Neuroendoscopy

Offering more for patients through less invasive techniques

Aesculap Neurosurgery

AESCULAP®

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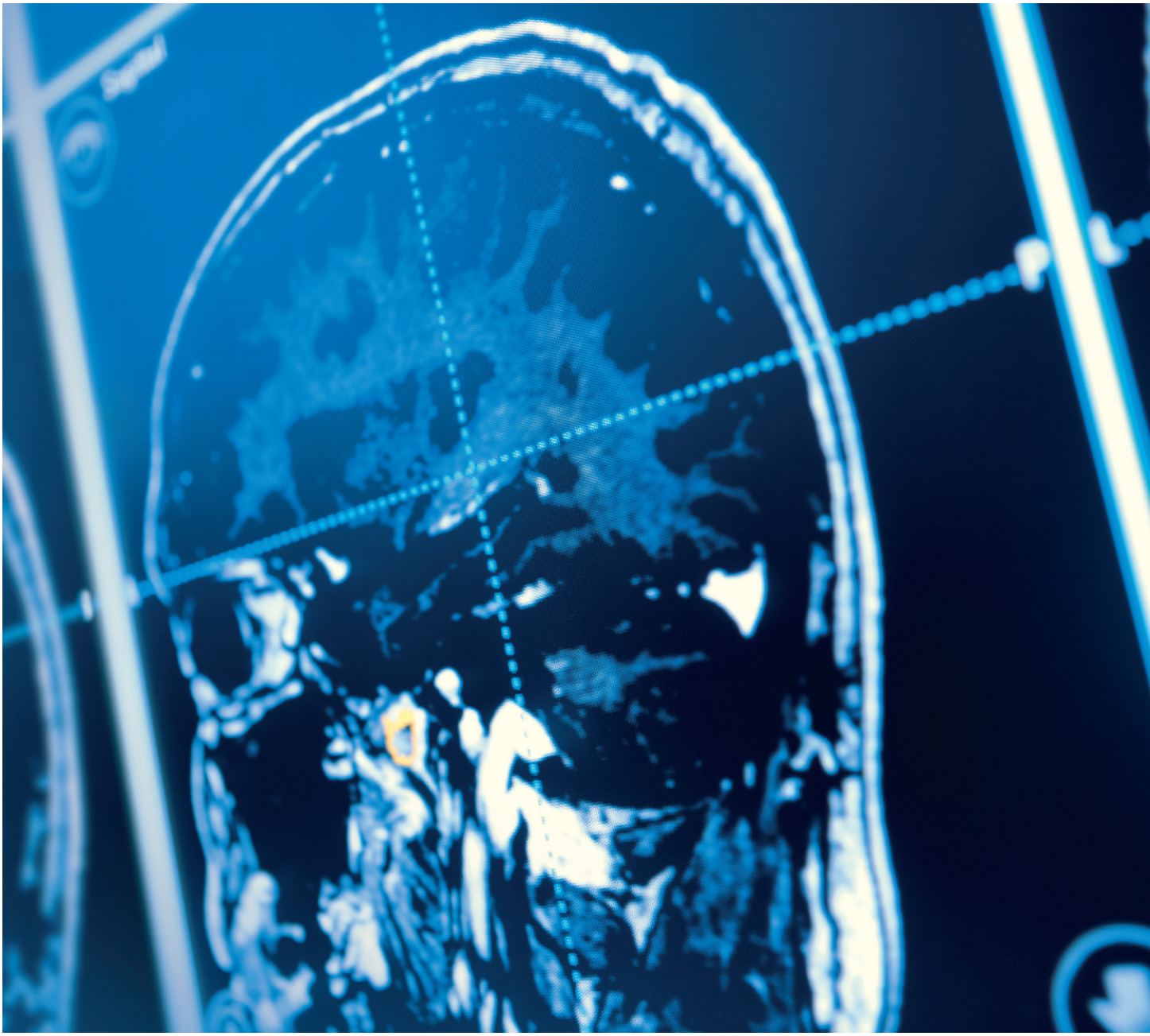
Neuroendoscopy



Michael Fritsch
Neubrandenburg, Germany

Jeremy Greenlee
Iowa City, USA

André Grotenhuis
Nijmegen, Netherlands

Nikolai Hopf
Stuttgart, Germany

In 1924, the famous general and neurosurgeon, William Halsted, expressed his belief that "the tendency will always be in the direction of exercising greater care and refinement in operating." Today, this fundamental philosophy of minimally invasive therapy should be emphasized more than ever before, encouraging the minimizing of iatrogenic trauma while achieving maximum surgical efficiency.

Recent improvements in preoperative imaging and surgical instrumentation allow neurosurgeons to treat more complex pathologies through customized less invasive approaches.

Using the advanced diagnostic tools of digital subtraction angiography, 3D angiography, computed tomography, and magnetic resonance imaging, one is able to see the individual anatomy and pathology of the patient – preoperatively. Therefore surgical dissections can be described prior to operating and may be included in the planning of surgery. The individual anatomic details of a specific patient allow the surgeon to perform a tailored surgical procedure reducing the size of the skin incision, the craniotomy, and the extent of brain surface trauma and retraction to a minimum. These advantages in minimally invasive microsurgery lead to improved postoperative results. This includes shorter hospitalization time, due to a reduction in the risk for complications.

While there are many benefits to minimally invasive approaches, they have two important limitations; the significant loss of optical control and the limited maneuverability of microsurgical instruments. The intraoperative use of endoscopes and dedicated minimally invasive instruments overcome these restrictions, enabling neurosurgeons to access deep seated regions without approach related traumatization of sensitive neurovascular structures. The endoscopic image allows illumination and inspection of angles in hidden parts of the surgical field with clear depiction of anatomical details. In addition, the large optical depth of field of modern endoscopes provides a three dimensional aspect of anatomic structures. Recently, the intraoperative use of full high definition (HD) image quality brought a new area in endoscopic neurosurgery with an increased range of indications in minimally invasive neurosurgery.

There are three main indications of endoscopic neurosurgery, intraventricular, transcranial, and transnasal applications. In this brochure contemporary endoscopic equipment and instrumentation are presented in a comprehensive format. Commentary from international experts in the field of minimally invasive and endoscopic neurosurgery provide insight into the various applications, offering valuable instructions for the use of endoscopes in the field of minimally invasive neurosurgery.

The Aesculap Advisory Board for "Minimally Invasive Neurosurgery and Neuroendoscopy"

Michael Fritsch, Neubrandenburg, Germany
Jeremy Greenlee, Iowa City, USA
André Grotenhuis, Nijmegen, Netherlands
Nikolai Hopf, Stuttgart, Germany
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Peter Nakaji
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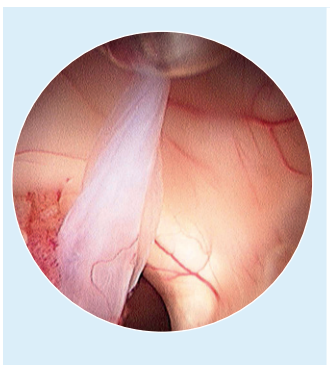
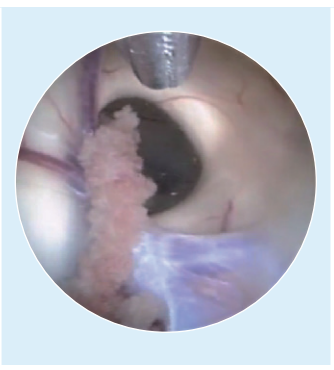
Zurich, Switzerland

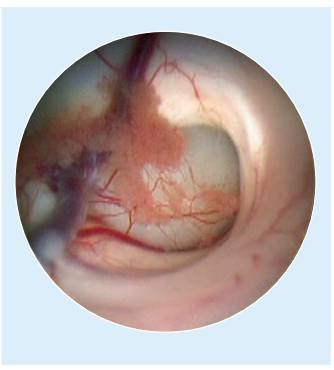
Mark Souweidane
New York, USA

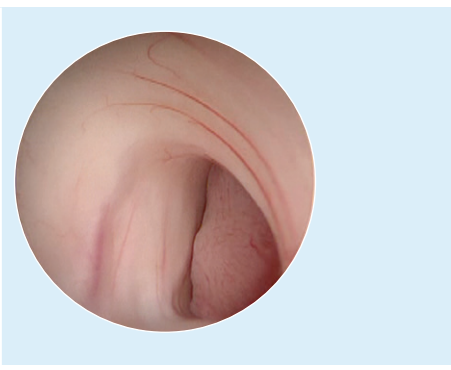
Charles Teo
Sydney, Australia

Intraventricular Neuroendoscopy









The genesis of endoscopic surgery within the ventricular compartment can be attributed to the development of small caliber rod lens optics, fiberoptic light transmission, and dedicated instrumentation. Since the advent of intraventricular endoscopic surgery, neurosurgeons have applied the technology to treat a number of disorders. Even without the full realization of its complete potential, this technology has been proven to have major patient benefits for selected conditions. Most notably, the treatment of non-communicating hydrocephalus, management of patients with pineal region tumors, fenestration of intracranial cysts, and removal of colloid cysts.

The benefit in minimally invasive endoscopic procedures is analogous to that of any endoscopic procedure, namely minimal tissue disruption, enhanced visualization, improved cosmetic results, shorter hospital stay, and less surgical morbidity. The surgeon willing to utilize intraventricular endoscopic surgery is first responsible for attaining a considerable degree of familiarity with the technology, relevant anatomy, and the surgical procedures. Given the relatively recent birth of this field, the discipline is only now being commonly implemented in training programs. Hence, for those that have not had the opportunity to have endoscopic surgery as part of their formal training, it is strongly recommended that the surgeon participates in established practical courses in endoscopic neurosurgery, such as the courses from the Aesculap Academy.

Few neurosurgical procedures require the degree of familiarity with equipment as do neuroendoscopic techniques. This feature is somewhat explained by the recent introduction of the neuroendoscope as well as the delicate nature of the equipment. The basic components of any neuroendoscopic procedure include the endoscope and trocar, a camera with light source and monitor, as well as compatible instrumentation.

Once fluent with the endoscopic equipment, more advanced procedures can be performed with greater familiarity and ease. It is anticipated with future generations of neurosurgeons that the endoscope will be an indispensable part of the neurosurgeon's portfolio – given its unmatched image resolution and minimally invasive qualities.

Charles Teo, Sydney, Australia
Mark Souweidane, New York, USA

Charles Teo
Sydney, Australia

Mark Souweidane
New York, USA

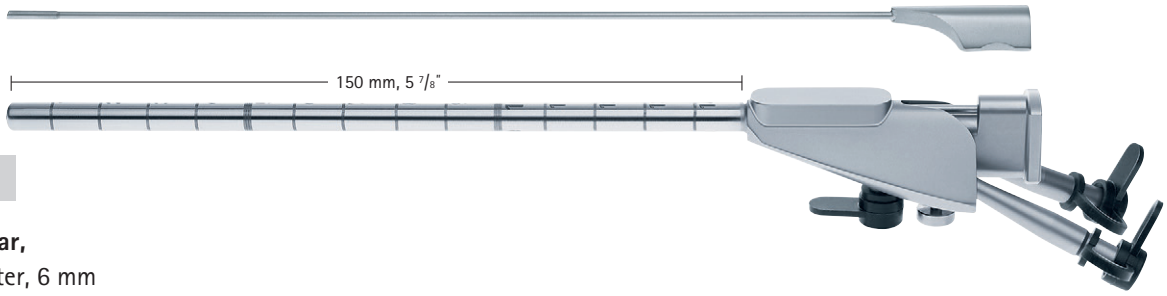
MINOP® Minimally Invasive Operating Procedure

Intraventricular Neuroendoscopic System

MINOP Trocars

Indications for Use: Aesculap's MINOP System is indicated for use in endoscope-assisted microneurosurgery and pure neuroendoscopy (i.e. ventriculoscopy) for direct visualization, diagnostic and/or therapeutic procedures such as ventriculostomies, biopsies and removal of cysts, tumors and other obstructions. See Instructions for Use for additional information, including warnings and precautions. Rx only.

