
					600 lm	6,500 K		DULUX-S		Lynx-S(6,000K)	
					900 lm	2,700 K	PL-S/2P	DULUX-S	Biax™ S-2P	Lynx-S	
			13W	GX23	900 lm	3,000 K		DULUX-S	Biax™ S-2P(3,500K)	Lynx-S	
					900 lm	4,000 K	PL-S/2P(4,100K)	DULUX-S	Biax™ S-2P(4,100K)	Lynx-S	
					900 lm	6,500 K	PL-S/2P	DULUX-S		Lynx-S(6,000K)	
					900 lm	2,700 K	PL-C/2P	DULUX-D	Biax™ D-2P	Lynx-D	
					900 lm	3,000 K	PL-C/2P	DULUX-D	Biax™ D-2P	Lynx-D	
TC-D			13W	G24d-1	900 lm	4,000 K	PL-C/2P	DULUX-D	Biax™ D-2P	Lynx-D	
					900 lm	6,500 K	PL-C/2P	DULUX-D	Biax™ D-2P	Lynx-D(6,000K)	
					1,200 lm	2,700 K	PL-C/2P	DULUX-D	Biax™ D-2P	Lynx-D	
					1,200 lm	3,000 K	PL-C/2P	DULUX-D	Biax™ D-2P	Lynx-D	
					1,200 lm	4,000 K	PL-C/2P	DULUX-D	Biax™ D-2P	Lynx-D	
			18W	G24d-2	1,200 lm	6,500 K	PL-C/2P	DULUX-D	Biax™ D-2P	Lynx-D(6,000K)	
					1,800 lm	2,700 K	PL-C/2P	DULUX-D	Biax™ D-2P	Lynx-D	
					1,800 lm	3,000 K	PL-C/2P	DULUX-D	Biax™ D-2P	Lynx-D	
					1,800 lm	4,000 K	PL-C/2P	DULUX-D	Biax™ D-2P	Lynx-D	
					1,800 lm	6,500 K	PL-C/2P	DULUX-D	Biax™ D-2P(1,710lm)	Lynx-D(6,000K)	
26W	G24d-3	1,800 lm	3,000 K	PL-C/2P	DULUX-D	Biax™ D-2P	Lynx-D				
		1,800 lm	4,000 K	PL-C/2P	DULUX-D	Biax™ D-2P	Lynx-D				
		1,800 lm	6,500 K	PL-C/2P	DULUX-D	Biax™ D-2P(1,710lm)	Lynx-D(6,000K)				
		1,200 lm	2,700 K	PL-T/2P	DULUX-T		Lynx-T				
		1,200 lm	3,000 K	PL-T/2P	DULUX-T		Lynx-T				
TC-T			18W	GX24d-2	1,200 lm	4,000 K	PL-T/2P	DULUX-T		Lynx-T	
					1,800 lm	2,700 K	PL-T/2P	DULUX-T		Lynx-T	
					1,800 lm	3,000 K	PL-T/2P	DULUX-T		Lynx-T	
					1,800 lm	4,000 K	PL-T/2P	DULUX-T		Lynx-T	
					1,800 lm	6,500 K	PL-T/2P	DULUX-T		Lynx-T	
TC-DEL			13W	G24q-1	900 lm	2,700 K	PL-C/4P	DULUX-D/E	Biax™ D-4P	Lynx-DE	
					900 lm	3,000 K	PL-C/4P	DULUX-D/E	Biax™ D-4P	Lynx-DE	
					900 lm	4,000 K	PL-C/4P	DULUX-D/E	Biax™ D-4P	Lynx-DE	
					900 lm	6,500 K	PL-C/4P	DULUX-D/E	Biax™ D-4P	Lynx-DE(6,000K)	
					1,200 lm	2,700 K	PL-C/4P	DULUX-D/E	Biax™ D-4P	Lynx-DE	
			18W	G24q-2	1,200 lm	3,000 K	PL-C/4P	DULUX-D/E	Biax™ D-4P	Lynx-DE	
					1,200 lm	4,000 K	PL-C/4P	DULUX-D/E	Biax™ D-4P	Lynx-DE	
					1,200 lm	6,500 K	PL-C/4P	DULUX-D/E	Biax™ D-4P	Lynx-DE(6,000K)	
					1,800 lm	2,700 K	PL-C/4P	DULUX-D/E	Biax™ D-4P(1,710lm)	Lynx-DE	
					1,800 lm	3,000 K	PL-C/4P	DULUX-D/E	Biax™ D-4P(1,710lm)	Lynx-DE	
26W	G24q-3	1,800 lm	4,000 K	PL-C/4P	DULUX-D/E	Biax™ D-4P(1,710lm)	Lynx-DE				
		1,800 lm	6,500 K	PL-C/4P	DULUX-D/E	Biax™ D-4P(1,710lm)	Lynx-DE(6,000K)				
		2,400 lm	2,700 K	PL-T/4P	DULUX-T/E	Biax™ T/E-4P(2,200lm)	Lynx-TE				
		2,400 lm	3,000 K	PL-T/4P	DULUX-T/E	Biax™ T/E-4P(2,200lm)	Lynx-TE				
		2,400 lm	4,000 K	PL-T/4P	DULUX-T/E	Biax™ T/E-4P(2,200lm)	Lynx-TE				
TC-TEL			32W	GX24q-3	3,200 lm	2,700 K	PL-T/4P	DULUX-T/E	Biax™ T/E-4P	Lynx-TE	
					3,200 lm	4,000 K	PL-T/4P	DULUX-T/E	Biax™ T/E-4P	Lynx-TE	
			42W	GX24q-4	3,200 lm	3,000 K	PL-T/4P	DULUX-T/E	Biax™ T/E-4P	Lynx-TE	
					3,200 lm	4,000 K	PL-T/4P	DULUX-T/E	Biax™ T/E-4P	Lynx-TE	



