ENDOSCOPIC SURGERY OF THE PARANASAL SINUSES AND SKULL BASE
The Endoscopically Assisted Bimanual Operating Technique

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Please note:
Attached to the inside back cover is the Video-DVD KS 632, “The bimanual operating technique for endoscopic paranasal and skull base surgery”, by D. B. Simmen and H. R. Briner.

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Introduction

Today, endoscopic surgery of the paranasal sinuses is among the most frequently performed rhinosurgical procedures. It can be an effective solution in patients with chronic rhinosinusitis who have responded poorly to medical therapy. In the orthodox technique, the endoscopic surgeon holds the endoscope with one hand while performing the actual surgical procedure with the other hand.

The indications for endoscopic surgery of the paranasal sinuses have been constantly expanding, so much so that even complex procedures on the frontal sinuses and anterior skull base can now be performed endoscopically. Besides inflammatory diseases, the range of indications has expanded to include the removal of benign and malignant tumors. It is becoming increasingly difficult, however, to conduct these expanded operations using the classic “one-handed” technique. The removal of bone and tumor tissue and the control of bleeding are particularly difficult to accomplish with one hand. Increasingly, these difficulties have made it necessary for surgeons to operate with both hands. The bimanual technique requires an assistant to hold and direct the video endoscope, enabling the endoscopic surgeon to use both hands while operating. This brochure explores the specific benefits and technical aspects of the bimanual endoscopic operating technique.

Basic Principles of Endoscopic Sinus Surgery

Diseases of the paranasal sinuses are common and may seriously affect the patients’ quality of life. Diagnostic advances, especially in CT technology, have greatly improved and refined the diagnosis of paranasal sinus pathology. With an incidence of 3–5%, chronic rhinosinusitis has become the most prevalent disease. In the more pronounced forms of chronic rhinosinusitis, the clinical symptoms often show inadequate response to pharmacologic therapy. Endoscopic surgery of the paranasal sinuses offers an effective therapeutic option in these cases. As a result, endoscopic sinus surgery is now among the most widely practiced rhinosurgical procedures.

Since endoscopic sinus surgery was first described, we have witnessed impressive advances in operating techniques. Better endoscopes, better video cameras, and improved operating instruments have made it possible to view all of the paranasal sinuses and perform surgical procedures through the natural nasal orifice. The indications for endoscopic sinus procedures are constantly being expanded. Today even complex procedures on the frontal sinuses, anterior skull base, and sphenoid bone can be performed endoscopically. Besides inflammatory conditions, the range of indications has expanded to include the removal of benign and malignant tumors. In the orthodox technique, the surgeon holds the endoscope in one hand and uses the other hand to the actual operation. This one-handed technique has its limitations, however, in the face of an expanding range of surgical procedures. It is particularly difficult to remove bone and tumor tissue and control bleeding with just one hand. These difficulties have engendered a need for endoscopic surgeons to use both hands while operating. In this bimanual technique an assistant holds the video endoscope, thus freeing both of the surgeon’s hands so that he or she can deal more effectively with the challenging situations that arise in endoscopic operations. The assistant is responsible for directing the endoscope and keeping a steady
image of the operative field displayed on the video monitor. This technique differs from procedures done under an operating microscope. While the microscope also allows surgeons to operate with both hands, the endoscopic technique is advantageous in that it provides a close-up, dynamic view of all the paranasal sinuses. It also eliminates the problem of light loss caused by instruments in the path of the microscope light beam, since the endoscopic light source is always “on site.” The endoscopically assisted bimanual operating technique thus combines the advantages of the endoscopic technique with the key advantage of the operating microscope the ability to operate with both hands.

The endoscopically assisted bimanual technique was first described by May et al. in 1990. Despite the advantages of the bimanual technique, the classic one-handed technique is still more widely practiced today. A major reason for this is the fact that the bimanual technique requires an extra assistant. Technical advances such as shaver technology and instruments with built-in suction channels have also made it easier to operate with one hand. But the advantages of the bimanual technique, especially the improved visualization of the operative field owing to the constant presence of a suction tip, make it possible to perform more complex procedures on the paranasal sinuses with greater safety and precision. This particularly applies to the more severe forms of chronic rhinosinusitis with polyposis. The bimanual technique is also advantageous for revision procedures and tumor resections.

Moreover, a recent study has documented a reduction in operating time when the bimanual technique is used (BRINER et al. 2005). The shorter operating times lead to lower costs, and this saving more than offsets the added costs for the extra assistant.
Advantages of the Endoscopically Assisted Bimanual Operating Technique

Operating with Both Hands

In the endoscopically assisted bimanual technique, the assistant holds and directs the endoscope with the attached video camera. The image is transmitted to a video monitor. The surgeon watches the monitor and has both hands free for manipulating the surgical instruments. This recreates the feel of two-handed open surgery that is already familiar to most surgeons, meaning that established operating skills can be transferred to endoscopic sinus procedures.

Suction Tip Stays in the Operative Field, Fewer Instrument Changes

Surgical procedures on the paranasal sinuses tend to cause relatively heavy bleeding, which may obscure the surgeon’s view of the operative site. Clear visualization of the operative site is essential for anatomical orientation, and therefore the extravasated blood should be removed as rapidly as possible. In this classic one-handed technique, the surgeon must pull out frequently and exchange the operating instrument for a suction tip. These frequent instrument changes not only prolong the operation but also increase the likelihood that the distal lens of the endoscope will become soiled or smeared. With the bimanual technique, the surgeon can keep the suction tip in the operative field at all times while having the other hand free for cutting tissue. In this way the operative field remains largely free of blood, resulting in better visualization and anatomical orientation and less frequent instrument changes. This is the major reason why the operating time is approximately 20% shorter with the bimanual technique than with the one-handed technique.

Fig. 2a
This close-up drawing shows how the endoscope is introduced at the top of the nasal orifice, leaving enough room below for introducing a suction tip (used here as a navigation instrument) and a second instrument (here, a Hayek forceps). By bracing the endoscope against the top of the nasal vestibule, the assistant can hold the scope steady and largely eliminate the problem of a shaky image.

Fig. 2b
This intraoperative view shows the suction tip (●) and periosteal elevator (X) simultaneously in the region of the right sphenopalatine artery, where a conchal branch of the artery is being dissected.
The ability to keep the suction tip in the operative field also facilitates bone removal with a drill or burr. The suction tip can provide a constant return of irrigating fluid during drilling, thus maintaining a clear view of the operative site and causing less compromise of endoscopic vision by the irrigating fluid.

**Optimum Exposure**

The bimanual technique also allows for better operative exposure since the second instrument can be used to retract tissues. For example, the suction tip can be used gently to push the middle turbinate medially toward the nasal septum, making it easier to see into the ethmoid and simplifying the operation. In tumor resections as well, it may be necessary to retract tumor tissue that is obscuring other structures.

**Holding and Cutting**

The bimanual technique allows for greater precision in the manipulation and cutting of tissues. For example, the surgeon can use the suction tip to hold the tissue in place while simultaneously resecting it with a scissors. This precise cut results in a smaller wound surface than removing tissue by applying traction with a grasping forceps, resulting in less intraoperative bleeding. The “hold-and-cut” technique eliminates the danger of removing too much tissue by avulsion with a grasper.
Teamwork

The endoscopically assisted bimanual technique requires an assistant who actively participates in the procedure by controlling the camera placement. This may be an advantage as it offers a constant opportunity to discuss intraoperative situations “as a team”. For example, the assistant may direct attention to critical anatomical structures that the surgeon might otherwise be too busy to notice right away. By promoting an ongoing, mutual exchange of information on anatomical and conceptual issues, this team approach has the potential to improve the quality of the operation.

Training

The bimanual technique is ideal for training purposes. The experienced surgeon can assist an inexperienced colleague and can take over the procedure at any time.
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Technical Requirements

Endoscope, Video Camera and Monitor

An essential piece of equipment for the endoscopically assisted bimanual operating technique is a video camera connected to the endoscope. The camera image is transmitted to the video monitor, which provides the surgeon with necessary orientation. The assistant holds the endoscope and is responsible for maintaining an optimum visual display of the operative field. Separating the two tasks – keeping the operative field on camera and performing the operation – requires good communication between the surgeon and assistant. The surgeon gives the assistant instructions on what part of the operative field to focus on. This requires some degree of training during initial team formation, but we know from experience that smooth and effective teamwork can be established within a short time, often in a matter of minutes.

Several years of experience with this technique have shown that coordination between surgeon and assistant goes like a clockwork almost automatically after just a few sessions, and that communication during the operation focuses almost entirely on the details of the operation itself, rather than on issues of coordination.

Installation and Technical Aspects

Fig. 7a, b

The assistant sits to the left of the surgeon, and they both watch the video monitor across the table. The assistant holds and directs the endoscope, enabling the surgeon to operate with both hands. As an option, the setup may include a navigation screen placed next to the endoscopy cart. The camera and light cables should be kept away from the surgeon so that they will not interfere with instrument passing by the scrub nurse.
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Operating Room Setup

The surgeon and assistant sit or stand next to each other. The video monitor is placed on the opposite side so that the operators can watch it without having to turn their heads. This is best from an ergonomic standpoint and makes it easier to operate for an extended period of time without experiencing neck strain. A nurse keeps the surgical instruments ready near the foot of the table next to the video monitor so that they can be optimally passed during the procedure. Whenever possible, an extra video monitor should be set up so that the nurse can follow the procedure more closely and anticipate the need for particular instruments.

It is advantageous to place the anesthesia equipment at the foot of the operating table, because space at the head of the table is limited due to the operating team, scrub nurse, operating instruments, and additional technical equipment (video cart, navigation unit).

Practical Tips

Ergonomic Handling of the Endoscope

The endoscope may be held with one or both hands, depending on which is more comfortable for the assistant. The flexible cold light cable should be brought out the top or side of the operative area so that it will not interfere with the surgeon. This also applies to the connecting cable for the video camera. Placing the patient’s head in a slightly hyperextended position will make it easier to control the endoscope and will also create some additional room for the surgeon.

