Subprograms, changing between subprograms

Function of subprograms

Subprograms can only be created by authorized persons. Each program can have up to 6 subprograms.

Different settings are saved in the subprograms of a program for the instruments. Settings may be e.g. mode, effect or assignment of a footswitch. Subprograms therefore offer you the possibility of switching settings of an instrument, without changing the mode, effect, footswitch assignment etc. on the touchscreen.

Appearance of subprograms

Fig. 5-21

You see subprograms as tabs under the name of the program (3). Example: Subprogram *monopolar* (1) and *bipolar* (2). The tab of the active subprogram is highlighted with a bold border.

Changing between subprograms

➤ Press the ReMode button of the footswitch.

– Or –

➤ If the handpiece of the instrument has a ReMode button, press the ReMode button of the handpiece.

– Or –

➤ An assistant can touch the tab of the subprogram on the touchscreen.

Functions in the "Menu" screen

Call up the User Manual

1. Call up the *Menu* with the Menu button.

2. Select the *User Manual* menu item in the left column.
   The VIO 3 User Manual is opened on the display.

Last messages called up

1. Call up the *Menu* with the Menu button.

2. Select the *Last messages* menu item in the left column.
   The *Last messages* screen shows you the last messages VIO 3 has displayed.

Changing system settings

The *Menu* offers you the opportunity to change various system settings (e.g. *Brightness*, *Volume*, *Start screen* etc.).

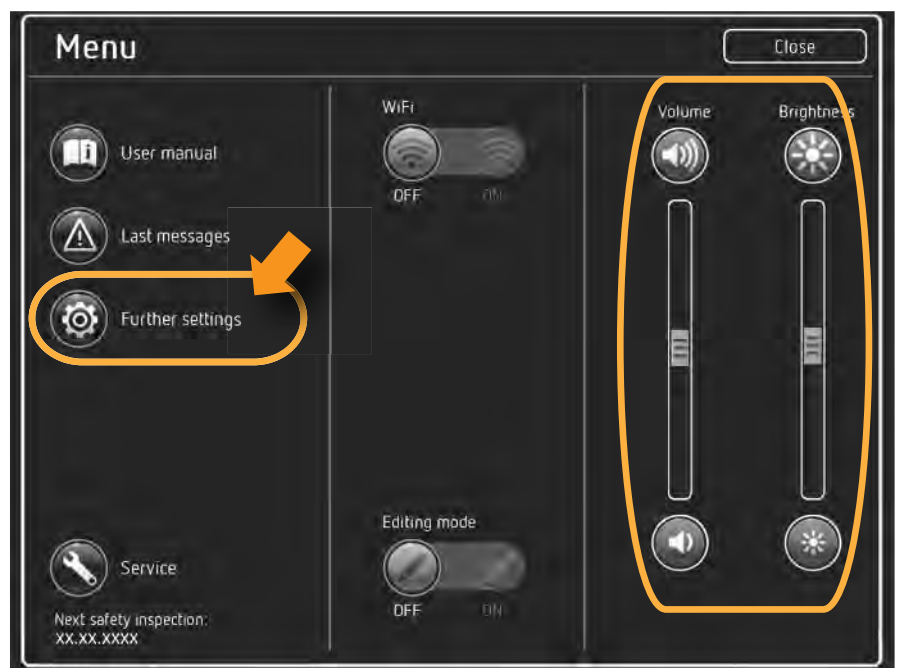1. Call up the *Menu* with the Menu button.

Fig. 5-22

Note: You can change the global *Volume* and *Brightness* directly in the *Menu*. You will find detailed setting options for *Volume* or *Brightness*, as well as a series of further system parameters, under menu item *Further settings*.

2. Change the global *Volume* or *Brightness* using the appropriate controller.
   – Or –

3. Touch the *Further settings* button.
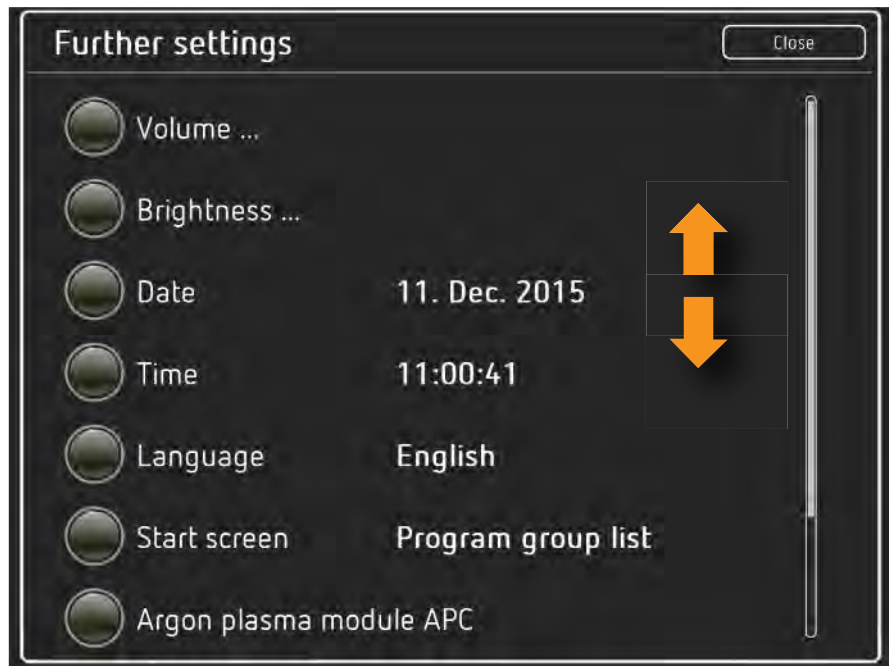
80114-601
03.16

Fig. 5-23

The *Further settings* screen is displayed.
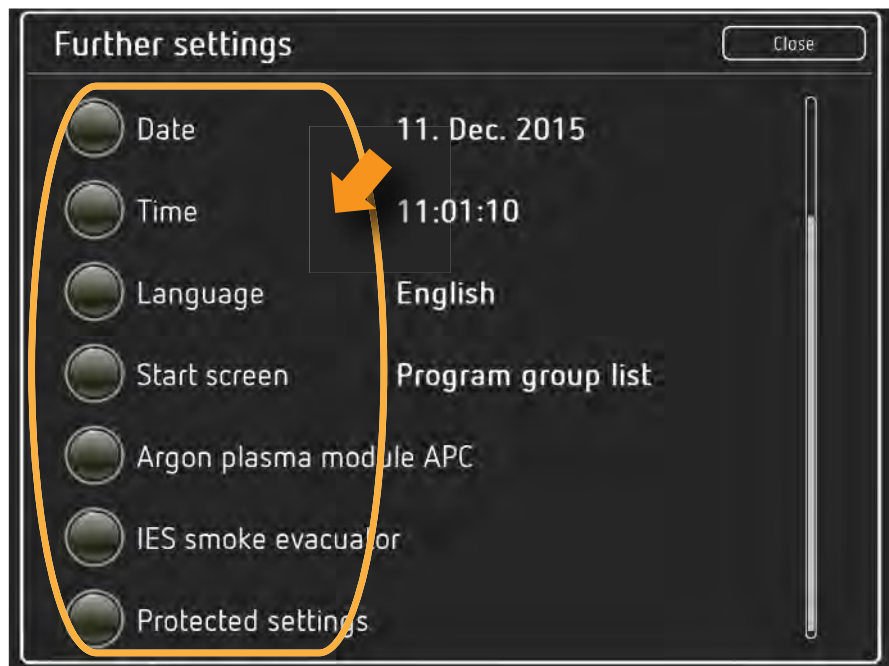
4. Scroll through the list, as required.

Fig. 5-24

The above figure shows the lower part of the list.

5. Select the setting you wish to change.
   A different setting screen opens depending on the setting selected.

6. Carry out the required setting.

Note: The *Protected settings* at the end of the list are not accessible for the user. The *Protected settings* can be changed as you wish by an authorized person.
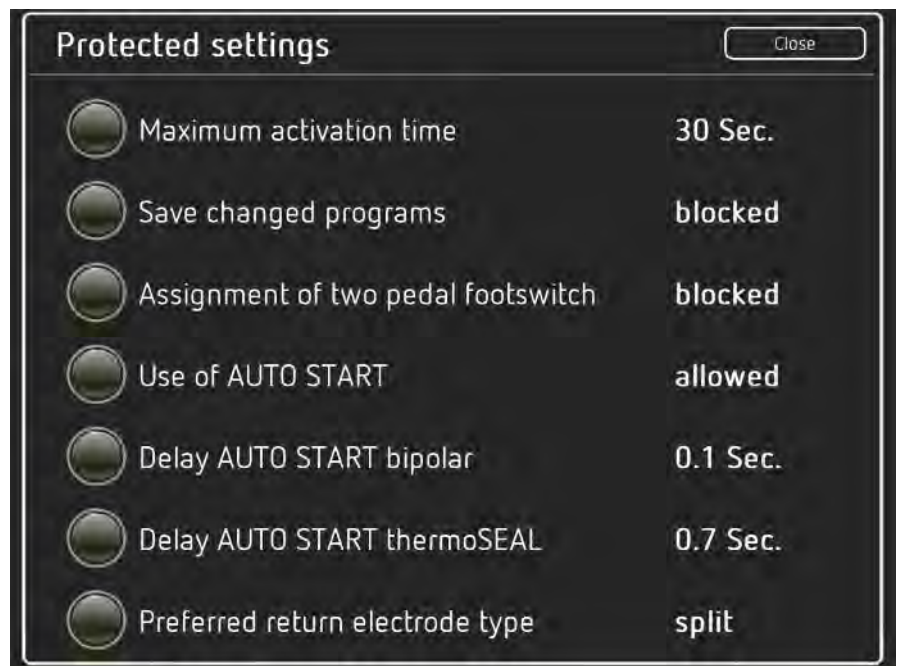
80114-601
03.16

Protected settings	Close
⦿ Maximum activation time	30 Sec.
⦿ Save changed programs	blocked
⦿ Assignment of two pedal footswitch	blocked
⦿ Use of AUTO START	allowed
⦿ Delay AUTO START bipolar	0.1 Sec.
⦿ Delay AUTO START thermoSEAL	0.7 Sec.
⦿ Preferred return electrode type	split

Fig. 5-25

WiFi function

WiFi On / Of

The WiFi function serves to connect the VIO 3 with a Windows PC or an iPad on which the Erbe Support App is installed. With the help of a WiFi connection, user programs can be replaced and service functions can be perceived by registered persons.

