# Visualization and Instruments for Keyhole Neurosurgery





## **Visualization and Instruments**

#### for Keyhole Neurosurgery

The telescopes and instruments from KARL STORZ for minimally invasive approaches in microneurosurgery are designed to display even the tiniest structures in narrow spaces. The main fields of application are intracranial expansive and vascular lesions. Minimally invasive approaches are particularly suited for treating deep-seated and small tumors in the anterior cranial fossa, the suprasellar and parasellar regions as well as the middle and posterior cranial fossa.



#### \* Rapid switch between the VITOM® 3D and endoscopic imaging in 2D and 3D:

The image on the left shows the VITOM<sup>®</sup> 3D in use and the image on the right shows endoscopy – both types of visualization require only one video tower, i.e. the surgeon does not have to change working positions and does not need to switch from the ocular to the monitor or vice versa.

The VITOM<sup>®</sup> 3D in particular provides a revolutionary solution for the visualization of neurosurgical interventions. Application possibilities are similar to that of the operating microscope. The surgeon can work comfortably via a 3D monitor which allows for a relatively free choice of working positions. The most important functions are controlled via the IMAGE1 PILOT, which is mounted on the OR table in close proximity to the surgeon.



\* Source: Prof. Reisch, Prof. Hopf, Klinik Hirslanden, Switzerland

EAM (Endoscopically-Assisted Microneurosurgey) is primarily used in minimally invasive keyhole approaches. In this specific technique, endoscopes are used in combination with the VITOM<sup>®</sup> 3D system or the operating microscope. The VITOM<sup>®</sup> 3D or the microscope illuminates and magnifies the superficial sectors of the operative field whereas the endoscope provides a targeted visualization of deeper-lying structures. The contribution of endoscopy to standard microsurgery is based on its ability to better identify anatomical structures under limited viewing angles and in blind areas around corners.

The IMAGE1 S<sup>™</sup> camera platform from KARL STORZ provides an imaging chain that is compatible with the VITOM<sup>®</sup> 3D and can offer a combination of endoscopic imaging in 2D and 3D. For the surgeon, this means that all types of visualization are available using only one video tower. It is possible to switch between the VITOM<sup>®</sup> 3D and endoscopy in a quick and ergonomic manner.



\* VITOM® 3D



\* Endoscope

This brochure lists all options in accordance with the product type (VITOM<sup>®</sup> 3D, endoscopes in 3D and 2D, coagulation instruments, suction instruments, forceps, curettes, scissors, etc.). This allows neurosurgeons to easily configure an instrument set according to individual needs or to complete existing equipment in order to expand the range of indications or to perform even more minimally invasive procedures.

To compile an instrument tray, the user can follow the steps below and choose from the various instrument categories:



# Visualization and Lens Cleaning VITOM<sup>®</sup> 3D



TH 200 **VITOM<sup>®</sup> 3D,** with zoom and focus function, integrated illumination and horizontal alignment, working distance 20-50 cm, fiber optic light transmission incorporated, suitable for wipe disinfection, for use with IMAGE1 S CONNECT<sup>™</sup> + IMAGE1 S D3-LINK<sup>™</sup> + IMAGE1 PILOT



TC 014 **IMAGE1 PILOT,** control unit with 3D wheel, 4 programmable function keys and USB port, for intuitive control of camera systems and connected units, for use with IMAGE1 S<sup>™</sup> and VITOM<sup>®</sup> 3D TH 200

Use of the IMAGE1 PILOT is mandatory for VITOM<sup>®</sup> 3D. The VITOM<sup>®</sup> 3D system and IMAGE1 PILOT are always used with a holding system.

Further information on holding systems is available in the final chapter of this brochure or in the Telepresence catalog.

# Visualization and Lens Cleaning Overview of VITOM<sup>®</sup> 3D





# Visualization and Lens Cleaning TIPCAM<sup>®</sup>1 S 3D NEURO



#### 3D telescope with 4 mm sheath diameter

With TIPCAM<sup>®</sup>1 S 3D, KARL STORZ sets new standards in 3D endoscopy with its brilliant, three-dimensional display. As part of the modular IMAGE1 S<sup>™</sup> camera platform, the existing system can be easily upgraded to 3D.