Type	Symbol	Voltage	Wattage	Lamp Holder	Luminous Flux(lm) Luminous Intensity(cd)	Color Temperature (K)	PHILIPS Description	OSRAM Description	G.E Description	SYLVANIA Description
TC-L		230V	36W	2G11	2,900 lm	2,700 K	PL-L	DULUX-L	Biax™L-4P	Lynx-L
					2,900 lm	3,000 K	PL-L	DULUX-L		Lynx-L
					2,900 lm	3,500 K		DULUX-L		Lynx-L
					2,900 lm	4,000 K	PL-L	DULUX-L	Biax™L-4P	Lynx-L
					2,900 lm	6,500 K	PL-L	DULUX-L (2,750lm)	Biax™L-4P(2,600lm)	Lynx-L(6,000K)
TC-L		230V	55W	2G11	4,800 lm	2,700 K	PL-L	DULUX-L	Biax™L-4P(4,100lm)	Lynx-L
					4,800 lm	3,000 K	PL-L	DULUX-L		Lynx-L
					4,800 lm	4,000 K	PL-L	DULUX-L	Biax™L-4P(4,100lm)	Lynx-L
					4,800 lm	6,500 K	PL-L	DULUX-L (4,550lm)	Biax™L-4P(4,100lm)	Lynx-L(6,000K)

Self Ballasted Lamp										
	230V	20W	E-27	900 lm	2,700 K	ECOTONE PLEU	DULUX-EL longlife	FLE(800lm)	Mini-Lynx longlife Triple	
				900 lm	4,000 K	ECOTONE PLEU	DULUX-EL longlife			
				900 lm	6,500 K	ECOTONE PLEU	DULUX-EL longlife	FLE(800lm)	Mini-Lynx longlife Triple	
				1,230 lm	2,700 K	ECOTONE PLEU(1,100lm)	DULUX-EL longlife	FLE(1,200lm)	Mini-Lynx longlife Triple	
				1,230 lm	4,000 K	ECOTONE PLEU(1,100lm)	DULUX-EL longlife			
				1,230 lm	6,500 K	ECOTONE PLEU(1,100lm)	DULUX-EL longlife	FLE(1,200lm)	Mini-Lynx longlife Triple	
				1,500 lm	2,700 K	ECOTONE PLEU(1,400lm)	DULUX-EL longlife	FLE	Mini-Lynx longlife Triple	
				1,500 lm	4,000 K	ECOTONE PLEU(1,400lm)	DULUX-EL longlife			
23W	1,500 lm	6,500 K	ECOTONE PLEU(1,400lm)	DULUX-EL longlife	FLE	Mini-Lynx longlife Triple				





Low Voltage Tungsten Halogen Lamp										
QT9-ax		12V	10W	G4	140 lm	3,000 K	CAPSULE line PRO	HALOSTARSTAR-LITE(130 lm)	Quartz Halogen	Low Pressure Capsule(100lm)
			20W		320 lm	3,000 K	CAPSULE line PRO	HALOSTARSTAR-LITE	Quartz Halogen(350lm)	Low Pressure Capsule(100lm)
			50W		950 lm	3,000 K	CAPSULE line PRO	HALOSTARSTAR-LITE(910 lm)	Quartz Halogen(900lm)	Low Pressure Capsule(900lm)
QT12-ax		12V	75W	GY6.35	1,575 lm	3,000 K	CAPSULE line PRO	HALOSTARSTAR-LITE(1,450 lm)	Quartz Halogen(1,350lm)	
			90W		1,800 lm	3,000 K		HALOSTARSTAR-LITE		
			100W		2,200 lm	3,000 K	CAPSULE line PRO		Quartz Halogen	










