Neuroendoscopy
Offering more for patients through less invasive techniques
# Table of Contents

**Intraventricular Neuroendoscopy** ........................................... 6
- MINOP® Trocars ........................................................... 8
- MINOP Endoscopes ......................................................... 10
- MINOP Rigid Instruments ............................................. 11
- MINOP – Electrodes ....................................................... 13
- MINOP Disposable Introducer ....................................... 14
- MINOP – Storage ......................................................... 15
- PaediScope® .............................................................. 16
- MINOP InVent ............................................................. 18
- MINOP InVent Instruments .......................................... 19
- MINOP InVent Electrodes ............................................. 23
- MINOP InVent – Disposable Introducer ....................... 26
- MINOP InVent – Storage ............................................. 27

**Endoscope Assisted Microneurosurgery** .............................. 28
- Angled “Perneczky” Scopes .......................................... 30
- XS Tube Shaft Microinstruments .................................... 32

**Transnasal Neuroendoscopy** .............................................. 34
- MINOP TREND ............................................................ 36
- TREND – Curettes and Dissectors ................................... 38

**Holding Devices** ............................................................. 43
- Mechanical Holding Arm ............................................. 43
- UNITRAC™ – Pneumatic Holding Arm ......................... 44
- Adapters for UNITRAC and M-TRAC ............................ 45
- NeuroPilot® – Fine-positioning for UNITRAC™ and Mechanical Holding Arm ........................................... 46

**MINOP Visual Equipment Systems** .................................. 47
- Full HD Camera System Components ............................ 48
- Lightcable Ordering Information .................................. 49

**Index** ............................................................................ 50
Neuroendoscopy
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
Peter Nakaji, Phoenix, USA
Robert Reisch, 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
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. ventriculosity) 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

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
**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

**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 safety and 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 safety and 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
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.
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

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 489 x 257 x 63 mm)

**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)

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
2:1

**FF374R**
Micro grasping and dissecting forceps
2:1

**FF378R**
Micro biopsy forceps
2:1

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

- **GK363R**
  - Needle electrode
  - 1:1
  - 255 mm, 10’

- **GK361R**
  - Blunt electrode
  - 1:1

- **GK246**
  - Monopolar cable, 12 ft

**Paediscope Disposable Introducer**

- 10 Fr 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 489 x 257 x 63 mm)

---

"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

**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

290 mm, 11⅜”

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

2 mm Complete instrument:
Handle · outer tube · jaw with inner tube

FH635R
MINOP InVent scissors,
sharp/sharp

FH636R
MINOP InVent scissors,
blunt/blunt

FH637R
MINOP InVent biopsy forceps

FH638R
MINOP InVent grasping and
dissecting forceps

FH639R
MINOP InVent surgical forceps
MINOP® InVent
Intraventricular Neuroendoscopy System

MINOP® InVent Instruments | Replacement Parts

Ø 2 mm  Jaw with inner tube

FF435R
MINOP InVent scissors
sharp/sharp

FF436R
MINOP InVent scissors
blunt/blunt

FF437R
MINOP InVent biopsy forceps

FF438R
MINOP InVent grasping and dissecting forceps

FF439R
MINOP InVent surgical forceps

FF633R
MINOP InVent instrument handle
MINOP® InVent – Bipolar Electrodes

**Width/Height:** 3.2 mm x 2.1 mm

- **GK343R**
  - MINOP InVent bipolar electrode 0°

- **GK344R**
  - MINOP InVent bipolar electrode 40°

- **GK345R**
  - MINOP InVent bipolar electrode 30°

- **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

- **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
MINOP® InVent – Bipolar Electrodes

1.0 mm

FF373R
Micro scissors

FF374R
Micro grasping and dissecting forceps

FF378R
Micro biopsy forceps

2.0 mm

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

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

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

JN446        JK489

Full-Size container          Full-Size lid
for FF358R and FF359R

Outside dimensions with lid:
L/W/H 592 x 285 x 265 mm
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
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
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
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
Endoscope-Assisted Microneurosurgery

