ENDOSCOPIC SURGICAL MANAGEMENT OF CEREBROSPINAL FLUID RHINORRHEA

Paolo CASTELNUOVO
Davide LOCATELLI
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Authors:
Paolo CASTELNUOVO
Prof., M.D., Chairman of Department of Otorhinolaryngology, Insubria University Clinical Center, Hospital Circolo e Fondazione Macchi, Varese, Italy

Davide LOCATELLI
M.D., Head of Neuroendoscopy Department of Neurosurgery General Hospital of Legnano, Italy

Co-Authors:
I. ACCHIARDI, M.D.
M. BIGNAMI, M.D.
F. De BERNARDI, M.D.
G. DELÙ, M.D.
G. Di GIULIO, M.D.
G. PADOAN, M.D.
A. PISTOCHINI, M.D.
F. RAMPA, M.D.
L. SAMMARCHI, M.D.

Contributors:
M. BRASCHI, M.D.
S. MAURI, M.D.
P. PALMA, M.D.
P. SCAGNELLI, M.D.

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Endoscopic Surgical Management of Cerebrospinal Fluid Rhinorrhea

Paolo Castelnuovo and Davide Locatelli

Correspondence address of the author:
Prof. Paolo Castelnuovo, M.D.
Direttore Clinica ORL
Università dell’Insubria, Varese
Azienda Ospedaliera-universitaria
Ospedale di Circolo e Fondazione Macchi
Clinica Otorinolaringoiatrica
Viale Borri, 57 – 21100 Varese, Italia
E-mail: paolo.castelnuovo@me.com
E-mail: paolo.castelnuovo@ospedale.varese.it

Davide Locatelli, M.D.
Azienda Ospedaliera di Legnano
Dipartimento di Neurochirurgia
Via Papa Giovanni Paolo II
20025 Legnano, Italy

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1.0 Introduction

Cerebrospinal fluid (CSF) leaks of the anterior skull base create a passage connecting the meninges and all tissues separating the subarachnoid space, filled with cerebrospinal fluid, from the underlying upper aerodigestive tract. CSF rhinorrhea therefore involves a large number of anatomical structures: the dura mater, the arachnoid, the skull base and the mucosa of the nasal cavities and the paranasal sinuses. The main surgical approaches for the surgical repair of CSF leaks are intracranial and extracranial.

Walter Dandy\textsuperscript{4} performed the first successful intracranial repair in 1926. The disadvantages of this approach are increased invasiveness and trauma, involving prolonged hospitalization and efficacy below 60%. Extracranial approaches comprise the external access by transorbital ethmoidectomy, microscopic endonasal approach, and endoscopic endonasal approach.

Dohlman\textsuperscript{5} in 1948, was the first to describe the extracranial approach, which he did through a naso-orbital incision with external ethmoidectomy for sealing a spontaneous leak of the cribriform plate by use of graft material harvested from the nasal turbinate and septum.

In 1981, Wigand\textsuperscript{5} was the first to provide a written description of the endoscopic repair of an iatrogenic CSF leak detected during transnasal endoscopic sinus surgery. This approach was later used by Stankiewicz, Mattox, Kennedy, Stammberger and Draf\textsuperscript{10,12,13}.

Over the last decade, endoscopic surgery has established itself as the most widely used technique for the repair of CSF fistulae\textsuperscript{2, 3, 8, 9}.

The endoscopic-guided approach for surgical repair of CSF rhinorrhea offers the benefit of both a panoramic and detailed image of the site of surgery. In fact, owing to the specific direction of view of the endoscope’s lens system it is possible to inspect the circumference of the operating field at 360° by rotating the telescope around its longitudinal axis. These technical features enable direct endonasal access to the anatomical structures at the rhinobase without the need for cutaneous incisions or cutting through bony segments and without dislodgement of bone structures.
2.0 Diagnostic Algorithm

The adequate diagnostic approach for the detection of a CSF fistula may pose different problems depending on whether rhinorrhea is present or not. Should rhinorrhea be present, the diagnostic work-up must first “confirm the fluid leak” by taking a thorough patient history and performing an objective examination and laboratory tests on collected samples of cerebrospinal fluid.

During a second phase “the leak is localized and the dimensions of the lesion determined” (Diagram 1). This involves the use of high-resolution X-ray images (CT and MRI) and, if required, endoscopic detection of the CSF leak by fluorescein application. If detection of cerebrospinal fluid fails due to its sporadic nature or because the only clinical symptoms are episodes of meningitis, it may prove difficult to localize signs of a defect despite all the above-mentioned procedures being conducted. In the absence of a CSF leak, but with a tentative diagnosis based on episodes of meningitis, it may prove necessary to resort to endonasal dissection of the rhinobase (ethmoidotomy-sphenoidotomy) and adjunctive administration of intrathecal fluorescein injected at lumbar level. This adjunctive, more invasive examination makes it possible to detect anatomical areas susceptible to meningeal infections. In fact, these areas are visualized by fluorescein-positive staining, even in the absence of cerebrospinal fluid.

Diagram 1
Diagnostic algorithm.
2.1 Basic Endoscopic Evaluation by Endonasal Inspection

A basic endoscopic examination of the nasal cavities makes it possible to identify the lesion in the evidence of an active CSF rhinorrhea. If there are no clinical signs of CSF rhinorrhea it is nonetheless possible to identify neoplasms by their translucent appearance similar to polyps. If inspected closely, it is possible to note the pulsation transmitted by the brain, indicative of a meningocele or meningoencephalocele (Figs. 1, 2). Nasal endoscopy is performed under local anesthesia with the patient in a supine position. Cotton pledgets are soaked in an anesthetic agent with vasoconstrictor and put in position. Rigid telescopes with 2.7 mm and 4 mm in diameter, and 0° and 45° directions of view are used.

2.2 Endonasal Endoscopic Evaluation Following Lumbar Intrathecal Administration of Sodium Fluorescein

This test is instrumental for accurate diagnosis and direct topographic analysis and involves the lumbar intrathecal injection of 1 ml sodium fluorescein 5%, based on the Graz protocol. Endoscopic endonasal inspection is performed using a cold light source with integrated blue-light filter and complementary yellow-light barrier filter adapted to the eyepiece of the scope. The test mandates a follow-up monitoring for the duration of 48 to 72 hours. If the test confirms the presence of cerebrospinal fluid – by emission of a glowing yellowish-green color – this should, in turn, allow to accurately localize the site of the defect (Fig. 3).
3.0 Classification of CSF Leaks

Various etiological factors account for the development of CSF rhinorrhea. Thus they are divided into two groups: traumatic and non-traumatic CSF fistulas (Diagram 2) (Figs. 4–6).

Diagram 2
Etiological Classification of Cerebrospinal Fluid Rhinorrhea (modified – Har-El G.).
4.0 Surgical Treatment

The surgical procedure comprises 2 stages: the first involving the approach to the lesion and the second the repair of the defect.

4.1.1 Identification and Localization of the Lesion

Once the patient has been fully instructed and his/her consent obtained, an intrathecal injection of 1 ml sodium fluorescein 5% is given at the lumbar level before starting surgery or after induction of anesthesia.

Initially, endonasal endoscopic evaluation is conducted by use of a fluorescein blue-light filter system attached to the cold light source and a specific fluorescein barrier filter mounted to the eyepiece of the telescope. When fluorescence is present, the true site of the leak can be generally identified by a characteristic green glow. In addition, owing to mucociliary clearance the dye will flow along the passageways determined by the mucociliary transport system, thus making it possible to trace the defect.

4.1.2 Methods of Approach

The method of approach varies depending on the type of lesion and its location. Five main different types of approach can be distinguished:

**Direct Paraseptal Approach to the Olfactory Fossa**

In the presence of an expansive lesion occupying almost the entire olfactory fossa, and if the herniated mass has lateralized the basal lamella of the ethmoidal turbinates, the access route is paraseptal, without sacrificing any ethmoid structures. The procedure starts by sectioning the stalk of the intranasal herniated sac through electro coagulation until the origin of the defect can be localized (Figs. 7–10).

Dissection of the dural margin from the endocranial bony side, exposure of the epidural space above the ethmoid roof, and elevation of the mucosa from the area surrounding the defect at the level of the olfactory fossa, the nasal septum, and the lateral nasal wall: the steps above are designed to prepare the target area around the defect for proper placement of the graft (Figs. 8, 9, 10).

**Direct Paraseptal Approach with Sphenoidotomy**

This approach is adopted to gain access to the posterior sphenoid sinus wall for repair of the sellar floor or treat CSF leaks localized on the planum sphenoidale. The surgical approach is also indicated in the event of an obliteration of sphenoid sinus cavity; autologous abdominal fat is used for this procedure which is indicated for the repair of CSF leaks in the sphenoid sinus area in the event of poorly pneumatized sinuses.
Endoscopic Surgical Management of Cerebrospinal Fluid Rhinorrhea

Fig. 11
Intraoperative endoscopic view of the right nasal cavity. Condition after repair of the dural defect using a cartilage graft harvested from the nasal septum (NS). This underlay graft is located inside the cranium in an extradural position.

Fig. 12
Intraoperative endoscopic view of the right nasal cavity. Placement of the mucoperi-chondrial overlay graft (MPC) at the level of the olfactory fossa in extracranial position (double-layer, combined graft).

Fig. 13
Endoscopic view of the right nasal cavity, demonstrating the natural sphenoid sinus ostium (SpS). S = Nasal septum; ST = posterior third of the supreme nasal turbinate

Fig. 14
Endoscopic view of the right nasal cavity (0° telescope). The natural sphenoid sinus ostium is identified and enlarged with an intranasal drill to access the sphenoid sinus. S = Nasal septum; ST = superior nasal turbinate

Fig. 15
This endoscopic view of the sphenoid cavity (0° telescope) allows for identification of the following anatomical landmarks: optic nerve (ON) and internal carotid artery (IC) bilaterally, sellar floor (SF) and intersphenoid septum (IS).

Fig. 16
Endoscopic view of the right nasal cavity. Access to the sphenoid sinus is obtained by drilling through the sphenoid rostrum. SR = sphenoid rostrum; ST = superior nasal turbinate

Fig. 17
The sphenoid rostrum is a safe spot for the drilling procedure to prevent iatrogenic trauma to the optic nerve and internal carotid artery. ST = superior nasal turbinate; S = nasal septum; SpS = sphenoid sinus

procedure, routinely used in the past and very rarely performed nowadays in our hospital, has been superseded by intrasinus management of the bony defect with the aid of multilayer grafts via the transthyroid-pterigoid-sphenoid approach18. The surgical procedure requires a tangential access to the nasal septum medial to the middle nasal turbinate, and to the posterior thirds of the superior and supreme nasal turbinates, where the natural sphenoid sinus ostium is located. The natural ostium is enlarged and the intersphenoid septum removed, thus creating a single cavity and allowing for identification of the relevant anatomical landmarks (opticocarotid recesses, optic nerves, internal carotid arteries) and localization of the lesion (Figs. 13–15).

If identification of the sphenoid ostium fails, access can be gained by targeted drilling at the site of the sphenoid rostrum, in paramedial position. In this way, iatrogenic trauma to the optic nerve and internal carotid artery can be prevented (Figs. 16, 17). In this case, removal of the terminal part of the nasal septum at the level of the vomer facilitates the use of both nasal cavities employing a 4-hand technique.

The direct paraseptal approach, with or without sphenoidotomy, also permits access to the clivus region. Once the posterior third of the septum has been removed with a 4-hand technique, it is possible to elevate an inferiorly-pedicled mucosal flap, with inferior axis of inversion at this site, and continue with dissection of the posterior cranial fossa via the transcavitory route until the dural defect is completely exposed.
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Transethmoidal Approach With Preservation of the Basal Lamella of the Middle Turbinate

If the defect is situated at the ethmoid level lateral to the basal lamella (Fig. 18), the roof of the ethmoid must be completely dissected to enable accurate localization of the lesion. This surgical technique involves the exenteration of the ethmoid labyrinth, dissection of the skull base, and enlargement of the natural ostia of the paranasal sinuses (ethmoidotomy, sphenoidotomy, frontal sinusotomy, and maxillary sinusotomy, under preservation of the nasal turbinates). By enlarging the natural sinus ostia it is possible to identify any multiple cerebrospinal fluid fistulae not detected yet during the diagnostic stage while using intrathecal fluorescein with a blue-light filter system and a specific barrier filter.

Provided the defect is located at the level of the posterior frontal sinus wall, consider the option of an approach via the endoscopic endonasal route exclusively. If the defect is close to the frontal infundibulum, with a frontal recess of sufficient inner diameter in antero-posterior direction, it is possible to repair the defect from below, following an extended sinusotomy (Draf type III). Otherwise, it will be necessary to use an external combined approach with frontal osteoplasty.

Transethmoidal Approach with Removal of the Basal Lamella of the Middle Turbinate

If the defect is located at the level of the middle and posterior thirds of the olfactory fossa or at the level of the ethmoid roof, with medial involvement of the olfactory fossa, the middle nasal turbinate and the entire basal lamella of the ethmoidal turbinates must be removed to obtain a smooth surface for proper implantation of the autologous graft previously harvested from the middle nasal turbinate (Figs. 19–22).

In these cases, the lesions are small in size (olfactory fossa meningoceles); a large part of the olfactory fossa is preserved along with the olfactory nerve fibers that traverse it. On account of this, the technique does not involve dissection of the epidural space.
Provided the defect is located at the level of the ethmoid roof, the edges of the bony defect are smoothly adapted even if this entails enlarging it. Following exposure of the epidural space, duraplasty is performed using the multilayer technique (Fig. 26).

**Tranethmoid-Pterygoid-Sphenoid Approach**

This approach is used for repairing defects of the lateral sphenoid sinus wall. After having completed an ethmoid sphenoidotomy and an extensive middle meatal antrostomy opening, the posterior fontanelle, the posterior maxillary sinus wall and the base of the pterygoid process can be identified. The nasal and septal branches of the sphenopalatine artery are coagulated. The anterior wall of the sphenoid sinus and the base of the pterygoid process are drilled by use of a diamond-tipped burr as far as the lateral sphenoid sinus wall, even if highly pneumatized. This allows dural lesions to be closed at the level of the middle cranial fossa, using a multilayer technique. (Figs. 23-25).

---

**Fig. 23**
CT in coronal view at the level of the right sphenoid sinus (SpS): the pointer indicates the bony defect, lateral to the V2 cleft. PP = pterygoid plate

**Fig. 24**
Previous case: the base of the pterygoid process is drilled by use of a burr as far as the lateral wall of the right sphenoid sinus. PP = pterygoid plate
SpS = sphenoid sinus
S = nasal septum

**Fig. 25**
View with 45° telescope: a first layer of synthetic dura (SD) is placed underlay in the epidural space of the middle cranial fossa floor.
SpS = sphenoid sinus
4.2 Repair of the Dural Defect (Duraplasty)

4.2.1 Graft Selection and Preparation of the Recipient Site

Donor materials for endoscopic repair of CSF leaks include autologous nasal, extranasal and heterologous grafts\textsuperscript{13, 14, 15, 16}. For many years we have used heterologous dura grafts as the first layer in contact with the cerebral parenchyma (Neuro-Patch\textsuperscript{9}) (Fig. 26), with good results. However, these materials do not integrate biologically with the surrounding tissue. This finding occurred in 4 patients. In 3 of them, the synthetic material was found to be extruded at 6, 11 and 15 months after surgery with an infection as sequela. In one patient, we found recurrence of CSF rhinorrhea at 7 days postoperatively due to dislocation of the first layer of duraplasty because the edges failed to integrate. In all these patients, revision surgery was successful, with use of a free graft of fascia lata as the first layer.

Currently, our primary treatment modality involves the use of autologous materials: the repair of dural defects can be performed with fascia lata or fascia temporalis as the first layer in contact with the cerebral parenchyma and the dura; for the extradural intracranial second layer it is possible to use septal or auricular conchal cartilage or bone harvested from the middle turbinate, vomer, or perpendicular plate of the ethmoid. These structures are used to improve adherence of the margins of the first layer of fascia. Approximation of margins is indeed the key to success in duraplasty and should be performed with great care.

Fig. 26
Endoscopic image (45° telescope) showing the repair of a defect located at the ethmoid roof. A patch of synthetic dura is placed by use of an angled positioner. The herniated cerebral tissue is then pushed into the epidural space.

Fig. 27
Preparation and placement of a pedunculated septal graft (LS) in the right nasal fossa. The graft is used to close a defect at the level of the right ethmoid-sphenoid planum.

\begin{itemize}
  \item $S =$ nasal septum
  \item $TM =$ middle turbinate
  \item $TI =$ inferior turbinate
  \item $\ast =$ skull base defect
\end{itemize}
Small pieces of abdominal fat may also be used to fill tiny dehiscences in the margins of the duraplasty. Mucosal defects can be repaired with septal mucoperichondrium, mucoperiosteum of the middle turbinate, or with fascia as the third overlay layer.

In the presence of large defects, located at the level of the middle and posterior cranial fossa, it is possible to replace heterologous materials with a mucosal flap from the nasal septum pedunculated on the septal branch of the sphenopalatine artery. In this case, the graft is prepared prior to removal of the posterior part of the nasal septum, if required. For convenience, the flap can be extensively mobilized – drilling out the base of the pterygoid following its removal – and positioning it in the homolateral maxillary sinus secondary to a large antrostomy. This flap is used as the second layer of the graft, while the first, in contact with the dura and the cerebral parenchyma, is shaped from fascia lata or temporalis (Figs. 27a–d).

The choice of the graft is based on the anatomic site, the size of the defect and the individual patient’s anatomy. Once the fistula has been identified, the recipient site must be prepared. Depending on the closure technique to be used (overlay or multilayer) the graft bed must be prepared by removing mucosa from the area around the bone defect. Bone surface irregularities need to be smoothed out with an intranasal drill to obtain as even a recipient surface as possible. Finally, preparation requires that the endocranial osseous margins be carefully dissected from the dura.
4.2.2 Selection of the Type of Duraplasty

Like the selection of the graft type, the closure technique is also closely related to the anatomic location, the size of the leak and the individual patient’s anatomy. The closure techniques include the overlay technique, which involves positioning the graft above the extracranial edge of the lesion, and the combined technique using several layers. Another option is the obliterative technique using autologous material.

The overlay technique is primarily used for covering small defects at the level of the olfactory fossa. After having exposed the defect, evened out the bone edges and removed surface irregularities from the rhinobase with the intranasal drill, the recipient site for the mucoperichondrial or mucoperiosteal flap is denuded of mucosa (Figs. 28, 29). Careful preparation of the recipient site of the graft is the most important condition for the success of duraplasty. The graft is implanted with the connective side toward the defect and is then stabilized with pieces of resorbable sponge and fibrin glue, applied to the margins of the graft.

The combined technique (multilayer) is used for medium and large lesions at the level of the ethmoid and sphenoid roof, the sellar floor and the lateral sphenoid sinus wall. This technique may be employed with a variable number of layers. In addition to debridement of the lesion previously described, it is also crucial to dissect the dural margins from the endocranial side of the rhinobase, the epidural space. If two layers are employed, the first one is placed between the dura mater and the endocranial bony surface (fascia lata); the second one is the overlay graft (mucoperichondrium, mucoperiosteum) (Fig. 30).
If three layers are used, the first is placed at intradural level (in the past we used dural substitutes; now we prefer the use of autologous material such as fascia lata or temporalis); the second one is the intracranial extradural layer (cartilage, bone, fascia); the third one is the overlay graft (mucoperichondrium, mucoperiosteum or pedunculated graft from the nasal septum) (Fig. 31). The **obliteration technique** is used predominantly for the sphenoid or frontal sinuses, provided they show only a minor degree of pneumatization. In these cases it is easier to completely remove the mucosa from the sinus, which is important for preventing iatrogenic formation of mucoceles. We use autologous abdominal fat in one piece as obliterative material. It is positioned so that it completely obliterates the sinus and is covered at the level of the anterior sinus wall by a mucoperichondrial or mucoperiosteal flap (Fig. 32). As previously indicated, in recent years, the obliteration technique for the sphenoid sinus has been superseded by the multilayer duraplasty technique in the management of a bony defect via the transethmoid-pterigoid-sphenoid route.\(^\text{18}\)
4.3 Intraoperative Assessment with Yellow- and Blue-Light Filters

Once the leak has been covered, an intraoperative fluorescein test allows to immediately confirm patency of the repaired defect. The site of the former fistula should be carefully inspected endoscopically through a blue light filter. As a rule, a negative test result means that the defect has been repaired successfully.

5.0 Postoperative Follow-up

The therapeutic measures during the postoperative period vary depending on the general conditions of the patient and the characteristics of the CSF rhinorrhea. In order to prevent secondary infection caused by the surgical trauma and the packing, all patients are administered a course of antibiotics in addition to antihistamines to prevent sneezing.

Generally, we do not place an external lumbar drainage in the postoperative period; it is used only in cases of previously documented endocranial hypertension.

A period of supine bed rest is necessary, with trunk and head raised by 25° until removal of the packing, which is generally done on the second postoperative day. The patient is discharged 3–5 days following surgery, and is instructed to avoid physical stress for 30 days.

The first follow-up takes place after 15 days. During this session, the residues of the absorbable packing and any scabs are removed, and the correct placement and vitality of the graft are confirmed. If necessary, the absorbable sponges and a silastic cover can be replaced in the nasal cavity. The normal postoperative procedure involves successive follow-up examinations in the third month and every three months for the following year, then six-monthly follow-up examinations for 2 years and yearly follow-up examinations for a further 2 years. A follow-up MRI is performed 6 months after the operation, then after 2 and 5 years post-operatively.
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References


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<td>4.0 mm</td>
<td>18 cm</td>
</tr>
<tr>
<td>7220 AS</td>
<td>7220 AA</td>
<td>3.7 x 4.8 mm</td>
<td>10 cm</td>
<td>7220 AS</td>
<td>0°</td>
<td>3.0 mm</td>
<td>14 cm</td>
</tr>
<tr>
<td>7220 BS</td>
<td>7220 BA</td>
<td>3.7 x 4.8 mm</td>
<td>10 cm</td>
<td>7220 BS</td>
<td>30°</td>
<td>3.0 mm</td>
<td>14 cm</td>
</tr>
<tr>
<td>7220 FS</td>
<td>7220 FA</td>
<td>3.7 x 4.8 mm</td>
<td>10 cm</td>
<td>7220 FS</td>
<td>45°</td>
<td>3.0 mm</td>
<td>14 cm</td>
</tr>
<tr>
<td>7220 CS</td>
<td>7220 CA</td>
<td>3.7 x 4.8 mm</td>
<td>10 cm</td>
<td>7220 CS</td>
<td>70°</td>
<td>3.0 mm</td>
<td>14 cm</td>
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<tr>
<td>7219 AS</td>
<td>7229 AA</td>
<td>3.5 x 4.7 mm</td>
<td>14 cm</td>
<td>7219 AS</td>
<td>0°</td>
<td>2.7 mm</td>
<td>18 cm</td>
</tr>
<tr>
<td>7219 BS</td>
<td>7229 BA</td>
<td>3.5 x 4.7 mm</td>
<td>14 cm</td>
<td>7219 BS</td>
<td>30°</td>
<td>2.7 mm</td>
<td>18 cm</td>
</tr>
<tr>
<td>7219 FS</td>
<td>7229 FA</td>
<td>3.5 x 4.7 mm</td>
<td>14 cm</td>
<td>7219 FS</td>
<td>45°</td>
<td>2.7 mm</td>
<td>18 cm</td>
</tr>
<tr>
<td>7219 CS</td>
<td>7229 CA</td>
<td>3.5 x 4.7 mm</td>
<td>14 cm</td>
<td>7219 CS</td>
<td>70°</td>
<td>2.7 mm</td>
<td>18 cm</td>
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<tr>
<td>7230 AES</td>
<td>7230 AE</td>
<td>4.8 x 6 mm</td>
<td>14 cm</td>
<td>7230 AES</td>
<td>15°– 90°</td>
<td>4 mm</td>
<td>18 cm</td>
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</table>
Elevators, Curettes and Knives

479100  COTTLE Elevator, double-ended, semisharp and blunt, graduated, length 20 cm
660500  Sickle Knife, slightly curved, pointed, length 18 cm
660506  Round Knife, vertical cutting, 3.5 x 2.5 mm, length 18 cm
660509  Round Knife, angled 45°, diameter 2 mm, length 18 cm

628702  Antrum Curette, oblong, small size, length 19 cm
628712  KUHN-BOLGER Frontal Sinus Curette, 55° curved, oval, forward cutting, length 19 cm
628714  Same, 90° curved

STAMMBERGER RHINOFORCE® II Forceps

651010  STAMMBERGER RHINOFORCE® II Forceps, cupped jaws, vertical opening, 65° upturned, cupped jaws diameter 3 mm, with cleaning connector, working length 12 cm
651020  Same, horizontal opening
STAMMBERGER Punch

651055 STAMMBERGER Punch, circular cutting, for sphenoid, ethmoid and choanal atresia, diameter 3.5 mm, with cleaning connector, working length 18 cm, including Cleaning Tool 651050 R

651050 Same, diameter 4.5 mm

651060 STAMMBERGER Punch, circular cutting, 65° upturned, for frontal sinus recess, diameter 3.5 mm, with cleaning connector, working length 17 cm, including Cleaning Tool 651050 R

651065 Same, diameter 4.5 mm

651061 STAMMBERGER Punch, egg-shaped tip, circular cut, 90° cutting direction, tip diameter 3.5 mm, sheath 65° upturned, for frontal sinus recess, with cleaning connector, working length 17 cm

651066 Same, diameter 4.5 mm

Cleaning Tool

651050 R Cleaning Tool, for circular cutting punches type 651050 / 651055 / 60 / 65, double-ended, length 14 cm
HOSEMANN **Frontal Sinus/Recess Punch**

HOSEMANN **Sphenoid Punch**

with integrated irrigation channel

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HOSEMANN **Frontal Sinus/Recess Punch**
70° upturned, slender model, punch head diameter 3.5 mm, not through-cutting, upper part of punch fixed, lower part of punch movable, sheath diameter 2.5 mm, integrated irrigation channel with LUER-Lock, working length 13 cm

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HOSEMANN **Sphenoid Punch**
straight, slender model, punch head diameter 3.5 mm, not through-cutting, front part of punch fixed, rear part of punch movable, sheath diameter 2.5 mm, integrated irrigation channel with concealed LUER-Lock irrigation adaptor, working length 13 cm

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**BLAKESLEY RHINOFORCE® II Nasal Forceps**

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BLAKESLEY **RHINOFORCE® II Nasal Forceps**, straight, size 0, with cleaning connector, working length 13 cm

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BLAKESKEY-WILDE **RHINOFORCE® II Nasal Forceps**, 45° upturned, size 0, with cleaning connector, working length 13 cm
BLAKESLEY-CASTELNUOVO RHINOFORCE® II Nasal Forceps
end of sheath 25° upturned

GRÜNWALD-HENKE RHINOFORCE® II Nasal Forceps
straight, through-cutting, tissue-sparing, BLAKESLEY shape, size 0, width 3 mm, with cleaning connector, working length 13 cm

Same, 45° upturned
BLAKESLEY-CASTELNUOVO RHINOFORCE® II Nasal Forceps
end of sheath 25° upturned

456009 B  BLAKESLEY-CASTELNUOVO RHINOFORCE® II Nasal Forceps, end of sheath 25° upturned, with straight jaw, width 2.5 mm, with cleaning connector, working length 13 cm

456010 B  BLAKESLEY-CASTELNUOVO RHINOFORCE® II Nasal Forceps, end of sheath 25° upturned, with straight jaws, width 3 mm, with cleaning connector, working length 13 cm

456509 B  Same, jaws 45° upturned, width 2.5 mm

456510 B  Same, jaws 45° upturned, width 3 mm

451010 B  CASTELNUOVO RHINOFORCE® II Nasal Forceps, end of sheath 25° upturned, through-cutting, with straight jaws, BLAKESLEY shape, width 3 mm, with cleaning connector, working length 13 cm

451510 B  Same, jaws 45° upturned
SILCUT® Nasal Forceps

Special features:
- Tactile instrument feedback
- Uniform patented force transmission
- Powerful resection under precise control
- Accurate incision due to small tolerances
- Special cutting geometry to prevent tissue from slipping
- Large aperture angle
- Flat jaws
- Through-cutting and backward-cutting versions also available

456021 GRÜNWALD-HENKE SILCUT® Nasal Forceps, straight, not through-cutting, extremely powerful resection, patented uniform force transmission for gently controlled grasping and removal of tissue, cartilage and bone fragments, new ergonomic handle design, BLAKESLEY shape, size 1, with cleaning connector, working length 13 cm

456521 Same, 45° upturned

451020 GRÜNWALD-HENKE SILCUT® Nasal Cutting Forceps, straight, through-cutting, extremely powerful resection, patented uniform force transmission for gently controlled cutting, new ergonomic handle design, BLAKESLEY shape, size 0, with cleaning connector, working length 13 cm

451021 Same, size 1

451520 GRÜNWALD-HENKE SILCUT® Nasal Cutting Forceps, 45° upturned, through-cutting, extremely powerful resection, patented uniform force transmission for gently controlled cutting, new ergonomic handle design, BLAKESLEY shape, size 0, with cleaning connector, working length 13 cm

451521 Same, size 1

459151 STAMMBERGER SILCUT® Antrum Punch, extremely powerful resection, patented uniform force transmission for gently controlled cutting, new ergonomic handle design, right side downward and forward cutting, with cleaning connector, working length 10 cm

459152 Same, left side downward and forward cutting

459161 SILCUT® Antrum Punch, right side upward and forward cutting, sheath distally curved right, with cleaning connector, working length 10 cm

459162 Same, left side upward and forward cutting, sheath distally curved left

452011 MACKAY-GRÜNWAld SILCUT® Nasal Cutting Forceps, straight, through-cutting, extremely powerful resection, patented uniform force transmission for gently controlled cutting, new ergonomic handle design, size 1, 8 x 3 mm, with cleaning connector, working length 13 cm

452021 SILCUT® Nasal Cutting Forceps, straight, through-cutting, extremely powerful resection, patented uniform force transmission for gently controlled cutting, new ergonomic handle design, width of cut 1.5 mm, with cleaning connector, working length 13 cm

452031 Same, jaws upturned 15°
RHINOFORCE® II Nasal Scissors

RHINOFORCE® II, Nasal Scissors, straight, small model, length of cut 10 mm, with cleaning connector, working length 13 cm

- 449211
- 449212 Same, curved to right
- 449213 Same, curved to left

RHINOFORCE® II Miniature Nasal Forceps

RHINOFORCE® II Miniature Nasal Forceps, with extra fine flat jaws, through-cutting, tissue-sparing, straight sheath, straight jaws, width of cut 1.5 mm, with cleaning connector, working length 13 cm

- 452831
- 452832 Same, jaws upturned 45°
- 452833 Same, sheath curved 30°, straight jaws
- 452834 Same, sheath curved 30°, jaws 45° upturned
CASTELNUOVO RHINOFORCE® II Miniature Nasal Forceps

452841 CASTELNUOVO RHINOFORCE® II Miniature Nasal Forceps, with extra fine flat jaws, through-cutting, tissue-sparing, 65° upturned, backward opening, width of cut 1.5 mm, with cleaning connector, working length 13 cm

452841 L Same, left side opening

452841 R Same, right side opening

HEUWIESER Antrum Grasping Forceps

653000 HEUWIESER Antrum Grasping Forceps, jaws curved downwards, fixed jaw curved 90°, movable jaw backward opening 120°, with cleaning connector, working length 10 cm

653005 HEUWIESER Antrum Grasping Forceps, with extra long curve for anterior alveolar recess, fixed jaw curved downwards 115°, movable jaw backward opening up to 140°, with cleaning connector, working length 10 cm
CASTELNUOVO **Sphenoid Punch**

615015  CASTELNUOVO **Sphenoid Punch,** rigid, 65° upbiting forward cutting, size 3.5 x 3.7 mm, fixed jaw extra thin, working length 11 cm

615025  CASTELNUOVO **Sphenoid Punch,** rigid, 30° upturned, not through-cutting, upbiting forward cutting, fixed jaw extra flat, size 2 x 2 mm, working length 11 cm

PARSONS **RHINOFORCE® II Punch**

459040  PARSONS **RHINOFORCE® II Punch,** for partial resection of the uncinate process, upside backward cutting, movable jaw with round tip, diameter 2.5 mm, with cleaning connector, working length 10 cm

OSTRUM **Rotating Antrum Punch**

459097  **Rotating Punch,** for resection of the uncinate process, with set screw, backward cutting, sheath slightly curved downwards, small size, bite 2.3 x 4 mm, with cleaning connector, working length 9 cm
STAMMBERGER Antrum Punch

459051 STAMMBERGER Antrum Punch, right side downward and forward cutting, working length 10 cm

459052 Same, left side downward and forward cutting

CASTELNUOVO TAKE-APART® Bipolar Forceps

462020 CASTELNUOVO TAKE-APART® Bipolar Forceps with fine jaws, width 2 mm, distally angled 45°, outer diameter 3.4 mm, working length 14 cm, with irrigation connection for cleaning, including:
Handle
Outer Sheath
Inner Sheath
Bipolar Insert
CASTELNUOVO Frontal Sinus Probe and Positioning Instrument

629820  Probe, double-ended, maxillary sinus ostium seeker, ball-shaped ends diameter 1.2 and 2 mm, length 19 cm

629822  CASTELNUOVO Positioning Instrument, double-ended, curved/double curved, with 4 spikes, length 22 cm

629823  CASTELNUOVO Positioning Instrument, double-ended, straight/curved 60°, with 4 spikes, length 22 cm

629824  CASTELNUOVO Frontal Sinus Probe, curved, double-ended, length 22 cm
### CASTELNUOVO Elevators, double-ended

- **CASTELNUOVO Suction Elevators**

<table>
<thead>
<tr>
<th>Item Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>28164 EA</td>
<td>CASTELNUOVO Elevator, double-ended, semisharp and blunt, length 26 cm</td>
</tr>
<tr>
<td>28164 EB</td>
<td>Same, angled end shovel-shaped, semisharp, blunt end slightly curved</td>
</tr>
<tr>
<td>28164 EC</td>
<td>Same, blunt end angled, semisharp end slightly curved, graduated</td>
</tr>
<tr>
<td>474015</td>
<td>CASTELNUOVO Suction Elevator, flat tip, 5 x 1.8 mm, lateral suction opening, bayonet-shaped, with grip plate, length 21 cm</td>
</tr>
<tr>
<td>474016</td>
<td>CASTELNUOVO Suction Elevator, flat tip, 3 x 1.8 mm, lateral suction opening, bayonet-shaped, with grip plate, length 21 cm</td>
</tr>
<tr>
<td>474017</td>
<td>CASTELNUOVO Suction Elevator, 5 x 1.8 mm, double curved, length 21 cm</td>
</tr>
<tr>
<td>474018</td>
<td>CASTELNUOVO Suction Elevator, 3 x 1.8 mm, double curved, length 21 cm</td>
</tr>
</tbody>
</table>
STRÜMPEL Nasal Forceps

634825 A  STRÜMPEL Forceps, with oval, fenestrated, cupped jaws, 45° upturned, width 2.5 mm, working length 12.5 cm

Forceps

663239  Forceps, straight, not through-cutting, with oval, fenestrated cupped jaws, width 2.5 mm, working length 18 cm

663217  Forceps, 45° upturned, not through-cutting, extra sharp, with oval fenestrated spoon, width 1.5 mm, working length 18 cm, color code: one blue handle
RHINOFORCE® II Nasal Forceps

RHINOFORCE® II Nasal Forceps, with extra fine flat jaws, through-cutting, tissue sparing, width of cut 1.5 mm, straight sheath, straight jaws, with cleaning connector, working length 18 cm

28164 UB Same, jaws angled upwards 45°

28164 UE Same, jaws angled downwards 45°

Scissors

663300 Scissors, straight, working length 18 cm

663301 Scissors, straight, delicate, working length 18 cm

663302 Scissors, straight, extra delicate, working length 18 cm

663304 Same, curved to right

663305 Same, curved to left

663307 Same, 45° curved upwards

663327 Scissors, 45° upwards curve, delicate, shaft 360° rotatable, with cleaning connector, working length 18 cm
### Curettes, Dissectors and Elevators

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>28164 KA</td>
<td><strong>Curette</strong>, round spoon, tip slightly angled, size 1 mm, with round handle, length 23 cm</td>
</tr>
<tr>
<td>28164 KB</td>
<td>CAPPABIANCA-de DIVITIIS <strong>Curette</strong>, round spoon, tip slightly angled, size 2 mm, with round handle, length 23 cm</td>
</tr>
<tr>
<td>28164 KF</td>
<td><strong>Curette</strong>, round spoon, tip highly angled, size 2 mm, with round handle, length 23 cm</td>
</tr>
<tr>
<td>28164 KG</td>
<td><strong>Same</strong>, size 3 mm</td>
</tr>
<tr>
<td>28164 RN</td>
<td>CAPPABIANCA-de DIVITIIS <strong>Ring Curette</strong>, with round wire, inner diameter 3 mm, tip angled 45°, with round handle, length 25 cm</td>
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<tr>
<td>28164 RE</td>
<td><strong>Same</strong>, malleable</td>
</tr>
<tr>
<td>28164 RO</td>
<td>CAPPABIANCA-de DIVITIIS <strong>Ring Curette</strong>, with round wire, inner diameter 5 mm, tip angled 45°, with round handle, length 25 cm</td>
</tr>
<tr>
<td>28164 RJ</td>
<td><strong>Same</strong>, malleable</td>
</tr>
<tr>
<td>28164 RI</td>
<td>CAPPABIANCA-de DIVITIIS <strong>Ring Curette</strong>, with round wire, inner diameter 3 mm, tip angled 90°, with round handle, length 25 cm</td>
</tr>
<tr>
<td>28164 RG</td>
<td><strong>Same</strong>, inner diameter 5 mm</td>
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<tr>
<td>28164 RB</td>
<td>CAPPABIANCA-de DIVITIIS <strong>Ring Curette</strong>, with round wire, inner diameter 3 mm, laterally curved sheath end, with round handle, length 25 cm</td>
</tr>
<tr>
<td>28164 RD</td>
<td>CAPPABIANCA-de DIVITIIS <strong>Ring Curette</strong>, with round wire, inner diameter 5 mm, laterally curved sheath end 90°, with round handle, length 25 cm</td>
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<tr>
<td>28164 RW</td>
<td><strong>Same</strong>, inner diameter 7 mm</td>
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<tr>
<td>28164 RR</td>
<td>CAPPABIANCA-de DIVITIIS <strong>Curette</strong>, blunt, stirrup-shape, with round handle, length 25 cm</td>
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<tr>
<td>28164 DA</td>
<td><strong>Dissector</strong>, sharp, tip angled 45°, round spatula, with round handle, size 2 mm, length 23 cm</td>
</tr>
<tr>
<td>28164 DB</td>
<td><strong>Same</strong>, size 3 mm</td>
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<tr>
<td>28164 DF</td>
<td><strong>Dissector</strong>, sharp, tip angled 15°, flat long spatula, with round handle, size 1.5 mm, length 23 cm</td>
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<tr>
<td>28164 DS</td>
<td><strong>Elevator</strong>, sharp, tip angled 15°, slightly curved spatula, with round handle, size 2 mm, length 23 cm</td>
</tr>
<tr>
<td>28164 DM</td>
<td><strong>Elevator</strong>, sharp, straight tip, slightly curved spatula, with round handle, size 3 mm, length 23 cm</td>
</tr>
</tbody>
</table>
de DIVITIIS-CAPPABIANCA **Scalpel**

**Round Knife**

![Image of Round Knife](image)

- **28164 M** de DIVITIIS-CAPPABIANCA **Scalpel**, with retractable blade, length 23 cm, including:
  - Handle
  - Outer Sheath
  - Micro Knife, pointed

- **28164 KK** de DIVITIIS-CAPPABIANCA **Scalpel**, with retractable blade, length 23 cm, including:
  - Handle
  - Outer Sheath
  - Micro Knife, sickle-shaped

- **28164 MP** **Round Knife**, vertical, oval, with round handle, 3.5 x 2.5 mm, length 25 cm

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**Suction Curettes, with stylet, basket-shaped and hook-shaped**

![Image of Suction Curettes](image)

- **28164 RSB** CAPPABIANCA-de DIVITIIS **Suction Curette**, blunt, inner diameter 5 mm, tip angled 45°, LUER, length 25 cm

- **28164 RSC** **Same**, inner diameter 7 mm

- **28164 RT** CAPPABIANCA-de DIVITIIS **Suction Curette**, with basket, round, size 5 mm, rotatable tube, LUER, length 25 cm

- **28164 RU** **Same**, size 6.5 mm

- **28164 HKL** **Hook Curette**, curved to left, hook width 2.5 mm, hook size 0.5 mm, length 25 cm

- **28164 HKR** **Hook Curette**, curved to right, hook width 2.5 mm, hook size 0.5 mm, length 25 cm
CASTELNUOVO Hook and Suction Tube

28164 H

CASTELNUOVO Hook, 90°, blunt, with round handle, length 25 cm

28164 X

CASTELNUOVO Suction Tube, diameter 2 mm, malleable, lateral suction holes, working length 25 cm

Fluorescein Blue Filter System

20100032

Fluorescein Blue Filter System for fluorescence diagnosis, with 2 rotatable integrated blue filters of different spectral characteristic and additional passage for white light illumination, for use with KARL STORZ cold light fountains and fiber optic light cables. The use of fluorescein barrier filter 20100033 is recommended

20100033

Fluorescein Barrier Filter, for use with fluorescein blue filter systems 20100032 and HOPKINS® telescopes series 7230, for visual observation or for connection to KARL STORZ Endovision® video cameras
Antrum Cannulas

- **586125** v. EICKEN **Antrum Cannula**, Luer-Lock, long curved, malleable, serrated grip plate, outer diameter 2.5 mm, length 12.5 cm
- **586130** Same, outer diameter 3 mm
- **586225** v. EICKEN **Antrum Cannula**, Luer-Lock, short curved, outer diameter 2.5 mm, length 12.5 cm
- **586230** Same, outer diameter 3 mm
- **586145** v. EICKEN-CASTELNUOVO **Antrum Cannula**, Luer-Lock, S-shaped slightly curved, malleable, serrated grip plate, outer diameter 2.5 mm, length 12.5 cm
- **586146** Same, S-shaped strongly curved
Suction Tube

- **722830** Suction Tube, angular, with grip plate and cut-off hole, Luer-Lock, outer diameter 3 mm, working length 14 cm

- **649180 N** FERGUSON-CASTELNUOVO Suction Tube, without cut-off hole, with stylet, Luer, diameter 2 mm, working length 15 cm

- **649182 BU** FERGUSON-CASTELNUOVO Suction Tube, with cut-off hole and mandrel, with calibration markings, lateral opening downwards, diameter 2.5 mm, working length 15 cm

- **649183** FERGUSON Suction Tube, with cut-off hole and stylet, Luer, 10 Fr., working length 15 cm

- **662882** FRANK-PASQUINI Suction Tube, angular, tip curved upwards, ball end, with grip plate and cut-off hole, Luer, diameter 2.4 mm, working length 13 cm

- **662883** Same, tip curved downwards

- **662885** FRANK-PASQUINI Suction Tube, angular, tip curved upwards, ball end, with grip plate and cut-off hole, Luer, diameter 3 mm, working length 13 cm

- **662886** Same, tip curved downwards
**Instrument Set for Endonasal Dacryocystorhinostomy**

*according to* Prof. CASTELNUOVO

- **CASTELNUOVO** 
  **Dissector**, 90°, right, double curved, length 19.5 cm
- **CASTELNUOVO** 
  **Dissector**, 45°, right, double curved, length 19.5 cm
- **CASTELNUOVO** 
  **Dissector**, left, double curved
- **CASTELNUOVO** 
  **Knife**, round, 45°, horizontal, diameter 2 mm, double curved, length 19.5 cm
- **CASTELNUOVO** 
  **Knife**, vertical, diameter 2 mm, double curved
- **CASTELNUOVO** 
  **Palpation Probe**, 90°, double curved, length 19.5 cm
Endoscopic Surgical Management of Cerebrospinal Fluid Rhinorrhea

Knives, Elevator, Hook and WILDER Dilator

BOWMAN Lachrymal Probe, Light Transmission Probe

748000  Surgical Handle, Fig. 7, length 16.5 cm, for Blades 208010–15, 208210–15
208215  Blade, Fig. 15, sterile, package of 100
660512  Elevator, sharp, curved to right, length 18 cm
660515  Elevator, sharp, curved to left, length 18 cm
660521  Hook, 90°, blunt, length 18 cm
745900  WILDER Dilator, for salivary duct, length 11 cm

634840  BOWMAN Lachrymal Probe, length 13 cm including:
   Probe, size 0000–000
   Probe, size 00–0
   Probe, size 1–2

496 V  Light Transmission Probe, for diaphanoscopic localization of the nasolacrimal ducts and fistulae, diameter of distal tip 0.5 mm, sterile, for single use, for use with Fiber Optic Light Cable 495 NL, package of 3
UNIDRIVE® S III ENT SCB/UNIDRIVE® S III ECO
The multifunctional unit for ENT

Special Features:

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

### Specifications

#### System specifications

<table>
<thead>
<tr>
<th>Mode</th>
<th>Order No.</th>
<th>rpm</th>
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</thead>
<tbody>
<tr>
<td><strong>Shaver mode</strong></td>
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<tr>
<td>Operation mode:</td>
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<td>Max. rev. (rpm):</td>
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<tr>
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<td>10,000*</td>
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<td>in conjunction with Handpiece:</td>
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<tr>
<td>DRILLCUT-X® II Shaver Handpiece</td>
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<td>DRILLCUT-X® II N Shaver Handpiece</td>
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<td>40712055</td>
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<td><strong>Sinus burr mode</strong></td>
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<td>Operation mode:</td>
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<td>Max. rev. (rpm):</td>
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<tr>
<td>rotating</td>
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<tr>
<td>in conjunction with Handpiece:</td>
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<tr>
<td>DRILLCUT-X® II Shaver Handpiece</td>
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<tr>
<td>DRILLCUT-X® II N Shaver Handpiece</td>
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<tr>
<td>40712055</td>
<td>12,000</td>
<td></td>
</tr>
<tr>
<td><strong>High-speed drilling 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>counterclockwise or clockwise</td>
<td>20712033</td>
<td>60,000/100,000</td>
</tr>
<tr>
<td>in conjunction with:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High-Speed Micro Motor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20712033</td>
<td>60,000/100,000</td>
<td></td>
</tr>
<tr>
<td><strong>Drilling mode</strong></td>
<td>[20711033]</td>
<td>40,000/80,000</td>
</tr>
<tr>
<td>Operation mode:</td>
<td>[20711173]</td>
<td></td>
</tr>
<tr>
<td>Max. rev. (rpm):</td>
<td>[20711033]</td>
<td></td>
</tr>
<tr>
<td>counterclockwise or clockwise</td>
<td>[20711173]</td>
<td></td>
</tr>
<tr>
<td>in conjunction with:</td>
<td>[20711033]</td>
<td></td>
</tr>
<tr>
<td>micro motor and connecting cable</td>
<td>[20711173]</td>
<td></td>
</tr>
<tr>
<td>20711033</td>
<td>40,000/80,000</td>
<td></td>
</tr>
<tr>
<td>20711173</td>
<td>40,000/80,000</td>
<td></td>
</tr>
<tr>
<td><strong>Micro saw mode</strong></td>
<td>[20711033]</td>
<td>15,000/20,000</td>
</tr>
<tr>
<td>Max. rev. (rpm):</td>
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<td></td>
</tr>
<tr>
<td>in conjunction with:</td>
<td>[20711033]</td>
<td></td>
</tr>
<tr>
<td>micro motor and connecting cable</td>
<td>[20711173]</td>
<td></td>
</tr>
<tr>
<td>20711033</td>
<td>15,000/20,000</td>
<td></td>
</tr>
<tr>
<td>20711173</td>
<td>15,000/20,000</td>
<td></td>
</tr>
<tr>
<td><strong>Dermatome mode</strong></td>
<td>[20711033]</td>
<td>8,000</td>
</tr>
<tr>
<td>Max. rev. (rpm):</td>
<td>[20711173]</td>
<td></td>
</tr>
<tr>
<td>in conjunction with:</td>
<td>[20711033]</td>
<td></td>
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<tr>
<td>micro motor and connecting cable</td>
<td>[20711173]</td>
<td></td>
</tr>
<tr>
<td>20711033</td>
<td>8,000</td>
<td></td>
</tr>
<tr>
<td>20711173</td>
<td>8,000</td>
<td></td>
</tr>
</tbody>
</table>

**Power supply:** 100–240 VAC, 50/60 Hz

**Dimensions:** 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.*

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

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

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

- Maximum torque 6 Ncm
- Number of revolutions can be continuously adjusted up to 60,000 rpm
- Provided a suitable handle is used, the number of revolutions can be continuously adjusted up to 100,000 rpm

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

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

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

**UNIDRIVE® S III ENT SCB**

40701620-1

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

**UNIDRIVE® S III ECO**

40701420

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>Feature</th>
<th>Specification</th>
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<tbody>
<tr>
<td>Touch Screen</td>
<td>UNIDRIVE® S III ENT SCB: 6.4*/300 cd/m²</td>
</tr>
<tr>
<td>Flow</td>
<td>9 steps</td>
</tr>
<tr>
<td>Power supply</td>
<td>100–240 VAC, 50/60 Hz</td>
</tr>
<tr>
<td>Dimensions w x h x d</td>
<td>300 x 165 x 265 mm</td>
</tr>
<tr>
<td>Weight</td>
<td>5.2 kg</td>
</tr>
<tr>
<td>Certified to</td>
<td>EC 601-1, CE acc. to MDD</td>
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* *
UNIDRIVE® S III ENT SCB
UNIDRIVE® S III ECO
System Components

Two-Pedal Footswitch
Single Use Tubing Set

Two-Pedal Footswitch
Single Use Tubing Set

Shaver Blade
Shaver Blade, curved
Sinus Burr

High-Speed Micro-Motor
High-Performance EC Micro Motor II
DRILLCUT-X² II Shaver Handpiece, for use with UNIDRIVE® S III ECO/ENT/NEURO
DRILLCUT-X² II N Shaver Handpiece, optional adaptability to Shaver Tracker, for use with UNIDRIVE® S III ECO/ENT/NEURO

High-Speed Handpiece
INTRA Drill Handpiece

2071033
20711033
20711173

40712050
40712055

252660 – 252692
252575 – 252590

20016630
031131-10

20712033
2071033
20711033
20711173

40712050
40712055

252660 – 252692
252575 – 252590

41201KN
41302KN
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>Universal Spray, 6x 500 ml bottles – HAZARDOUS GOODS – UN 1950 including:</td>
</tr>
<tr>
<td></td>
<td>Spray Nozzle</td>
</tr>
<tr>
<td>280053 C</td>
<td>Spray Nozzle, for the reprocessing of INTRA burr handpieces, for use with Universal Spray 280053 B</td>
</tr>
<tr>
<td>031131-10*</td>
<td>Tubing Set, 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</th>
<th>DRILLCUT-X® N</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>

![DRILLCUT-X® II Shaver Handpiece](image)

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

![DRILLCUT-X® N Shaver Handpiece](image)

**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**

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

---

**40712090**

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

---

**Optional Accessory:**

**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

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

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

Optional Accessory:

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 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>41201 GN</td>
<td>DRILLCUT-X® II Handpiece</td>
<td>length 12 cm</td>
</tr>
<tr>
<td>40712050</td>
<td>DRILLCUT-X® II Handpiece</td>
<td>serrated cutting edge, diameter 4 mm, color code: blue-red</td>
</tr>
<tr>
<td>40712055</td>
<td>DRILLCUT-X® II N Handpiece</td>
<td>double serrated cutting edge, diameter 4 mm, color code: blue-yellow</td>
</tr>
<tr>
<td>41201 GN</td>
<td>concave cutting edge, oblique cutting window, diameter 4 mm, color code: blue-black</td>
<td></td>
</tr>
<tr>
<td>41201 LN</td>
<td>concave cutting edge, oblique cutting window, diameter 4 mm, color code: blue-black</td>
<td></td>
</tr>
<tr>
<td>41201 SN</td>
<td>straight cutting edge, diameter 4 mm, color code: blue-blue</td>
<td></td>
</tr>
<tr>
<td>41201 KSA</td>
<td>serrated cutting edge, diameter 3 mm, color code: blue-red</td>
<td></td>
</tr>
<tr>
<td>41201 KKSA</td>
<td>double serrated cutting edge, diameter 3 mm, color code: blue-yellow</td>
<td></td>
</tr>
<tr>
<td>41201 KKSB</td>
<td>double serrated cutting edge, diameter 2 mm, color code: blue-yellow</td>
<td></td>
</tr>
<tr>
<td>41201 LSA</td>
<td>concave cutting edge, oblique cutting window, diameter 3 mm, color code: blue-black</td>
<td></td>
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</tbody>
</table>

Optional Accessory:

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

<table>
<thead>
<tr>
<th>Detail</th>
<th>for use with</th>
<th>Shaver Blade</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>40712050</td>
<td>curved 35°, cutting edge serrated backwards, diameter 4 mm, color code: blue-red</td>
</tr>
<tr>
<td>41202 KN</td>
<td>40712055</td>
<td>curved 40°, cutting edge serrated forwards, double serrated, diameter 4 mm, color code: blue-yellow</td>
</tr>
<tr>
<td>41204 KKF</td>
<td></td>
<td>curved 40°, cutting edge serrated backwards, double serrated, diameter 4 mm, color code: blue-yellow</td>
</tr>
<tr>
<td>41204 KKB</td>
<td></td>
<td>curved 40°, cutting edge serrated forwards, double serrated, diameter 4 mm, color code: blue-yellow</td>
</tr>
<tr>
<td>41204 KKFA</td>
<td></td>
<td>curved 40°, cutting edge serrated backwards, double serrated, diameter 3 mm, color code: blue-yellow</td>
</tr>
<tr>
<td>41204 KKBA</td>
<td></td>
<td>curved 40°, cutting edge serrated backwards, double serrated, diameter 3 mm, color code: blue-yellow</td>
</tr>
</tbody>
</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

<table>
<thead>
<tr>
<th>Detail</th>
<th>for use with</th>
<th>Shaver Blade</th>
</tr>
</thead>
<tbody>
<tr>
<td>41203 KKF</td>
<td>curved 65°, cutting edge serrated forwards, diameter 4 mm, color code: blue-red</td>
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</tr>
<tr>
<td>41203 KNF</td>
<td>curved 65°, cutting edge serrated backwards, diameter 4 mm, color code: blue-red</td>
<td></td>
</tr>
<tr>
<td>41203 KNB</td>
<td>curved 65°, cutting edge serrated forwards, double serrated, diameter 4 mm, color code: blue-yellow</td>
<td></td>
</tr>
<tr>
<td>41203 KKB</td>
<td>curved 65°, cutting edge serrated backwards, double serrated, diameter 4 mm, color code: blue-yellow</td>
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</tr>
<tr>
<td>41203 KKFA</td>
<td>curved 65°, cutting edge serrated forwards, double serrated, diameter 3 mm, color code: blue-yellow</td>
<td></td>
</tr>
<tr>
<td>41203 KKBA</td>
<td>curved 65°, cutting edge serrated backwards, double serrated, diameter 3 mm, color code: blue-yellow</td>
<td></td>
</tr>
<tr>
<td>41203 GNF</td>
<td>curved 65°, concave cutting edge, oval cutting window, forward opening, diameter 4 mm, color code: blue-green</td>
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</tr>
<tr>
<td>41203 GNB</td>
<td>curved 65°, concave cutting edge, oval cutting window, backward opening, diameter 4 mm, color code: blue-green</td>
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</tbody>
</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>
<tr>
<th>Detail</th>
<th>for use with</th>
<th>Shaver Blade</th>
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</thead>
<tbody>
<tr>
<td>41301 KN</td>
<td>40712050 DRILLCUT-X® II Handpiece</td>
<td>serrated cutting edge, diameter 4 mm, color code: blue-red</td>
</tr>
<tr>
<td>41301 KK</td>
<td>40712055 DRILLCUT-X® II N Handpiece</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>
<td></td>
</tr>
<tr>
<td>41301 LN</td>
<td>concave cutting edge, oblique cutting window, diameter 4 mm, color code: blue-black</td>
<td></td>
</tr>
<tr>
<td>41301 SN</td>
<td>straight cutting edge, diameter 4 mm, color code: blue-blue</td>
<td></td>
</tr>
<tr>
<td>41301 KSA</td>
<td>serrated cutting edge, diameter 3 mm, color code: blue-red</td>
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</tr>
<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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</tr>
</tbody>
</table>
**Shaver Blades, curved**
for Nasal Sinuses and Skull Base Surgery

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

![Diagram of shaver blades](image)

<table>
<thead>
<tr>
<th>Detail</th>
<th>for use with</th>
<th>Shaver Blade length 12 cm</th>
</tr>
</thead>
<tbody>
<tr>
<td>41302 KN</td>
<td>40712050 DRILLCUT-X® II Handpiece 40712055 DRILLCUT-X® II N Handpiece</td>
<td>curved 35°, cutting edge serrated backwards, diameter 4 mm, color code: blue-red</td>
</tr>
<tr>
<td>41304 KKF</td>
<td></td>
<td>curved 40°, cutting edge serrated forwards, double serrated, diameter 4 mm, color code: blue-yellow</td>
</tr>
<tr>
<td>41304 KKB</td>
<td></td>
<td>curved 40°, cutting edge serrated backwards, double serrated, diameter 4 mm, color code: blue-yellow</td>
</tr>
<tr>
<td>41304 KKFA</td>
<td></td>
<td>curved 40°, cutting edge serrated forwards, double serrated, diameter 3 mm, color code: blue-yellow</td>
</tr>
<tr>
<td>41304 KKBA</td>
<td></td>
<td>curved 40°, cutting edge serrated backwards, double serrated, diameter 3 mm, color code: blue-yellow</td>
</tr>
</tbody>
</table>
Shaver Blades, curved for Nasal Sinuses and Skull Base Surgery

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

![Shaver Blade Image]

<table>
<thead>
<tr>
<th>Detail</th>
<th>for use with</th>
<th>Shaver Blade</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>40712050 DRILLCUT-X® II Handpiece</td>
<td>length 12 cm</td>
</tr>
<tr>
<td></td>
<td>40712055 DRILLCUT-X® II N Handpiece</td>
<td></td>
</tr>
<tr>
<td>41303 KKB</td>
<td>curved 65°, cutting edge serrated forwards, diameter 4 mm, color code: blue-red</td>
<td></td>
</tr>
<tr>
<td>41303 KNF</td>
<td>curved 65°, cutting edge serrated backwards, diameter 4 mm, color code: blue-red</td>
<td></td>
</tr>
<tr>
<td>41303 KNB</td>
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<tr>
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<td></td>
</tr>
<tr>
<td>41303 KKB</td>
<td>curved 65°, cutting edge serrated forwards, double serrated, diameter 3 mm, color code: blue-yellow</td>
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</tr>
<tr>
<td>41303 KKFA</td>
<td>curved 65°, cutting edge serrated backwards, double serrated, diameter 3 mm, color code: blue-yellow</td>
<td></td>
</tr>
<tr>
<td>41303 KKBA</td>
<td>curved 65°, cutting edge concave forwards, oval cutting window, diameter 4 mm, color code: blue-green</td>
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</tr>
<tr>
<td>41303 GNF</td>
<td>curved 65°, cutting edge concave backwards, oval cutting window, diameter 4 mm, color code: blue-green</td>
<td></td>
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<tr>
<td>41303 GNB</td>
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</table>
Sinus Burrs, curved
for Nasal Sinuses and Skull Base Surgery

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

Sinus Burrs, curved 70°/55°/40°/15°, for single use, sterile, package of 5

<table>
<thead>
<tr>
<th>Detail</th>
<th>for use with</th>
<th>Sinus Burr length 12 cm</th>
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</thead>
<tbody>
<tr>
<td>41304 W</td>
<td>40 7120 50 DRILLCUT-X® II Handpiece</td>
<td>curve 40°, cylindric, drill diameter 3 mm, shaft diameter 4 mm, color code: red-blue</td>
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<tr>
<td>41303 WN</td>
<td>40 7120 55 DRILLCUT-X® II N Handpiece</td>
<td>curve 55°, cylindric, drill diameter 3.6 mm, shaft diameter 4 mm, color code: red-blue</td>
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<tr>
<td>41305 RN</td>
<td></td>
<td>curve 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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<tr>
<td>41305 D</td>
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<td>curve 15°, diamond head, drill diameter 5 mm, shaft diameter 4 mm, color code: red-yellow</td>
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<tr>
<td>41305 DW</td>
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<td>curve 40°, diamond head, drill diameter 5 mm, shaft diameter 4 mm, color code: red-yellow</td>
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<tr>
<td>41303 DT</td>
<td></td>
<td>curve 70°, diamond head, drill diameter 3.6 mm, shaft diameter 4 mm, color code: red-yellow</td>
</tr>
</tbody>
</table>
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

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>
<th>Dia. mm</th>
<th>Standard</th>
<th>Diamond</th>
<th>Diamond coarse</th>
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<td>649723 G</td>
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<td>649670</td>
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<td>649770 G</td>
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</tbody>
</table>

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 1:1 (40,000 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>
<tr>
<th>Detail</th>
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<th>Diamond coarse sterilizable</th>
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<td>649723 GL</td>
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</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

**NEW** 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

39552 A **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

39552 B **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

252681

252682

252681  High-Speed Handpiece, medium, angled, 100,000 rpm,
for use with High-Speed Micro-Motor 20712033

252682  High-Speed Handpiece, long, angled, 100,000 rpm,
for use with High-Speed Micro-Motor 20712033
**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

20712033

51 mm
5.5 mm
252691

71 mm
5.5 mm
252692

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>
<thead>
<tr>
<th>Diameter in mm</th>
<th>medium</th>
<th>long</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>350110 M</td>
<td>–</td>
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<tr>
<td>2</td>
<td>350120 M</td>
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<td>350130 L</td>
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<td>4</td>
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<td>350150 L</td>
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<tr>
<td>6</td>
<td>350160 M</td>
<td>350160 L</td>
</tr>
<tr>
<td>7</td>
<td>350170 M</td>
<td>350170 L</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Diameter in mm</th>
<th>medium</th>
<th>long</th>
</tr>
</thead>
<tbody>
<tr>
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<td>350210 M</td>
<td>–</td>
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<tr>
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<td>350220 L</td>
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<tr>
<td>3</td>
<td>350230 M</td>
<td>350230 L</td>
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<tr>
<td>4</td>
<td>350240 M</td>
<td>350240 L</td>
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<td>5</td>
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<td>350250 L</td>
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<tr>
<td>6</td>
<td>350260 M</td>
<td>350260 L</td>
</tr>
<tr>
<td>7</td>
<td>350270 M</td>
<td>350270 L</td>
</tr>
</tbody>
</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

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

<table>
<thead>
<tr>
<th>Diameter in mm</th>
<th>medium</th>
<th>long</th>
</tr>
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<tbody>
<tr>
<td>3</td>
<td>350330 M</td>
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<td>350360 L</td>
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<tr>
<td>7</td>
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</table>

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

<table>
<thead>
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<th>Diameter in mm</th>
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<td>350675 M</td>
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<td>9</td>
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High-Speed Barrel Burrs, 100,000 rpm, for single use, sterile, package of 5

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<tr>
<th>Diameter in mm</th>
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<tr>
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High-Speed Neuro Fluted Burrs, 100,000 rpm, for single use, sterile, package of 5

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<thead>
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<th>Diameter in mm</th>
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<th>long</th>
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<tr>
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<tr>
<td>3</td>
<td>350730 M</td>
<td>350730 L</td>
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</tbody>
</table>
## UNIDRIVE® S III ENT SCB

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

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

![Image of burrs](image)

- **60,000 rpm**
- **diameter 5.5 mm**

### High-Speed Standard 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>
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<td>7</td>
<td>330170 S</td>
<td>330170 M</td>
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### High-Speed Diamond Burrs, 60,000 rpm, for single use, sterile, package of 5

<table>
<thead>
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<tr>
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<td>1.5</td>
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<tr>
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<td>330220 L</td>
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<tr>
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<td>330260 M</td>
<td>330260 L</td>
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<td>7</td>
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</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

### 60,000 rpm
diameter 5.5 mm

<table>
<thead>
<tr>
<th>Diameter in mm</th>
<th>short</th>
<th>medium</th>
<th>long</th>
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</thead>
<tbody>
<tr>
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<tr>
<td>7</td>
<td>330370 S</td>
<td>330370 M</td>
<td>330370 L</td>
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</tbody>
</table>

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

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

### LINDEMANN High-Speed Fluted Burrs, 60,000 rpm, for single use, sterile, package of 5
**UNIDRIVE® S III ENT SCB**

High-Speed Diamond Burrs

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

<table>
<thead>
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<th>Diameter in mm</th>
<th>extra long</th>
<th>super long</th>
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<tr>
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<td>320230 SL</td>
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<td>320240 EL</td>
<td>320240 SL</td>
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High-Speed Coarse Diamond Burrs, 60,000 rpm, for single use, sterile, package of 5

<table>
<thead>
<tr>
<th>Diameter in mm</th>
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<th>super long</th>
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<tr>
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<td>320330 SL</td>
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<td>4</td>
<td>320340 EL</td>
<td>320340 SL</td>
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</table>
**Endoscopic Surgical Management of Cerebrospinal Fluid Rhinorrhea**

**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
**IMAGE1 S Camera System**

**NEW**

**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

---

**FULL HD image**

**CLARA**

**FULL HD image**

**CHROMA**

**FULL HD image**

**SPECTRA A**

**FULL HD image**

**SPECTRA B**

---

* SPECTRA A: Not for sale in the U.S.
** SPECTRA B: Not for sale in the U.S.
**Endoscopic Surgical Management of Cerebrospinal Fluid Rhinorrhea**

**IMAGE1 S Camera System**

**TC 200EN**

**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

- **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:**

<table>
<thead>
<tr>
<th>Feature</th>
<th>TC 200EN*</th>
</tr>
</thead>
<tbody>
<tr>
<td>HD video outputs</td>
<td>2 x DVI-D</td>
</tr>
<tr>
<td>Format signal outputs</td>
<td>2 x 3G-SDI</td>
</tr>
<tr>
<td>LINK video inputs</td>
<td>1920 x 1080p, 50/60 Hz</td>
</tr>
<tr>
<td>USB interface</td>
<td>4 x USB, (2 x front, 2 x rear)</td>
</tr>
<tr>
<td>SCB interface</td>
<td>2 x 6-pin mini-DIN</td>
</tr>
</tbody>
</table>

**For use with IMAGE1 S**

**IMAGE1 S CONNECT Module TC 200EN**

**TC 300**

**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**

- **Mains Cord**, length 300 cm
- **Link Cable**, length 20 cm

**Specifications:**

<table>
<thead>
<tr>
<th>Feature</th>
<th>TC 300 (H3-Link)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supported camera heads/video endoscopes</td>
<td>TH 100, TH 101, TH 102, TH 103, TH 104, TH 106 (fully compatible with IMAGE1 S) 22 2200 55-3, 22 2200 56-3, 22 2200 53-3, 22 2200 60-3, 22 2200 61-3, 22 2200 54-3, 22 2200 85-3 (compatible without IMAGE1 S technologies CLARA, CHROMA, SPECTRA*)</td>
</tr>
<tr>
<td>LINK video outputs</td>
<td>1 x</td>
</tr>
<tr>
<td>Power supply</td>
<td>100 – 120 VAC/200 – 240 VAC</td>
</tr>
<tr>
<td>Power frequency</td>
<td>50/60 Hz</td>
</tr>
<tr>
<td>Protection class</td>
<td>I, CF-Defib</td>
</tr>
<tr>
<td>Dimensions w x h x d</td>
<td>305 x 54 x 320 mm</td>
</tr>
<tr>
<td>Weight</td>
<td>1.86 kg</td>
</tr>
</tbody>
</table>

* SPECTRA A: Not for sale in the U.S.
** SPECTRA B: Not for sale in the U.S.
Endoscopic Surgical Management of Cerebrospinal Fluid Rhinorrhea

**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 \( f = 15–31 \text{ mm (2x)} \), 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 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 \text{ 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 \( f = 15–31 \text{ mm (2x)} \), 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 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 \text{ 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,  
  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 Cord, 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

Equipment Cart
wide, high, rides on 4 antistatic dual wheels
powered 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
inluding:
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

Monitor Swivel Arm,
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
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.