High Voltage Tungsten Halogen Lamp										
QT32		230V	100W	E-27	1,500 lm	2,900 K	HalogenA PRO T32	HALOLUX T		DLX-T
			150W		2,500 lm	2,900 K	HalogenA PRO T32	HALOLUX T		DLX-T
QT-DE12		230V	100W	R7s	1,600 lm	2,900 K	PLUS line PRO	HALOLINE	Quartzline	Liner Double Ended
			150W		2,500 lm	2,900 K	PLUS line PRO(2,400lm)	HALOLINE	Quartzline(2,600lm)	Liner Double Ended(2,600lm)
QT-DE12		230V	150W	R7s	2,400 lm	2,900 K	PLUS line PRO(2,250lm)	HALOLINE	Quartzline(2,100lm)	Liner Double Ended(1,875lm)
			200W		3,500 lm	2,900 K	PLUS line PRO(3,520lm)	HALOLINE	Quartzline(3,100lm)	Liner Double Ended(3,000lm)
			300W		5,300 lm	2,900 K	PLUS line PRO(5,600lm)	HALOLINE	Quartzline(5,100lm)	Liner Double Ended(5,000lm)


Type	Symbol	Voltage	Wattage	Lamp Holder	Luminous Flux(lm) Luminous Intensity(cd)	Color Temperature (K)	PHILIPS Description	OSRAM Description	G.E Description	SYLVANIA Description
Reflector Incandescent Lamp										
PAR38		230V	80W	E-27	∠12° 5,400 cd	2,800 K	SPOTONE PAR38	CONCENTRA PAR 38	PAR 38	PAR 38
					∠30° 1,800 cd	2,800 K	SPOTONE PAR38	CONCENTRA PAR 38	PAR 38	PAR 38
			120W	E-27	∠12° 9,300 cd	2,800 K	SPOTONE PAR38	CONCENTRA PAR 38	PAR 38	PAR 38
					∠30° 3,100 cd	2,800 K	SPOTONE PAR38	CONCENTRA PAR 38	PAR 38	PAR 38
Reflector Incandescent Lamp										
QR-CBC35		12V	20W	GU4	∠10° 4,000 cd	3,000 K	BRILLIANTline PR (4,800 cd)	DECOSTAR 35 TITAN	Precise™ MR11 (3,960 cd)	Dichroic 35 (3,600 cd)
					∠36° 700 cd	3,000 K	BRILLIANTline PR (∠30° -800 cd)	DECOSTAR 35 TITAN	Precise™ MR11 (∠26° -1,800 cd)	
			35W	GU4	∠10° 6,200 cd	3,000 K	BRILLIANTline PR (7,000 cd)	DECOSTAR 35 TITAN	Precise™ MR11 (6,300 cd)	Dichroic 35 (3,600 cd)
					∠36° 1,350 cd	3,000 K	BRILLIANTline PR (∠30° -1,500 cd)	DECOSTAR 35 TITAN	Precise™ MR11 (∠26° -490 cd)	
QR-CBC51		12V	35W	GU5.3/ GX5.3	∠10° 9,100 cd	3,000 K	BRILLIANTline PRO	DECOSTAR 51 TITAN	Precise™ MR16 (∠26° -6,750 cd)	Dichroic 50 (5,000 cd)
					∠24° 3,100 cd	3,000 K	BRILLIANTline PRO (8,000 cd)	DECOSTAR 51 TITAN		
					∠36° 1,500 cd	3,000 K	BRILLIANTline PRO	DECOSTAR 51 TITAN	Precise™ MR16 (830 cd)	Dichroic 50 (∠38° -1,200 cd)
					∠60° 700 cd	3,000 K	BRILLIANTline PRO	DECOSTAR 51 TITAN		
			50W	GU5.3/ GX5.3	∠10° 9,100 cd	3,000 K	BRILLIANTline PRO (13,000 cd)	DECOSTAR 51 TITAN	Precise™ MR16 (∠12° -8,550 cd)	Dichroic 50 (8,000 cd)
					∠24° 3,100 cd	3,000 K	BRILLIANTline PRO	DECOSTAR 51 TITAN	Precise™ MR16 (2,700 cd)	
					∠36° 1,500 cd	3,000 K	BRILLIANTline PRO	DECOSTAR 51 TITAN	Precise™ MR16 (1,350cd)	Dichroic 50 (∠38° -1,950 cd)
					∠60° 700 cd	3,000 K	BRILLIANTline PRO	DECOSTAR 51 TITAN	Precise™ MR16 (∠55° -630 cd)	Dichroic 50 (900 cd)
QR-LP111		12V	50W	G53	∠4° 40,000 cd	3,000 K		HALOSPOT 111		
					∠8° 20,000 cd	3,000 K	ALUline PRO111 (23,000 cd)	HALOSPOT 111	HALO AR 111 (17,800 cd)	SA 111 (23000 cd)
					∠24° 4,000 cd	3,000 K	ALUline PRO111	HALOSPOT 111	HALO AR 111 (3,500 cd)	SA 111
					∠45° 1,400 cd	3,000 K		HALOSPOT 111	HALO AR 111 (23,500 cd)	SA 111 (1,200 cd)
			75W	G53	∠8° 30,000 cd	3,000 K	ALUline PRO111	HALOSPOT 111	HALO AR 111	SA 111 (30,000cd)
					∠24° 5,300 cd	3,000 K	ALUline PRO111	HALOSPOT 111	HALO AR 111 (1,700 cd)	SA 111
					∠45° 2,000 cd	3,000 K	ALUline PRO111	HALOSPOT 111		SA 111 (1,700 cd)
					∠8° 48,000 cd	3,000 K		HALOSPOT 111		SA 111
100W	G53	∠24° 8,500 cd	3,000 K	ALUline PRO111	HALOSPOT 111		SA 111			
		∠45° 2,800 cd	3,000 K	ALUline PRO111	HALOSPOT 111		SA 111			
QPAR16		230V	50W	GU10/ GZ10	∠25° 1,250 cd	2,900 K	TWISTline	HALOPAR 16 (∠35° -950 cd)	MR16 TAL	Hi-Spot Home ES50(800 cd)
					∠50° 600 cd	2,900 K	TWISTline			

