



PATHFINDER LED
Lighting the way

HT SERIES

Extreme Environment LED High Bay Luminaires

CERTIFICATE OF GRANT STANDARD PATENT

2013247387

The Commissioner of Patents has granted the above patent on 15 June 2017, and certifies that the following are the particulars of this patent appearing in the Register of Patents:

Name and Address of Patentee(s):

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Name of Actual Inventor(s):

Valerio, Theodore and Zuberli, Bruno

Title of Invention:

Heat sink formed of stacked fin elements interlocked with soft deformable plates

Term of Patent:

Twenty years from 9 April 2013

Priority Details

Number	Date	Filed with
2012501408	11 April 2012	AU



Dated this 15th day of June 2017
Commissioner of Patents

PATENTS ACT 1990

The Australian Patent Register in the office mentioned above is subject to the full provisions of this IP Act.

The
United
States
of
America

**The Director of the United States
Patent and Trademark Office**

Has received an application for a patent for a new and useful invention. The title and description of the invention are enclosed. The requirements of law have been complied with, and it has been determined that a patent on the invention shall be granted under the law.

Therefore, this

United States Patent

Grants to the person(s) having title to this patent the right to exclude others from making, using, offering for sale, or selling the invention throughout the United States of America or importing the invention into the United States of America, and if the invention is a process, of the right to exclude others from using, offering for sale or selling throughout the United States of America, or importing into the United States of America, products made by that process, for the term set forth in 35 U.S.C. 154(a)(2) or (c)(1), subject to the payment of maintenance fees as provided by 35 U.S.C. 41(b). See the Maintenance Fee Notice on the inside of the cover.

Joseph Matal

Performing the Functions and Duties of the
Under Secretary of Commerce for Intellectual Property and
Director of the United States Patent and Trademark Office



URKUNDE

Europäisches Patent

Es wird hiermit bescheinigt, dass für die in der Patentschrift beschriebene Erfindung ein europäisches Patent für die in der Patentschrift beschriebenen Vertragsstaaten erteilt worden ist.

Europäisches Patent Nr.
European patent No.
Brevet européen n°

Patentnummer
Registration No. for patent
Titelnummer des Brevets

München, den
Munich, le

01.04.20

CERTIFICATE

European patent

It is hereby certified that a European patent has been granted in respect of the invention described in the patent specification for the Contracting States designated in the specification.

2806767

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Antonio Campino
Präsident des Europäischen Patentamts
President of the European Patent Office
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Antonio Campino
Präsident des Europäischen Patentamts
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Président de l'Office européen des brevets



INVENTRONICS

CITILED
The Light Engine



Proudly designed and manufactured in Australia by PlumLED, 'Pathfinder' solid state luminaires are engineered to satisfy the most demanding of lighting projects.

Understanding that the economical and environmental benefits of LED lighting can only be fully realised by absolute reliability and longevity, we have diligently created a range of luminaires employing the latest design philosophies and technology to attain that goal.

As thermal management is key to assuring proper LED lumen maintenance and long life, we embarked on a quest to develop a heat sink that would not only accommodate the ever increasing power requirements of COB's but also be simple and cost effective to manufacture and bring to market.

After years of intensive R&D we achieved our goal and, to date, have been awarded Australian, US, and European patents for our design.

This catalogue offers a range of luminaires crafted from our own heat sink technology and the highest quality components from leading manufacturers around the world. We sincerely hope that these products may offer some innovative solutions to your lighting projects.