You can switch the WiFi on and off in the *Menu* screen. If you switch on WiFi, a network name and password are displayed for you after a short time.

Connecting a Windows PC or iPad with VIO 3

1. Switch on the VIO 3 WiFi.

2. Display the network in the system settings of your unit.

3. Search for the name of the VIO 3 network.

4. Enter the VIO 3 password.

Service functions

The service functions behind the *Service* menu item are only accessible for the service personnel.

Editing mode

The editing mode is only accessible for the authorized persons.

The editing mode is described in detailed in the chapter "Editing mode" (see page 67).

Overwriting a modified program or saving as a new program

If you have changed a program setting, the program name in the screen title is provided with the supplement *changed*.

Fig. 5-26

You can overwrite a modified program or save it as a new program. *Saving modified programs* must be *permitted* in the *Protected settings* for this purpose.

1. Touch the screen title.

If *Saving modified programs* is **blocked**, the *Program list* opens and the modified program is shown in the list with the supplement *changed* (without figure). You can return to the unmodified program or to the modified program.
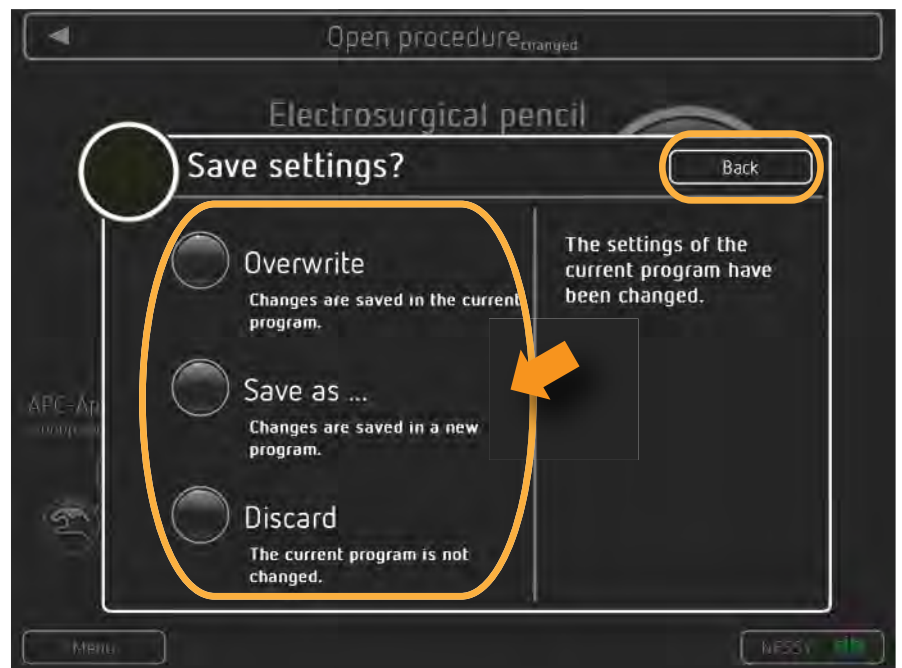
80114-601
03.16

Fig. 5-27

If *Saving modified programs* is **permitted**, the *Save settings?* window opens.

2. Overwrite the existing program or save the modified program under a new name. Alternatively, you can reject the changes (= irrevocably deleted) or return to the modified program without action with the *Back* button.

80114-601
03.16

Chapter 6
Editing mode

Authorized persons

The editing mode is only accessible for the authorized persons.

The editing mode may only be used by competent persons who can precisely assess the impacts of the changes undertaken.

Editing options

The editing mode offers the following options:

- Changing the unit name (in the *Program group list* screen title)
- Renaming, adding or deleting program groups, programs, subprograms and instruments
- Adding / changing pictograms in the *Program group list* and the *Program list*
- Changing program settings, such as mode and effect, without the changes having to be saved separately.

Note: In the editing mode, all changes are automatically accepted without a confirmation request. Changes can only be undone manually, e.g. by repeated entry of the previous names, values, etc.

Renaming, adding and deleting elements

Selecting the screen You can edit the following screens:

- *Program group list*
- *Program list*
- *Main screen*

➢ Select the screen in which you wish to edit, e.g. *Program list*.

Switch on editing mode **Note**: The unit cannot be activated in the editing mode.

Note: The editing mode, once switched on, remains active until the editing mode or the unit is switched off.

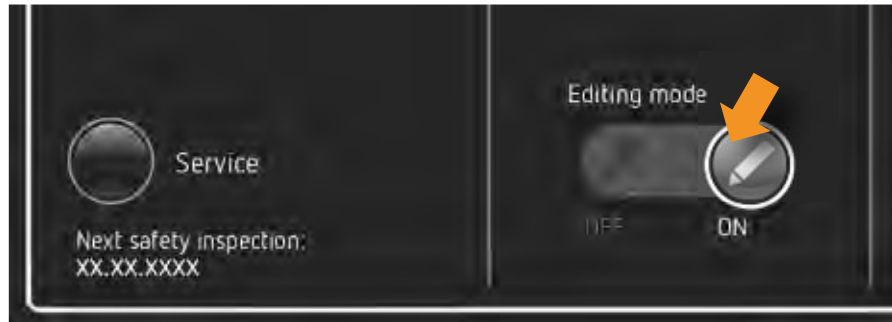1. Call up the *Menu* with the Menu button.

Fig. 6-1

2. Slide the *Editing mode* switch to *ON*.
   The screen keyboard is displayed. You are requested to enter a password.

3. Enter the password on the screen keyboard and touch the Enter button.
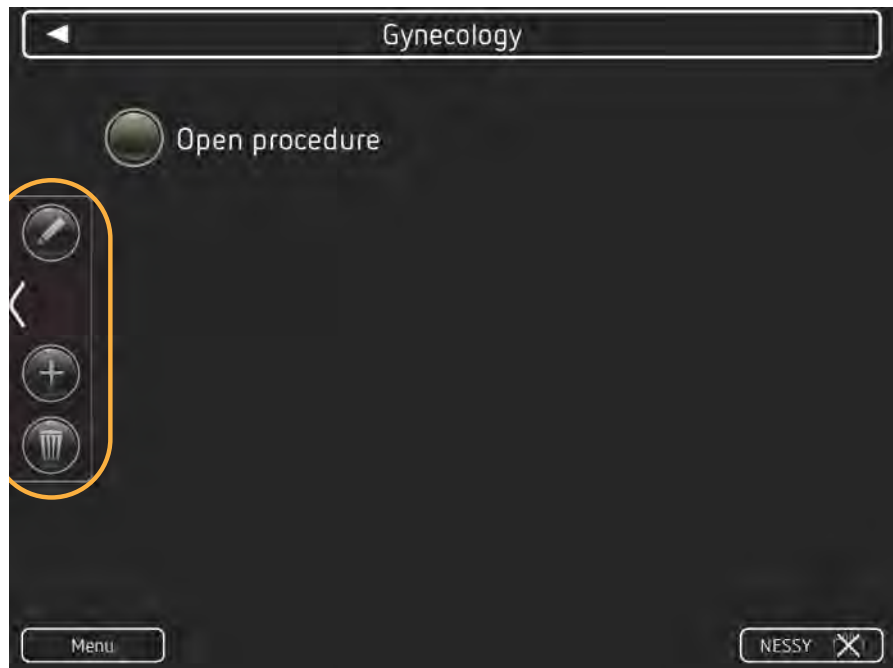
4. Close the *Menu*.

Fig. 6-2

The screen is displayed from which you called up the menu. The "Editing functions" field appears on the left side of the screen.

Using the arrow on the left side of the screen, you can show or hide the "Editing functions" field on the left side of the screen, as required.

Selecting the editing function

Note: To add, delete or rename elements, there is a dedicated editing function. You can change program settings (e.g. mode and effect) without selecting an editing function.

80114-601
03.16

Fig. 6-3

In the "Editing functions" field you can select between the following editing functions: "Rename", "Add", and "Delete" (from top to bottom).

➢ Touch the required editing function (e.g. "Rename").
The selected function and the editable elements are color-marked.
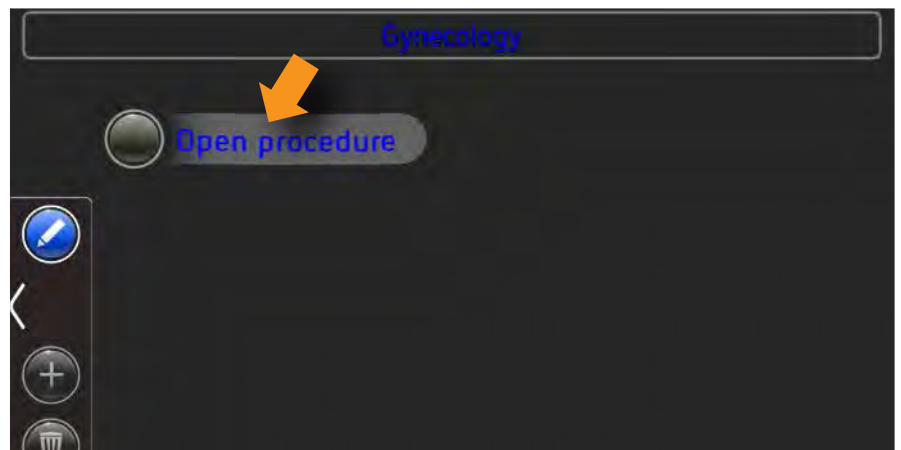
Performing change

Fig. 6-4

1. Touch the element you wish to edit (e.g. a program name).
A different window is displayed depending on the element and editing mode. By touching the program name, the screen keyboard opens, for example.

2. Carry out the required change.

The selected editing function is automatically ended after each change. For each further change you have to select the required editing function again.

Switching off the editing mode

1. Call up the *Menu* with the Menu button.

2. Slide the *Editing mode* switch to *OFF* and close the *Menu*.

Note: When you switch off the unit, the editing mode is automatically ended.

Creating a new program with two subprograms

The following describes, by way of example, how you create a program with two subprograms for laparoscopy.

In the example described, it is assumed that no instruments and no return electrode are connected when editing.

Subprograms at a glance   The tables show both subprograms created in the example.

Subprogram 1 "monopolar"

	Instrument 1: monopolar scissors	Instrument 2: bipolar coagulation forceps
CUT mode	dryCUT	–
CUT effect	4	–
COAG mode	swiftCOAG	–
COAG effect	5	–
Assigned footswitch	Two-pedal footswitch	–

Subprogram 2 "bipolar"

	Instrument 1: monopolar scissors	Instrument 2: bipolar coagulation forceps
CUT mode	–	–
CUT effect	–	–
COAG mode	–	softCOAG bipolar
COAG effect	–	5
Assigned footswitch	–	Two-pedal footswitch

Switch on editing mode   ➢ Switch on the editing mode in the *Menu* and close the *Menu*.

