



FlexPak

The ultimate high bay luminaire

THORN

Are you wasting money with inefficient lighting?

Traditional non-LED lighting technologies such as fluorescents and high intensity discharge lamps offer relatively low investment costs but the long-term running and maintenance costs are high.



Traditional lighting solutions are costly for the following reasons:

- High energy consumption resulting from inefficient optics and lamps
- High maintenance demands and costs. Discharge lamps for example have a short lifetime of less than 15000 hours*
- No dimming capability for discharge lamps, often leading to unnecessary light and therefore energy use

Other disadvantages include:

- Poor quality light. The colour rendition for example can vary strongly and be well below LED performance
- Delay in bulbs reaching their full brightness when turned on
- No possibility for hot-restrike solution, requiring expensive emergency lighting setup



FlexPak - improving your business environment

Building – increase building value by refurbishing with new LED luminaries

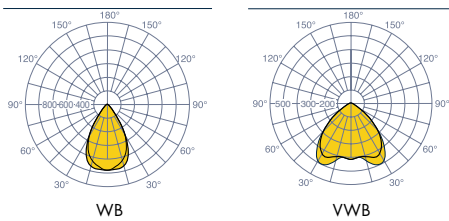
Employee – improve the workspace by providing better lit conditions, resulting in less faults, reduced number of accidents and motivated employees

Energy – benefit from wireless controls, significantly reducing energy costs by up to 70% vs conventional lighting

Stop losing money now with FlexPak

Engineered for minimal total cost of ownership

FlexPak's innovative design achieves low lifetime costs. From flexible lighting design options to minimise investment right the way through to maximised lifetime reliability to reduce maintenance.



- Choice of two optics with wide and extra wide light distributions providing the best possible spacing in new builds and maximised energy savings in refurbishments

