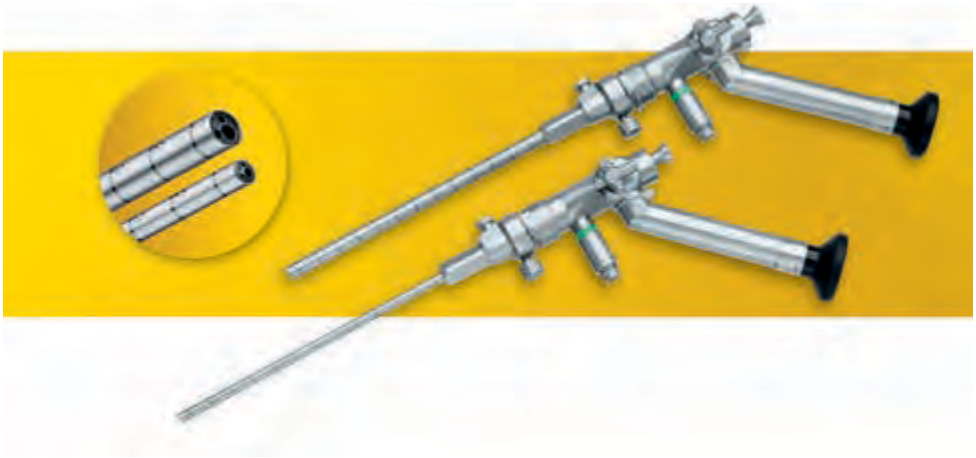
ENDOWORLD®
NEURO 12 11.0 10/2017-E

The LOTTA® System for
Intracranial Neuroendoscopy



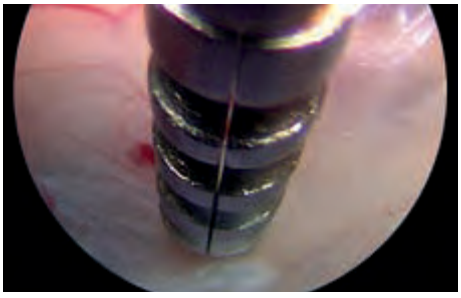
KARL STORZ — ENDOSKOPE

The SCHROEDER **LOTTA® System for Intracranial Neuroendoscopy**

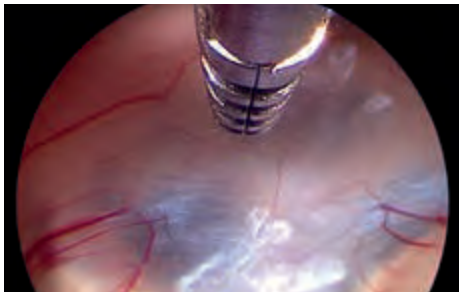
The LOTTA® system has been designed to perform the full range of endoscopic intracranial interventions in adults and children. The cornerstone of the system is based on the two ventriculoscopes Little LOTTA® and LOTTA®. These enable the treatment of all forms of obstructive hydrocephalus, intraventricular tumors and cysts as well as arachnoid and intraparenchymal cysts. An all-round solution, the LOTTA® system offers a free choice between the Little LOTTA® with its smaller diameter, more convenient handling and use in a wide range of applications such as ventriculostomies, septostomies, tumor biopsies and cyst fenestrations and the LOTTA® with its larger dimensions, which is not only suitable for the therapies mentioned above but is also particularly effective for the removal of colloid cysts, tumor resections, stent implantations as well as aqueductoplasties with subsequent stenting.

The somewhat larger diameter of the LOTTA® ventriculoscope allows the surgeon to perform bimanual dissection using two instruments. These can be used simultaneously in separate channels to enable more technically sophisticated procedures. Furthermore, the resection of larger tissue samples is possible, which benefits therapies such as tumor resection or cyst removal.

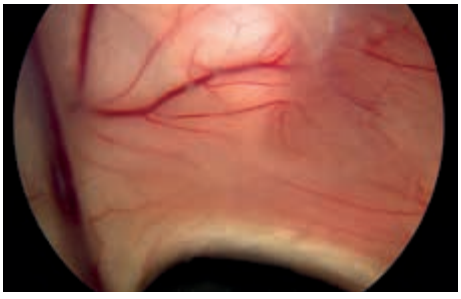
All intracranial procedures can thus be carried out. However, there are situations where a 30° viewing angle proves useful. A 30° viewing angle directed on the working channel allows earlier visualization of instruments. Therefore, the use of the LOTTA® 30° in narrow structures is beneficial. In addition, neighboring structures can easily be viewed during resections of cysts or tumors, for example, during the treatment of colloid cyst of the attachment point at the tela choroidea in the roof of the 3rd ventricle.



LOTTA® 30°



LOTTA® 6°



LOTTA® 30°

LOTTA® 6°

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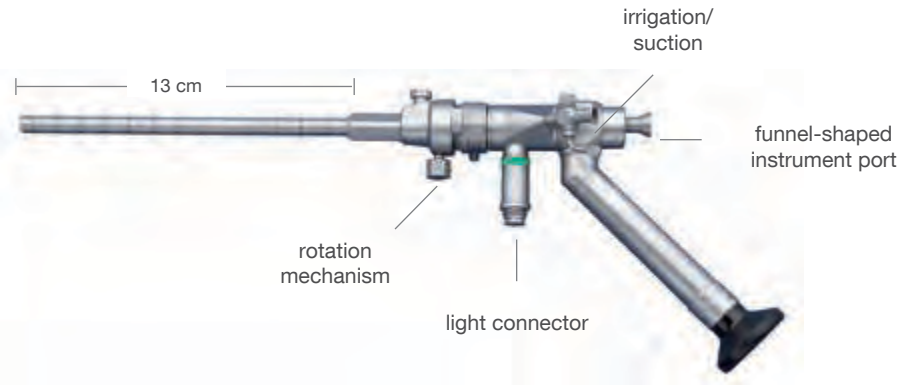
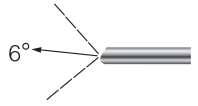
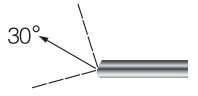
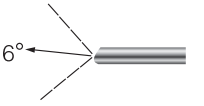
The LOTTA® 30° is particularly recommended for the resection of colloid cysts and intraventricular tumors. It can also be used for all other endoscopic procedures such as ventriculostomies, septostomies, tumor biopsies, cyst fenestrations and stent placements.

With a similar, yet more slender design, the Little LOTTA®, with the same viewing angle of 6° as the LOTTA®, proves to be particularly valuable for treating patients with a narrow foramen of Monro. In ventriculostomies in both children and adults, the prepontine cistern can be reached directly through the ventriculostomas and, if necessary, the arachnoid membranes can be transected to establish the cerebrospinal fluid (CSF) flow. Although too slender for the simultaneous use of two instruments, the Little LOTTA® offers the same range of functions as its two larger counterparts.

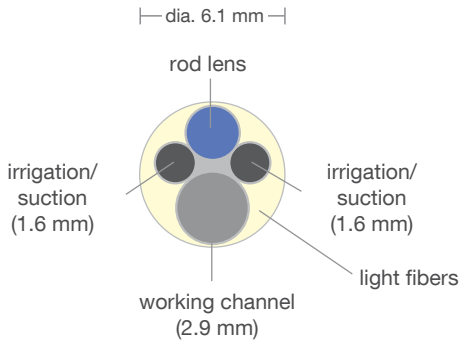


Viewing Angle

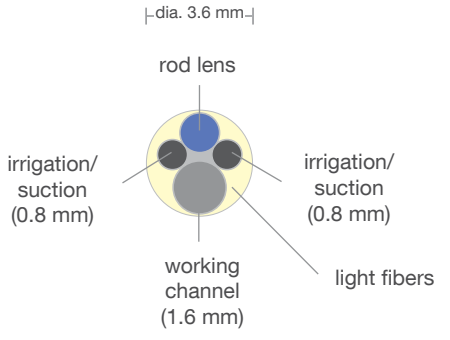
LOTTA®	LOTTA® 30°	Little LOTTA®
		

Cross-section of the Ventriloscope

LOTTA® and LOTTA® 30°



Little LOTTA®



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The ventriculoscopes are equipped with a HOPKINS® wide-angle straight forward telescope with a high light-transmitting capacity which delivers unsurpassed image quality and safe orientation, even in protein-rich or bloody CSF fluid. The central working channel is flanked on both sides with two side channels with a smaller diameter. One is used for irrigation/suction and the other for the use of a second instrument.

The irrigation function ensures that continuous cleaning is maintained in the area in front of the endoscope, even when visibility is hindered (cloudy CSF in the case of ventriculitis and/or ventricle bleeding). The drainage channel always remains open to prevent critical intracranial pressure increase caused by excessive irrigation. To facilitate insertion of the instruments into the working channel, a funnel-shaped enlargement has been integrated at the entrance to the working channel. Thanks to this stable construction, both ventriculoscopes are less susceptible to damage during cleaning, sterilization and storage.

All ventriculoscopes have operating sheaths featuring rotational stability so that they can be fixed to the holding arm to prevent the telescope from sliding down and/or undesired rotational movements where the angle ratios are unfavorable.

However, the ventriculoscopes can still be rotated inside the sheath without having to alter the position on the holding arm – a considerable advantage for bimanual dissection. Furthermore, the operating sheaths can be taken apart for cleaning and sterilization. The LOTTA® system can, of course, be used “freehand”.

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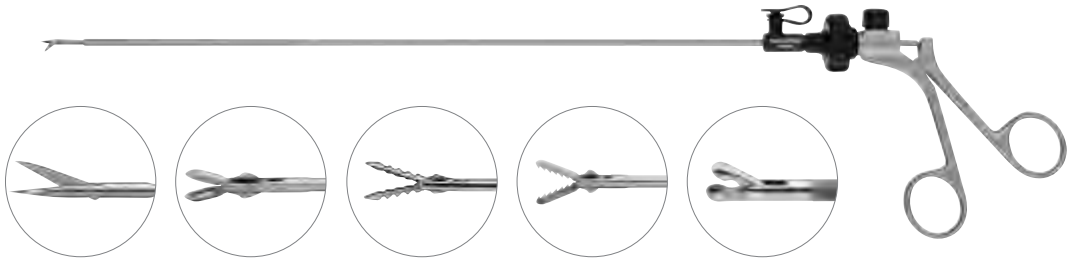
An obturator is inserted and locked into the working sheath before introduction. With its atraumatic distal tip, the obturator is required to facilitate introduction of the sheath into the ventricle or cysts. An optical obturator can also be used for this purpose, if necessary. A very slender HOPKINS® 0° telescope is introduced through the obturator in order to position the operating sheath under visual control.

