



Polaris 600
(Source: Dräger)

Zero Tolerance for Errors

Test system and test concept for medical lights at Dräger

Strict standards apply to lighting in operating theatres to ensure maximum safety during medical procedures. Quality measurements are an essential part of the end-of-line test.

Dräger has developed a completely new test system for a family of medical lights in cooperation with light measurement specialist Opsira. “Among other things, Polaris 600 offers the possibility of adjusting the color temperature to match the tissue,” explains Matthias Brauer, industrial engineering medical lights and video at Dräger. “In order to fully test these functions, our equipment construction department has worked together with Opsira to develop a test concept which

we have been using successfully since the introduction of Polaris 600.”

When the Polaris 600 family of luminaires came out of product development at Dräger, the test engineers faced a special challenge during the end-of-line test. The new functions of the luminaire could not be verified using conventional measuring technology. “The Polaris 600 brings a number of things together, which are otherwise not available on the market,” says Brauer. “The

variable color temperature is an essential feature, as is the ability to set different light beam diameters.” A camera is also integrated into the luminaire, with a wireless connection between camera and receiver. The manufacturer of medical and safety technology was therefore looking for a reliable testing concept that could help ensure compliance with all standards.

“We have been working with opsira for more than fifteen years,” says Brauer. „Measuring light is a complex matter and we have very demanding requirements – opsira meets them all. The cooperation also ran smoothly with regard to the test system design. Dräger’s equipment construction department was responsible for software development, while opsira contributed systems expertise and hardware to the project. Finally, a prototype of the test system was developed, in which all measuring processes were optimised. “The final test system was ready in time for the launch and the Polaris 600 was on the market,” says Brauer.

Precision as a commitment: test systems for medical lighting

Based on a photometrically corrected measuring camera, the medical lighting test system (mlts) from opsira enables fast and high-resolution measurement and testing of illuminance distributions. Within seconds, the illuminated area is photometrically and geometrically measured and tested against the relevant standards, e.g. DIN EN 60601-2-41. Where, in addition to testing, luminaires need to be adjusted or calibrated, the medical lighting calibration system (mlcs) offers a whole range of options for adjusting various operating points or different illuminated areas. Both systems can be supplemented by a spectrometer component. This allows all relevant colorimetric parameters such as color temperature, chromaticity coordinates or color rendering index to be checked and adjusted.



The test system for medical lighting mlts is based on the system add-on luca'lux for fast measurements with high resolution and test of illuminance distributions by a photometrically corrected measuring camera. The photometric and geometric measurement of the light field is done within seconds and tested against the respective standards (e.g. DIN EN 60601-2-41).

User-friendliness, functionality and the measuring sequence

When developing the test system, the two companies had three main aspects in mind – the user, the focus on the features of the new luminaire and the development of a reliable measuring sequence. “With other luminaires, we use separate assembly tables for individual test steps, so the luminaires have to be transported from table to table,” says Brauer. So the team designed an assembly trolley which the user pushes into a test chamber where all measurements take place – which is much easier and more ergonomic to handle.

New approaches also had to be taken with regard to measurement technology in order to meet all requirements. “To guarantee the necessary parameters, we work with sensors and a high-quality

class L photometer in combination with a white section and defined radii,” he explains. Furthermore, a spectrometer checks whether the luminaire’s color temperature can be set correctly. The measuring sequence is designed to quickly and accurately test all relevant parameters, which are guaranteed to the customer. “The whole thing is a semi-automated measuring sequence that protects against user errors,” continues Brauer. Upon successful completion, the user receives a calibration protocol and approval.

The measuring time is very short thanks to a test system that is optimally adapted to the requirements. “The faster our processes are, the sooner we get our product to the customer – but we make no compromises in terms of quality,” he asserts. “We carry out the final exam-

ination with 100 % accuracy before it goes into the operating theater. There is zero tolerance for errors.” As the test concept has been a complete success, it will continue to contribute to the timely delivery of high-quality Dräger luminaires in the future.

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For more than 20 years, opsira has been supporting its customers in the field of optical system technology – from the concept to the prototype ready for serial production. Whether competent development support, measurements in the opsira light labs or customized measuring systems for application on site: opsira offers exactly what users need. The company develops and optimizes optical systems using the most modern and efficient simulation and measuring technology.

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Dräger

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