

White Edition

**maXium®**

Innovative technology in white!



Where every look and every hand count,  
straightforward and easy operation is top priority.  
The maXium® unit offers you both.

## Reduction is perfection Highest level of simplicity

Nowadays, a trend towards “simplified dialog”, i.e. improved communications with the user, is clearly underway in all fields of medical engineering. Especially during extensive surgeries, extremely complex background processes are going on. Particularly in this field, easy and at the same time intuitive handling of the devices is therefore increasingly gaining significance. The surgeon and his team want to have at their fingertips just those functions and information that they really need for their current tasks, especially in stressful situations.

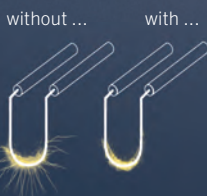
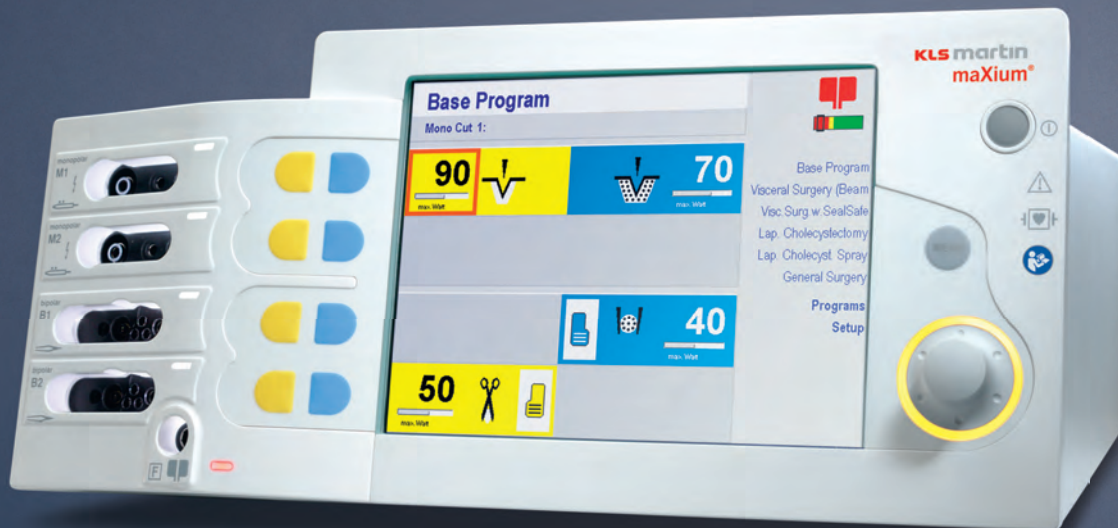
The maXium® meets these high demands. With this future-oriented generation of HF units, KLS Martin sets entirely new standards in terms of ease of use and performance. maXium® – this is the innovative symbiosis of state-of-the-art high-frequency technology and a whole range of user-friendly assets. This is exactly what makes this unit a “high-end reference system” in the field of multi-functional HF surgery.

## **maXium®** The unit for all applications

Nowadays, the technical requirements in electrosurgery are particularly complex and diverse. Innovative technology as well as safe and easy handling combined with utmost efficiency are among the most important requirements that have to be met by surgical units.

This is exactly what maXium® offers: The unit exhibits a wide range of precisely regulated currents, enabling you to choose between a great number of applications, such a monopolar and bipolar cutting and coagulation. Besides the standard current types PureCut and BlendCut, you have additional, application-specific currents at your disposal.

But it has still more to offer: The maXium® provides you with important safety mechanisms such as spark control and characteristics control, benefits that guarantee you optimum power adjustment at any time.



### Spark control

- Automatic power adjustment to the necessary minimum and thus reduced spark formation – patient-friendly application.
- Constant cutting quality, irrespective of the tissue properties and the electrode geometry



### NE indicator

Using the PCS system (Patient Control System – a monitoring system for split neutral electrodes) and the NE indicator, not only the status of the applied neutral electrode but also the application quality is displayed - continuously throughout the entire application.



### NE baby

When using small-area neutral electrodes, undesired temperature rises underneath the neutral electrode may occur, depending on the current used. Using the NE baby function, unsuitable current types are blocked and the maximum output power of permissible current types is limited.

## Intuitive. Fast. Straightforward. The **maXium**<sup>®</sup> and its operability



|   |                  |
|---|------------------|
|   | C a n c e l      |
|   | <b>Confirm</b>   |
|   | All disciplines  |
| ✗ | General Surgery  |
| ✓ | Urology          |
| ✓ | Gynaecology      |
| ✗ | Cardio-Thoracic  |
| ✗ | Gastroenterology |

In order to make the operation even easier and clearer, you can select one or several medical disciplines in the menu. As a result, only the relevant programs and current types are made available.