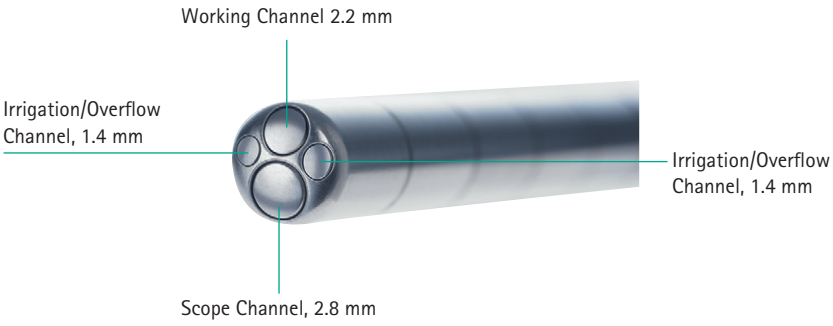
- Ultra-smooth tip of trocar for atraumatic insertion into the brain
- Single obturator for working channel enables insertion of the trocar, under visual control, with the scope
- Large mm-length inscription on the outer shaft of the trocar
- Conical entry of working channel for intuitive insertion of instruments into trocar
- Attachment on top of trocar for improved handling and universal connection of peripheral devices



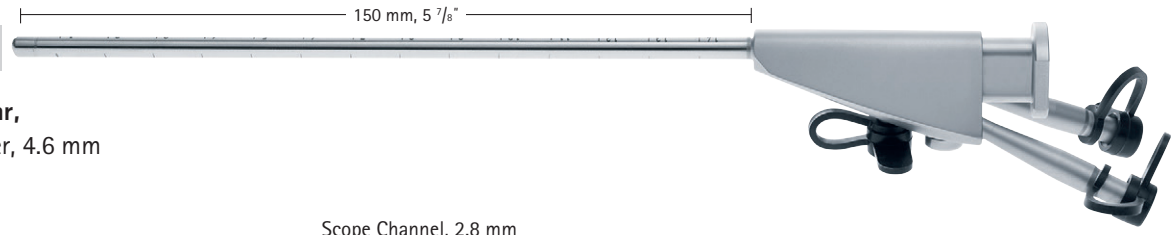
FF399R

MINOP Trocar,
Outer Diameter, 6 mm

4 channels:
Scope Channel, diam. 2.8 mm
Working Channel, diam. 2.2 mm
Irrigation Channel, diam. 1.4 mm
Overflow Channel, diam. 1.4 mm
Including 4 obturators
for all channels

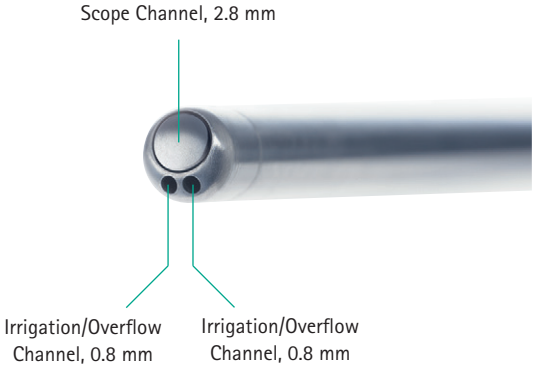


FF398R

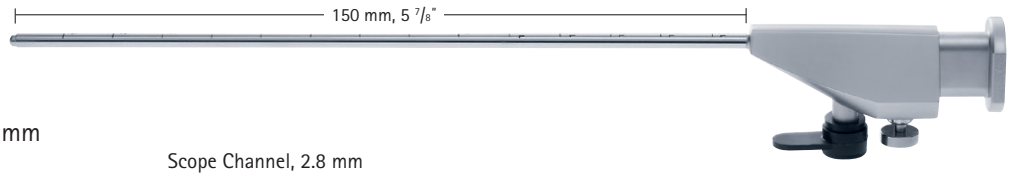


MINOP® Trocar,
Outer Diameter, 4.6 mm

3 Channels:
Scope Channel, diam. 2.8 mm
Irrigation Channel, diam. 0.8 mm
Overflow Channel, diam. 0.8 mm
Including one obturator for scope channel
One sealing cap for pressure balance in scope channel

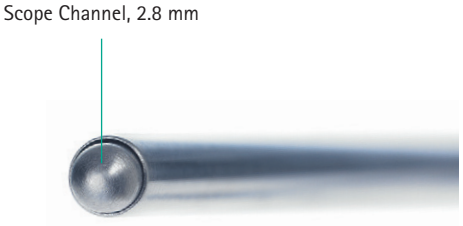


FF397R



MINOP Trocar,
Outer Diameter, 3.2 mm

1 channel:
Single Channel for Scope
Including one obturator
Optic channel, diam. 2.8 mm
One sealing cap for pressure balance in scope channel



MINOP®

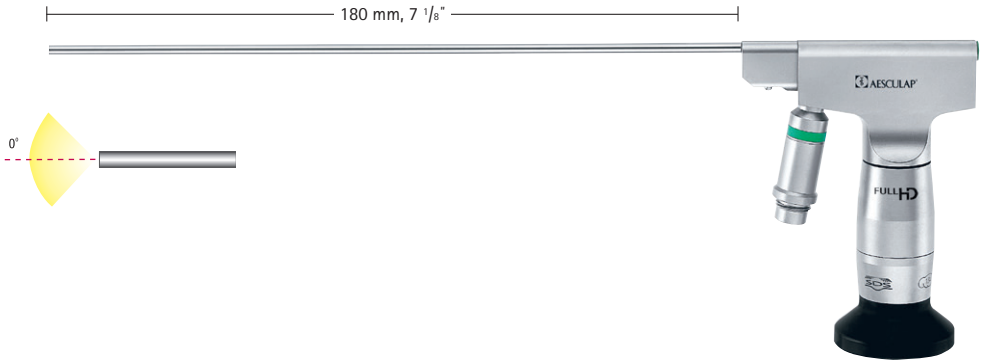
Intraventricular Neuroendoscopic System

MINOP Endoscopes

- FULL HD compatible scopes
- Rust-proof steel outer casing for virtually problem-free reprocessing
- The external tube is made from a high strength special alloy for superior breaking resistance
- Optimized fiber optics provide more light
- Service-optimized construction reduces maintenance costs
- Highly rectified optical systems

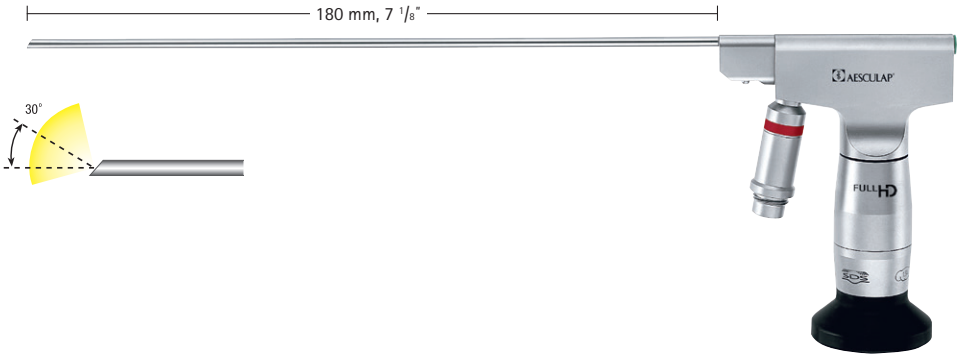
PE184A

MINOP Endoscope
Direction of view 0°
(green ring)
Shaft diameter, 2.7 mm
Shaft length, 180 mm



PE204A

MINOP Endoscope
Direction of view 30°,
upwards (red ring)
Shaft diameter 2.7 mm
Shaft length 180 mm



"The angled design of the MINOP ventricular endoscope plays a central role in ergonomic and effective application, allowing the use of rigid instruments through the straight working channel. In this way, the side-gated camera and light cable do not disturb surgical manipulation. In my hands, an undisputable advantage!"

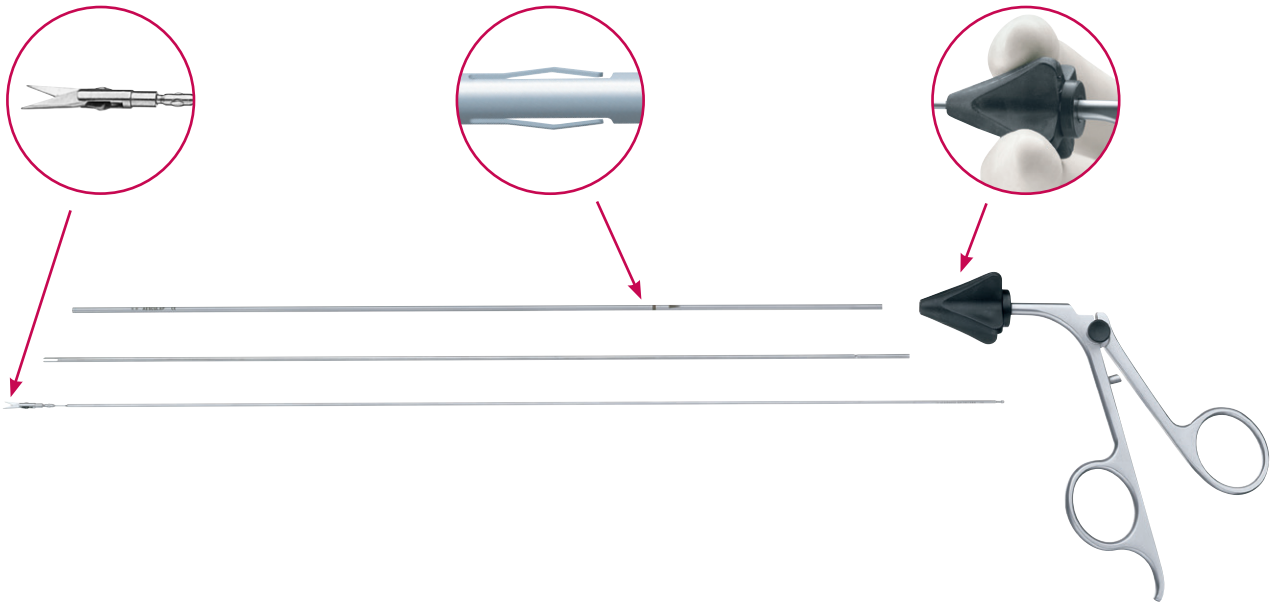
Robert Reisch, Zurich, Switzerland

MINOP® Rigid Instruments

Instruments
- Shaft length 265 mm
- Diam. 2.0 mm
- Fully detachable for reprocessing
- High precision instrument tip

Tactile Feedback
- Integrated tactile feedback delivers small resistance indicating that the instrument tip has emerged from the trocar
- Improves control during insertion of instruments

Rotating Knob
- By rotating the knob slightly with index finger, the tip of instrument turns equally
- No need to turn/rotate instrument with the entire arm/ handle
- Improves precision of neuroendoscopic surgery
- Integrated safety mechanism in instrument shaft



"A very appealing feature of the MINOP tube shaft instruments is a rotational capability of the instrument tip through a coaxial system thus eliminating the need for hand rotation and reducing excessive movement of the endoscope. Irrespective of the instrument, graduated markings or precalibrated indicators on the shaft are important in providing the surgeon knowledge as to when the instrument will enter the endoscopic field. Even more safety is provided by the new tactile feedback of the improved MINOP instruments. A small spring delivers a tactile resistance "telling" the surgeon that the instrument tip is exiting the trocar."

