

FOCUSED ON ADVANTAGE



USER REPORT PHOTOTOXICITY

“MORE LIGHT!” WERE SUPPOSEDLY GOETHE’S LAST WORDS. “NO MORE!”  
**MORE INTENSE LIGHT SOURCES FOR  
EVER-SMALLER INCISIONS**



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Modern Pars Plana vitrectomy works with ever-smaller incisions – and requires ever more intense light sources. With the introduction of transconjunctival vitrectomy systems, sclera incisions have become ever smaller and the need for new, high-efficient lighting systems ever greater. Effective endoillumination is a prerequisite for the utilization of the full potential of sutureless vitrectomy with preservation of the sclera, maintenance of intraocular pressure with consistent infusion flow, uncomplicated instrument exchange and self-sealing incisions. The Xenotron®III by Geuder is a highly intensive light source which supports the smallest incision sizes with its extreme performance capability. With the Xenotron®III, maximum light intensity can be achieved even with 25 or 23 gauge handheld fiber optics.

**FIBER OPTIC CHANDELIER WITH 25 GAUGE FLATHEAD TROCAR FOR TRULY BI-MANUAL OPERATING**

The 25-gauge flathead trocar by Hattenbach can be introduced securely into the pars plana with a reliable self-sealing one-step-sclerotomy. A search for the incision location, a “blowing up” of the conjunctiva due to escaping infusion fluid or post-operative incision insufficiency, which is often observed with straight incision channels in the two-step procedure, are thus things of the past. The trocar’s flat design helps it not to be perceived as an obstruction on the surface of the bulbus during the operation. Its design minimizes height leverage and helps preserve the transcleral incision. Because of the tremendous performance capability of the Xenotron®III, the vitreous cavity is evenly illuminated by the 25-gauge chandelier light, and an outstanding view throughout the entire surgical procedure is guaranteed. The touchscreen facilitates handling of the light source. The integrated **phototoxGUARD** informs the surgeon reliably of the current parameters in order to prevent light toxicity and to ensure preservation of the retina.



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## LIGHT EXPOSURE IN VITREORETINAL SURGERY

Endoillumination can damage the retina. In the interaction between optical radiation and the retina, wavelength (nm), exposure time (s) and irradiance ( $W/cm^2$ ) play important roles. Shorter high-energy wavelengths lead to light-induced, chemical reactions. Low irradiation with long exposure time generally suffices. Photochemical light toxicity is, both in everyday situations and during intraoperative use of light sources, the decisive damaging mechanism of the retina. Due to the membranes in the outer segments of the photoreceptors and the RPE, photo-chemically induced lipid peroxidation in the retina plays an important role. In cases of mild lesions, the architecture of the retina can, apart from a lasting hypopigmentation, normalize after 30 days. The toxicity of indocyanine green in peeling surgery can also be increased by light exposure during operation. Functionally, varying degrees of vision loss due to light-induced damage have been confirmed.

## GEUDER XENOTRON®III – UNBEATABLELY BRIGHT AND STILL SECURE

To date surgeons have only been able to rely on light sources' fulfillment of the guideline ISO 15004-2 (prevention of damage by light) because the light output projected onto the retina was unknown. The **phototoxGUARD** of the Xenotron®III calculates the energy released into the eye and comprehensively informs the surgeon at any time of the light intensity at the fiber optic exit, of the level of energy already released into the eye and of the remaining safe surgical time in form of a countdown. The high intensity not only offers the surgeon outstanding bright and consistent illumination, but also makes the use of a single 25G fiber optic chandelier possible without compromising illumination. On the hand side this reduces the risk of phototoxic effects during long operations, and on one side this enables the surgeon to truly work bi-manually with two handheld instruments.

## COLOR CODING SIMPLIFIES SURGERY PREPARATION AND PREVENTS MIX-UPS

The Uno Colorline is distinguished by its uniform color coding, where red represents 20-gauge, green 23-gauge and blue 25-gauge. The color coding is also found on the touchscreen of the Xenotron®III, so that the only thing that needs to be selected is the fiber optic geometry. The color coding simplifies surgery preparation and prevents mix-ups. Depending on the size and geometry, the limit values for the Xenotron®III **phototoxGUARD** are loaded and displayed. For highly intense endoillumination, it is especially important to use the correct fiber optic with the corresponding fiber optic size and geometry in order to avoid unwanted phototoxic effects.

## EASY, INTUITIVE OPERATION WITH CLEARLY ARRANGED DISPLAY OF ALL RELEVANT INFORMATION – PHOTOTOXGUARD AND TOUCHSCREEN

Operation of the Xenotron®III occurs via a colored touchscreen. Surgeon, fiber optic and intensity (if not previously saved) are selected. The preferred settings of six different surgeons can be saved. The **phototoxGUARD** displays all relevant information on the touchscreen. A traffic light system informs the surgeon of the light-toxicity status. Green shows that all parameters comply with the guideline ISO 15004-2; yellow, that safe surgery time is getting shorter; and red, that more than  $10J/cm^2$  have been released into the eye and that safe surgery time has been exceeded. Of course, even in cases like this, the operation can be resumed and finished at full illumination.

