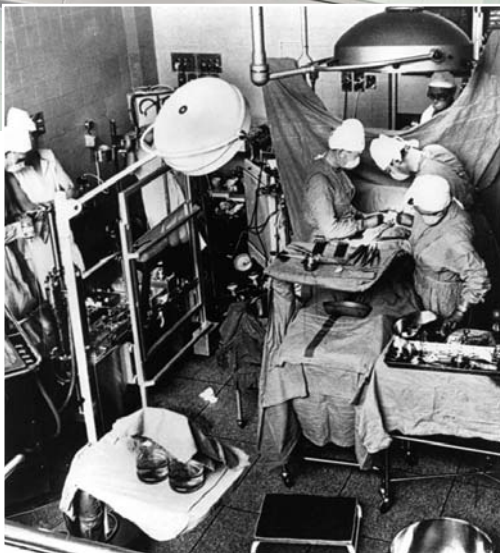


Surgical lights with HID and
BRITe™ technology

CHROMOPHARE® E-series

Proven classics with a future:



BERCHTOLD

The traditional company with vision for the future and proven technology

In December 1967 the first heart transplant was performed, led by Dr. Christiaan Barnard – even then with a CHROMOPHARE® lighting system by BERCHTOLD.

In the years thereafter, BERCHTOLD became an OR equipping specialist with its visionary »OR of the Future« and worldwide expansion.

Since then, surgical lights with HID and BRITe™ technology have joined BERCHTOLD's proven classics.

CHROMOPHARE® Surgical lights



The best light for every application

The surgeon in the operating room must be able to recognize contours, colours and tissue structures accurately. For this, surgeons need cool, daylight-quality light as well as light fields and illumination levels precisely tailored to different surgical situations.

As a pioneer in the field of OR-field illumination, BERCHTOLD meets all the requirements for lighting conditions in the OR. With our extensive range of surgical lighting and our decades of experience, we set standards.

More light

high quality and efficient

CHROMOPHARE® lights achieve an increase in illumination intensity compared to conventional lamps of up to 50% (BRITe™) and up to 55% (HID) at a constant energy consumption and the same light head temperature. An enormous increase in quality and efficiency of modern surgical lighting technology, which is especially visible in large and deep surgical fields.

More safety

durable and reliable with a backup solution

HID and BRITe™ technology lighting elements are durable. A sophisticated backup solution effectively prevents an intraoperative loss of light. If the first light source fails, a switching mechanism automatically activates a second light source that is swung into the optical centre of the lamp within milliseconds. This means you have unlimited illumination, even on the reserve lamp.

CHROMOPHARE® HID ...



Economical CHROMOPHARE® HID Gas discharge lamps

HID technology

Surgical lights with **HID** (High Intensity Discharge) gas discharge technology are characterized by a very homogeneously illuminated, large light field as well as constant light quality and consistent colour temperature. They offer light levels of up to 160,000 lux, an even greater light field diameter of up to 34 cm at a depth of illumination of up to 140 cm and a much longer bulb life.

At a glance

- 2 light-head sizes
- Illumination intensity of up to 160,000 lux
- Light field diameter of up to 34 cm
- 55% more light output than with conventional halogen lights

HID – Applications

Technology	HID	
	E 805	E 655
Abdominal / general surgery	•	•
Gynaecology	•	•
Heart / vascular / thorax surgery	•	•
Neurosurgery		•
Orthopaedics	•	•
Traumatology / emergency OR		•
Urology / urology TUR		•
ENT / OMF / ophthalmology		
Endoscopy / angiography		•
Accouchement		
Ambulatory centre/outpatient departm.		•
Preparation room		

... innovative and futuristic

convenient and durable
more light – more safety

- **AutoLux™:**
 - Constant Illumination intensity regardless of light field size.
- **Sleep mode:**
 - Light switches off and on without a preheating phase.
- **GuideLite™:**
 - Downward-facing orientation light.
- **EndoLite®:**
 - Upward-facing indirect lighting.
- **ThermoSorb filter system:**
 - Filtering of 99.5% of IR radiation.
 - Cool, bright light.
 - Reduced heat input.
- **Colour properties in daylight quality:**
 - Colour temperature 4500 K.
 - Clear delineation of different tissue structures.
- **Free-form polygon reflector:**
 - Consists of hundreds of facets.
 - Homogeneous, shadow-free light column in daylight quality.
 - Excellent, vivid vision, even if much of the light source is obscured.