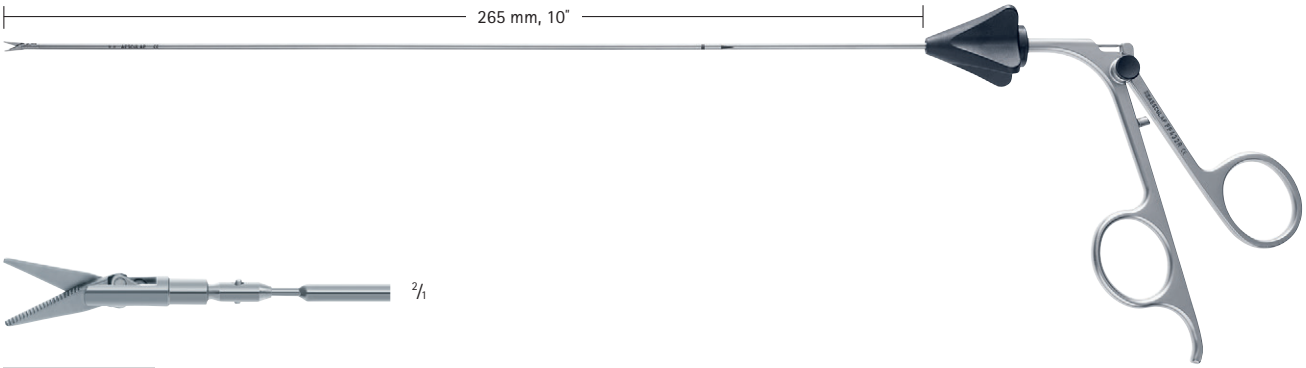
Mark Souweidane, New York, USA

MINOP®

Intraventricular Neuroendoscopic System

MINOP Rigid Instruments

Ø 2 mm **Instrument Complete:** Handle · outer tube · jaw part with inner tube



FF385R

MINOP Micro Scissors
sharp / sharp

FF386R

MINOP Micro Scissors
blunt / blunt

FF387R

MINOP Biopsy Forceps

FF388R

MINOP Grasping and Dissecting Forceps

FF389R

MINOP Surgical Micro Forceps, 1x2 Teeth

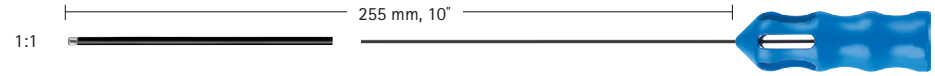
The very delicate MINOP instruments should be detached completely and pre-cleaned manually at the end of the operation. Keeping them in dedicated trays for reprocessing and sterilization protects the super-fine instrument tips. Careful handling by trained operating & CSSD staff is highly recommended and can reduce the wear and tear of these sensitive but highly necessary neuroendoscopic tools.

For MINOP Rigid Instrument Spare Parts please see page 47.

MINOP® – Electrodes

GK361R

Blunt Electrode, diam. 1.1 mm



GK363R

Needle Electrode, diam. 1.1 mm

GK364R

Hook Electrode, 45°, diam. 2.2 mm

GK365R

Hook Electrode, 70°, diam. 2.2 mm

GK362R

Hook Electrode, 90°, diam. 2.2 mm

GK366R

Hook Electrode, 180°, diam. 2.2 mm

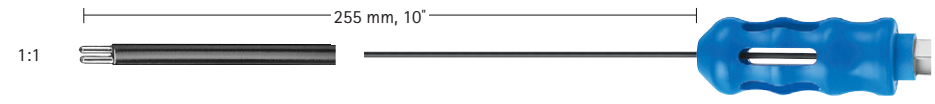
GK246

Monopolar Cable, 12 ft

BIPOLAR ELECTRODES

GK360R

Fork Electrode, diam. 2.1 mm



"The MINOP system is providing bi-instrumental endoscopic work. For example in cyst removal or endoscopic tumor surgery the surgeon has the opportunity to grasp and cut or grasp and coagulate at the same time. One can utilize flexible instruments or electrodes in one of the side-channels and rigid tube shaft instruments in the working channel. The design of the side-channels of the MINOP trocar makes sure that both instruments do not interfere with each other."

Michael Fritsch, Neubrandenburg, Germany

MINOP®

Intraventricular Neuroendoscopic System

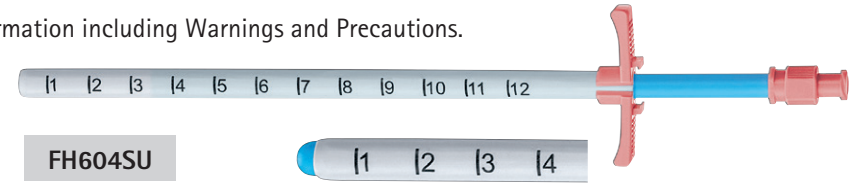
MINOP – Disposable Introducer

Indications for Use: The purpose of the MINOP Disposable Introducer is to obtain and maintain a temporary pathway to the ventricular system of the patient. The MINOP Disposable Introducer is designed to be split lengthwise and peeled down to the skull level of the patient, accommodating different depth requirements.

See Instructions for Use for additional information including Warnings and Precautions.
Rx Only.

MINOP Disposable Introducer

- 19 Fr disposable introducer set including obturator and sheath
- Especially for MINOP trocar FF399R
- Introducer sheath protects the brain while inserting and removing the endoscope/trocar
- Round & blunt obturator tip for atraumatic insertion into the ventricles
- Depth scale for precise positioning and perfect control
- Easy to peel with side handles



FH604SU

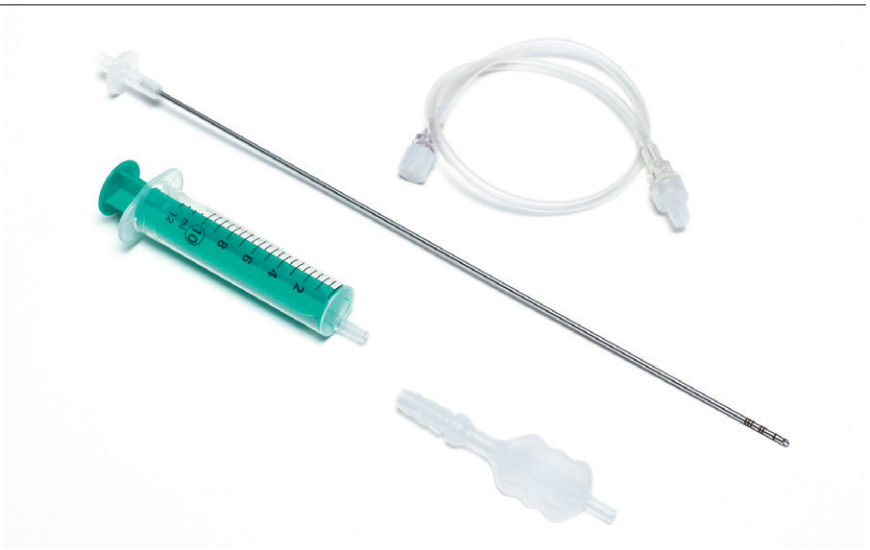
Introducer
19 Fr (inner diameter)
22 Fr (outer diameter)

FH606SU

Suction Cannula,
blunt tip 0°, diam. 2.0 mm

FH607SU

Suction Cannula,
sharp tip 45°, diam. 2.0 mm



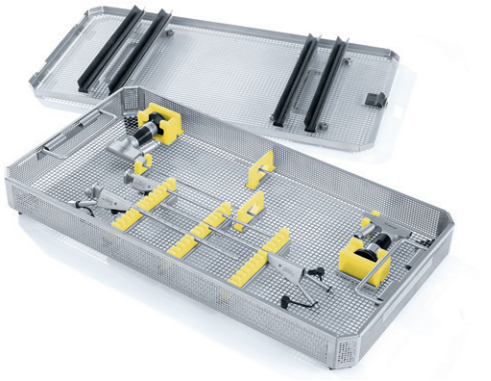
The MINOP suction cannula and the MINOP disposable introducer can be used in almost any intraventricular neuroendoscopic surgery providing more safety and control during the procedure. The suction cannula can be used for the controlled and fast removal of intraventricular soft tumors or colloid cysts with its sharp cannula tip or even for the opening of the floor of the 3rd ventricle. The disposable introducer (also called peel away) is very helpful when several intraparenchymal in- and out-movements of the trocar are necessary.

MINOP® – Storage

FF358R

For MINOP Trocars and Scopes

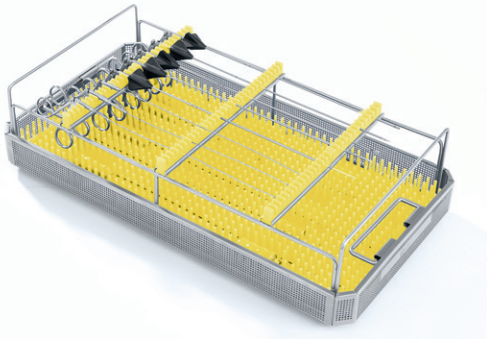
- Storage rack with silicone protection cushioning
- Bottom and lid
- Only for reprocessing, not for transportation/shipment (L/W/H 485 x 253 x 63 mm)
- Aesculap container JK441 with JK489 lid (sold separately)



FF359R

For MINOP Instruments and Electrodes

- Storage rack with silicone protection cushioning
- Bottom only, lid not necessary
- Only for reprocessing, not for transportation/shipment (L/W/H 485 x 253 x 120 mm)
- Aesculap container JN444 with JK489 lid (sold separately)



Dedicated storage racks for cleaning and reprocessing are highly recommended for your neuroendoscopic equipment. A safe and special-designed storage concept keeps the scopes and instruments protected and safe.

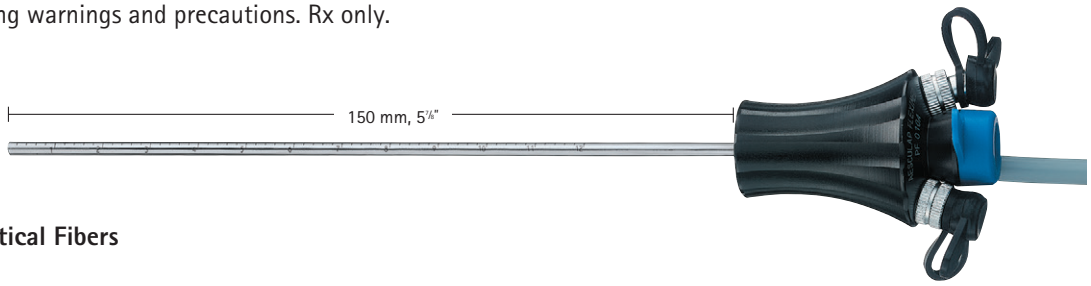
PaediScope®

Paediatric Intraventricular Neuroendoscopic System

PaediScope

Indications for Use: Aesculap's MINOP System is indicated for use in endoscope-assisted microneurosurgery and pure neuroendoscopy (i.e. ventriculoscopy) for direct visualization, diagnostic and/or therapeutic procedures such as ventriculostomies, biopsies and removal of cysts, tumors and other obstructions. See Instructions for Use for additional information, including warnings and precautions. Rx only.