28164 LS

28164 LLS

The LOTTA® system is equipped with very stable instruments that can be used through the central working channel. A further feature is the marking on the upper part of the sheath which shows when the distal tip emerges from the working channel. This minimizes the danger of unintentional and uncontrolled movements during instrument introduction. Furthermore, the jaws can be aligned by rotating the adjustment wheel, without having to rotate the entire instrument.



28164 LB 28164 LC 28164 LD 28164 LE 28164 LF

The instrument section of this brochure offers you a range of different sets containing all the instruments required for performing the most common endoscopic procedures such as, for example, ventriculostomies, aqueductoplasties, septostomies, foraminoplasties, tumor resections and cyst fenestrations. A full set configuration includes additional diagnostic telescopes with different angles of view that ensure better orientation in the ventricular system.

Customized sets can, of course, be arranged to suit individual requirements.

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Universitätsmedizin Greifswald
Germany

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Documentation of Findings
LOTTA® Neuroendoscope

Fig. 7: Foramen of Monro

Fig. 8: Foramen of Monro with suprasellar arachnoid cyst

Fig. 9: Tumor in foramen of Monro

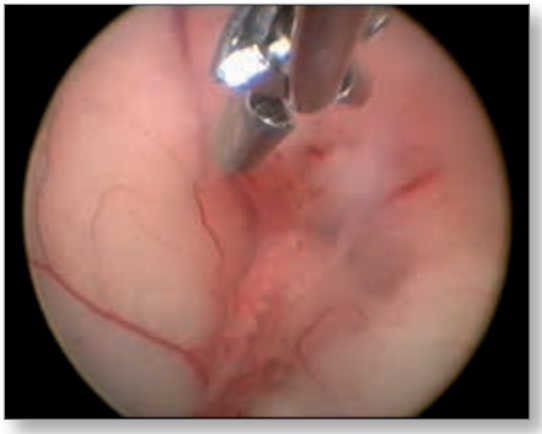

Fig. 10: Biopsy of a tumor in foramen of Monro

Fig. 11: Bimanual dissection by cutting into the membrane of a suprasellar arachnoid cyst with forceps and scissors

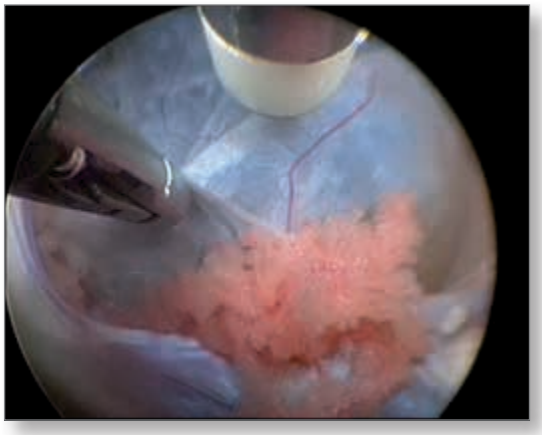

Fig. 12: Bimanual dissection using forceps and bipolar electrode

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Fig. 13: Floor of the third ventricle

Fig. 14: Choroid plexus in the lateral ventricle

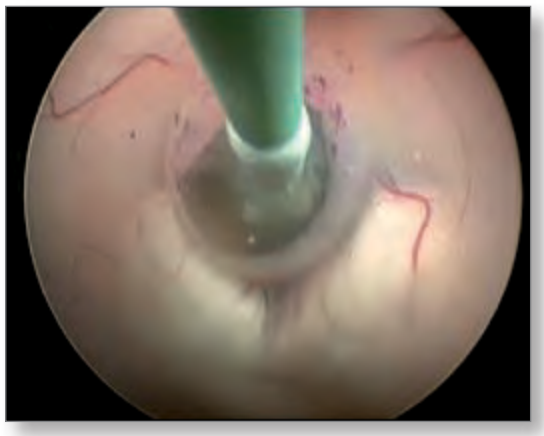

Fig. 15: Ventriculostomy with balloon catheter

Fig. 16: Pellucid septum

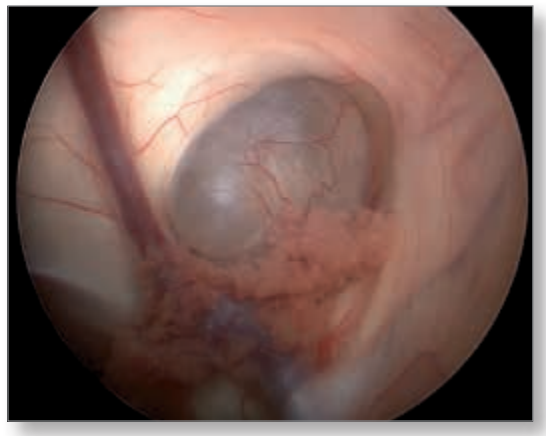

Fig. 17: Colloid cyst

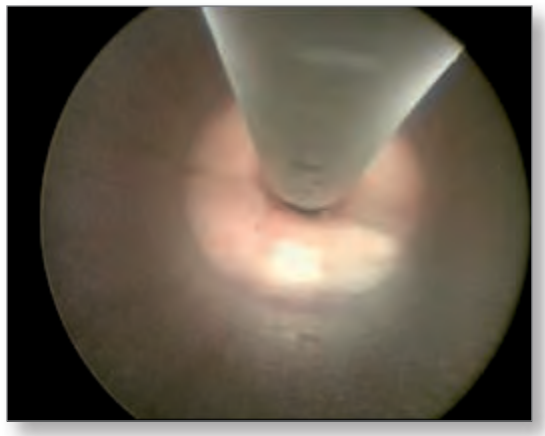

Fig. 18: Stent in the aqueduct

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LOTTA® Neuroendoscope

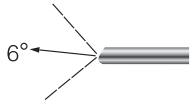
SCHROEDER **Recommended Set**

28164 LA/28164 LS

28164 LO

28164 LP

28008 AA

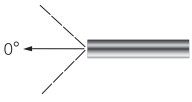


28164 LA **LOTTA® Ventriculoscope with HOPKINS® Wide Angle Straight Forward Telescope 6°,** angled eyepiece, outer diameter 6.1 mm, length 18 cm, working channel diameter 2.9 mm, irrigation/suction channel diameter 1.6, **autoclavable,** fiber optic light transmission incorporated,
color code: green

28164 LS **Operating Sheath,** graduated, rotating, outer diameter 6.8 mm, working length 13 cm, for use with LOTTA® Ventriculoscope 28164 LA

28164 LO **Obturator,** for use with Operating Sheaths 28164 LS and 28164 LSB

28164 LP **Optical Obturator,** for positioning Operating Sheaths 28164 LS and 28164 LSB under visual control, for use with HOPKINS® Telescope 28008 AA



28008 AA **HOPKINS® Straight Forward Telescope 0°,** diameter 2 mm, length 26 cm, **autoclavable,** fiber optic light transmission incorporated,
color code: green

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LOTTA® Neuroendoscope 30°

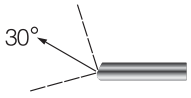
SCHROEDER **Recommended Set**

28164 LAB/28164 LSB

28164 LO

28164 LP

28008 AA

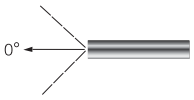


28164 LAB* **LOTTA® Ventriculoscope, HOPKINS® wide angle telescope 30°,** angled eyepiece, outer diameter 6.1 mm, length 18 cm, working channel diameter 2.9 mm, irrigation/suction channel diameter 1.6 mm, **autoclavable,** fiber optic light transmission incorporated, color code: red

28164 LSB **Operating Sheath,** graduated, rotating, outer diameter 6.8 mm, working length 13 cm, for use with LOTTA® Ventriculoscope 30° 28164 LAB

28164 LO **Obturator,** for use with Operating Sheaths 28164 LS and 28164 LSB

28164 LP **Optical Obturator,** for positioning Operating Sheaths 28164 LS and 28164 LSB under visual control, for use with HOPKINS® Telescope 28008 AA



28008 AA **HOPKINS® Straight Forward Telescope 0°,** diameter 2 mm, length 26 cm, **autoclavable,** fiber optic light transmission incorporated,
color code: green

* Currently not available in CE markets

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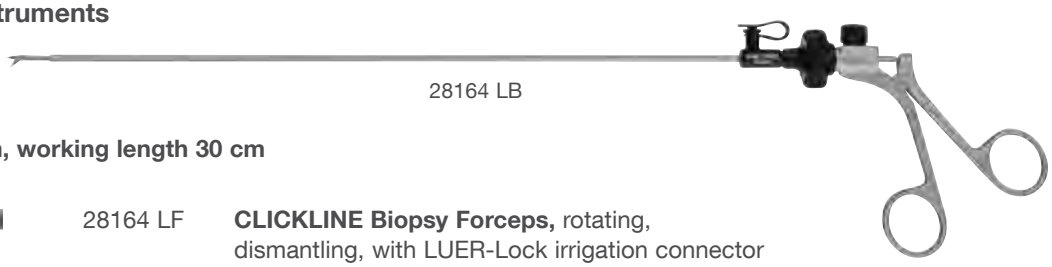
Neuroendoscope Operating Instruments

SCHROEDER **Recommended Set**

For use with LOTTA® Ventriculoscope 28164 LA/28164 LAB and Operating Sheath 28164 LS/28164 LSB

CLICKLINE Instruments



28164 LB

Diameter 2.7 mm, working length 30 cm

28164 LF **CLICKLINE Biopsy Forceps,** rotating, dismantling, with LUER-Lock irrigation connector for cleaning, single action jaws, diameter 2.7 mm, working length 30 cm
including:
Metal Handle, without ratchet
Outer Sheath, with forceps insert

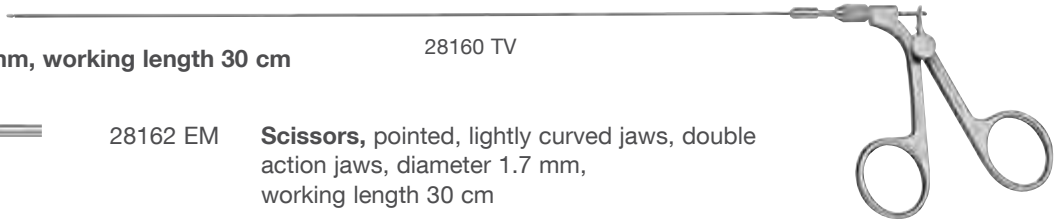
Diameter 2 mm, working length 30 cm

28164 LB **CLICKLINE Scissors,** pointed, rotating, dismantling, with LUER-Lock irrigation connector for cleaning, single action jaws, diameter 2 mm, working length 30 cm

28164 LC **CLICKLINE Biopsy Forceps,** rotating, dismantling, with LUER-Lock irrigation connector for cleaning, double action jaws, diameter 2 mm, working length 30 cm

28164 LD **CLICKLINE Ventriculostomy Forceps,** rotating, dismantling, with LUER-Lock irrigation connector for cleaning, diameter 2 mm, working length 30 cm