Stabilizing the Endoscope in the Nasal Vestibule

A stable position of the endoscope is essential for maintaining a good video image. This is achieved by gently bracing the endoscope against the roof of the nasal vestibule. In this way the assistant can direct the scope more precisely and eliminate a shaky image. The surgeon can facilitate insertion of the endoscope by using both instruments to gently spread open the tissue at the narrowest point in the nasal vestibule, the nasal valve. This will also prevent smearing of the lens during endoscope insertion.
Retraction of Structures and Tissue

One difficulty in operating on the paranasal sinuses is the tight confines of the anatomical passages. Inflammatory mucosal changes or tumor tissue will often further restrict the space that is available to the surgeon. With the bimanual technique, one instrument (e.g., the suction tip) can be used for tissue retraction. This improves visualization and increases surgical precision. In our experience, careful retraction of the middle turbinate toward the nasal septum also makes it easier to work in the ethmoid.

Cleaning the Endoscope

If the endoscope lens is slightly soiled, it can often be cleaned by rinsing it with water. This is most easily done by directing the irrigating fluid along the shaft of the endoscope and removing the fluid with the suction tip, which is always present in the field. In this way the lens can be cleaned and the operation can be continued without delay. If the lens is more heavily soiled, however, it should be withdrawn and cleaned mechanically by an assistant.

Holding and Cutting

By working with both hands, the surgeon is able to fix the targeted tissue with one instrument (a suction tip or grasper) and cut it with a second instrument. This allows for high surgical precision. It results in a smaller wound surface than is produced by traction with a grasping instrument, and there is less bleeding. This technique also reduces the danger of removing too much tissue.
Drilling and Suction

An endoscopic drill or burr is frequently used for bone removal. With the bimanual technique, the suction tip can remain in the operative field and is always on standby for clearing the field of irrigating fluid and drilling debris. This improves visualization and reduces soiling of the lens.

Even prolonged drilling in the frontal sinus or sphenoid sinus can be done without difficulty. It is important, however, for the assistant to position the endoscope carefully so that the lens is not damaged by the drill.

Coagulation and Suction

Heavy bleeding is not uncommon in sinus operations, particularly when operating near the branches of the sphenopalatine artery. This arterial bleeding must be controlled by electrocoagulation. With the bimanual technique, the suction tip is constantly available to keep extravasated blood from pooling in the operative field. The bleeding vessel can be precisely cauterized with a conventional monopolar or bipolar instrument. The bimanual technique also eliminates the danger that a cautery instrument with a built-in suction channel may become clogged by coagulated blood.
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Fig. 14a
A diamond burr has been positioned at the frontal spine of the right frontal sinus for removal of the sinus floor. Meanwhile the suction tip, which also serves as the navigation instrument, clears the field of irrigating fluid and bone dust to maintain optimum visualization.

Navigation and Drilling
The endoscopically assisted bimanual operating technique is also advantageous when used in conjunction with a navigation system. The suction tip, for example, may function as the tracking instrument for surgical navigation.

We know from experience that the suction tip spends the most time in the operative field, making it an excellent navigation sensor for all phases of the operation (e.g., drilling at anatomically challenging sites such as the frontal sinus and sphenoid sinus).

Fig. 14b
The navigation screen indicates the position of the suction tip, which functions as the tracking instrument. The three CT images show the position of the suction tip at the right frontal spine in three orthogonal planes.
Revision operations for nasal polyposis are notoriously difficult, requiring both technical proficiency and the proper instrumentation. Only the complete exenteration of the ethmoid cells along the skull base with maximal opening of the sphenoid, frontal, and maxillary sinuses can guarantee an optimum result. The frequent lack of anatomical landmarks, the frequent osteitic bone changes resulting from prolonged inflammation, and the increased bleeding tendency due to infection and scarring are responsible for the high degree of difficulty of this operation. The advantages of the bimanual operating technique are fully realized in these procedures.

Illustrative Cases

Case 1: Revision Surgery for Nasal Polyposis after Multiple Operations on the Paranasal Sinuses

Revision operations for nasal polyposis are notoriously difficult, requiring both technical proficiency and the proper instrumentation. Only the complete exenteration of the ethmoid cells along the skull base with maximal opening of the sphenoid, frontal, and maxillary sinuses can guarantee an optimum result. The frequent lack of anatomical landmarks, the frequent osteitic bone changes resulting from prolonged inflammation, and the increased bleeding tendency due to infection and scarring are responsible for the high degree of difficulty of this operation. The advantages of the bimanual operating technique are fully realized in these procedures.

Legend:
Endoscopic view (a) of recurrent polyposis and the corresponding CT scan (b) demonstrate the features of the case described above. Precise bimanual operation along the skull base (c) with optimum visualization, even under conditions of heavy bleeding, is helpful in achieving complete exenteration of the ethmoid compartments. Endoscopic view 3 years after the procedure (d) shows a lateralized middle turbinate and the interior of the left olfactory groove, which can be kept patent with topical steroids.
Case 2: Recurrence of an Inverted Papilloma of the Frontal Sinus

Inverted papilloma, a benign tumor of the frontal sinus, was long considered to be a definite indication for open, external surgery of the frontal sinus. Today, however, advances in endoscopic sinus surgery have made it possible to perform this surgery safely by the endonasal route. The bimanual operating technique is particularly helpful in these cases, because the surgeon must burr away a considerable amount of bone and is able to work under optimum viewing conditions in more remote areas near the skull base.

Legend:
Endoscopic view of a recurrent inverted papilloma. View into the left frontal recess shows a typical appearance of recurrent papilloma next to the stump of the middle turbinate (a). The corresponding CT scan (b) shows typical calcifications of the tumor in the frontal sinus. The 5-year postoperative result shows the status of a frontal sinus drainage procedure (Draf type III) with healthy-looking mucosa and no evidence of recurrent disease (c).
Case 3: Postoperative Stenosis of the Left Frontal Recess Following Paranasal Sinus Surgery with Frontal Headaches

The anatomy of the frontal recess is particularly challenging in previously operated cases and increases the degree of difficulty of additional procedures in that region. The frequent absence of landmarks and the close proximity to the skull base call for a very careful and precise technique. Often, the necessary bone removal can be accomplished only with a burr, and frequent irrigation and bleeding continually obscure the operative field when a one-handed technique is used.

Legend:
The coronal CT scan shows postoperative stenosis on the left side with obliteration of the frontal sinus (a). The corresponding endoscopic view shows pus tracking from the frontal recess on that side (b). The intraoperative view illustrates the bimanual technique with the suction tip held in the left hand and the diamond burr in the right hand during removal of the frontal spine to establish broad median drainage (c). The 4-year postoperative result shows the median frontal-sinus drainage cavity with a view into both frontal sinus compartments after removal of the interfrontal septum (d).
Lesions of the posterior skull base, as in this example, require a very meticulous operating technique because of their proximity to vitally important structures. Potential danger zones are the sphenopalatine artery and its branches, the carotid artery, the optic nerve, and the dura of the posterior cranial fossa. Surgery in this posterior region of the nasal cavity is made even more difficult by the depth of the operative field.

Legend:
The sagittal CT scan (a) and MR image (b) show the clivus tumor (dermoid) on the floor of the sphenoid sinus in direct contact with the dura of the brainstem region. The intraoperative views illustrate the bimanual use of the navigation suction tip (argent) and diamond burr (x) on the clivus (c) and demonstrate the operative site with the dura exposed (d).
Legend:
Images one year postoperatively show an endoscopic survey view (e) and close-up view (f) and the corresponding CT scans (g, h), which confirm a complete resection of the clivus pathology.
Case 5: Adenocarcinoma of the Anterior Skull Base

Tumors of the anterior skull base with a benign histology are now operated almost exclusively by the endonasal route. The surgical team must be ready at all times, however, to change to an external approach if problems arise and the tumor cannot be adequately resected through the initial approach. This particularly applies to the endonasal removal of malignant tumors in this region. The main challenge in this region is the difficult anatomy of the cribriform plate and frontal sinus drainage zone. An effective dural repair and the ability to control bleeding from the ethmoidal artery are prerequisites for these complex procedures.

Legend:
View of an adenocarcinoma of the anterior skull base with lateralization of the middle turbinate by the tumor in the right olfactory cleft (a). The corresponding MR image (b) displays the extent of the tumor. The intraoperative view shows the appearance of the field after tumor resection using bimanual technique and after duraplasty with fascia lata to seal the anterior skull base (c). A survey view through the nasal cavity at 4 years postoperatively shows the reconstructed anterior skull base (d).
Case 6: Frontoethmoidal Osteoma

Bony hard alterations in the paranasal sinuses are a particularly difficult surgical problem because they require extensive drilling and because the degree of tumor mobilization necessary for complete removal can easily damage potentially significant structures such as the skull base and orbit.
Case 7: Angiofibroma of the Infratemporal Fossa

Endonasal surgery of the infratemporal fossa has become increasingly important during recent years. It is important to identify lesions that border directly upon this important and poorly accessible region and to remove them completely. It should be emphasized, however, that this type of tumor removal is best accomplished by a team of operators who can switch to an external approach at any time should the need arise. The endonasal removal of infratemporal fossa tumors has been considerably simplified by the advent of angiography and embolization. In many cases, preoperative embolization is considered an essential prelude to surgical removal.

The infratemporal fossa presents a number of anatomical challenges that include various arterial vessels, the cavernous sinus, the optic nerve, the orbit, and the adjacent middle cranial fossa. A detailed knowledge of the local anatomy and the ability to deal with potential complications arising from injury to these structures are prerequisites for operating in this region.