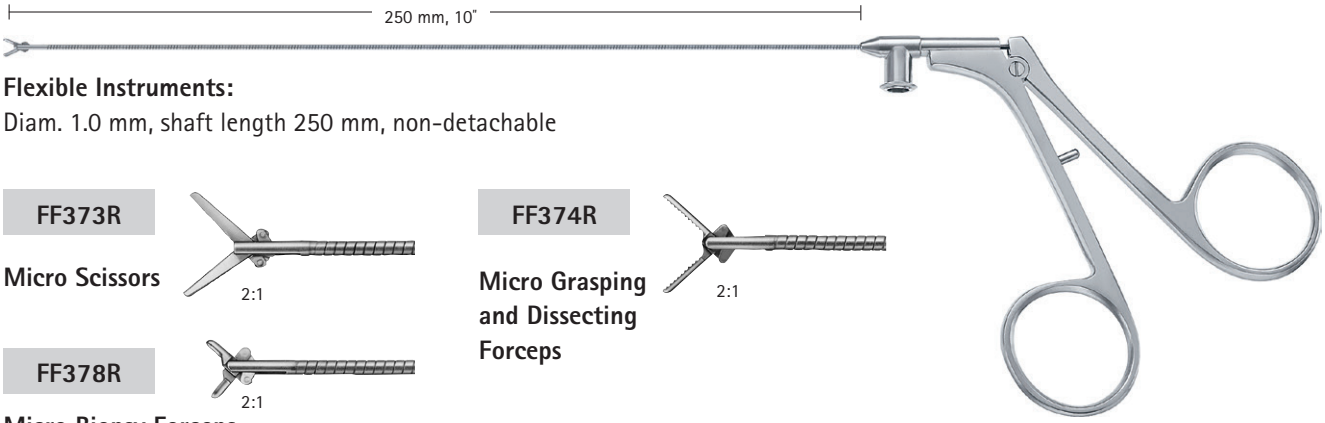
PF010A



Endoscope Shaft with Integrated Optical Fibers

- 30,000 pixel fiber optic
- Fibers integrated in rigid shaft for high precision and control
- 3.0 mm outer diameter for minimally invasive pediatric surgery
- Light-weight and ergonomic design
- Black handle can be held like a pencil
- Weight of camera ocular is away from the operating site

PF011A



Flexible Instruments:
Diam. 1.0 mm, shaft length 250 mm, non-detachable

FF373R

Micro Scissors

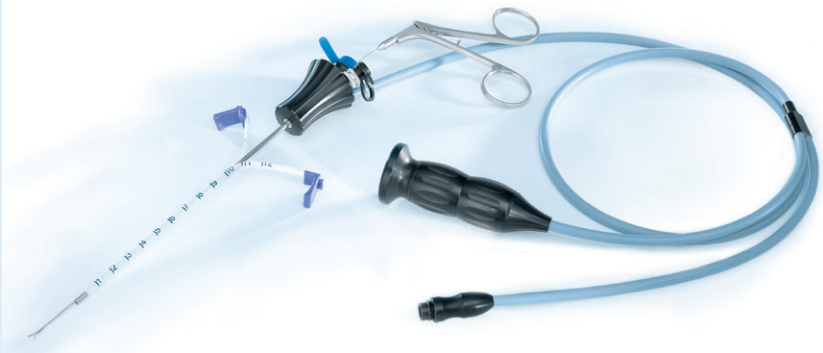
FF374R

Micro Grasping and Dissecting Forceps

FF378R

Micro Biopsy Forceps

*Can also be used with MINOP® Trocar FF399R through irrigation or overflow channel.



PaediScope®

GK363R

Needle Electrode

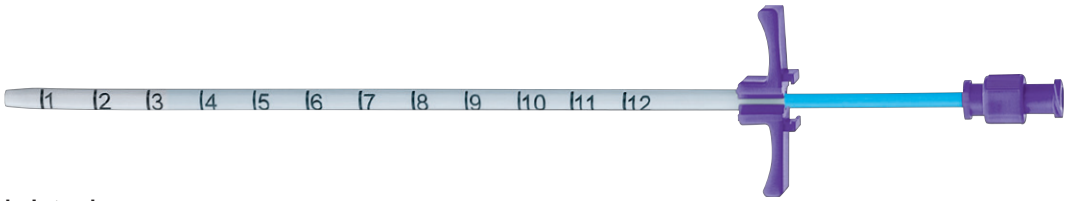
GK361R

Blunt Electrode

GK246

Monopolar Cable, 12 ft

FH603SU



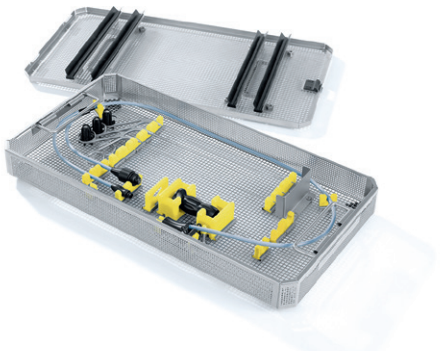
Paediscope Disposable Introducer

- 10 Fr (inner diameter), 13 Fr (outer diameter) disposable introducer set including obturator and sheath
- Especially made for Paediscope PF010A
- Introducer sheath protects the brain while inserting and removing the endoscope/trocar
- Round & blunt obturator tip for atraumatic insertion into the ventricles
- Depth scale for precise positioning and perfect control
- Easy to peel with side handles

FF379R

For Paediscope Shaft, Instruments and Electrodes

- Storage rack with silicone protection cushioning
- Bottom and lid only for reprocessing, not for transportation/ shipment (L/W/H 485 x 253 x 63 mm)
- Aesculap container JN441 with JK489 lid (sold separately)



"The peel away sheath protects the brain while inserting and removing the pediatric endoscope. Because of its small outer diameter, the Paediscope does not have a dedicated trocar. The blunt obturator tip of the sheath allows atraumatic insertion into the ventricles. The sheath has a depth scale for precise positioning and is easy to peel back the side handles. Using a peel away sheath is especially helpful, if repeated in and out movements of the scope are necessary or different instruments or catheters (e.g. for aqueductoplasty) have to be utilized in addition to the scope."

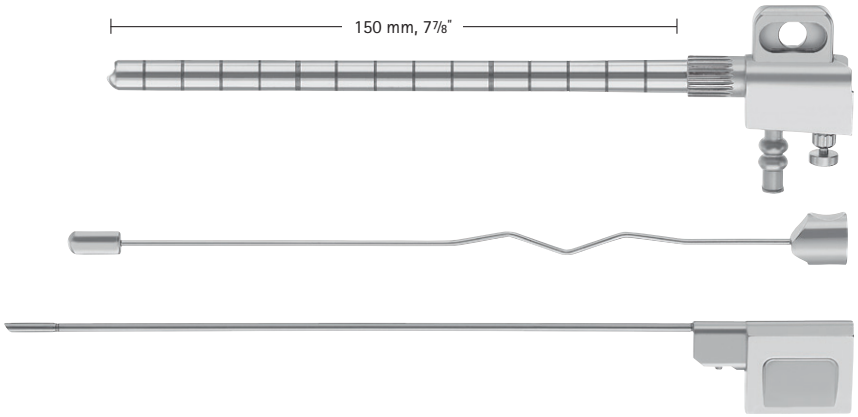
Michael Fritsch, Neubrandenburg, Germany

MINOP® InVent

Intraventricular Neuroendoscopy System

MINOP InVent

FH620R



MINOP InVent Trocar
Outer diameter: 8.3 mm
3(4) channels

- Scope channel: diam. 2.8 mm
- Irrigation channel: diam. 1.0 mm

Two merging channels:

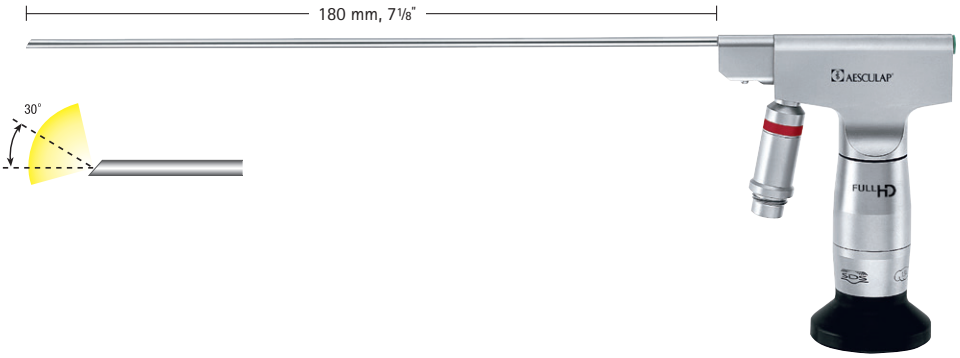
- Large working/overflow channel: 3.7 mm x 6.5 mm
- Small working/overflow channel: 2.2 mm

including 2 obturators for scope channel and working channel

RT068R

MINOP InVent holding arm adapter for Aesculap holding arms

PE204A



MINOP Endoscope

- Direction of view 30°, upwards (red ring)
- Shaft diameter: 2.7 mm
- Shaft length: 180 mm

MINOP® InVent Instruments

FH629R

MINOP InVent Dissector,
tip width 2.2 mm

FH630R

MINOP InVent Dissector,
tip width 1.7 mm

FH631R

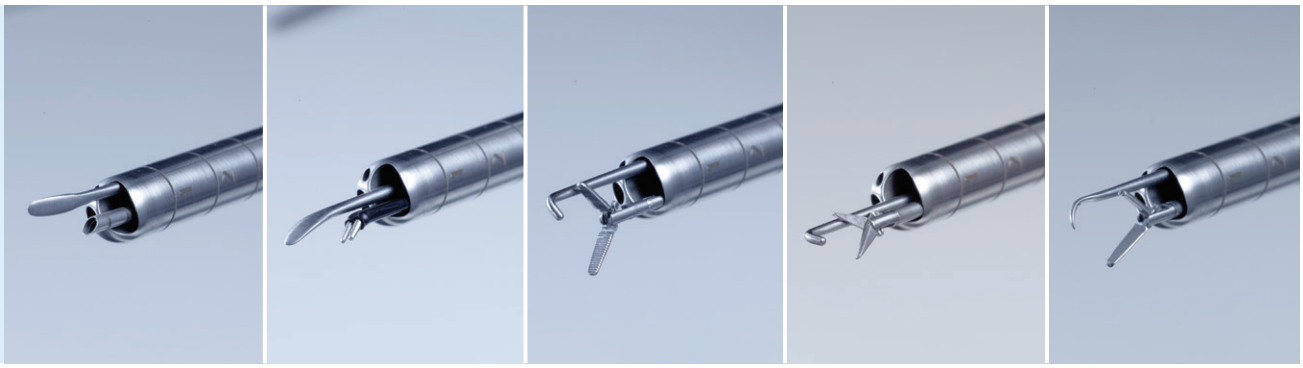
MINOP InVent Dissector,
tip width 1.0 mm

FH632R

MINOP InVent hook 90° blunt,
hook deflection width 3.5 mm

FH634R

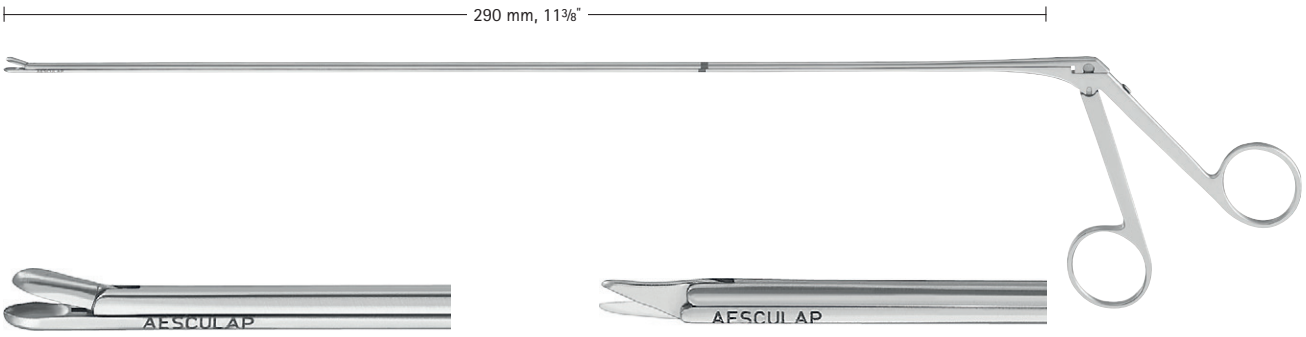
MINOP InVent Knife, backwards cutting,
knife deflection width 3.0 mm