**XS Micro Scissors,** straight, sharp/sharp
- Working length: 70 mm (2 3/4"")
- Total length: 200 mm (8"")
- Code: **FM670R**

**XS Micro Scissors,** straight, blunt/blunt
- Working length: 100 mm (4"")
- Total length: 230 mm (9"")
- Code: **FM690R**

**XS Micro Scissors,** curved, sharp/sharp
- Working length: 130 mm (5 1/4"")
- Total length: 260 mm (10 1/4"")
- Code: **FM680R**

**XS Micro Scissors,** curved, blunt/blunt
- Code: **FM700R**

**XS Micro Forceps,** Jaw 0.9 mm
- Code: **FM710R**

**XS Micro Tumor Grasping Forceps,** Jaw 3 mm, sharp
- Code: **FM720R**

**FM665R,**
Storage tray for XS Microinstruments (not included)
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
MINOP® TREND
TRansnasal ENDooscopic 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**
Storage tray with silicone padding and lid
for all MINOP TREND components
(L/W/H 410 x 257 x 64 mm)

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
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® TRENDS an asset for endonasal surgery.

Jeremy Greenlee, Iowa City, USA
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
MINOP® TREND
TRansnasal ENDoscoptic 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
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
MINOP® TR Endoscopic Pituitary Surgery

The MINOP TR System was developed in cooperation with:
Prof. Dr. Axel Perneczky  
Neurosurgical University Hospital  
Mainz, Germany
Dr. Wesley King  
Center for Minimally Invasive Neurosurgery  
Los Angeles, CA

MINOP TR Trocar
Outer diameter: 4.6 mm
3 channels:
Optic channel, diam. 2.8 mm
Irrigation channel, diam. 0.8 mm
Suction channel, diam. 0.8 mm

MINOP Endoscope
Direction of view: 0°
Shaft diameter: 2.7 mm

MINOP TR Endoscope
Direction of view: 30°, downwards
Shaft diameter: 2.7 mm

MINOP TR Foot Switch for FH602

MINOP TR Tube Set for FH601R
Length: 8 m
Diameter: 4 mm
with Luer-Lock and puncture needle, sterile
Package contains 5 single tube sets
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
**UNITRAC™ – Pneumatic Holding Arm**

**RT040R**

**UNITRAC**

- Single handed use
- Fast sterile set-up in the OR
- Universal retraction and holding system with special accessories for neuroendoscopy
- Simple to assemble onto the OR table railing
- Integrated safety systems prevent collapse of holding arm if OR compressed air supply is interrupted
- Direct connection to OR compressed air supply
- Diameter of fixation bar: 20 mm
- To be used with JG901

**RT020R**

Quick connect adapter for use with sterile drape JG901 allows the change of instruments after draping with JG901.

**JG901**

Sterile drape for coverage of the Unitrac arms, single-use product, package of 50 pcs.

---

*Bimanual, two-handed dissection forms the foundation of microneurosurgery and is also an essential precondition for transsphenoidal endoneurosurgery. For this reason, the TREND endoscope can be easily fixed in a special holding arm: the endoscope placed through nostril does not disturb surgical dissection, especially by using biportal – binostril approaches. The pneumatic and mechanical devices can be also used effectively in transcranial endoscope-controlled and intraventricular pure endoscopic neurosurgery.*

Nikolai Hopf, Stuttgart, Germany
Adapters for UNITRAC™ and 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
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
Full HD technology has quickly established itself as the standard for quality. It has the following advantages when compared to the previously used PAL/NTSC formats:

- Full HD: 1080p60 delivering six times higher resolution than standard cameras for crystal-clear images of the highest quality (1920 x 1080 pixels)
- Progressive Scan: Images are refreshed 60 times per second to eliminate flicker for a sharper, lag-free image
- 2.5x optical zoom plus 2.0x digital zoom for a max 5.0x zoom
- Groundbreaking new 3-chip technology provides impressive color depth and differentiation
MINOP® Visual Equipment Systems