Legend:
Endoscopic view of an angiofibroma causing complete obstruction of the right nasal cavity and nasopharynx (a). The intraoperative view shows bimanual dissection of the sphenopalatine foramen to eliminate the main arterial supply to the tumor (b). Preoperative (c) and postoperative (d) CT scans of the angiofibroma of the right infratemporal fossa. Endoscopic survey view 6 years after successful tumor resection shows the posterior skull base and nasopharynx with healthy-appearing mucosa (e).
Recommended Reading


Special Nasal Instrument Set (Basic Set)
according to SIMMEN-BRINER

Special Instrument Set for Paranasal Sinus Surgery
according to SIMMEN-BRINER
SIMMEN-BRINER Special Nasal Instrument Set
SIMMEN-BRINER Special Nasal Instrument Set

1  7230 AA  HOPKINS® Straight Forward Telescope 0°, enlarged view, diameter 4 mm, length 18 cm, autoclavable, fiber optic light transmission incorporated, color code: green

2  723772  STAMMBERGER Telescope Handle, round, standard model, length 11 cm, for use with HOPKINS® telescopes 30° – 120° with diameter 4 mm and length 18 cm

3  403835  COTTLE Nasal Speculum, with set screw, blade length 35 mm, length 13 cm

3  403855  Same, blade length 55 mm

3  403875  Same, blade length 75 mm

3  403390  KILLIAN-STRUYCKEN Nasal Speculum, with set screw, blade length 90 mm, length 15 cm

7  810506  Septum Needle, angular, LUER-Lock

8  208000  Surgical Handle, Fig. 3, length 12.5 cm, for Blades 208010 – 15, 208210 – 15

8  208100  Surgical Handle, Fig. 4, length 13.5 cm, for Blades 208019, 208120 – 21, 208320 – 21

8  748000  Surgical Handle, Fig. 7, length 16.5 cm, for Blades 208010 – 15, 208210 – 15

11  474000  FREER Elevator, double-ended, semisharp and blunt, length 20 cm

11  479000  MASING Elevator, double-ended, graduated, sharp and blunt, length 22.5 cm

11  2x  499001  KILNER-GILLIES Hook, one prong, small curve, length 17 cm

11  499210  JOSEPH Double Hook, sharp, width 10 mm, length 15 cm

11  791815  REYNOLDS Scissors, curved, delicate tips, length 15 cm

11  511615  METZENBAUM-LAHEY Scissors, curved, extra slender, length 15 cm

11  2x  533113  ADSON Tissue Forceps, micro-model, 1 x 2 teeth, length 12 cm

11  533112  ADSON Tissue Forceps, 1 x 2 teeth, length 12 cm

11  793301  Tissue Forceps, 1 x 2 teeth, standard width, length 13 cm

11  793403  Tissue Forceps, 1 x 2 teeth, narrow, length 14.5 cm

11  2x  533212  ADSON-BROWN Tissue Forceps,atraumatic, fine side grasping teeth, length 12 cm

11  792303  Dressing Forceps, narrow width, length 13 cm

11  792301  Dressing Forceps, standard width, length 13 cm

11  534015  COTTLE Lower Lateral Forceps, bayonet-shaped, with set screw, serrated tips and teeth on the inside, length 15 cm

11  426620  GRUNWALD Nasal Dressing Forceps, bayonet-shaped, length 20 cm

11  455500  TAKAHASHI Nasal Forceps, straight, working length 9.5 cm

11  456002  BLAKESLEY Nasal Forceps, straight, size 2, working length 11 cm

11  456003  BLAKESLEY Nasal Forceps, straight, size 3, working length 11 cm

11  449002  HEYMANN Nasal Scissors, medium, (standard model), working length 9.5 cm

11  488034  CRAIG Septum Forceps, straight, special matt finish, working length 9 cm

20  204809  FERGUSON Suction Tube, with cut-off hole and stylet, LUER, 9 Fr., working length 11 cm

20  204810  Same, 10 Fr.

20  204812  Same, 12 Fr.

20  204815  Same, 15 Fr.

479800 SB  Suction Raspatory, length 19.5 cm

486103 SB  Osteotome, flat, double-edged grinding, with enlarged distal finger grip plate, width 3 mm, length 19 cm

486104 SB  Same, width 4 mm

486107 SB  Same, width 7 mm

174200  COTTLE Metal Mallet, length 18 cm

844219  Bipolar Coagulation Forceps, insulated, bayonet-shaped, blunt, tip 1 mm, length 19 cm

839330  BRINER Bipolar Suction Cannula, angular, insulated, length of electrodes 3.5 mm, with cut-off hole, outer diameter 4.5 mm, working length 11 cm, (illustration on page 32)

847000 E  Bipolar High Frequency Cord, length 300 cm (not illustrated)

839312  SIMMEN Suction Cannula, for nose and epistaxis, angular, insulated, malleable, distal with not insulated horn, outer diameter 3.5 mm, working length 12 cm

839312 A  Same, outer diameter 4 mm

839313  Same, outer diameter 4.5 mm

26005 M  Unipolar High Frequency Cord, with 5 mm plug, length 300 cm, (not illustrated)

440000  KRAUSE Nasal Snare, length 25 cm

443500  Nasal Snare Wire, for 440000 – 441510, standard size, diameter 0.3 mm, length 10 cm, package of 25 (not illustrated)

523900  COTTLE Bone Crusher, with clip, crusher size 5 x 1.5 cm

2x  794014  ROCHESTER-PEAN Artery Forceps, straight, length 14 cm

2x  535212  HALSTEAD “Mosquito” Artery Forceps, curved, length 12.5 cm

2x  794214  ROCHESTER-PEAN Artery Forceps, curved, length 14 cm

2x  535412  HALSTEAD “Mosquito” Artery Forceps, straight, 1 x 2 teeth, length 12.5 cm

516015  Needle Holder, tungsten carbide inserts, length 15 cm

515117  Same, length 17 cm

791903  MAYO Scissors, straight, length 15 cm

792003  Same, curved

748220  DUPLAY Dressing and Sponge Holding Forceps, curved, with ratchet, length 21 cm

10x  796109  Towel Forceps, with serrated inserts, length 9.5 cm, for paper cover sheets

810805  Cup Medicine, 50 cm³, diameter 57 mm, height 47 mm (not illustrated)

810810  Cup Medicine, 100 cm³, diameter 80 mm, height 30 mm (not illustrated)

Recommended Container Accessories (not illustrated):

39502 Z  Wire Tray for Cleaning, Sterilization and Storage of instruments

39751 A2  Sterilization Container, with MicroStop®

39763 A2  Coding Label, inscribed

39762 D2  Color Tab, blue

Further Accessories for Cleaning and Sterilization

see catalog ENDOPROTECT1
SIMMEN-BRINER Special Instrument Set for Paranasal Sinus Surgery
It is recommended to check the suitability of the product for the intended procedure prior to use.
HOPKINS® Telescopes – autoclavable

diameter 4 mm, length 18 cm

7230 AA

HOPKINS® Straight Forward Telescope 0°,
enlarged view, diameter 4 mm, length 18 cm,
auclovable,
fiber optic light transmission incorporated,
color code: green

7230 FLA

HOPKINS® Forward-Oblique Telescope 45°,
enlarged view, diameter 4 mm, length 18 cm,
auclovable,
connection for fiber optic light cable on the left,
fiber optic light transmission incorporated,
color code: black

723772

STAMMBERGER Telescope Handle, round,
standard model, length 11 cm, for use with
HOPKINS® telescopes 30° – 120° with diameter 4 mm
and length 18 cm
KERRISON Bone Punch

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
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<tbody>
<tr>
<td>662101</td>
<td>KERRISON Bone Punch, detachable, rigid, 90° upbiting, not through-cutting, size 1 mm, working length 17 cm</td>
</tr>
<tr>
<td>662102</td>
<td>Same, size 2 mm</td>
</tr>
<tr>
<td>662103</td>
<td>Same, size 3 mm</td>
</tr>
<tr>
<td>662112</td>
<td>KERRISON Bone Punch, detachable, rigid, 90° downbiting, not through-cutting, size 2 mm, working length 17 cm</td>
</tr>
<tr>
<td>662113</td>
<td>Same, size 3 mm</td>
</tr>
</tbody>
</table>
**Nasal Scissors, ZÜRICH model**

![Nasal Scissors, ZÜRICH model](image)

449251  **Nasal Scissors, ZÜRICH model**, straight, small model, cutting length 12 mm, working length 12 cm

**SIMMEN Suction Cannula**

*for nose and epistaxis*

![SIMMEN Suction Cannula](image)

839312 – 839313  **SIMMEN Suction Cannula**, for nose and epistaxis, angular, insulated, malleable, distal with not insulated horn, outer diameter 3.5 mm, working length 12 cm, for use with Unipolar High Frequency Cords 26005 M/MW, 26004 M/MW, 26002 M, 26006 M

839312 A  **Same**, outer diameter 4 mm

839313  **Same**, outer diameter 4.5 mm

**BRINER Bipolar Suction Cannula**

![BRINER Bipolar Suction Cannula](image)

839325  **BRINER Bipolar Suction Cannula**, angular, insulated, length of electrodes 3.2 mm, with cut-off hole, outer diameter 3.5 mm, working length 11 cm, for use with Bipolar High Frequency Cords 847000 or 847000 A/E/M/V

839330  **Same**, length of electrodes 3.5 mm, outer diameter 4.5 mm
STAMMBERGER Bipolar Suction Forceps

461010  STAMMBERGER Bipolar Suction Forceps, 15° upturned, with suction channel, for bipolar coagulation in paranasal areas, working length 12.5 cm, for use with Bipolar High Frequency Cords 847002 E or 847002 A/M/V/U

461015  STAMMBERGER Bipolar Suction Forceps, 45° upturned, with suction channel, for bipolar coagulation in paranasal areas, working length 12.5 cm, for use with Bipolar High Frequency Cords 847002 E or 847002 A/M/V/U
**High Frequency Cords**

for use with STAMMBERGER Bipolar Suction Forceps

**Accessories**

<table>
<thead>
<tr>
<th>KARL STORZ Instruments</th>
<th>High Frequency Electrosurgery Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>847002 E</td>
<td>Bipolar High Frequency Cord, for KARL STORZ Coagulator 26021 B/C/D, 860021 B/C/D, 27810 B/C/D, 28810 B/C/D, AUTOCON® system (50, 200, 350), AUTOCON® II 400 SCB system (111, 113, 115) and Erbe coagulator, T and ICC series, with two 2 mm cable sockets for KARL STORZ Bipolar Suction Forceps 461010, 461015 and Bipolar Forceps 8615 A/AS, 28164 BGK, length 450 cm</td>
</tr>
<tr>
<td>847002 M</td>
<td>Bipolar High Frequency Cord, for Martin and Berchtold coagulator, with two 2 mm cable sockets for KARL STORZ Bipolar Suction Forceps 461010, 461015 and Bipolar Forceps 8615 A/AS, 28164 BGK, length 450 cm</td>
</tr>
<tr>
<td>847002 A</td>
<td>Bipolar High Frequency Cord, with 2x 4 mm banana plug for KARL STORZ coagulator 26020 XA/XB, with two 2 mm cable sockets for KARL STORZ Bipolar Suction Forceps 461010, 461015 and Bipolar Forceps 8615 A/AS, 28164 BGK, length 450 cm</td>
</tr>
<tr>
<td>847002 V</td>
<td>Bipolar High Frequency Cord, for KARL STORZ AUTOCON® II 400 SCB system (112, 114, 116), Valleylab coagulator, with two 2 mm cable sockets for KARL STORZ Bipolar Suction Forceps 461010, 461015 and Bipolar Forceps 8615 A/AS, 28164 BGK, length 450 cm</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>KARL STORZ Instruments</th>
<th>Standard Forceps Bipolar Cords</th>
</tr>
</thead>
<tbody>
<tr>
<td>847002 U</td>
<td>Bipolar Universal High Frequency Cord, one side with two 2 mm cable sockets for KARL STORZ Bipolar Suction Forceps 461010, 461015 and Bipolar Forceps 8615 A/AS, 28164 BGK, other side with standard pin for connection to all current forceps bipolar cords, length 40 cm</td>
</tr>
</tbody>
</table>
### Special Features:

<table>
<thead>
<tr>
<th>Feature</th>
<th>UNIDRIVE® S III ENT SCB</th>
<th>UNIDRIVE® S III ECO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Touch Screen: Straightforward function selection via touch screen</td>
<td>●</td>
<td>-</td>
</tr>
<tr>
<td>Set values of the last session are stored</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Optimized user control due to touch screen</td>
<td>●</td>
<td>-</td>
</tr>
<tr>
<td>Choice of user languages</td>
<td>●</td>
<td>-</td>
</tr>
<tr>
<td>Operating elements are single and clear to read due to color display</td>
<td>●</td>
<td>-</td>
</tr>
<tr>
<td>One unit – multifunctional:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Shaver system for surgery of the paranasal sinuses and anterior skull base</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>- INTRA Drill Handpieces (40,000 rpm and 80,000 rpm)</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>- Sinus Shaver</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>- Micro Saw</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>- Dermatome</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>- High-Speed Handpieces (60,000 rpm and 100,000 rpm)</td>
<td>●</td>
<td>-</td>
</tr>
<tr>
<td>Two motor outputs: Two motor outputs enable simultaneous connection of two motors:</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>For example, a shaver and micro motor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Soft start function</td>
<td>●</td>
<td>-</td>
</tr>
<tr>
<td>Textual error messages</td>
<td>●</td>
<td>-</td>
</tr>
<tr>
<td>Integrated irrigation and coolant pump:</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>- Absolutely homogeneous, micro-processor controlled irrigation rate throughout the entire irrigation range</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>- Quick and easy connection of the tubing set</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Easy program selection via automated motor recognition</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Continuously adjustable revolution range</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Maximum number of revolutions and motor torque: Microprocessor-controlled motor rotation speed. Therefore the preselected parameters are maintained throughout the drilling procedure</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Maximum number of revolutions can be preset</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>SCB model with connections to the KARL STORZ Communication Bus (KARL STORZ-SCB)</td>
<td>●</td>
<td>-</td>
</tr>
<tr>
<td>Irrigator rod included</td>
<td>●</td>
<td>-</td>
</tr>
</tbody>
</table>
## Motor Systems

### Specifications

<table>
<thead>
<tr>
<th>Mode</th>
<th>Order No.</th>
<th>rpm</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Shaver mode</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operation mode:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. rev. (rpm):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>oscillating</td>
<td>40 7120 50</td>
<td>10,000*</td>
</tr>
<tr>
<td>in conjunction with Handpiece:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DRILLCUT-X® II Shaver Handpiece</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DRILLCUT-X® II N Shaver Handpiece</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sinus burr mode</strong></td>
<td>40 7120 55</td>
<td>10,000*</td>
</tr>
<tr>
<td>Operation mode:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. rev. (rpm):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>rotating</td>
<td>40 7120 50</td>
<td>12,000</td>
</tr>
<tr>
<td>in conjunction with Handpiece:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DRILLCUT-X® II Shaver Handpiece</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DRILLCUT-X® II N Shaver Handpiece</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>High-speed drilling mode</strong></td>
<td>20 7120 33</td>
<td>60,000/100,000</td>
</tr>
<tr>
<td>Operation mode:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. rev. (rpm):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>counterclockwise or clockwise</td>
<td></td>
<td></td>
</tr>
<tr>
<td>in conjunction with:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High-Speed Micro Motor</td>
<td>20 7110 33</td>
<td>40,000/80,000</td>
</tr>
<tr>
<td><strong>Drilling mode</strong></td>
<td>20 7111 73</td>
<td>40,000/80,000</td>
</tr>
<tr>
<td>Operation mode:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. rev. (rpm):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>counterclockwise or clockwise</td>
<td></td>
<td></td>
</tr>
<tr>
<td>in conjunction with:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>micro motor</td>
<td>20 7110 33</td>
<td>15,000/20,000</td>
</tr>
<tr>
<td>and connecting cable</td>
<td>20 7111 73</td>
<td></td>
</tr>
<tr>
<td><strong>Micro saw mode</strong></td>
<td>20 7110 33</td>
<td>8,000</td>
</tr>
<tr>
<td>Operation mode:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. rev. (rpm):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>in conjunction with:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>micro motor</td>
<td>20 7110 33</td>
<td></td>
</tr>
<tr>
<td>and connecting cable</td>
<td>20 7111 73</td>
<td></td>
</tr>
<tr>
<td><strong>Dermatome mode</strong></td>
<td>20 7110 33</td>
<td>8,000</td>
</tr>
<tr>
<td>Operation mode:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. rev. (rpm):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>in conjunction with:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>micro motor</td>
<td>20 7110 33</td>
<td></td>
</tr>
<tr>
<td>and connecting cable</td>
<td>20 7111 73</td>
<td></td>
</tr>
<tr>
<td><strong>Power supply:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>100–240 VAC, 50/60 Hz</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Dimensions:**

(w x h x d) 300 x 165 x 265 mm

**Two outputs for parallel connection of two motors**

**Integrated irrigation pump:**

Flow: adjustable in 9 steps

*Approx. 4,000 rpm is recommended as this is the most efficient suction/performance ratio.

## UNIDRIVE® S III ENT SCB vs. UNIDRIVE® S III ECO

<table>
<thead>
<tr>
<th></th>
<th>UNIDRIVE® S III ENT SCB</th>
<th>UNIDRIVE® S III ECO</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Touch Screen:</strong></td>
<td>6.4&quot; / 300 cd/m²</td>
<td></td>
</tr>
<tr>
<td><strong>Weight:</strong></td>
<td>5.2 kg</td>
<td>4.7 kg</td>
</tr>
<tr>
<td><strong>Certified to:</strong></td>
<td>IEC 601-1 CE acc. to MDD</td>
<td>IEC 60601-1</td>
</tr>
<tr>
<td><strong>Available languages:</strong></td>
<td>English, French, German, Spanish, Italian, Portuguese, Greek, Turkish, Polish, Russian</td>
<td>numerical codes</td>
</tr>
</tbody>
</table>
Motor Systems

Special features of high-performance EC micro motor II
and of the high-speed micro motor

Special features of high-performance EC micro motor II:
- Self-cooling, brushless high-performance EC micro motor
- Smallest possible dimensions
- Autoclavable
- Reprocessable in a cleaning machine
- Detachable connecting cable

Special Features of the high-speed micro motor:
- Brushless high-speed micro motor
- Smallest possible dimensions
- Autoclavable
- Reprocessable in a cleaning machine
- Maximum torque 6 Ncm

- INTRA coupling enables a wide variety of applications
- Maximum torque 4 Ncm
- Number of revolutions can be continuously adjusted up to 40,000 rpm
- Provided a suitable handle is used, the number of revolutions can be continuously adjusted up to 80,000 rpm

![Image of High-Performance EC Micro Motor II](20711033)

20711033  **High-Performance EC Micro Motor II**, for use with UNIDRIVE® II/UNIDRIVE® ENT/OMFS/NEURO/ECO and Connecting Cable 20711073, or for use with UNIDRIVE® S III ENT/ECO/NEURO and Connecting Cable 20711173

![Image of Connecting Cable](20711173)

20711173  **Connecting Cable**, to connect High-Performance EC Micro Motor 20711033 to UNIDRIVE® S III ENT/ECO/NEURO

![Image of High-Speed Micro-Motor](20712033)

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

407016 20-1 UNIDRIVE® S III ENT SCB, motor control unit with color display, touch screen, two motor outputs, integrated irrigation pump and SCB module, power supply 100–240 VAC, 50/60 Hz
including:
Mains Cord
Irrigator Rod
Two-Pedal Footswitch, two-stage, with proportional function
Clip Set, for use with silicone tubing set
SCB Connecting Cable, length 100 cm
Single Use Tubing Set*, sterile, package of 3

407014 01 UNIDRIVE® S III ECO, motor control unit with two motor outputs and integrated irrigation pump, power supply 100–240 VAC, 50/60 Hz
including:
Mains Cord
Two-Pedal Footswitch, two-stage, with proportional function
Clip Set, for use with silicone tubing set
Single Use Tubing Set*, sterile, package of 3

Specifications:

<table>
<thead>
<tr>
<th>Item</th>
<th>UNIDRIVE® S III ENT SCB</th>
<th>Dimensions w x h x d</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Touch Screen</td>
<td>6.4”/300 cd/m²</td>
<td>300 x 165 x 265 mm</td>
<td>5.2 kg</td>
</tr>
<tr>
<td>Flow</td>
<td>9 steps</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power supply</td>
<td>100–240 VAC, 50/60 Hz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Certified to</td>
<td>EC 601-1, CE acc. to MDD</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Endoscopic Surgery of the Paranasal Sinuses and Skull Base – The Endoscopically Assisted Bimanual Operating Technique

UNIDRIVE® S III ENT SCB
UNIDRIVE® S III ECO
System Components

Two-Pedal Footswitch

Single Use Tubing Set

Two-Pedal Footswitch

High-Speed Micro-Motor

High-Performance EC Micro Motor II

DRILLCUT-X® II Shaver Handpiece, for use with UNIDRIVE® S III ECO/ENT/NEURO

DRILLCUT-X® II Shaver Handpiece, optional adaptability to Shaver Tracker, for use with UNIDRIVE® S III ECO/ENT/NEURO

High-Speed Handpiece

INTRA Drill Handpiece

DRILLCUT-X® II Shaver Handpiece, for use with UNIDRIVE® S III ECO/ENT/NEURO

Shaver Blade

Shaver Blade, curved

Sinus Burr

High-Speed Handpiece

20712033

2071033

2071113

252660 – 252692

252575 – 252590

4071030

4071130

40712050

40712055

20016630

031131-10

41201 KN

41302 KN

41305 DN
### Optional Accessories

for UNIDRIVE® S III ENT SCB and UNIDRIVE® S III ECO

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>280053</td>
<td><strong>Universal Spray</strong>, 6x 500 ml bottles – HAZARDOUS GOODS – UN 1950</td>
</tr>
<tr>
<td></td>
<td>including:</td>
</tr>
<tr>
<td></td>
<td><strong>Spray Nozzle</strong></td>
</tr>
<tr>
<td>280053 C</td>
<td><strong>Spray Nozzle</strong>, for the reprocessing of INTRA burr handpieces, for use with Universal Spray 280053 B</td>
</tr>
<tr>
<td>031131-10*</td>
<td><strong>Tubing Set</strong>, for irrigation, for single use, sterile, package of 10</td>
</tr>
</tbody>
</table>
**DRILLCUT-X® Shaver Handpieces**