MINOP® InVent

Intraventricular Neuroendoscopy System

MINOP® InVent Instruments



FH621R

MINOP InVent Forceps straight

FH622R

MINOP InVent Forceps right

FH623R

MINOP InVent Forceps left

FH624R

MINOP InVent Grasping Forceps straight

FH625R

MINOP InVent Scissors straight

FH626R

MINOP InVent Scissors left

FH627R

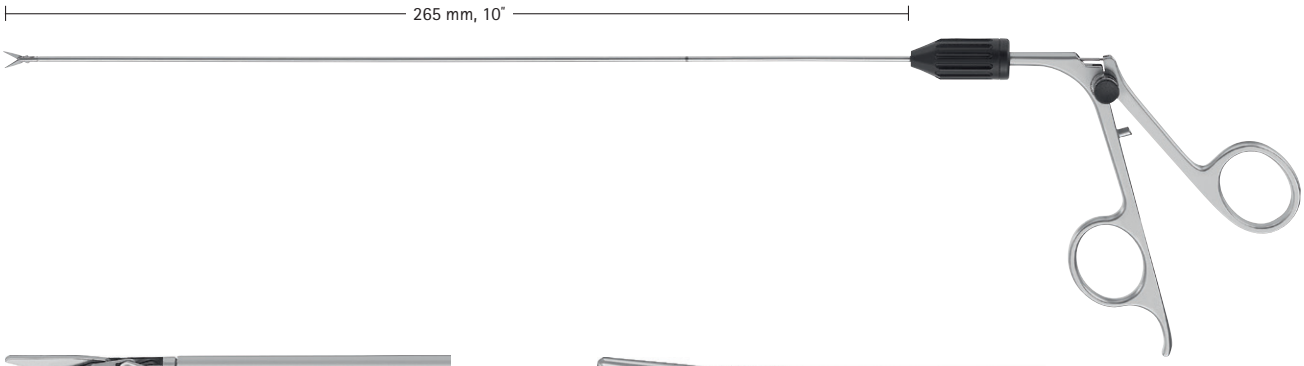
MINOP InVent Scissors right

FH628R

MINOP InVent Scissors upwards

MINOP® InVent – Instruments | Complete Instruments

Ø 2 mm **Complete Instrument:**
handle · outer tube · jaw with inner tube



FH635R

MINOP InVent Scissors,
sharp/sharp

FH638R

MINOP InVent Grasping and Dissecting Forceps

FH636R

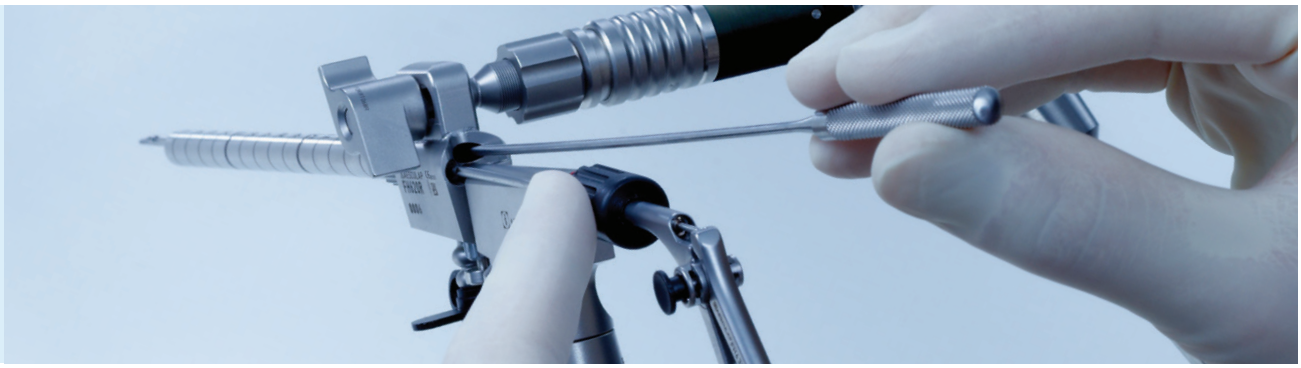
MINOP InVent Scissors,
blunt/blunt

FH639R

MINOP InVent Surgical Forceps, 1x2 Teeth

FH637R

MINOP InVent Biopsy Forceps



MINOP® InVent

Intraventricular Neuroendoscopy System

MINOP® InVent Instruments – Replacement Parts

Ø 2 mm Jaw with Inner Tube

FF435R

MINOP InVent Scissors
sharp / sharp

FF438R

MINOP InVent Grasping and Dissecting Forceps

FF436R

MINOP InVent Scissors
blunt / blunt

FF439R

MINOP InVent Surgical Forceps

FF437R

MINOP InVent Biopsy Forceps

FF633R

MINOP InVent Instrument Handle

FF635200R

MINOP InVent Outer Tube

MINOP® InVent – Bipolar Electrodes

Width/Height:
3.2 mm x 2.1 mm

GK343R

MINOP InVent Bipolar Electrode 0°

GK345R

MINOP InVent Bipolar Electrode 30°

GK344R

MINOP InVent Bipolar Electrode 40°

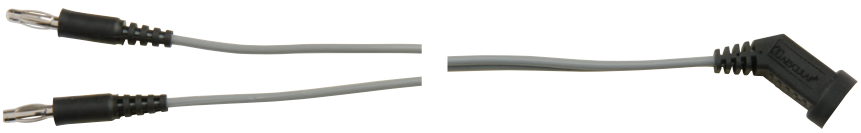
2.1 mm

GK360R

MINOP InVent Bipolar Electrode 0°

US359

Bipolar Cable, 12 ft



MINOP® InVent

Intraventricular Neuroendoscopy System

MINOP® InVent – Monopolar Electrodes

GK361R

Blunt Electrode, diam. 1.1 mm

GK365R

Hook Electrode, 70°, diam. 2.2 mm

GK363R

Needle Electrode, diam. 1.1 mm

GK362R

Hook Electrode, 90°, diam. 2.2 mm

GK364R

Hook Electrode, 45°, diam. 2.2 mm

GK366R

Hook Electrode, 180°, diam. 2.2 mm

GK246

Monopolar Cable, 12 ft

MINOP® InVent

FF373R

Micro Scissors

FF374R

Micro Grasping and Dissecting Forceps

FF378R

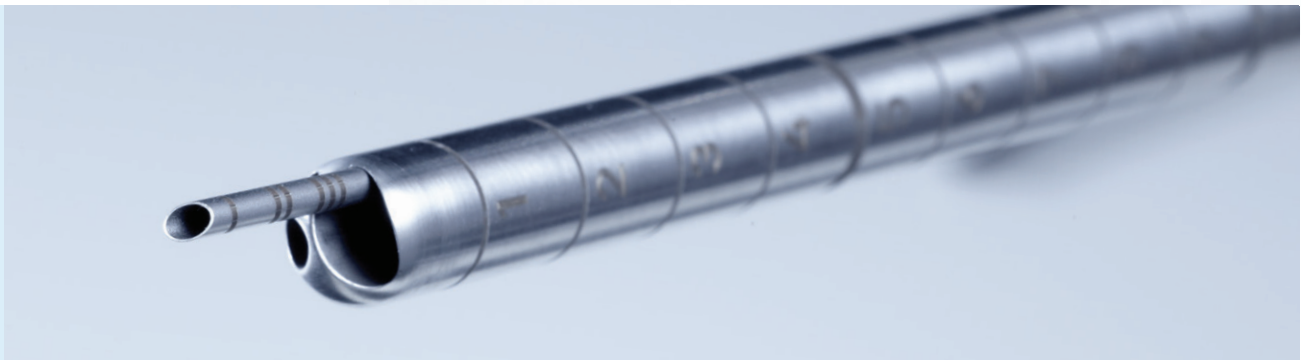
Micro Biopsy Forceps

FH606SU

Suction Cannula,
blunt tip 0°, diam. 2.0 mm

FH607SU

Suction Cannula,
sharp tip 45°, diam. 2.0 mm



MINOP® InVent

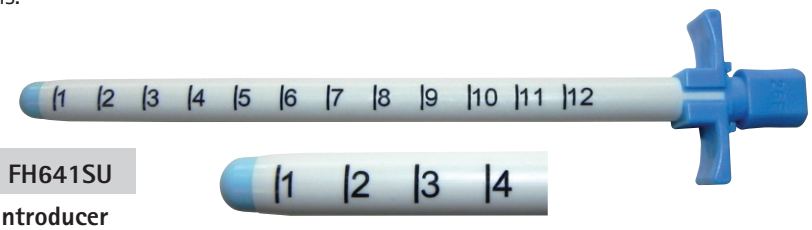
Intraventricular Neuroendoscopy System

MINOP InVent – Disposable Introducer

Indications for Use: The purpose of the MINOP Disposable Introducer is to obtain and maintain a temporary pathway to the ventricular system of the patient. The MINOP Disposable Introducer is designed to be split lengthwise and peeled down to the skull level of the patient, accommodating different depth requirements. See Instructions for Use for additional information including Warnings and Precautions.
Rx Only.

MINOP InVent Disposable Introducer

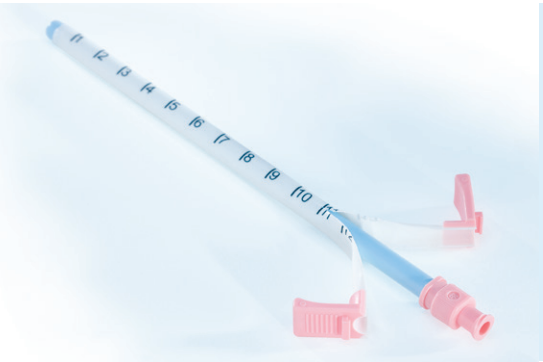
- 26 Fr disposable introducer set including obturator and sheath
- Especially for MINOP trocar FH620R
- Introducer sheath protects the brain while inserting and removing the endoscope/trocar
- Round & blunt obturator tip for atraumatic insertion into the ventricles
- Depth scale for precise positioning and perfect control
- Easy to peel with side handles



FH641SU

Introducer
26 Fr (inner diameter)
28 Fr (outer diameter)

The MINOP suction cannula and the MINOP disposable introducer can be used in almost any intraventricular neuroendoscopic surgery providing more safety and control during the procedure. The suction cannula can be used for the controlled and fast removal of intraventricular soft tumors or colloid cysts with its sharp cannula tip or even for the opening of the floor of the 3rd ventricle. The disposable introducer (also called peel away) is very helpful when several intraparenchymal in- and out-movements of the trocar are necessary.