Full HD Camera System Components

- **PV959**
  26” Full HD Flat Panel Display

- **PV904**
  21.5” Touchscreen Monitor

- **PV647**
  Monitor Stand

- **PV460**
  Camera Control Unit

- **PV462**
  Camera Head with cable and zoomcoupler

- **OP940**
  LED Lightsource

- **OP923**
  Lightcable for Lightsource: 8.2 feet
  OP914: 11.5 feet

- **PV840**
  Full HD Recorder

*See “Visual Equipment Brochure” for ordering information*
**Lightcable Ordering Information**

Follow these steps to use the table below to identify the appropriate lightcable:

- Step 1 - Select your lightsource from the horizontal column.
- Step 2 - Select your scope from the vertical column.
- Step 3 - The box where they meet represents the appropriate lightcable.

*Example: Using an Aesculap lightsource and an Aesculap scope – Order MB111*

<table>
<thead>
<tr>
<th>Your Scope(s) is from</th>
<th>Aesculap/Storz</th>
<th>Olympus</th>
<th>CIRCON/ACMI</th>
<th>STRYKER</th>
<th>WOLF/DYONICS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aesculap/Storz</td>
<td>Lightcable: MB111 (Aesculap LS/Aesculap S)</td>
<td>Lightcable: MB112 (Olympus LS/Aesculap S)</td>
<td>Lightcable: MB113 (Circon LS/Aesculap S)</td>
<td>Lightcable: MB114 (Stryker LS/Aesculap S)</td>
<td>Lightcable: MB115 (Wolf LS/Aesculap S)</td>
</tr>
</tbody>
</table>

- The universal lightcable and all adapters can also be ordered separately

<table>
<thead>
<tr>
<th>MB100</th>
<th>Universal lightcable with no end fittings, Light fiber bundle: 5 mm, Length: 10 ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>MB001</td>
<td>Aesculap / Storz adapter for lightcable (LS end)</td>
</tr>
<tr>
<td>MB002</td>
<td>Olympus adapter for lightcable (LS end)</td>
</tr>
<tr>
<td>MB003</td>
<td>Circon / ACMI adapter for lightcable (LS end)</td>
</tr>
<tr>
<td>MB004</td>
<td>Stryker adapter for lightcable (LS end)</td>
</tr>
<tr>
<td>MB005</td>
<td>Wolf/Dyonics adapter for lightcable (LS end)</td>
</tr>
<tr>
<td>MB010</td>
<td>Aesculap / Storz / Olympus adapter for lightcable (S end)</td>
</tr>
<tr>
<td>MB020</td>
<td>Olympus (with condenser lens) adapter for lightcable (S end)</td>
</tr>
<tr>
<td>MB030</td>
<td>Circon / ACMI / Stryker adapter for lightcable (S end)</td>
</tr>
<tr>
<td>MB050</td>
<td>Wolf/Dyonics adapter for lightcable (S end)</td>
</tr>
</tbody>
</table>
MINOP® Intraventricular

Scopes
PE184A – MINOP Ventriculoscope 0°
PE204A – MINOP Ventriculoscope 30°

Trocar
FF399R – MINOP Trocar, 4 channel, 6.0 mm diameter
FF398R – MINOP Trocar, 3 channel, 4.6 mm diameter
FF397R – MINOP Trocar, 1 channel, 3.2 mm diameter

Instruments
FF385R – MINOP Microscissors sharp/sharp
FF386R – MINOP Microscissors blunt/blunt
FF387R – MINOP Biopsy Forceps
FF388R – MINOP Fixation and Dissection Forceps
FF389R – MINOP Surgical Micro Forceps
Replacement Inntube
FF435R – Inntube for FF385R
FF436R – Inntube for FF386R
FF437R – Inntube for FF387R
FF438R – Inntube for FF388R
FF439R – Inntube for FF389R
Replacement Handle
FF432R – Handle for MINOP Instruments FF385R-FF389R
Replacement Outer Tube
FF433R – Outer Tube for MINOP Instruments FF385R-FF389R