**Special Features:**

<table>
<thead>
<tr>
<th>Feature</th>
<th>DRILLCUT-X® II Shaver Handpiece</th>
<th>DRILLCUT-X® II N Shaver Handpiece</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. 10,000 rpm for shaver blades, max. 12,000 rpm for sinus shaver</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Straight suction channel</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Integrated irrigation channel</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Powerful motor, also suitable for harder materials</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Absolutely silent running, no vibration</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Completely immersible and machine-washable</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>LOCK allows fixation of shaver blades and sinus shavers</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Extremely lightweight design</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Optional, ergonomic handle, detachable</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Can be adapted to navigation tracker</td>
<td>-</td>
<td>●</td>
</tr>
</tbody>
</table>

40712050  **40712050**  **DRILLCUT-X® II Shaver Handpiece**, for use with UNIDRIVE® S III ECO/ENT/NEURO/OMFS

40712055  **40712055**  **DRILLCUT-X® II N Shaver Handpiece**, optional adaptability to Shaver Tracker 40800122, for use with UNIDRIVE® S III ECO/ENT/NEURO/OMFS
DRILLCUT-X® II Shaver Handpiece

Special Features:
- Powerful motor
- Absolutely silent running
- Enhanced ergonomics
- Lightweight design
- Oscillation mode for shaver blades, max. 10,000 rpm
- Rotation mode for sinus shavers, max. 12,000 rpm
- Straight suction channel and integrated irrigation

- The versatile DRILLCUT-X® II Shaver Handpiece can be adapted to individual needs of the user
- Easy hygienic processing, suitable for use in washer and autoclavable at 134° C
- Quick coupling mechanism facilitates more rapid exchange of work inserts
- Proven DRILLCUT-X® blade portfolios can be used

40712050

40712050  DRILLCUT-X® II Shaver Handpiece, for use with UNIDRIVE® S III ECO/ENT/NEURO/OMFS

40712090

40712090  Handle, adjustable, for use with DRILLCUT-X® II 40712050 and DRILLCUT-X® II N 40712055

Optional Accessory:

41250 RA

41250 RA  Cleaning Adaptor, Luer-Lock, for cleaning DRILLCUT-X® shaver handpieces
DRILLCUT-X® II Shaver N Handpiece

Special Features:
- Powerful motor
- Absolutely silent running
- Enhanced ergonomics
- Lightweight design
- Oscillation mode for shaver blades, max. 10,000 rpm
- Rotation mode for sinus shavers, max. 12,000 rpm
- Straight suction channel and integrated irrigation
- The versatile DRILLCUT-X® II Shaver N Shaver Handpiece can be adapted to the individual needs of the user

- Easy hygienic processing, suitable for use in washer and autoclavable at 134° C
- Quick coupling mechanism facilitates more rapid exchange of working inserts
- Proven DRILLCUT-X® blade portfolios can be used
- Optional adaptability to Shaver Tracker 40 8001 22
- Allows shaver navigation when used with NPU 40 8000 01

40 7120 55

40 7120 55 DRILLCUT-X® II N Shaver Handpiece, optional adaptability to Shaver Tracker 40 8001 22, for use with UNIDRIVE® S III ECO/ENT/NEURO/OMFS

40 7120 90

40 7120 90 Handle, adjustable, for use with DRILLCUT-X® II 40 7120 50 and DRILLCUT-X® II N 40 7120 55

Optional Accessory:

41250 RA

41250 RA Cleaning Adaptor, LUER-Lock, for cleaning DRILLCUT-X® shaver handpieces
Handle for DRILLCUT-X® II Shaver Handpiece
for use with DRILLCUT-X® II 40712050 and DRILLCUT-X® II N 40712055

Special Features:
- Ergonomic design
- Ultralight construction
- Easy handle control allows individual adjustment
- The adjustable handle can be mounted to DRILLCUT-X® II or -X II N Shaver Handpiece
- Easy fixation via rotary lock
- Sterilizable

40712090

40712090 Handle, adjustable, for use with DRILLCUT-X® II 40712050 and DRILLCUT-X® II N 40712055
Shaver Blades, straight
for Nasal Sinuses and Skull Base Surgery

For use with DRILLCUT-X® II and DRILLCUT-X® II N

<table>
<thead>
<tr>
<th>Detail</th>
<th>for use with</th>
<th>Shaver Blade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Detail 40</td>
<td>40712050 DRILLCUT-X® II Handpiece 40712055 DRILLCUT-X® II N Handpiece</td>
<td>length 12 cm</td>
</tr>
</tbody>
</table>

- **41201 KN**
  - serrated cutting edge,
  - diameter 4 mm,
  - color code: blue-red

- **41201 KK**
  - double serrated cutting edge,
  - diameter 4 mm,
  - color code: blue-yellow

- **41201 GN**
  - concave cutting edge,
  - oval cutting window, diameter 4 mm,
  - color code: blue-green

- **41201 LN**
  - concave cutting edge, oblique cutting window, diameter 4 mm,
  - color code: blue-black

- **41201 SN**
  - straight cutting edge,
  - diameter 4 mm,
  - color code: blue-blue

- **41201 KSA**
  - serrated cutting edge,
  - diameter 3 mm,
  - color code: blue-red

- **41201 KKSA**
  - double serrated cutting edge,
  - diameter 3 mm,
  - color code: blue-yellow

- **41201 KKSB**
  - double serrated cutting edge,
  - diameter 2 mm,
  - color code: blue-yellow

- **41201 LSA**
  - concave cutting edge, oblique cutting window, diameter 3 mm,
  - color code: blue-black

Optional Accessory:

- **41200 RA**
  - Cleaning Adaptor, Luer-Lock, for cleaning the inner and outer blades of reusable Shaver Blades 412xx
Shaver Blades, curved
for Nasal Sinuses and Skull Base Surgery

For use with DRILLCUT-X® II and DRILLCUT-X® II N

Shaver Blades, curved 35°/40°, sterilizable

<table>
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<th>Detail</th>
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<td>41202 KN</td>
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<tr>
<td>41204 KKF</td>
<td>curved 40°, cutting edge serrated forwards, double serrated, diameter 4 mm, color code: blue-yellow</td>
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</tr>
<tr>
<td>41204 KKB</td>
<td>curved 40°, cutting edge serrated backwards, double serrated, diameter 4 mm, color code: blue-yellow</td>
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<tr>
<td>41204 KKFA</td>
<td>curved 40°, cutting edge serrated forwards, double serrated, diameter 3 mm, color code: blue-yellow</td>
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<tr>
<td>41204 KKBA</td>
<td>curved 40°, cutting edge serrated backwards, double serrated, diameter 3 mm, color code: blue-yellow</td>
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</table>

Optional Accessory:

41200 RA Cleaning Adaptor, LUER-Lock, for cleaning the inner and outer blades of reusable Shaver Blades 412xx
### Shaver Blades, curved

for Nasal Sinuses and Skull Base Surgery

For use with DRILLCUT-X® II and DRILLCUT-X® II N

**Shaver Blades, curved 65°, sterilizable**

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<tr>
<td>41203 KNF</td>
<td>40712050 DRILLCUT-X® II Handpiece 40712055 DRILLCUT-X® II N Handpiece</td>
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<td>41203 KKF</td>
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<td>41203 KKB</td>
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<td>41203 KKFA</td>
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<td>41203 KKBA</td>
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<td>curved 65°, cutting edge serrated backwards, double serrated, diameter 3 mm, color code: blue-yellow</td>
</tr>
<tr>
<td>41203 GNF</td>
<td></td>
<td>curved 65°, concave cutting edge, oval cutting window, forward opening, diameter 4 mm, color code: blue-green</td>
</tr>
<tr>
<td>41203 GNB</td>
<td></td>
<td>curved 65°, concave cutting edge, oval cutting window, backward opening, diameter 4 mm, color code: blue-green</td>
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</table>

Optional Accessory:

41200 RA **Cleaning Adaptor**, LUER-Lock, for cleaning the inner and outer blades of reusable Shaver Blades 412xx
Shaver Blades, straight
for Nasal Sinuses and Skull Base Surgery

For use with DRILLCUT-X® II and DRILLCUT-X® II N

<table>
<thead>
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<td>41301 KN</td>
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<tr>
<td>41301 KK</td>
<td>double serrated cutting edge, diameter 4 mm, color code: blue-yellow</td>
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<tr>
<td>41301 GN</td>
<td>concave cutting edge, oval cutting window, diameter 4 mm, color code: blue-green</td>
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<tr>
<td>41301 LN</td>
<td>concave cutting edge, oblique cutting window, diameter 4 mm, color code: blue-black</td>
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<tr>
<td>41301 SN</td>
<td>straight cutting edge, diameter 4 mm, color code: blue-blue</td>
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<tr>
<td>41301 KSA</td>
<td>serrated cutting edge, diameter 3 mm, color code: blue-red</td>
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<tr>
<td>41301 KKSA</td>
<td>double serrated cutting edge, diameter 3 mm, color code: blue-yellow</td>
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<tr>
<td>41301 KKSB</td>
<td>double serrated cutting edge, diameter 2 mm, color code: blue-yellow</td>
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<tr>
<td>41301 LSA</td>
<td>concave cutting edge, oblique cutting window, diameter 3 mm, color code: blue-black</td>
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Shaver Blades, curved
for Nasal Sinuses and Skull Base Surgery

For use with DRILLCUT-X\textsuperscript{®} II and DRILLCUT-X\textsuperscript{®} II N

Shaver Blades, curved 35°/40°, for single use, sterile, package of 5

<table>
<thead>
<tr>
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<tr>
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</tr>
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<td>41304 KKF</td>
<td>curved 40°, cutting edge serrated forwards, double serrated, diameter 4 mm, color code: blue-yellow</td>
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<tr>
<td>41304 KKB</td>
<td>curved 40°, cutting edge serrated backwards, double serrated, diameter 4 mm, color code: blue-yellow</td>
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<td>41304 KKFA</td>
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Shaver Blades, curved
for Nasal Sinuses and Skull Base Surgery