28164 AA 3D\* **TIPCAM®1 S 3D NEURO**, direction of view 0°, diameter 4 mm, length 18 cm, two FULL HD image sensors, **autoclavable**, S-Technologies available, freely programmable camera head buttons, including video connecting cable, for use with IMAGE1 S<sup>TM</sup>



28164 BA 3D\* **TIPCAM®1 S 3D NEURO,** direction of view 30°, diameter 4 mm, length 18 cm, two FULL HD image sensors, **autoclavable**, S-Technologies available, freely programmable camera head buttons, including video connecting cable, for use with IMAGE1 S<sup>TM</sup>

\* Currently not available on CE markets

#### **Angled Telescopes**

The telescopes with 45° angled eyepieces provide excellent intraoperative imaging and also offer the operating surgeon an optimal view of the surgical field as well as blind areas around corners.



HOPKINS® Telescope, diameter 2.7 mm, length 15 cm, **autoclavable**, angled eyepiece, fiber optic light transmission incorporated



#### **Angled Telescopes**

HOPKINS<sup>®</sup> Telescope, diameter 2.7 mm, length 20 cm, **autoclavable**, angled eyepiece, fiber optic light transmission incorporated



HOPKINS® Telescope, diameter 4 mm, length 20 cm, **autoclavable**, angled eyepiece, fiber optic light transmission incorporated



**CLEARVISION®** II for intraoperative cleaning of the front lens



40334101 CLEARVISION<sup>®</sup> II Set, lens irrigation system for endoscopes, power supply 100-240 VAC, 50/60 Hz including:
Mains Cord
One-Pedal Footswitch
Tubing Set, sterile, for single use, sterile, package of 3

## Visualization and Lens Cleaning CLEARVISION<sup>®</sup> II Irrigation and Suction Sheaths



28162 AUS*	Irrigation and Suction Sheath 0°, oval, 3.5 x 4.7 mm, working length 12 cm, for use with HOPKINS® Telescope 28162 AUA and KARL STORZ lens irrigation system CLEARVISION® II
28162 BOS*	Irrigation and Suction Sheath 30°, oval, 3.5 x 4.7 mm, working length 12 cm, for use with HOPKINS® Telescope 28162 BOA and KARL STORZ lens irrigation system CLEARVISION® II
28162 BUS*	Irrigation and Suction Sheath 30°, oval, 3.5 x 4.7 mm, working length 12 cm, for use with HOPKINS <sup>®</sup> Telescope 28162 BUA and KARL STORZ lens irrigation system CLEARVISION <sup>®</sup> II
7230 AS*	Irrigation and Suction Sheath 0°, outer diameter 4.8 x 6 mm, working length 14 cm, for use with HOPKINS® Telescopes 7230 AA, 28132 AA, TIPCAM®1 S 3D 7240 AA 3D, TIPCAM®1 S 3D 28164 AA 3D NEURO and KARL STORZ lens irrigation system CLEARVISION® II
7230 BS*	Irrigation and Suction Sheath 30°, outer diameter 4.8 x 6 mm, working length 14 cm, for use with HOPKINS® Telescopes 7230 BA, 28132 BA, TIPCAM®1 S 3D 7240 BA 3D, TIPCAM®1 S 3D 28164 BA 3D NEURO and KARL STORZ lens irrigation system CLEARVISION® II

\* Note: In the CE region, not for use in direct contact with the central nervous system