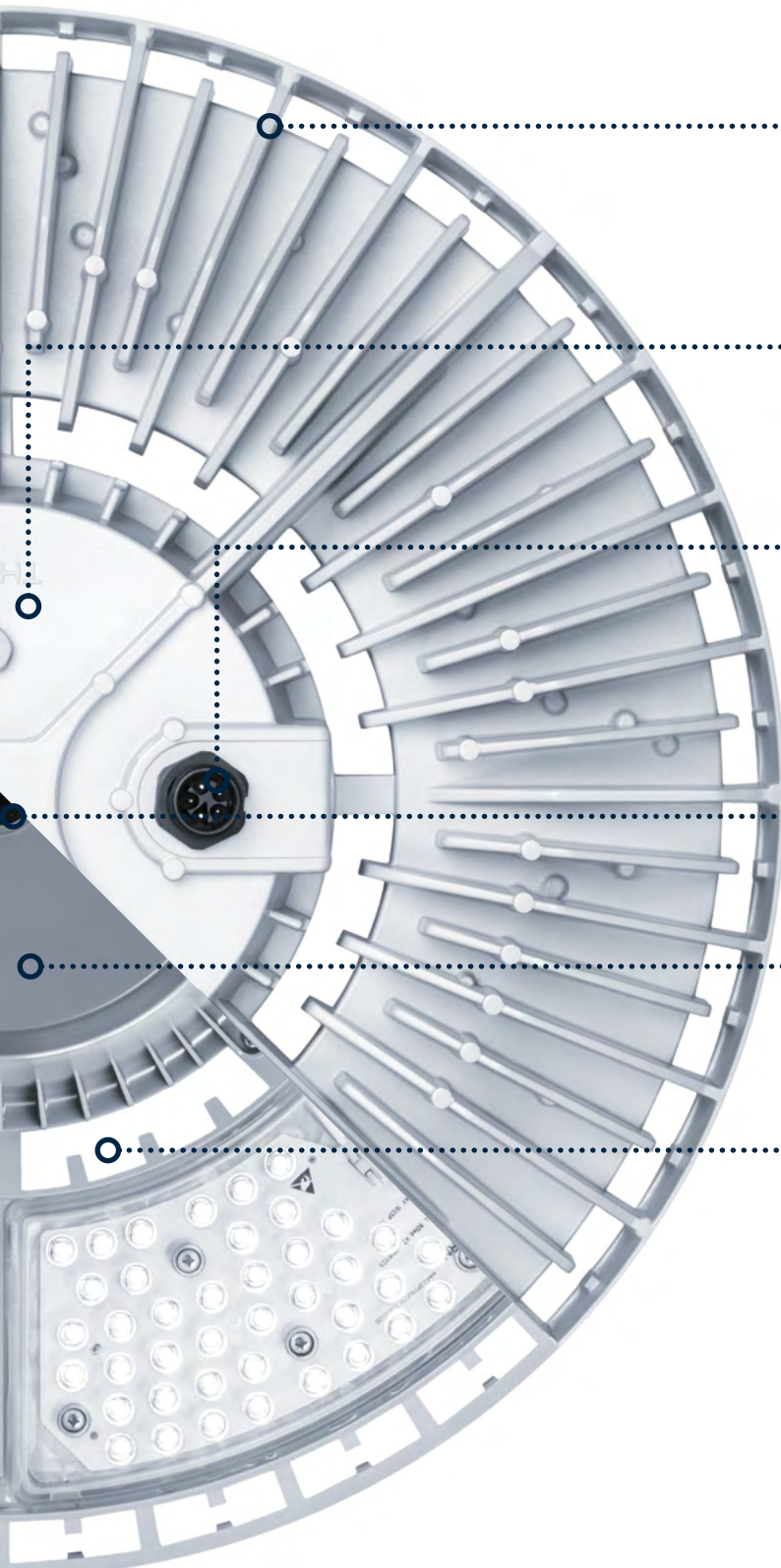


- Single point suspension design with quick connector to quickly and easily replace existing HID luminaires and plug and play



- Integrated wireless communication for instant energy savings when no light is needed





– Quality die-cast aluminium provides optimal thermal management to keep electronic components cool for maximum lifetime reliability

– Breathable GORE-TEX™ prevents ingress of dust and moisture

– Ready for emergency



– Intelligent eye enables commissioning with remote control

– Robust industrial LED drivers with 10kV surge protection and intelligent temperature guard

– Separated design maximises air circulation and avoids dust accumulation to guarantee low component temperatures for a long, reliable lifetime