Type	Symbol	Voltage	Wattage	Lamp Holder	Luminous Flux(lm) Luminous Intensity(cd)	Color Temperature (K)	PHILIPS Description	OSRAM Description	G.E Description	SYLVANIA Description
QPAR20		230V	50W	E-27	∠10° 3,000 cd	2,900 K	PAR 20 HalogenA	HALOPAR 20	HALOgen PAR 20	Hi-Spot 63
					∠25° 1,000 cd	2,900 K	PAR 20 HalogenA	HALOPAR 20	HALOgen PAR 20	Hi-Spot 63
QPAR30		230V	75W	E-27	∠10° 6,500 cd	2,900 K	PAR 30S HalogenA	HALOPAR 30	HALOgen PAR 30	Hi-Spot 95
					∠30° 2,000 cd	2,900 K	PAR 30S HalogenA	HALOPAR 30	HALOgen PAR 30	Hi-Spot 95
			100W		∠10° 9,000 cd	2,900 K	PAR 30S HalogenA		HALOgen PAR 30	Hi-Spot 95
					∠30° 3,000 cd	2,900 K	PAR 30S HalogenA		HALOgen PAR 30	Hi-Spot 95



Metal Halide Lamp

HIE			70W	E-27	5,200 lm	3,100 K		HQI-E		HAI-MP	
					5,500 lm	4,200 K	MH(5,600lm)	HQI-E		HAI-MP	
					8,500 lm	3,100 K		HQI-E		HAI-MP	
					8,400 lm	4,200 K	MH(9,000lm)	HQI-E		HAI-MP	
HIE			150W	E-27	12,900 lm	3,100 K		HQI-E		HAI-MP	
					12,500 lm	4,200 K		HQI-E		HAI-MP	
			250W		E-40	19,000 lm	5,200 K	HPI Plus(4,300K)	HQI-E	Arcstream™ Elliptical	HIS-SX
						20,000 lm	5,200 K	HPI-T Plus (4,500K)	HQI-T	Arcstream™ Tubular (6,000 K)	HIS-TSX
400W	E-40	34,000 lm	4,400 K	HPI Plus(4,300K)		HQI-E	Arcstream™ Tubular (6,000 K)	HIS-SX			
		42,000 lm	4,000 K	HPI-T Plus(4,300K)		HQI-T	Arcstream™ Tubular	HIS-TSX			
HIT-DE-CE				70W	RX7S	35,000 lm	5,200 K		HQI-BT		
						5,100 lm	3,000 K	MHW-TD(6,200lm)	HQI-TS		HSI-TD (5,500 lm)
	150W			RX7S-24		5,700 lm	4,000 K	MHN-TD	HQI-TS		HSI-TD (5,800 lm)
						5,500 lm	5,200 K		HQI-TS		HSI-TD (5,400 lm)
150W	RX7S-24	11,700 lm	3,000 K		MHW-TD(13,800lm)	HQI-TS		HSI-TD (12,500 lm)			
		12,000 lm	4,000 K		MHN-TD(12,900lm)	HQI-TS		HSI-TD (12,500 lm)			
250W		Fc2	12,000 lm	5,200 K				HSI-TD (11,000 lm)			
			22,000 lm	3,200 K		HQI-TS		HSI-TD (20,000 lm)			
250W	Fc2		22,000 lm	4,200 K	MHN-TD	HQI-TS		HSI-TD			
			22,000 lm	5,100 K		HQI-TS		HSI-TD (18,000 lm)			
HIT-CE				70W	G12	5,300 lm	3,000 K		HQI-T		HSI-T (5,200 lm)
						5,800 lm	4,200 K		HQI-T		HSI-T (5,200 lm)
	150W			G12		13,000 lm	3,000 K		HQI-T		HSI-T (12,000 lm)
						13,000 lm	4,200 K		HQI-T		HSI-T (12,500 lm)