- **100% light availability:**
 - Gas discharge lamp with ± 5000-hour lamp life.
 - BRITe™ backup solution for lamp failure during surgery.
 - 100% illumination intensity even on the reserve lamp.
 - Simple replacement of the lamp without tools (after surgery).
- **Easy to use, long life:**
 - Positioning via sterilizable handle or continuous rail.
 - The underside of the light is made of special safety glass.
 - Powder-coated aluminium construction.
 - Shock and impact-resistant polymer cover.
 - All parts are easy to clean and disinfect.
 - Long life due to solid construction.

CHROMOPHARE® BRITe™ ...



Economical halogen lights for every application

BRITe™ technology

BRITe™ stands for “**B**ERCHTOLD **R**eflective **I**llumination **T**echnology”, referring to a halogen technology that reflects unwanted hot infrared radiation precisely back onto the filament. This causes it to emit additional light rays, from which in turn only cool, visible light can escape. Light intensities of up to 160,000 lux and light field diameters of up to 28 cm with homogeneous illumination are achieved with the BRITe™ technology.

At a glance

- 2 light-head sizes
- Illumination intensity of up to 160,000 lux
- Light field diameter of up to 28 cm
- 50% more light output than with conventional halogen lights

... proven and reliable

Large, bright, homogeneous

Optimum Illumination intensity for each size

- **EndoLife®:**
 - Upward-facing indirect lighting.
- **ThermoSorb filter system:**
 - Filtering of 99.5% of IR radiation.
 - Cool, bright light.
 - No tissue dehydration.
- **Colour properties in daylight quality:**
 - Colour temperature 4500 K.
 - Clear delineation of different tissue structures.
- **Free-form polygon reflector:**
 - Consists of hundreds of facets.
 - Homogeneous, shadow-free light column in daylight quality.
 - Excellent, vivid vision, even if much of the light source is obscured.
- **100% light availability:**
 - Halogen lamp with ± 1000-hour lamp life.
 - Automatic activation of reserve lamp for intraoperative light failure.
 - 100% illumination intensity even on the reserve lamp.
 - Simple replacement of the lamp without tools (after surgery).
- **Easy to use, long life:**
 - Positioning via sterilizable handle or continuous rail.
 - The underside of the light is made of special safety glass.
 - Powder-coated aluminium construction.
 - Shock and impact-resistant polymer cover.
 - All parts are easy to clean and disinfect.
 - Long life due to solid construction.



BRITe™ – Applications

Technology	BRITe™		
	E 650	E 550	E 520
Abdominal / general surgery	•	• *	
Gynaecology	•	• *	
Heart / vascular / thorax surgery	•	•	•
Neurosurgery	•	•	•
Orthopaedics	•	• *	
Traumatology / emergency OR	•	•	•
Urology / urology TUR	•	•	
ENT / OMF / ophthalmology		•	•
Endoscopy / angiography		•	•
Accouchement		•	•
Ambulatory centre/outpatient departm.	•	•	
Preparation room			•

* in combination with E 650

HID and BRITe™ – the technology behind it ...