Electrodes
GK361R – MINOP Monopolar Blunt Electrode
GK362R – MINOP Monopolar 90° Hook Electrode
GK363R – MINOP Monopolar Needle Electrode
GK364R – MINOP Monopolar 45° Hook Electrode
GK365R – MINOP Monopolar 70° Hook Electrode
GK366R – MINOP Monopolar J Hook Electrode
GK246 – Monopolar Cable, 12 ft
GK360R – Bipolar Fork Electrode
US359 – Bipolar Cable, dual pin, reusable
US349SP – Bipolar Cable, dual pin, disposable (pack of 10)

Accessories
FH606SU – Suction Cannula, blunt tip 0°
FH607SU – Suction Cannula, sharp tip 45°
FH604SU – Disposable Introducer, 19Fr

Storage
FF358R – MINOP Storage Rack – Trocars/Endoscope
FF359R – MINOP Storage Rack – Instruments/Electrodes
JN440 – Container Bottom, full-size, perforated, 4/4", for FF358R
JN444 – Container Bottom, full-size, perforated, 8", for FF359R
JK489 – Container Lid, full-size, silver

MINOP InVent

Scope
PE204A – MINOP Angled Endoscope 30° 180 mm 2.7 mm

Holding Arm
RT068R – MINOP InVent Adapter for Holding Arm
FF168R – Holding Arm MECH.3 Joints Right Adapter
FF280R – Adapter For OR Table

Trocar
FH620R – MINOP InVent 30° Trocar, D:8.3 mm L:150 mm

Shaft Instruments
FH621R – MINOP InVent Forceps Straight, L:290 mm
FH622R – MINOP InVent Forceps Right, L:290 mm
FH623R – MINOP InVent Forceps Left, L:290 mm
FH624R – MINOP InVent Grasping Forceps, L:290 mm
FH625R – MINOP InVent Scissors Straight, L:290 mm
FH626R – MINOP InVent Scissors Left, L:290 mm
FH627R – MINOP InVent Scissors Right, L:290 mm
FH628R – MINOP InVent Scissors Upwards, L:290 mm