Theo Valerio
Chief Design Engineer

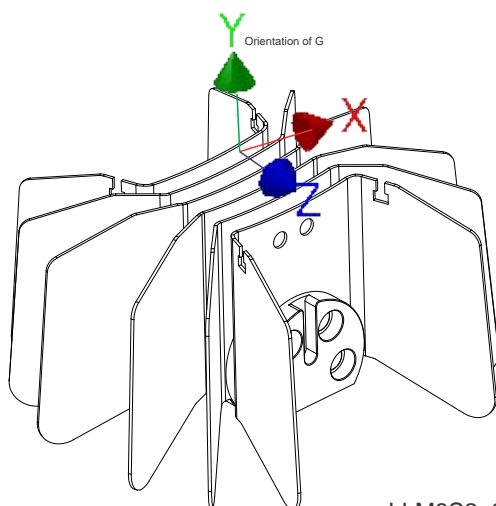


Pathfinder HT Series

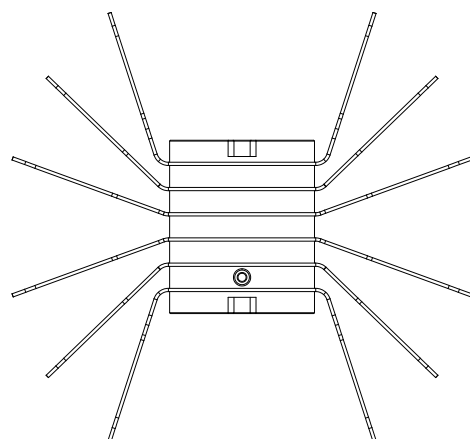
The Pathfinder HT Hibay luminaire series has been specifically designed for installations where extraordinary environmental conditions are present. Reliability and longevity are directly impacted by design configuration and ambient conditions that adversely effect overall fixture thermal cooling performance therefor, it is essential that the conformation of the specific luminaire be tailored to the intended application thereby ensuring published lifetime and lumen values are realised. With this condition as the prime directive, our engineers utilised the latest developments in CAD and CFD software, coupled with an exhaustive testing program to produce a luminaire design that delivers maximum performance, flexibility, and dependability.

Simulation and testing revealed that hot dusty climates posed the greatest threat to long term reliability, particularly in the case of close co-mounted heat sinks and drivers with large horizontal areas. This particular configuration, common in most HiBay designs, suffered from high particle accumulation rates with subsequent thermal blanketing severely limiting the cooling performance. Unless regular cleaning maintenance is performed, in these cases, premature failure or severely degraded performance is a common outcome. With this in mind design emphasis focussed strongly on thermal independence of driver and heat sink with the lowest possible surface area presenting normally to the vertical.

The end result of our diligent iterative design effort was a lightweight thermally advanced heat sink packaged into a compact and powerful luminaire that is capable of continued performance in locations where atmospheric contamination and temperature extremes prevail.



LLM8S2_250_0_V4B Heat Sink



Total heat sink area normal to the vertical axis represents less than 2.6% of total effective thermal transfer area

'Pathfinder' HT Series

Extreme Environment Industrial HiBay Luminaires



P h t 2 5 0 R

Page 04



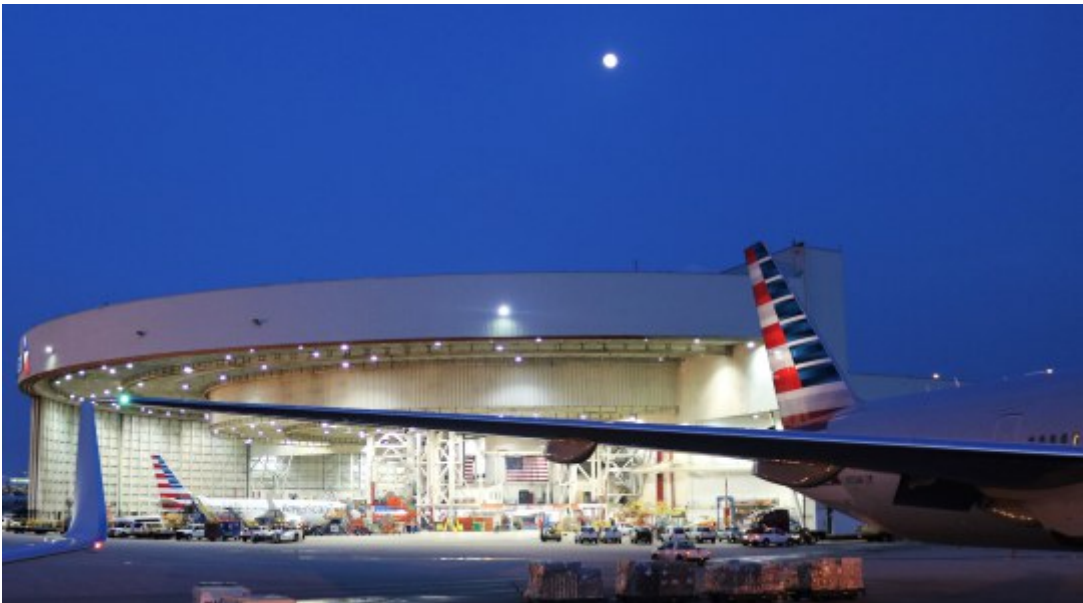
P h t 2 5 0 S

Page 06



M o d e l O r d e r N u m b e r G u i d e Page 8





P h t 2 5 0 R

High Performance HiBay

Ip 65

IK 09

t_a 60°C



Manufactured from high quality, anodised, 6061-T6 Aluminium Alloy and 316 Stainless steel the Pathfinder HT series is engineered to endure.