See better – operate more efficiently.
With lighting technology by BERCHTOLD



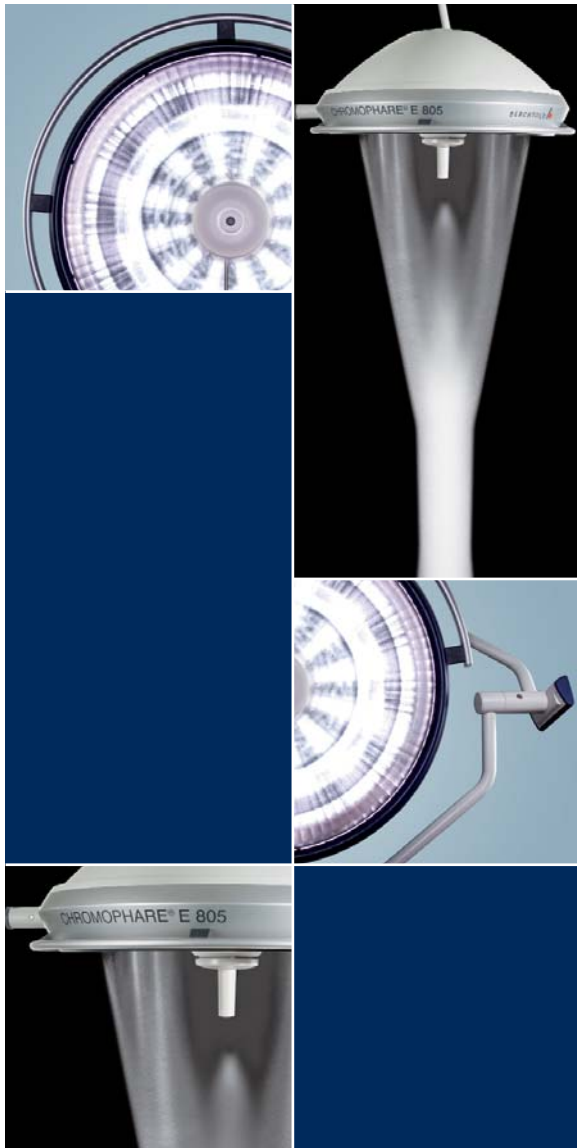
Free-form polygon reflector

shadow-free vision with advanced technology

The constantly evolving polygon reflector consists of hundreds of facets. Hundreds of cones of light illuminate the entire surgical field. The homogeneous light column produced in this way acts like a sun beam, is shadow-free and guarantees good, vivid vision.

Even if a large surgical team obscures part of the light with shoulders, hands or heads.

... convenient and uncompromising



AutoLux™

Optimum Illumination intensity for each size

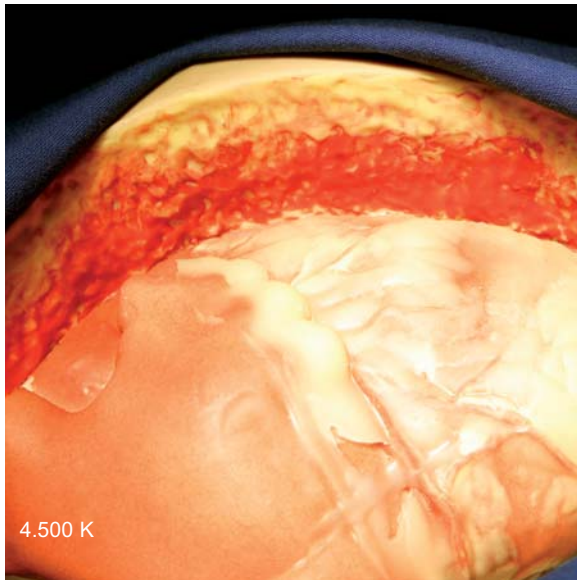
Our innovative light-control technology, such as in the CHROMOPHARE® E 805 lamp, guarantees consistent light quality regardless of the light field size. This allows the surgeon to increase and decrease the light field size while colour temperature and illumination intensity remain constant, so that the eye does not need to adapt. Refocusing is no longer necessary. Even when raising and lowering the patient, the illumination colour remains stable and homogeneous.

Sleep function, EndoLite® & GuideLite™

Light without compromise

For the first time, light can be faded out and restored to full power during surgery as needed at the touch of a button, without having to wait for the usual gas-discharge lamp preheat phase. In the sleep function, the residual "GuideLite™" provides a pleasant, downward-facing orientation light, while EndoLite® gives muted, indirect upward-facing lighting. With the press of a button, the surgical light can be switched from the normal surgical light to a second light source. EndoLite® solves all lighting problems in endoscopic procedures.