Dissectors
FH629R – MINOP InVent Dissector Large, L:356 mm
FH630R – MINOP InVent Dissector Medium, L:356 mm
<table>
<thead>
<tr>
<th>Item Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FH631R</td>
<td>MINOP InVent Dissector Small, L:356 mm</td>
</tr>
<tr>
<td>FH632R</td>
<td>MINOP InVent Hook 90°Blunt, L:356 mm</td>
</tr>
<tr>
<td>FH634R</td>
<td>MINOP InVent Knife Backwards Cutting, L:356 mm</td>
</tr>
<tr>
<td></td>
<td><strong>Tube Shaft Instruments</strong></td>
</tr>
<tr>
<td>FH635R</td>
<td>MINOP InVent Microscissors Sharp</td>
</tr>
<tr>
<td>FH636R</td>
<td>MINOP InVent Microscissors Blunt</td>
</tr>
<tr>
<td>FH637R</td>
<td>MINOP InVent Micro Biopsy Forceps</td>
</tr>
<tr>
<td>FH638R</td>
<td>MINOP InVent Micro Grasping Forceps</td>
</tr>
<tr>
<td>FH639R</td>
<td>MINOP InVent Surgery Micro Grasping Forceps</td>
</tr>
<tr>
<td></td>
<td><strong>Replacement Innertube</strong></td>
</tr>
<tr>
<td>FF435R</td>
<td>Innertube for FH635R</td>
</tr>
<tr>
<td>FF436R</td>
<td>Innertube for FH636R</td>
</tr>
<tr>
<td>FF437R</td>
<td>Innertube for FH637R</td>
</tr>
<tr>
<td>FF438R</td>
<td>Innertube for FH638R</td>
</tr>
<tr>
<td>FF439R</td>
<td>Innertube for FH639R</td>
</tr>
<tr>
<td></td>
<td><strong>Replacement Handle</strong></td>
</tr>
<tr>
<td>FH633R</td>
<td>MINOP InVent Handle for Tube Shaft Instrument</td>
</tr>
<tr>
<td></td>
<td><strong>Replacement Outer Tube</strong></td>
</tr>
<tr>
<td>FH635200</td>
<td>MINOP InVent Outer Tube</td>
</tr>
<tr>
<td></td>
<td><strong>Bipolars</strong></td>
</tr>
<tr>
<td>GK343R</td>
<td>MINOP InVent Bipolar 0° D: 2.7 mm L:310 mm</td>
</tr>
<tr>
<td>GK344R</td>
<td>MINOP InVent Bipolar 40° D: 2.7 mm L:310 mm</td>
</tr>
<tr>
<td>GK345R</td>
<td>MINOP InVent Bipolar 30° D: 2.7 mm L:310 mm</td>
</tr>
<tr>
<td>US359</td>
<td>Bipolar Cable, 12 ft</td>
</tr>
<tr>
<td></td>
<td><strong>Bipolars and Monopolars</strong></td>
</tr>
<tr>
<td>GK360R</td>
<td>MINOP Bipolar Fork Electrode, 2.1 mm</td>
</tr>
<tr>
<td>GK361R</td>
<td>MONOPOLAR Blunt Electrode, 1.1 mm D: 255 mm</td>
</tr>
<tr>
<td>GK362R</td>
<td>MINOP Monopolar Hook Electrode, 2.1 mm D: 255 mm</td>
</tr>
<tr>
<td>GK363R</td>
<td>MINOP Monopolar Needle Electrode, 1.1 mm D: 255 mm</td>
</tr>
<tr>
<td>GK364R</td>
<td>MINOP Monopolar Hook Electrode 45°, 2.2 mm DIA:255 mm</td>
</tr>
<tr>
<td></td>
<td><strong>Flexible Instruments</strong></td>
</tr>
<tr>
<td>FK365R</td>
<td>MINOP Monopolar Hook Electrode 70°, 2.2 mm D: 255 mm</td>
</tr>
<tr>
<td>FK366R</td>
<td>MINOP Monopolar J-Hook Electrode, 2.2 mm D: 255 mm</td>
</tr>
<tr>
<td>FK246</td>
<td>Monopolar Cable, 12 ft</td>
</tr>
<tr>
<td></td>
<td><strong>Accessories</strong></td>
</tr>
<tr>
<td>FH606SU</td>
<td>MINOP Suction Cannula 0°, D: 2.0 mm</td>
</tr>
<tr>
<td>FH607SU</td>
<td>MINOP Suction Cannula 45°, D: 2.0 mm</td>
</tr>
<tr>
<td>FH641</td>
<td>MINOP InVent Disposable Introducer, 26F</td>
</tr>
<tr>
<td></td>
<td><strong>Trays</strong></td>
</tr>
<tr>
<td>FH358R</td>
<td>MINOP InVent Storage Rack</td>
</tr>
<tr>
<td>FH359R</td>
<td>MINOP InVent Storage Rack for Instruments &amp; Electrodes</td>
</tr>
<tr>
<td></td>
<td><strong>Containers</strong></td>
</tr>
<tr>
<td>JK489</td>
<td>Full-Size Lid with Retention Plate, silver</td>
</tr>
<tr>
<td>JN446</td>
<td>Full-Size Solid Bottom, 10½”</td>
</tr>
<tr>
<td></td>
<td>* Items additionally available</td>
</tr>
</tbody>
</table>

**MINOP Pediatric Ventriculoscope, Paediscope**

**Scopes**
- PF010A – PaediScope Flexible Scope
- PF011A – PaediScope Eyeiece

**Instruments**
- FF373R – PaediScope Micro Scissors
- FF374R – PaediScope Micro Grasping Forceps
- FF378R – PaediScope Micro Biopsy Forceps

**Electrodes**
- GK361R – Monopolar Blunt Electrode
- GK363R – Monopolar Needle Electrode
- GK246 – Monopolar Cable
Index