For use with DRILLCUT-X® II and DRILLCUT-X® II N

Shaver Blades, curved 65°, for single use, sterile, package of 5

<table>
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<tr>
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<tr>
<td>41303 KKF</td>
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<td>curved 65°, cutting edge concave forwards, oval cutting window, diameter 4 mm, color code: blue-green</td>
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Sinus Burrs, curved
for Nasal Sinuses and Skull Base Surgery

For use with DRILLCUT-X® II and DRILLCUT-X® II N

<table>
<thead>
<tr>
<th>Detail</th>
<th>Sinus Burr for use with</th>
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<tr>
<td>41304 W</td>
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<td>41303 WN</td>
<td>40 7120 55 DRILLCUT-X® II N Handpiece</td>
<td>curved 55°, cylindric, drill diameter 3.6 mm, shaft diameter 4 mm, color code: red-blue</td>
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<td>41305 RN</td>
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<td>curved 15°, bud drill, drill diameter 4 mm, shaft diameter 4 mm, color code: red-black</td>
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<tr>
<td>41305 DN</td>
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<td>41305 D</td>
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<td>curved 15°, diamond head, drill diameter 5 mm, shaft diameter 4 mm, color code: red-yellow</td>
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Accessories for Shaver

39550 A  **Wire Tray**, provides safe storage of accessories for KARL STORZ paranasal sinus shaver systems during cleaning and sterilization

for storage of:
- Up to 7 shaver attachments
- Connecting cable

*Please note:* The instruments displayed are not included in the sterilizing and storage tray.
INTRA Drill Handpiece
for Surgery in Ethmoid and Skull Base Area

Special Features:
- Tool-free closing and opening of the drill
- Right/left rotation
- Max. rotating speed up to 40,000 rpm / 80,000 U/min
- Detachable irrigation channels

*INTRA Drill Handpiece*, angled, length 15 cm, transmission 1:1 (40,000 rpm), for use with KARL STORZ high-performance EC micro motor II and burrs

*SAME*, Transmission 1:2 (80,000 rpm)

*INTRA Drill Handpiece*, straight, length 13 cm, transmission 1:1 (40,000 rpm), for use with KARL STORZ high-performance EC micro motor II and burrs

<table>
<thead>
<tr>
<th>Detail</th>
<th>Size</th>
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<td>649770 G</td>
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649600 **Standard Straight Shaft Burr**, stainless, size 014 – 070, length 9.5 cm, set of 11

649700 **Diamond Straight Shaft Burr**, stainless, size 014 – 070, length 9.5 cm, set of 11

649700 G **Rapid Diamond Straight Shaft Burr**, stainless, with coarse diamond coating for precise drilling and abrasion without hand pressure and generating minimal heat, size 023 – 070, length 9.5 cm, set of 9, color code: gold

280033 **Rack**, for 36 straight shaft burrs with a length of 9.5 cm, foldable, sterilizable, size 22 x 14 x 2 cm
INTRA Drill Handpiece
for Surgery in Ethmoid and Skull Base Area

Special Features:
- Tool-free closing and opening of the drill
- Right/left rotation
- Max. rotating speed up to 40,000 rpm / 80,000 U/min
- Detachable irrigation channels
- Lightweight construction
- Operates with little vibrations
- Low maintenance
- Reprocessable in a cleaning machine
- Safe grip

INTRA Drill Handpiece, angled, length 18 cm, transmission 1:2 (80,000 rpm), for use with KARL STORZ high-performance EC micro motor II and burrs

INTRA Drill Handpiece, straight, length 17 cm, transmission 1:1 (40,000 rpm), for use with KARL STORZ high-performance EC micro motor II and burrs

<table>
<thead>
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<td>649770 GL</td>
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</tbody>
</table>

649600 L Standard Straight Shaft Burr, stainless, size 014–070, length 12.5 cm, set of 11

649700 L Diamond Straight Shaft Burr, stainless, size 014–070, length 12.5 cm, set of 11

649700 GL Rapid Diamond Straight Shaft Burr, stainless, with coarse diamond coating for precise drilling and abrasion without hand pressure and generating minimal heat, sizes 023–070, length 12.5 cm, set of 9, color code: gold

280034 Rack, for 36 straight shaft burrs with a length of 12.5 cm, foldable, sterilizable, size 22 x 17 x 2 cm
Accessories for Burrs

280033  **Rack**, for 36 straight shaft burrs with a length of 9.5 cm, foldable, sterilizable, size 22 x 14 x 2 cm

280034  **Rack**, for 36 straight shaft burrs with a length of 12.5 cm, foldable, sterilizable, size 22 x 17 x 2 cm

280043  **Rack**, flat model, to hold 21 straight shaft burrs with a length of 7 cm (6 pcs) and 9.5 cm (15 pcs), folding model, sterilizable, size 17.5 x 11.5 x 1.2 cm

*Please note:* The burrs displayed are not included in the racks.
Accessories for Burrs

Wire Tray, provides safe storage of accessories for KARL STORZ drilling/grinding systems during cleaning and sterilization, includes tray for small parts, for use with Rack 280030, rack **not** included

**for storage of:**
- Up to 6 drill handpieces
- Connecting cable
- EC micro motor
- Small parts

Wire Tray, provides safe storage of accessories for KARL STORZ drilling/grinding systems during cleaning and sterilization, includes tray for small parts, for use with Rack 280030, rack **included**

**for storage of:**
- Up to 6 drill handpieces
- Connecting cable
- EC micro motor
- Up to 36 drill bits and burrs
- Small parts

**Please note:** The instruments displayed are not included in the sterilizing and storage tray.
UNIDRIVE® S III ENT SCB
High-Speed Handpieces, angled, 100,000 rpm

For use with High-Speed Drills, shaft diameter 3.17 mm
and with High-Speed Micro Motor 20712033

20712033

7.5 mm
53 mm

252681

7.5 mm
93 mm

252682

High-Speed Handpiece, medium, angled, 100,000 rpm,
for use with High-Speed Micro-Motor 20712033

252681

High-Speed Handpiece, long, angled, 100,000 rpm,
for use with High-Speed Micro-Motor 20712033

252682
UNIDRIVE® S III ENT SCB
High-Speed Handpieces, angled, 60,000 rpm

For use with High-Speed Drills, shaft diameter 2.35 mm and with High-Speed Micro Motor 20712033

- 252661 High-Speed Handpiece, short, angled, 60,000 rpm, for use with High-Speed Micro-Motor 20712033
- 252662 High-Speed Handpiece, medium, angled, 60,000 rpm, for use with High-Speed Micro-Motor 20712033
- 252663 High-Speed Handpiece, long, angled, 60,000 rpm, for use with High-Speed Micro-Motor 20712033
UNIDRIVE® S III ENT SCB
High-Speed Handpieces, straight, 60,000 rpm

For use with High-Speed Drills, shaft diameter 2.35 mm
and with High-Speed Micro Motor 20712033

60,000 rpm
diameter 5.5 mm

252691  High-Speed Handpiece, short, straight, 60,000 rpm,
for use with High-Speed Micro-Motor 20712033

252692  High-Speed Handpiece, medium, straight, 60,000 rpm,
for use with High-Speed Micro-Motor 20712033
UNIDRIVE® S III ENT SCB
High-Speed Handpieces, malleable, slim, angled, 60,000 rpm

For use with High-Speed Drills, shaft diameter 1 mm
and with High-Speed Micro Motor 20712033

The handpieces have malleable shafts that can be bent up to 20° according to user requirements.

252671  High-Speed Handpiece, extra long, malleable, slim, angled, 60,000 rpm, for use with High-Speed Micro-Motor 20712033

252672  High-Speed Handpiece, super long, malleable, slim, angled, 60,000 rpm, for use with High-Speed Micro-Motor 20712033
**UNIDRIVE® S III ENT SCB**

*High-Speed Standard Burrs, High-Speed Diamond Burrs*

For use with High-Speed Handpieces, 100,000 rpm

<table>
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<tr>
<th>Diameter in mm</th>
<th>medium</th>
<th>long</th>
</tr>
</thead>
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<table>
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<th>Diameter in mm</th>
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</table>
**UNIDRIVE® S III ENT SCB**

High-Speed Diamond Burrs, High-Speed Acorn, High-Speed Barrel Burrs, High-Speed Neuro Fluted Burrs

For use with High-Speed Handpieces, 100,000 rpm

<table>
<thead>
<tr>
<th>Diameter in mm</th>
<th>medium</th>
<th>long</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>350330 M</td>
<td>350330 L</td>
</tr>
<tr>
<td>4</td>
<td>350340 M</td>
<td>350340 L</td>
</tr>
<tr>
<td>5</td>
<td>350350 M</td>
<td>350350 L</td>
</tr>
<tr>
<td>6</td>
<td>350360 M</td>
<td>350360 L</td>
</tr>
<tr>
<td>7</td>
<td>350370 M</td>
<td>350370 L</td>
</tr>
</tbody>
</table>

High-Speed Coarse Diamond Burrs, 100,000 rpm, single use, sterile, package of 5

<table>
<thead>
<tr>
<th>Diameter in mm</th>
<th>medium</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.5</td>
<td>350675 M</td>
</tr>
<tr>
<td>9</td>
<td>350690 M</td>
</tr>
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</table>

High-Speed Acorn, 100,000 rpm, single use, sterile, package of 5

<table>
<thead>
<tr>
<th>Diameter in mm</th>
<th>medium</th>
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<tbody>
<tr>
<td>6.0</td>
<td>350960 M</td>
</tr>
<tr>
<td>9.1</td>
<td>350991 M</td>
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High-Speed Barrel Burrs, 100,000 rpm, single use, sterile, package of 5

<table>
<thead>
<tr>
<th>Diameter in mm</th>
<th>medium</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.8</td>
<td>350718 M</td>
</tr>
<tr>
<td>3</td>
<td>350730 M</td>
</tr>
</tbody>
</table>

High-Speed Neuro Fluted Burrs, 100,000 rpm, single use, sterile, package of 5

<table>
<thead>
<tr>
<th>Diameter in mm</th>
<th>medium</th>
<th>long</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.8</td>
<td>350718 M</td>
<td>350718 L</td>
</tr>
<tr>
<td>3</td>
<td>350730 M</td>
<td>350730 L</td>
</tr>
</tbody>
</table>
UNIDRIVE® S III ENT SCB
High-Speed Standard Burrs, High-Speed Diamond Burrs