HID and BRITe™ – the technology behind it ...



cooler light – better concentration

Colour properties in daylight quality

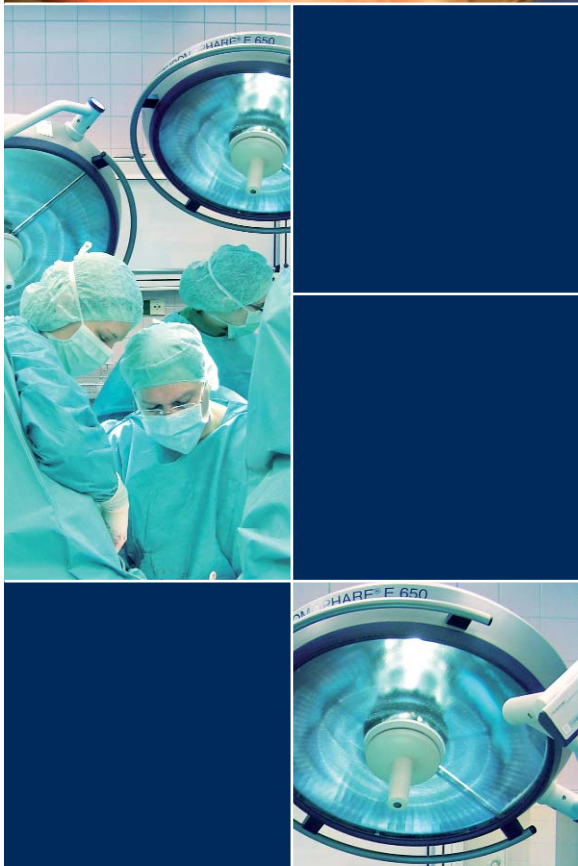
optimum vision

Thanks to their colour temperature of 4,500 K, CHROMOPHARE® lights produce white light in daylight quality, letting you distinguish clearly between a variety of tissues. High colour temperatures are also proven to increase the performance and concentration of surgical teams, thereby significantly reducing the risk of concentration-dependent errors.

ThermoSorb filter system

Cool surgery without tissue desiccation

For many years, surgeons have valued the CHROMOPHARE® ThermoSorb filter system, whereby up to 99.5% of the IR radiation is filtered out of the light. In this way, the surgeon gets cool, bright light with a consumption of only 70 or 150 W. This does not dry out the tissue.



ergonomic and intuitive

An intuitive concept

easy use and position

All functions are quickly and intuitively controlled from the control panel on light head and/or the wall control box.

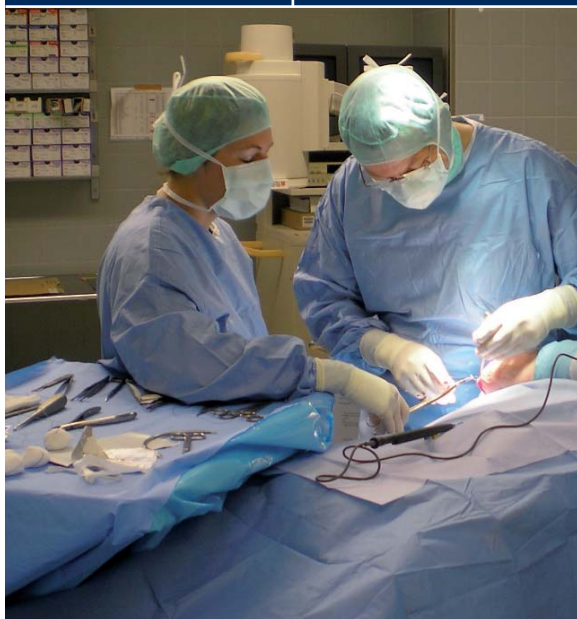
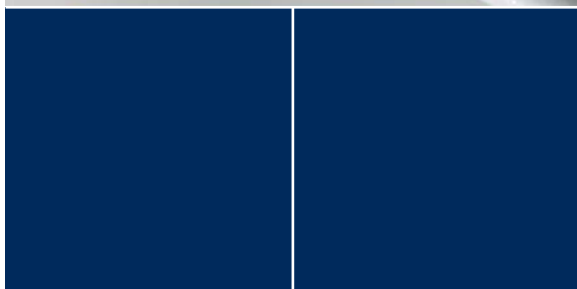
When using more than one light, certain features can be controlled synchronously.

CHROMOPHARE® lights are small and powerful. The easy-to-move spring arms with 360° rotation around three axes lets you move the lights simply and position them safely.