<table>
<thead>
<tr>
<th>Accessories</th>
<th>Trocars</th>
</tr>
</thead>
<tbody>
<tr>
<td>FH603SU – MINOP Disposable Introducer, 10Fr</td>
<td>FH610R – MINOP TREND Irrigation/Suction Trocar for PE487A</td>
</tr>
<tr>
<td>Storage</td>
<td>FH611R – MINOP TREND Irrigation/Suction Trocar for PE507A</td>
</tr>
<tr>
<td>FF379R – Storage Rack for Paediscope, Instruments, and Electrodes</td>
<td>FH615 – MINOP TREND Ergonomic Grasping Handle with irrigation button</td>
</tr>
<tr>
<td>JN440 – Container Bottom, full-size, perforated, 4 7/8”</td>
<td>FH615B1 – Irrigation Button</td>
</tr>
<tr>
<td>JK489 – Container Lid, full-size, silver</td>
<td>Tubing</td>
</tr>
<tr>
<td>MINOP Endoscope Assisted</td>
<td>FH605SU – Suction and Irrigation Tubing, sterile, pack of 10</td>
</tr>
<tr>
<td>Scopes</td>
<td>Storage</td>
</tr>
<tr>
<td>PE486A – MINOP Endoscope Assisted 0°</td>
<td>FF357R – Storage Tray for all MINOP TREND components</td>
</tr>
<tr>
<td>PE506A – MINOP Endoscope Assisted 30°</td>
<td>JK740 – Container Bottom, ¼ size, solid, 4 7/8”</td>
</tr>
<tr>
<td>PE526A – MINOP Endoscope Assisted 70°</td>
<td>JK789 – Container Lid, ¼ size, silver</td>
</tr>
<tr>
<td>Instruments</td>
<td>Instruments</td>
</tr>
<tr>
<td>FM670R – XS Micro Scissors, straight, sharp/sharp, 8”</td>
<td>FA041R – TREND Nicola Currette Bayonet, D: 6.5 mm, 45° vertical angle</td>
</tr>
<tr>
<td>FM671R – XS Micro Scissors, straight, sharp/sharp, 9”</td>
<td>FA042R – TREND Nicola Currette Bayonet, D: 6.5 mm, 45° horizontal angle</td>
</tr>
<tr>
<td>FM672R – XS Micro Scissors, straight, sharp/sharp, 10 7/8”</td>
<td>FA043R – TREND Hardy Enucleator Bayonet, left cutting</td>
</tr>
<tr>
<td>FM690R – XS Micro Scissors, straight, blunt/blunt, 8”</td>
<td>FA044R – TREND Hardy Enucleator Bayonet, right cutting</td>
</tr>
<tr>
<td>FM691R – XS Micro Scissors, straight, blunt/blunt, 9”</td>
<td>FA045R – TREND Hardy Curette Bayonet, D: 4.0 mm, 90° left angle, long neck</td>
</tr>
<tr>
<td>FM692R – XS Micro Scissors, straight, blunt/blunt, 10 7/8”</td>
<td>FA046R – TREND Hardy Curette Bayonet, D: 4.0 mm, 90° left angle, short neck</td>
</tr>
<tr>
<td>FM680R – XS Micro Scissors, curved, sharp/sharp, 8”</td>
<td>FA047R – TREND Hardy Curette Bayonet, D: 4.0 mm, 90° right angle, long neck</td>
</tr>
<tr>
<td>FM681R – XS Micro Scissors, curved, sharp/sharp, 9”</td>
<td>FA060R – TREND Hardy Curette Bayonet, D: 4.0 mm, 90° right angle, short neck</td>
</tr>
<tr>
<td>FM682R – XS Micro Scissors, curved, sharp/sharp, 10 7/8”</td>
<td>FA061R – TREND Hardy Curette Bayonet, D: 4.0 mm, 45° left horizontal angle</td>
</tr>
<tr>
<td>FM700R – XS Micro Scissors, curved, blunt/blunt, 8”</td>