Type	Symbol	Voltage	Wattage	Lamp Holder	Luminous Flux(lm)	Color Temperature (K)	PHILIPS Description	OSRAM Description	G.E Description	SYLVANIA Description
Ceramics Metal Halide Lamp										
HIT-DE-CE			35W	RX7S	3,400 lm	3,000 K			CMH-TD(3,400 lm)	
			70W	RX7S	6,500 lm	3,000 K	CDM-TD	HCI-TS(6,900 lm)	CMH-TD(7,000 lm)	CMI-TD(6,200 lm)
			150W	RX7S-24	13,250 lm	3,000 K	CDM-TD	HCI-TS(14,800 lm)	CMH-TD(14,500 lm)	CMI-TD(13,500 lm)
					14,200 lm	4,200 K	CDM-TD	HCI-TS(14,800 lm)	CMH-TD(12,500 lm)	CMI-TD(12,500 lm)
HIT-DE			250W	Fc2	25,000 lm	3,000 K		HCI-TS		
HIT-TC-CE			20W	PGJ5/GU6.5	1,650 lm	3,000 K	CDM-Tm	HCI-TF(1,700 lm)	CMH-super mini(1,615 lm)	
			35W	PGJ5/GU6.5	3,000 lm	3,000 K	CDM-Tm	HCI-TF	CMH-super mini(3,400 lm)	
HIT-TC-CE			20W	G85	1,700 lm	3,000 K		HCI-TC	CMH-TC(1,650 lm)	
			35W	G85	3,500 lm	3,000 K	CDM-TC	HCI-TC	CMH-TC(3,400 lm)	CMI-TC(3,400 lm)
					3,200 lm	4,200 K	CDM-TC	HCI-TC(3,200 lm)	CMH-TC	
			70W	G85	7,300 lm	3,000 K	CDM-TC	HCI-TC	CMH-TC(6,200 lm)	CMI-TC(6,200 lm)
HIT-CE			20W	G12	1,650 lm	3,000 K			CMH-T	
			35W	G12	3,300 lm	3,000 K	CDM-T	HCI-T(3,400 lm)	CMH-T(3,400 lm)	CMI-T(3,400 lm)
					3,300 lm	4,200 K	CDM-T	HCI-T(3,300 lm)	CMH-T(3,200 lm)	
			70W	G12	6,600 lm	3,000 K	CDM-T	HCI-T(7,000 lm)	CMH-T(6,200 lm)	CMI-T(6,200 lm)
					6,600 lm	4,200 K	CDM-T	HCI-T(6,700 lm)	CMH-T(6,300 lm)	CMI-T(6,000 lm)
			100W	G12	9,500 lm	3,000 K		HCI-T		
					9,300 lm	4,200 K		HCI-T		
					14,000 lm	3,000 K	CDM-T	HCI-T(15,500 lm)	CMH-T	CMI-T(13,500 lm)
					12,700 lm	4,200 K	CDM-T	HCI-T(14,500 lm)	CMH-T(13,000 lm)	CMI-T(13,000 lm)
			250W	G12/G22	23,000 lm	3,000 K	CDM-T	HCI-T(26,000 lm)		
23,000 lm	4,200 K	CDM-T			HCI-T(25,000 lm)					
400W	G22	40,000 lm	4,200 K		HCI-T					
HIE			70W	E-27	6,000 lm	3,000 K	CDM-TP/F	HCI-T/P(6,400 lm)		
					6,000 lm	3,500 K	CDM-TP/F			
			100W	E-27	8,500 lm	3,000 K		HCI-T/P		
					8,300 lm	4,200 K		HCI-T/P		
			150W	E-27	13,500 lm	3,000 K	CDM-TP/F	HCI-T/P(14,000 lm)		
					13,500 lm	3,500 K	CDM-TP/F			
13,500 lm	4,200 K	CDM-TP/F	HCI-T/P(13,300 lm)							
HIE			35W	E-27	2,850 lm	3,000 K		HCI-EP		
					2,850 lm	4,200 K		HCI-EP		
			70W	E-27	6,400 lm	3,000 K		HCI-EP		
					6,000 lm	4,200 K		HCI-EP		
			100W	E-27	8,500 lm	3,000 K		HCI-EP		
8,300 lm	4,200 K				HCI-EP					
150W	E-27	13,300 lm	3,000 K		HCI-EP					
13,300 lm	4,200 K		HCI-EP							
HIE			70W	E-27	6,300 lm	3,000 K	CDM-TT	HCI-TT(7,000 lm)	CMH-Tubular(6,000 lm)	
					6,400 lm	4,200 K	CDM-TT			
			100W	E-40	9,200 lm	3,000 K			CMH-Tubular	
					13,500 lm	3,000 K	CDM-TT	HCI-TT(14,500 lm)	CMH-Tubular(14,000 lm)	
			150W	E-40	12,000 lm	4,200 K	CDM-TT			
250W	E-40	25,000 lm	3,000 K			CMH-Tubular				
400W	E-40	42,000 lm	3,000 K			CMH-Tubular				
HIE			70W	E-27	5,600 lm	2,800 K	CDO-ET		KLUX CMH Elliptical	
					5,800 lm	4,200 K				
			100W	E-40	8,300 lm	3,000 K	CDO-ET		KLUX CMH Elliptical	
					5,800 lm	4,200 K				
			150W	E-40	12,500 lm	3,000 K	CDO-ET		KLUX CMH Elliptical	
					5,800 lm	4,200 K				
250W	E-40	22,500 lm	2,800 K							
400W	E-40	39,000 lm	3,000 K							
		39,000 lm	3,600 K							

