



CASE STUDY

LED Light Source Used To Upgrade Lighthouse

Nakkehoved, Denmark



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Project Overview



Application

Survey, supply and installation of an upgrade to the LED light source in Nakkehoved Lighthouse.



Product

SL-LED-324 Light Source, Universal LED Controller and Mounting Pedestal.



Location

Nakkehoved, Denmark.



Date

December 2017



“Sealite’s LED light source range offers simple and economical solutions for the conversion of most stationary or rotating lighthouse optics.”

- Chris Reeder
Business Development Manager
Europe

Background

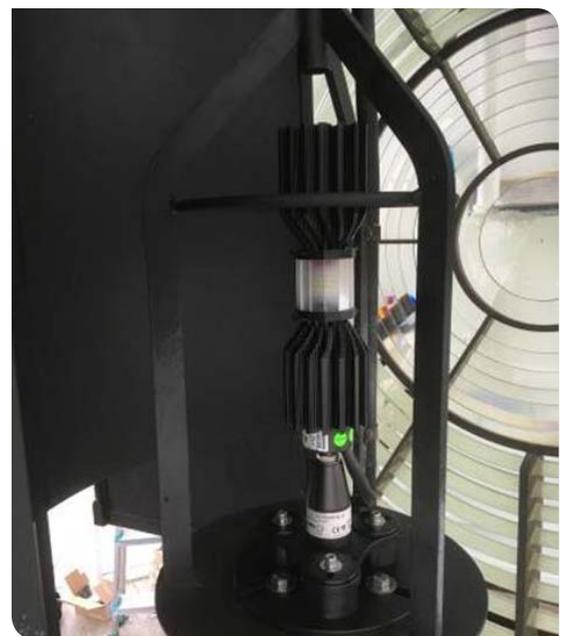
In 1772, two coal-fired lighthouses were erected at Nakkehoved near Gilleleje, Denmark intending to offer southbound shipping fixed points that would prevent ships from going aground on the treacherous north coast. The Western lighthouse is still in use today and required updating to meet current requirements. Standing at 21 metres tall, Nakkehoved is one of the very few coal-fired lighthouses still preserved in the world.

The Danish Maritime Authority are responsible for maintaining and inspecting lighthouses as part of their mission to “promote safety and health on clean seas”, and a key area of responsibility being “safe waters, buoyage and navigation”.

The LED light source was fittingly installed on the 13th December, which is Lucia Day, the Christian Festival of Light. The SL-LED-324 is a revolutionary light source specifically designed to replace traditional lamps in classical lighthouse optics. Sealite assists in the matching of a new light source to customers’ original lens, to define a new range.

Challenge

The Danish Maritime Authority wanted to replace the main powered 400W SON Lamp from MBI at Nakkehoved Lighthouse, Denmark with a more efficient lamp which would not need replacing. Whilst mains power supply was available, the customer wanted to consider either providing battery backup for the main lamp or solar power as a longer term aim. With three panels and a slow rotation the customer wanted to retain the large flash length of the MBI lamp, the large diameter creating the large flash. Whilst range was not a predominant factor, 20 nautical miles had to be achieved.



Sealite’s SL-LED 324 LED Light Source on mounting pedestal.





Solution

An initial survey was undertaken by Sealite to confirm the existing lens dimensions and site conditions, allowing us to create a tailored solution. A comprehensive survey was completed including mounting arrangements for the existing lamp holder, cable runs and automated monitoring.

Sealite's LED light source product range offers a simple and economical solution for the conversion of most stationary or rotating lighthouse optics. Each surface-emitting LED consists of a flat array of LEDs connected together. The SL-LED-324 is a twelve-sided light source using 36 surface emitting LED's which are 9watts each. The LEDs are mounted on a post enabling the light to shine in all directions, as well as acting as a heat-sink to keep the LED's cool. The light source's low power and low voltage operation makes solar possible. Capable of continuous or flashing operation and suitable for revolving or fixed optics, the crisp white light of the LED Light Source improves conspicuity.

A detailed photometric calculation was undertaken by Sealite, which resulted in a calculation that confirmed the SL-LED-324 light source would be suitable, especially driven by our standard universal LED controller. This would allow the option of mains power supply as phase 1 of the automation programme. The customer could then phase in a by-pass of the power supply and run the controller from a 24 volt DC power supply or batteries floated on the existing mains.

To achieve the required large flash length, a custom designed diffuser was retro-fitted to optically mirror the diameter of the previous 400W MBI lamp. The SL-LED-324 was mounted on Sealite's standard mounting pedestal offering both vertical and horizontal adjustment whilst using the original lamp holder mounting holes.

The SL-LED-324 achieves 23 nautical miles and 448,000 candelas at 1.5 amps, consuming 162 watts at 24 volts DC. If the light source was reduced to a quarter of this it would achieve a range of 20 nautical miles with a flash length of 0.31 seconds. This calculation sets a strong case for solar power for future development and efficiency savings.

The Universal LED controller allows the customer to change these settings via the PC programmer without returning it to the factory. Further efficiency savings could be made by switching off the LED display over land.



In the dwelling of the lighthouse there is a Historical Lighthouse Museum and the staff of the museum supported the event by cake, and coffee to celebrate the great event – the white light is back.





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