The railing surrounding them enables positioning of the light even from outside the sterile OR field. The handle can be sterilised, and the underside of the lights is made of a special, easy-to-clean safety glass. The aluminum design with powder mould coating guarantees simple, hygienic cleaning and a long service life.

At a glance

- Proven symbolic keyboard
- High end and intuitively operated elements
- Optimised cardanic case
- Wall control box in surface-mounted, recessed and integrated versions
- Dual control options and RS-232 interface for system integration
- Communications interface for remote control and operation via a control system



HID and BRITe™ – an overview of the technology

Technical data	E 805	E 655	E 650	E 550	E 520
Light head diameter	80 cm	65 cm	65 cm	58 cm	58 cm
Light intensity	80,000–160,000 lx	80,000–160,000 lx	80,000–160,000 lx	70,000–135,000 lx	85,000 lx
Brightness control	50–100%	50–100%	50–100%	50–100%	–
Light field diameter	22–34 cm	18–28 cm	17–28 cm	16–27 cm	20 cm
Depth of illumination (L1+L2)	140 cm	126 cm	122 cm	121 cm	138 cm
Colour rendering index (Ra)	96	96	94	94	94
Colour temperature	4,500 K	4,500 K	4,500 K	4,500 K	4,500 K
Bulb	150 W HID Gas discharge	70 W HID Gas discharge	150 W BRITe™ Halogen	150 W BRITe™ Halogen	150 W BRITe™ Halogen
Ø Bulb service life	5,000 h	5,000 h	1,000 h	1,000 h	1,000 h
Backup bulb (integrated)	BRITe™ Halogen	BRITe™ Halogen	BRITe™ Halogen	BRITe™ Halogen	BRITe™ Halogen
Total radiant power at max. light intensity	592 W/m²	592 W/m²	681 W/m²	607 W/m²	418 W/m²
Light head power consumption	250 VA at 24-28 V(DC)	250 VA at 24-28 V(DC)	170 VA at 24-28 V(DC)	170 VA at 24-28 V(DC)	170 VA at 24-28 V(DC)
Electricity	100/120/127 V(AC); 220/230/240 V(AC)	100/120/127 V(AC); 220/230/240 V(AC)	100/120/127 V(AC); 220/230/240 V(AC)	100/120/127 V(AC); 220/230/240 V(AC)	100/120/127 V(AC); 220/230/240 V(AC)
Radiation energy	3.7 mW/m²lx	3.7 mW/m²lx	4.7 mW/m²lx	4.7 mW/m²lx	4.7 mW/m²lx
Temperature increase at head area	approx. 1°C	approx. 1°C	approx. 1°C	approx. 1°C	approx. 1°C
Degree of protection acc. to DIN 1946	5	5	5	5	5
Assembly options	Ceiling, Ceiling pendant	Ceiling, Ceiling pendant	Ceiling, Ceiling pendant	Ceiling, Wall, Ceiling pendant Mobil	Ceiling, Wall, Ceiling pendant Mobil
Certificates	CE, UL	CE, UL	CE, UL	CE, UL	CE, UL

Measurements according to EN 60 601-2-41. All light technical data max. +/- 10% tolerance.

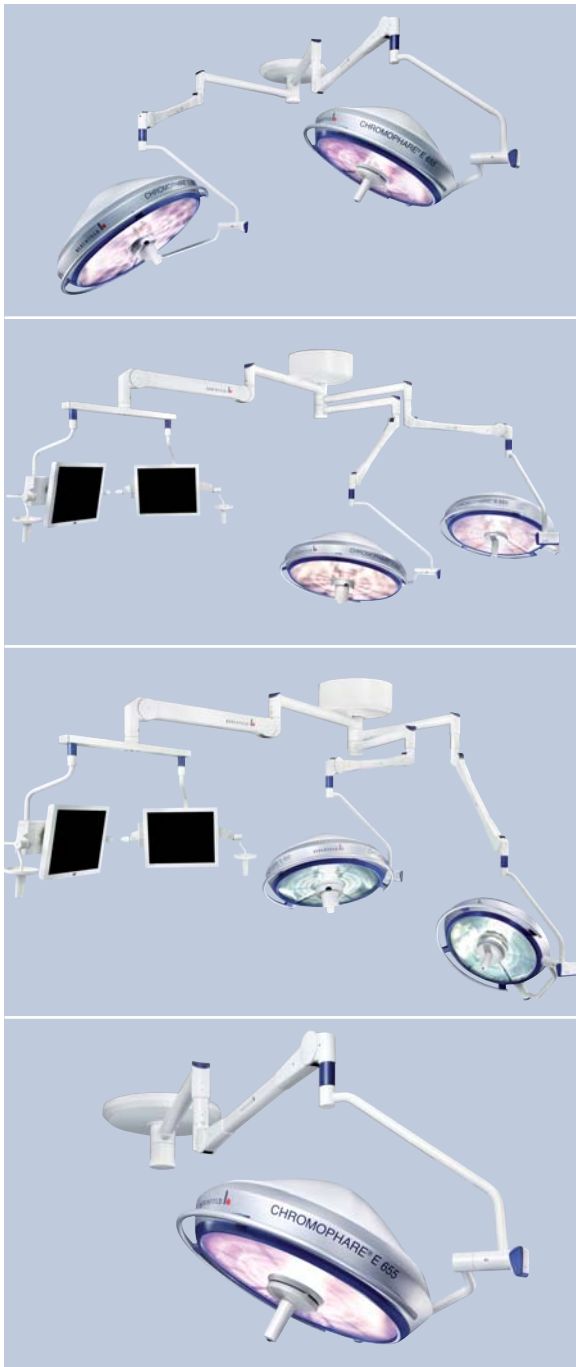
Equipment	E 805	E 655	E 650	E 550	E 520
Rotation	360°	360°	360°	360°	360°
Peripheral rail	270°	270°	270°	270°	270°
Sterilisable handle	Standard	Standard	Standard	Standard	Standard
Membrane keypad	Standard	Standard	Standard	Standard	Standard
EndoLite®*	optional in the central light suspension				
GuideLite™	Standard	Standard	–	–	–
AutoLux™	Standard	–	–	–	–
Backup light with central positioning	Standard	Standard	Standard	optional	–
AC suspension	yes	yes	yes	yes	yes
NC suspension	yes	yes	yes	yes	yes
RS 232	optional	optional	optional	optional	optional
ChromoVision®	optional	optional	optional	optional	–

* Not available in combination with ChromoVision® ECO.

Variable system for every need

Any combination with camera systems and monitors

CHROMOPHARE® surgical lights can be combined in any way with up to 4 suspensions and also mobile mounting.

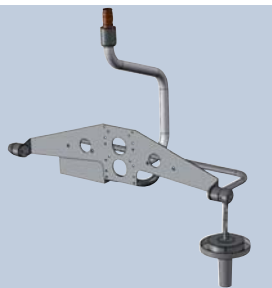


ChromoView™ monitor support arms



right: monitor arm

below: external full-HD camera module



ChromoView™ monitor support arms make it possible to position medical screens flexibly.

- Compatible with all monitor sizes up to 42" diagonal screens
- Monitor support arms for larger screen diagonals on request
- Point of rotation at the centre of gravity facilitates feather-light positioning
- Wide cable opening for multiple video signal cables
- Installation of one or two flat screens with large tilt and swivel ranges
- Double monitor support available with either freely movable or fixed monitor position
- Weight range from standard 10 kg up to 26 kg
- Support arms for attaching external cameras available

All major manufacturer monitors, including full-HD solutions, can be purchased directly through us. Just ask! We would be glad to be of assistance.

ChromoVision® camera systems ...



Quick overview of training and know-how exchange

The use of modern information and communication technologies improves the availability of medical knowledge and facilitates interactive collaboration between operating rooms and other facilities for training purposes or know-how exchange.

The ORICS® communications solution turns the ChromoVision® integrated camera system into a video communication system with diverse applications.

Interactive communication ...

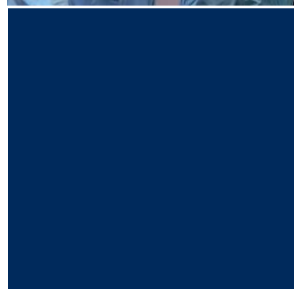
ChromoVision® camera systems

ChromoVision® ECO camera system with manual zoom. The single-chip CCD camera system is highly economical and designed for universal use.

ChromoVision® 1 C camera system with a variety of control options. Designed for professional use, the single-chip CCD camera system is distinguished by the excellent picture quality it provides.

ChromoVision® HD the camera system with a variety of control options meets the highest standards of image quality and is best suited to professional use. The HD camera module used captures pictures with more than 2 million pixels, which corresponds to 5x higher resolution compared to conventional systems. With the SDI version, images can be effectively viewed on HD monitors in 16:9 format.

ChromoVision® full HD and full HD external - camera systems without compromise. With the new ChromoVision® full HD and full HD external camera systems you have a perfect view of the surgical procedure. Thanks to the high-definition video technology and the flexible system concept you can expand your scope of use in many ways. Comprehensive control features and an intuitive operating concept make it possible to use impressive HD image quality efficiently in daily surgical procedures. The excellent camera systems offer true-colour rendition and high-resolution picture quality in 16:9 and 4:3 formats.



... for training purposes and know-how exchange



mobile control unit
for operation of
camera functions

External camera
control unit



ChromoVision® Full HD – the highlights at a glance:

- Image capture of the highest quality (high-resolution full-HD image quality with 2 million pixel image capture system)
- 16:9 and 4:3 image formats
- 10 x optical zoom and 12 x digital zoom (120 x zoom)
- Excellent colour reproduction
- Free-rotating 360° suspension
- Excellent electronic and manual image alignment
- Ergonomic design for increased user friendliness and hygiene
- Handle for positioning in sterile environment
- Auto/manual focus, white balance and exposure setting
- Manual light field adjustment
- Dual camera control – intuitive operation directly on the mobile control unit, on the camera or via remote control
- Precise push-button control of image settings with automatic and manual control modes
- Still image function in combination with ORICS®
- Compatible with ORICS® communications system
- Live streaming and image storage with ORICS®
- Serial interface for remote operation with external systems
- Simple implementation in existing infrastructure
- Flexible expansion options

ChromoVision® – the technology

ChromoVision® technology at a glance

	ChromoVision® ECO	ChromoVision® 1 C	ChromoVision® HD SD	ChromoVision® Full HD	ChromoVision® Full HD ext.
Image sensor	1/4 type super HAD CCD	1/4 type super HAD CCD	1/3 type HD CMOS	1/3 type HD CMOS	1/3 type HD CMOS
Video standard	PAL or NTSC	PAL or NTSC	PAL or NTSC SD-SDI standard SMPTE 259M ⁵	Full-HD 1080, standard and/or PAL/NTSC	Full-HD 1080, standard and/or PAL/NTSC
Pixel	Approx. 440,000 pixels	Approx. 440,000 pixels	Approx. 2,000,000 pixels	Approx. 2,000,000 pixels	Approx. 2,000,000 pixels
Resolution	460 lines (PAL), 470 (NTSC)	460 lines (PAL), 470 (NTSC)	460 lines (PAL), 470 lines (NTSC) 576i (PAL), 480i (NTSC) ⁵	1080i	1080i
Minimum working distance (Wide-angle/tele)	10 - 800 mm	10 - 800 mm	10 - 800 mm	10 - 800 mm	10 - 800 mm
Image format	4:3	4:3	4:3 16:9 ⁵	16:9 (4:3 for PAL/NTSC)	16:9 (4:3 for PAL/NTSC)
Optical zoom	18x zoom	18x zoom	10x zoom*	10x zoom	10x zoom
Digital zoom	4x (72x with opt. zoom)	4x (72x with opt. zoom)	12x (120x with opt. zoom)	12x (120x with opt. zoom)	12x (120x with opt. zoom)
Focal length (mm)	f = 4.1 – 73.8 mm	f = 4.1 – 73.8 mm	f = 5.1 – 51.0 mm	f = 3.4 – 33.9 mm	f = 3.4 – 33.9 mm
Auto shutter (AES)	1/50- 1/10,000 s	1/50- 1/10,000 s	1/2- 1/10,000 s	1/2- 1/10,000 s	1/2- 1/10,000 s
Signal/noise ratio (S/N) ¹	> 50 dB	> 67 dB	> 50 dB	50 dB	50 dB
White balance	Automatic	Automatic / manual	Automatic / manual	Automatic / manual	Automatic / manual
Focus	Automatic	Automatic / manual	Automatic / manual	Automatic / manual	Automatic / manual
Exposure setting	Automatic	Automatic / manual	Automatic / manual	Automatic / manual	Automatic / manual
Complete image reorientation	no ²	yes ²	yes ²	yes	yes
Signal output	Y/C, 1.0 Vpp (Sync negative)	Y/C, 1.0 Vpp (Sync negative)	2x Y/C (Y = 1Vpp, C = 0.258 Vpp); 2x composite 1.0 Vpp 2x SD-SDI, SMPTE 259M stand. ⁵	2x HD-SDI (SMPTE 292M/ 374M), 1x DVI 1080 (2x, 1080p ready), 1x fibre optic (RGB0) through adapter, 1x S-Video (PAL/NTSC), parallel output of Full HD and SD signal	2x HD-SDI, DVI 1080i (2-x, 1080p ready), YUV analog, FBAS (PAL, NTSC), Y/C (PAL/NTSC) parallel output of full HD and SD signal
Serial interface RS232	no	yes	yes	yes	RS 232 (RS 485)
Versions	In-light / external ³ camera	In-light / external ³ camera	In-light / external ³ camera	In-light camera	ext. camera/sep. Support arm
Camera operation	At the surgical light	Mobile control unit	Mobile control unit	Mobile control unit	Mobile control unit
IR remote control	–	yes	yes	yes	no
Power supply					
Camera control	via surgical light	via surgical light	via surgical light	via separate power supply	via sep. power supply (integr. IEC connector)
Available with ORICS ^{®4}	no	yes	yes no ⁵	no	no
ORICS [®] compatible	no	yes	yes no ⁵	yes ⁶	yes ⁶

