



maXium®

*Ingenuity is always quite simple*



*Where every look and every hand counts,  
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 multifunctional HF surgery.

- ✓ Simple
- ✓ Versatile
- ✓ Safe



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.



without ...      with ...

**Spark control**

- Automatic power adjustment to the necessary minimum and thus reduced spark formation
- 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**

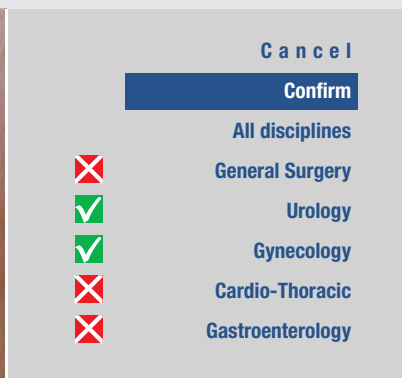
When using small-area neutral electrodes, undesired temperature rises underneath the neutral electrode may occur, depending on the current used. Using the NE baby function, unsuitable current types are blocked and the maximum output power of permissible current types is limited.

*Intuitive. Fast. Straightforward.*

## The maxium® and its operability



- = Cutting
- = Coagulation
- = Menu control



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.

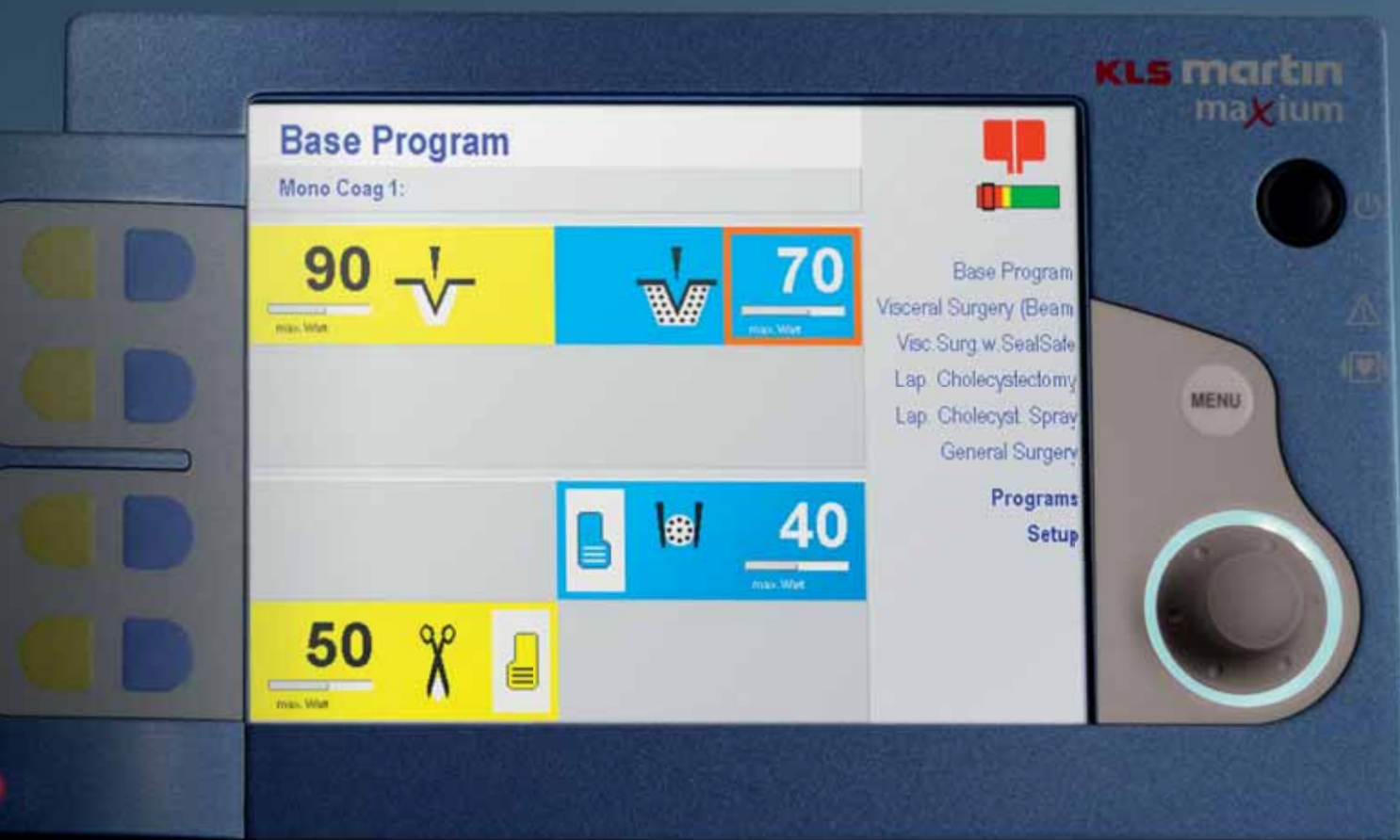
### *Control takes just a turn*

Thanks to its ingenious “Quick Step” control, the maxium® 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.





*As flexible as you are*

The maxium® fits in any environment



*Can be integrated into OR1*