Specifically designed for environments where high ambient temperatures and atmospheric contamination predominantly prevails the PHT 250R's physical conformation ensures that both driver and COB operate well within the published operational envelopes laid down by their respective manufacturers. With multiple permutations of colour temperature and lens combinations available the PHT 250R will satisfy even the most demanding of requirements

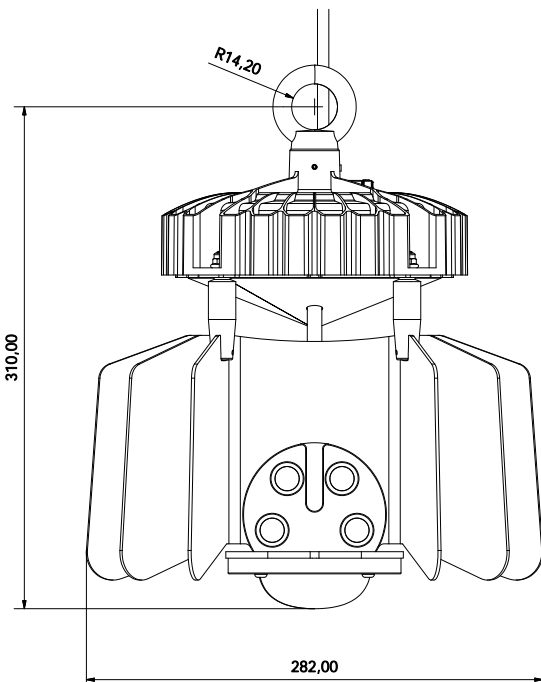


Features:

- Patented High Capacity Flow Through Heat Sink
- State of the Art Citizen COB Light Source
- Thermally Independent Driver and Heat Sink
- IK09/IP65 weighing less than 5.5 kg
- PWM, 1 -10V, or Resistance Dimming(On Request)
- DALI (On Request)
- Plug & Play Installation
- RCM, CE, TM21 and LM79 Certification

Applications:

- Aerospace
- Maritime including Shipboard
- Industrial and Mining



Performance Summary:

- Delivered Light Output 31,200 Lumens
- Luminaire Input Power 250 Watts
- Input Voltage 90 – 305 Vac
- Frequency 47 – 63 Hz
- Power Factor 0.96
- Light Source Citizen CLU059
- CRI Ra 90
- CCT 4000K @ CRI 90 (2700, 3000, 3500K On Request)
- Efficacy >120 lumens/watt (Nominal)
- Working Life L₇₀> 100,000 Hours @ 40°C
- Operating Temperature -30°C to 60°C

