



VISULAS Trion

Extend the spectrum of application



Seeing beyond



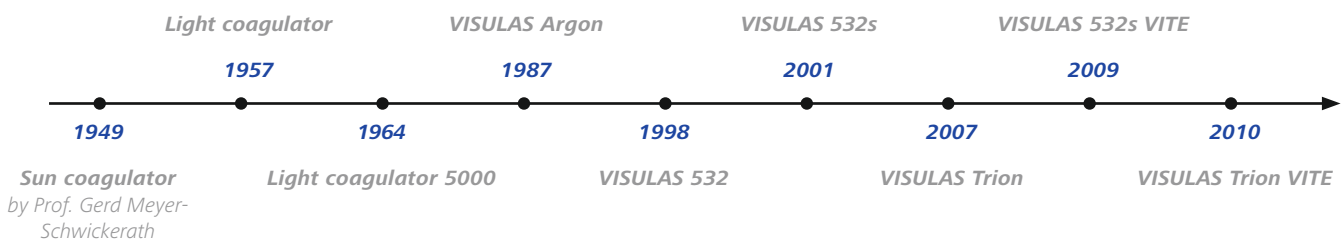
// PHOTOCOAGULATION
MADE BY CARL ZEISS

When darkness led to enlightenment, when spontaneous retinal damage led to an effective therapy.

*Sparked by the solar eclipse in 1945
and driven by visionary clinical partners*

Carl Zeiss has been committed to precision, innovation and passion for more than half a century in retinal photocoagulation. Ever since the first photocoagulation with sunlight was tested on the rooftop of a Hamburg eye clinic in 1949, dedicated Zeiss employees have sought intense dialogue with visionary ophthalmologists of their time. Dialogue that led, in 1957, to the first commercially available photocoagulator in the world. Simultaneously this marked the birth of contactless surgery on the human eye.

Carl Zeiss has been a strong driving force behind the focused optical therapy of retinal diseases. Committed to this tradition is the VISULAS Trion *VITE* – the latest flagship in a fleet of innovative lasers with one singular objective: precise, effective and gentle therapy to preserve the eyesight and quality of life of patients.



VISULAS Trion

Impress with a sophisticated performance.
Efficient. Intelligent. Successful.

The VISULAS Trion impresses as a high-performance, compact and sophisticated multi-wavelength laser for controlled treatment of the retina and choroid membrane.

The VISULAS Trion offers demanding ophthalmologists of various specialities the added flexibility and individuality that is crucial for treating a wide range of retinal diseases.



LSL Trion with ACCENTO eyepiece.

Extend the scope of application

The VISULAS Trion leaves little to be desired with regard to stability of the laser output: its active thermo-electric stabilization, due to Peltier elements, guarantees consistent and reproducible performance, even with significant fluctuation in utilization and varying environmental conditions. Whether lesions are being created locally using short laser pulses, or the laser energy of a long pulse is distributed homogeneously over a larger lesion area, or whether you are working in a controlled manner using single pulses, or efficiently in the rapid auto-repeat mode, the VISULAS Trion allows you to realize your individual treatment strategy.



Control panel of the VISULAS Trion.

Build on a versatile platform

Together with the laser slit lamp LSL 532s/Trion, the VISULAS Trion unfolds its full strengths. Equipped with an electronic micromanipulator, a physician detection sensor and an illuminated *SPOTview™* display, the VISULAS Trion offers numerous intelligent extras to facilitate laser therapy. In the active physician safety filter mode, it is possible to examine the retina, completely unfiltered, between laser pulses. In continuous physician safety filter mode, the *ClearView™* filter always remains fixed in the optical path of the slit lamp, which speeds up treatment times. The *ParFocus™* zoom system of the VISULAS Trion delivers a homogeneous, focused and reproducible laser spot to the retina, minimizing heat-related side effects on the patient's cornea.



Accentuated – visibly and ergonomically

The optional ACCENTO eyepiece allows treatment parameters, such as laser output and shot count, to be displayed directly in the physician's field of view, meaning that the physician does not have to look away from the field of treatment. The optional ACCENTO footswitch enables the active treatment parameters to be adjusted during treatment.



Navigate with fingertip precision: the electronic micromanipulator.