Type	Symbol	Voltage	Wattage	Lamp Holder	Luminous Flux(lm) Luminous Intensity(cd)	Color Temperature (K)	PHILIPS Description	OSRAM Description	G.E Description	SYLVANIA Description
HIE		230V	70W	E-27	6,300 lm	2,800 K	CDO-TT		KLUX CMH Tubular	
			100W	E-40	8,800 lm	2,800 K	CDO-TT		KLUX CMH Tubular	
			150W	E-40	13,500 lm	2,800 K	CDO-TT		KLUX CMH Tubular	
			250W	E-40	22,500 lm	2,800 K	CDO-TT		KLUX CMH Tubular	
			400W	E-40	39,000 lm	3,000 K			KLUX CMH Tubular	
					39,000 lm	3,600 K			KLUX CMH Tubular	

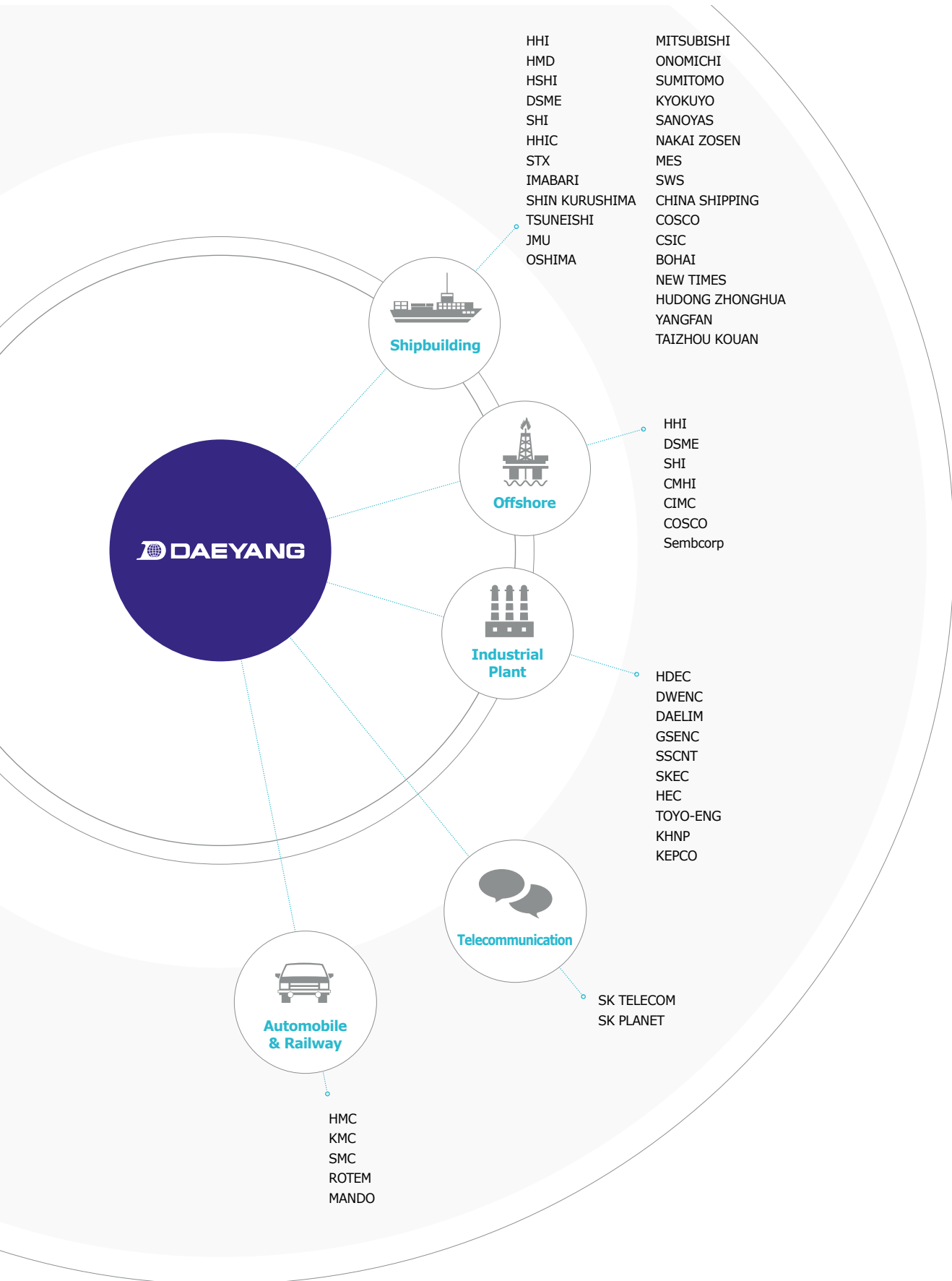
Ceramics Metal Halide Reflector Lamp

	230V	20W	GX10	∠12°	9,000 cd	3,000 K	CDM-R mini	CMH-MR16	BriteSpot ES50(∠24°-3500 cd)
				∠25°	2,700 cd		CDM-R mini	CMH-MR16	BriteSpot ES50(∠38°-2000 cd)
				∠40°	1,500 cd		CDM-R mini	CMH-MR16	BriteSpot ES50(∠60°-1000 cd)
		35W	GX10	∠12°	16,000 cd	3,000 K		CMH-MR16	BriteSpot ES50(∠24°-7000 cd)
				∠25°	5,500 cd			CMH-MR16	BriteSpot ES50(∠38°-4000 cd)
				∠40°	3,000 cd			CMH-MR16	BriteSpot ES50(∠60°-2000 cd)
		35W	GX10	∠12°	16,000 cd	4,200 K		CMH-MR16	
				∠25°	5,500 cd			CMH-MR16	
				∠40°	3,000 cd			CMH-MR16	
HIPAR20	230V	20W	E-27	∠10°	13,000 cd	3,000 K			CMH PAR20
				∠25°	3,750 cd				CMH PAR20
		35W	E-27	∠10°	23,000 cd	3,000 K	CDM-R PAR20	HCI-PAR20	CMH PAR20