P h t 2 5 0 S

High Performance HiBay

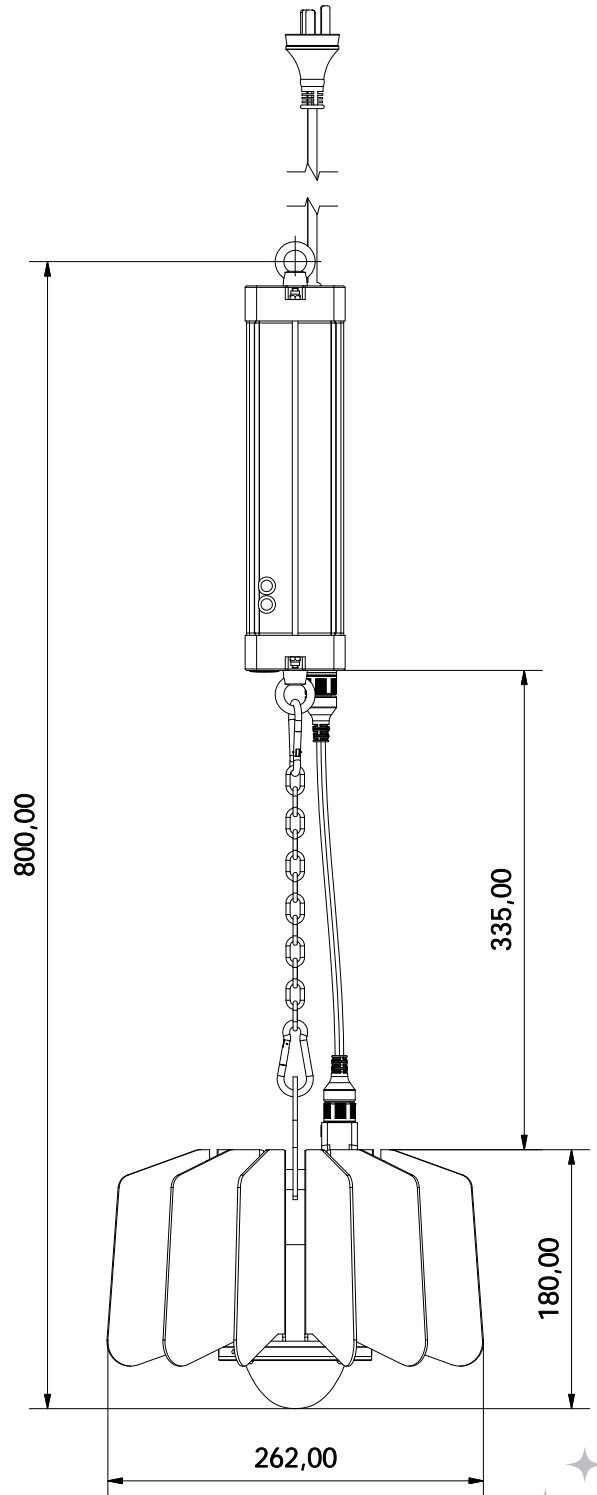
Ip 65

IK 09

t_a 60°C



The PHT 250S is identical in performance to the PHT 250R with the exception of the luminaire assembly conformation. Long term testing data reveals that driver/heatsink combinations, not co-located, exhibited far higher survival rates in conditions of consistent high ambient temperatures and airborne particulate concentrations. Consequently the 250S was conceived to offer customers a highly maintainable, highly flexible, plug and play option for installations where these extreme environmental conditions are likely to be encountered. This model is recommended for installations where the luminaire will run continuously for more than 17 hours per day in ambient temperature conditions greater than 40°C, and where high levels of ore derived airborne particulates will be encountered, such as in mining and heavy industrial facilities. The robust plug and play assembly provides for quick replacement of either driver or light engine modules ensuring a rapid return to service in the event of damage or malfunction.



PHT 250R / 250S Optical options

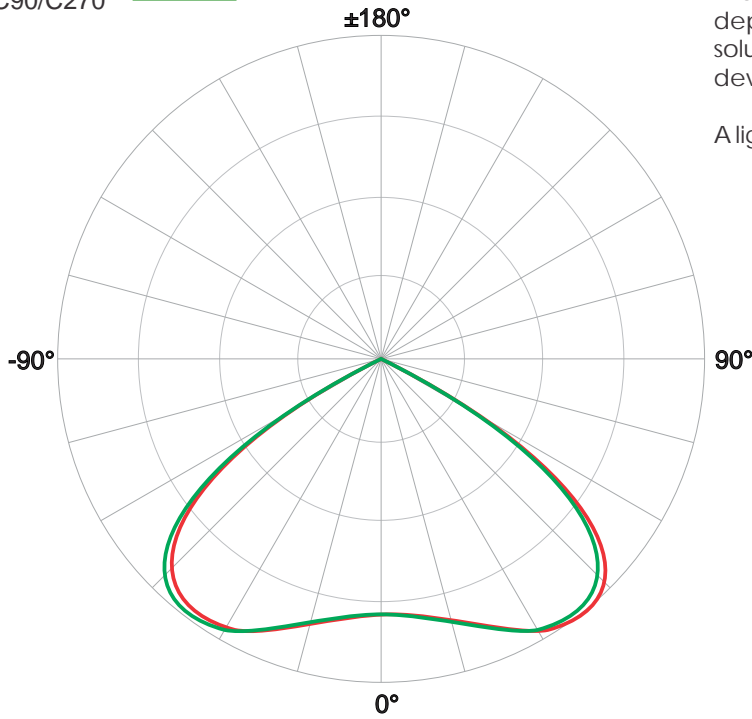
Light Distribution Curves Borosilicate Glass Options

C0/C180 —
 C90/C270 —

Optics

The PHT 250 Series is available with the following lens options depending on customer requirements however, custom solutions for demanding projects are easily cooperatively developed.