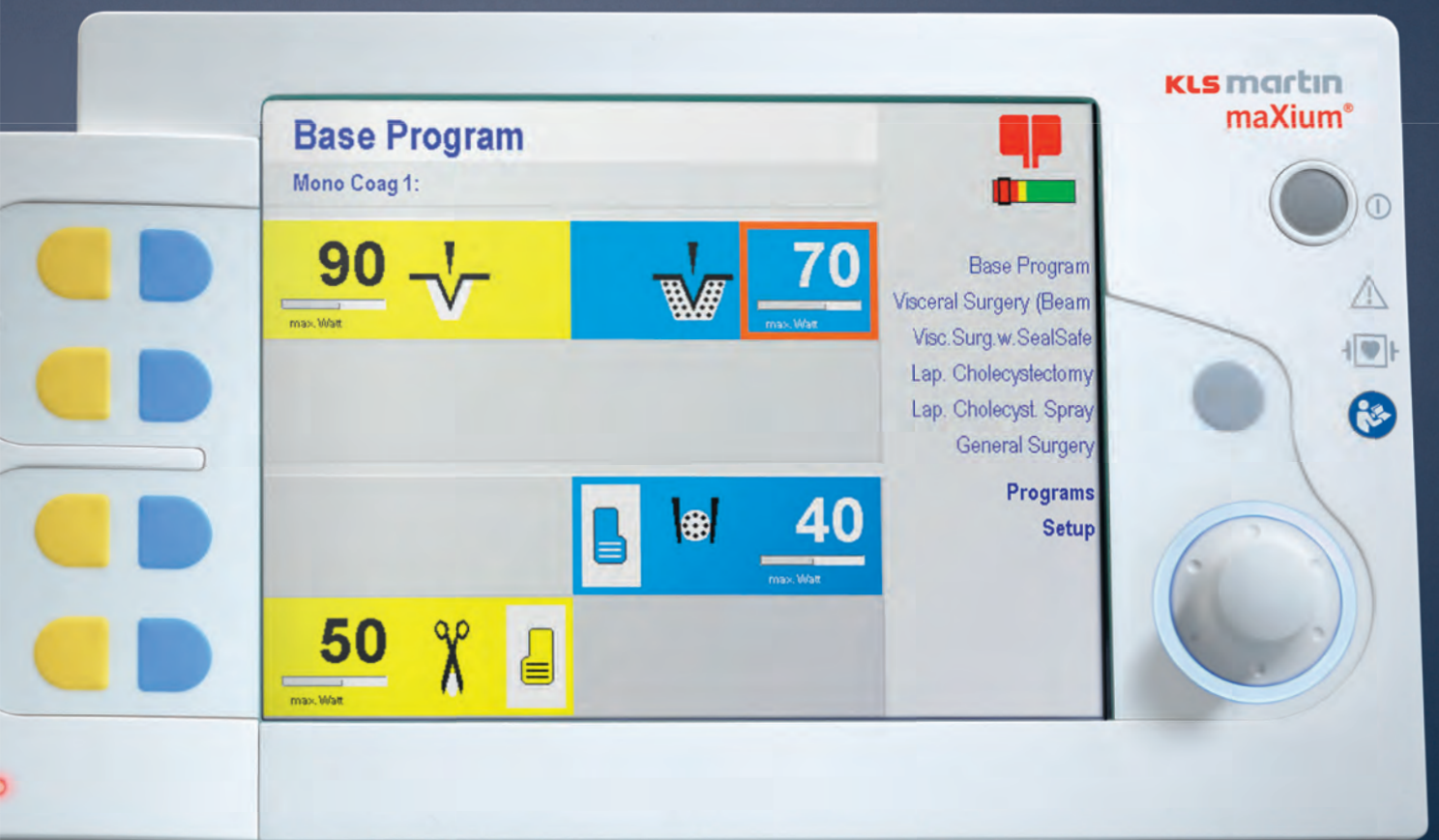
### Control takes just a turn

Thanks to its ingenious “Quick Step” control, the maXium<sup>®</sup> can be easily operated with one hand in a split second. Due to its multifunctional rotary switch, all parameters can be set and changed any time according to your individual needs. The patented backlight additionally indicates the respective status of the rotary switch.

The system’s memory offers you a multitude of application possibilities through 99 storage positions for user-defined programs, plus a preset standard program. These can be stored under the respective medical specialization, the specific indication or a freely definable name – just as you prefer. The list of favorites enables you to access the “last used programs” with ease and call them up in a second when you need them.

### Everything at a glance: The maxi-display

Whether it's monopolar, bipolar, cutting or coagulation: The type of the active program, the set output power, the selected type of current and the chosen switching mode (hand or foot switch) can be checked at a glance in the maxi-display. In doing so, the various settings are displayed simultaneously for all four working channels. The unit does not only show you the type of the neutral electrode used via an icon - the NE indicator also continuously provides you information about the current application status on the patient.





### Available in three versions

As a standard feature, the maXium® offers you four working channels, each of them with two monopolar and two bipolar outputs. These are available in three different configurations:

- **m-version:** with socket module for KLS Martin accessories
- **i-version:** with socket module for international accessories
- **e-version:** with socket module for Erbe accessories

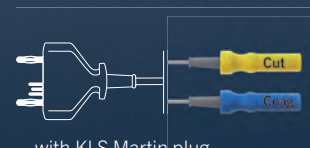
These three different socket modules allow for the connection of plug-compatible third-party accessories to the maXium® unit without any problems.

### Expandable through three port expanders

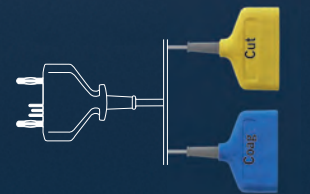
Each of the four outputs can be selected individually, either via the channel selector button or the rotary switch. The bipolar outputs can additionally be expanded by using bipolar port expanders. This enables you to connect and use a total of four bipolar instruments – without using a second HF unit.

The combination with the bipolar expanders makes it possible to connect e.g. bipolar scissors, bipolar forceps and bipolar sealing instruments simultaneously and configure them independently from each other during extensive surgical interventions. For combining the instruments with KLS Martin, international or Erbe plugs, you have the respective appropriate expanders at your disposal.