28164 LE **CLICKLINE Grasping Forceps,** rotating, dismantling, with LUER-Lock irrigation connector for cleaning, double action jaws, diameter 2 mm, working length 30 cm



28160 TV

Diameter 1.7 mm, working length 30 cm

28162 EM **Scissors,** pointed, lightly curved jaws, double action jaws, diameter 1.7 mm, working length 30 cm

Diameter 1.3 mm, working length 30 cm

28162 FP **Scissors,** pointed, single action jaws, diameter 1.3 mm, working length 30 cm

Diameter 1 mm, working length 30 cm

28160 TV **Forceps,** for ventriculostomy, flexible, double action jaws, diameter 1 mm, working length 30 cm

28160 ZJ **Biopsy Forceps,** flexible, double action jaws, diameter 1 mm, working length 30 cm

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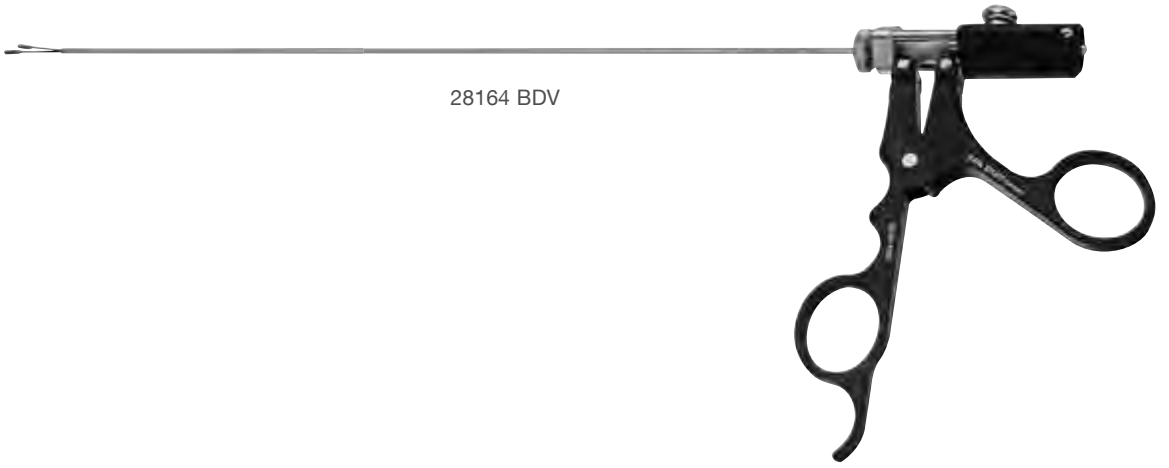
Neuroendoscope Operating Instruments

SCHROEDER **Recommended Set**

For use with LOTTA® Ventriculoscope 28164 LA/28164 LAB and Operating Sheath 28164 LS/28164 LSB

bipolar

Outer diameter 2.4 mm, working length 30 cm



28164 BDV

28164 BDV **TAKE-APART® Bipolar Forceps,**
long, flat jaws, outer diameter 2.4 mm,
including
Bipolar Ring Handle
Outer Sheath
Bipolar Insert, for single use, package of 5

28164 LG

28164 LG **Guillotine Knife,** outer diameter 2.7 mm,
working length 30 cm,
including:
Handle
Guillotine Knife Insert

533 TVA **Adaptor, autoclavable,** permits telescope changing under sterile conditions

28762 KB **Bipolar Coagulation Electrode,**
diameter 1.7 mm, working length 30 cm

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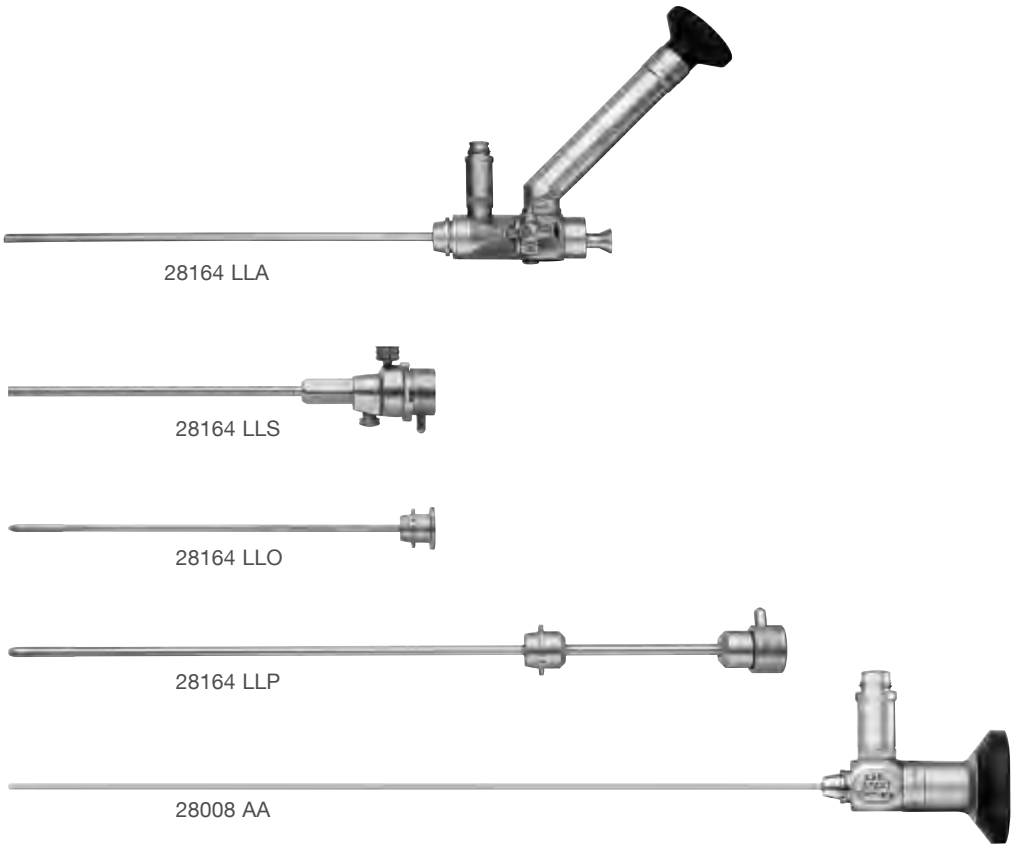
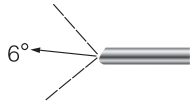
Little LOTTA® Neuroendoscope

SCHROEDER **Recommended Set**



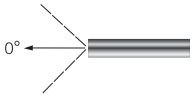


28164 LLA **Little LOTTA® Ventriculoscope, HOPKINS® Wide Angle Straight Forward Telescope 6°,** small, with angled eyepiece, outer diameter 3.6 mm, length 18 cm, working channel diameter 1.6 mm, with suction and irrigation channel diameter 0.8 mm, **autoclavable,** with irrigation adaptor, fiber optic light transmission incorporated, color code: green

28164 LLS **Operating Sheath,** small, outer diameter 4.5 mm, working length 13.3 cm, for use with SCHROEDER Ventriculoscope 28164 LLA

28164 LLO **Obturator,** for use with operating sheath 28164 LLS

28164 LLP **Optical Obturator,** for use with operating sheath 28164 LLS and HOPKINS® Telescope 28008 AA



28008 AA **HOPKINS® Straight Forward Telescope 0°,** diameter 2 mm, length 26 cm, **autoclavable,** fiber optic light transmission incorporated, color code: green

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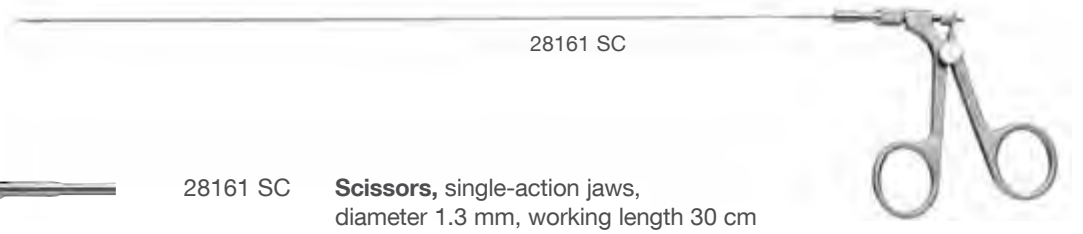
Neuroendoscope Operating Instruments

SCHROEDER **Recommended Set**

For use with LOTTA® Ventriculoscope 28164 LLA and Operating Sheath 28164 LLS

CLICKLINE Instruments



28161 SC **Scissors,** single-action jaws, diameter 1.3 mm, working length 30 cm

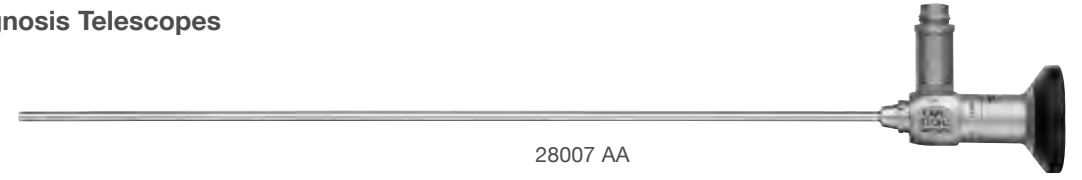
28161 SB **Biopsy Forceps,** double action jaws, diameter 1.3 mm, working length 30 cm

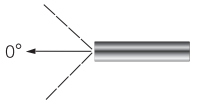
28161 SG **Grasping Forceps,** double-action jaws, diameter 1.3 mm, working length 30 cm

28161 SF **Bipolar Coagulation Electrode,** diameter 1.3 mm, working length 30 cm

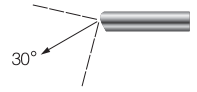
28160 TV **Forceps,** for ventriculostomy, flexible, double action jaws, diameter 1 mm, working length 30 cm

Diagnosis Telescopes

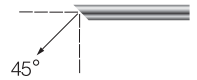




28007 AA **HOPKINS® Straight Forward Telescope 0°,** enlarged view, diameter 3.3 mm, length 25 cm, **autoclavable,** fiber optic light transmission incorporated, color code: green



28007 BA **HOPKINS® Forward-Oblique Telescope 30°,** diameter 3.3 mm, length 25 cm, **autoclavable,** fiber optic light transmission incorporated, color code: red



28007 FA **HOPKINS® Telescope 45°,** enlarged view, diameter 3.3 mm, length 25 cm, **autoclavable,** fiber optic light transmission incorporated, color code: black

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POINT SETTER – Pneumatic Holding System

28172 WKS **POINT SETTER,** pneumatic holding arm, set
including:
POINT SETTER Arm
OR Table Adaptor
KSLOCK Adaptor, for KARL STORZ clamping jaws
KARL STORZ Clamping Jaw, large
KARL STORZ Clamping Jaw, small
KARL STORZ Clamping Jaw, for fiberscopes
Pressure Regulator, 7 bar
Cover*, elasticated, 42 x 164 cm, package of 20

Note: Compressed air tubing is required to operate the POINT SETTER arm.
Please select the appropriate tubing and add it to your order.