– Three sizes with lumen packages ranging from 8000 - 36000 lumens



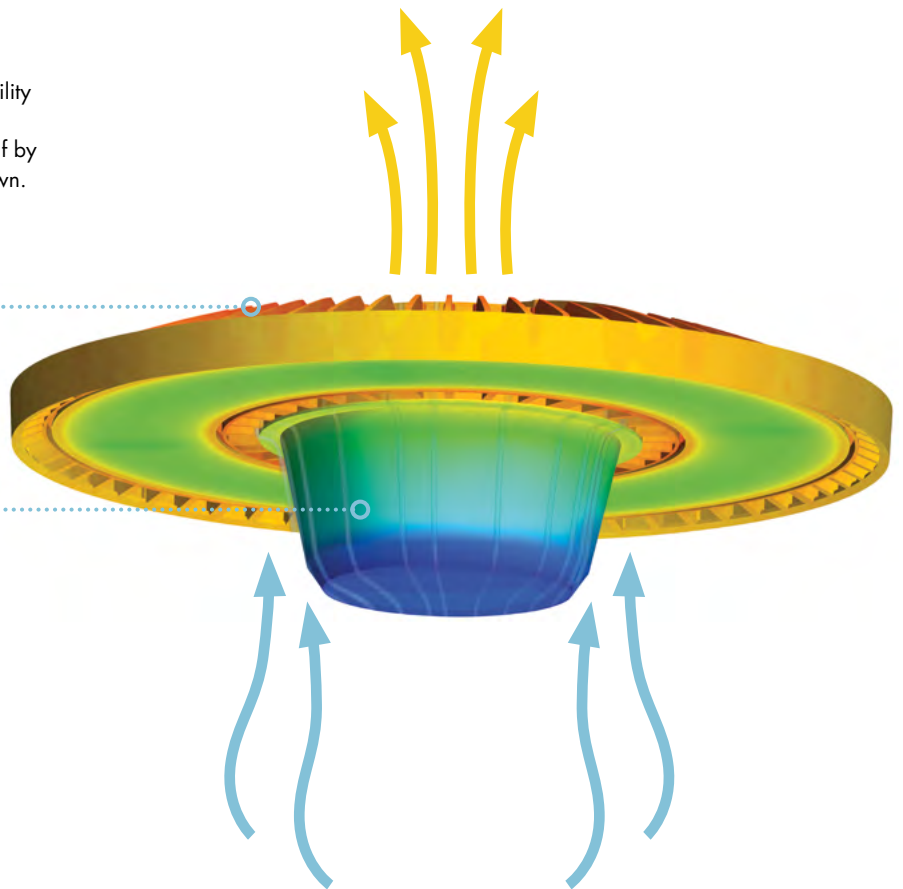
Lifetime reliability

Dependable operation under challenging conditions.

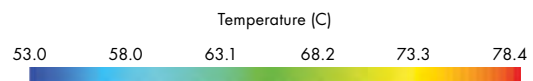
In industrial, warehousing and storage applications the ambient temperature can temporarily pass 50 °C where ceilings are poorly insulated. Considering this can occur many times over a luminaire's lifetime, the thermal capability of the product has a fundamental impact on its reliability. In case of overheating FlexPak automatically protects itself by reducing the output power so that the luminaire cools down.

The LED cooling surface is decoupled from the gear box to reduce the temperature of LED drivers and controls.

The gear box and the sensitive electronic components are positioned below the warmest part of the luminaire and benefit from active cooling through a chimney effect.



Thermal distribution at an ambient temperature of 50 °C

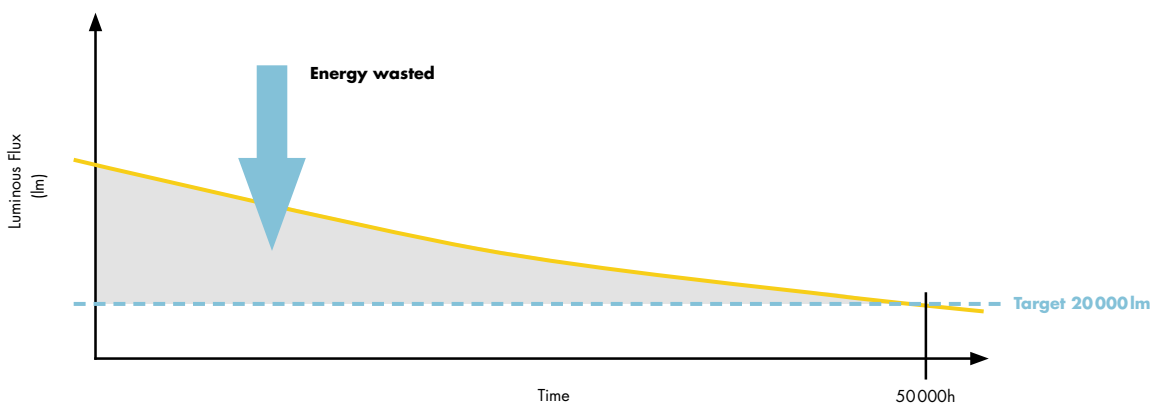


Constant lumen output

Avoid over lighting and waste of energy.

Lifetime efficiency losses mean many installations start with over specified light levels to compensate for the inevitable loss of light. The result is unnecessarily high energy consumption and costs.

Thanks to algorithms used in FlexPak's intelligent driver, the luminous flux is kept stable over the luminaire's lifetime with no light loss. In turn, this means over lighting is not required, which results in lifetime energy savings of up to 10%.



Without constant lumen output (CLO)

Without constant lumen output installations are typically designed for higher illuminance than needed to compensate for the loss during the LED lifetime.

With constant lumen output (CLO)

Light output is maintained over the designed lifetime. This increases the average efficacy and eliminates wasted energy and costs.

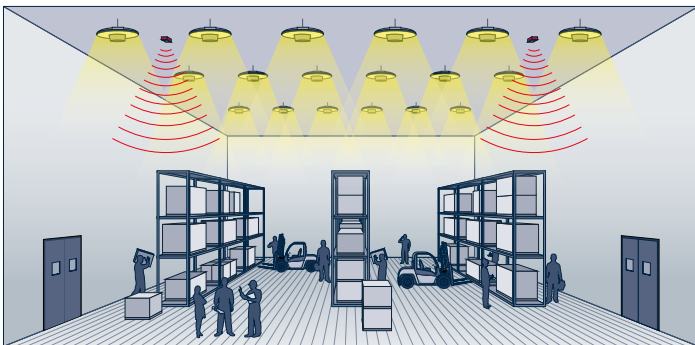
Wireless sensors

Bring intelligence into your project to maximise energy savings.