For use with High-Speed Handpieces, 60,000 rpm

<table>
<thead>
<tr>
<th>Diameter in mm</th>
<th>short</th>
<th>medium</th>
<th>long</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>330110 S</td>
<td>330110 M</td>
<td>–</td>
</tr>
<tr>
<td>2</td>
<td>330120 S</td>
<td>330120 M</td>
<td>330120 L</td>
</tr>
<tr>
<td>3</td>
<td>330130 S</td>
<td>330130 M</td>
<td>330130 L</td>
</tr>
<tr>
<td>4</td>
<td>330140 S</td>
<td>330140 M</td>
<td>330140 L</td>
</tr>
<tr>
<td>5</td>
<td>330150 S</td>
<td>330150 M</td>
<td>330150 L</td>
</tr>
<tr>
<td>6</td>
<td>330160 S</td>
<td>330160 M</td>
<td>330160 L</td>
</tr>
<tr>
<td>7</td>
<td>330170 S</td>
<td>330170 M</td>
<td>330170 L</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Diameter in mm</th>
<th>short</th>
<th>medium</th>
<th>long</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.6</td>
<td>330206 S</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>1</td>
<td>330210 S</td>
<td>330210 M</td>
<td>–</td>
</tr>
<tr>
<td>1.5</td>
<td>330215 S</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>2</td>
<td>330220 S</td>
<td>330220 M</td>
<td>330220 L</td>
</tr>
<tr>
<td>3</td>
<td>330230 S</td>
<td>330230 M</td>
<td>330230 L</td>
</tr>
<tr>
<td>4</td>
<td>330240 S</td>
<td>330240 M</td>
<td>330240 L</td>
</tr>
<tr>
<td>5</td>
<td>330250 S</td>
<td>330250 M</td>
<td>330250 L</td>
</tr>
<tr>
<td>6</td>
<td>330260 S</td>
<td>330260 M</td>
<td>330260 L</td>
</tr>
<tr>
<td>7</td>
<td>330270 S</td>
<td>330270 M</td>
<td>330270 L</td>
</tr>
</tbody>
</table>
**UNIDRIVE® S III ENT SCB**  
*High-Speed Diamond Burrs, High-Speed Cylinder Burrs, LINDEMANN High-Speed Fluted Burrs*

For use with High-Speed Handpieces, 60,000 rpm

### High-Speed Coarse Diamond Burrs, 60,000 rpm, for single use, sterile, package of 5

<table>
<thead>
<tr>
<th>Diameter in mm</th>
<th>short</th>
<th>medium</th>
<th>long</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>330330 S</td>
<td>330330 M</td>
<td>330330 L</td>
</tr>
<tr>
<td>4</td>
<td>330340 S</td>
<td>330340 M</td>
<td>330340 L</td>
</tr>
<tr>
<td>5</td>
<td>330350 S</td>
<td>330350 M</td>
<td>330350 L</td>
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<tr>
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<td>330360 S</td>
<td>330360 M</td>
<td>330360 L</td>
</tr>
<tr>
<td>7</td>
<td>330370 S</td>
<td>330370 M</td>
<td>330370 L</td>
</tr>
</tbody>
</table>

### High-Speed Cylinder Burrs, 60,000 rpm, for single use, sterile, package of 5

<table>
<thead>
<tr>
<th>Diameter in mm</th>
<th>short</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>330440 S</td>
</tr>
<tr>
<td>6</td>
<td>330460 S</td>
</tr>
</tbody>
</table>

### LINDEMANN High-Speed Fluted Burrs, 60,000 rpm, for single use, sterile, package of 5

<table>
<thead>
<tr>
<th>Size in mm (diameter x length)</th>
<th>short</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diameter 2.1/11</td>
<td>330511 S</td>
</tr>
<tr>
<td>Diameter 2.3/26</td>
<td>330526 S</td>
</tr>
</tbody>
</table>
### High-Speed Diamond Burrs

**UNIDRIVE® S III ENT SCB**

**High-Speed Diamond Burrs**

For use with High-Speed Handpieces, 60,000 rpm

<table>
<thead>
<tr>
<th>Diameter in mm</th>
<th>extra long</th>
<th>super long</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>320220 EL</td>
<td>320220 SL</td>
</tr>
<tr>
<td>3</td>
<td>320230 EL</td>
<td>320230 SL</td>
</tr>
<tr>
<td>4</td>
<td>320240 EL</td>
<td>320240 SL</td>
</tr>
</tbody>
</table>

### High-Speed Coarse Diamond Burrs

<table>
<thead>
<tr>
<th>Diameter in mm</th>
<th>extra long</th>
<th>super long</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>320320 EL</td>
<td>320320 SL</td>
</tr>
<tr>
<td>3</td>
<td>320330 EL</td>
<td>320330 SL</td>
</tr>
<tr>
<td>4</td>
<td>320340 EL</td>
<td>320340 SL</td>
</tr>
</tbody>
</table>
**IMAGE1 S Camera System**

**Economical and future-proof**
- Modular concept for flexible, rigid and 3D endoscopy as well as new technologies
- Forward and backward compatibility with video endoscopes and FULL HD camera heads
- Sustainable investment
- Compatible with all light sources

**Innovative Design**
- Dashboard: Complete overview with intuitive menu guidance
- Live menu: User-friendly and customizable
- Intelligent icons: Graphic representation changes when settings of connected devices or the entire system are adjusted
- Automatic light source control
- Side-by-side view: Parallel display of standard image and the Visualization mode
- Multiple source control: IMAGE1 S allows the simultaneous display, processing and documentation of image information from two connected image sources, e.g., for hybrid operations

---

**Dashboard**

**Live menu**

**Intelligent icons**

**Side-by-side view: Parallel display of standard image and Visualization mode**
Brilliant Imaging
- Clear and razor-sharp endoscopic images in FULL HD
- Natural color rendition

- Reflection is minimized
- Multiple IMAGE1 S technologies for homogeneous illumination, contrast enhancement and color shifting

* SPECTRA A: Not for sale in the U.S.
** SPECTRA B: Not for sale in the U.S.
TC 200EN*

**IMAGE1 S CONNECT**, connect module, for use with up to 3 link modules, resolution 1920 x 1080 pixels, with integrated KARL STORZ-SCB and digital Image Processing Module, power supply 100–120 VAC/200–240 VAC, 50/60 Hz including:
- **Mains Cord**, length 300 cm
- **DVI-D Connecting Cable**, length 300 cm
- **SCB Connecting Cable**, length 100 cm
- **USB Flash Drive**, 32 GB, USB silicone keyboard, with touchpad, US

*Available in the following languages: DE, ES, FR, IT, PT, RU

**Specifications:**
- HD video outputs: - 2x DVI-D
  - 1x 3G-SDI
- Format signal outputs: 1920 x 1080p, 50/60 Hz
- LINK video inputs: 3x
- USB interface: 4x USB, (2x front, 2x rear)
- SCB interface: 2x 6-pin mini-DIN
- Power supply: 100–120 VAC/200–240 VAC
- Power frequency: 50/60 Hz
- Protection class: I, CF-Defib
- Dimensions w x h x d: 305 x 54 x 320 mm
- Weight: 2.1 kg

For use with **IMAGE1 S CAMERA SYSTEM**

TC 200EN

TC 300

**IMAGE1 S H3-LINK**, link module, for use with **IMAGE1 FULL HD three-chip camera heads**, power supply 100–120 VAC/200–240 VAC, 50/60 Hz, for use with **IMAGE1 S CONNECT TC 200EN** including:
- **Mains Cord**, length 300 cm
- **Link Cable**, length 20 cm

**Specifications:**
- Camera System: **TC 300 (H3-Link)**
  - Supported camera heads/video endoscopes: TH 100, TH 101, TH 102, TH 103, TH 104, TH 106 (fully compatible with **IMAGE1 S**), **22 220055-3, 22 220056-3, 22 220053-3, 22 220060-3, 22 220061-3, 22 220054-3, 22 220085-3** (compatible without **IMAGE1 S** technologies CLARA, CHROMA, SPECTRA*)
- LINK video outputs: 1x
- Power supply: 100–120 VAC/200–240 VAC
- Power frequency: 50/60 Hz
- Protection class: I, CF-Defib
- Dimensions w x h x d: 305 x 54 x 320 mm
- Weight: 1.86 kg

* **SPECTRA A**: Not for sale in the U.S.
** **SPECTRA B**: Not for sale in the U.S.
**IMAGE1 S Camera Heads**

For use with IMAGE1 S Camera System
IMAGE1 S CONNECT Module TC 200EN, IMAGE1 S H3-LINK Module TC 300
and with all IMAGE1 HUB™ HD Camera Control Units

**TH 100**

**IMAGE1 S H3-Z Three-Chip FULL HD Camera Head**, 50/60 Hz, IMAGE1 S compatible, progressive scan, soakable, gas- and plasma-sterilizable, with integrated Parfocal Zoom Lens, focal length \( f = 15–31 \) mm (2x), 2 freely programmable camera head buttons, for use with IMAGE1 S and IMAGE1 HUB™ HD/HD

**Specifications:**

<table>
<thead>
<tr>
<th>IMAGE1 FULL HD Camera Heads</th>
<th>IMAGE1 S H3-Z</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product no.</td>
<td>TH 100</td>
</tr>
<tr>
<td>Image sensor</td>
<td>3x ( \frac{1}{3} )&quot; CCD chip</td>
</tr>
<tr>
<td>Dimensions w x h x d</td>
<td>39 x 49 x 114 mm</td>
</tr>
<tr>
<td>Weight</td>
<td>270 g</td>
</tr>
<tr>
<td>Optical interface</td>
<td>integrated Parfocal Zoom Lens, ( f = 15–31 ) mm (2x)</td>
</tr>
<tr>
<td>Min. sensitivity</td>
<td>F 1.4/1.17 Lux</td>
</tr>
<tr>
<td>Grip mechanism</td>
<td>standard eyepiece adaptor</td>
</tr>
<tr>
<td>Cable</td>
<td>non-detachable</td>
</tr>
<tr>
<td>Cable length</td>
<td>300 cm</td>
</tr>
</tbody>
</table>

**TH 104**

**IMAGE1 S H3-ZA Three-Chip FULL HD Camera Head**, 50/60 Hz, IMAGE1 S compatible, **autoclavable**, progressive scan, soakable, gas- and plasma-sterilizable, with integrated Parfocal Zoom Lens, focal length \( f = 15–31 \) mm (2x), 2 freely programmable camera head buttons, for use with IMAGE1 S and IMAGE1 HUB™ HD/HD