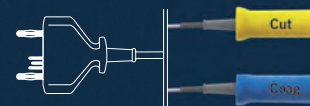
#### Port expanders for instruments:



– with KLS Martin plug



– with international plug



– with Erbe plug



As flexible as you are  
The **maxium**<sup>®</sup> fits in any environment



#### **Integrated OR systems**

Integrated surgical systems are increasingly gaining significance. KLS Martin takes account of this future trend: Now the maxium<sup>®</sup> unit can be combined with the OR1 NEO system of Karl Storz Company and the CORE nova<sup>®</sup> of Richard Wolf Company. This makes it possible to change all settings and use all programs required individually for the application out of the sterile area.

## Solutions for hand and foot – for those who are quick on the uptake



### Program switching with the SWAP mode

The fastest way of changing settings is the SWAP mode. Using this function, you are provided the opportunity to change between two preset programs via the foot switch or the push-buttons on the electrode handle.

The advantages of the SWAP mode:

- Switching directly by the surgeon (no non-sterile person is needed)
- Use of different settings during the surgery
- Optimum performance for all work steps
- Easy handling for creation of SWAP programs
- Switching via:
  - the convenient foot switch with additional button
  - any existing handle with two push-buttons

## Plug & Play – automatic identification of instruments with intelligent IQ

With hardware version 06 the name of the connected instrument is automatically displayed by maxium® as soon as an IQ instrument is plugged in, and the current associated with the instrument is set to a matching default value – it simply could not be more straightforward!

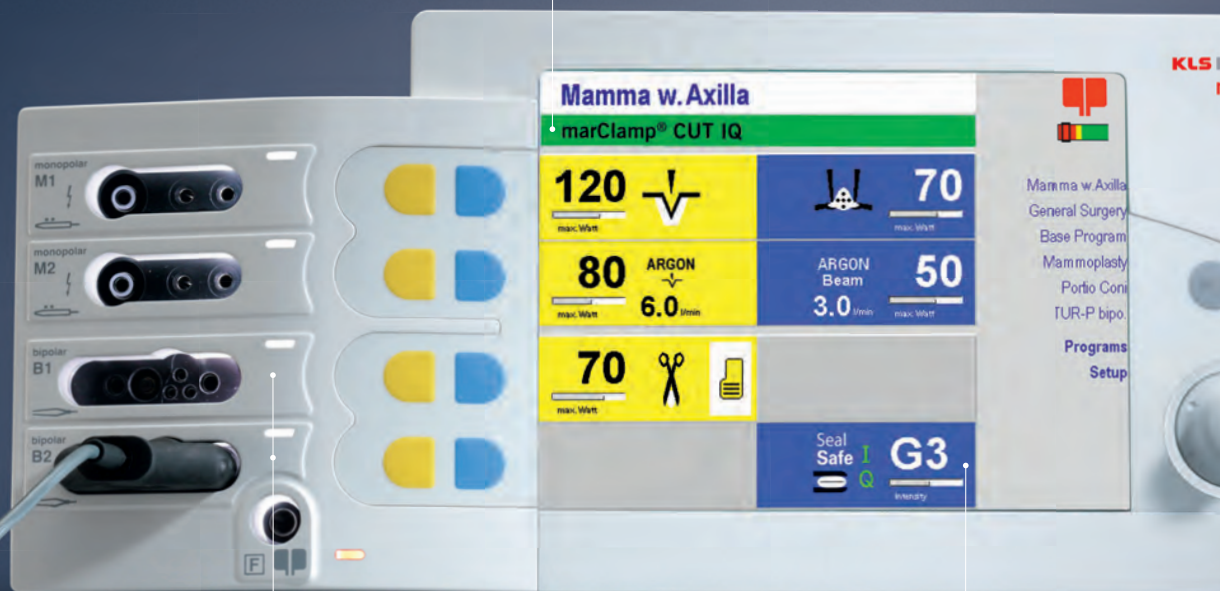
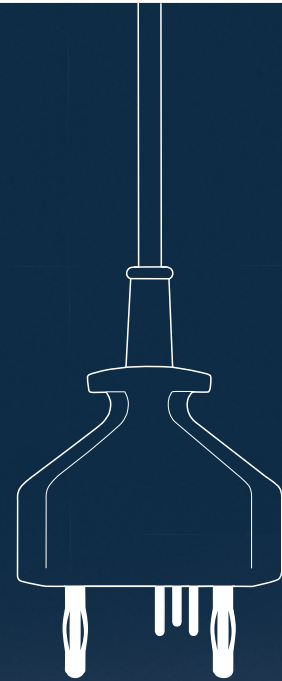
If you do not wish to work with the instrument-specific default values, simply change them as required and save the new values in the usual, program-specific manner. The advantage of this method is that when the IQ instrument is plugged in again, your customized values will appear instead of the default values.