				∠30°	5,000 cd		CDM-R PAR20	HCI-PAR20	CMH PAR20
				∠10°	23,000 cd	4,200 K	CDM-R PAR20		CMH PAR20
				∠30°	5,000 cd		CDM-R PAR20		CMH PAR20
HIPAR-L30	230V	20W	E-27	∠10°	24,000 cd	3,000 K			CMH PAR30
				∠30°	4,000 cd				CMH PAR30
		35W	E-27	∠10°	44,000 cd	3,000 K	CDM-R PAR30	HCI-PAR30	CMH PAR30
				∠30°	7,400 cd		CDM-R PAR30	HCI-PAR30	CMH PAR30
				∠10°	44,000 cd	4,200 K	CDM-R PAR30		CMH PAR30
				∠30°	7,000 cd		CDM-R PAR30		CMH PAR30
70W	E-27	∠10°	70,000 cd	3,000 K	CDM-R PAR30	HCI-PAR30	CMH PAR30		
		∠30°	14,000 cd		CDM-R PAR30	HCI-PAR30			
		∠40°	12,000 cd		CDM-R PAR30	HCI-PAR30	CMH PAR30		
		∠10°	63,000 cd	4,200 K	CDM-R PAR30				
	230V	20W	GX8.5	∠10°	17,000 cd	3,000 K	CDM-R 111	HCI-R 111	
				∠24°	4,200 cd		CDM-R 111	HCI-R 111	
				∠40°	2,000 cd		CDM-R 111	HCI-R 111	
		35W	GX8.5	∠10°	35,000 cd	3,000 K	CDM-R 111	HCI-R 111	
				∠24°	8,500 cd		CDM-R 111	HCI-R 111	
				∠40°	4,000 cd		CDM-R 111	HCI-R 111	
		70W	GX8.5	∠10°	35,000 cd	4,200 K	CDM-R 111	HCI-R 111	
				∠24°	8,500 cd		CDM-R 111	HCI-R 111	
				∠40°	4,000 cd		CDM-R 111	HCI-R 111	
				∠10°	55,000 cd	3,000 K	CDM-R 111	HCI-R 111	
				∠24°	15,000 cd		CDM-R 111	HCI-R 111	
				∠40°	9,000 cd		CDM-R 111	HCI-R 111	
70W	GX8.5	∠10°	55,000 cd	4,200 K	CDM-R 111				
		∠24°	15,000 cd		CDM-R 111				
		∠40°	9,000 cd		CDM-R 111				