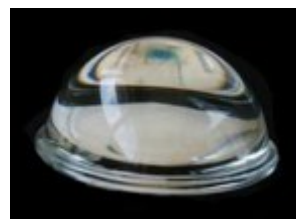
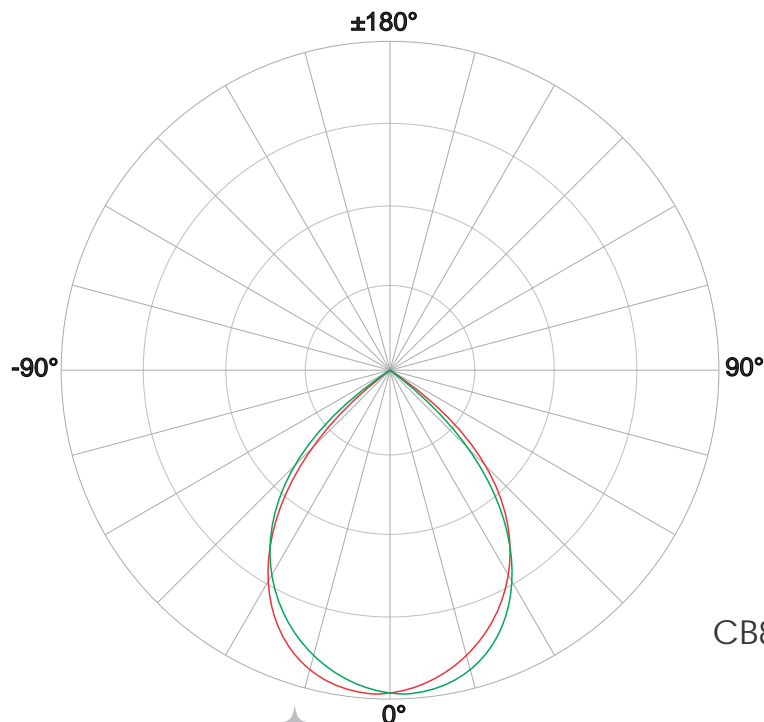
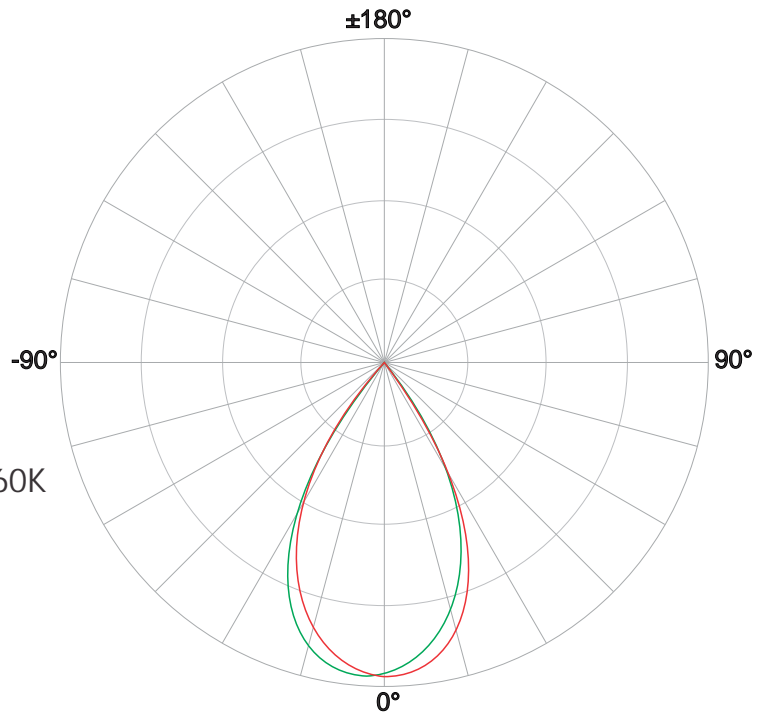
A light plan service is available, contact us for further details.