The following items are currently available with IQ functionality together with the SealSafe® IQ current mode:

From software version V3.400: marClamp® IQ, marSeal IQ, marSeal Slim IQ and marSeal 5 IQ

From software version V3.412: marClamp® Cut IQ

From software version V3.423: marSeal 5 plus



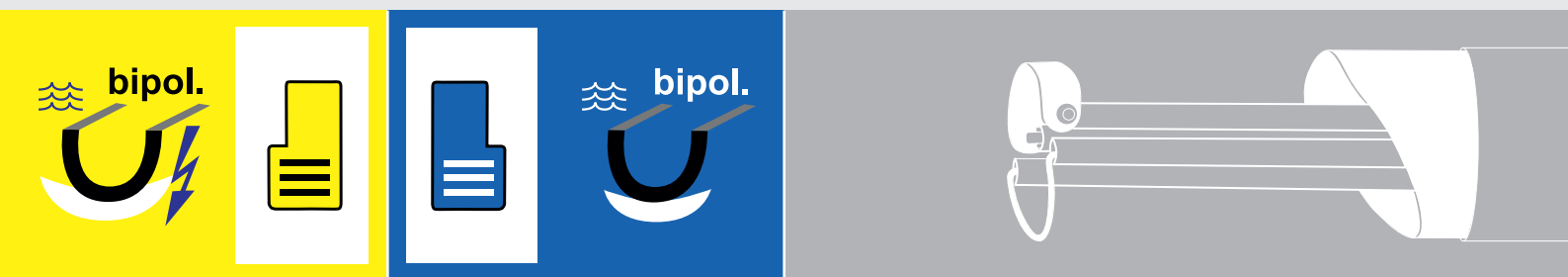
Displaying the name of the connected instrument

Use of the two bipolar connecting sockets

Automatic assignment of the required current type and set-up of the required performance parameters

## Bipolar resection

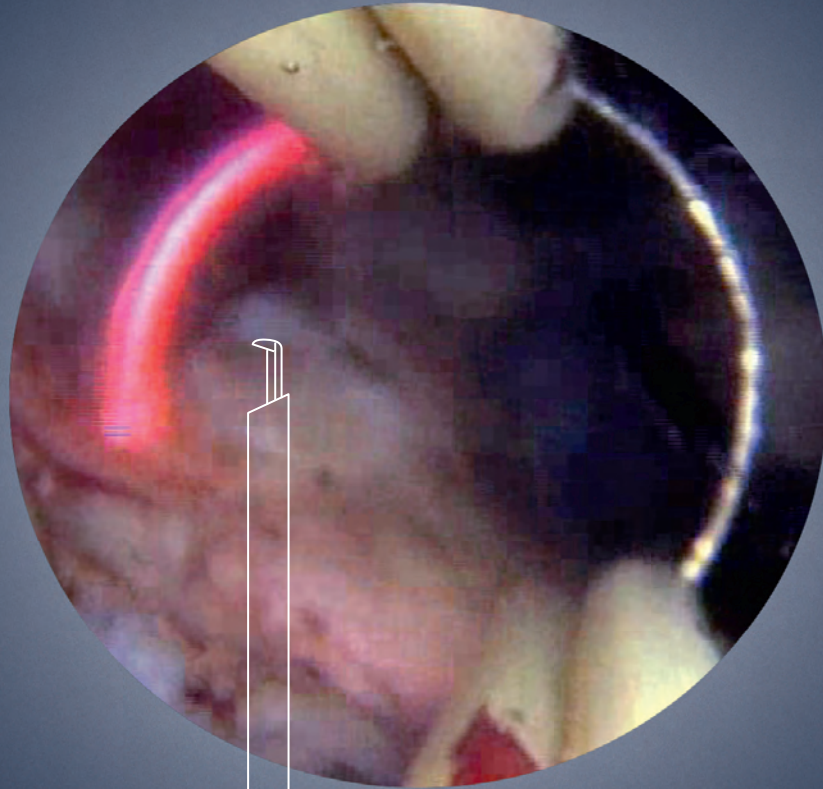
✓ Effective ✓ Compatible ✓ Safe



### With optimized current types and booster pulse

In contrast to classic, monopolar resection, where an electrically non-conductive irrigation liquid is used, the bipolar resection technique exclusively uses an electrically conductive saline solution (NaCl) for irrigation. This provides two advantages for the surgeon: First, the risk of a TUR syndrome is reduced; second, the duration of the surgery can be extended.

Special types of current have been developed specifically for bipolar resection. They feature a booster pulse for starting the cutting process, making it possible to use large cutting loops. Since they exhibit a high resection rate, they are particularly advantageous for TUR-P applications. Using the booster pulse, the cutting process can be initiated quickly and without compressing the tissue with the wire loop.



#### **Examples of bipolar resection**

The bipolar resection option gives you the opportunity to use the maXium® unit for bipolar cutting and coagulation in transurethral/transcervical interventions as well. This operating mode requires the use of a bipolar resectoscope manufactured by Storz, Wolf or Olympus.