## **Irrigation Sheaths**

	28164 CAK	Irrigation Sheath, outer diameter 3.8 mm, working length 15 cm, for use with HOPKINS <sup>®</sup> Telescope 0° 28162 AKA and KARL STORZ lens irrigation system CLEARVISION <sup>®</sup> II
	28164 CBK	Same, for use with HOPKINS <sup>®</sup> Telescope 30° 28162 BKA and KARL STORZ lens irrigation system CLEARVISION <sup>®</sup> II
	28164 CFK	Same, for use with HOPKINS <sup>®</sup> Telescope 45° 28162 FKA and KARL STORZ lens irrigation system CLEARVISION <sup>®</sup> II
	28164 CCK	Same, for use with HOPKINS <sup>®</sup> Telescope 70° 28162 CKA and KARL STORZ lens irrigation system CLEARVISION <sup>®</sup> II
	28162 AVS	Irrigation Sheath, outer diameter 4.8 mm, working length 18 cm, for use with HOPKINS® Telescope 28162 AVA and KARL STORZ lens irrigation system CLEARVISION® II
(	28162 BVS	Same, for use with HOPKINS <sup>®</sup> Telescope 30° 28162 BVA and KARL STORZ lens irrigation system CLEARVISION <sup>®</sup> II
	28162 FVS	Same, for use with HOPKINS® Telescope 45° 28162 FVA and KARL STORZ lens irrigation system CLEARVISION® II
	28164 CBA	Irrigation Sheath, outer diameter 5 mm, working length 14 cm, for use with HOPKINS <sup>®</sup> Telescopes 7230 AA and 28132 AA and KARL STORZ lens irrigation systems CLEARVISION <sup>®</sup> and CLEARVISION <sup>®</sup> II
	28164 CBB	Same, for use with HOPKINS <sup>®</sup> Telescopes 30° 7230 BA and 28132 BA and KARL STORZ lens irrigation systems CLEARVISION <sup>®</sup> and CLEARVISION <sup>®</sup> II
	28164 CBF	Same, for use with HOPKINS <sup>®</sup> Telescopes 45° 7230 FA and 28132 FA/FVA and KARL STORZ lens irrigation systems CLEARVISION <sup>®</sup> and CLEARVISION <sup>®</sup> II

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The suction tubes with a special elongated or drop-shaped cut-off hole are designed for microsurgery in delicate areas. The special, slit-shaped cut-off hole makes it possible to regulate the suction power, which is especially important in sensitive regions.

649179 A	Suction Tube, malleable, with elongated cut-off hole and stylet, LUER, 4 Fr., working length 12 cm
649179 B	Same, working length 15 cm
649179 C	Same, working length 18 cm
649180 A	<b>Suction Tube,</b> malleable, with elongated cut-off hole and stylet, LUER, 6 Fr., working length 12 cm
649180 B	Same, working length 15 cm
649180 C	Same, working length 18 cm
649182 A	<b>Suction Tube,</b> malleable, with elongated cut-off hole and stylet, LUER, 8 Fr., working length 12 cm
649182 B	Same, working length 15 cm
649182 C	Same, working length 18 cm
649183 A	<b>Suction Tube,</b> malleable, with elongated cut-off hole and stylet, LUER, 10 Fr., working length 12 cm
649183 B	Same, working length 15 cm
649183 C	Same, working length 18 cm

28164 XB 28164 XA	<b>Suction Tube,</b> with cut-off hole, drop-shaped, with distance markings, LUER, conical distal end, 6 Fr., working length 15 cm <b>Same,</b> 8 Fr.	
28164 XC	Suction Tube, with cut-off hole, drop-shaped, with distance markings, LUER, conical distal end, tip curved upwards, ball end, 2.4 mm, working length 15 cm	
28164 XE 28164 XD	Suction Tube, with cut-off hole, drop-shaped, with distance markings, LUER, conical distal end, malleable, 6 Fr., working length 15 cm Same, 8 Fr.	- Art







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\* Note: In the CE region, not for use in direct contact with the central nervous system

		Lipolar
<u>``</u>		
	28164 BDN	TAKE-APART® Bipolar Forceps, rounded tip, width 2 mm, outer diameter 3.4 mm, working length 20 cm
	28164 BDM	Same, with fine jaws, width 1 mm, distally angled 45°, horizontal closing
	28164 BDD	<b>Same,</b> width 2 mm, distally angled 45°, horizontal closing
	28164 BDK	<b>Same,</b> width 4 mm, distally angled 45°, horizontal closing
	28164 BDL	<b>Same,</b> with fine jaws, width 1 mm, distally angled 45°, vertical closing
	28164 BDG	Same, width 1.8 mm
$\geq$	28164 BGS	<b>Same,</b> with fine jaws, width 2 mm, distally angled 45°, size 3 mm, working length 10 cm





844524\* **Bipolar Forceps,** bayonet-shaped, with bar, tip 0.7 mm, length 23 cm

844525\* **Same,** angled

\* Note: In the CE region, not for use in direct contact with the central nervous system

SEPEHRNIA Micro Instruments



#### SEPEHRNIA Micro Instruments





#### Wire Tray

A special wire tray is available for SEPEHRNIA micro instruments that allows cleaning and sterilization of up to six instruments in parallel.



39501 AN Wire Tray for Cleaning, Sterilization and Storage of up to 6 SEPEHRNIA instruments with silicone holders and with direct connection to washer-disinfector via detachable Multiport Bridge 39100 VA, external dimensions (w x d x h): 480 x 125 x 54 mm

#### KERRISON Bone Punches

		DETACHABLE
	28164 MKA	KERRISON <b>Bone Punch,</b> detachable, rigid, upbiting 60° forward, size 1 mm, working length 17 cm
	28164 MKB	Same, size 2 mm
_	28164 MKC	Same, size 3 mm
-	28164 MKK	Same, size 4 mm
1-	28164 MKL	Same, size 5 mm
P-2-	28164 MKD	KERRISON <b>Bone Punch,</b> detachable, rigid, downbiting 60° forward, size 1 mm, working length 17 cm
	28164 MKE	Same, size 2 mm
	28164 MKF	Same, size 3 mm
5-	28164 MKO	Same, size 4 mm

#### **Micro Scissors**

The delicate micro scissors, both straight and curved, allow precise and atraumatic dissection in narrow spaces.





**Micro Forceps** 





28164 MZA **Grasping Forceps,** fine serration, straight, with cleaning connector, working length 18 cm





28164 MZF **Spoon Forceps,** spoon size 3 x 10 mm, single action jaws, working length 17 cm

#### **Micro Dissectors**

 28164 GBO	<b>Dissector,</b> bayonet-shaped, sharp, round spatula, tip angled upwards 45°, with round handle, size 3 mm, length 25 cm
28164 GBU	Same, tip angled downwards 45°
28164 GFO	<b>Dissector,</b> bayonet-shaped, sharp, flat long spatula, tip angled upwards 15°, with round handle, size 1.5 mm, length 25 cm
28164 GFU	Same, tip angled downwards 15°
28164 DL	<b>Dissector,</b> bayonet-shaped, sharp, curved to left, length 24 cm
28164 DR	Same, curved to right



**Micro Dissectors** 

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28164 DKA	Dissector, tip angled 15°, width 1 mm, working length 10 cm
28164 DLA	Same, working length 13 cm
28164 DKB	Dissector, tip angled 45°, width 1 mm, working length 10 cm
28164 DLB	Same, working length 13 cm
28164 DKC	Dissector, tip angled 90°, width 1 mm, working length 10 cm
28164 DLC	Same, working length 13 cm
28164 DKD	<b>Dissector,</b> tip angled 15°, width 0.5 mm, working length 10 cm
28164 DLD	Same, working length 13 cm
28164 DKE	<b>Dissector,</b> tip angled 45°, width 0.5 mm, working length 10 cm
28164 DLE	Same, working length 13 cm
28164 DKF	<b>Dissector,</b> tip angled 90°, width 0.5 mm, working length 10 cm
28164 DLF	Same, working length 13 cm

- 2

### Instruments Round Knives



#### **Ring Curettes and Hooks**

0		
•		
0		
Q	28164 GGO	<b>Ring Curette,</b> bayonet-shaped, round wire, inner diameter 5 mm, tip angled upwards 90°, with round handle, length 25 cm
	28164 GGU	Same, angled downwards
Q		
	28164 GKO	<b>Ring Curette,</b> bayonet-shaped, blunt, tip angled upwards 45°, outer diameter 4 mm, with round handle, length 25 cm
	28164 GKU	Same, angled downwards
•		
	28164 GLL	<b>Ring Curette,</b> bayonet-shaped, blunt, tip angled to left 90°, outer diameter 3.3 mm, with round handle, length 25 cm
	28164 GLR	Same, angled to right
0		
	28164 HGA	Micro Hook, bayonet-shaped, blunt, working length 11.5 cm
	28164 HGB	Same, working length 13.5 cm

## Instruments Spoon Curettes



## **Holding Systems**

#### Armrest

This armrest makes it easier to keep a steady hand, even during long surgeries. This can be used with KARL STORZ holding arms and is simply attached via the KSLOCK.







28272 AR

**Armrest,** with quick release coupling, rotating, for use with mechanical holding systems with KSLOCK



# Holding Systems Manual and Pneumatic Holding System

Mounting the telescope to a holding arm enables the surgeon to perform bimanual surgery.