Traditional HID Luminaires

- All on 100%
- Not dimmable
- No sensor



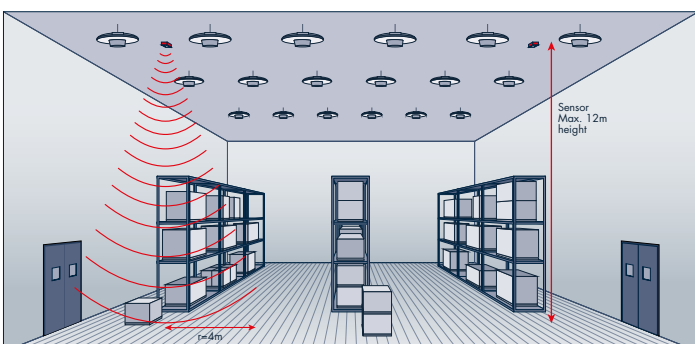
FlexPak solutions

- Can directly replace existing HID luminaires
- The sensors are wireless and can be placed at room entry points or where needed
- Presence detection with delay time setting saves energy by switching lights off when the room/space is unoccupied
- Daylight threshold saves energy by ensuring the lights are never on when natural light exceeds the set value



Group luminaires

- Group according to the room/space use
- Luminaires can be connected with up to 15 sensors to optimise detection and maximise energy savings
- Correctly positioned presence detectors switch off luminaires when no occupation is registered



Remote sensor

- Sensors can be distributed freely in the room
- Max detection height is 12m
- Max radio range is 30m radius
- Max detection pattern is 5m radius

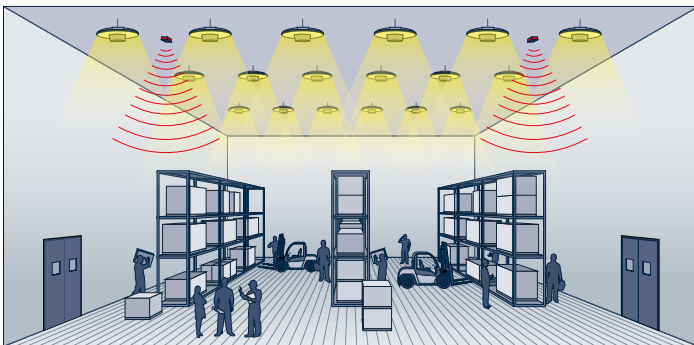
Corridor function

Enhance safety and comfort.

Rather than simple on/off switching, FlexPak benefits from corridor function to dim to 10% when no presence is detected.

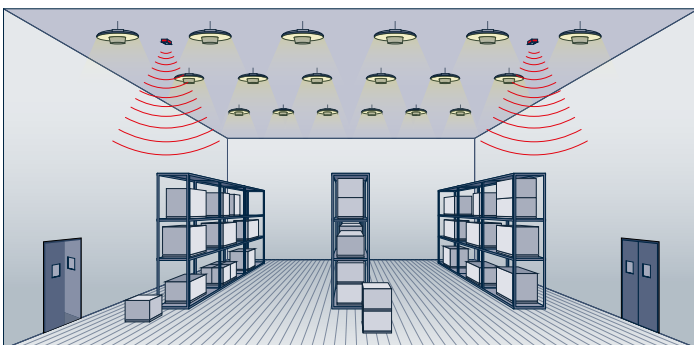
From a building safety perspective, this is particularly important given that unlit buildings are often perceived as unoccupied and an attractive burglary target.

From an occupant comfort perspective, for those who are frequently entering non-lit spaces FlexPak prevents discomfort from the dramatic change of light associated with on/off switching. Corridor function is also beneficial because it can increase occupants' sense of safety and security.



Room occupied

- Lights are switched on with 100% output when lux level is 200lx (or a set value)



Room unoccupied

- Lights are on but dimmed to 10% output (or a set value)

Optics

Light it your way - optimise lighting with a choice of optics.

Whether you want to minimise investment costs or maximise uniformity, FlexPak is available with wide and very wide optics to create the best lighting solution for your application.

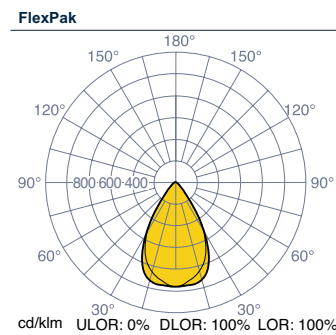
Refurbishment

FlexPak's wide beam (WB) optic achieves maximum energy savings for direct 1:1 replacements. The very wide beam (VWB) optic is ideal when ceiling heights are low or better uniformity is desired.

New installation

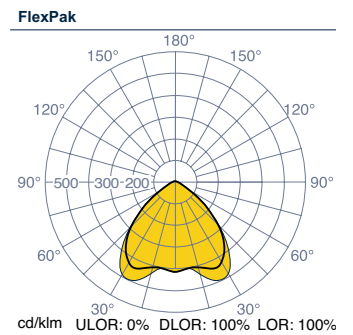
For new installations, FlexPak's wide beam (WB) optic is the perfect choice for high ceilings, ensuring good illumination on the floor. FlexPak's very wide beam (VWB) optic reduces investment costs by allowing maximum spacing between the individual light points and therefore reducing the overall quantity required.

Wide optics



- General room lighting and racking applications
- Ideal for ceiling heights from 9 – 40m
- Excellent glare control for comfort – UGR < 22

Very wide optics



- General room lighting
- Ideal for ceiling heights from 6 – 15m
- Allows maximum spacing to reduce investment costs – UGR < 25



FlexPak LED Vs traditional lamps

| Traditional HIE/ HSE Lamp | FlexPak S | | FlexPak M | | FlexPak L | |
|---------------------------|------------|------------|------------|------------|------------|--|
| with CLO | 8000lm | 13000lm | 17000lm | 23000lm | 31500lm | |
| without CLO | (8000lm) | (15000lm) | (20000lm) | (25000lm) | (36000lm) | |
| 100 - 150 W HIE | [Blue bar] | | | | | |
| 250 W HIE | | [Blue bar] | | | | |
| 400 W HIE | | | [Blue bar] | | | |
| 400 W HSE | | | | [Blue bar] | | |
| 1000 W HIE | | | | | [Blue bar] | |

Lighting design

Discover FlexPak's flexibility –
Achieve the same results with different luminaire quantities.



FlexPak's flexible lighting design enables you to achieve the same lighting results with different luminaire quantities. Simply choose your preferred lumen package and optic.

The lighting design example below is based on a warehouse example. Option one uses the existing installation while option two works with the lowest possible luminaire count while maintaining the same illuminance and uniformity.

In combination with constant lumen output (CLO), FlexPak can be calculated with a high maintenance factor (MF 0.9).

The integration of sensors allows additional energy savings.

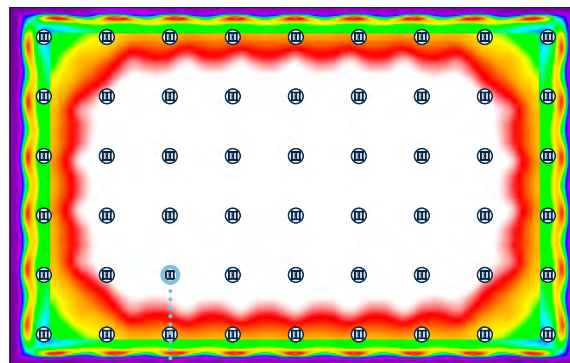
Calculation assumptions

Illuminance reached (E_m): 200lx
Uniformity (U_o): 0.4

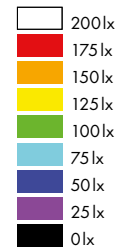
Application example: Warehouse
Room dimensions: 50 x 80 x 12m
Luminaire installation height: 11m
Room surface reflectance: 50%/30%/10%

Traditional HIE luminaires

- HIE luminaires: 54 pieces 1x400W HIE Lamp (27000lm)
- Maintenance factor (MF): 0.67
- E_m : 218lx
- U_o : 0.45
- No lighting management



False colours
Illuminance diagram



EN 12464-1 Recommendations

Production and manufacturing areas

| Type of Area, task or activity | \bar{E}_m (lx) | UGR | U_o | Ra |
|--|------------------|-----|-------|----|
| Store, warehouses and stockrooms (continuously occupied) | 200 | 25 | 0.4 | 60 |
| Dispatch packing handling areas | 300 | 25 | 0.6 | 60 |
| Production and manufacture areas | 500 | 22 | 0.6 | 80 |

\bar{E}_m (lx) - Illuminance given in lux

U_o - Uniformity

UGR - Unified Glare Rating

Ra - Colour Rendering

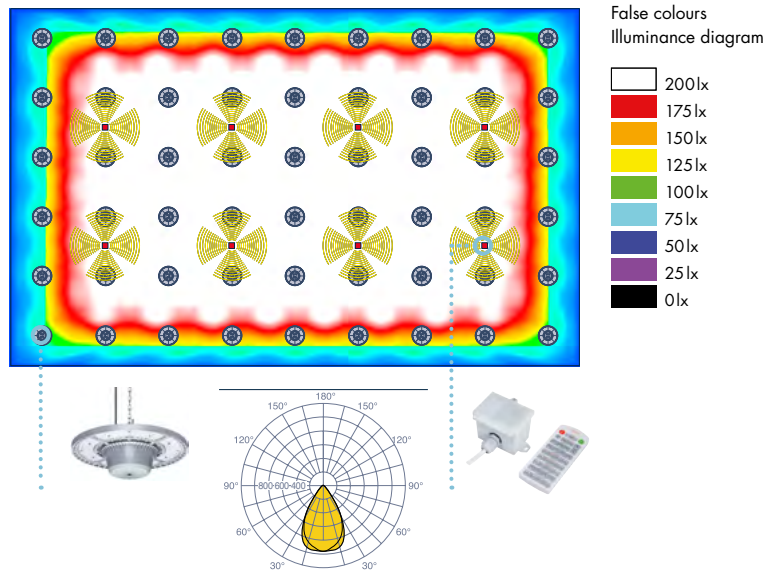
For comparative lifetime costs please see page 13

Lighting design

Discover FlexPak's flexibility –
Achieve the same results with different luminaire quantities.

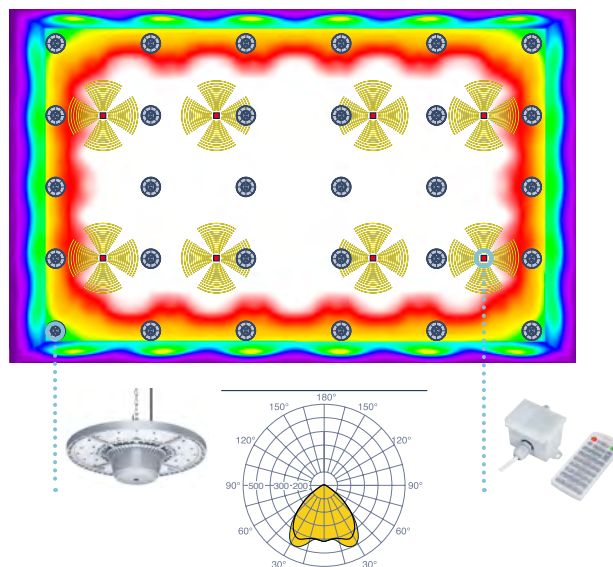
Option 1: Direct 1:1 replacement using existing installation setup.

- LED Luminaires: 54 pieces FlexPak M WB
CLO 17 000lm
- Maintenance factor (MF): 0.9
- Em: 210lx
- U_o: 0.53
- Lighting management: 8 sensors



Option 2: New installation with lowest amount of luminaires.