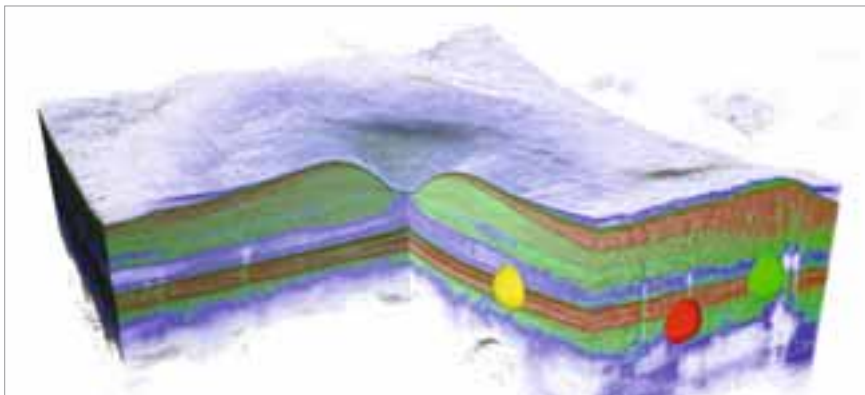


A strong team: LSL 532s/Trion and VISULAS Trion.

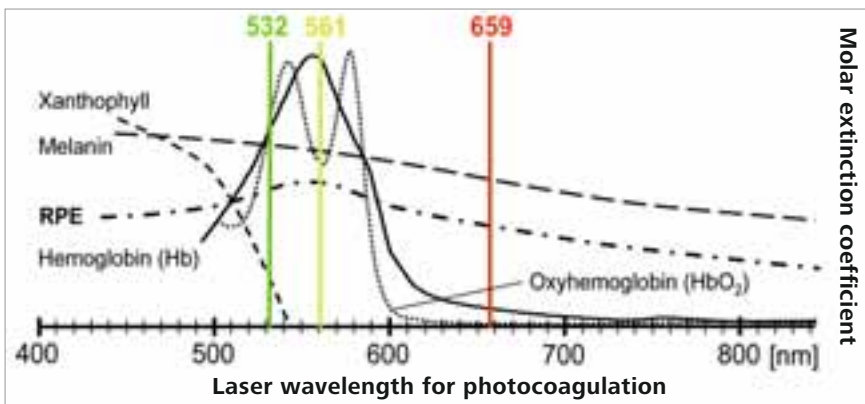
VISULAS Trion

Add more color to clinical routine.
Selective. Individual. Effective.

Stable generation, precise beam control and rapid switching ability between the three laser wavelengths are the technological strengths of the VISULAS Trion. It is therefore an extraordinarily flexible and highly selective retinal laser that causes little stress to the patient.



3D illustration of lesion examples made by VISULAS Trion using rendered OCT data.

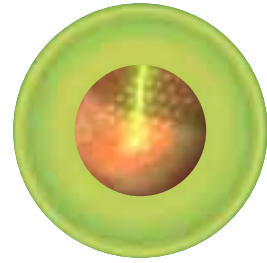


Absorption of retinal pigments (VISULAS Trion wavelengths are highlighted)



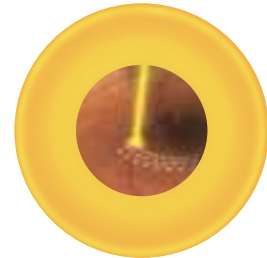
532 nm: gold standard for pan-retinal treatment.

In the melanosomes of the retinal pigment epithelium (RPE) green light is converted particularly efficiently into thermal energy. With mostly clear ocular media, it delivers effective and conservative lesions. The immediately visible tissue response permits precise and immediate administration of the laser output and thus promotes a fluid treatment process. Maximum power reserves have long since established the laser wavelength of 532 nm as the gold standard for pan-retinal photocoagulation.



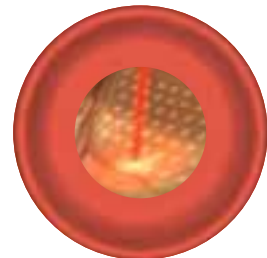
561 nm: best prospects in central retinal position.

The pigment xanthophyll, which is mainly found in the region of the macula, exhibits only negligible absorption at wavelengths of >550 nm. Yellow laser light is therefore particularly suitable for gentle photocoagulation of the central retinal area. Due to the high absorption by hemoglobin in the yellow spectral range, the wavelength of 561 nm is also generally suitable for the focal treatment of microaneurysms and for the cauterization of retinal blood vessels. Low divergence losses favor the use of the yellow laser wavelengths in cloudy media.



659 nm: powerhouse with subretinal penetration.