#### **Main application areas**

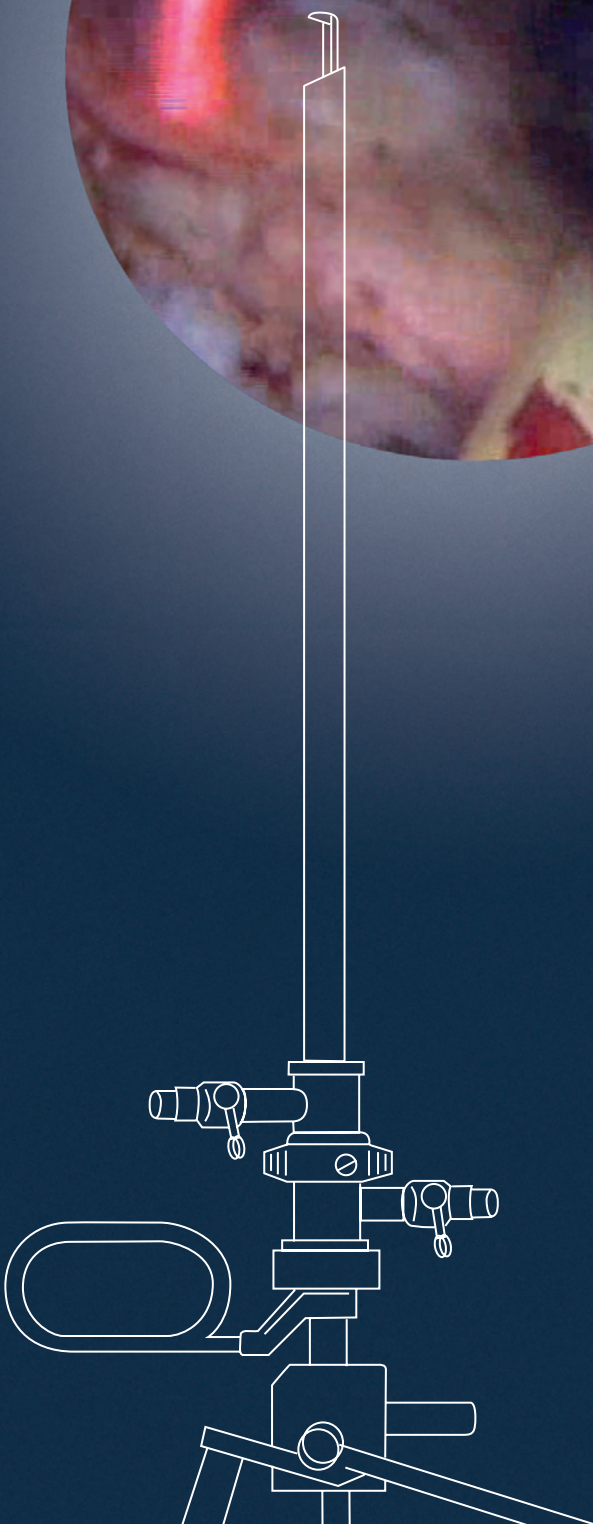
- Transurethral resection (TUR-B, TUR-P)
- Transcervical resection (TCR)

#### **General advantages of bipolar resection**

- Resection can be performed with saline solution
- No risk of causing a TUR syndrome
- No time limits for the intervention
- No neutral electrode required

#### **Special advantages of bipolar resection by KLS Martin**

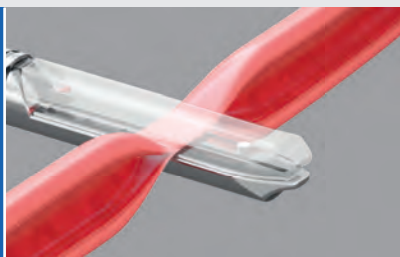
- Excellent cutting effect due to “booster” impulse
- Larger loops possible for faster resection
- Longer service life of the loop electrodes
- No warmed saline solution necessary



Intelligent vessel sealing with  
**SealSafe® IQ**, **marSeal IQ**,  
**marClamp® Cut IQ** and **marClamp® IQ**

Up to 25 % faster sealing!

By optimizing the sealing process, a 25% shorter sealing time is achieved.



Vessel sealing up to  $\varnothing$  7 mm  
Lateral thermal expansion < 2 mm  
Burst pressure at least 360 mmHg

#### Safe – vessel sealing with SealSafe® IQ

Bipolar vessel sealing systems allow for sealing vessels and tissue bundles effectively and permanently without any previous dissection or detailed exposure. With the maXium® HF generator, the SealSafe® IQ current, the marClamp® IQ and the marSeal IQ, KLS Martin offers you a fast, reliable and economical vessel sealing system.

Thanks to the precise adaptation of the SealSafe® IQ current to the applications and instruments, exclusively the tissue located between the instrument's jaws is sealed – lateral thermal tissue damage and tissue adherence can thus be kept to an absolute minimum. Besides, the SealSafe® IQ current has been optimized to prevent tissue carbonization to full extent. Due to the effective combination of the constant high pressure applied to the tissue and the high electric current, a permanently sealed zone is reliably created on arteries, veins or tissue bundles.



marSeal Slim IQ



marSeal IQ



marSeal 5 IQ



marSeal 5 plus

## marSeal 5 plus

### marSeal IQ – one instrument for two work steps

Combined with the maXium® unit and the optimally adapted SealSafe® IQ current, vessels and tissue bundles can be effectively sealed and tissue damage caused by lateral heat propagation can largely be avoided. Adhesion of tissue to the contact surfaces can also be reduced to a minimum. The required constant pressure on the tissue to be sealed is ensured by a ratchet integrated into the handle.

The marSeal IQ instruments provide the optimum basis for easy and tissue-saving sealing with the possibility of subsequent dissection – without any need for exchanging instruments. Thanks to its modular design offering different shaft lengths, the marSeal IQ can be used for laparoscopic applications as well as open surgery. The additional rotation of the tubular shaft by 360 degrees enables easy application of the instrument and fatigue-free working. Since the marSeal can be completely taken apart, it is additionally easy to clean and autoclavable at 134°C (273°F).