Integrated surgical systems are increasingly gaining significance. KLS Martin takes account of this future trend: Now the maxium® unit can be combined with the OR1 system by the market leader Karl Storz. This makes it possible to change all settings and use all programs required for the application individually 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.

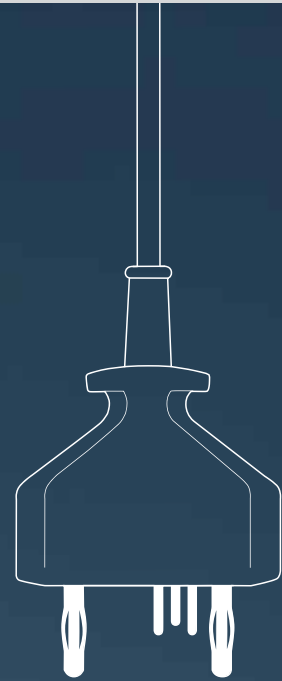
The advantages of the SWAP mode:

- 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*

As soon as an IQ instrument is connected, the maxium® automatically displays the name of the connected instrument and assigns the appropriate current type with an appropriate default value. When connecting an instrument that is actuated via the foot switch, the foot switch selection menu is automatically called up. If you choose not to use the instrument-specific default values, you can change them according to your individual needs and save them for the specific program as usual.

The advantage: When the IQ instrument is connected again, your individual values appear instead of the default values. At present, the following products are available with the IQ function in connection with the SealSafe® IQ current: marSeal, marSeal Slim, marSeal 5, marClamp®.



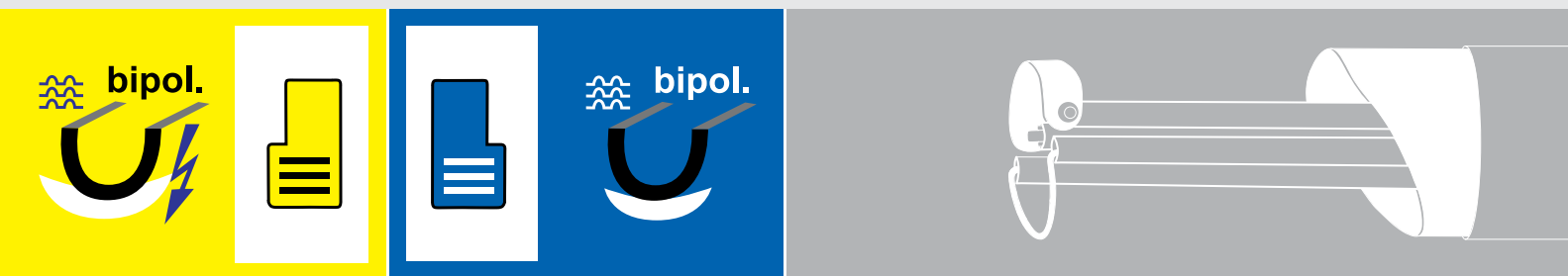
Displaying the name of the connected instrument