Since red laser light is barely absorbed by hemoglobin, it effortlessly penetrates mild to moderate hemorrhages in the vitreous or retina. The depth of its penetration is particularly suitable for selective treatment of extra-foveal choroidal neovascularizations, such as age-related macular degeneration or polypoidal choroidal vasculopathy. The red wavelength can also be used for lesions close to the papilla.



// GAIN MORE TIME
MADE BY CARL ZEISS

VISULAS Trion *VITE*

Maximizing on high-performance equipment.
Efficient. Flexible. Physician-controlled.

In addition to the conventional single-spot mode, the VISULAS Trion *VITE* can also operate in multi-spot mode. A linear sequence of up to 12 laser pulses can be triggered at the touch of a button on the slit lamp joystick of the VISULAS Trion *VITE*.



Fundus before laser treatment¹⁾



Fundus 1 day after laser treatment¹⁾

Significantly reduce treatment times

The automated micromanipulator reliably controls the fast progression of an entire sequence of laser spots. Extremely precise and long-term stable linear motors move the laser beam in just a few milliseconds to the next pre-calculated target position. Efficiently and precisely. This saves valuable treatment time.

Customize treatment strategies

The active control on the trigger button of the slit lamp allows the physician to maintain control over treatment progress at all times, with "fingertip precision". A slight rotation of the joystick is all that is needed to adjust the position of the aiming beam as treatment proceeds. A multi-spot cascade allows the treatment strategy to be customized to the irregular contours of the retina.



Intelligently streamline treatment workflows

The clear layout of the graphic elements on the control panel follows a logical sequence and efficiently supports clinical workflows. Multi-spot treatment parameters, such as spot spacing, number of laser spots per sequence and angle of orientation of a sequence, are homogeneously embedded in the VISULAS Trion user interface and can be adjusted during treatment. The illuminated *SPOTview* display allows the physician to continuously monitor the laser spot diameter, even in darkened environments.

Effortlessly monitor treatment progression

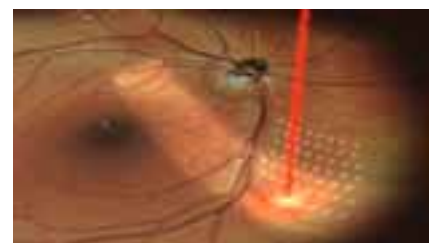
As a guide during multi-spot laser treatment, the ACCENTO eyepiece permits direct monitoring of the maximum number of semi-automatic spot sequences, together with the current sequence. Without having to avert one's gaze from the field of treatment. The contacts on the side of the ACCENTO footswitch²⁾ allow the respective active treatment parameters to be conveniently adjusted. Without using the touch panel. While remaining fully focused, the physician may interrupt treatment at any time in an instant: with spot precision within the current sequence and in a controlled manner. This ensures the physician maximum precision and the patient optimum protection.



3D illustration of a linear VITE cascade (532 nm)



3D illustration of a circular VITE cascade (561 nm)



3D illustration of a contoured VITE cascade (659 nm)

¹⁾ Dr. Fang Lu, West China Hospital, Sichuan University, Chengdu, China.

²⁾ optional accessory

// ADAPTABILITY
MADE BY CARL ZEISS

VISULAS Trion

Steal the show in a well-rehearsed team.
Expert. Reliable. Professional.

Particularly high-performance therapeutic lasers are used around the clock: in the private practice, the outpatient retina clinic, and the operating room. With its well-considered design, the VISULAS Trion is optimally prepared for all these applications and is thus equipped for high-demand multi-user operation.

Compact in design, mobile in use

In highly frequented clinics and practices, often each square meter of space is planned and utilized. As the most compact multi-wavelength laser in its class, the VISULAS Trion is a truly space-saving miracle. The base with castors allows the laser to be maneuvered easily from one location to the next, in an ergonomically comfortable position.

High contrast in interaction

The Heine laser ophthalmoscope is modified for the application requirements of Carl Zeiss: the LIO 532s/Trion is therefore ideally suited for the wavelengths of the VISULAS Trion. It is light and stable and stands out in particular due to its high aiming beam contrast compared to the retinal background.



VISULAS Trion laser module: Easy to transport thanks to castors and ergonomic handles



LIO 532s/Trion indirect ophthalmoscope



Ready to use after instant switching

The two fiber ports of the VISULAS Trion permit quick and uncomplicated switching between the different laser applications. From the indirect ophthalmoscope to the Zeiss laser slit lamp or the endoprobe in the operating room, there is no need for any physical unplugging and replugging of devices, but, rather, just a few clicks on the touchscreen and the VISULAS Trion is once again fully operational.