Compressed air tubing and accessories for the POINT SETTER:

28172 WA **Connecting Tube,** for POINT SETTER, Dräger,
max. pressure 8 bar/115 psi, length 600 cm

28172 WB **Connecting Tube,** for POINT SETTER, Dräger air motor,
max. pressure 8 bar/115 psi, length 600 cm

28172 WC **Connecting Tube,** for POINT SETTER, compressor,
max. pressure 8 bar/115 psi, length 600 cm

28172 WN **Connecting Tube,** for POINT SETTER, Schrader,
max. pressure 8 bar/115 psi, length 600 cm

28172 WO **Connecting Tube,** for POINT SETTER, with open end,
max. pressure 8 bar/115 psi, length 600 cm

28272 CN **Clamping Cylinder,** folding, for flexible mounting of 10 mm telescopes to telescope sheath, **autoclavable.** The clamping cylinder allows vertical movement and rotation of the telescope. For use with Clamping Jaw 28272 UGN and 28272 UGK and POINT SETTER universal adaptor 10-15 mm

041150-20* **Cover,** elasticated, 42 x 164 cm, sterile, for single use, STERILE
package of 20, for use with KARL STORZ holding arms

041150-80* **Same,** package of 80

* mtp

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Mechanical Holding System

28272 RKB **Holding System, autoclavable,** with quick release coupling KSLOCK
including:
Rotation Socket, to clamp to the OR table, for European and US standard rails, with lateral clamp for height and angle adjustment of the articulated stand
Articulated Stand, reinforced version, L-shaped, with one central clamp for all five joint functions, height 48 cm, swivel range 52 cm, with quick release coupling KSLOCK (female)
Clamping Jaw, metal, clamping range 4.8 up to 12.5 mm, with quick release coupling KSLOCK (male), for use with instrument and telescope sheaths

28272 RKA **Holding System, autoclavable,** with quick release coupling KSLOCK
including:
Rotation Socket, to clamp to the OR table, for European and US standard rails, with lateral clamp for height and angle adjustment of the articulated stand
Articulated Stand, reinforced version, straight, with one central clamp for all five joint functions, height 30 cm, swivel range 37 cm, with quick release coupling KSLOCK (female)
Clamping Jaw, metal, clamping range 4.8 up to 12.5 mm, with quick release coupling KSLOCK (male), for use with instrument and telescope sheaths

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

UNIDRIVE® S III NEURO

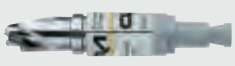
40701701-1 **UNIDRIVE® S III NEURO SCB,**
motor control unit with color display, touch screen,
two motor outputs, integrated irrigation pump and integrated SCB module,
power supply 100-240 VAC, 50/60 Hz
including:
Mains Cord
Irrigator Rod
Two-Pedal Footswitch
SCB Connecting Cable, length 100 cm
Single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

High-Speed Mikro-Motor

High-Speed Micro-Motor

Perforator

252640 **Perforator Handpiece,** max. speed 1200 rpm, without perforator blade,
Hudson connector, for use with High-Speed Micro-Motor **20**712033

	**Disposable Cranial Perforator, with Hudson End, sterile for use with Perforator Handpiece 252640** STERILE	
size	14/11 mm	11/7 mm
	252641	252642

* mtp™

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Craniotome

252645

252646 **Pediatric Dura Protector,**
for use with Craniotome Handpiece 252645

252646 **Duraschutz,** pädiatrisch, zur Verwendung mit Kraniotom-Handstück 252645

The medium dura protector is automatically delivered with the craniotome handpiece.

252647 **Medium Dura Protector,**
for use with Craniotome Handpiece 252645

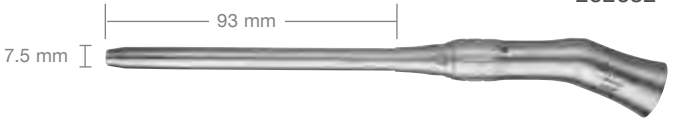
252648 **Large Dura Protector,**
for use with Craniotome Handpiece 252645

	**High-Speed Craniotome Burrs,** 60,000 rpm, sterile, **for single use,** package of 5 STERILE	
pediatric	**medium**	**long**
360000 S	360000 M	360000 L

High-Speed Handpieces – 100,000 rpm

252680 **High-Speed Handpiece,**
short, angled, 100,000 rpm,
for use with High-Speed
Micro-Motor **20**712033

252681 **High-Speed Handpiece,**
medium, angled, 100,000 rpm,
for use with High-Speed
Micro-Motor **20**712033



252682 **High-Speed Handpiece,**
long, angled, 100,000 rpm,
for use with High-Speed
Micro-Motor **20**712033

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Burrs
for High-Speed Handpieces

STERILE	short: 252680	medium: 252681	long: 252682
Standard Burrs			
1.0 mm	350110 S	350110 M	
2.0 mm	350120 S	350120 M	350120 L
3.0 mm	350130 S	350130 M	350130 L
4.0 mm	350140 S	350140 M	350140 L
5.0 mm	350150 S	350150 M	350150 L
6.0 mm	350160 S	350160 M	350160 L
7.0 mm	350170 S	350170 M	350170 L
Diamond Burrs			
0.6 mm			
1.0 mm	350210 S	350210 M	
1.5 mm			
2.0 mm	350220 S	350220 M	350220 L
3.0 mm	350230 S	350230 M	350230 L
4.0 mm	350240 S	350240 M	350240 L
5.0 mm	350250 S	350250 M	350250 L
6.0 mm	350260 S	350260 M	350260 L
7.0 mm	350270 S	350270 M	350270 L
Diamond Burrs, coarse			
2.0 mm			
3.0 mm	350330 S	350330 M	350330 L
4.0 mm	350340 S	350340 M	350340 L
5.0 mm	350350 S	350350 M	350350 L
6.0 mm	350360 S	350360 M	350360 L
7.0 mm	350370 S	350370 M	350370 L
Acorn			
7.5 mm	350675 S	350675 M	
9.0 mm	350690 S	350690 M	
Barrel Burrs			
6.0 mm	350960 S	350960 M	
9.1 mm	350991 S	350991 M	
NEURO Fluted Burrs			
1.8 mm	350718 S	350718 M	350718 L
3.0 mm	350730 S	350730 M	350730 L

Accessories

280053 **Universal Spray,** 6x 500 ml bottles – HAZARDOUS GOODS – UN 1950
including:
Spray Nozzle

031131-10* **Tubing Set,** for irrigation, for single use, sterile, package of 10 STERILE

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Wire Trays for Cleaning, Sterilization and Storage

For ventriculoscopes

39501 XP **Wire Tray for Cleaning, Sterilization and Storage,** including cleaning adaptor for washer-disinfector, with lid, spare parts basket 39501 XS and silicone telescope holders, external dimensions (w x d x h): 460 x 150 x 80 mm, for instruments with up to 27 cm working length

39501 XRV **Multiport Bridge**

For instruments

39502 Z

39502 Z **Wire Tray,** for cleaning, sterilization and storage of instruments, stackable, including hole plate walls and foldaway handles, external dimensions (w x d x h): 480 x 250 x 66 mm

39502 L **Lid,** for use with 480 x 250 mm wire tray

39100 S **Silicone Grid Insert LARGE DIAMOND GRID,** blue, extra wide meshed, external dimensions (w x d): 470 x 240 mm

39100 PS **Fixation Pin,** iincluding screw and washer, to screw instruments into position in wire trays, height 38 mm, package of 12, for use with Silicone Tie-Downs 39360 AS

39360 AS **Silicone Tie-Downs,** package of 12, for use with Fixation Pins 39100 PS and 39360 AP

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KARL STORZ — ENDOSKOPE

THE DIAMOND STANDARD

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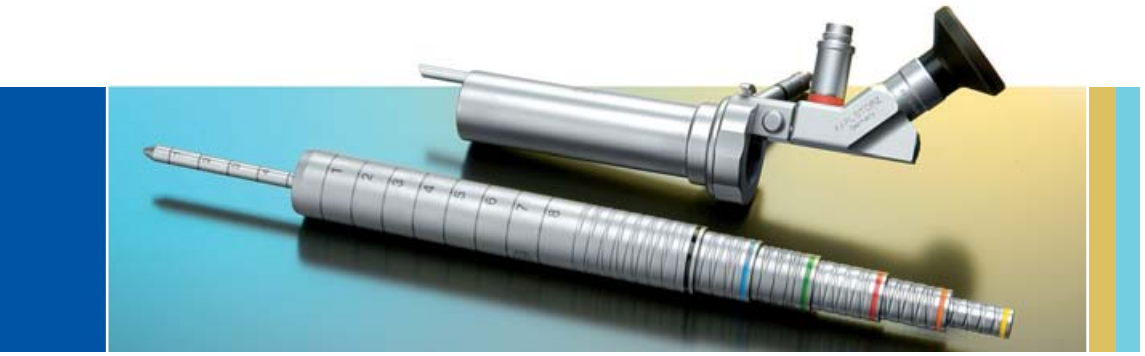
Endoscopic Spinal Surgery with the EasyGO! System



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Prof. Dr. med. Joachim OERTEL
Neurosurgical Clinic
University Medical Center of the Johannes-Gutenberg-University Mainz, Germany

STORZ
KARL STORZ — ENDOSKOPE
THE DIAMOND STANDARD

Introduction

Dear colleagues,

Thank you for your interest in our new EasyGO! spine system. Resection of herniated discs, microsurgical decompression and, where indicated, stabilization have all been gold standards for the surgical treatment of degenerative spine diseases since the 1970s. Since then, all three procedures have been performed microsurgically by neurosurgeons.

Despite a high success rate (85-90%), there is an increasing demand for minimally invasive, less traumatic techniques. Endoscopic techniques permit smaller incisions, less muscle damage and less irritation to the nerve root. The resulting loss in muscle strength is also considerably less with endoscopic techniques. This is an important factor as the strength of the extending lumbar and cervical muscles is the main contributor to a natural stabilization in the patient and thus crucial to the prevention of future degeneration. When compared with microsurgery, the main disadvantages of conventional endoscopic techniques are the intensity of the corresponding learning curves, which is such that the techniques can only be applied in selected cases, and that significantly longer surgical times are required.