Creating a new program   1. Call up the *Program list* to which you wish to add a new program.

2. In the "Editing function" field on the left side of the screen, select the "Add" editing function.
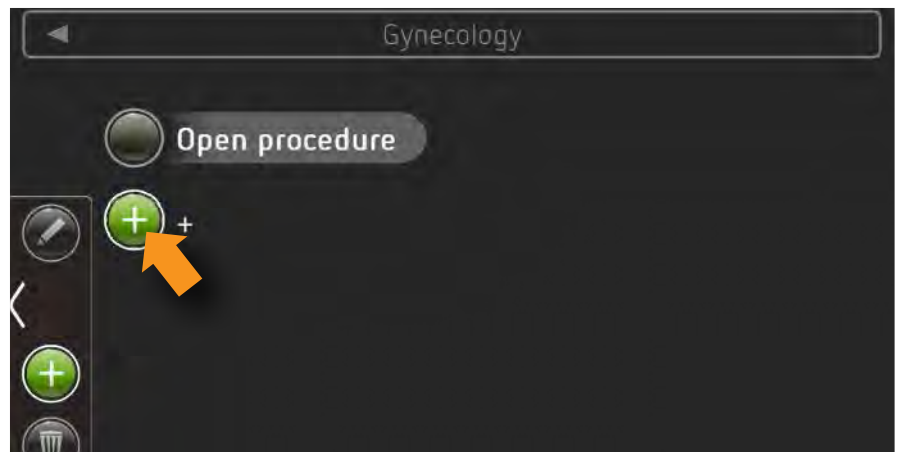
80114-601
03.16

Fig. 6-5

3. Touch the plus button in the *Program list*.
   The screen keyboard is displayed.

4. Enter the required program name, e.g. "Laparoscopic procedure" on the screen keyboard.

5. Confirm the program name with the Enter button.

Adding instruments

1. Select the new program *Laparoscopic procedure*.
   The *Main screen* is displayed.
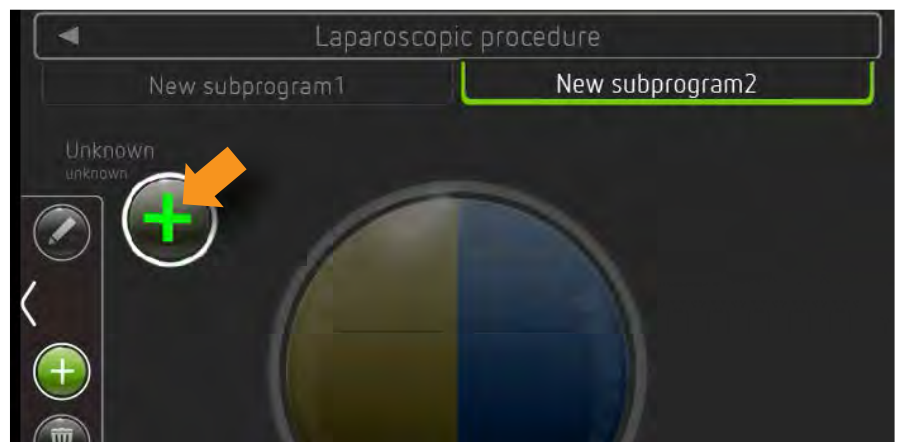
2. Select the "Add" editing function.

Fig. 6-6

3. Touch the big plus button labeled *Unknown*.

4. Select the *Monopolar instrument* option.

5. Select the *Scissors* instrument and confirm the selection with the Close button.

6. Select the "Add" editing function.

7. Touch the big plus button labeled *Unknown*.

8. Select the *Bipolar instrument* option.

9. Select the *Coagulation forceps* instrument and confirm the selection with the Close button.

80114-601
03.16

Creating subprograms

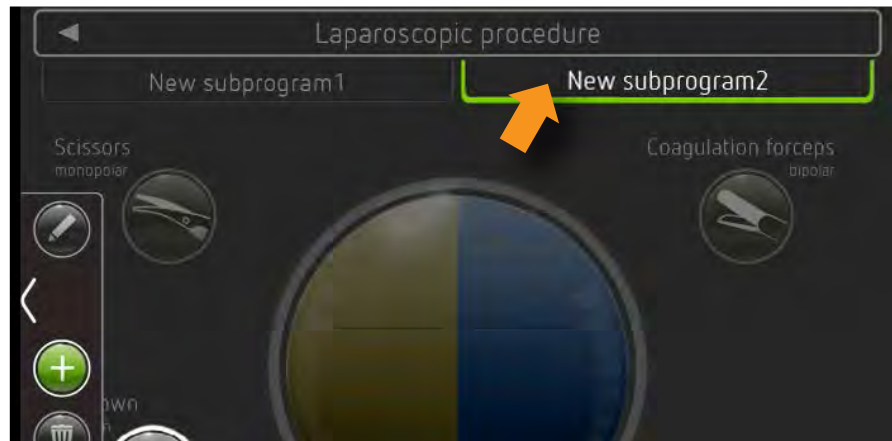1. Select the "Add" editing function.

Fig. 6-7

2. Touch the *New subprogram2* tab.

3. Enter the required subprogram name (e.g. "bipolar") on the screen keyboard and touch the Enter button.

4. Select the "Rename" editing function.

5. Touch the *New subprogram1* tab.

6. Enter the required subprogram name (e.g. "monopolar") on the screen keyboard and touch the Enter button.

Editing the *monopolar* subprogram

1. Select the tab of the *monopolar* subprogram.

2. Touch the symbol of the *Monopolar scissors* instrument.

3. Assign the scissors to the two-pedal footswitch by dragging the footswitch symbol from the "Activation type" field to the instrument.

4. Select the CUT mode dryCUT.

5. Set the CUT effect to 4.

6. Select the COAG mode swiftCOAG.

7. Set the COAG effect to 5.

The *Main screen* now looks as follows:

80114-601
03.16

80114-601
03.16

Fig. 6-8

Editing the *bipolar* subprogram

1. Select the tab of the *bipolar* subprogram.

2. Touch the symbol of the *Coagulation forceps* instrument.

3. Assign the coagulation forceps to the two-pedal footswitch by dragging the footswitch symbol from the "Activation type" field to the instrument.

4. Select softCOAG bipolar as the COAG mode.

5. Set the COAG effect to 5.

The *Main screen* now looks as follows:

Fig. 6-9

Switching off the editing mode   ➤ Switch off the editing mode in the *Menu*.

Note: When you switch off the unit, the editing mode is automatically ended.

80114-601
03.16

Chapter 7
Description of receptacle hardware

Individual socket configuration

You can individually configure the sockets of your unit when ordering the unit.

Purchasing further receptacles

After purchase, it is possible to add further sockets or to replace existing sockets with others. Please contact Erbe Elektromedizin. You will find the addresses in this User Manual.

Monopolar socket MO 3-pin; 9/5
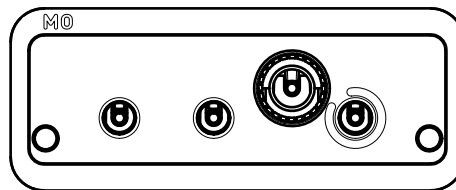
Fig. 7-1

Erbe No. 20160-001

Connectors supported

- 3-pin single use
- 3-pin reusable
- 9/5

Monopolar socket MO 3-pin; Bovie
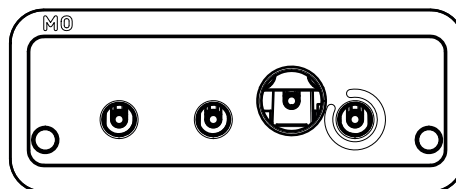
Fig. 7-2

Erbe No. 20160-002

Connectors supported

- 3-pin single use
- 3-pin reusable
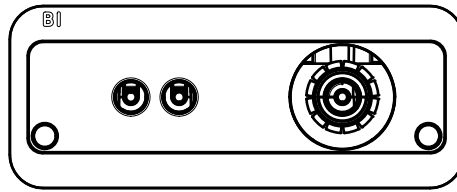- Bovie jack

Bipolar socket BI 2-pin 22–28; 8/4

Fig. 7-3

Erbe No. 20160-003

Connectors supported
- 2-pin single use (22 or 28.5 mm pin distance)
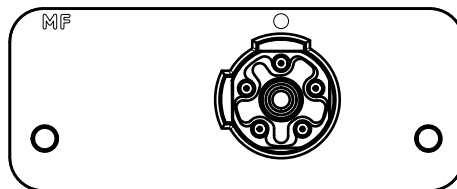- 2-pin reusable (22 or 28.5 mm pin distance)
- 8/4

Multifunction socket MF

Fig. 7-4

Erbe No. 20160-004
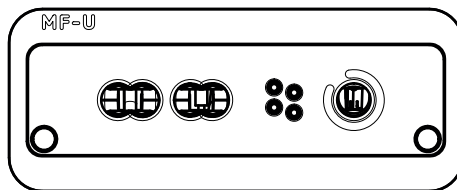
Connectors supported
- MF plug

MF–U socket

Fig. 7-5

Erbe No. 20160-005

Connectors supported
- 3-pin single use
- 3-pin reusable
- 2-pin single use (22 or 28.5 mm pin distance)
- 2-pin reusable (22 or 28.5 mm pin distance)
- MF–2
- MF–U

80114-601
03.16

80114-601
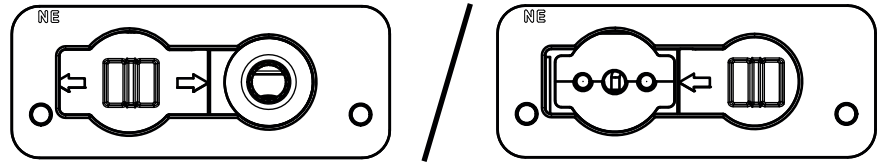03.16

return electrode socket NE 6; 2-pin

Fig. 7-6

Function The receptacle is used to connect a neutral electrode.

Connectors supported You can connect ONE of the following connectors as required: Erbe patient plate connector (Ø 6.35 mm); patient plate connector with 2 pins. The receptacle is equipped with a slide switch. Depending on the position of this switch, either a Ø 6.35 mm or a 2-pin connector is permitted (see the illustration above).