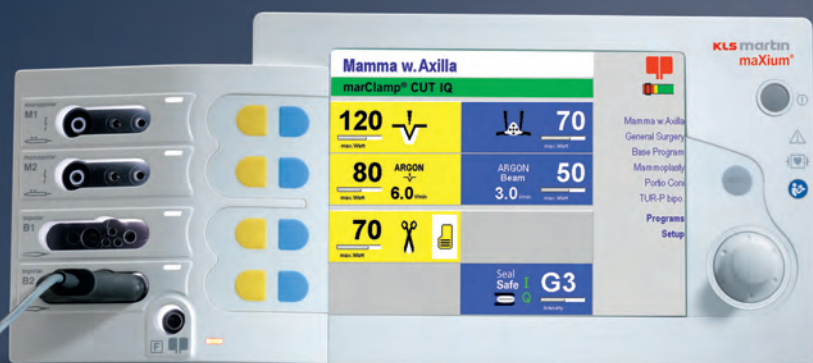
The following marSeal IQ instruments are currently available: marSeal IQ, marSeal Slim IQ, marSeal 5 IQ and marSeal 5 plus. For further details, please order our separate marSeal brochure marSeal and marSeal 5 plus!

### Application of marSeal IQ in gynaecology:

- Laparoscopic Supracervical Hysterectomy (LASH)
- Laparoscopically Assisted Vaginal Hysterectomy (LAVH )
- Total Laparoscopic Hysterectomy (TLH)
- Vaginal hysterectomy
- Abdominal hysterectomy
- Ovariectomy and salpingectomy
- Adhesiolysis
- Cystectomy

### Application of marSeal IQ in general surgery:

- Colectomy
- Nissen Fundoplicatio
- Gastrectomy
- Splenectomy
- Adrenalectomy
- Nephrectomy
- Cholecystectomy



## marClamp® Cut IQ



### marClamp® Cut IQ instruments and maXium® – the sealing system for fast and safe working

The reusable sealing instrument marClamp® Cut IQ enables tissue preparation and the permanent sealing of veins, arteries and tissue layers with subsequent separation – **without any change of instrument!**

The switch integrated in the instrument automatically triggers the special SealSafe® IQ sealing current once the tissue has been gripped, so no additional footswitch is required.

When sealing has been performed, the current is stopped and an acoustic signal sounds.

The sterile disposable blade guarantees an optimal cutting result at all times.

For more information, please request our separate marClamp® Cut IQ brochure!

#### Applications of marClamp® Cut IQ

##### ENT

- Thyroidectomy
- Neck preparation
- Laryngectomy

##### Gynaecology

- Lymphadenectomy
- Adhesiolysis
- Cystectomy

##### Visceral surgery

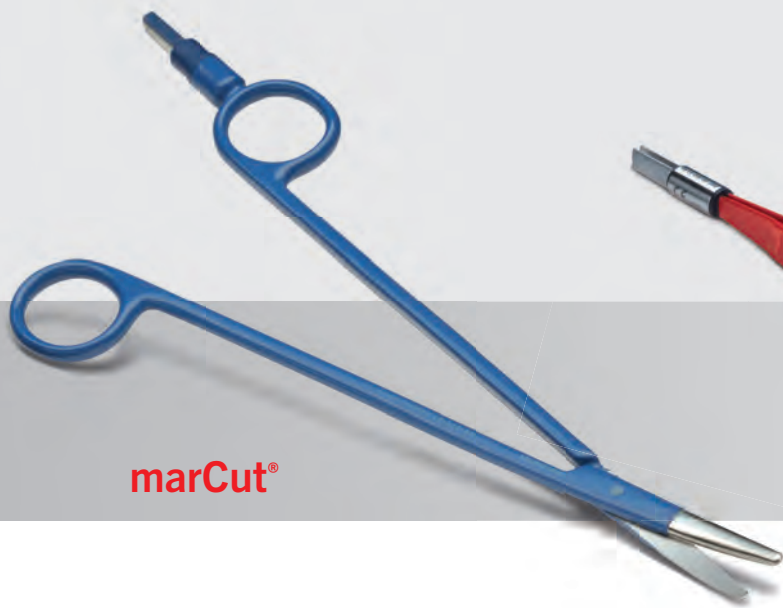
- Colectomy
- Gastrectomy
- Splenectomy
- Adrenalectomy
- Nephrectomy

##### Urology

- Cystectomy
- Hydrocele
- Partial cystectomy



The appropriate accessories –  
the basis for a successful surgery



**marCut®**



**nonStick red**

**Tissue-friendly and precise – the marCut® bipolar scissors**

Even more safety for patients: Combined with the maXium® unit and the Forfex current, the marCut® bipolar scissors provide you with a system that enables the precise, bloodless and rapid dissection of tissue. Since only the tissue that is located between the scissor blades is integrated into the electric circuit, the energy consumed during marCut® applications is significantly reduced compared to the monopolar procedure. With its special surface hardening and its unilateral ceramic coating, the durable scissor blade provides for a consistently sharp cutting edge, which can be re-sharpened several times. The marCut® is available in standard, slim line and super slim line versions – each of them in different lengths as well.

**nonStick red – bipolar forceps with non-stick effect**

Combined with the MicroCoag and MacroCoag currents, the new nonStick red enables you to perform bipolar coagulation in all open-surgical applications – without tissue adherence, permanently and reliably. There is a multitude of various models available for this purpose.

Please order our separate brochures marCut® and nonStick red!

maXium®, maXium® Beamer and maXium® smart Cart. Together they form the first-class system for open and endoscopic argon plasma surgery.

**maXium®**

**maXium® Beamer**

When performing surgeries with the maXium® Beamer, tissue carbonization is reduced and the wound healing process thus accelerated. Due to the low penetration depth, the risk of perforations is significantly reduced as well.