Fig. 1: Endoscopic operation with the smallest EasyGO! trocar (color code orange, O.D. 15 mm)

As a solution to this conflict, we have developed a new universal system for minimally invasive lumbar and dorsal cervical disc and spinal surgery. The EasyGO! system aims to combine the microsurgery with the advantages of spinal endoscopy. With the EasyGO!, microsurgical skills can be applied and enhanced under endoscopic guidance. Since microsurgical techniques are already well established in neurosurgical spinal surgery, most neurosurgical spinal surgeons require only brief training to be able to perform endoscopic lumbar disc surgery with EasyGO! The use of a dilator system in conjunction with a selected range of working tubes (15 mm, 19 mm, 23 mm) affords the main advantages of minimal incision lengths and will reduce muscle trauma. Lumbar disc procedures with EasyGO! can be performed with a skin incision of 1.0 cm using small tubes. When larger tubes are employed, all decompression techniques can be applied – even drill procedures can be performed with only minor trauma to the dorsal structures. The 30° large field HOPKINS II® telescope with adjustable depth and viewing angle (360°) provides excellent optical quality and maneuverability, which allows inspection and manipulation even far lateral and to the opposite side of the spine, e.g., for resection of the lateral recess, in the foramina along the nerve roots, and a bilateral bony decompression of the spinal canal via a unilateral approach. The application of pedicle screws is also possible.

We hope that you will find the EasyGO! system helpful in creating minimally invasive but adequate and effective approaches to the lumbar and dorsal cervical spine.

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Neurosurgical Clinic,
University Medical Center of the Johannes-Gutenberg-University Mainz,
Germany

Indications

- All types of lumbar disc herniations from medial to far lateral
- Spinal and foraminal stenosis – the EasyGO! allows a bilateral decompression using a unilateral approach. Also multilevel decompression is possible
- Cervical disc herniations and stenosis

Step 1: Skin incision

Fig. 2: Skin incision – between 0.8 cm and 1.5 cm, depending on the size of the trocar

Step 2: Minimally invasive approach through progressive dilation

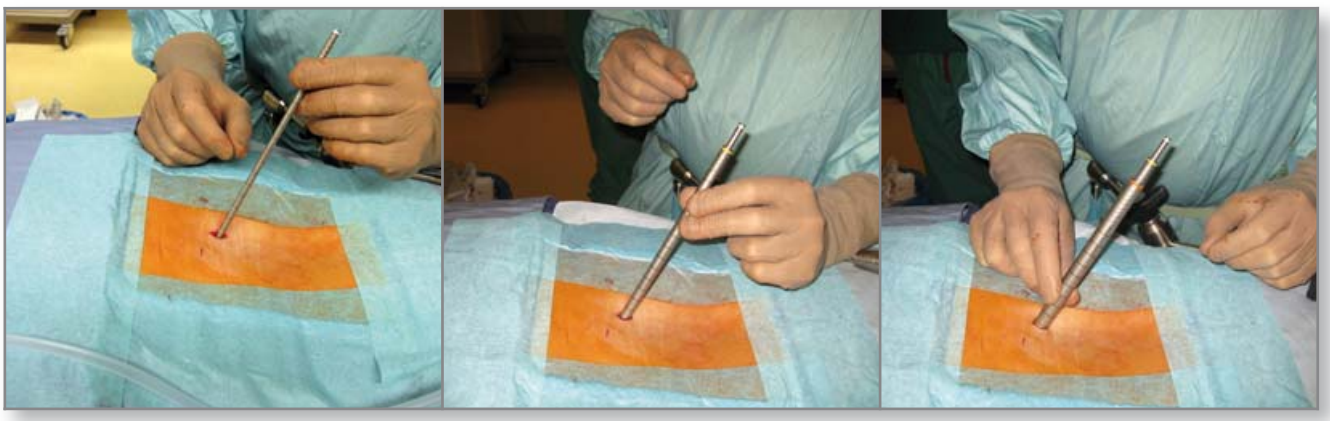


Fig. 3: Sequential dilation of soft tissue. In this case, dilation is used to prepare for the "orange" trocar which is the smallest in the range with an outer diameter of 15 mm. Additional dilation for the bigger trocars (19 mm or 23 mm) is possible at any time.

The approach with the dilation system and the introduction of the (initial) working tube before optical visualization of the structures must be controlled by fluoroscopy, especially in the lateral view (neuronavigation might also be considered, but must be precise – its disadvantage is the dependence on proper system referencing). Please note that the dilation system, if not properly and cautiously inserted, might perforate the intervertebral space through the ligamentum flavum and possibly through to the dura, especially in the case of a lumbar spine where bony stenosis is not present or in large intervertebral spaces/ lig. flava. If the dilation system is not properly inserted and this is not immediately recognized, the ligamentum flavum or a perforated dura might be dilated by dilation tubes, with the subsequent risk of damage to the intradural structures (nerve roots, cauda). Therefore, the initial puncture with the puncture needle must only penetrate to the surface of the upper vertebral arch (above the intervertebral space, not below the lower end of the limiting bony rim of the arch). Instead of using the puncture needle initally, surgery may also be initiated with the smallest dilation tube (outer diameter 5.2 mm, white label, no. 28163 CNS). Likewise, the initial puncture must strictly go to the surface of the upper arch (lower end – be cautious not to slip below).

If too much exertion is applied with the small-white label first dilator, it could also perforate the ligamentum flavum. The hard bony surface of the upper arch must also be felt with each subsequent dilation tube. The lower end of all tubes must visible with fluoroscopy above the spinal canal approx. 1/3 of the diameter securely positioned over the upper arch. Standard practice normally involves an initial, definite, visual identification with the endoscope of the lower margin of the upper arch and parts of the joint surface following insertion of the working tube. From this point on, surgery is guided by continuous endoscopic vision, as with microsurgery, using identical techniques and similar instruments, which, however, have been adapted to the ‘tube-guided’ approach. Then under visual control, the direction of the working tube might be varied according to the approach required for dissection. In case of orientation problems, the tube position should be rechecked using fluoroscopy.

Step 3: Introduction of the trocar

Fig. 4: Final dilation with ‘orange’ dilator and insertion of final ‘orange’ working tube. The orange trocar is the smallest tube with an outer diameter of 15 mm, allowing a ‘single-stitch‘ approach

Fig. 5: Axial T1 weighted MRI showing a large left mediolateral sequestered disc prolaps at the level of L5/S1

Step 4: Attachment of the holding arm and insertion of the scope

Fig. 6a: Inserted working tube connected to the holder

Fig. 6b: Then the working insert is attached and the endoscope inserted into the trocar

Step 5: Connection of the camera head and the light cable

Fig. 7: The endoscope is then connected to the camera head and to the light source via the light cable

Step 6: Endoscopic operation

Fig. 8: Fully installed system in working environment

Fig. 9: Lateral fluoroscopy to check for the appropriate approach parallel to the disc space. Note the position above the spinal canal, about 1/3 (upper end of tube) over the upper arch!

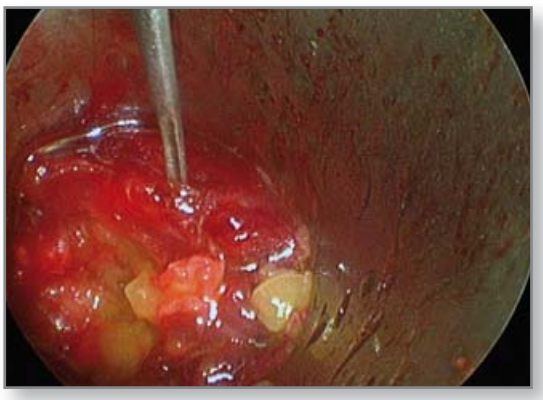


Fig. 10: After insertion of the endoscope, bony resistance of the lamina is felt

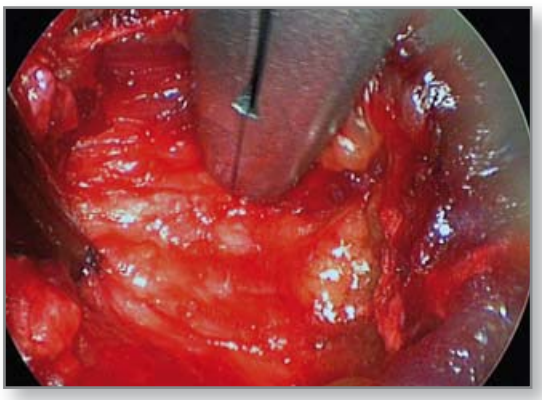


Fig. 11: Remnant muscle tissue is removed with forceps ...