Chapter 8
Monopolar CUT modes

autoCUT

Properties
Reproducible, smooth cuts, minimal to moderate hemostasis.

PPS (Power Peak System)
The autoCUT mode is equipped with PPS.

A special problem during incision may be posed by the initial incision phase, in particular when the cutting electrode is pressed firmly against the tissue to be cut, before activation of the HF generator. The cutting electrode therefore has a relatively extensive, low-resistance contact with the tissue, e.g. in TUR.

In such cases, the HF generator must offer an above-average output so that the initial incision is not delayed, as otherwise an excessive coagulation necrosis may be produced at the point of initial incision.

The VIO 3 is equipped with automatic power control (PPS). PPS detects low resistance loads and controls the HF generator such that it briefly provides sufficient output to ensure the HF voltage necessary or intensity of the electrical arc for the cutting quality selected even with low-resistance loads.

Thanks to PPS, the average output can be limited to relatively low levels, something which represents improved protection from unintentional thermal tissue damage.

Areas of use
All cutting procedures in electrically conductive tissue: e.g. muscle tissue and vascular tissue. Dissections and cutting of fine structures.

Technical data

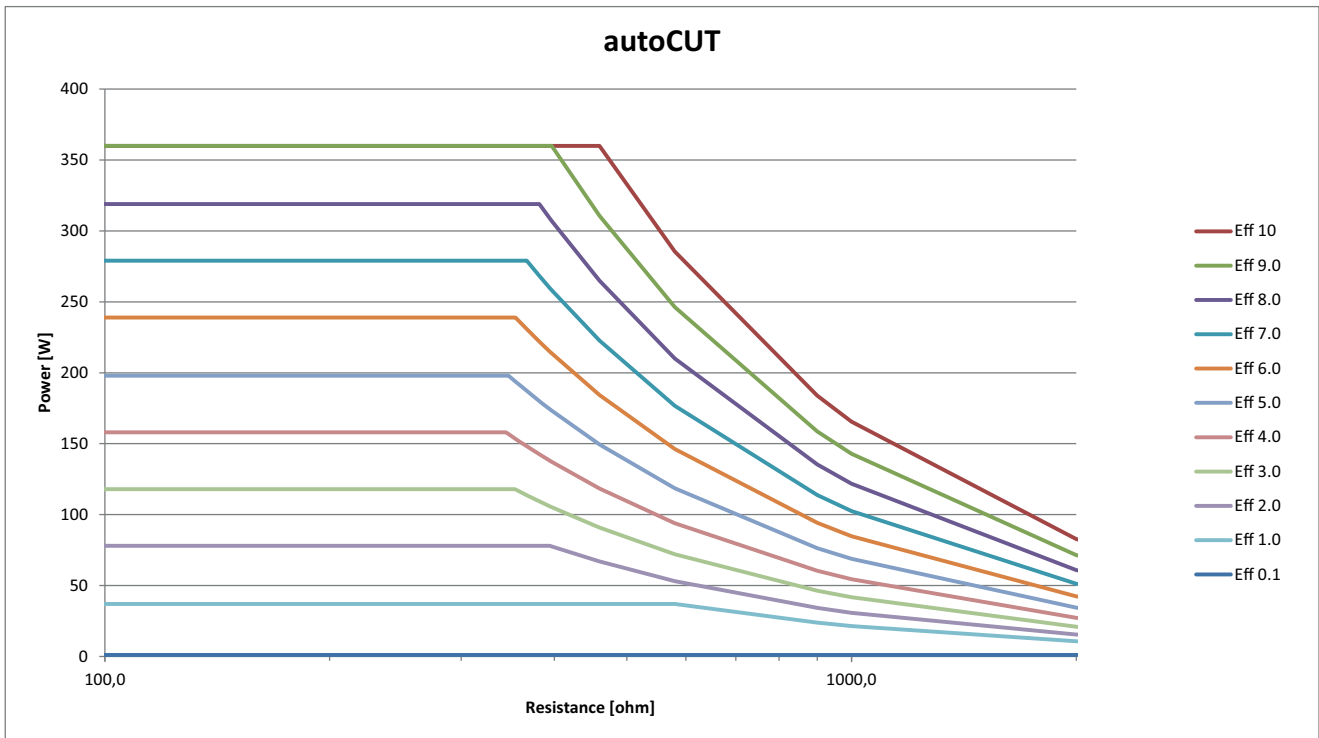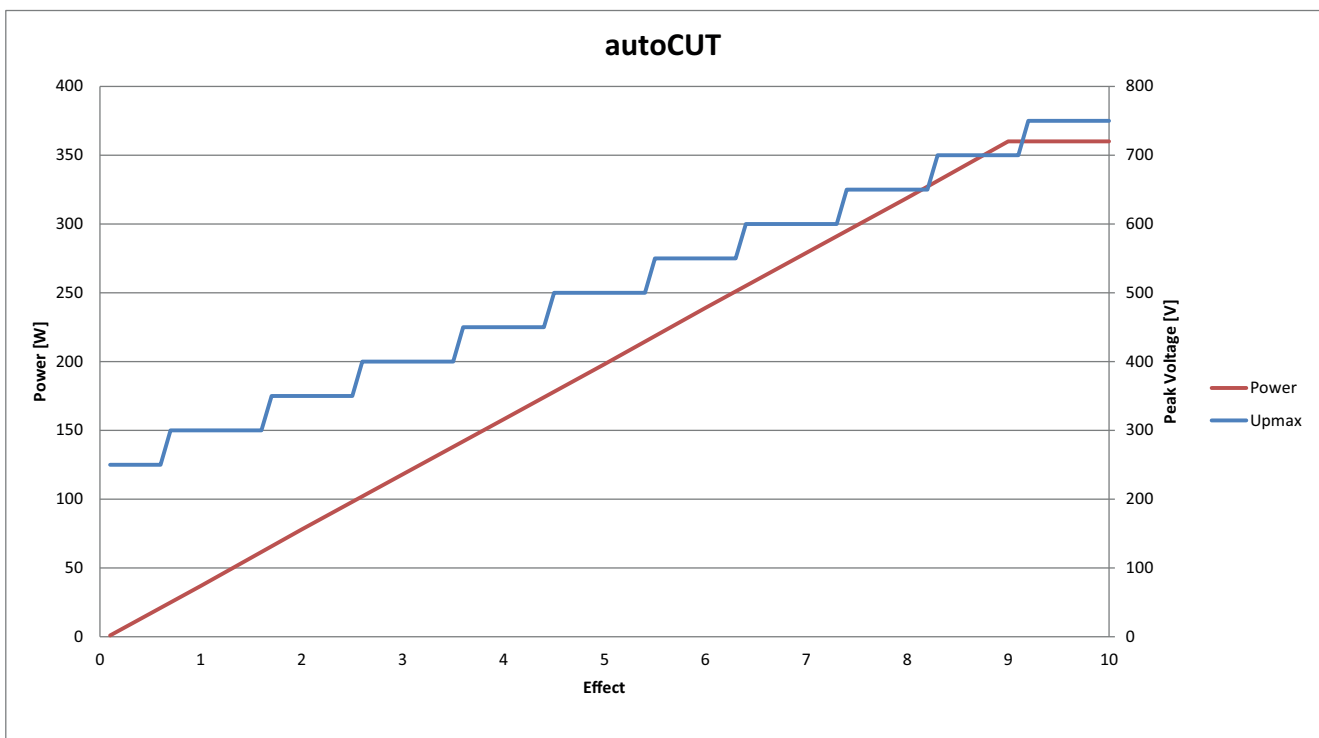|	
Type of HF voltage	Unmodulated sinusoidal AC voltage
Nominal frequency	350 kHz (no load) ±10%
Crest factor	1.62 (at R_L = 300 Ohm)
Designed load resistance	300 Ohm
Max. HF peak voltage	750 V
Number of effects	0.1 − 10.0
Consistency of effects	Automatic control of HF peak voltage
Max. output across the designed load resistor	400 watts

Diagrams

Fig. 8-1

Fig. 8-2

80114-601
03.16

highCUT

| Properties | Reproducible, smooth cuts, in particular in poorly conductive and varying tissue. |

PPS (Power Peak System)

The highCUT mode is equipped with PPS.

A special problem during incision may be posed by the initial incision phase, in particular when the cutting electrode is pressed firmly against the tissue to be cut, before activation of the HF generator. The cutting electrode therefore has a relatively extensive, low-resistance contact with the tissue, e.g. in TUR.

In such cases, the HF generator must offer an above-average output so that the initial incision is not delayed, as otherwise an excessive coagulation necrosis may be produced at the point of initial incision.

The VIO 3 is equipped with automatic power control (PPS). PPS detects low resistance loads and controls the HF generator such that it briefly provides sufficient output to ensure the HF voltage necessary or intensity of the electrical arc for the cutting quality selected even with low-resistance loads.

Thanks to PPS, the average output can be limited to relatively low levels, something which represents improved protection from unintentional thermal tissue damage.

Areas of use

For example, for cutting fat-containing structures, cutting under water, e.g. with TUR-P.