<td>FA062R – TREND Hardy Curette Bayonet, D: 4.0 mm, 45° right horizontal angle</td>
</tr>
<tr>
<td>FM701R – XS Micro Scissors, curved, blunt/blunt, 9”</td>
<td>FA063R – TREND Hardy Curette Bayonet, D: 6.0 mm, 90° left angle, long neck</td>
</tr>
<tr>
<td>FM702R – XS Micro Scissors, curved, blunt/blunt, 10 7/8”</td>
<td>FA064R – TREND Hardy Curette Bayonet, D: 6.0 mm, 90° left angle, short neck</td>
</tr>
<tr>
<td>FM710R – XS Micro Forceps, 8”</td>
<td>FA065R – TREND Hardy Curette Bayonet, D: 6.0 mm, 90° right angle, long neck</td>
</tr>
<tr>
<td>FM711R – XS Micro Forceps, 9”</td>
<td>FA066R – TREND Hardy Curette Bayonet, D: 6.0 mm, 90° right angle, long neck</td>
</tr>
<tr>
<td>FM712R – XS Micro Forceps, 10 7/8”</td>
<td>FA067R – TREND Reulen-Landolt Micro Hook Bayonet, D: 1.7 mm</td>
</tr>
<tr>
<td>FM720R – XS Micro Tumor Grasping Forceps, 8”</td>
<td></td>
</tr>
<tr>
<td>FM721R – XS Micro Tumor Grasping Forceps, 9”</td>
<td></td>
</tr>
<tr>
<td>FM722R – XS Micro Tumor Grasping Forceps, 10 7/8”</td>
<td></td>
</tr>
<tr>
<td>Item Code</td>
<td>Description</td>
</tr>
<tr>
<td>-----------</td>
<td>-------------</td>
</tr>
<tr>
<td>FA068R</td>
<td>TREND Reulen-Landolt Dissector Bayonet, D: 2.0 mm</td>
</tr>
<tr>
<td>FA030R</td>
<td>TREND Nicola Currette, D: 6.5 mm, 45° vertical angle</td>
</tr>
<tr>
<td>FA031R</td>
<td>TREND Nicola Currette, D: 6.5 mm, 45° horizontal angle</td>
</tr>
<tr>
<td>FA032R</td>
<td>TREND Hardy Enucleator, left cutting</td>
</tr>
<tr>
<td>FA033R</td>
<td>TREND Hardy Enucleator, right cutting</td>
</tr>
<tr>
<td>FA034R</td>
<td>TREND Hardy Curette, D: 4.0 mm, 90° angle, long neck</td>
</tr>
<tr>
<td>FA035R</td>
<td>TREND Hardy Curette, D: 4.0 mm, 90° angle, short neck</td>
</tr>
<tr>
<td>FA036R</td>
<td>TREND Hardy Curette, D: 4.0 mm, 45° angle, short neck</td>
</tr>
<tr>
<td>FA037R</td>
<td>TREND Hardy Curette, D: 6.0 mm, 90° angle, long neck</td>
</tr>
<tr>
<td>FA038R</td>
<td>TREND Hardy Curette, D: 6.0 mm, 90° angle, short neck</td>
</tr>
<tr>
<td>FA039R</td>
<td>TREND Landolt-Reulen Micro-Hook, D: 1.7 mm</td>
</tr>
<tr>
<td>FA040R</td>
<td>TREND Landolt-Reulen Dissector, D: 2.0 mm</td>
</tr>
<tr>
<td>RT040R</td>
<td>UNITRAC Pneumatic Holding Arm</td>
</tr>
<tr>
<td>GA468R</td>
<td>Connection Hose, 5.0 mm</td>
</tr>
<tr>
<td>JG901</td>
<td>Sterile Cover for UNITRAC Arm</td>
</tr>
<tr>
<td>RT020R</td>
<td>Quick Adapter for use with JG901</td>
</tr>
<tr>
<td>FF280R</td>
<td>Flexible Fixation Element with ball joint for RT040R / FF168R</td>
</tr>
<tr>
<td>RT090R</td>
<td>Flexible Fixation Element with sprocket for RT040R / FF168R</td>
</tr>
<tr>
<td>FF151R</td>
<td>Rigid Fixation Element for RT040R / FF168R</td>
</tr>
</tbody>
</table>