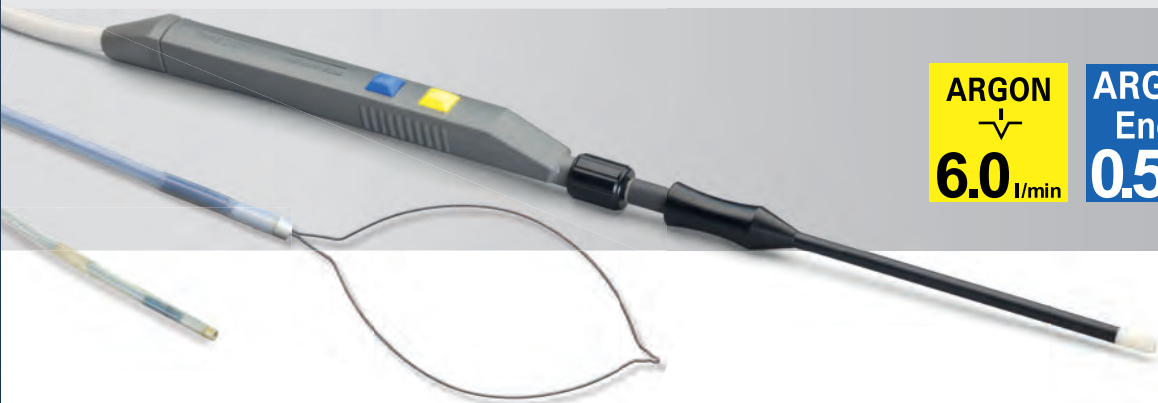
**maXium® smart Vac**

**maXium® smart Cart**

The maXium® smart Cart exhibits a compact and ergonomic design to securely accommodate the entire equipment.



We provide the technology –  
to put you in control



ARGON  
∇  
6.0 l/min

ARGON  
Endo  
0.5 l/min

ARGON  
⌋⌋⌋⌋  
1.0 l/min

ARGON  
Beam  
3.0 l/min

**Fast and gentle: Argon makes it possible**

In argon plasma surgery, argon gas is ionized with high-frequency current. This produces conductive plasma. The result is extremely homogeneous, flexible and superficial coagulation. During application, the argon gas is always directed at tissue portions that are still bleeding and not yet coagulated.

This process facilitates rapid hemostasis, which is of particular importance especially when dealing with diffuse hemorrhages.

Owing to this, you can significantly reduce blood loss and shorten the operating time. Fractionated currents with low voltage are available specifically for endoscopic applications. They offer you the highest degree of safety and efficiency in interventions with gastrointestinal and tracheobronchial probes.

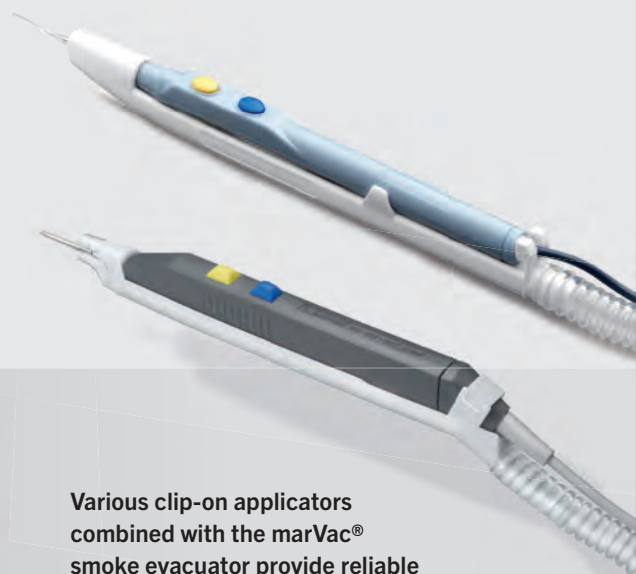
For further details, please order our separate MABS brochure!

The perfect surgical team:  
**maXium®** and **marVac®**



**smartLap**

Electrodes with smoke evacuation  
for laparoscopy



Various clip-on applicators  
combined with the marVac®  
smoke evacuator provide reliable  
protection from smoke gases.

**Reliable protection from particles and viruses in the operating room:  
the marVac® smoke evacuator**

Thanks to its special filter technology, the marVac® eliminates viruses and particles particularly effectively. The suction process is initiated simultaneously with the activation of the HF surgical unit.

Individual suction parameters can be called up and saved directly in the user program of the maXium® HF unit. Thanks to the different connection diameters available, various tubes can be connected without using adapters.

Furthermore, the marVac® impresses with its TURBO and LAP modes as well as the possibility to connect it to a central OR suction system. The maXium® unit and the marVac® smoke evacuator can be accommodated on the maXium® Cart or alternatively integrated into ceiling mounts.

For further details, please order our marVac® brochure!



**TURBO mode**

Huge quantities of smoke can be eliminated effectively from the operating room.



**LAP mode**

Automatic reduction of maximum suction performance during laparoscopic interventions



**Active suction/  
Standby suction**

Active suction, standby suction and delay time can be selected as required before and during the surgical procedure. These parameters can be easily adjusted by pressing the up and down buttons.



**Modification  
of parameters**



## Six good reasons for the **maXium®**



### **Easy handling – perfect result**

The “Quick Step” control integrated into the maXium® unit allows for particularly easy handling - at all times and for all types of applications.

### **Plug & Play with IQ**

The maXium® unit provides you the opportunity to connect encoded KLS Martin IQ instruments. There is a multitude of special instruments available for this purpose.