Use of the two bipolar connecting sockets

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

## *Bipolar resection*

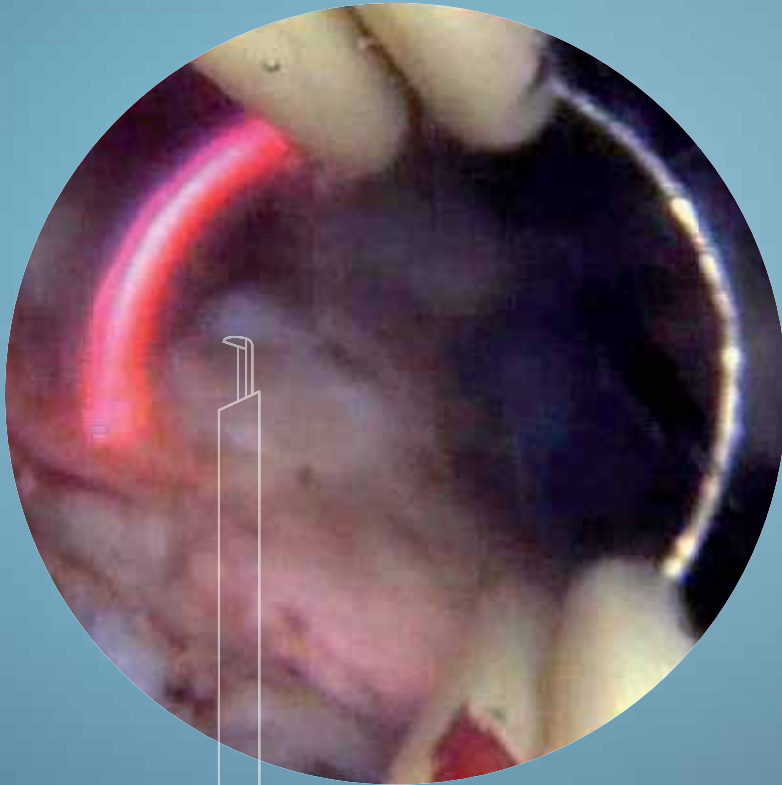
✓ Effective   ✓ Compatible   ✓ Safe



### *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**

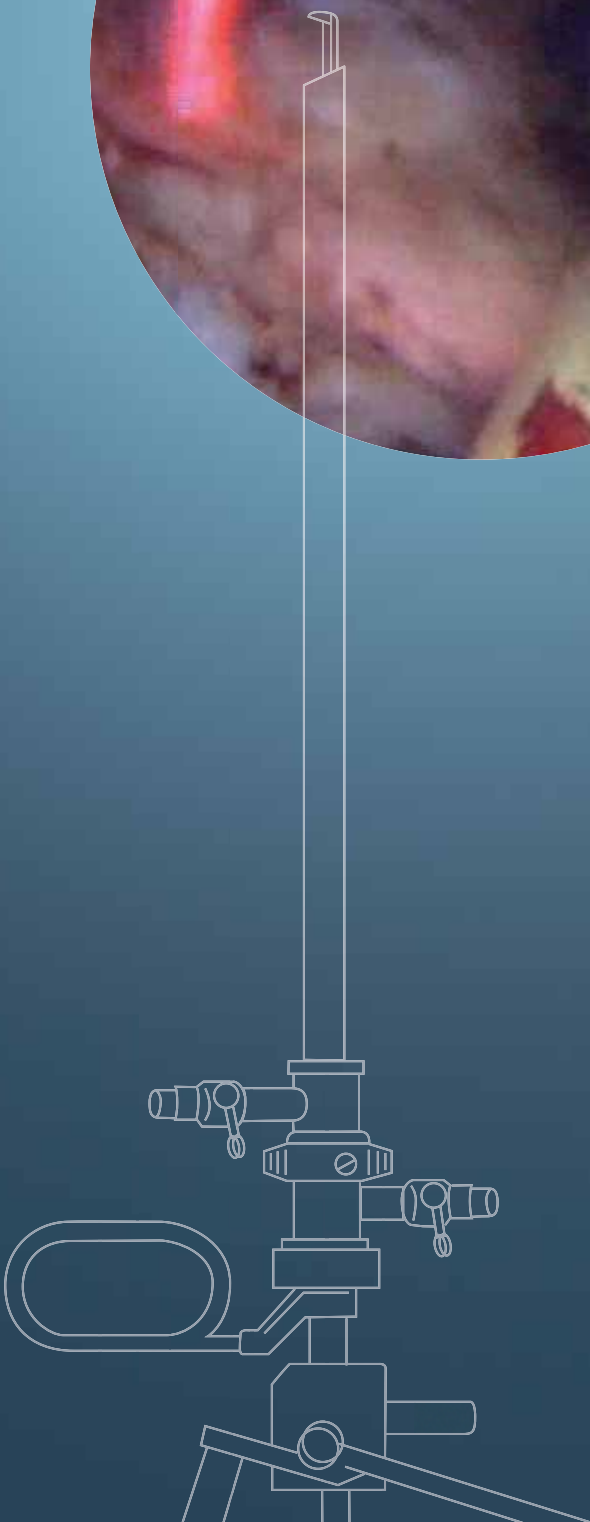
- Transurethral resection (TUR-B, TUR-P)
- Transcervical resection (TCR)