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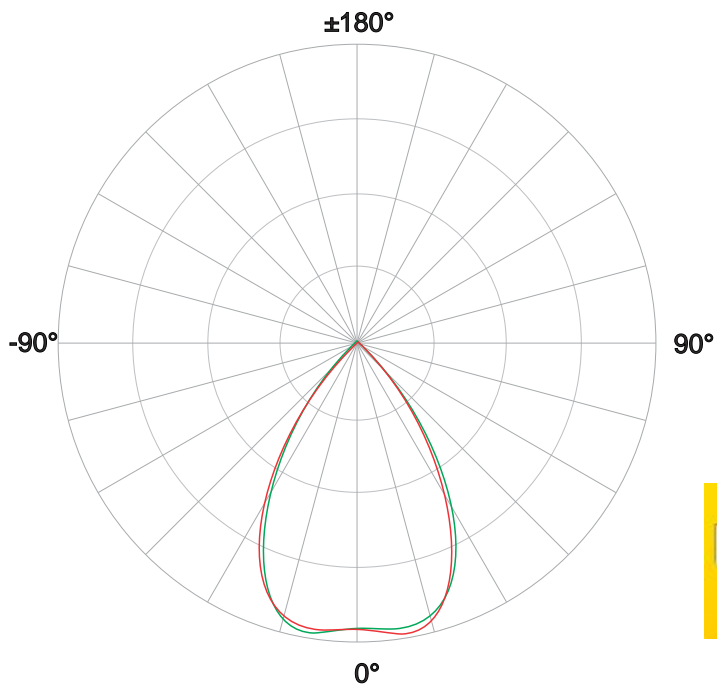
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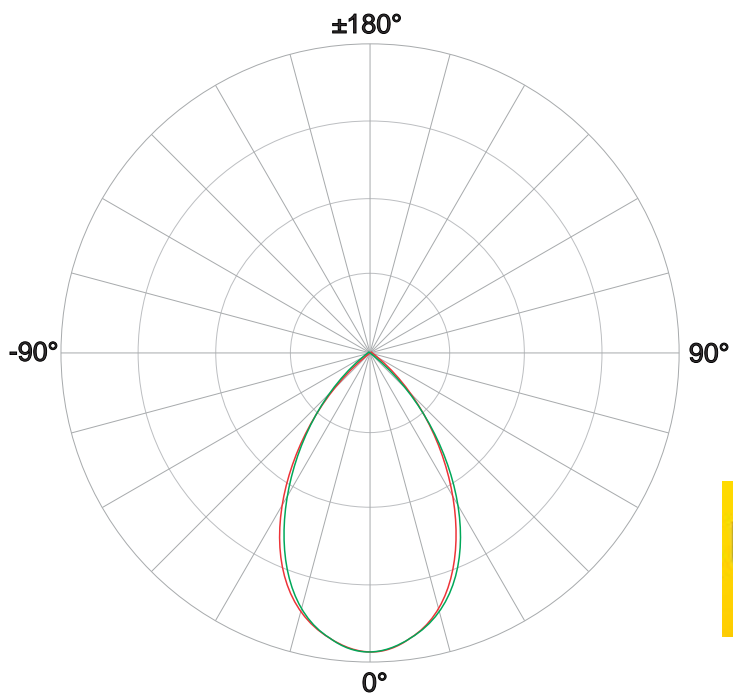
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Light Distribution Curves Ledil Freeform Silicone Options

C0/C180 —
C90/C270 —



FN15264_STELLA-HB-WWW



FN14074_STELLA-HB

Order Number Guide Table PHT 250 Series

MODEL ORDER NUMBER	Lens					Colour Temperature CCT/Ra				Driver	
	HB 120	HB 90	HB 60	Stella 100	Stella 75	2700/90	3000/90	3500/90	4000/90	Integrated	Satellite
PHT 250R-40312	☑					On Req	On Req	On Req	☑	☑	
PHT 250R-40309		☑				On Req	On Req	On Req	☑	☑	
PHT 250R-40306			☑			On Req	On Req	On Req	☑	☑	
PHT 250R-403LFN64				☑		On Req	On Req	On Req	☑	☑	
PHT 250R-403LFN86					☑	On Req	On Req	On Req	☑	☑	
PHT 250S-40312	☑					On Req	On Req	On Req	☑		☑
PHT 250S-40309		☑				On Req	On Req	On Req	☑		☑
PHT 250S-40306			☑			On Req	On Req	On Req	☑		☑
PHT 250S-403LFN64				☑		On Req	On Req	On Req	☑		☑
PHT 250S-403LFN86					☑	On Req	On Req	On Req	☑		☑

To use table:

- Locate desired features in the vertical columns
- Move vertically in the table until desired feature green ticks are collinear
- Read horizontally for Luminaire part number

Example shown is PHT 250S Luminaire equipped with a 120° Beam Angle lens, COB colour temperature of 4000K @90 CRI, and a Satellite style driver

Luminaire part number: **PHT 250S-40312**