**Specifications:**

<table>
<thead>
<tr>
<th>IMAGE1 FULL HD Camera Heads</th>
<th>IMAGE1 S H3-ZA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product no.</td>
<td>TH 104</td>
</tr>
<tr>
<td>Image sensor</td>
<td>3x ( \frac{1}{3} )&quot; CCD chip</td>
</tr>
<tr>
<td>Dimensions w x h x d</td>
<td>39 x 49 x 100 mm</td>
</tr>
<tr>
<td>Weight</td>
<td>299 g</td>
</tr>
<tr>
<td>Optical interface</td>
<td>integrated Parfocal Zoom Lens, ( f = 15–31 ) mm (2x)</td>
</tr>
<tr>
<td>Min. sensitivity</td>
<td>F 1.4/1.17 Lux</td>
</tr>
<tr>
<td>Grip mechanism</td>
<td>standard eyepiece adaptor</td>
</tr>
<tr>
<td>Cable</td>
<td>non-detachable</td>
</tr>
<tr>
<td>Cable length</td>
<td>300 cm</td>
</tr>
</tbody>
</table>
Monitors

9619 NB

19" HD Monitor,
color systems PAL/NTSC, max. screen resolution 1280 x 1024, image format 4:3,
power supply 100–240 VAC, 50/60 Hz,
wall-mounted with VESA 100 adaption,
including:
External 24 VDC Power Supply
Mains Cord

9826 NB

26" FULL HD Monitor,
wall-mounted with VESA 100 adaption,
color systems PAL/NTSC,
max. screen resolution 1920 x 1080,
image format 16:9,
power supply 100–240 VAC, 50/60 Hz
including:
External 24 VDC Power Supply
Mains Cord
## Monitors

<table>
<thead>
<tr>
<th>KARL STORZ HD and FULL HD Monitors</th>
<th>19&quot;</th>
<th>26&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wall-mounted with VESA 100 adaption</td>
<td>9619 NB</td>
<td>9826 NB</td>
</tr>
</tbody>
</table>

### Inputs:

- DVI-D
- Fibre Optic
- 3G-SDI
- RGBS (VGA)
- S-Video
- Composite/FBAS

### Outputs:

- DVI-D
- S-Video
- Composite/FBAS
- RGBS (VGA)
- 3G-SDI

### Signal Format Display:

- 4:3
- 5:4
- 16:9
- Picture-in-Picture
- PAL/NTSC compatible

### Optional accessories:

- 9826 SF **Pedestal**, for monitor 9826 NB
- 9626 SF **Pedestal**, for monitor 9619 NB

### Specifications:

<table>
<thead>
<tr>
<th>KARL STORZ HD and FULL HD Monitors</th>
<th>19&quot;</th>
<th>26&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Desktop with pedestal</td>
<td>optional</td>
<td>optional</td>
</tr>
<tr>
<td>Product no.</td>
<td>9619 NB</td>
<td>9826 NB</td>
</tr>
<tr>
<td>Brightness</td>
<td>200 cd/m² (typ)</td>
<td>500 cd/m² (typ)</td>
</tr>
<tr>
<td>Max. viewing angle</td>
<td>178° vertical</td>
<td>178° vertical</td>
</tr>
<tr>
<td>Pixel distance</td>
<td>0.29 mm</td>
<td>0.3 mm</td>
</tr>
<tr>
<td>Reaction time</td>
<td>5 ms</td>
<td>8 ms</td>
</tr>
<tr>
<td>Contrast ratio</td>
<td>700:1</td>
<td>1400:1</td>
</tr>
<tr>
<td>Mount</td>
<td>100 mm VESA</td>
<td>100 mm VESA</td>
</tr>
<tr>
<td>Weight</td>
<td>7.6 kg</td>
<td>7.7 kg</td>
</tr>
<tr>
<td>Rated power</td>
<td>28 W</td>
<td>72 W</td>
</tr>
<tr>
<td>Operating conditions</td>
<td>0–40°C</td>
<td>5–35°C</td>
</tr>
<tr>
<td>Storage</td>
<td>-20–60°C</td>
<td>-20–60°C</td>
</tr>
<tr>
<td>Rel. humidity</td>
<td>max. 85%</td>
<td>max. 85%</td>
</tr>
<tr>
<td>Dimensions w x h x d</td>
<td>469.5 x 416 x 75.5 mm</td>
<td>643 x 396 x 87 mm</td>
</tr>
<tr>
<td>Power supply</td>
<td>100–240 VAC</td>
<td>100–240 VAC</td>
</tr>
<tr>
<td>Certified to</td>
<td>EN 60601-1, protection class IPX0</td>
<td>EN 60601-1, UL 60601-1, MDD93/42/EEC, protection class IPX2</td>
</tr>
</tbody>
</table>
Data Management and Documentation
KARL STORZ AIDA® – Exceptional documentation

The name AIDA stands for the comprehensive implementation of all documentation requirements arising in surgical procedures: A tailored solution that flexibly adapts to the needs of every specialty and thereby allows for the greatest degree of customization.

This customization is achieved in accordance with existing clinical standards to guarantee a reliable and safe solution. Proven functionalities merge with the latest trends and developments in medicine to create a fully new documentation experience – AIDA.

AIDA seamlessly integrates into existing infrastructures and exchanges data with other systems using common standard interfaces.

WD 200-XX*

AIDA Documentation System, for recording still images and videos, dual channel up to FULL HD, 2D/3D, power supply 100-240 VAC, 50/60 Hz
including:
USB Silicone Keyboard, with touchpad
ACC Connecting Cable
DVI Connecting Cable, length 200 cm
HDMI-DVI Cable, length 200 cm
Mains Cord, length 300 cm

WD 250-XX*

AIDA Documentation System, for recording still images and videos, dual channel up to FULL HD, 2D/3D, including SMARTSCREEN® (touch screen), power supply 100-240 VAC, 50/60 Hz
including:
USB Silicone Keyboard, with touchpad
ACC Connecting Cable
DVI Connecting Cable, length 200 cm
HDMI-DVI Cable, length 200 cm
Mains Cord, length 300 cm

*XX Please indicate the relevant country code (DE, EN, ES, FR, IT, PT, RU) when placing your order.
Workflow-oriented use

**Patient**
Entering patient data has never been this easy. AIDA seamlessly integrates into the existing infrastructure such as HIS and PACS. Data can be entered manually or via a DICOM worklist. All important patient information is just a click away.

**Checklist**
Central administration and documentation of time-out. The checklist simplifies the documentation of all critical steps in accordance with clinical standards. All checklists can be adapted to individual needs for sustainably increasing patient safety.

**Record**
High-quality documentation, with still images and videos being recorded in FULL HD and 3D. The Dual Capture function allows for the parallel (synchronous or independent) recording of two sources. All recorded media can be marked for further processing with just one click.

**Edit**
With the Edit module, simple adjustments to recorded still images and videos can be very rapidly completed. Recordings can be quickly optimized and then directly placed in the report. In addition, freeze frames can be cut out of videos and edited and saved. Existing markings from the Record module can be used for quick selection.

**Complete**
Completing a procedure has never been easier. AIDA offers a large selection of storage locations. The data exported to each storage location can be defined. The Intelligent Export Manager (IEM) then carries out the export in the background. To prevent data loss, the system keeps the data until they have been successfully exported.

**Reference**
All important patient information is always available and easy to access. Completed procedures including all information, still images, videos, and the checklist report can be easily retrieved from the Reference module.
**Accessories for Video Documentation**

- **495 NL**
  - [Fiber Optic Light Cable](#), with straight connector, diameter 3.5 mm, length 180 cm

- **495 NA**
  - [Same](#), length 230 cm

**Cold Light Fountain XENON 300 SCB**

- **20133101-1**
  - [Cold Light Fountain XENON 300 SCB](#) with built-in antifog air-pump, and integrated KARL STORZ Communication Bus System SCB
  - power supply: 100–125 VAC/220–240 VAC, 50/60 Hz
  - including:
    - [Mains Cord](#)
    - [SCB Connecting Cable](#), length 100 cm

- **20133027**
  - [Spare Lamp Module XENON](#) with heat sink, 300 watt, 15 volt

- **20133028**
  - [XENON Spare Lamp](#), only, 300 watt, 15 volt

**Cold Light Fountain XENON NOVA® 300**

- **20134001**
  - [Cold Light Fountain XENON NOVA® 300](#), power supply: 100–125 VCA/220–240 VAC, 50/60 Hz
  - including:
    - [Mains Cord](#)

- **20132028**
  - [XENON Spare Lamp](#), only, 300 watt, 15 volt
Equipment Cart

- Monitor Swivel Arm, UG 540
  - Height and side adjustable
  - Can be turned to the left or the right side
  - Swivel range 180°, overhang 780 mm
  - Overhang from centre 1170 mm
  - Load capacity max. 15 kg
  - With monitor fixation VESA 5/100
  - For usage with equipment carts UG xxx

Equipment Cart, UG 220
- Wide, high, rides on 4 antistatic dual wheels
- Equipped with locking brakes 3 shelves
- Mains switch on top cover
- Central beam with integrated electrical subdistributors
- With 12 sockets, holder for power supplies, potential earth connectors and cable winding on the outside

Dimensions:
- Equipment cart: 830 x 1474 x 730 mm (w x h x d)
- Shelf: 630 x 510 mm (w x d)
- Caster diameter: 150 mm

Including:
- Base module equipment cart, wide
- Cover equipment, equipment cart wide
- Beam package equipment, equipment cart high
- 3x Shelf, wide
- Drawer unit with lock, wide
- 2x Equipment rail, long
- Camera holder
Recommended Accessories for Equipment Cart

**UG 310**  
**Isolation Transformer,**  
200 V – 240 V; 2000 VA with 3 special mains socket, expulsion fuses, 3 grounding plugs, dimensions: 330 x 90 x 495 mm (w x h x d), for usage with equipment carts UG xxx

**UG 410**  
**Earth Leakage Monitor,**  
200 V – 240 V, for mounting at equipment cart, control panel dimensions: 44 x 80 x 29 mm (w x h x d), for usage with isolation transformer UG 310

**UG 510**  
**Monitor Holding Arm,**  
height adjustable, inclinable, mountable on left or right, turning radius approx. 320°, overhang 530 mm, load capacity max. 15 kg, monitor fixation VESA 75/100, for usage with equipment carts UG xxx

Please note that the described products in this medium may not be available yet in all countries due to different regulatory requirements.
Notes: