FIRST SINGLE-PORTAL LAPAROSCOPIC SURGERY
Using Curved And Reusable Instruments

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Acknowledgement
This brochure reflects the successful integration of all working groups that contributed to the development of the single-portal access including a dedicated set of instruments.

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I am deeply indebted to my cousin who made the original drawings ( “… hoping he will never feel the need to have them used on himself …”). 

A final thanks goes to my father for his support and advise.
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Please note:
Attached to the inside back cover is a Video DVD ROM (MediaService KS 718) on the same topic, issued by Dr. Giovanni Dapri.

Hardware and software requirements:
PC with at least an 800 MHz processor and 64 MB of RAM, resolution 1024 x 768 with 24-bit color depth, Windows 98/NT/2000/XP, MPEG Player Active-Movie (included on the CD-ROM), CD-ROM drive, sound card, speakers, mouse.

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**Single-Portal Laparoscopic Surgery Using Curved and Reusable Instruments**

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Introduction

With the advent of Natural Orifice Translumenal Endoscopic Surgery (NOTES), the concept stands a good chance that laparoscopy can be performed in an even less invasive manner, if the number of the abdominal incisions can be reduced. The principal idea of single port access is to permit standard laparoscopic procedures to be performed through a single approach.

The main advantage of this approach is obviously the cosmetic result, which is why this type of operative procedures is called “scarless surgery”. Empirical evidence seems to indicate that postoperative pain can also be reduced as a result of lesser incisions and abdominal trauma.

The umbilicus constitutes a well-healing site of access to the peritoneal cavity through a single-portal approach. Once the laparoscope has been inserted in the abdomen, other instruments can be placed through the same access, establishing an operative field similar to the one seen in classic laparoscopy.

One of the principles of laparoscopy is to work while viewing the operative site on the video monitor, with the operative field and the surgeon’s head aligned on the same axis. Another rule is that the axis of the operative trocars should be aligned perpendicular to the axis of the laparoscope, at the angle bisector. Therefore, it was our objective to develop curved laparoscopic instruments that should allow to apply this rule in a single-portal access. Owing to the curved shaft design, the right angle outside the abdomen at the umbilicus can be established inside the cavity and close to the viscera. Accordingly, no additional trocars need to be inserted in the abdomen. Another advantage of the specific shaft design is that the handles are less prone to getting in the way of the laparoscope, which allows the surgeon to work in a convenient ergonomic position, with angled arms, as in classic laparoscopy.

The laparoscope is inserted in the abdominal cavity through an 11-mm trocar placed in the umbilicus or in another abdominal quadrant. The operating instruments can be introduced without placing any ancillary trocar. They are just inserted alongside the trocar cannula used for the laparoscope.

This brochure is to introduce a set of new curved instruments that have been especially designed for use in single-portal laparoscopic procedures (e.g. appendectomy, cholecystectomy, Nissen fundoplication, incisional hernia repair, diagnostic laparoscopy for tumor) through one transumbilical or transabdominal incision. The added benefit of these new instruments is that they are available in a cost-effective, reusable design.

G. Dapri
Laparoscopic Instruments

The Trocar

- An 11-mm trocar is used.
- The trocar is inserted in the abdomen, once access to the peritoneal cavity has been obtained using the Hasson technique.
- A purse-string suture (e.g., #1 polydioxone) is applied in the umbilicus or in the abdominal access in order to maintain the pneumoperitoneum during the procedure.
- The pneumoperitoneum is created by insufflation of carbon dioxide through the 11-mm trocar.

![Reusable sharp trocar](image)

Reusable sharp trocar (KARL STORZ 30103 AP), size 11 mm, length of cannula 10.5 cm.

The Laparoscope

- A 30° forward-oblique HOPKINS® laparoscope, diameter 10 mm is used through the 11-mm trocar.
- The laparoscope offers a magnified view of the operative field.
- The 30° direction of view provides for precise viewing conditions during each step of the procedure.

![Forward-Oblique Laparoscope](image)

Forward-Oblique HOPKINS® Telescope 30°, enlarged view, diameter 10 mm, length 31 cm, autoclavable, fiber optic light transmission incorporated (KARL STORZ 26003 BA).
DAPRI Curved Grasping Forceps I

- The curved grasping forceps I has been designed to perform a variety of laparoscopic procedures (e.g. appendectomy, incisional hernia repair, diagnostic laparoscopy for tumor) through the umbilical or abdominal access. 
- The shaft features an S-shaped design, that permits access to the target site without getting in the way of the laparoscope’s axis. Owing to the curved shaft, the grasper’s tip is the only part of the instrument that reaches the distal end of the scope. 
- The grasper I is inserted through the umbilicus or abdominal incision, using a different entry site outside the purse-string suture created by a slender trocar sleeve. While following the shaft’s curves during insertion of the instrument, an angle of 45° is maintained between the longitudinal axis of the shaft and the abdominal wall. 
- The handle is mounted perpendicularly to the longitudinal axis of the shaft. The curved grasping forceps I is available in a cost-effective, reusable design.

DAPRI Curved Grasping Forceps II

- The curved grasping forceps II has been designed to perform laparoscopic cholecystectomy via a single-portal transumbilical approach. 
- The shaft features three curvatures, which permits access to the target site without getting in the way of the laparoscope’s axis. The grasper’s tip is the only part of the instrument that reaches the distal end of the scope. 
- The grasper II is inserted through the umbilicus, using a different entry site outside the purse-string suture created by a slender trocar sleeve. While following the shaft’s curves during insertion of the instrument, an angle of 45° is maintained between the longitudinal axis of the shaft and the abdominal wall. 
- The handle is mounted perpendicularly to the longitudinal axis of the shaft. The curved grasping forceps II is available in a cost-effective, reusable design.

DAPRI Curved Grasping Forceps III

- The curved grasping forceps III has been designed to perform laparoscopic Nissen fundoplication and other procedures (e.g. gastro-jejunostomy, splenectomy) through the umbilical or abdominal access. 
- The shaft features two main curves, one of which passes through the abdominal entry site, and avoids getting into conflict with the laparoscope. The other curve, close to the jaws, allows to operate in a triangulated configuration with an additional curved instrument. 
- The grasper III is inserted through the umbilicus or abdominal incision, using a different entry site outside the purse-string suture created by a slender trocar sleeve. While following the shaft’s curves during insertion of the instrument, an angle of 90° is maintained between the longitudinal axis of the shaft and the abdominal wall. 
- The handle is mounted perpendicularly to the longitudinal axis of the shaft. The curved grasping forceps III is available in a cost-effective, reusable design.

DAPRI Curved Grasping Forceps I, outer tube with working insert, fenestrated, single-action jaws, with especially atraumatic serration, size 5 mm, straight length 40 cm, (KARL STORZ 23161 ONF).

DAPRI Curved Grasping Forceps II, outer tube with working insert, fenestrated, single-action jaws, with especially atraumatic serration, size 5 mm, straight length 40 cm, (KARL STORZ 23161 ONE).

DAPRI Curved Grasping Forceps III, outer tube with working insert, fenestrated, single-action jaws, 90°-angled tip with especially atraumatic serration, size 5 mm, straight length 40 cm, (KARL STORZ 23161 ONH).
The curved scissors have been designed for laparoscopic procedures using a single-portal transumbilical or transabdominal approach. These scissors have only one curve, which avoids getting into conflict with the laparoscope outside the abdomen. The jaws are curved 90° with respect to the main shaft’s curve. The instrument is inserted in the abdomen alongside the 11-mm trocar and inside the purse-string suture. During insertion, an angle of 45° is maintained between the longitudinal axis of the shaft and the abdominal wall. The handle is mounted perpendicularly to the longitudinal axis of the shaft. The curved scissors are available in a cost-effective, reusable design.

DAPRI Curved Dissecting and Coagulating Electrode

- The curved hook-shaped dissecting and coagulating electrode has been designed for laparoscopic procedures using a single-portal transumbilical or transabdominal approach.
- The hook features only one curve, which allows the surgeon to use the dominant hand without getting in the way of the laparoscope. The tip, curved 90° with respect to the main shaft’s curve, allows a gentle tissue dissection with the external surface, and tissue section with the internal part.
- The instrument is inserted in the abdomen alongside the 11-mm trocar and inside the purse-string suture. During insertion, an angle of 45° is maintained between the longitudinal axis of the shaft and the abdominal wall.
- The curved dissecting and coagulating electrode is available in a cost-effective, reusable design.

DAPRI Curved RoBi™ Bipolar Scissors

- The curved RoBi™ bipolar scissors have been designed for laparoscopic procedures using a single-portal transumbilical or transabdominal approach.
- These scissors have only one curve, which avoids getting into conflict with the laparoscope outside the abdomen.
- The instrument is inserted in the abdomen alongside the 11-mm trocar and inside the purse-string suture. During insertion, an angle of 45° is maintained between the longitudinal axis of the shaft and the abdominal wall.
- The handle is mounted perpendicularly to the longitudinal axis of the shaft. The curved RoBi™ bipolar scissors are available in a cost-effective, reusable design.

DAPRI Curved Scissors

- The curved scissors have been designed for laparoscopic procedures using a single-portal transumbilical or transabdominal approach.
- These scissors have only one curve, which avoids getting into conflict with the laparoscope outside the abdomen. The jaws are curved 90° with respect to the main shaft’s curve.
- The instrument is inserted in the abdomen alongside the 11-mm trocar and inside the purse-string suture. During insertion, an angle of 45° is maintained between the longitudinal axis of the shaft and the abdominal wall.
- The handle is mounted perpendicularly to the longitudinal axis of the shaft. The curved scissors are available in a cost-effective, reusable design.

DAPRI Curved Dissecting and Coagulating Electrode, L-shaped 90°-angled tip, tapered tip acc. to CADIERE, with connector pin for unipolar coagulation, size 5 mm, straight length 46 cm, (KARL STORZ 23775 CLG).

DAPRI Curved Scissors, outer tube with working insert, double-action METZENBAUM blades, 90°-angled tip, curved, length of jaws 12 mm, size 5 mm, straight length 40 cm, (KARL STORZ 23261 MSG).

DAPRI Curved RoBi™ Bipolar Scissors, outer tube with working insert, double-action slender METZENBAUM blades, with connector pin for bipolar coagulation, size 5 mm, straight length 43 cm, (KARL STORZ 38421 MWG).
**DAPRI Curved Dissecting Forceps**

- The curved dissecting forceps has been designed for laparoscopic procedures using a single-portal transumbilical or transabdominal approach.
- The shaft of the instrument features one curve only, which avoids getting into conflict with the laparoscope outside the abdomen. The jaws are curved 90° with respect to the main shaft’s curve.
- The instrument is inserted in the abdomen alongside the 11-mm trocar and inside the purse-string suture. During insertion, an angle of 45° is maintained between the longitudinal axis of the shaft and the abdominal wall.
- The handle is mounted perpendicularly to the longitudinal axis of the shaft. The curved dissecting forceps is available in a cost-effective, reusable design.

**DAPRI Curved Needle Holder I**

- The curved needle holder I has been designed for laparoscopic procedures using a single-portal transumbilical or transabdominal approach.
- The needle holder I features one curve only, which avoids getting into conflict with the laparoscope outside the abdomen. The jaws are curved 45° with respect to the main shaft’s curve, thus facilitating the intracorporeal knotting technique.
- The instrument is inserted in the abdomen alongside the 11-mm trocar and inside the purse-string suture. During insertion, an angle of 45° is maintained between the longitudinal axis of the shaft and the abdominal wall.
- The curved needle holder I is available in a cost-effective, reusable design.

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**DAPRI Curved Dissecting Forceps**, outer tube with working insert, double-action jaws, 90°-angled, size 5 mm, straight length 40 cm, (KARL STORZ 23125 RG).

**DAPRI Curved Needle Holder I**, ergonomic axial handle with disengageable ratchet, release on the right side, jaw opening 45° oblique downward, size 5 mm, straight length 43 cm, (KARL STORZ 23178 KAR).
First Single-Portal Laparoscopic Surgery Using Curved and Reusable Instruments

**DAPRI Curved Needle Holder II**

- The curved needle holder II has been designed for laparoscopic Nissen fundoplication and some other procedures (e.g., gastro-jejunostomy, splenectomy) using a single-portal transumbilical or transabdominal approach.
- The needle holder II features two main curves, one of which passes through the abdominal entry site, and avoids getting into conflict with the laparoscope. The other curve, close to the jaws, allows to operate in a triangulated configuration with the curved grasping forceps III. The jaws are curved 45° with respect to the main shaft's curve, thus facilitating the intracorporeal knotting technique.
- The instrument is inserted in the abdomen alongside the 11-mm trocar and inside the purse-string suture. While following the shaft's curves during insertion of the instrument, an angle of 45° is maintained between the longitudinal axis of the shaft and the abdominal wall.
- The curved needle holder II is available in a cost-effective, reusable design.

**Curved Suction and Irrigation Cannula**

- The curved suction and irrigation cannula has been designed for laparoscopic procedures using a single-portal transumbilical or transabdominal approach.
- The shaft of the instrument features one curve only, which avoids getting into conflict with the laparoscope outside the abdomen.
- The instrument is inserted alongside the 11-mm trocar and inside the purse-string suture. During insertion, an angle of 45° is maintained between the longitudinal axis of the shaft and the abdominal wall.
- The curved suction and irrigation cannula is available in a cost-effective, reusable design.

**DAPRI Curved Needle Holder II**, ergonomic axial handle with disengageable ratchet, release on the right side, jaw opening 45° oblique downward, size 5 mm, straight length 43 cm, (KARL STORZ 23178 LAR).

**Curved Suction and Irrigation Cannula**, with lateral holes, bended, size 5 mm, straight length 40 cm (KARL STORZ 23460 LHG and 30805).
Single-Portal Transumbilical Laparoscopic Appendectomy

Patient and Team Positioning

- The patient is lying in a supine position on the operating table, with the legs straight and the arms alongside the body.
- The surgeon stands to the patient’s left, and the camera assistant assumes a position on the right side of the surgeon.
- The video monitor is placed in front of the surgeon.

Instrument Set

- One 11-mm trocar.
- HOPKINS® Forward-Oblique Telescope 30°, diameter 10 mm.
- DAPRI Curved Grasping Forceps I.
- DAPRI Curved Dissecting and Coagulating Electrode.
- DAPRI Curved Scissors.
- DAPRI Curved RoBi™ Bipolar Scissors.
- DAPRI Curved Needle Holder I.
- Curved Suction and Irrigation Cannula.
- Straight Preformed Knotting Device (Endoloop).
- Straight Grasping Forceps.
- Disposable Extraction Bag.
**Procedure**

- An incision of about 15 mm is made in the umbilicus. Applying the Hasson technique the abdominal cavity is entered, and a purse-string suture (#1 polydioxanone) is applied. An 11-mm trocar is inserted in the umbilicus, and the pneumoperitoneum is established. The curved grasping forceps I is advanced using a new window outside the purse-string. The other curved instruments (dissecting and coagulating electrode, scissors, RoBi™ bipolar scissors, needle holder I, suction and irrigation cannula), the straight preformed knotting device and the straight grasping forceps are inserted alongside the 11-mm trocar, without placing any ancillary trocar (Figs. 1, 2).

- The curved grasping forceps I picks up the appendix, and the appendicular mesentery is transected using the curved dissecting and coagulating electrode (Fig. 3).

- Preformed knots are placed at the base of the appendix (Fig. 4) and the curved scissors cuts the viscera between them.

- Final cosmetic result, after removal of the appendix from the abdomen at the umbilicus (in a disposable bag) with the straight grasping forceps (Fig. 5).
Single-Portal Transumbilical Laparoscopic Cholecystectomy

Patient and Team Positioning

- The patient is lying in a supine position on the operating table, with the legs in split position and the arms alongside the body.
- The surgeon stands between the patient’s legs, and the camera assistant to the patient’s left.
- The video monitor is placed in front of the surgeon.

Instrument Set

- One 11-mm trocar.
- **HOPKINS®** Forward-Oblique Telescope 30°, diameter 10 mm.
- DAPRI Curved Grasping Forceps II.
- DAPRI Curved Dissecting and Coagulating Electrode.
- DAPRI Curved Scissors.
- DAPRI Curved RoBi™ Bipolar Scissors.
- DAPRI Curved Dissecting Forceps.
- Curved Suction and Irrigation Cannula.
- Straight Clip Applicator, 5 mm.
- Straight Grasping Forceps.
- Disposable Extraction Bag.
**Procedure**

- An incision of about 15 mm is made in the umbilicus. Applying the Hasson technique the abdominal cavity is entered, and a purse-string suture (#1 polydixone) is applied. An 11-mm trocar is inserted in the umbilicus, and the pneumoperitoneum is established. The curved grasping forceps II is advanced using a new window outside the purse-string. The other curved instruments (dissecting and coagulating electrode, scissors, RoBi™ bipolar scissors, dissecting forceps, suction and irrigation cannula), the straight clip applicator 5 mm and the straight grasping forceps are inserted alongside the 11-mm trocar, without placing any ancillary trocar (Figs. 1, 2).

- The curved grasping forceps II retracts the gallbladder laterally to expose Calot’s triangle for dissection of the cystic duct and artery (Fig. 3). The cystic duct is sectioned between clips and the cystic artery is coagulated or sectioned between clips as per routine.

- The gallbladder is freed from the right liver lobe using the transumbilical curved dissecting and coagulating electrode (Fig. 4).

- Final cosmetic result, after removal of the gallbladder from the abdomen at the umbilicus (in a disposable bag) with the straight grasping forceps (Fig. 5).
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Single-Portal Transumbilical Laparoscopic Nissen Fundoplication

Patient and Team Positioning

- The patient is lying in a supine position on the operating table, with the legs in split position and the arms alongside the body.
- The surgeon stands between the patient’s legs, the camera assistant to the patient’s right, and the scrub-nurse to the patient’s left.
- The video monitor is placed in front of the surgeon.

Instrument Set

- One 11-mm trocar.
- **HOPKINS** II Forward-Oblique Telescope 30°, diameter 10 mm.
- DAPRI Curved Grasping Forceps III.
- DAPRI Curved Dissecting and Coagulating Electrode.
- DAPRI Curved Needle Holder II.
- DAPRI Curved Scissors.
- DAPRI Curved RoBi™ Bipolar Scissors.
- Curved Suction and Irrigation Cannula.
- Straight Grasping Forceps.
- Umbilical Tape.
First Single-Portal Laparoscopic Surgery Using Curved and Reusable Instruments

Procedure

- An incision of about 15 mm is made in the umbilicus. Applying the Hasson technique the abdominal cavity is entered, and a purse-string suture (#1 polydiaxone) is applied. An 11-mm trocar is inserted in the umbilicus, and the pneumoperitoneum is established. The curved grasping forceps III is introduced using a new window outside the purse-string. The other curved instruments (dissecting and coagulating electrode, needle holder II, scissors, RoBi™ bipolar scissors, suction and irrigation cannula) and the straight grasping forceps are inserted alongside the 11-mm trocar, without placing any ancillary trocar (Figs. 1, 2).
- Owing to the curves of the grasping forceps III, the left hepatic lobe can be retracted, increasing exposure of the gastroesophageal junction. The cruraplasty is performed by placing intracorporeal figure-of-eight sutures with 2/0 silk (Fig. 3).
- A 360° wrap is performed using a transoral 34 Fr bougie, and 2/0 silk intracorporeal knots (Fig. 4).
- Final cosmetic result (Fig. 5).
Single-Portal Transabdominal Laparoscopic Incisional Hernia Repair (right hemi-abdomen)

Patient and Team Positioning

- The patient is lying in a supine position on the operating table, with the legs straight and the arms alongside the body.
- The surgeon stands to the patient’s left, and the camera assistant assumes a position on the right side of the surgeon.
- The video monitor is placed in front of the surgeon.

Instrument Set

- One 11-mm trocar.
- [HOPKINS® Forward-Oblique Telescope 30°, diameter 10 mm.]
- DAPRI Curved Grasping Forceps I.
- DAPRI Curved Dissecting and Coagulating Electrode.
- DAPRI Curved Scissors.
- DAPRI Curved RoBi™ Bipolar Scissors.
- Curved Suction and Irrigation Cannula.
- Straight Grasping Forceps.
- Dualface Prosthesis.
- Disposable Straight Tacker Fixation Device, 5 mm.
Procedure

- An incision of about 20 mm is made in the left abdominal quadrant in front of the incisional hernia (e.g., left flank). Applying the Hasson technique, the abdominal cavity is entered, and a purse-string suture (#1 polydioxone) is applied. An 11-mm trocar is inserted in the purse-string, and the pneumoperitoneum is established. The curved grasping forceps is introduced using a new window outside the purse-string. The other curved instruments (dissecting and coagulating electrode, scissors, RobiT™ bipolar scissors, suction and irrigation cannula), the straight tacker fixation device, and the straight grasping forceps are inserted alongside the 11-mm trocar, without placing any ancillary trocar (Figs. 1, 2).

- In case of need, the defect is freed from the incarcerated viscera (e.g., greater omentum, small bowel). The peritoneum is freed from the overlying fatty tissue (Fig. 3).

- A dualface prosthesis is inserted in the abdomen through the 11-mm trocar with the straight grasping forceps, and fixed to the abdominal wall using tacks (Fig. 4).

- Final cosmetic result (Fig. 5).
Single-Portal Transabdominal Laparoscopic Incisional Hernia Repair (left hemi-abdomen)

Patient and Team Positioning

- The patient is lying in a supine position on the operating table, with the legs straight and the arms alongside the body.
- The surgeon stands to the patient’s right, and the camera assistant assumes a position on the right side of the surgeon.
- The video monitor is placed in front of the surgeon.

Instrument Set

- One 11-mm Trocar.
- HOPKINS® Forward-Oblique Telescope 30°, diameter 10 mm.
- DAPRI Curved Grasping Forceps I.
- DAPRI Curved Dissecting and Coagulating Electrode.
- DAPRI Curved Scissors.
- DAPRI Curved RoBi™ Bipolar Scissors.
- Curved Suction and Irrigation Cannula.
- Straight Grasping Forceps.
- Dualface Prosthesis.
- Disposable Straight Tacker Fixation Device, 5 mm.
Procedure

- An incision of about 20 mm is made in the right abdominal quadrant in front of the incisional hernia (e.g., right flank). Applying the Hasson technique the abdominal cavity is entered, and a purse-string suture (#1 polydioxone) is applied. An 11-mm trocar is inserted in the purse-string, and the pneumoperitoneum is established. The curved grasping forceps I is introduced using a new window outside the purse-string. The other curved instruments (dissecting and coagulating electrode, scissors, RoBi™ bipolar scissors, suction and irrigation cannula), the straight tacker fixation device and the straight grasping forceps are inserted alongside the 11-mm trocar, without placing any ancillary trocar (Figs. 1, 2).

- In case of need, the defect is freed from the incarcerated viscera (e.g. greater omentum, small bowel). The peritoneum is freed from the overlying fatty tissue (Fig. 3).

- A dualface prosthesis is inserted in the abdomen through the 11-mm trocar with the straight grasping forceps, and fixed to the abdominal wall using tacks (Fig. 4).

- Final cosmetic result (Fig. 5).
Single-Portal Transumbilical Diagnostic Laparoscopy for Tumor

Patient and Team Positioning

- The patient is lying in a supine position on the operating table, with the legs in split position and the arms alongside the body.
- The surgeon stands between the patient’s legs, and the camera assistant to the patient’s right.
- The video monitor is placed in front of the surgeon.

Instrument Set

- One 11-mm trocar.
- One 6-mm trocar.
- One 13-mm trocar.
- \textsuperscript{\textregistered} Forward-Oblique Telescope 30°, diameter 10 mm.
- \textsuperscript{\textregistered} Forward-Oblique Telescope 30°, diameter 5 mm.
- DAPRI Curved Grasping Forceps I.
- DAPRI Curved Dissecting and Coagulating Electrode.
- DAPRI Curved RoBi\textsuperscript{TM} Bipolar Scissors.
- Curved Suction and Irrigation Cannula.
- Ultrasound Probe, 10 mm.
- DAPRI Curved Grasping Forceps III.
- DAPRI Curved Needle Holder II.
- DAPRI Curved Scissors.
- Straight Grasping Forceps.
- Disposable Extraction Bag.
Procedure

- An incision of about 15 mm is made in the umbilicus. Applying the Hasson technique the abdominal cavity is entered, and a purse-string suture (#1 polydioxanone) is applied. An 11-mm trocar is inserted in the umbilicus, and the pneumoperitoneum is established. The curved grasping forceps I is introduced using a new window outside the purse-string. The other curved instruments (dissecting and coagulating electrode, RoB™ bipolar scissors, suction and irrigation cannula, grasping forceps III, needle holder II, scissors) and the straight grasping forceps are inserted alongside the 11-mm trocar, without placing any ancillary trocar (Figs. 1a, 2).

- Peritoneal lesion biopsy or lymph node biopsy can be performed (Fig. 3), and the sample is transumbilically removed in a disposable bag with the straight grasping forceps.

- The 11-mm trocar is switched to the new 13-mm trocar for use of the ultrasound probe. In addition a 6-mm trocar, for use of the 5-mm telescope, is inserted parallel to the 13-mm trocar (Fig. 1b).

- Laparoscopic ultrasound (e.g., pancreas, liver) is performed using the 10-mm ultrasound probe (Figs. 4, 5).

- If required, gastrointestinal bypass surgery can be performed using grasping forceps III and curved needle holder II.
# Single-Portal Laparoscopic Surgery Using Curved and Reusable Instruments

## Instrument Set according to Dr. G. DAPRI

<table>
<thead>
<tr>
<th>Telescopes and Instruments:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>30103 AP</strong> Trocar, size 11 mm, color code: green, including: Trocar only, with pyramidal tip Cannula, without valve, with insufflation stopcock, length 10.5 cm <strong>Automatic Valve</strong></td>
<td></td>
</tr>
<tr>
<td><strong>30160 MP</strong> Trocar, size 6 mm, color code: black, including: Trocar only, with pyramidal tip Cannula, without valve, with insufflation stopcock, length 10.5 cm <strong>Multifunctional Valve</strong></td>
<td></td>
</tr>
</tbody>
</table>
| **30107 MP** Trocar, size 13 mm, color code: black, including: Trocar only, with pyramidal tip Cannula, without valve, with insufflation stopcock, length 11.5 cm **Multifunctional Valve**, size 13 mm **26003 BA** HOPKINS® Forward-Oblique Telescope 30º, enlarged view, diameter 10 mm, length 31 cm, autoclavable, fiber optic light transmission incorporated, color code: red **26046 BA** HOPKINS® Forward-Oblique Telescope 30º, enlarged view, diameter 5 mm, length 29 cm, autoclavable, fiber optic light transmission incorporated, color code: red **23161 ONF** CLICKline Grasping Forceps, with especially atraumatic serration, fenestrated, single action jaws, with connector pin for unipolar coagulation, sheath curved according to DAPRI, size 5 mm, straight length 40 cm, including: Metal Handle, insulated, without ratchet, with 4 locking positions Outer Sheath with working insert **23161 ONE** CLICKline Grasping Forceps, with especially atraumatic serration, fenestrated, single action jaws, with connector pin for unipolar coagulation, sheath curved according to DAPRI, size 5 mm, straight length 40 cm, including: Metal Handle, insulated, without ratchet, with 4 locking positions Outer Sheath with working insert **23161 ONH** CLICKline Grasping Forceps, with especially atraumatic serration, fenestrated, single-action jaws, 90°-angled tip, with connector pin for unipolar coagulation, sheath curved according to DAPRI, size 5 mm, straight length 40 cm, including: Metal Handle, insulated, without ratchet, with 4 locking positions Outer Sheath with working insert **23775 CLG** Dissecting and Coagulating Electrode, L-shaped, 90°-angled tip, tapered tip acc. to CADIÈRE, with connector pin for unipolar coagulation, sheath curved acc. to DAPRI, size 5 mm, straight length 46 cm **23261 MSG** CLICKline METZENBAUM Scissors, curved, length of blades 12 mm, double-action jaws, 90°-angled tip, with connector pin for unipolar coagulation, sheath curved according to DAPRI, size 5 mm, straight length 40 cm, including: Metal-Handle, insulated, without ratchet, with 4 locking positions Outer Tube with working insert **38421 MWG** RoBi® METZENBAUM Scissors, rotational, with connector pin for bipolar coagulation, CLERMONT-FERRAND Model, curved jaws, double-action jaws, slender blades, sheath curved according to DAPRI, size 5 mm, straight length 43 cm, including: Ring Handle Outer Tube with working insert **23125 RG** CLICKline Dissecting and Grasping Forceps, right-angled, double-action jaws, 90°-angled tip, with connector pin for unipolar coagulation, sheath curved according to DAPRI, size 5 mm, straight length 40 cm, including: Metal Handle, insulated, without ratchet, with 4 locking positions Outer Tube with working insert **23178 KAR** Dismantling KOH Needle Holder, ergonomic axial handle with disengageable ratchet, ratchet release on the right side, with tungsten carbide insert, jaw opening 45° oblique downward, sheath curved according to DAPRI, size 5 mm, straight length 43 cm, including: Outer Tube with working insert **23178 LAR** Dismantling KOH Needle Holder, ergonomic axial handle with disengageable ratchet, ratchet release on the right side, with tungsten carbide insert, jaw opening 45° oblique downward, sheath curved according to DAPRI, size 5 mm, straight length 43 cm, including: Handle Outer Tube with working insert **23460 LHG** Suction and Irrigation Cannula, with lateral holes, curved, size 5 mm, straight length 40 cm **30805** Handle with Two-Way Stopcock, for suction and irrigation, autoclavable, for use with suction and irrigation tubes size 5 mm **33332 ON** CLICKline Grasping Forceps, rotating, size 5 mm, length 36 cm, atraumatic, fenestrated, single action jaws, including: Metal Handle, with MANHES style, ratchet Outer Tube, insulated Forceps Insert **Straight Preformed Knotting Device (Endoloop)** **Straight Clip Applicator, 5 mm** **Disposable Extraction Bag** **Umbilical Tape** **Dualface Prosthesis** **Disposable Straight Tacker Fixation Device, 5 mm** **Ultrasound Probe, 10 mm**
Trocars
size 11/6/13 mm, working length 10.5/10.5/11.5 cm

30103 AP  Trocar, size 11 mm, color code: green, including:
Trocar only, with pyramidal tip
Cannula, without valve, with insufflation stopcock, length 10.5 cm
Automatic valve

30160 MP  Trocar, size 6 mm, color code: black, including:
Trocar only, with pyramidal tip
Cannula without valve, with insufflation stopcock, length 10.5 cm
Multifunctional Valve

30107 MP  Trocar, size 13 mm, color code: black, including:
Trocar only, with pyramidal tip
Cannula without valve, with insufflation stopcock, length 11.5 cm
Multifunctional Valve, size 13 mm
HOPKINS® Telescopes
Diameter 10 / 5 mm, length 31 / 29 cm

26003 BA

Forward-Oblique Telescope 30°,
enlarged view, diameter 10 mm, length 31 cm,
autoclavable,
fiber optic light transmission incorporated,
color code: red

26046 BA

Forward-Oblique Telescope 30°,
enlarged view, diameter 5 mm, length 29 cm,
autoclavable,
fiber optic light transmission incorporated,
color code: red
**Curved Grasping Forceps** according to DAPRI

size 5 mm, straight length 40 cm
**Curved Grasping Forceps** according to DAPRI

size 5 mm, straight length 40 cm

23161 ONH CLICK lined Grasping Forceps, with especially atraumatic serration, fenestrated, single action jaws, 90°-angled tip, with connector pin for unipolar coagulation, sheath curved according to DAPRI, size 5 mm, straight length 40 cm, including: Metal Handle, insulated, without ratchet, with 4 locking positions Outer Sheath with working insert

**Curved Dissecting and Coagulating Electrode** according to DAPRI

size 5 mm, straight length 46 cm

23775 CLG Coagulating and Dissecting Electrode, L-shaped, 90°-angled tip, tapered tip acc. to CADIÈRE, with connector pin for unipolar coagulation, sheath curved acc. to DAPRI, size 5 mm, straight length 46 cm
Curved METZENBAUM Scissors according to DAPRI
size 5 mm, straight length 40 cm

Curved RoBi® METZENBAUM Scissors according to DAPRI
size 5 mm, straight length 43 cm
Curved Dissecting and Grasping Forceps according to DAPRI
size 5 mm, straight length 40 cm

23125 RG CLICKline Dissecting and Grasping Forceps,
right-angled, double-action jaws, 90°-angled tip,
with connector pin for unipolar coagulation,
sheath curved according to DAPRI,
size 5 mm, straight length 40 cm,
including:
- Metal Handle, insulated, without ratchet,
  with 4 locking positions
- Outer Tube with working insert
Dismantling KOH Needle Holder curved according to DAPRI
size 5 mm, straight length 43 cm

23178 KAR  Dismantling KOH Needle Holder,
ergonomic axial handle with disengageable ratchet,
ratchet release on the right side,
with tungsten carbide insert,
jaw opening 45° oblique downward,
sheath curved according to DAPRI,
size 5 mm, straight length 43 cm,
including:
  Outer Tube with working insert
  Handle

23178 LAR  Dismantling KOH Needle Holder,
ergonomic axial handle with disengageable ratchet,
ratchet release on the right side,
with tungsten carbide insert,
jaw opening 45° oblique downward,
sheath curved according to DAPRI,
size 5 mm, straight length 43 cm,
including:
  Handle
  Outer Tube with working insert
Curved Suction and Irrigation Cannula
size 5 mm, straight length 40 cm

23460 LHG  
Curved Suction and Irrigation Cannula, with lateral holes, curved, size 5 mm, straight length 40 cm

30805  
Handle with Two-Way Stopcock, for suction and irrigation, autoclavable, for use with suction and irrigation tubes size 5 mm

CLICKliné Grasping Forceps
rotating, size 5 mm, straight length 36 cm

33332 ON  
CLICKliné Grasping Forceps, rotating, size 5 mm, length 36 cm, atraumatic, fenestrated, single action jaws, including:
   Metal Handle, with MANHES style, ratchet
   Outer Tube, insulated
   Forceps Insert
Genuine FULL HD (High Definition) is guaranteed by a maximum resolution and the consistent use of the native 16:9 aspect ratio throughout the entire image chain, from image capture, signal transmission to display.

FULL HD-compatible endoscopic video camera systems must be equipped with three-CCD chips supporting the 16:9 input format and require that image capture is performed at a resolution of 1920 x 1080 pixels.

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

- Up to 6 times higher input resolution of the camera delivers more detail and depth of field.
- Using 16:9 format during image acquisition enlarges the field of view.
- The 16:9/16:10 format of the widescreen monitor supports ergonomic viewing.
- Enhanced color brilliance for optimal diagnosis.
- Progressive scan technology provides a steady, flicker-free display and helps eliminate eyestrain and fatigue.

**IMAGE1 HUB™ HD**

**IMAGE1 HUB™ HD Camera Control Unit**

for use with IMAGE1 HD and standard one- and three-chip camera heads, max. resolution 1920 x 1080 pixels, with integrated KARL STORZ SCB® and integrated digital Image Processing Module, color systems PAL/NTSC, power supply 100 – 240 VAC, 50/60 Hz including:

- Mains Cord
- S-Video (Y/C) Connecting Cable
- 2x Connecting Cable, for controlling peripheral units
- DVI-D Connecting Cable
- SCB® Connecting Cable
- Keyboard, with US English character set
**IMAGE1 HUB™ HD**

**HD Camera Control Unit**

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

- **Mains Cord**
- S-Video (Y/C) Connecting Cable
- 2x Connecting Cable, for controlling peripheral units
- DVI-D Connecting Cable
- SCB® Connecting Cable
- Keyboard, with US English character set
- 2x KARL STORZ USB Stick, 4 GB

**Specifications:**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Signal-to-noise ratio</td>
<td>IMAGE 1 HUB™ HD, three-chip camera systems ≥ 60 dB</td>
</tr>
<tr>
<td>AGC</td>
<td>Microprocessor-controlled</td>
</tr>
<tr>
<td>Video output</td>
<td>- FULL HD signal to DVI-D socket (2x)</td>
</tr>
<tr>
<td></td>
<td>- SDI signal to BNC socket, (only IMAGE 1 HUB™ HD with SDI-Modul) (2x)</td>
</tr>
<tr>
<td></td>
<td>- RGBS signal to D-Sub socket</td>
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<tr>
<td></td>
<td>- S-Video to 4-pin Mini-DIN socket (2x)</td>
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<tr>
<td></td>
<td>- Composite signal to BNC socket</td>
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<tr>
<td>Input</td>
<td>Keyboard for title generator, 5-pin DIN socket</td>
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</table>

**Control output/input:**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>- KARL STORZ-SCB to 6-pin socket</td>
</tr>
<tr>
<td></td>
<td>- Mini-DIN socket (2x)</td>
</tr>
<tr>
<td></td>
<td>- 3.5 mm stereo jack plug (ACC 1, ACC 2),</td>
</tr>
<tr>
<td></td>
<td>- Serial port at RJ</td>
</tr>
<tr>
<td></td>
<td>- USB port (only IMAGE 1 HUB™ HD with ICM) (2x)</td>
</tr>
</tbody>
</table>

**Dimensions w x h x d:** 305 x 89 x 335 mm

**Weight:** 3.35 kg

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

**Certified to:** IEC 601-1, 601-2-18, CSA 22.2 Nr. 601, UL 2601-1 and CE acc. to MDD, protection class 1/CF defibrillation-safe
First Single-Portal Laparoscopic Surgery Using Curved and Reusable Instruments

**IMAGE1 HD**

FULL HD Camera Control Unit

---

**22 2020 11U110**  [IMAGE 1 HD Camera Control Unit SCB®](#), with ICM module

for use with IMAGE1 FULL HD three-chip camera heads, max. resolution 1920 x 1080 pixels, with integrated ICM (Image Capture Module), KARL STORZ-SCB® and digital Image Processing Module, power supply 100 – 240 VAC, 50/60 Hz

including:

- **Mains Cord**
- 2x **Connecting Cable**, for controlling peripheral units
- **DVI-D Connecting Cable**
- **SCB® Connecting Cable**
- **Keyboard**, with US-English character set
- 2x **KARL STORZ USB Stick**, 4 GB

---

**22 2020 11U1**  [IMAGE 1 HD Camera Control Unit SCB®](#)

for use with IMAGE1 FULL HD three-chip camera heads, max. resolution 1920 x 1080 pixels, with integrated KARL STORZ-SCB® and digital Image Processing Module, power supply 100 – 240 VAC, 50/60 Hz

including:

- **Mains Cord**
- 2x **Connecting Cable**, for controlling peripheral units
- **DVI-D Connecting Cable**
- **SCB Connecting Cable**
- **Keyboard**, with US-English character set

---

**Specifications:**

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<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Signal-to-noise ratio</td>
<td>IMAGE1 HUB™ HD, three-chip camera systems &gt; 60 dB</td>
</tr>
<tr>
<td>AGC</td>
<td>Microprocessor-controlled</td>
</tr>
<tr>
<td>Video output</td>
<td>FULL HD signal to DVI-D socket</td>
</tr>
<tr>
<td>Input</td>
<td>Keyboard for title generator, 5-pin DIN socket</td>
</tr>
<tr>
<td>Control output/input</td>
<td>- USB port (only IMAGE1 HD with ICM) (2x)</td>
</tr>
<tr>
<td></td>
<td>- Serial port at RJ-11</td>
</tr>
<tr>
<td></td>
<td>- 3.5 mm stereo jack plug (ACC 1, ACC 2)</td>
</tr>
<tr>
<td></td>
<td>- KARL STORZ-SCB to 6-pin socket</td>
</tr>
<tr>
<td></td>
<td>Mini-DIN socket (2x)</td>
</tr>
<tr>
<td>Dimensions w x h x d</td>
<td>305 x 89 x 335 mm</td>
</tr>
<tr>
<td>Weight</td>
<td>3.35 kg</td>
</tr>
<tr>
<td>Power supply</td>
<td>100-240 VAC, 50/60 Hz</td>
</tr>
<tr>
<td>Certified to</td>
<td>IEC 601-1, 601-2-18, CSA 22.2 No. 601, UL 2601-1 and CE acc. to MDD, protection class 1/CF defibrillation-safe</td>
</tr>
</tbody>
</table>
First Single-Portal Laparoscopic Surgery Using Curved and Reusable Instruments

**IMAGE1 HUB™ HD**
FULL HD Camera Head

![Image1 Hub HD Camera Head](image)

**IMAGE1 HUB™ HD**
FULL HD Camera Head

<table>
<thead>
<tr>
<th>222200 55-3</th>
<th>50 Hz</th>
<th>IMAGE1 H3-Z</th>
</tr>
</thead>
<tbody>
<tr>
<td>60 Hz</td>
<td>60 Hz</td>
<td>Three-Chip HD Camera Head</td>
</tr>
</tbody>
</table>

max. resolution 1920 x 1080 pixels, progressive scan, soakable, gas-sterilizable, plasma-sterilizable, with integrated Parfocal Zoom Lens, focal length f = 15 – 31 mm (2x), 2 freely programmable camera head buttons

### Specifications:

<table>
<thead>
<tr>
<th>IMAGE1 FULL HD Camera Heads</th>
<th>H3-Z</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 Hz</td>
<td>222200 55-3 (50/60 Hz)</td>
</tr>
<tr>
<td>60 Hz</td>
<td>–</td>
</tr>
<tr>
<td>Image Sensor</td>
<td>3x ¼” CCD chip</td>
</tr>
<tr>
<td>Pixel Output Signal H x V</td>
<td>1920 x 1080</td>
</tr>
<tr>
<td>Dimensions (w x h x l)</td>
<td>39 x 49 x 114 mm</td>
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<tr>
<td>Weight</td>
<td>270 g</td>
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<tr>
<td>Optical Interface</td>
<td>Integrated Parfocal Zoom Lens, f = 15–31 mm (2x)</td>
</tr>
<tr>
<td>Min. Sensitivity</td>
<td>F 1.4/1.17 Lux</td>
</tr>
<tr>
<td>Grip Mechanism</td>
<td>Standard eyepiece adaptor</td>
</tr>
<tr>
<td>Cable</td>
<td>non-detachable</td>
</tr>
<tr>
<td>Cable Length</td>
<td>300 cm</td>
</tr>
</tbody>
</table>

Standard IMAGE1 camera heads may also be used with the IMAGE1 HUB™ HD camera control unit.
First Single-Portal Laparoscopic Surgery Using Curved and Reusable Instruments

**IMAGE 1 HUB™ HD**
FULL HD Camera Head

**22 2200 61-3**

**50 Hz**

**H3-ZA**
Three-Chip FULL HD Camera Head

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

**22 2200 60-3**

**50 Hz**

**H3-FA**
Three-Chip FULL HD Camera Head

Autoclavable, max. resolution 1920 x 1080 pixels, progressive scan, soakable, gas and plasma-sterilizable, fixed focus, focal length f = 17 mm, 2 freely programmable camera head buttons, for use with color systems PAL/NTSC

---

**Specifications:**

<table>
<thead>
<tr>
<th>IMAGE 1 FULL HD Camera Heads</th>
<th>H3-ZA</th>
<th>H3-FA</th>
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</thead>
<tbody>
<tr>
<td><strong>50 Hz</strong></td>
<td>22 2200 61-3 (50/60 Hz)</td>
<td>22 2200 60-3 (50/60 Hz)</td>
</tr>
<tr>
<td>Image Sensor</td>
<td>3x 1/3&quot; CCD chip</td>
<td>3x 1/3&quot; CCD chip</td>
</tr>
<tr>
<td>Pixels Output Signal H x V</td>
<td>1920 x 1080</td>
<td>1920 x 1080</td>
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<td>Dimensions (w x h x l)</td>
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<td>39 x 49 x 93 mm</td>
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<td>261 g</td>
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<td>Integrated Parfocal Zoom Lens, f = 15-31 mm</td>
<td>Fixed focus f = 17 mm</td>
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<tr>
<td>Min. Sensitivity</td>
<td>F 1.4/1,17 Lux</td>
<td>F 1.4/1,17 Lux</td>
</tr>
<tr>
<td>Grip Mechanism</td>
<td>Standard eyepiece adaptor</td>
<td>Standard eyepiece adaptor</td>
</tr>
<tr>
<td>Cable</td>
<td>non-detachable</td>
<td>non-detachable</td>
</tr>
<tr>
<td>Cable Length</td>
<td>300 cm</td>
<td>300 cm</td>
</tr>
</tbody>
</table>

For use with IMAGE 1 HUB™ HD Camera Control Unit SCB 22 22010 11-1xx and IMAGE 1 HD Camera Control Unit SCB 22 2202011-1xx
First Single-Portal Laparoscopic Surgery Using Curved and Reusable Instruments

KARL STORZ FULL HD Monitors

9619 NB

9626 NB/NB-2

<table>
<thead>
<tr>
<th>KARL STORZ HD and FULL HD Monitors</th>
<th>19&quot;</th>
<th>26&quot;</th>
<th>26&quot;</th>
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<tbody>
<tr>
<td>Wall-mounted with VESA 100 adaption</td>
<td>9619 NB</td>
<td>9626 NB</td>
<td>9626 NB-NB-2</td>
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**Inputs:**

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<th>19&quot;</th>
<th>26&quot;</th>
<th>26&quot;</th>
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</thead>
<tbody>
<tr>
<td>DVI-D</td>
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<td>1x</td>
<td>2x</td>
</tr>
<tr>
<td>Fiber Optic</td>
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<td>optional</td>
<td>optional</td>
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<tr>
<td>RGBS/VGA</td>
<td>1x</td>
<td>1x</td>
<td>2x</td>
</tr>
<tr>
<td>S-Video</td>
<td>1x</td>
<td>1x</td>
<td>2x</td>
</tr>
<tr>
<td>Composite</td>
<td>1x</td>
<td>1x</td>
<td>2x</td>
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**Outputs:**

<table>
<thead>
<tr>
<th></th>
<th>19&quot;</th>
<th>26&quot;</th>
<th>26&quot;</th>
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<tbody>
<tr>
<td>DVI-D</td>
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<td>●</td>
<td>●</td>
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<tr>
<td>S-Video</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Composite</td>
<td>●</td>
<td>●</td>
<td>●</td>
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</tbody>
</table>

**Displayable signal formats:**

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

**Specifications:**

<table>
<thead>
<tr>
<th>KARL STORZ HD and FULL HD Monitors</th>
<th>19&quot;</th>
<th>26&quot;</th>
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</thead>
<tbody>
<tr>
<td>Pedestal</td>
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<td>optional</td>
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<tr>
<td>Wall-mounted with VESA 100 adaption</td>
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<td>9626 NB-NB-2</td>
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<tr>
<td>Brightness</td>
<td>280 cd/m²</td>
<td>400 cd/m²</td>
</tr>
<tr>
<td>Max. Viewing Angle</td>
<td>178° vertical</td>
<td>178° vertical</td>
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<tr>
<td>Pixel Distance</td>
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<td>0.30 mm</td>
</tr>
<tr>
<td>Reaction Time</td>
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</tr>
<tr>
<td>Contrast Ratio</td>
<td>700:1</td>
<td>700:1</td>
</tr>
<tr>
<td>Mounting</td>
<td>100 mm VESA</td>
<td>100 mm VESA</td>
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<tr>
<td>Weight</td>
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<tr>
<td>Rated Power</td>
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<td>120 W</td>
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<tr>
<td>Operating Conditions</td>
<td>0-40°C</td>
<td>0-40°C</td>
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<tr>
<td>Storage</td>
<td>-20-60°C</td>
<td>-20-60°C</td>
</tr>
<tr>
<td>Rel. Humidity</td>
<td>max. 80%</td>
<td>max. 80%</td>
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<tr>
<td>Dimensions w x h x d</td>
<td>469.5 x 416 x 75.5 mm</td>
<td>699 x 645.6 x 87.5 mm</td>
</tr>
<tr>
<td>Power Supply</td>
<td>85-264 VAC</td>
<td>85-264 VAC</td>
</tr>
</tbody>
</table>

**Following accessories included:**

- Mains Cord
- External 24VDC Power Supply
- Signal cables: DVI-D, VGA, S-Video, BNC

**Optional accessories:**

- 9626 SF Pedestal, suitable for monitors of the 96xx series

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KARL STORZ FULL HD Monitors

NEW

KARL STORZ HD and FULL HD Monitors

Wall-mounted with VESA 100 adaption

Inputs:

- DVI-D: 1x
- Fiber Optic: optional
- RGBS/VGA: 1x
- S-Video: 1x
- Composite: 1x

Outputs:

- DVI-D: ●
- S-Video: ●
- Composite: ●

Displayable signal formats:

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

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>Pedestal</td>
<td>optional</td>
<td>optional</td>
</tr>
<tr>
<td>Wall-mounted with VESA 100 adaption</td>
<td>9619 NB</td>
<td>9626 NB-NB-2</td>
</tr>
<tr>
<td>Brightness</td>
<td>280 cd/m²</td>
<td>400 cd/m²</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>0.30 mm</td>
</tr>
<tr>
<td>Reaction Time</td>
<td>≤ 12 ms</td>
<td>≤ 12 ms</td>
</tr>
<tr>
<td>Contrast Ratio</td>
<td>700:1</td>
<td>700:1</td>
</tr>
<tr>
<td>Mounting</td>
<td>100 mm VESA</td>
<td>100 mm VESA</td>
</tr>
<tr>
<td>Weight</td>
<td>10 kg</td>
<td>14 kg</td>
</tr>
<tr>
<td>Rated Power</td>
<td>120 W</td>
<td>120 W</td>
</tr>
<tr>
<td>Operating Conditions</td>
<td>0-40°C</td>
<td>0-40°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. 80%</td>
<td>max. 80%</td>
</tr>
<tr>
<td>Dimensions w x h x d</td>
<td>469.5 x 416 x 75.5 mm</td>
<td>699 x 645.6 x 87.5 mm</td>
</tr>
<tr>
<td>Power Supply</td>
<td>85-264 VAC</td>
<td>85-264 VAC</td>
</tr>
</tbody>
</table>

---

**KARL STORZ FULL HD Monitors**
# KARL STORZ HD and HD WideView™ Monitors

![Image](image.png)

## TFT Flat Screens vs HD WideView™ Monitors

<table>
<thead>
<tr>
<th>15&quot;</th>
<th>19&quot;</th>
<th>24&quot;</th>
<th>26&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Wall-mounted with VESA 100 adaption</strong></td>
<td><strong>Inputs:</strong></td>
<td><strong>Outputs:</strong></td>
<td><strong>Displayable signal formats:</strong></td>
</tr>
<tr>
<td>9515 NB</td>
<td>9519 NB</td>
<td>9524 NB</td>
<td>9526 NB</td>
</tr>
</tbody>
</table>

### Inputs:
- **SDI**
- **HD-SDI**
- **RGBS**
- **S-Video**
- **Composite**
- **SOG**
- **DVI-D**
- **Fiber Optic**
- **VGA**

### Outputs:
- **SDI**
- **HD-SDI**
- **RGBS**
- **S-Video**
- **Composite**
- **DVI-D**

### Displayable signal formats:
- 4:3
- 5:4
- 16:9
- 16:10
- Picture-in-Picture
- PAL/NTSC compatible

### Following accessories included:
- **Mains Cord**
- **External 24VDC Power Supply**
- **Signal Cables:** DVI-D, BNC

### Optional accessories:
- **9526 Pedestal**, suitable for 19", 23", 24" and 26" monitors of the 94xx- and 95xx- series
KARL STORZ HD and HD WideView™ Monitors

Specifications:

<table>
<thead>
<tr>
<th></th>
<th>15&quot;</th>
<th>19&quot;</th>
<th>24&quot;</th>
<th>26&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wall-mounted with VESA 100 adaption</td>
<td>9515 NB</td>
<td>9519 NB</td>
<td>9524 NB/NBO</td>
<td>9526 NB/NBO</td>
</tr>
<tr>
<td>Brightness</td>
<td>430 cd/m²</td>
<td>300 cd/m²</td>
<td>400 cd/m²</td>
<td>500 cd/m²</td>
</tr>
<tr>
<td>Max. Viewing Angle</td>
<td>178° vertical</td>
<td>178° vertical</td>
<td>178° vertical</td>
<td>178° vertical</td>
</tr>
<tr>
<td>Pixel Distance</td>
<td>0.297 mm</td>
<td>0.294 mm</td>
<td>0.270 mm</td>
<td>0.287 mm</td>
</tr>
<tr>
<td>Reaction Time</td>
<td>10-16 ms</td>
<td>10-16 ms</td>
<td>5-12 ms</td>
<td>5-12 ms</td>
</tr>
<tr>
<td>Contrast Ratio</td>
<td>500:1</td>
<td>600:1</td>
<td>1000:1</td>
<td>800:1</td>
</tr>
<tr>
<td>Mount</td>
<td>100 mm VESA</td>
<td>100 mm VESA</td>
<td>100 mm VESA</td>
<td>100 mm VESA</td>
</tr>
<tr>
<td>Weight</td>
<td>4.8 kg</td>
<td>6.8 kg</td>
<td>7.3 kg</td>
<td>8.2 kg</td>
</tr>
<tr>
<td>Rated Power</td>
<td>40 Watt</td>
<td>65 Watt</td>
<td>115 Watt</td>
<td>115 Watt</td>
</tr>
<tr>
<td>Operating Conditions</td>
<td>0-40 °C</td>
<td>0-38 °C</td>
<td>0-40 °C</td>
<td>0-40 °C</td>
</tr>
<tr>
<td>Storage</td>
<td>-20-60 °C</td>
<td>-20-60 °C</td>
<td>-20-60 °C</td>
<td>-20-60 °C</td>
</tr>
<tr>
<td>Rel. Humidity</td>
<td>5-85 %, non-condensing</td>
<td>5-85 %, non-condensing</td>
<td>20-85 %, non-condensing</td>
<td>20-85 %, non-condensing</td>
</tr>
<tr>
<td>Dimensions w x h x d</td>
<td>385 x 301 x 81 mm</td>
<td>465 x 400 x 98 mm</td>
<td>597 x 401 x 100 mm</td>
<td>627 x 427 x 100 mm</td>
</tr>
<tr>
<td>Power Supply</td>
<td>100-240 VAC</td>
<td>100-240 VAC</td>
<td>100-240 VAC</td>
<td>100-240 VAC</td>
</tr>
</tbody>
</table>

9515 NB 15" HD Monitor
Wall-mounted with VESA 100 adaption, color systems PAL/NTSC, max. screen resolution 1024 x 768, power supply 100 – 240 VAC, 50/60 Hz including:
- Power Supply
- Mains Cord
- Signal cables: DVI-D, BNC

9519 NB 19" HD Monitor
Wall-mounted with VESA 100 adaption, color systems PAL/NTSC, max. screen resolution 1280 x 1024, power supply 100 – 240 VAC, 50/60 Hz including:
- Power Supply
- Mains Cord
- Signal cables: DVI-D, BNC

9524 NB 24" HD WideView™ Monitor
Wall-mounted with VESA 100 adaption, color systems PAL/NTSC, max. screen resolution 1920 x 1200, image format 16:10, power supply 100 – 240 VAC, 50/60 Hz including:
- Power Supply
- Mains Cord
- Signal cables: DVI-D, BNC

9526 NB 26" HD WideView™ Monitor
Wall-mounted with VESA 100 adaption, color systems PAL/NTSC, max. screen resolution 1920 x 1200, image format 16:10, power supply 100 – 240 VAC, 50/60 Hz including:
- Power Supply
- Mains Cord
- Signal cables: DVI-D, BNC

9524 NBO 24" HD WideView™ Monitor (Fiber)
Wall-mounted with VESA 100 adaption, optical input, color systems PAL/NTSC, max. screen resolution 1920 x 1200, image format 16:10, power supply 100 – 240 VAC, 50/60 Hz including:
- Power Supply
- Mains Cord
- Signal cables: DVI-D, BNC

9526 NBO 26" HD WideView™ Monitor (Fiber)
Wall-mounted with VESA 100 adaption, optical input, color systems PAL/NTSC, max. screen resolution 1920 x 1200, image format 16:10, power supply 100 – 240 VAC, 50/60 Hz including:
- Power Supply
- Mains Cord
- Signal cables: DVI-D, BNC
Cold Light Fountain XENON 300®

- **20133101-1** Cold Light Fountain XENON 300®
  - with built-in antifog air-pump, and integrated KARL STORZ Communication Bus System®
  - power supply: 100–125 V AC/220–240 V AC, 50/60 Hz
  - including:
    - Mains Cord
    - Silicone Tubing Set, autoclavable, length 250 cm
    - 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

Fiber Optic Light Cable

- **495 NCS** Fiber Optic Light Cable,
  - with straight connector, extremely heat-resistant, diameter 4.8 mm, length 250 cm
Electronic CO₂-ENDOFLATOR with KARL STORZ®

26430508-1 Electronic CO₂-ENDOFLATOR®
including:
Electronic CO₂-ENDOFLATOR®
with KARL STORZ®
power supply: 100 – 240 VAC, 50/60 Hz
Mains Cord
Silicone Tubing Set, sterilizable
Universal Wrench
Connecting Cable, length 100 cm
* CO₂/N₂O-Gas Filter, sterile, for single use,
package of 10

Subject to the customer's application-specific requirements additional accessories must be ordered separately.

* This product is marketed by mtp.
For additional information, please apply to:

mtp medical technical promotion gmbh,
Take-Off Gewerbepark 46, D-78579 Neuhausen ob Eck, Germany

HAMOU ENDOMAT® with KARL STORZ®
Suction and Irrigation System

2633109-1 HAMOU ENDOMAT®
including:
HAMOU ENDOMAT® with KARL STORZ®
power supply 100 – 240 VAC, 50/60 Hz
Mains Cord
3x * HYS Tubing Sets, disposable
3x * LAP Tubing Sets, disposable
Connecting Cable, length 100 cm
* VACUsafe Promotion Pack, suction, 2l

Subject to the customer's application-specific requirements additional accessories must be ordered separately.

* This product is marketed by mtp.
For additional information, please apply to:

mtp medical technical promotion gmbh,
Take-Off Gewerbepark 46, D-78579 Neuhausen ob Eck, Germany
AUTOCON® II 400

20 5352 01-11x AUTOCON® II 400 including:
AUTOCON® II 400 with KARL STORZ power supply 100 – 240 VAC, 50/60 Hz
Mains Cord
Connecting Cable, length 100 cm

20 5352 01-115 AUTOCON® II 400 High-End, power supply 230 VAC, 50/60 Hz, HF connecting sockets: 2x bipolar standard, bipolar multifunction, unipolar 3-pin and Erbe, neutral electrode 6.3 mm jack, system requirements: SCB R-UI Software Release 2009001-26, including:
AUTOCON® II 400 with KARL STORZ Mains Cord
Connecting Cable, length 100 cm

Equipment Cart

29005 LAP Equipment Cart,
rides on 4 antistatic dual wheels,
2 equipped with locking brakes,
3 fixed shelves, one with handles,
main switch at vertical beam,
integrated cable conduits in vertical beams,
drawer unit with lock,
3 horizontal cable conduits,
one with cable winding,
two with 4-times electrical sub-distributer,
1 set of non-sliding stands for units,
1 TFT-Monitor arm (VESA 75/100),
1 camera holder,
8 power cords (50 cm), 2 power cords (2 m),
2 equipment rails,
1 CO2-bottle holder, max. diameter 155 mm,
Isolation transformer 230 VAC (50/60 Hz) with 8 sockets and earth potential
and earth leakage monitor (2000 VA),
Dimensions: Equipment Cart 730 x 1470 x 716 mm (w x h x d),
shelf: 630 x 480 mm (w x d), caster diameter: 150 mm
Data Management and Documentation
KARL STORZ AIDA® compact NEO (HD/SD)
Brilliance in documentation continues!

AIDA compact NEO from KARL STORZ combines all the required functions for integrated and precise documentation of endoscopic procedures and open surgeries in a single system.

Data Acquisition
Still images, video sequences and audio comments can be recorded easily during an examination or intervention on command by either pressing the on screen button, voice control, foot switch or pressing the camera head button. All captured images will be displayed on the right hand side as a “thumbnail” preview to ensure the still image has been generated.

The patient data can be entered by the on-screen keyboard or by a standard keyboard.

Flexible post editing and data storage
Captured still images or video files can be previewed before final storage or can be edited and deleted easily in the edit screen.

Reliable storage of data
- Digital saving of all image, video and audio files on DVD, CD-ROM, USB stick, external/internal hard-drive or to the central hospital storage possibilities over DICOM/HL7
- Buffering ensures data backup if saving is temporarily not possible
- Continuous availability of created image, video and sound material for procedure documentation and for research and teaching purposes.

Efficient data archiving
After a procedure has been completed, KARL STORZ AIDA® compact HD/SD saves all captured data efficiently on DVD, CD-ROM, USB stick, external hard-drive, internal hard-drive and/or the respective network on the FTP server. Furthermore the possibility exists to store the data directly on the PACS respective HIS server, over the interface package AIDA communication HL7/DICOM.

Data that could not be archived successfully remains in a special buffered procedure until it is finally saved. A two-line report header and a logo can be used by the user to meet his or her needs.

Multisession and Multipatient
Efficient data archiving is assured as several treatments can be saved on a DVD, CD-ROM or a USB stick.
First Single-Portal Laparoscopic Surgery Using Curved and Reusable Instruments

Features and Benefits

- Digital storage of still images with a resolution of 1920 x 1080 pixels, video sequences in 720p and audio files with AIDA compact NEO HD
- Optional interface package DICOM/HL7
- Sterile, ergonomic operation via touch screen, voice control, camera head buttons and/or foot switches
- Auto detection of the connected camera system on HD-SDI/SD-SDI input
- Efficient archiving on DVD, CD-ROM or USB stick, multi-session and multi-patient
- Network saving
- Automatic generation of standard reports
- Approved use of computers and monitors in the OR environment as per EN 60601-1
- Compatibility with the KARL STORZ Communication Bus (SCB®) and with the KARL STORZ OR1™ AV NEO
- KARL STORZ AIDA® compact NEO HD/SD is an attractive, digital alternative to video printers, video recorders and dictaphones.

Specifications:

| Video Systems   | - PAL  
|-----------------|-------
| - NTSC          |       
| Signal Inputs   | - S-Video (Y/C)  
|                 | - Composite  
|                 | - RGBS  
|                 | - SDI  
|                 | - HD-SDI  
|                 | - DVI  
| Image Formats   | - JPG  
|                 | - BMP  
| Video Formats   | - MPEG2  
| Audio Formats   | - WAV  
| Storage Media   | - DVD+R  
|                 | - DVD+RW  
|                 | - DVD-R  
|                 | - DVD-RW  
|                 | - CD-R  
|                 | - CD-RW  
|                 | - USB stick  

20040910 KARL STORZ AIDA® compact NEO SD Communication, documentation system for digital storage of still images, video sequences and audio files, power supply 115/230 VAC, 50/60 Hz

20040911 KARL STORZ AIDA® compact NEO HD Communication, documentation system for digital storage of still images, video sequences and audio files, power supply 115/230 VAC, 50/60 Hz

20040610 KARL STORZ AIDA® compact NEO SD, documentation system for digital storage of still images, video sequences and audio files, power supply 115/230 VAC, 50/60 Hz

20040611 KARL STORZ AIDA® compact NEO HD, documentation system for digital storage of still images, video sequences and audio files, power supply 115/230 VAC, 50/60 Hz
Notes:
WITH COMPLIMENTS OF
KARL STORZ—ENDOSKOPE