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#### **VERSACRANE™**

#### Holding system for the convenient positioning of the VITOM® system



## Motor System UNIDRIVE® S III NEURO SCB



40701701-1 UNIDRIVE® S III NEURO SCB, motor control unit with color display, touch screen, two motor outputs, integrated irrigation pump and integrated SCB module, power supply 100-240 VAC, 50/60 Hz including:
Mains Cord Irrigator Rod Two-Pedal Footswitch SCB Connecting Cable, length 100 cm Single Use Tubing Set\*, sterile, package of 3



20712033 High-Speed Micro-Motor, max. speed 60,000 rpm, including connecting cable, for use with UNIDRIVE® S III ENT/NEURO

Specifications			
Touch screen	6.4"/300 cd/m <sup>2</sup>	Dimensions w x h x d	300 x 165 x 265 mm
Available languages	English, French, German, Spanish, Italian, Portuguese, Greek, Turkish, Polish, Russian	Weight	5.2 kg
Power supply	100-240 VAC, 50/60 Hz	Certified to	IEC 601-1, CE acc. to MDD



All items on this page are not available for sale in the USA.

# Recommended KARL STORZ Standard Set Configuration for Craniotomies

- **40**701701-1 **UNIDRIVE® S III NEURO SCB,** motor control unit with color display, touch screen, two motor outputs, integrated irrigation pump and integrated SCB module, power supply 100-240 VAC, 50/60 Hz
- 20712033 High-Speed Micro-Motor, max. speed 60,000 rpm, including connecting cable
- 252645 **Craniotome Handpiece,** max. speed 60,000 rpm, including medium dura protector, for use with High-Speed Micro-Motor **20**712033 as well as 3.17 mm craniotome burrs and suitable dura protector
- 252640 **Perforator Handpiece,** max. speed 1200 rpm, without perforator blade, Hudson connector, for use with High-Speed Micro-Motor **20**712033

252645		
Dura Protector, for use with Craniotome Handpiece 252645		
pediatric medium long		
252646	252647	252648
High-Speed Craniotome Burr, shaft diameter 3.17 mm, sterile, [STERILE] (2) for single use, package of 5, for use with 60,000 rpm craniotome handpiece		
pediatric	medium	long
360000 S	360000 M	360000 L

	252640		
	Single-Use Perforator Handpiece, with Hudson connector, sterile, [STERILE] (S) for use with Perforator Handpiece 252640		
Size	14/11 mm 11/7 mm		
	252641 252642		

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More information on handpieces and burrs is available in the Neurosurgery catalog.

# Recommended KARL STORZ Standard Set Configuration for Craniotomies

- **40**701701-1 **UNIDRIVE® S III NEURO SCB,** motor control unit with color display, touch screen, two motor outputs, integrated irrigation pump and integrated SCB module, power supply 100-240 VAC, 50/60 Hz
- 20712033 High-Speed Handpiece, max. speed 60,000 rpm, including connecting cable
- 252690 High-Speed Handpiece, extra short, straight, short, angled
- 252691 High-Speed Handpiece, short, straight, 60,000 rpm
- 252680 High-Speed Handpiece, short, angled, 100,000 rpm
- 252681 High-Speed Handpiece, medium, angled, 100,000 rpm
- 252660 High-Speed Handpiece, extra short, angled, 60,000 rpm
- 252661 High-Speed Handpiece, short, angled, 60,000 rpm

	252680							
	<b>High-Speed Acorn,</b> sterile, for single use, p for use with 100,000 rpm High-Speed Hand	STERILE 🔇						
Diameter	short	medium						
7.5 mm	350675 S	350675 M						
9 mm	350690 S	350690 M						
	<b>High-Speed Barrel Burr,</b> sterile, for single use, package of 5, for use with 100,000 rpm High-Speed Handpiece							
Diameter	short	medium						
6 mm	350960 S	350960 M						
9.1 mm	350991 S	350991 M						
	<b>High-Speed Neuro Fluted Burr,</b> sterile, for single use, package of 5, for use with 100,000 rpm High-Speed Handpiece							
Diameter	short	medium						
1.8 mm	350718 S	350718 M						
3 mm	350730 S	350730 M						

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More information on handpieces and burrs is available in the Neurosurgery catalog.

# Notes



## Notes

It is recommended to check the suitability of the product for the intended procedure prior to use.



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