Impressive in operative use

With VISULAS Trion and OPMI LUMERA® 700 Carl Zeiss provides surgeons with a professional duo which interact in harmony, guaranteeing successful surgical interventions in the posterior eye segment. The variable view, font size and color contrast of VISULAS Trion display are predestined for application in the operating room: all parameters are always clearly and distinctly legible – even from a distance and in a darkened environment.



VISULAS Trion: Mobile and ready for use, anywhere



Convenient power adjustment with the ACCENTO footswitch



VISULAS Trion display for application in the operating room



Technical data

VISULAS Trion

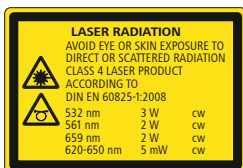
VISULAS Trion / VISULAS Trion VITE

Laser type	Frequency-doubled solid-state laser
Wavelength	532 nm, 561 nm, 659 nm
Aiming beam	Diode, 630 – 670 nm, adjustable brightness, max. 1 mW at the cornea
Rated voltage and frequency	100 V to 240 V, 50/60 Hz
Pulse duration (single pulse)	10 to 3000 ms
Pulse duration (VITE option)	20 to 50 ms
Pulse interval (single pulse)	100 to 6000 ms
Maximum power	1.5 W (532 nm), 0.8 W (561 nm), 1.0 W (659 nm) at the cornea
Cooling system	Thermoelectric
Laser console dimensions (H x W x D)	H 785 x W 330 x D 670 mm (30.9 x 13.0 x 26.4) inches
Weight	48 kg (105.8 lbs)
Accessories	LIO 532s/Trion laser indirect ophthalmoscope, instrument table, laser safety goggles, contact lenses, ACCENTO footswitch, laser warning light



LSL Trion / LSL Trion *VITE* laser slit lamp

Laser beam delivery	Interlaced with slit illumination system
Laser spot diameter	Continuously adjustable, parfocal, larger spot sizes depending on contact lens used
Illumination	12 V, 30 W, brightness continuously adjustable, Physician detection sensor (switches off if physician is absent)
Slit adjustment	Slit length: variable in steps of 1/3/5/9/14 mm Slit width: continuously adjustable from 0 to 14 mm Slit image rotation: 0°, ±45°, 90°
Magnification	5 x, 8 x, 12 x, 20 x, 32 x
Physician safety filter	ClearView (true to color)
Micromanipulator	Servo-electric
Weight	11 kg (24.2 lbs)
Accessories	Tonometer, co-observation tube, video documentation equipment from the range of accessories for the SL 120 and SL 130 slit lamps



Your local contact:**Argentina**

Carl Zeiss Argentina S.A.
Calle Nahuel Huapi 4015 / 25
C1430 BCO Buenos Aires
Argentina
Phone: +54 11 45 45 66 61
bruzzi@zeiss.com.ar

Australia

Carl Zeiss Pty Ltd
Tenancy Office 4, Level 1
40-52 Talavera Road
North Ryde NSW 2113
Australia
Phone: +61 2 9020 1333
med@zeiss.com

Austria

Carl Zeiss GmbH
Laxenburger Str. 2
1100 Vienna
Austria
Phone: +43 1 79 51 80
austria@zeiss.org

Belgium

Carl Zeiss NV-SA
Ikaroslaan 49
1930 Zaventem
Belgium
Phone: +32 2 719 39 11
info@zeiss.be

Brazil

Carl Zeiss do Brasil Ltda.
Av. Nações Unidas, 21711
CEP04795-100 São Paulo
Brazil
Phone: +55 11 5693 5521
medbrasil@zeiss.org

Canada

Carl Zeiss Canada Ltd.
45 Valleybrook Drive
Toronto, ON M3B 2S6
Canada
Phone: +1 800 387 8037
czcmed@zeiss.com

China

Carl Zeiss Shanghai Co. Ltd.
1/f., Ke Yuan Building
11 Ri Yin Nan Road
Waigaoqiao Free Trade Zone
2005 Yang Gao Bei Road
Shanghai 200131
China
Phone: +86 21 5048 17 17
sro@zeiss.com.cn

Czech Republic

Carl Zeiss spol. s.r.o.
Radlická 14/3201
150 00 Prague 5
Czech Republic
Phone: +420 233 101 221
zeiss@zeiss.cz

France

Carl Zeiss Meditec France SAS
60, route de Sartrouville
78230 Le Pecq
France
Phone: +33 1 34 80 21 00
med@zeiss.fr

Germany

Carl Zeiss Meditec VG mbH
Carl-Zeiss-Strasse 22
73447 Oberkochen
Germany
Phone: +49 7364 20 6000
vertrieb@meditec.zeiss.com
Surgical Ophthalmology:
Phone: +49 800 470 50 30
iol.order@meditec.zeiss.com

Hong Kong

Carl Zeiss Far East Co. Ltd.
Units 11-12, 25/F
Tower 2, Ever Gain Plaza
No. 88 Container Port Road
Kwai Chung
Hong Kong
Phone: +852 2332 0402
cffe@zeiss.com.hk

India

Carl Zeiss India Pvt. Ltd.
Plot No.3, Jigani Link Road
Bommasandra Industrial Area
Bangalore - 560 099
India
Phone: +91 80 4343 8000
info@zeiss.co.in

Italy

Carl Zeiss S.p.A.
Viale delle Industrie 20
20020 Arese (Milan)
Italy
Phone: +39 02 93773 1
infomed@zeiss.it

Japan

Carl Zeiss Meditec Japan Co. Ltd.
Shinjuku Ku
Tokyo 160-0003
22 Honchio-Cho
Japan
Ophthalmic instruments:
Phone: +81 3 33 55 0331
medsales@zeiss.co.jp
Surgical instruments:
Phone: +81 3 33 55 0341
cmskoho@zeiss.co.jp

Malaysia

Carl Zeiss Sdn Bhd.
Lot2, Jalan 243/51 A
46100 Petaling Jaya
Selangor Darul Ehsan
Malaysia
Phone: +60 3 7877 50 58
malaysia@zeiss.com.sg

Mexico

Carl Zeiss de México S.A. de C.V.
Avenida Miguel Angel de Quevedo
496
04010 Mexico City
Mexico
Phone: +52 55 59 99 0200
cz-mexico@zeiss.org

Netherlands

Carl Zeiss B.V.
Trapezium 300
Postbus 310
3364 DL Sliedrecht
Netherlands
Phone: +31 184 43 34 00
info@zeiss.nl

New Zealand

Carl Zeiss (N.Z.) Ltd.
15B Paramount Drive
P.O. Box 121 - 1001
Henderson, Auckland 0650
New Zealand
Phone: +64 9 838 5626
med@zeiss.com

Poland

Carl Zeiss sp. z o.o.
ul. Lopuszanska 32
02-220 Warsaw
Poland
Phone: +48 22 858 2343
medycyna@zeiss.pl

Singapore

Carl Zeiss Ptd. Ltd.
50 Kaki Bukit Place
Singapore 415926
Singapore
Phone: +65 6741 9600
info@zeiss.com.sg

South Africa

Carl Zeiss (Pty.) Ltd.
363 Oak Avenue
Ferndale
Randburg 2194
South Africa
Phone: +27 11 886 9510
info@zeiss.co.za

South Korea

Carl Zeiss Co. Ltd.
Seoul 121-828
Mapo-gu
141-1, Sangsu-dong
2F, BR Elitel Bldg.
South Korea
Phone: +82 2 3140 2600
korea@zeiss.co.kr

Spain

Carl Zeiss Meditec Iberia S.A.U.
Ronda de Poniente, 15
Tres Cantos
28760 Madrid
Spain
Phone: +34 91 203 37 00
info@zeiss.es

Sweden

Carl Zeiss AB
Tegeludsvaegen 76
10254 Stockholm
Sweden
Phone: +46 84 59 25 00
info@zeiss.se

Switzerland

Carl Zeiss AG
Feldbachstrasse 81
8714 Feldbach
Switzerland
Phone: +41 55 254 7534
info@zeiss.ch

Thailand

Carl Zeiss Thailand
90 CyberWorld Tower A,
36th Floor, Unit A 3601
230 Ratchadapisek Road
Huaykhwang, Bangkok 10310
Thailand
Phone: +66 2 248 8787
thailand@zeiss.com.sg

United Kingdom

Carl Zeiss Ltd.
509 Coldhams lane
Cambridge
CAMBS
CB1 3JS,
United Kingdom
Phone: +44 1707 871200
info@zeiss.co.uk

United States of America

Carl Zeiss Meditec USA, Inc.
5300 Central Parkway
Dublin, CA 94568
USA
Phone: +1 925 557 4100
www.zeiss.com/us/med

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