- LED Luminaires: 30 pieces FlexPak L VWB
CLO 31 500lm
- Maintenance factor (MF): 0.9
- Em: 200lx
- U_o: 0.47
- Lighting management: 8 sensors



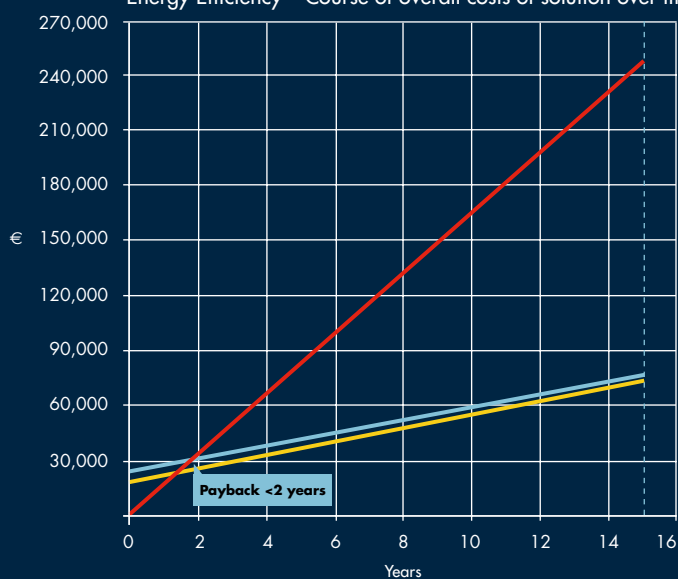
Lifetime cost saving opportunities

Reduce lifetime costs by more than 70% with FlexPak.

FlexPak is over 70% more efficient than non-LED solutions. Combined with lower maintenance costs, FlexPak offers substantial lifetime savings and a payback period of less than two years.

Total costs of solution

Energy Efficiency – Course of overall costs of solution over lifetime:



54 pieces non-LED luminaires with HIE 1x400W lamps
 54 pieces FlexPak M 17 000lm WB CLO with lighting management
 30 pieces FlexPak L 31 500lm VWB CLO with lighting management

Scheme details:

Room dimensions: 50x80x12 m

Designed to meet 200lx and 0,4 uniformity

Non LED-scheme: Changing lamps and cleaning the luminaire every 2 years

LED: Cleaning the luminaires every 2 years

Lighting management: 8 sensors for the solutions in LED

Operating hours: 3754,29 h/a from Monday to Saturday from 07h00 to 19h00

Calculation Period: 15 years

All calculations are based on an annual energy and operating cost increase of 5%

For industrial applications with CLO:

Presence Control (Fo)=0,95 (Values based on EN 15193)

Constant Illuminance Factor (Fc)=0,93 (Values based on EN 15193)

Daylight dependent lighting control (Fd)= 0,80 (estimated value depending on the daylight penetration in the room)

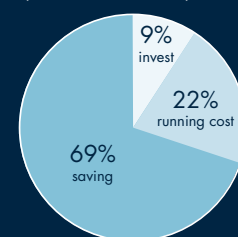
Old solution vs new solutions

Traditional HIE luminaire



No Savings

Option 1: Direct 1:1 replacement



€209 Saving
luminaire/year

Option 2: New installation with lowest amount of luminaires



€380 Saving
luminaire/year

Installation

Installing FlexPak is easy with different mounting options, single point suspension and pre-installed plug and play connectors.



Choice of mounting options

FlexPak can be suspended from a chain with adjustable length, a cord with one, two or five metre wire, or a trunking system. It can also be stirrup mounted for surface installation, which is particularly ideal for low ceiling heights or where the luminaire needs to be positioned at an angle.



Single point suspension

Enables simple point for point replacement of traditional HID high bay luminaires without the cost and inconvenience of additional installation points.

Pre-installed plug and play connectors

Allows fast and easy installation with no internal wiring, particularly beneficial for high mounting heights.



Convenient emergency version

FlexPak is a "ready for emergency" luminaire, allowing the connection of a remote emergency box (plug & play) as well being suitable for central battery systems by default.

Accessories



Chain



Chain suspension



Cord suspension with 1, 2 or 5 metre wire



Also available:
Stirrup - surface installation

Product specification

The ultimate high bay luminaire.