Measurements according to EN 60 601-2-41.
All light technical data max +/- 10% tolerance.

¹ Measured on the control panel

² Only for in-light cameras

³ On request

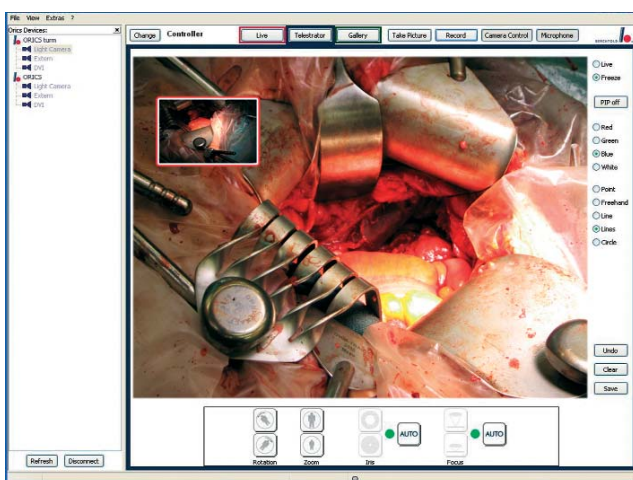
⁴ Available in selected markets

⁵ For HD SD-SDI versions

⁶ SD-Videostreaming

*HD camera with 40 x activated zoom on request

Visualization with ORICS®



ORICS® communications systems

Live transmission in TV quality

- Site-independent information exchange, live and in real time
- Easy integration into existing network
- Increased workflow efficiency
- Quality assurance through documentation of all relevant data
- Better-informed decision making through well-founded information

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For 90 years, BERCHTOLD has been a specialist in equipping surgical theatres. We offer best-in-class products, global experience in planning and project management, and individual service. Our products and services include:

- CHROMOPHARE® surgical and examination lights
- ChromoVision® video and camera systems
- ChromoView™ monitor carrier arms
- OPERON® operating tables and accessories
- ORICS® telemedicine
- SUPERSUITE® all-round, customised OR solutions
- TELETOM® ceiling pendants
- 3D-OR™ design software
- Development, consulting, project management
- Service and installation by the best-trained specialists

We look forward to hearing from you and helping you plan, design and install your next surgical environment.



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