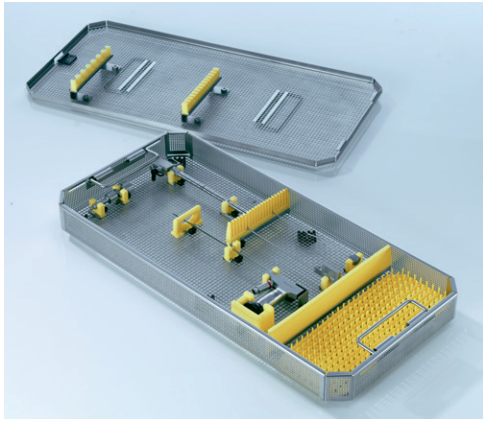


MINOP® InVent – Storage

FH358R

For MINOP InVent Trocars and Scope

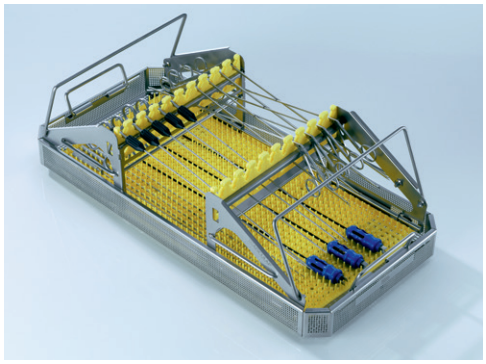
- Storage rack with silicone protection and cushioning bottom and lid
- L/W/H 540 x 253 x 56 mm
- Aesculap container JN441 with JK489 lid (sold separately)



FH359R

For MINOP InVent Instruments and Electrodes

- Storage rack with silicone protection and cushioning bottom and lid
- L/W/H 540 x 253 x 166 mm
- Aesculap container JN446 with JK489 lid (sold separately)



Endoscope Assisted Microneurosurgery

The aim of minimally invasive neurosurgery is to avoid approach-related traumatization to the patient by creating a tailor-made, limited craniotomy based on skilled preoperative planning.

Using modern diagnostic tools, surgical instruments, and visual equipment, the specific anatomy and pathology of the individual patient can be precisely visualized and anatomical pathways and surgical corridors can be determined for the surgical approach. Using this predefined plan, surgical dissection can be subsequently performed creating a much less traumatic cranial opening. The aim is not the limited cranial opening but the minimization of injury with less brain exploration and retraction. The craniotomy should be as small as possible for minimally invasive exposure, but as large as necessary for achieving maximal surgical effect. In this way, limited exposure is not the primary goal but the result of the keyhole concept, with the main goal being the avoidance of any surgery-related complications.

The intraoperative use of microscopes is mandatory in keyhole neurosurgery. The operating microscope provides both stereoscopic magnification and illumination of the surgical field. However, the loss of light intensity in the depth of the surgical field is a fundamental problem in keyhole approaches.

For the purpose of bringing light into the site, operating microscopes can effectively be combined with intraoperative use of modern endoscopes. The advantages of the endoscopic image are increased light, extended viewing angle, and a better depiction of anatomical details in close-up. The endoscope is especially ideal for obtaining a detailed view about structures in the shadow of the microscope's light beam. Thus, in situations during microsurgical dissection, where additional visual information about the target area is desired or when avoidance of superficial structure retraction is recommended, an endoscope may be introduced into the surgical site.

The use of dedicated microneurosurgical instruments is obligatory in transcranial endoscope assisted microneurosurgery. Highly sophisticated instrumentation including microdrills, kerrison bonepunches, self-retaining retractors, suction tubes, fine bipolar forceps, microscissors, diamond knives, microforceps, microdissectors, microcurettes, and clip appliers are mandatory for microsurgical dissection.

All before mentioned surgical tools – the microscope, endoscope and dedicated surgical instruments – complement each other and contribute in a TEAM-work manner to meet the goal of the keyhole concept: Achieving the smallest iatrogenic trauma with the highest therapeutic effect for the patients.

Nikolai Hopf, Stuttgart, Germany
Peter Nakaji, Phoenix, USA

Peter Nakaji
Phoenix, USA

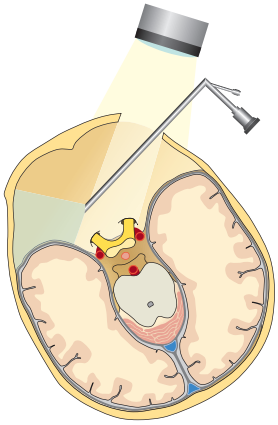
Nikolai Hopf
Stuttgart, Germany

Transcranial Endoscope Assisted Microneurosurgery

Angled "Perneczky" Scopes

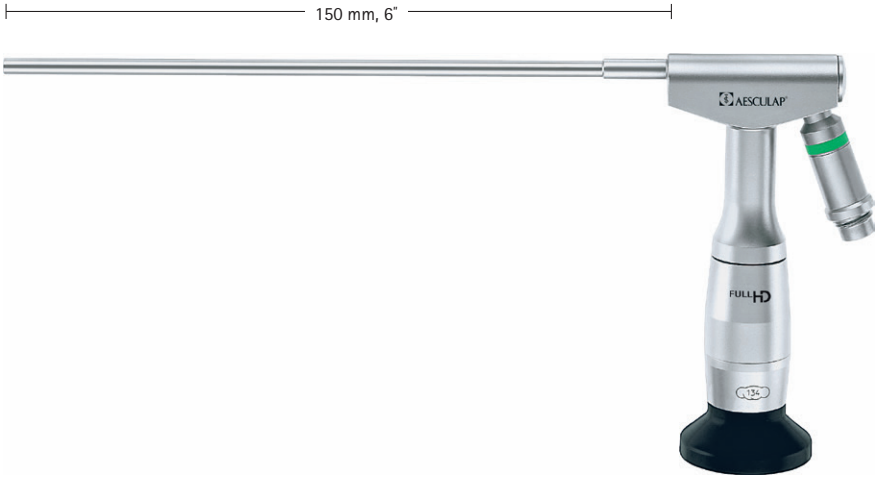
Indications for Use: Aesculap's angled neuroendoscopes are intended for use in visualization of ventricles and structures within the brain. See Instructions for Use for additional information, including warnings and precautions. Rx only.

- FULL HD ready scopes, diam. 4.0 mm
- Brilliant image, rod lens system and different viewing directions (0°, 30°, 70°)
- Angled endoscope design and lateral connection for camera and light source
- Ergonomic handling by centered balance of weight
- Permits parallel microscope image
- Free area around the scope shaft for parallel use of micro instruments
- Robust and rigid scope sheath enables the scope to be used as a dissector, manipulating delicate structures without bending the scope



PE486A

Angled Endoscope
Direction of view: 0°
Shaft diameter: 4 mm
Shaft length: 150 mm, 6"

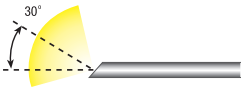


"I have been using the Aesculap angled Perneczky scopes since the mid nineties and in over 1000 cases. I have trialed many different scopes for endoscope-assisted surgery but the Perneczky scopes have the versatility that I need when removing tumors from many different cranial locations. The main advantage of the angled scopes is the unique design that allows simultaneous use of endoscope and microscope. Other important qualities that are met by this system are robustness, ability to use it to retract if necessary and clarity of image. I believe these scopes are an essential tool in the neurosurgeon's armamentarium."

Charles Teo, Sydney, Australia

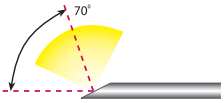
PE506A

Angled Endoscope
Direction of view: 30°, upwards
Shaft diameter: 4 mm
Shaft length: 150 mm, 6"



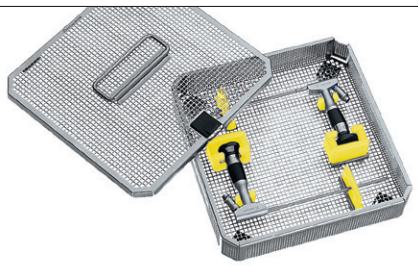
PE526A

Angled Endoscope
Direction of view: 70°, upwards
Shaft diameter: 4 mm
Shaft length: 150 mm, 6"



JF324R

For "Perneczky" Scopes
- Storage tray with silicone cushioning racks and lid for 2 angled neuroscopes (not included) (L/W/H 243 x 253 x 64 mm)
- Aesculap container JN341 with JK389 lid (sold separately)

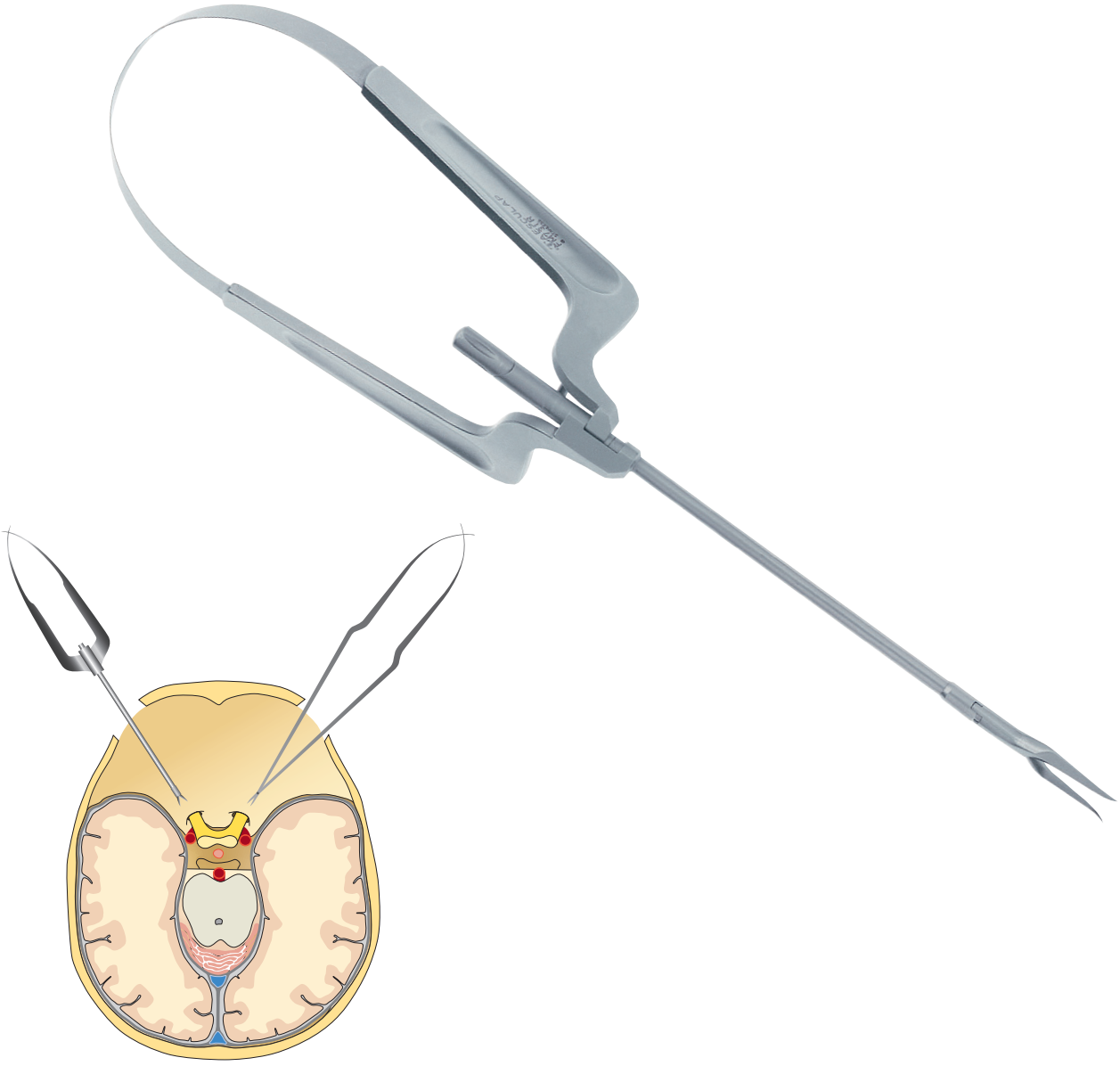


"During microneurosurgical skull base approaches for either vascular lesions or tumors, there is often a difficulty of visualizing important neurovascular structures around and behind the lesion. In such a situation, the use of endoscopes has greatly advanced my surgical possibilities. The additional view through the endoscopes, which is complementary to what can be seen through the operating microscope, facilitates the handling of the lesion, be it aneurysm clipping or tumor removal, while at the same time there is no need for extensive retraction or bone removal."