### Adapters for Holding Arms

<table>
<thead>
<tr>
<th>Item Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RT046P</td>
<td>Universal Endoscope Holder (consists of RT081R and RT055P)</td>
</tr>
<tr>
<td>RT081R</td>
<td>Adapter for Universal Insert RT055P</td>
</tr>
<tr>
<td>RT055P</td>
<td>PEEK Insert for RT081R</td>
</tr>
<tr>
<td>RT099R</td>
<td>Adapter for MINOP TREND (FH615)</td>
</tr>
<tr>
<td>RT079R</td>
<td>Adapter for Fixation of Endo Assisted Scopes</td>
</tr>
</tbody>
</table>

### Fine Positioning for Holding Arms

<table>
<thead>
<tr>
<th>Item Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RT060R</td>
<td>NeuroPilot Micro-Manipulator</td>
</tr>
<tr>
<td>RT061R</td>
<td>4.0 mm Insert for Endoscope Assisted Scopes</td>
</tr>
<tr>
<td>RT062R</td>
<td>6.2 mm Insert</td>
</tr>
<tr>
<td>RT063R</td>
<td>3.2 mm Insert for MINOP Trocar FF397R</td>
</tr>
<tr>
<td>RT064R</td>
<td>4.6 mm Insert for MINOP Trocar FF398R</td>
</tr>
<tr>
<td>RT065R</td>
<td>6.0 mm Insert for MINOP Trocar FF399R</td>
</tr>
<tr>
<td>RT066R</td>
<td>3.0 mm Insert for Paediscope PF010A</td>
</tr>
</tbody>
</table>

### Storage for NeuroPilot

<table>
<thead>
<tr>
<th>Item Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>JF113R</td>
<td>Half-Size Perforated Basket, 3”</td>
</tr>
<tr>
<td>JF117R</td>
<td>Half-Size Perforated Basket Lid</td>
</tr>
<tr>
<td>MD896R</td>
<td>Half-Size Instrument Pad</td>
</tr>
<tr>
<td>JN341</td>
<td>Container Bottom, half-size, perforated, 5½”</td>
</tr>
<tr>
<td>JK389</td>
<td>Half-Size Lid, silver</td>
</tr>
</tbody>
</table>

### Storage for Holding Arms

<table>
<thead>
<tr>
<th>Item Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>JN441</td>
<td>Container Bottom, full-size, perforated, 5½”</td>
</tr>
<tr>
<td>JK489</td>
<td>Container Lid, full-size, perforated, silver</td>
</tr>
<tr>
<td>JF224R</td>
<td>Basket, full-size, perforated, 4½”</td>
</tr>
<tr>
<td>JF227R</td>
<td>Basket Lid, full-size, perforated</td>
</tr>
<tr>
<td>MD898</td>
<td>Silicone Cushioning Pad, full-size</td>
</tr>
</tbody>
</table>

### Micro-Manipulators, Holding Arms, and Adapters

<table>
<thead>
<tr>
<th>Item Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FF168R</td>
<td>Mechanical Holding Arm</td>
</tr>
<tr>
<td>FF169270</td>
<td>Silicone Disk for FF168R/RT040R</td>
</tr>
</tbody>
</table>
## Aesculap Visual Equipment

### Full HD System Components
- PV462 – HD Camera Head with Cable
- PV460 – Camera Control Unit
- PV959 – 26” Full HD Flat Panel Display
- PV904 – 21.5” Touchscreen Monitor
- PV840 – Full HD Recorder
- PV946 – 24” Full HD LCD Monitor
- PV647 – Monitor Stand
- PV436 – DVI-D Cable
- US735 – Power Cord

### Light Source
- OP940 – LED Lightsource AXeL
- OP923 – Lightcable for Lightsource
- OP914 – Lightcable for Lightsource
- US735 – Power Cord