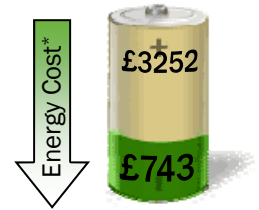


**Application**

PhotonStar were invited to supply an energy efficient solution to replace 29 halogen 35W MR16 downlighters in the spa changing room & entrance of St. Michaels Hotel Falmouth as part of a larger LED refurbishment project. The area is not always occupied and the client wanted to use occupancy sensors to minimize the amount of electricity used. This ruled out CFLs as a light source due to the slow warm up time, and halogens do not tolerate repeated switching as their lifetime is greatly reduced. With no natural lighting in the area, failed bulbs had been a problem, and a safety issue with wet slippery floors. The area is adjacent to the pool and is classed as zone 2 and also required an additional emergency light fitting.



**Solution**

29 CeilingStar IC LED luminaires each consuming 7W of power were installed into the existing cut-outs (75mm) This required no major refurbishment work. The new installation required 5.74W/m<sup>2</sup> to achieve the illumination levels of 240lx at floor level, an 80% efficiency saving over the previous halogen downlighters (and 40% more efficient than the alternative CFL Downlighters). Efficacy was dramatically improved from 10.45W/m<sup>2</sup>/100lx for the previous halogens to 2.39W/m<sup>2</sup>/100lx using the CS5.

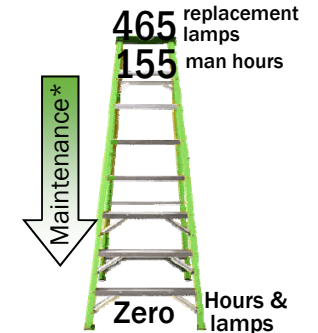


The CS5-IC illuminates instantly with no warm up time or flicker, operating perfectly with occupancy sensors and adding improved safety eliminating any moments of darkness for a guest with a wet slippery floor. The product lifetime is not reduced by repeated switching.

The CS5 IC is IP65 rated and was installed with an IP67 driver, required for the Spa changing room and pool entrance way area which is classed as Zone 2. Integrated emergency packs were installed to meet safety requirements without the need for separate unattractive emergency lighting.

The LED Luminaire has a projected 80,000 hr operational lifetime (L70), backed by a 5 year guarantee. With no lamp changes for over 5 years, maintenance costs are dramatically reduced. Combined maintenance and electricity savings

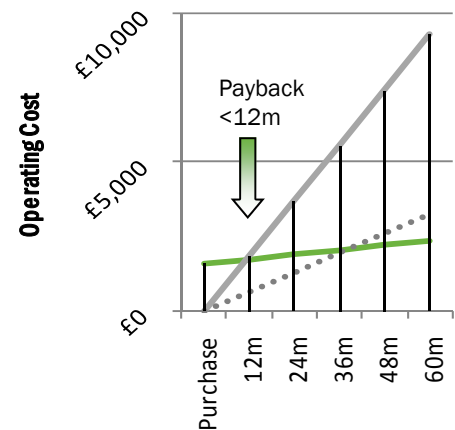
result in a payback time of less than 12 months. Each individual unit during the first 5 years will eliminate 16 lamp changes, each taking 20 minutes, saving over £200 in maintenance costs. A further benefit is the reduced exposure to the risks of working on a ladder with electricity in a wet slippery area. Figures shown do not reflect additional savings from use of occupancy sensors.



- Key Features**
- IP65—Zone 2, IP67 driver
  - The LED Luminaire has a projected 80,000 hr operational lifetime (L70), backed by 5 year guarantee providing huge maintenance savings.
  - Installation saves over £2500 in electricity and 10 Tons of CO<sub>2</sub> over 5 years, with additional savings from occupancy sensor use.
  - Instant on—compatible with occupancy sensors
  - 75mm cut out—no structural changes when replacing MR16 downlighters
  - Wide bezel design covered damage from previous MR16 installation
  - No failed lamps
  - Payback period less than 12 months
  - Optional integrated emergency pack.

### Payback

- PhotonStar CS5 (all costs)
- MR16s (all costs inc. Maintenance)

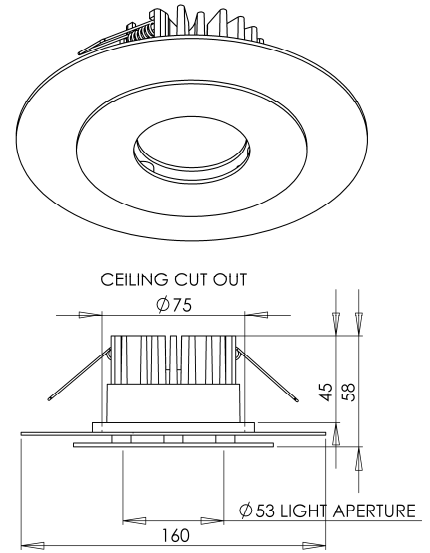


\*Based on energy cost of 0.10 per kWh, 0.4Kg CO<sub>2</sub>/kWh, savings over 5 years, 18hrs use per day. Existing fittings presumed to have no cost.

## CS5 IC

### Insulated or non-insulated ceilings

The innovative CeilingStar5 (CS5) range can be used in residential and commercial new builds, refurbishments or retrofit. The CeilingStar5-NIC is an energy efficient and zero maintenance light fitting which is a superior replacement for MR16 and GU10 ceiling downlighters or incandescent downlighters. As one of it's state of the art design features, all the thermal management of the LED is at the front of the product, so the fitting can be used in fully insulated ceilings. It is IP65 compliant and fire rated. These light fittings make changing light bulbs a thing of the past. The CS5 is constructed of materials that are designed for long life and is 100% recyclable. In addition it contains the most efficient, ultra bright, long life (80,000hrs) LEDs available today. The CS5 range offers equivalent illumination to 20W, 35W and 50W halogens consuming just 4W, 7W, and 10W of power. (The 7W unit is featured in this example)



Equivalent Output Lamps

Lamp Type (emitting equivalent output in lumens)	Number of Lamps	Power per lamp	Total Power of all Lamps	Energy Cost over 80,000hrs operation	Relative energy saving over 80,000hrs operation	Annual Energy Cost	CO2 (kg) emitted over 80,000hrs operation	Relative CO2 (Tons) saved over 80,000hrs operation
65W BR30	29	65W	1885W	£15,080	£0	£1,208	60320	0
35W MR16	29	35W	1015W	£8,120	£6,960	£650	32480	28
35W PAR30	29	35W	1015W	£8,120	£6,960	£650	32480	28
14W CFL	29	14W	406W	£3,248	£11,832	£260	12992	47
CeilingStar 5	29	8W	232W	£1,856	£13,224	£149	7424	53



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