Compact High Pressure Sodium Lamp

HST		50W	G12-1	2,400 lm	2,550 K	SDW-TG	
		100W		4,900 lm	2,550 K	SDW-TG	
HST-DE-CE		70W	RX7S	6,800 lm	2,000 K		NAV-TS
		150W	RX7S-24	15,000 lm	2,000 K		NAV-TS

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	Read's Electric Company PTY. Ltd	http://www.readselectric.com/
Belgium	Maintenance Partners NV	https://maintenancepartners.com/
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Canada	Oasis Marine Services, LTD.	http://www.oasismarine.ca/home.htm
	CETCME	http://www.cetcme.com/
	Huludao Haitong electric equipment manufacturing Co., Ltd.	http://www.hldht.cn/
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	Zhejiang Xin Ya Electric Development Co. Ltd.	http://www.xy-cd.com/
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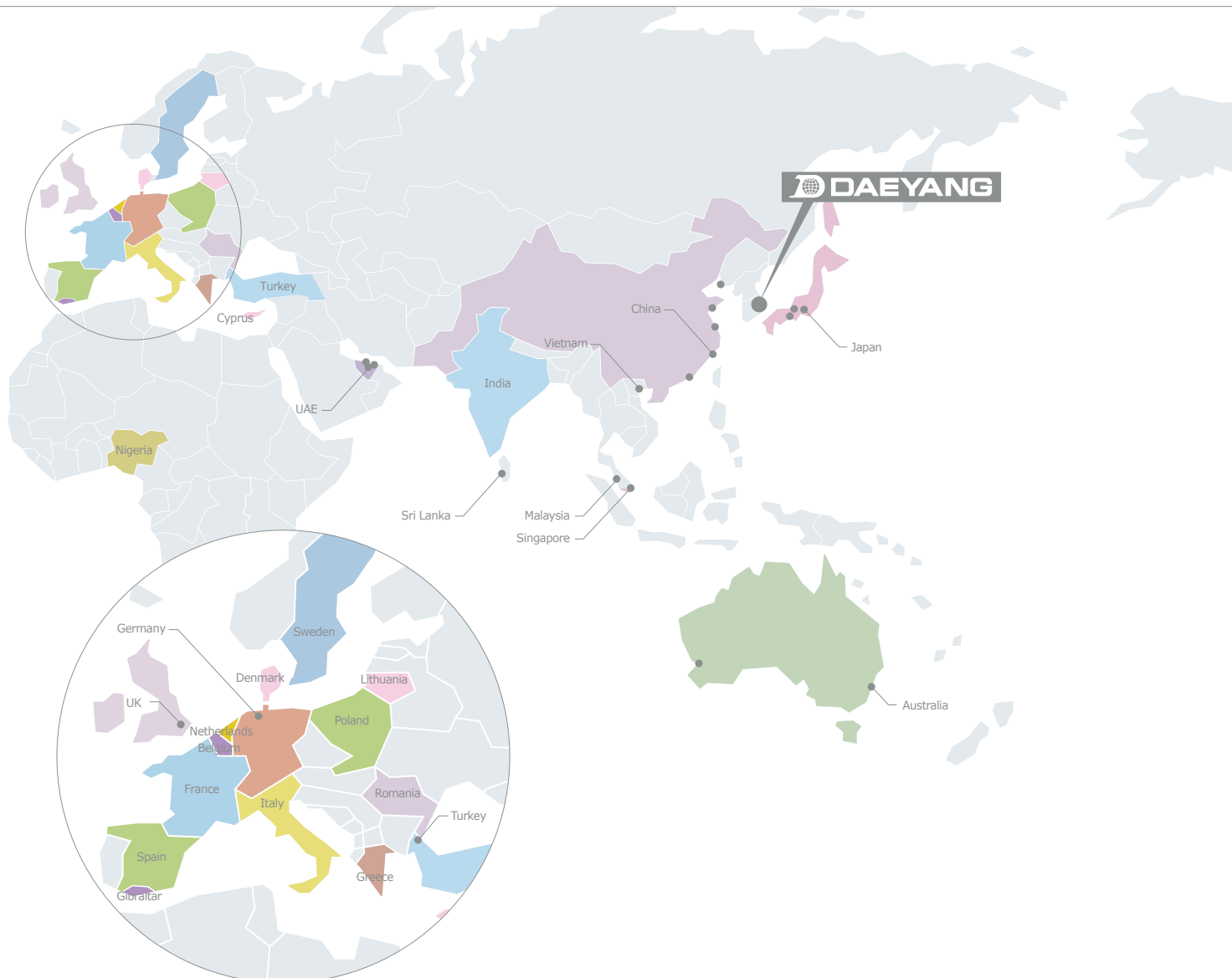
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