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

- Resection can be performed with saline solution
- Low 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 and marClamp® IQ



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*



## **mar**Seal IQ

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

Combined with the maxium® unit and the optimally adapted Seal-Safe® 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.  
For further details, please order our separate marSeal brochure!

#### **Application of marSeal IQ in gynecology:**

- 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 fundoplication
- Appendectomy
- Gastrectomy
- Splenectomy
- Adrenalectomy
- Nephrectomy
- Cholecystectomy
- Adrenalectomy
- Nephrectomy
- Cholecystectomy



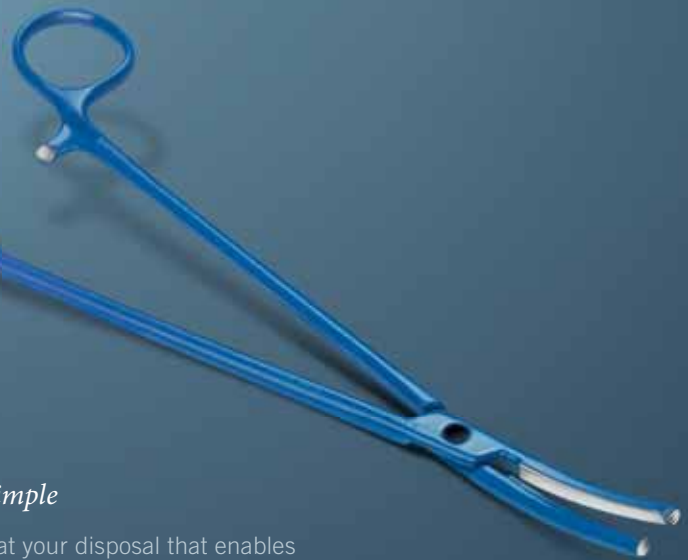
## **marClamp® IQ**

### *Sealing with marClamp® IQ – reliable and simple*

With the marClamp® IQ, you have an instrument at your disposal that enables you to reliably seal vessels or tissue bundles without previous dissection or detailed exposure. The exact limitation of the lateral thermal expansion enables precise application. The lateral thermal expansion is kept to a minimum. Ceramic pins on the instrument jaws ensure a defined distance and prevent tissue slippage as well.

Tissue adherence and carbonization are reduced by the applied SealSafe® IQ current. The result: safe surgical results without using foreign materials, such as sutures or clips. Compared to the conventional suture technique, the application of the marClamp® also saves considerable amounts of time. In most cases, one single application is sufficient. There is a great variety of clamp modules available for different applications.

Order our separate marClamp® brochure!





*The appropriate accessories –*  
The basis for a successful surgery



*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.

*NON-STICK red – bipolar forceps with non-stick effect*

Combined with the MicroCoag and MacroCoag currents, the new NON-STICK 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 marCut® and NON-STICK red brochures!

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

#### **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® Cart II**

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



*We provide the technology –*  
To put you in control



*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®

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.



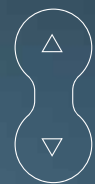
**LAP mode**

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

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

### The prerequisites for integrating into OR1

- OR1 system (NEO)
- Required hardware by Karl Storz:
  - Interface control set
  - maxium® module set
- maxium® with hardware 06 and software from V3.398
- maxium® option OR1

### 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 MDD	II b
Argon gas flow CUT	0.1 to 12 l/min ±20% 0.0 l/min = off
Argon gas flow COAG	0.1 to 12 l/min ±20% 0.0 l/min = off
LF leakage currents	complying with IEC 601, Part 1 (testing in connection with maxium® HF generator)
Type of applied part	CF; defibrillation-proof
Duty type	INT 10 s/30 s (= 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
Approval/Mark of conformity	CE 0297 in compliance with 93/42/EEC

### Article

Article	Article number
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
Cart II	80-047-00-04
maxium® OR1	80-093-01-04
maxium® TUR	80-093-00-04

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