Fig. 12: … and punches

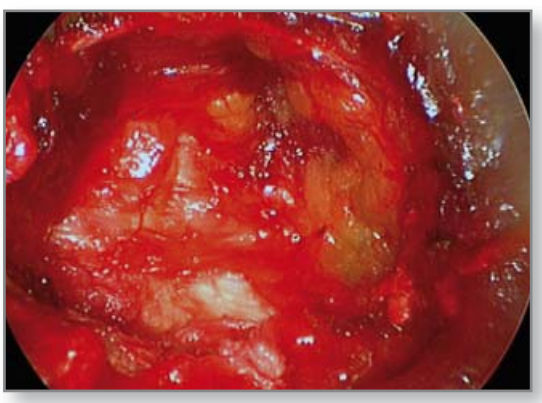


Fig. 13: The ligamentum flavum is exposed

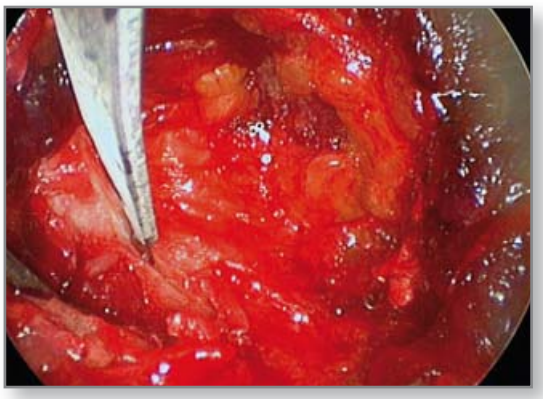


Fig. 14: The ligament is incised with a scalpel

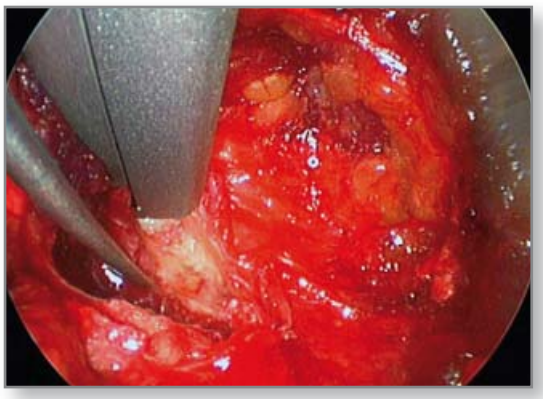


Fig. 15: After incision, the ligament is partially removed with a punch

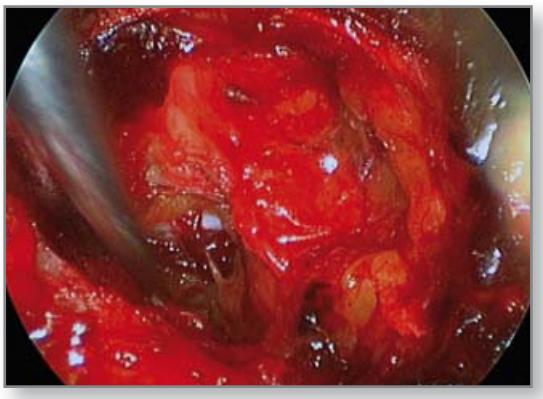


Fig. 16: The dura is visible

Fig. 17: The prolapse is localized using a dissector

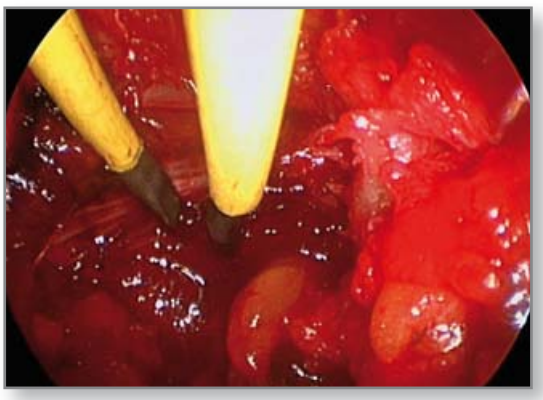


Fig. 18: Epidural vessels are coagulated

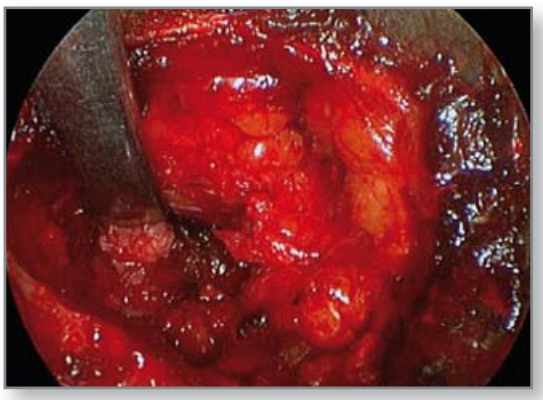


Fig. 19: A nerve retractor is inserted and the prolapse is exposed

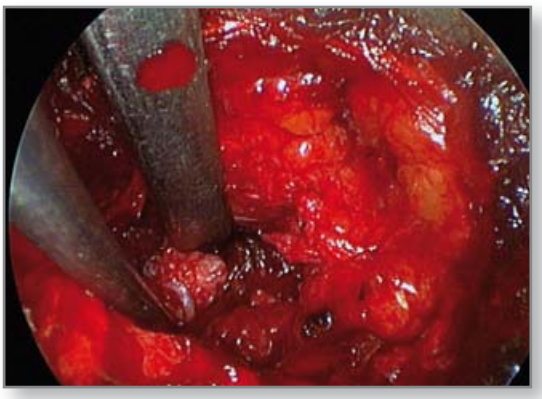


Fig. 20: The prolapse is mobilized with a hook …

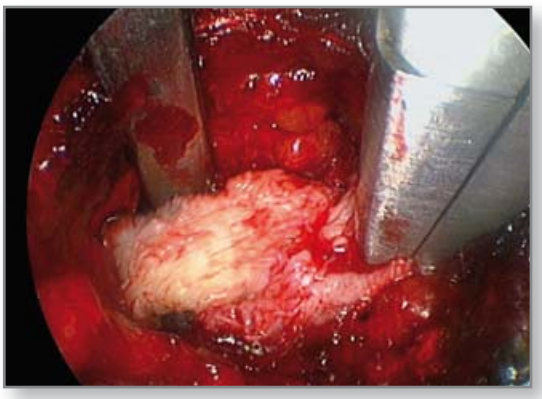


Fig. 21: … and subsequently removed with grasping forceps

Fig. 22: Removing the prolapse

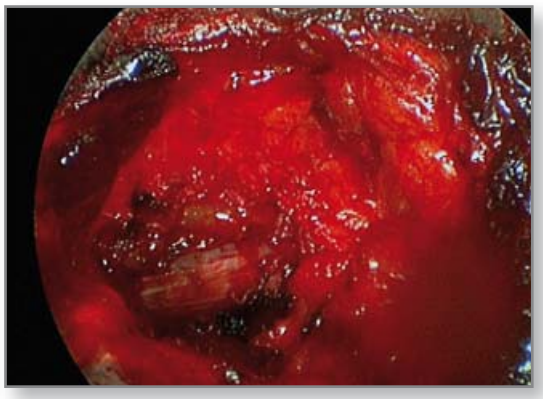


Fig. 23: At the end of the procedure, the decompressed dural sac and nerve root are visible

Fig. 24: Disc sequesters as large as almost 4 cm can be removed with this technique

Fig. 25: The skin incision is about 1.8 cm – the skin incision obviously depends on the size of the trocar used.

Advantages of the EasyGO!

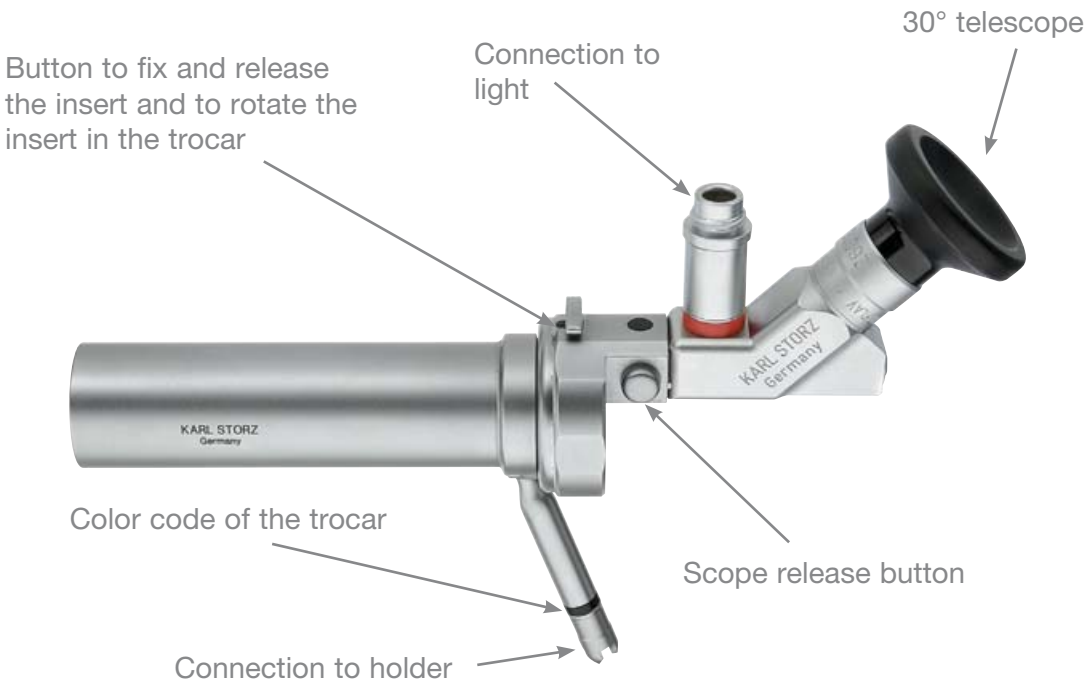
For surgeons

- Easy and safe procedure with a standard bimanual microsurgical technique
- Short learning curve as operating technique is very similar to microsurgery
- Improved visualization thanks to HOPKINS® telescopes, especially in combination with HD video technology
- Improved differentiation of anatomic structures resulting in a gentler manipulation of the neural structures
- EasyGO! is basically applicable for any degenerative lumbar and cervical spine indication. The size of the trocar can be chosen depending on the indication:
  orange trocar with OD 15 mm = single stitch technique
  green trocar with OD 19 mm
  black trocar with OD 23 mm
- Use of a high-speed drill possible
- Dilation system reduces muscle trauma
- Decompression at two levels with one approach possible
- Bilateral decompression via unilateral approach
- Low complication rate if properly done (approach primarily directed to the upper bony verterbral arch, not into the intervertebral space; then ‘only dissect what you can see’ / anatomically defined!)

For patients

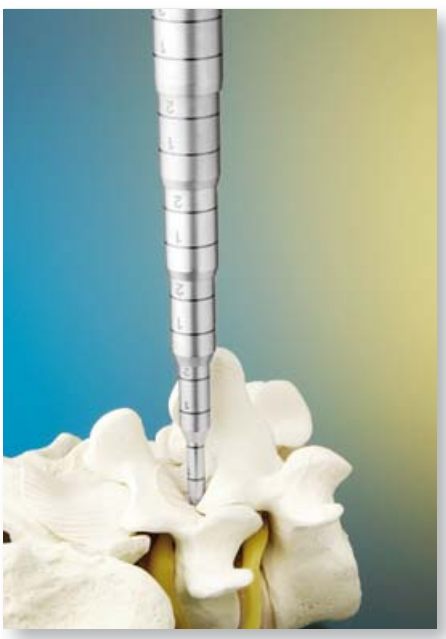
- Less invasive
- Good postoperative results as with microsurgery
- Smaller incisions and less tissue trauma, especially when using the small orange trocar (OD 15 mm) which allows a single-stich technique
- Less postoperative pain
- Earlier return to work
- High patient satisfaction

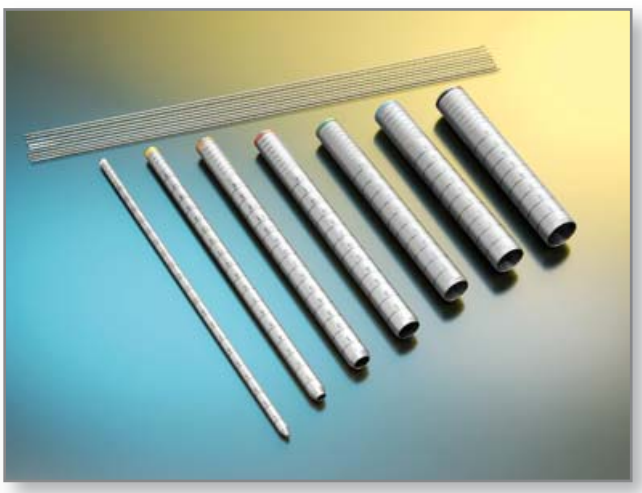
Assembled system



Dilators

A color-coded dilator set is used for the minimally invasive approach. Due to the muscle-sparing access, patients report about less post-operative pain.The color coding of the dilators guide the surgeon as the trocars have the same color codes. Additional dilation is possible at any time.