André Grotenhuis, Nijmegen, Netherlands

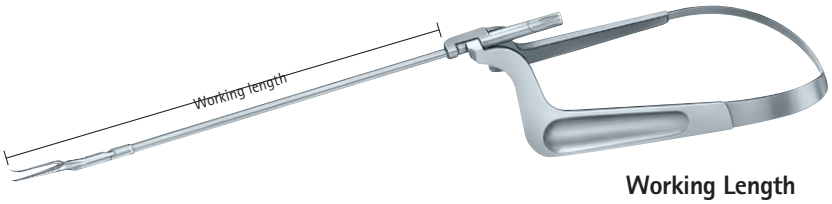
Transcranial Endoscope Assisted Microneurosurgery

XS Tube Shaft Microinstruments

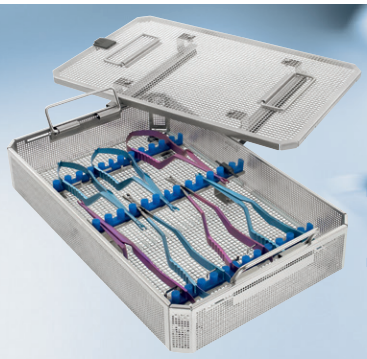


Performing limited keyhole approaches, the application of conventional microsurgical instruments becomes limited in several cases. Slender keyhole microinstruments have been specially created to overcome this problem allowing unhindered introduction of the tool through the limited craniotomy. These XS tube-shaft designed instruments can be used in very small operating corridor enabling safe manipulation within the narrow surgical passage and obvious visualisation of the surgical field.

Robert Reisch, Zurich, Switzerland



	Working Length	70 mm 2 3/4"	100 mm 4"	130 mm 5 1/8"
	Total Length	200 mm 8"	230 mm 9"	260 mm 10 1/4"
 **XS Micro Scissors,** straight, sharp/sharp		**FM670R**	**FM671R**	**FM672R**
 **XS Micro Scissors,** straight, blunt/blunt		**FM690R**	**FM691R**	**FM692R**
 **XS Micro Scissors,** curved, sharp/sharp		**FM680R**	**FM681R**	**FM682R**
 **XS Micro Scissors,** curved, blunt/blunt		**FM700R**	**FM701R**	**FM702R**
 **XS Micro Forceps,** Jaw 0.9 mm		**FM710R**	**FM711R**	**FM712R**
 **XS Micro Tumor Grasping Forceps,** Jaw 3 mm, sharp		**FM720R**	**FM721R**	**FM722R**

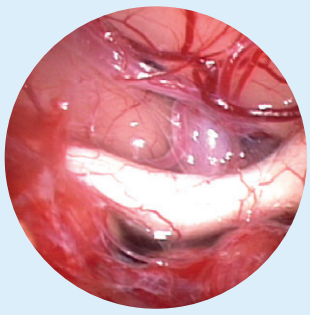


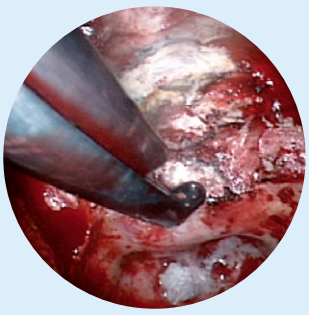
FM665R
For XS Tube Shaft Microinstruments

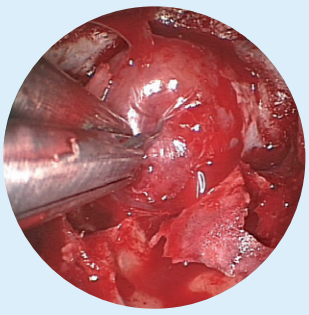
- Storage tray for XS Microinstruments (not included) (L/W/H 406 x 253 x 76 mm)
- Aesculap container JN741 with JK789 lid (sold separately)

MINOP® TREND

TRansnasal ENDoscopic System







When looking at recent publications on transsphenoidal surgery, it will be clear that TRanssphenoidal ENDoscopy is TREND-setting! However, this endoscopic technique is not in routine use everywhere and neurosurgeons are often reluctant to use it because permanent contamination of the endoscope with blood and nasal secretions hinders orientation. In addition, para-endoscopic and biportal dissection are very unfamiliar and possess steep learning curves.

Nevertheless, endoscopic visualization and para-endoscopic dissection without using the surgical microscope offer several undisputable advantages. Advantages in visualization increase light intensity in the deep-seated surgical field and clearly display patho-anatomical details. In addition, the extended viewing angle of endoscopes enable surgeons to observe hidden parts of the surgical field. The major benefit in surgical dissection is the unhindered approach to these clearly visible structures. Without using a nasal speculum, surgical manipulation is not impeded and the instruments are freely mobile. In addition, a pure endoscopic technique avoids the need for rhinoseptal submucosal dissection, providing a more direct and quicker approach to the sphenoid sinus. This method avoids the need for postoperative nasal packing, thus causing less pain and discomfort after surgery, providing better nasal airflow and a shorter hospital stay.

Pre-conditions of transsphenoidal endoscopy are the basic endoscopic experience and anatomical studies in the laboratory; however, it is indispensable to use a dedicated endoscopic system to further shorten the learning phase. The endoscope for transsphenoidal skull-base surgery must provide a brilliant image quality with true colors, high contrast, and highly realistic images. This simplifies the differentiation between healthy and pathological structures. It is essential to have an effective cleaning function in order to free the endoscope lens from fog, blood, or mucosal secretions. Additionally, the endoscope must offer a highly ergonomic design and sufficient working length for extended approaches. For selected cases, it is also necessary to connect the endoscope to a navigation system or a holding device.

André Grotenhuis, Nijmegen, Netherlands
Robert Reisch, Zurich, Switzerland

André Grotenhuis
Nijmegen, Netherlands

Robert Reisch
Zurich, Switzerland

MINOP® TREND

TRansnasal ENDoscopic System

MINOP TREND

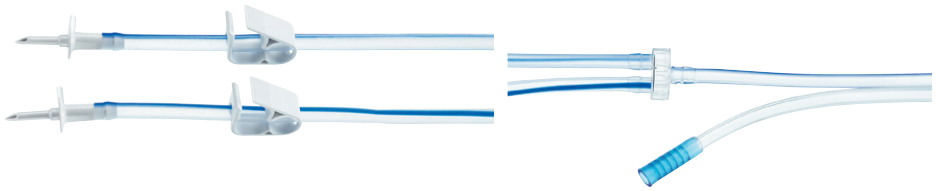
Indications for Use: Aesculap's MINOP System is indicated for use in endoscope-assisted microneurosurgery and pure neuroendoscopy (i.e. ventriculoscopy) for direct visualization, diagnostic and/or therapeutic procedures such as ventriculostomies, biopsies and removal of cysts, tumors and other obstructions. See Instructions for Use for additional information, including warnings and precautions. Rx only.

FH615

Handle with Irrigation Button
for FH610R and FH611R
Ergonomic grasping part

FH605SU

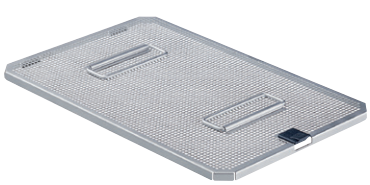
Suction and Irrigation Tube
sterile, 4.5 m, 2 puncture needles,
for MINOP TREND handle FH615
and FH610R/FH611R,
Package of 10 tubes

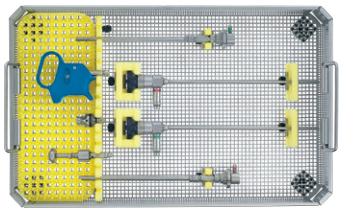


FF357R

For MINOP Trend Scopes and Trocars

- Storage tray with silicone padding and lid for all MINOP TREND components (L/W/H 406 x 253 x 64 mm)
- Aesculap container JN741 with JK789 lid (sold separately)





"The view through the operating microscope allows a purely coaxial visualisation in transsphenoidal surgery: laterally located structures are concealed behind the nasal speculum. Blind tumor removal involves a higher risk of iatrogenic damage to neurovascular structures and a possible increase in tumor remnants. With the use of the MINOP TREND endoscope for transnasal procedures, these laterally located parts of the field are directly visible and therefore surgically better approachable. In the past 15 years of endoscopic transnasal surgery, the use of endoscopes has proven to be not only indispensable but rather mandatory for a safe and effective transnasal surgery in the sellar and parasellar region."

André Grotenhuis, Nijmegen, Netherlands

PE487A

Endoscope
0° viewing angle,
shaft diameter 4.0 mm

PE507A

Endoscope
30° viewing angle,
shaft diameter 4.0 mm

FH610R

Suction and Irrigation Trocar
for 0° endoscope PE487A
Diameter: 4.5 / 6.0 mm
Working length: 120 mm

FH611R

Suction and Irrigation Trocar
for 30° endoscope PE507A
Diameter: 4.5 / 6.0 mm
Working length: 120 mm

"No other system that I have used combines as many helpful features in a single 'instrument'. The lens cleaning is rapid and conveniently controlled with a button, instead of a pedal. The suction is effective. The ability to rotate the scope easily and quickly within the handle improves angled viewing. Overall, these features make the MINOP® TREND an asset for endonasal surgery."

Jeremy Greenlee, Iowa City, USA

MINOP® TREND

TRansnasal ENDoscopic System

TREND – Curettes and Dissectors

FA041R-FA068R
Working length
130 mm, 5 ⅛"
Total length
280 mm, 11"

NICOLA
FA041R
Curette
diam. 6.5 mm
45° vertical angled
long neck

NICOLA
FA042R
Curette
diam. 6.5 mm
45° horizontal
angled, short
neck

HARDY
FA043R
Enucleator
left cutting

HARDY
FA044R
Enucleator
right cutting

HARDY
FA045R
Curette
diam. 4.0 mm
90° left angled
long neck

HARDY
FA046R
Curette
diam. 4.0 mm
90° left angled
short neck

HARDY
FA047R
Curette
diam. 4.0 mm
90° right angled
long neck

HARDY
FA060R
Curette
diam. 4.0 mm
90° right angled
short neck

"Difficulties in the learning curve of transsphenoidal endoscopy are often caused by handicaps of endoscope systems. The TREND endoscope clearly compensates this drawback with a human-engineered grasping part. The surgeon holds the TREND endoscope as a fine microinstrument allowing precise manipulation; the unique construction and perfect balance provide a less tiring tool for the neurosurgeon. The efficient suction/irrigation device is also incorporated within the grasping part where the valve is controlled simply with the index finger. Moreover the grasping part offers a quick connection of the endoscope to a holding arm and easy application with several navigation systems."