Technical data

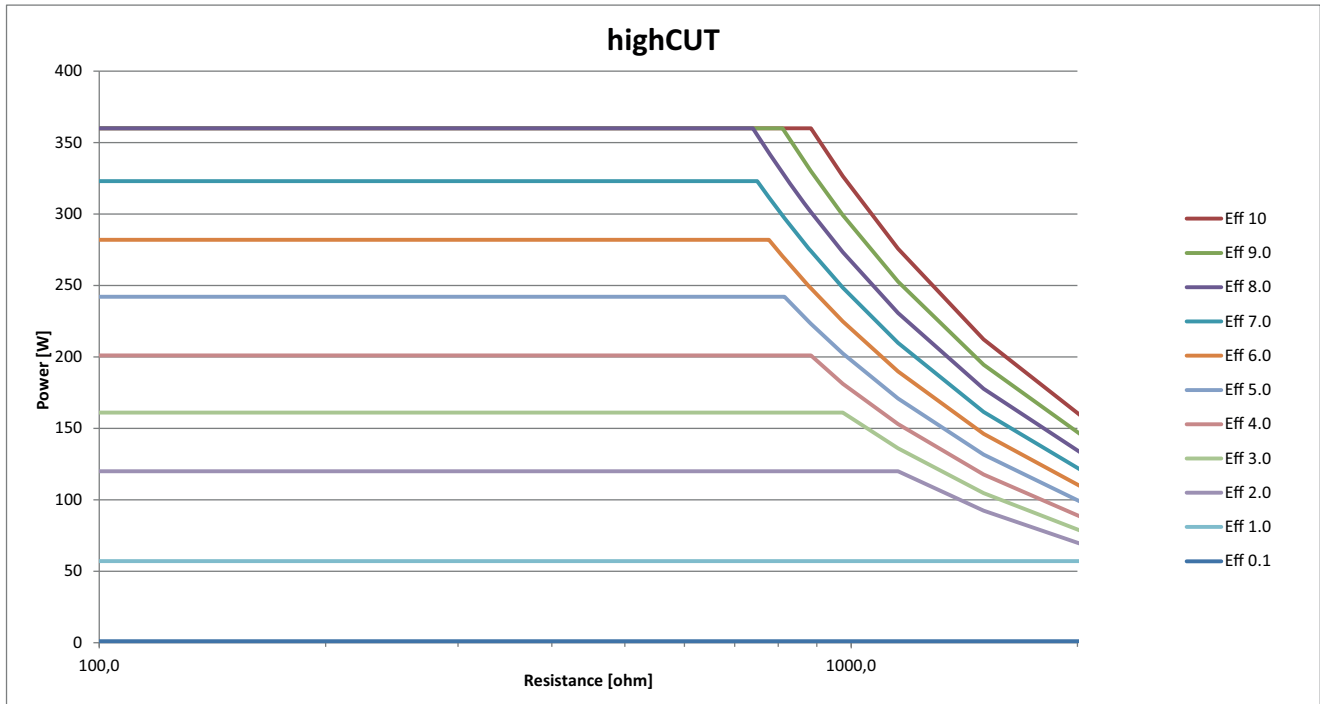| Type of HF voltage	Unmodulated sinusoidal AC voltage
Nominal frequency	350 kHz (no load) ±10%
Crest factor	1.62 (at R_L = 300 Ohm)
Designed load resistance	300 Ohm
Max. HF peak voltage	1100 V
Number of effects	0.1 − 10.0
Consistency of effects	Automatic control of arc intensity
Max. output across the designed load resistor	400 watts

80114-601
03.16

Diagrams
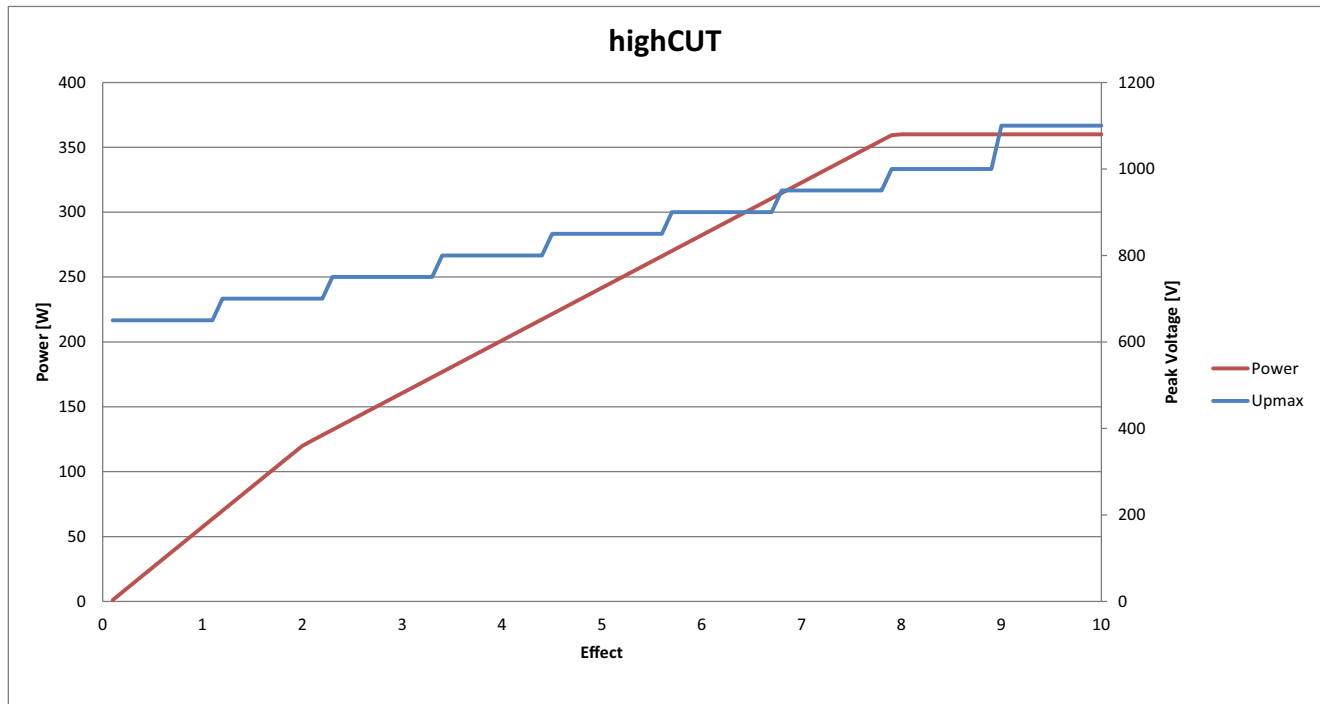
Fig. 8-3

Fig. 8-4

80114-601
03.16

dryCUT®

Properties   Reproducible, slightly slower cut with pronounced hemostasis.

Areas of use   For example, cuts in "open surgery" and cuts in endoscopic operations that require very good primary hemostasis during the cut and require a somewhat slower cutting speed.

Technical data

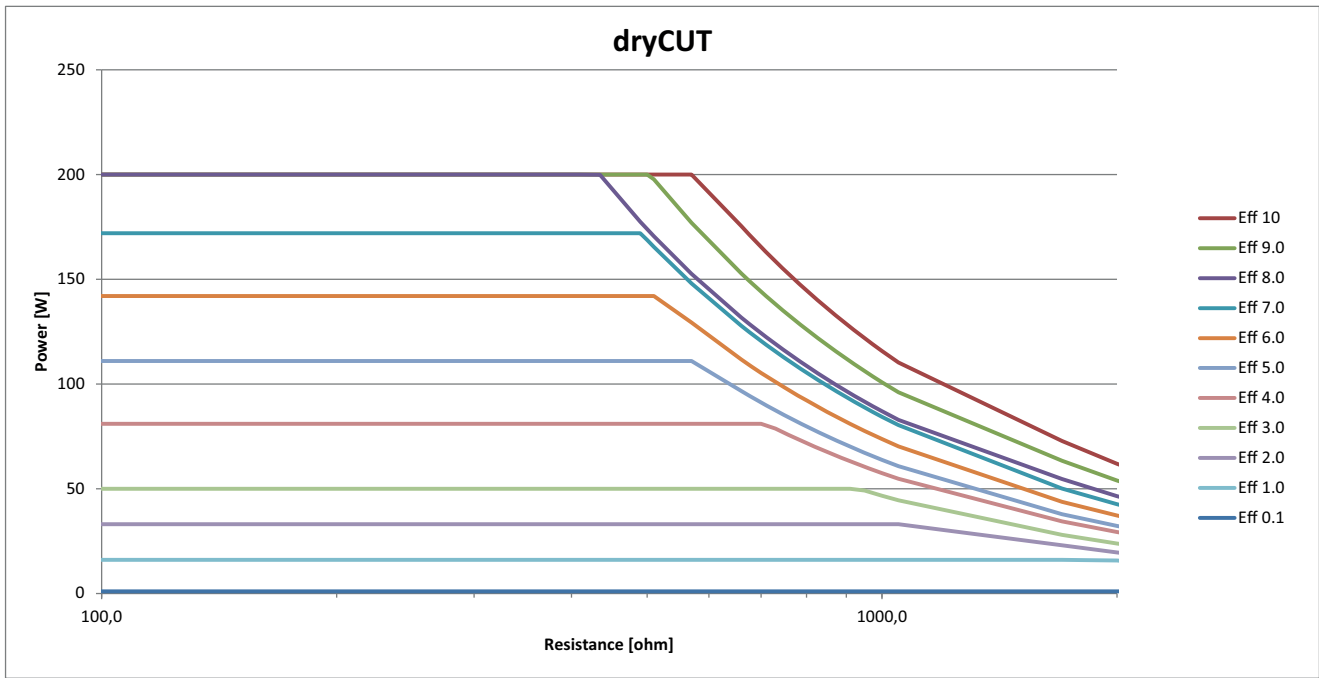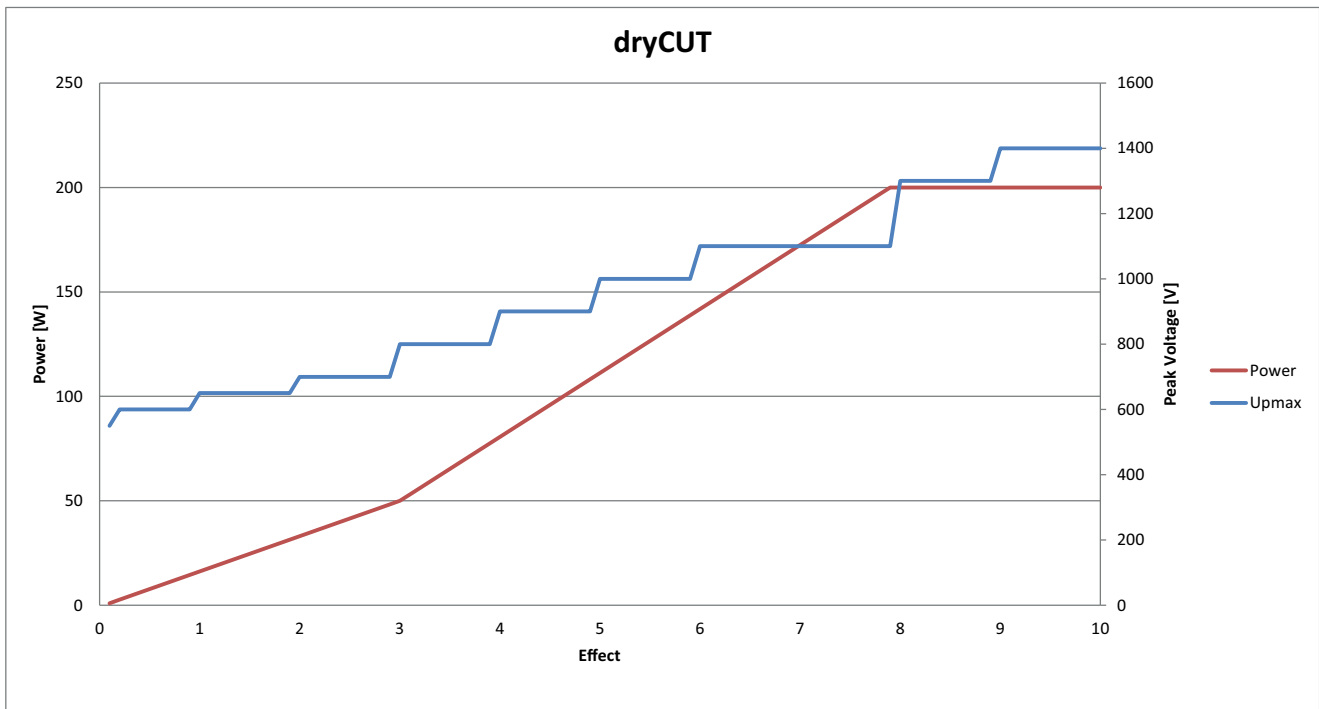| Type of HF voltage	Pulse-modulated sinusoidal AC voltage
Nominal frequency	350 kHz (no load) ±10%
Crest factor	Effect: 0.1 − 4.9: 3.1 (at R_L = 300 Ohm)
	Effect: 5.0 − 7.9: 3.38 (at R_L = 300 Ohm)
	Effect: 8.0 − 10.0: 3.8 (at R_L = 300 Ohm)
Designed load resistance	300 Ohm
Max. HF peak voltage	1400 V
Number of effects	0.1 − 10.0
Consistency of effects	Automatic control of HF peak voltage
Max. output across the designed load resistor	240 watts

Diagrams

Fig. 8-5

Fig. 8-6

endoCUT® I

| | Properties | The cut consists of alternating cutting and coagulating phases. The cut is easy to control and is characterised by a reproducible, preselectable coagulation property while cutting. |

Areas of use Endoscopic interventions in which alternating cutting and coagulation with activation is called for.

Cutting duration Depending on the size, type and location of lesions, it may be advantageous to vary cutting duration. You can set cutting duration to one of 4 levels. Cutting duration has a major influence on cutting width.

Cutting interval The cutting interval is the amount of time between the start of a cutting cycle and the start of the next cutting cycle. The cutting interval thus comprises one cutting cycle and one coagulation cycle. You can set the cutting interval to one of 10 levels. The higher the level, the longer the cutting interval and coagulation cycle. A short cutting interval makes it easier to remove the lesion quickly. A long cutting interval makes it easier to remove the lesion slowly under control.

Technical data

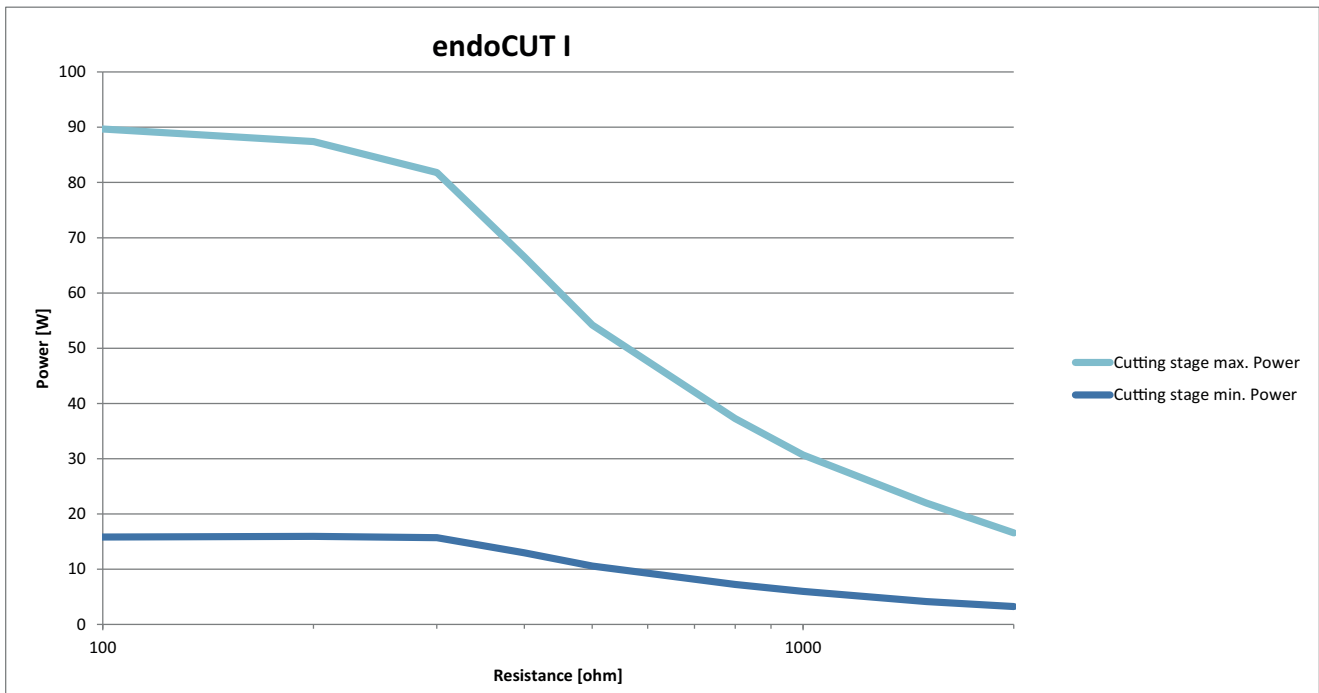| Type of HF voltage	Unmodulated sinusoidal AC voltage
Nominal frequency	350 kHz (no load) ±10%
Crest factor	Initial incision: 1.54 (at R_L = 100 Ohm)
Designed load resistance	100 Ohm
Max. HF peak voltage	700 V
Number of effects	1 – 4
Consistency of effects	Automatic control of HF peak voltage
Max. output across the designed load resistor	110 watts

Diagram

Fig. 8-7

endoCUT® Q

Properties

The cut consists of alternating cutting and coagulating phases. The cut is easy to control and is characterised by a reproducible, preselectable coagulation property while cutting.

Areas of use

Endoscopic interventions in which alternating cutting and coagulation with activation is called for.

Cutting duration

Depending on the size, type and location of lesions, it may be advantageous to vary cutting duration. You can set cutting duration to one of 4 levels. Cutting duration has a major influence on cutting width.

Cutting interval

The cutting interval is the amount of time between the start of a cutting cycle and the start of the next cutting cycle. The cutting interval thus comprises one cutting cycle and one coagulation cycle. You can set the cutting interval to one of 10 levels. The higher the level, the longer the cutting interval and coagulation cycle. A short cutting interval makes it easier to remove the lesion quickly. A long cutting interval makes it easier to remove the lesion slowly under control.

Technical data

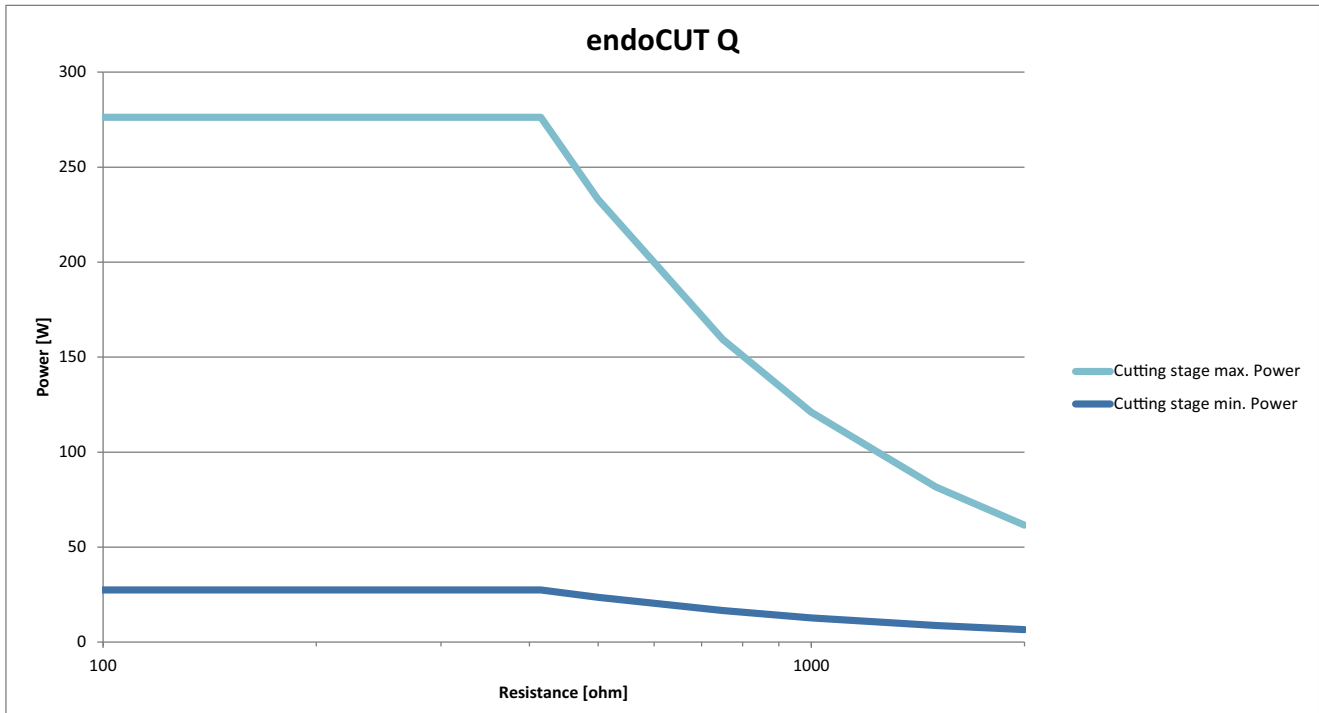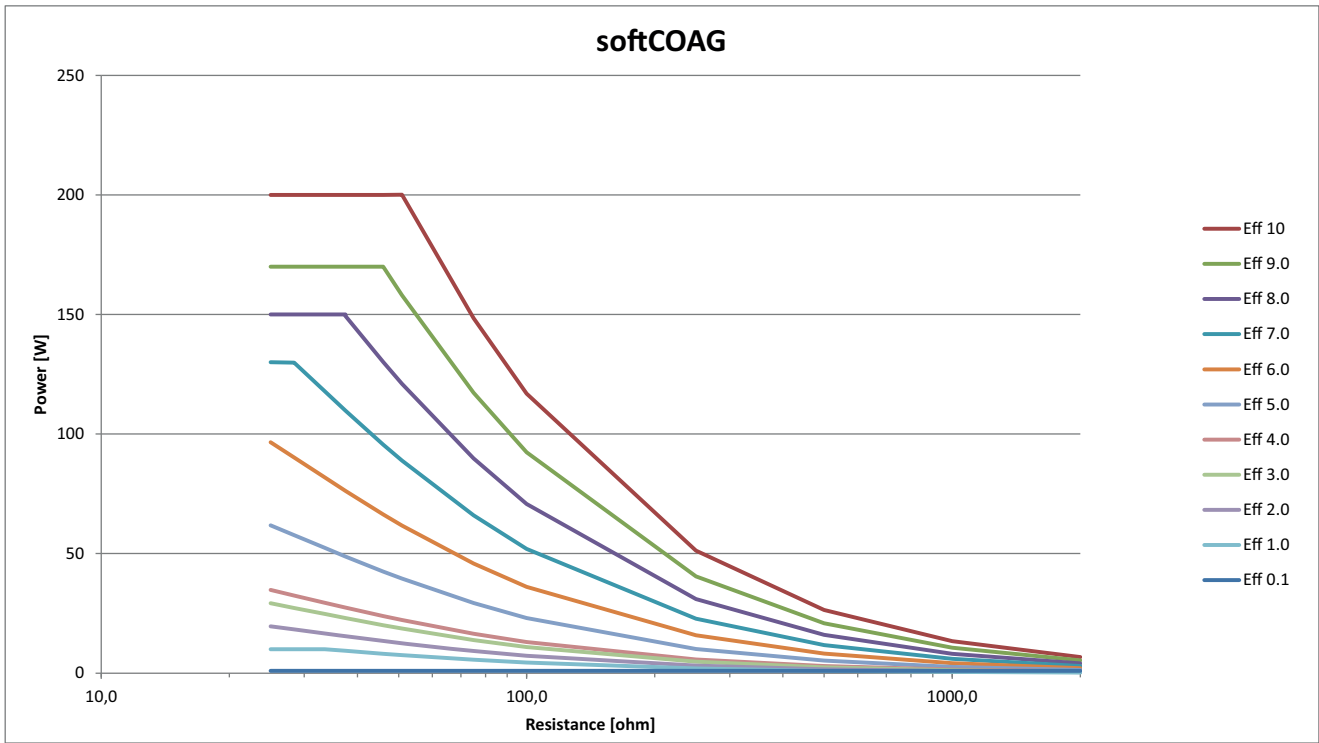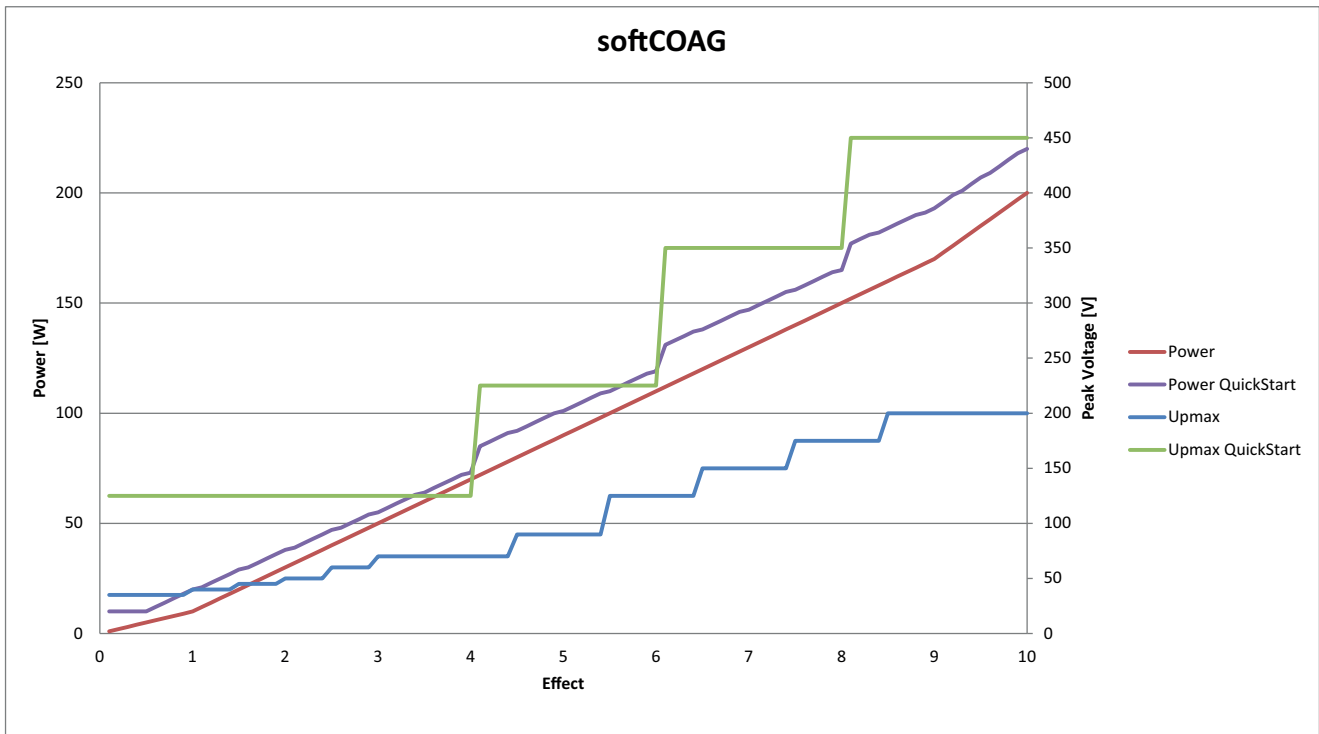|	
Type of HF voltage	Unmodulated sinusoidal AC voltage
Nominal frequency	350 kHz (no load) ±10%
Crest factor	Initial incision: 1.63 (at R_L = 300 Ohm)
Designed load resistance	300 Ohm
Max. HF peak voltage	800 V
Number of effects	1 – 4
Consistency of effects	Automatic control of HF peak voltage
Max. output across the designed load resistor	330 watts

Diagram

Fig. 8-8

Chapter 9
Monopolar COAG modes

softCOAG®

Properties	Slow, deep coagulation without spark generation, consequently no carbonization of the tissue. Adhesion of the electrode to the tissue is greatly reduced.
Areas of use	All surgical procedures that call for safe, "deep" coagulation or in which adhesion of the electrode would have a negative effect on the coagulation process.
AUTO STOP switchable	AUTO STOP ends activation automatically on attainment of sufficient desiccation.
	Touch the arrow on the lower edge of the main screen if required. The *Assign activation type* field opens. Drag the AUTO STOP symbol to the docking point of the required instrument.
QuickStart switchable	With QuickStart, a brief voltage pulse is applied to the tissue to attain a tissue effect quicker, without essentially influencing the coagulation result.
	Touch the COAG effect display on the main screen if required. A window opens in which you can switch on QuickStart.

Technical data

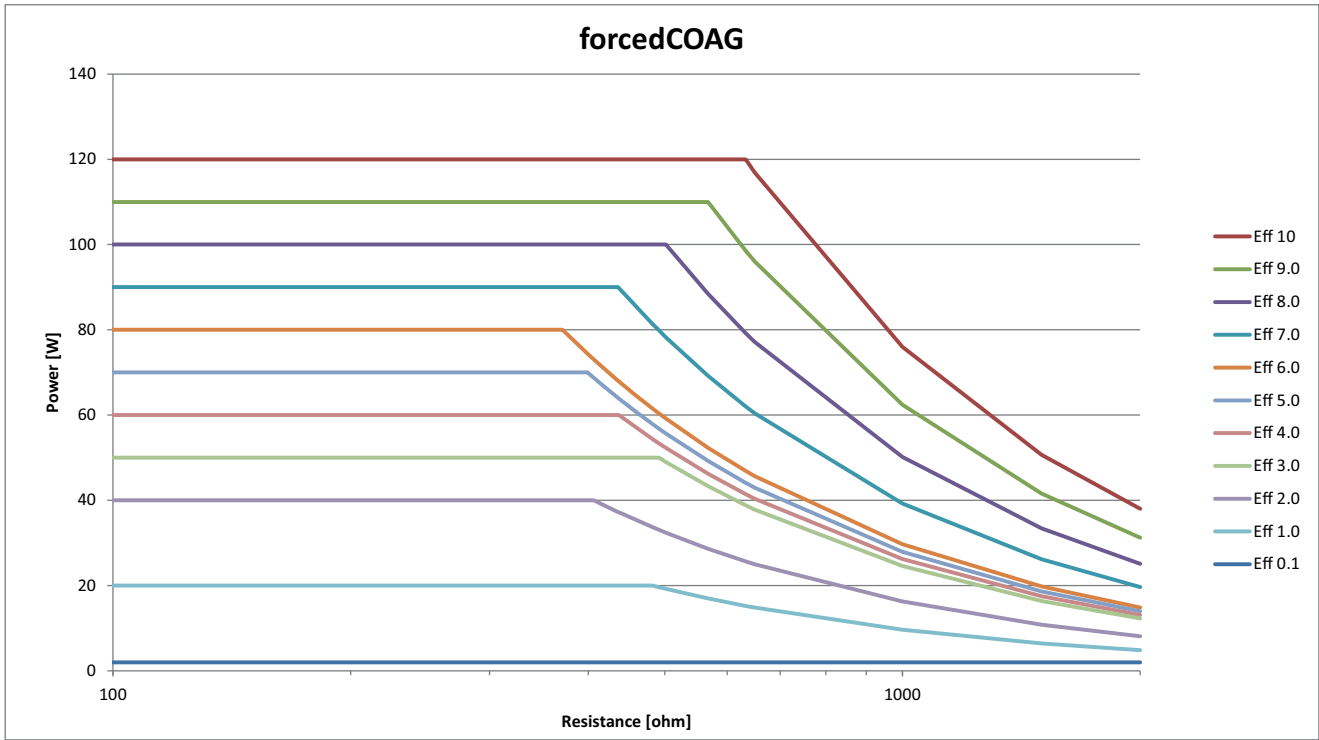| Type of HF voltage	Unmodulated sinusoidal AC voltage
Nominal frequency	350 kHz (no load) ±10%
Crest factor	1.52 (at R_L = 25 Ohm)
Designed load resistance	25 Ohm
Max. HF peak voltage	200 V
	450 V QuickStart
Number of effects	0.1 − 10.0
Consistency of effects	Automatic control of HF peak voltage
Max. output across the designed load resistor	240 watts

Diagrams

Fig. 9-1

Fig. 9-2

80114-601
03.16

forcedCOAG®

Properties	Effective, fast "standard" coagulation.
Areas of use	Contact coagulation, clamp coagulation, e.g. via insulated monopolar forceps.
AUTO STOP switchable	On detection of a spark, adhesion of tissue to the instrument and carbonization is significantly reduced by automatically switching off.
	Touch the arrow on the lower edge of the main screen if required. The *Assign activation type* field opens. Drag the AUTO STOP symbol to the docking point of the required instrument.