Color-coded dilation set for easy use.

Trocars and Inserts

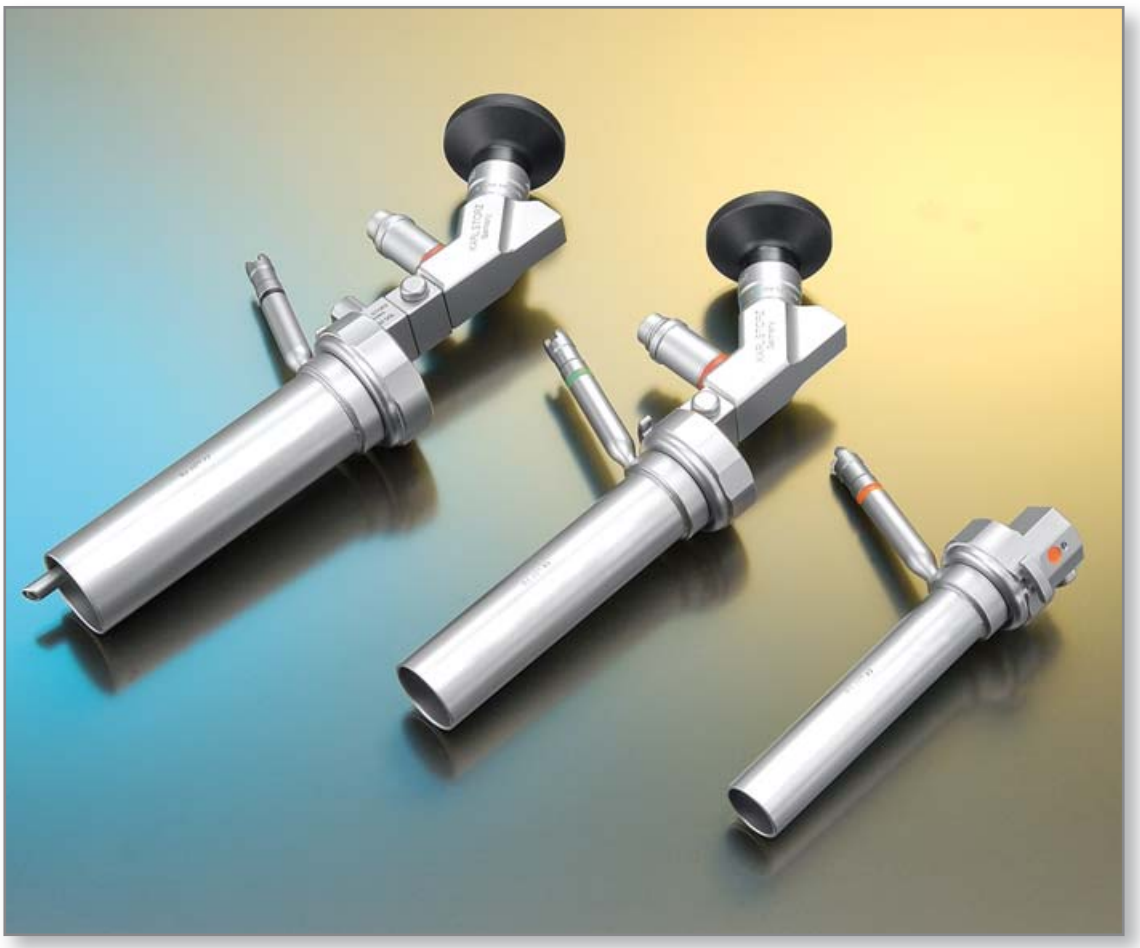
There are three different trocars with outer diameters of 15 mm (color code orange, art. no. 28163 GTM), 19 mm (color code green, art. no. 28163 GTK) and 23 mm (color code black, art. no. 28163 GTG). There are two different inserts for each of these trocars.

Here you see a picture of the medium trocar (19 mm) from below. Note the spacious working channel!

One insert is fixed in the trocar with a corresponding scope. The other insert comes with an optic sheath, which can be moved up and down in the trocar.

The non-movable insert is useful for simple, standard disc herniations, whereas the movable insert provides the opportunity to move the scope inside the spinal canal (below the edge of the trocar). Both inserts and therefore the scope can be rotated by 360° allowing a panoramic vision of the operative field.

Color code	Orange = small	Green = medium	Black = large
Trocar	28163 GTM	28163 GTK	28163 GTG
Non-movable insert Corresponding telescope	28163 GAM 28095 BAK	28163 GAK 28095 BAK	28163 GAG 28095 BAK



Range of EasyGO! trocars with inserted scopes: orange trocar with OD 15mm, green trocar with OD 19mm, black trocar with 23mm - this allows miniaturized approaches and more maximized ones to cover all possible indications.

Telescopes

Two 30° telescopes belong to the set. The shorter one is for the non-movable insert. The longer one can be adjusted in depth and is especially recommended for decompression/dissection ‘under the margins’, in the foramina and on the controlateral side for bilateral decompression through a unilateral approach.

Scopes with 30° angle of view and two different length to optimize the operative field viewing

Holder

The attached metal rod on the side of the trocar is the connection to the holder. Here you can see a picture of the assembled EasyGO! system.

The holder has a newly-developed, fast-locking clamp, called the ‘KS lock’, art. no. 28272 HB with socket 28172 HR. This ‘friction type’ holder allows various positions – from ‘completely’ loose to ‘fixed, but still movable’ or ‘firmly fixed in position’.

Low-Profile, easy "snap-on" holder to quickly and accurately position the trocar

Recommended set acc. to Prof. GAAB and Prof. OERTEL

①	28163 PL	**Puncture Needle**, diameter 1.7 mm, working length 18 cm, with 1.4 mm opening for guide wire
②	28163 KD	**Guide wire**, not sterile, diameter 1.2 mm, length 31 cm, pack of 10
③	28163 CNS	**Dilation Sleeve**, OD 5.2 mm, ID 1.5 mm, graduated, length 23 cm, color code white
④	28163 COS	**Dilation Sleeve**, OD 8.9 mm, ID 5.3 mm, graduated, length 21 cm, for use with trocar 28163 CO, color code yellow
⑤	28163 CPS	**Dilation Sleeve**, OD 12.7 mm, ID 9.7 mm, graduated, length 19 cm, for use with trocar 28163 CP, color code orange
⑥	28163 CQS	**Dilation Sleeve**, OD 14.9 mm, ID 12.9 mm, graduated, length 17 cm, color code red
⑦	28163 CRS	**Dilation Sleeve**, OD 16.9 mm, ID 15.1 mm, graduated, length 15 cm, for use with trocar 28163 CR, color code green
⑧	28163 CSS	**Dilation Sleeve**, OD 18.9 mm, ID 17.1 mm, graduated, length 14 cm, colour code blue
⑨	28163 CTS	**Dilation Sleeve**, OD 20.9 mm, ID 19 mm, graduated, length 13 cm, for use with trocar 28163 CT, color code black
	28163 GTM	**EasyGO! Trocar**, diameter 15 mm, working length 70 mm, for use with EasyGO! inserts and according telescope (not pictured)
	28163 GAM	**EasyGO! Insert**, diameter 15 mm, for use with EasyGO! Trocar 28163 GTM and telescope 28095 BAK (not pictured)
	28163 GML	**EasyGO! Insert,** diameter 15 mm, for use with EasyGO! Trocar 28163 GTM and telescope 28095 BAL, movable inside the trocar (not pictured)
⑩	28163 GTK	**EasyGO! Trocar**, diameter 19 mm, working length 74 mm, for use with EasyGO! inserts and according telescope
	28163 GAK	**EasyGO! Insert**, diameter 19 mm, for use with EasyGO! Trocar 28163 GTK and telescope 28095 BAK
	28163 GKL	**EasyGO! Insert**, diameter 19 mm, for use with EasyGO! Trocar 28163 GTK and telescope 28095 BAL, movable inside the trocar
⑪	28163 GTG	**EasyGO! Trocar**, diameter 23 mm, working length 76 mm, for use with EasyGO! inserts and according telescope
⑫	28095 BAK	HOPKINS II® **Straight Forward Telescope 30°**, eyepiece 45° angled, diameter 4 mm, length 9.5 cm, for use with EasyGO! system, **autoclavable**, fiberoptic light transmission incorporated, color code: red
	28095 BAL	HOPKINS® **Straight Forward Telescope 30°**, eyepiece 45° angled, diameter 4 mm, length 12 cm, for use with EasyGO! system, autoclavable, fiberoptic light transmission incorporated, color code: red
	28163 GAG	**EasyGO! Insert**, diameter 23 mm, for use with EasyGO! Trocar 28163 GTG and telescope 28095 BAK
	28163 GGL	**EasyGO! Insert**, diameter 23 mm, for use with EasyGO! Trocar 28163 GTG and telescope 28095 BAL, movable inside the trocar
	28163 GLS	**EasyGO! Telescope Sheath**, for use with 28095 BAL
⑬	495 NL	**Fiberoptic Light Cable**, size 3.5 mm, length 180 cm
⑭	28163 CLS	KERRISON **Bone Punch 90°**, upbiting forward, size 2 mm, working length 24 cm
⑮	28163 CLB	KERRISON **Bone Punch 90°**, upbiting forward, size 4 mm, working length 24 cm
⑯	28163 CFS	KERRISON **Bone Punch 40°**, upbiting forward, size 2 mm, working length 24 cm
⑰	28163 CFB	KERRISON **Bone Punch 40°**, upbiting forward, size 4 mm, working length 24 cm
⑱	28163 BKD	KERRISON **Punch**, bayonet-shaped, downbiting 40° forward, size 2 mm, working length 17 cm

Recommended set acc. to Prof. GAAB and Prof. OERTEL

⑲ 28163 BKU KERRISON **Punch**, bayonet-shaped, upbiting 40° forward, size 2 mm, working length 17 cm

⑳ 28163 EHK **Hook Scissors**, single action jaws, size 2.7 mm, working length 25 cm

28163 FB BLAKESLEY **Nucleus Cutting Forceps,** single action jaws, movable jaw opening upwards, diameter 3.5 mm, working length 20 cm (not pictured)

㉑ 28163 CC **Spoon Forceps**, heavy, oval, spoon size 3 × 10 mm, single action jaws, working length 20 cm

㉒ 28164 MDB MORTINI **Dissector**, dead hand, bayonet shaped, 3 mm, curved upward, with round handle, sharp, working length 16 cm

28163 AH **Palpation Hook,** hook distally angled 90°, blunt, working length 20 cm (not pictured)

㉓ 28163 DSB **Dissector**, distal tapered, bajonet-shaped, working length 15 cm

㉔ 28163 NSB **Nerve Hook**, distal length 3 mm, bajonet-shaped, working length 15 cm

㉕ 28163 NBB **Nerve Hook**, distall length 5 mm, bajonet-shaped, working length 15 cm