Robert Reisch, Zurich, Switzerland

HARDY

FA061R

Curette
diam. 4.0 mm
45° left
horizontal angled
short neck

HARDY

FA062R

Curette
diam. 4.0 mm
45° right
horizontal angled
short neck

HARDY

FA063R

Curette
diam. 6.0 mm
90° left angled
long neck

HARDY

FA064R

Curette
diam. 6.0 mm
90° left angled
short neck

HARDY

FA065R

Curette
diam. 6.0 mm
90° right angled
long neck

HARDY

FA066R

Curette
diam. 6.0 mm
90° right angled
short neck

REULEN-
LANDOLT

FA067R

Micro Hook
diam. 1.7 mm

1/1

REULEN-
LANDOLT

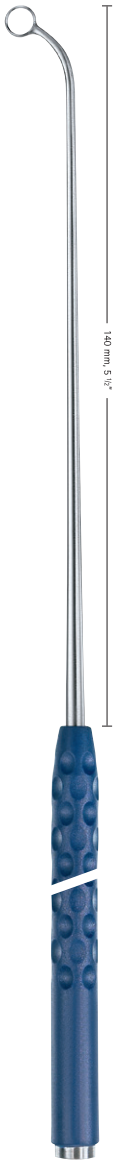
FA068R

Dissector
diam. 2.0 mm
blunt

MINOP® TREND

TRansnasal ENDoscopic System

TREND – Curettes and Dissectors



FA030R-FA040R

- Working length: 140 mm, 5½"
- Total length: 265 mm, 10½"
- Straight design with ergonomic grasping part and semi-sharp tips

NICOLA
FA030R
Curette
diam. 6.5 mm
45° vertical
angled, long neck

NICOLA
FA031R
Curette
diam. 6.5 mm
45° horizontal
angled, short neck

HARDY
FA032R
Enucleator

left cutting

HARDY
FA033R
Enucleator

right cutting

HARDY
FA034R
Curette
diam. 4.0 mm
90° angled
long neck

HARDY
FA035R
Curette
diam. 4.0 mm
90° angled
short neck

1/1

HARDY
FA036R
Curette
diam. 4.0 mm
45° angled
short neck

HARDY
FA037R
Curette
diam. 6.0 mm
90° angled
long neck

HARDY
FA038R
Curette
diam. 6.0 mm
90° angled
short neck

LANDOLT-REULEN
FA039R
Micro Hook
diam. 1.7 mm

LANDOLT-REULEN
FA040R
Dissector
diam. 2.0 mm
blunt

1/1

The TREND Instruments join a long line of pituitary and transnasal instruments from Aesculap

Extra Long Power Handpieces

Thin Footplate Kerrison Bone Punches

Suction Instruments

Sensation Instruments

Micro Instruments

Bipolar Coagulation Forceps

XS Micro Instruments

TREND Transnasal Instruments

Holding Devices

Mechanical Holding Arm

FF168R

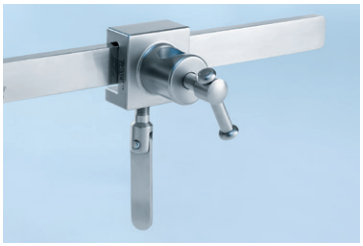
- Flexible holding device with mechanical fixation
- Assembly: flexible holding arm with integrated fixation bar
- Total length: 107 cm
- Length of fixation bar: 46 cm
- Diameter of fixation bar: 20 mm
- Total weight: 0.7 kg
- Holding force: 4 kg
- Easy mechanical fixation by clamping handle
- Small, flexible joints for fine positioning
- Full range of accessories/adapters for connecting Aesculap endoscopes, trocars and instruments
- Holding Arm fits into regular standard 1/1 container

FF280R

Flexible fixing element with ball joint suitable for RT040R and FF168R

RT090R

Flexible fixing element with sprocket suitable for RT040R and FF168R



FF151R

Rigid fixation element suitable for RT040R and FF168R

Adapters for M-TRAC

RT046P

Universal Holder
for Endoscopes diam. 3.0-7.5 mm
consisting of: RT081R and RT055P

RT081R

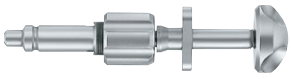
Adapter
for universal insert RT055P

RT055P

Universal Insert (Spare Part) for
Endoscopes diam. 3.0-7.5 mm

RT099R

Adapter
for fixation of MINOP® TREND
handle, FH615



RT079R

Adapter
for fixation of angled
neuroscopes PE486A, PE506A,
PE526A

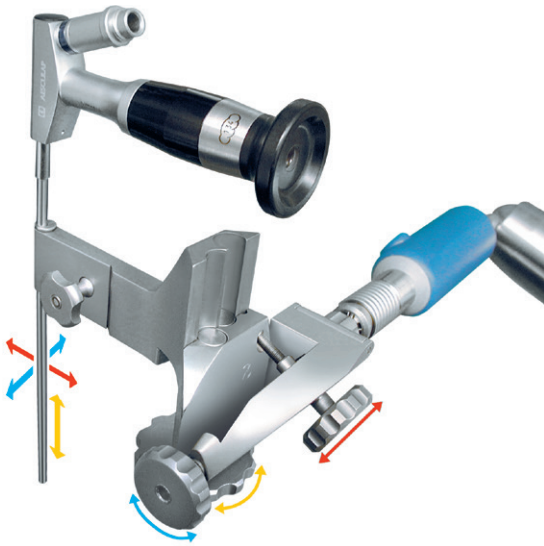
Holding Devices

NeuroPilot® – Fine-positioning for Mechanical Holding Arm

NeuroPilot is a unique steering device for neuroendoscopes. After positioning the neuroendoscope in situ, finest corrections or adjustments are necessary, to receive the optimal endoscopic image. With traditional holding devices, only rough positioning is possible; a precise and fine steering of the neuro-endoscope can be compromised.

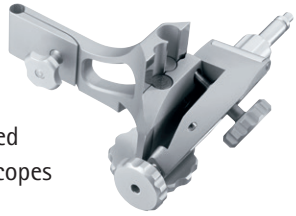
NeuroPilot offers a number of unique advantages:

- Optimal fixation of the neuro-endoscope in the NeuroPilot and the holding device UNITRAC
- Precise steering of the neuroendoscope by three screws in the three-dimensional space
- Safe maneuvering of the neuroendoscope by defined movements in the sub-millimeter area
- Optimal positioning of the neuroendoscope in situ



RT060R

NeuroPilot
for intraventricular and endoscope-assisted indications with all Aesculap neuroendoscopes



RT061R

Insert for angled neuroscopes PE486A - PE526A with diam. 4 mm

RT064R

Insert for MINOP trocars FF398R and FH601R with diam. 4.6 mm

RT065R

Insert for MINOP trocar FF399R with diam. 6 mm

RT066R

Insert for PaediScope® PF010A with diam. 3 mm

"In pure intraventricular neuroendoscopy, a micro-steering device can be extremely useful. If the precision and adjustment of a holding arm is not enough, the Neuropilot closes this gap. Additionally, in cases where both hands are needed for instrumentation the Neuropilot is of great help. The Aesculap Neuropilot is the only system on the market providing finest correction of your endoscope in a three-dimensional space inside the ventricular compartments."

Peter Nakaji, Phoenix, USA

Aeos™ Digital Microscope

Rethink your microscope.
We did.

The future of digital surgical microscopy has arrived. The advanced features of the Aeos Digital Microscope raise the bar on the surgical capabilities compared to traditional microscopes.

Immersive 4K 3D + HDR imaging
Large 55" screen capability during surgery provides the surgeon and entire OR team with the same high quality image.

Heads up surgery
Unrestricted, unobstructed view allows the surgeon, not the microscope, to determine ergonomics.

Robotic-assisted movements
Precise repositioning places the camera head exactly where it needs to be and when the surgeon needs it there.

Contact your Aesculap sales representative to learn how the Aeos Digital Microscope can change your surgical view.

ELAN® 4 Power System

ELAN 4 is intended for high speed cutting, sawing and drilling of bone in the fields of Spine, ENT, Neuro and Maxillofacial Surgery. See Instructions for Use for additional information, including contraindications, warnings and precautions.

Rx only.

ELAN 4 is the next generation of electric and pneumatic power systems for neuro and spine surgery. ELAN 4 delivers a new technical concept that addresses important requirements not only for the surgeon, but for an OR Team, Sterile Processing Department and members of a hospital's buying center.

ELAN 4 electro and ELAN 4 air are two systems with one handling philosophy. This means that ELAN 4 electro and air are as similar as possible in handling, accessories, tools, and reprocessing. All couplings are plug and play, creating a system that is intuitive, making ELAN 4 extremely easy to understand and use. ELAN 4 introduces direct drive technology, which delivers increased power while reducing heat generation, resulting in a reliable,high performing, precision handpiece.

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MINOP Endoscope Assisted

Scopes

PE486A – MINOP Endoscope Assisted 0°

PE506A – MINOP Endoscope Assisted 30°

PE526A – MINOP Endoscope Assisted 70°

Instruments

FM670R – XS Micro Scissors, straight, sharp/sharp, 8"

FM671R – XS Micro Scissors, straight, sharp/sharp, 9"

FM672R – XS Micro Scissors, straight, sharp/sharp, 10¼"

FM690R – XS Micro Scissors, straight, blunt/blunt, 8"

FM691R – XS Micro Scissors, straight, blunt/blunt, 9"

FM692R – XS Micro Scissors, straight, blunt/blunt, 10¼"

FM680R – XS Micro Scissors, curved, sharp/sharp, 8"

FM681R – XS Micro Scissors, curved, sharp/sharp, 9"

FM682R – XS Micro Scissors, curved, sharp/sharp, 10¼"

FM700R – XS Micro Scissors, curved, blunt/blunt, 8"

FM701R – XS Micro Scissors, curved, blunt/blunt, 9"

FM702R – XS Micro Scissors, curved, blunt/blunt, 10¼"

FM710R – XS Micro Forceps, 8"

FM711R – XS Micro Forceps, 9"

FM712R – XS Micro Forceps, 10¼"

FM720R – XS Micro Tumor Grasping Forceps, 8"

FM721R – XS Micro Tumor Grasping Forceps, 9"

FM722R – XS Micro Tumor Grasping Forceps, 10¼"

Storage

JF324R – MINOP Storage Rack for two scopes

JN341 – Container Bottom, half-size, perforated, 4¼", for JF324R

JK389 – Container Lid, half-size, silver

MINOP TREND Transphenoidal Endoscopic

Scopes

PE487A – MINOP TREND 0° Scope

PE507A – MINOP TREND 30° Scope

Trocars

FH610R – MINOP TREND Irrigation/Suction Trocar for PE487A

FH611R – MINOP TREND Irrigation/Suction Trocar for PE507A

FH615 – MINOP TREND Ergonomic Grasping Handle with irrigation button

FH615801 – Irrigation Button

Tubing

FH605SU – Suction and Irrigation Tubing, sterile, pack of 10

Storage

FF357R – Storage Tray for all MINOP TREND components

JK741 – Container Bottom, ¾ size, perforated, 4¼", for FF357R

JK789 – Container Lid, ¾ size, silver

Instruments

FA041R – TREND Nicola Currette Bayonet, D: 6.5 mm, 45° vertical angle

FA042R – TREND Nicola Currette Bayonet, D: 6.5 mm, 45° horizontal angle

FA043R – TREND Hardy Enucleator Bayonet, left cutting

FA044R – TREND Hardy Enucleator Bayonet, right cutting

FA045R – TREND Hardy Curette Bayonet, D: 4.0 mm, 90° left angle, long neck

FA046R – TREND Hardy Curette Bayonet, D: 4.0 mm, 90° left angle, short neck

FA047R – TREND Hardy Curette Bayonet, D: 4.0 mm, 90° right angle, long neck

FA060R – TREND Hardy Curette Bayonet, D: 4.0 mm, 90° right angle, short neck

FA061R – TREND Hardy Curette Bayonet, D: 4.0 mm, 45° left horizontal angle

FA062R – TREND Hardy Curette Bayonet, D: 4.0 mm, 45° right horizontal angle

FA063R – TREND Hardy Curette Bayonet, D: 6.0 mm, 90° left angle, long neck

FA064R – TREND Hardy Curette Bayonet, D: 6.0 mm, 90° left angle, short neck

FA065R – TREND Hardy Curette Bayonet, D: 6.0 mm, 90° right angle, long neck

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Notes

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