Application

- Warehouses
- Exhibition halls
- Airport hangers
- Industrial halls
- Shop and retail
- Logistics centres

Standards



Light source information

Lifetime 64 000 Hours @L85 Ta 35°C
 Up to 37 000Lm without CLO, Up to 31 500Lm with CLO
 Colour temperature 4000K
 CRI >80
 MacAdams 3

Materials/Finish

Housing: Die-cast aluminium, close to RAL 9006
 Lens: UV stabilised polycarbonate
 Gasket: Silicone-free
 Gear housing: Polycarbonate

Installation/Mounting

Supplied complete with quick and easy to connect connector/plug. Suitable for single point suspension with wide and very wide optic. Can be mounted with additional accessories (to be ordered separately), including stirrup for surface and wall mounting, and chain or cord for suspension.

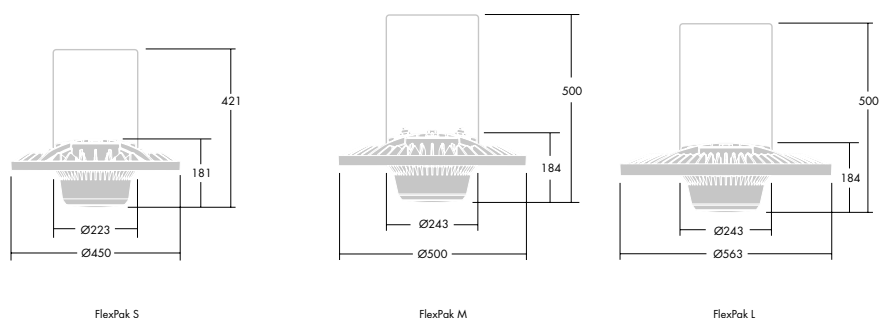
Specification

To specify state: A high bay luminaire available in three sizes with aluminium die cast housing and a gear tray with GORE-TEX™ membrane for pressure compensation. Featuring CLO - Constant Lumen Output (lumen maintenance over lifetime), CORR (reduction of light output to 10% when no occupancy detected), RF (wireless communication between luminaires and sensors) and thermal management. Wide and very wide beam optics available. As Thorn FlexPak.

Ordering guide

| Description | Wt (Kg) | SAP Code |
|---------------------------------------|---------|----------|
| FlexPak Standard | | |
| FLEXPAK S LED8000-840 HF CLO RFH WB | 8.30 | 96628794 |
| FLEXPAK S LED8000-840 HF CLO RFH VWB | 8.30 | 96628795 |
| FLEXPAK S LED13000-840 HF CLO RFH WB | 8.30 | 96628798 |
| FLEXPAK S LED13000-840 HF CLO RFH VWB | 8.30 | 96628799 |
| FLEXPAK M LED17000-840 HF CLO RFH WB | 9.60 | 96628802 |
| FLEXPAK M LED17000-840 HF CLO RFH VWB | 9.60 | 96628803 |
| FLEXPAK M LED23000-840 HF CLO RFH WB | 9.60 | 96628806 |
| FLEXPAK M LED23000-840 HF CLO RFH VWB | 9.60 | 96628807 |
| FLEXPAK L LED31500-840 HF CLO RFH WB | 11.80 | 96628810 |
| FLEXPAK L LED31500-840 HF CLO RFH VWB | 11.80 | 96628811 |
| Accessories | | |
| FLEXPAK BATTERY PACK E3XR | 2.00 | 96628821 |
| FLEXPAK BATTERY PACK E3R | 2.00 | 96628814 |
| HIGHBAY SENSOR 12m RFH IP65 | 0.50 | 96628815 |
| REMOTE CONTROL RFH | 0.20 | 96628816 |
| FLEXPAK / FLEXPAK STIRRUP S (6pcs.) | 0.50 | 96628820 |
| FLEXPAK / FLEXPAK STIRRUP M/L (6pcs.) | 0.80 | 96628822 |
| PR2/ HIGH BAY CH | 0.10 | 96502605 |
| FLEXPAK CHAIN SUSPENSION (SPARE) | 0.05 | 96628823 |
| FLEXPAK CORD SUSPENSION 1000MM | 0.07 | 96628824 |
| FLEXPAK CORD SUSPENSION 2000MM | 0.08 | 96628825 |
| FLEXPAK CORD SUSPENSION 5000MM | 0.07 | 96628826 |

RFH - Radio Frequency
 HFIX - Electronic, DALI dimmable
 CLO - Constant Lumen Output
 WB - Wide Beam
 VWB - Very Wide Beam



FlexPak S

FlexPak M

FlexPak L

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