28163 GBM **Knife**, bajonett shaped with surgical handle (not shown), working length 15 cm, for blades 208010 - 15, 208210 - 15

㉖ 28163 RAS **Raspatory**, rasp 6 × 2 mm, working length 20 cm

28163 GBM Surgical handle, bayonet-shaped with working length 15 cm for blades 208010-15, 208210-15

㉗ 28163 RN **Nerve Retractor**, hook 4 mm, angled sheath, working length 20 cm

649182 FERGUSON **Suction Tube,** with cut-off hole and stylet, LUER, working length 15 cm, 8 Fr. (not pictured)

㉘ 844523 **Bipolar Coagulating Forceps**, insulated, bayonet-shaped, tip 0.3 mm, length 23 cm, for use with bipolar high frequency cord 847000 E or 847000 A/M/T/V

㉙ 844623 **Bipolar Coagulating Forceps**, insulated, bayonet, blunt, tip 1.2 mm wide, length 23 cm, for use with bipolar high frequency cords 847000 E or 847000A/F/M/N/S/T/V

28164 BDG **Take-apart** TAN **BipolarGrasping Forceps,** size 3,4 mm, length 20 cm, for use with trocar size 3.9 mm,

consisting of:

26284 HM	**Ring Handle**
26284 AS	**Outer Tube**
26284 BS	**Inner Tube**
28164 FDG	**Forceps Insert**

㉚ 426620 GRUENWALD **Nasal Dressing Forceps**, bayonet, 20 cm

㉛ 28272 HB **Articulated Stand**, reinforced version, only, L-shaped, with one mechanical central clamp for all five joint functions, height 48 cm, operating range 52 cm, with fastener: ‘KS lock’ (female)

28172 HR **Rotation Socket** to clamp on the operating table with one already mounted butterfly nut 28172 HRS, for use with European and United States standard rails, with lateral clamping element for height and angle adjustment of the articulated stand

Bipolar Cable (not pictured)

Recommended Sterilization Containers:

Telescopes: 39301 A

Instruments: 39360 AK (2×)

201331 01-1 **KARL STORZ Cold Light Fountain XENON 300,**
with integrated KARL STORZ SCB, integrated anti-fog pump, one 300 watt XENON lamp and one KARL STORZ light outlet, power supply: 100–125/220–240VAC, 50/60Hz consisting of:

201331 20-1	**XENON 300**
400 A	**Mains Cord**
610 AFT	**Silicone Tubing Set,** length 250 cm
200901 70	**SCB-Connecting Cable**, length 100 cm

201340 01 **KARL STORZ Cold Light Fountain XENON NOVA 300,**
with one 300 watt XENON lamp and one KARL STORZ light outlet, power supply: 100-125/220-240 VAC, 50/60 Hz consisting of:

201340 20	**XENON NOVA 300**
400 A	**Mains Cord**

495 NCS **Fiber Optic Light Cable,**
size 4.8 mm, length 250 cm, heat-resistant

IMAGE 1™ HD

HD Camera Control Unit

- **Maximum resolution and the consistent use of the 16:9 aspect ratio guarantee FULL HD**
- **Endoscopic camera systems have to be equipped with three-CCD chips that support the 16:9 input format as well as capturing images with a resolution of 1920 x 1080 pixels**

The benefits of High Definition Technology (HD) for medical applications are

- **Up to 6 times* higher input resolution of the camera delivers more detail and depth of focus**
- **Using 16:9 format during image acquisition enlarges the field of vision and supports ergonomic viewing**
- **The brilliance of color enables optimal diagnosis**
- **Lateral view is enhanced by 32% when the endoscope is withdrawn slightly, providing the same image enhancement as a standard system. Any vertical information loss is restored and the lens remains clean**

22 2010 20-1xx

22 2010 11U102 **IMAGE 1 HUB™ HD Camera Control Unit** (CCU) with SDI Module

for use with IMAGE 1™ HD and standard one- and three-chip camera heads, max. resolution 1920 x 1080 Pixel, with integrated KARL STORZ SCB® and integrated digital Image Processing Module, color systems PAL/NTSC, power supply 100 – 240 VAC, 50/60 Hz

consisting of:

22 2010 20-102	**IMAGE 1 HUB™ HD (with SDI) Camera Control Unit**
400 A	**Mains Cord**
3 x 536 MK	**BNC/BNC Video Cable**, length 180 cm
547 S	**S-Video (Y/C) Connecting Cable**, length 180 cm
20 2032 70	**Special RGB Connecting Cable**
2x **20** 2210 70	**Connecting Cable**, for controlling peripheral units, length 180 cm
20 0400 86	**DVI Connecting Cable**, length 180 cm
20 0901 70	**SCB Connecting Cable**, length 100 cm
20 2001 30U	**Keyboard**, with English character set

Specifications:

Signal-to-noise ratio	AGC	Video output	Input
IMAGE 1 HUB™ HD Three-chip camera systems ≥ 60 dB	Micro-processor-controlled	- Composite signal to BNC socket - S-Video signal to 4-pin Mini DIN socket (2x) - RGBS signal to D-Sub socket - SDI signal to BNC socket (only IMAGE 1 HUB™ HD with SDI module)(2x) - HDTV signal to DVI-D socket (2x)	Keyboard for title generator, 5-pin DIN socket

Control output /input	Dimensions w x h x d (mm)	Weight (kg)	Power supply	Certified to:
- KARL STORZ-SCB® at 6-pin Mini DIN socket (2x) - 3.5 mm stereo jack plug (ACC 1, ACC 2), - Serial port at RJ-11 - USB port (only IMAGE 1 HUB™ HD with ICM) (2x)	305 x 89 x 335	2.95	100-240 VAC, 50/60 Hz	IEC 601-1, 601-2-18, CSA 22.2 No. 601, UL 2601-1 and CE acc. to MDD, protection class 1/CF

SDI – Serial Digital Interface: optimized to display medical images on Flat Screens, Routing with OR1™ and digital recording with AIDA-DVD-M

ICM: USB-connector for recording video streams and stills on USB storage media or for connection of USB printers for direct printing of the recorded stills

22 2200 55-3

22 2200 55-3	**50 Hz** **60 Hz**	**IMAGE 1™ H3-Z,** **Drei-Chip HD Kamerakopf**

max. resolution 1920 x 1080 pixels, progressive scan, soakable, gas and plasmasterilizable, with integrated Parfocal Zoom Lens, focal length f = 15 – 31 mm (2x), 2 freely programmable camera head buttons, for use with color system PAL/NTSC

Image sensor	3x ⅓" CCD-Chip
Pixel output signall H x V	1920 x 1080
Dimensions	Diameter 32-44 mm, length 114 mm
Weight	246 g
Min. sensitivity	F 1,4/1,17 Lux
Lens	Integrated Parfocal Zoom Lens, f = 15-31 mm
Grip mechanism	Standard eyepiece detector,
Cable	non-detachable
Cable length	300 cm

KARL STORZ HD Flat Screens Color systems PAL/NTSC	Version	Order No.	Screen diagonal	Max. screen resolution	Video input							
				1920 x 1200	Composite signal to BNC socket	S-Video to 4-pin Mini DIN socket	RGB to 5x BNC socket	VGA to 15-pin HD-D-Sub socket	SDI to BNC socket	HD-SDI to BNC socket	DVI to DVI-D socket	
	Wall mounted with VESA 100-adaption	9524 NB	24"	●	●	●	●	●	●	●	●	
		9526 NB	26"									
	Desktop with pedestal	9524 N	24"									
		9526 N	26"									

The following accessories are included:

400 A	**Mains Cord**
9523 PS	**External 24VDC Power Supply**
9419 NSF	**Pedestal**

KARL STORZ AIDA™ DVD-M

Special features:

- **Digital storage of still images, video sequences and audio files**
- **Digital alternative to video printer and video recorder**
- **Compact housing**
- **Easy and intuitive handling via touch screen, camera head buttons or footswitch**
- **Archiving on DVD, CD-ROM, USB stick or network path, multisession and multipatient**
- **SDI, S-Video and composite video inputs**
- **All video signals are transferred directly to the video monitor**
- **Print-out of still images via HP ink jet printer**
- **Compatible with KARL STORZ Communication Bus (SCB) and OR1™ connect series**

20 2045 01-140 **KARL STORZ AIDA® DVD-M**
with Smartscreen™

Compact storage unit with integrated DVD/CD writer and integrated Smartscreen™, color systems **PAL/NTSC,** power supply 100 – 240 VAC, 50/60 Hz

consisting of:

20 2045 20-140	**KARL STORZ AIDA® DVD-M**
400 A	**Mains Cord**
400 B	**Mains Cord,** US-version
536 MK	**BNC/BNC Video Cable,** length 180 cm
547 S	**S-Video (Y/C) Connecting Cable,** length 180 cm
2x **20** 0400 83	**Adaptor BNC Cinch**
20 0400 84	**Serial Connecting Cable,** length 20 cm
20 0400 85	**DVI Connecting Cable,** length 20 cm
20 0400 88	**USB Extension Cable,** length 7.5 cm

20 2045 02-1 **KARL STORZ AIDA® DVD-M**
without Smartscreen™

Compact storage unit with integrated DVD/CD writer, color systems **PAL/NTSC,** power supply 100–240 VAC, 50/60 Hz

consisting of:

20 2045 20-1	**KARL STORZ AIDA® DVD-M**
400 A	**Mains Cord**
400 B	**Mains Cord,** US-version
536 MK	**BNC/BNC Video Cable,** length 180 cm
547 S	**S-Video (Y/C) Connecting Cable,** length 180 cm
2x **20** 0400 83	**Adaptor BNC Cinch**
20 0400 88	**USB Extension Cable,** length 7.5 cm

Specifications:

Video systems	Signal inputs	Image formats	Video formats	Audio frormats	Storage media
- PAL - NTSC	- SDI - S-Video (Y/C) - Composite	- JPG - BMP - TIFF	MPEG2	WAV	- DVD+R - DVD-R - CD-R - USB stick

KARL STORZ AIDA™ DVD-M HD Kit

20 2000 75	**KARL STORZ AIDA DVD-M HD Kit (EU)**	
	Power supply: 100 VAC – 230 VAC, 50/60 Hz	
	consisting of:	
	202000 72	**AIDA DVD-M HD Box**, incl. power supply and power cable
	202000 73	**USB Connecting Cable**, length 180 cm
	536 MK	**SDI Connecting Cable**, length 180 cm
	200400 86	2x **DVI-D Connecting Cable**, length 180 cm
	202000 74	**USB Hub**
	202040 77-01	**AIDA DVD-M Software Upgrade** for HD compatibility

Note:
Two adapter cables (28003 TE) for the isolating transformer are required for the AIDA DVD-M HD Kit

ENDOWORLD®

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