### **Maxi-display – maximum sight**

The extra-large display immediately and clearly shows you all active parameters.

### **Always the appropriate current type at hand**

There are numerous different current types available for all applications, among them fractionated currents and currents for bipolar vessel sealing.

### **Perfect cutting results**

Using the dynamic characteristics control and the accurate spark control, you obtain cutting currents of up to 360 watts and optimum cutting results.

### **Preselection of medical discipline**

Using the medical discipline preselection function, the maXium® is reduced to the current types and programs designed for the specific medical discipline. Focus on what's essential.

### Technical data maXium®

| Mains connection            |                     |
|-----------------------------|---------------------|
| Power requirements          | 100 V – 240 V ± 10% |
| Mains current               | max. 6.3 A          |
| Mains fuse                  | 6.3 A               |
| Nominal frequencies         | 300/400/600 kHz     |
| Power input in standby mode | 40 Watt             |
| Max. power input            | 600 Watt            |

### Output power

|                   |               |
|-------------------|---------------|
| Cutting power     | max. 360 Watt |
| Coagulation power | max. 320 Watt |

### Safety

|                      |  |
|----------------------|--|
| PCS and NE indicator |  |
| Error log            |  |
| Activation log       |  |

### Weight and dimensions

|                        |                    |
|------------------------|--------------------|
| Weight                 | 8.3 kg             |
| Width x height x depth | 390 x 182 x 436 mm |

### Standards

|                             |                                      |
|-----------------------------|--------------------------------------|
| Classification acc. to MDD  | II b                                 |
| Protection class            | I acc. to DIN EN 60-601-1            |
| Type of applied part        | CF; defibrillation-proof             |
| Approval/Mark of conformity | CE 0297 in compliance with 93/42 EEC |

### Technical data maXium® smart Cart

|                                    |  |
|------------------------------------|--|
| 4 equipotential bonding connectors |  |
| 4 dual castors with 2 brakes       |  |

### Weight and dimensions

|                        |                     |
|------------------------|---------------------|
| Weight                 | 40 kg               |
| Width x height x depth | 755 x 1080 x 655 mm |

### The prerequisites for integrating into OR1

|   |  |
|---|--|
| • OR1 system (NEO)  |  |
| • Required hardware by Karl Storz:<br>- Interface control set<br>- maXium® module set |  |
| • maXium® with hardware 06<br>and software from V3.398                                |  |
| • maXium® option OR1  |  |

### The prerequisites for integrating into CORE nova®

|   |  |
|---|--|
| • CORE nova®  |  |
| • Required hardware by Richard Wolf:<br>- Hardware CORE.CONNECT<br>- Software driver maXium®<br>- serial data cable 1 m |  |
| • maXium® with hardware 06<br>and software from V3.398  |  |
| • maXium® option CORE nova®   |  |

### Technical data maXium® Beamer

|                             |  |
|-----------------------------|--|
| Power supply                | via maXium® unit   |
| Device fuse                 | M 1.6 A  |
| Power input                 | max. 40 Watt   |
| Protection class            | I  |
| Classification acc. to MDDD | II b   |
| Argon gas flow CUT          | 0.1 to 12 l/min ± 20%<br>0.0 l/min = off   |
| Argon gas flow COAG         | 0.1 to 12 l/min ± 20%<br>0.0 l/min = off   |
| LF leakage currents         | complying with IEC 601, Part 1<br>(testing in connection<br>with maxium® HF generator) |
| Type of applied part        | CF; defibrillation-proof   |
| Duty type                   | INT 10 s/30 s<br>(= duty factor of 25%)  |

### Weight and dimensions

|                              |        |
|------------------------------|--------|
| Weight                       | 3.5 kg |
| Width                        | 390 mm |
| Height (w/o ball-head bolts) | 108 mm |
| Depth                        | 425 mm |

### Standards

|                             |                                      |
|-----------------------------|--------------------------------------|
| Classification acc. to MDD  | II b                                 |
| Protection class            | I acc. to DIN EN 60-601-1            |
| Type of applied part        | CF; defibrillation-proof             |
| Approval/Mark of conformity | CE 0297 in compliance with 93/42 EEC |

### Designation

| Designation                                   | Item No.     |
|---|--------------|
| maXium®, m-version                            | 80-042-00-04 |
| maXium®, i-version                            | 80-042-02-04 |
| maXium®, e-version                            | 80-042-04-04 |
| maXium® Beamer                                | 80-044-00-04 |
| maXium® TUR                                   | 80-093-00-04 |
| maXium® OR1                                   | 80-093-01-04 |
| maXium® CORE nova®                            | 80-093-02-04 |
| maXium® smart VAC, with LAP mode, 220 V       | 80-062-00-04 |
| maXium® smart VAC, 220 V                      | 80-062-01-04 |
| MCB connecting cable                          | 80-091-01-04 |
| maXium® smart Cart                            | 80-048-00-04 |
| Standard rail for maXium® smart cart          | 80-048-01-04 |
| Separating transformer for maXium® smart cart | 80-048-02-04 |
| Device holder for maXium® white edition       | 80-048-04-04 |
| Gas bottle holder for maXium® smart cart      | 80-048-05-04 |
| Mounting kit for maXium® smart Vac            | 80-048-06-04 |

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about the KLS Martin Energy Devices?

Please download KLS Martin App Energy Devices!  
The App is available for Android and iOS.



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<https://play.google.com/store/apps/details?id=com.klsmartin.energydevices>

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