Technical data

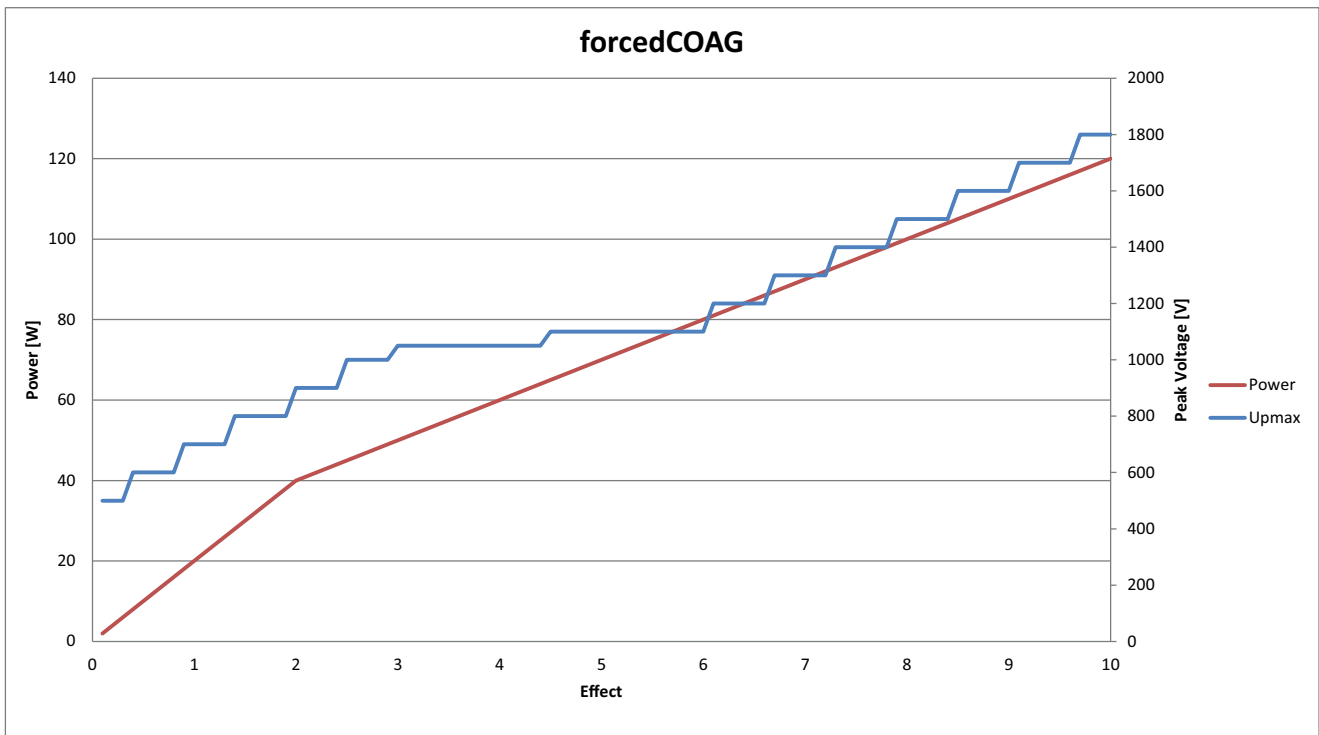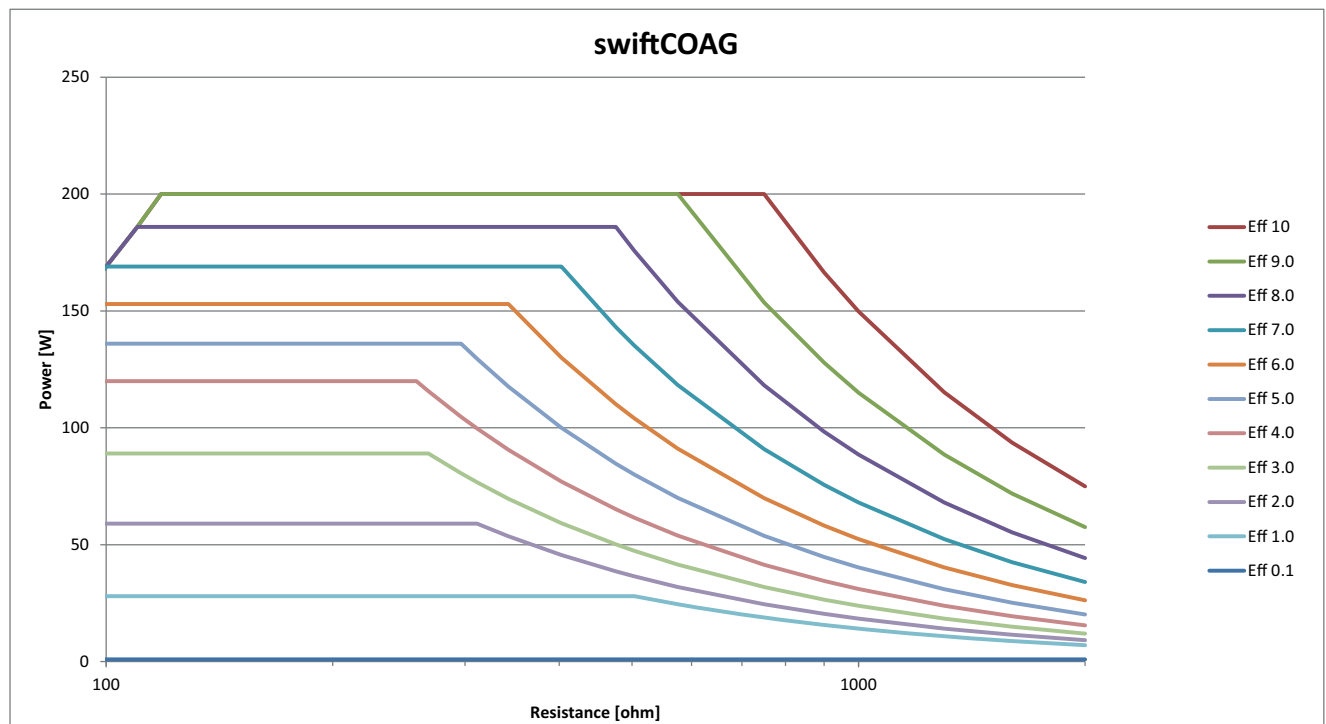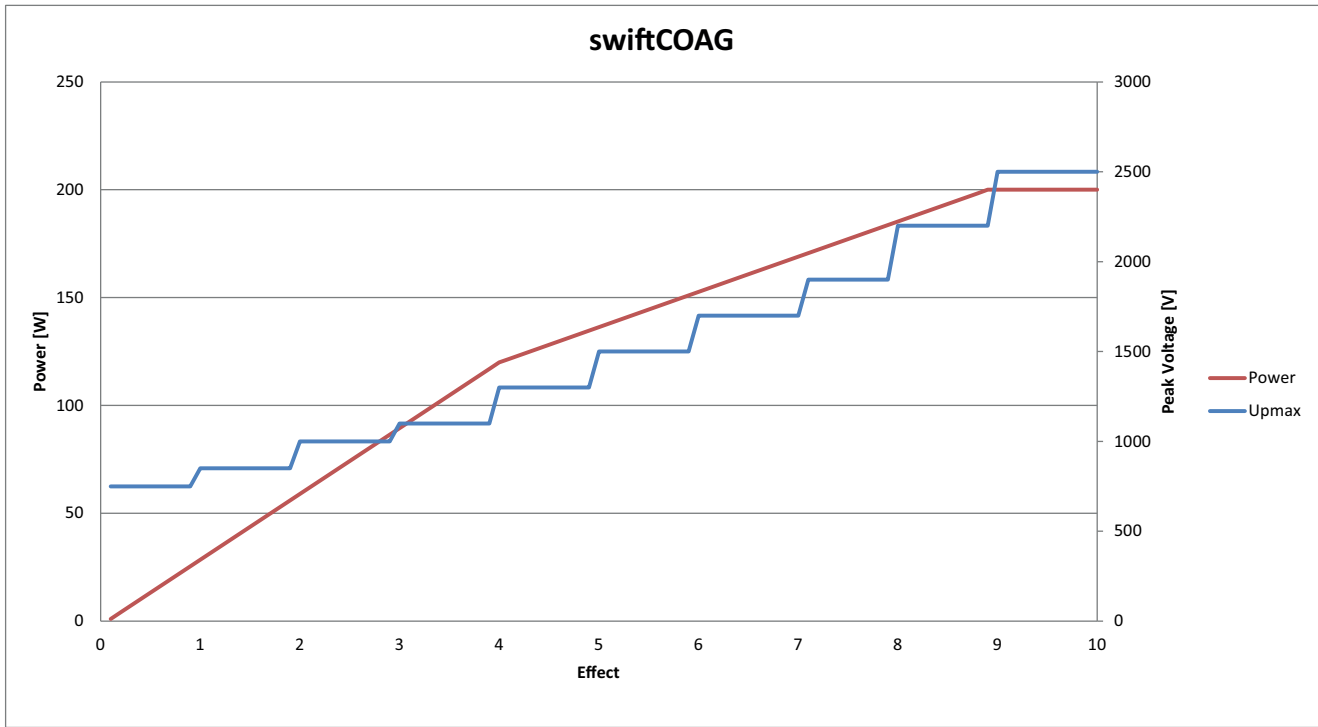| Type of HF voltage	Pulse-modulated sinusoidal AC voltage
Nominal frequency	350 kHz (no load) ±10%
Crest factor	5.8 (at R_L = 300 Ohm)
Designed load resistance	300 Ohm
Max. HF peak voltage	1800 V
Number of effects	0.1 – 10.0
Consistency of effects	Automatic control of HF peak voltage
Max. output across the designed load resistor	144 watts

Diagrams

Fig. 9-3

Fig. 9-4

swiftCOAG®

Properties Fast, effective coagulation, which is highly suitable for preparation with high hemostasis owing to its limited tissue-cutting property.

Areas of use Coagulation and preparation.

Technical data

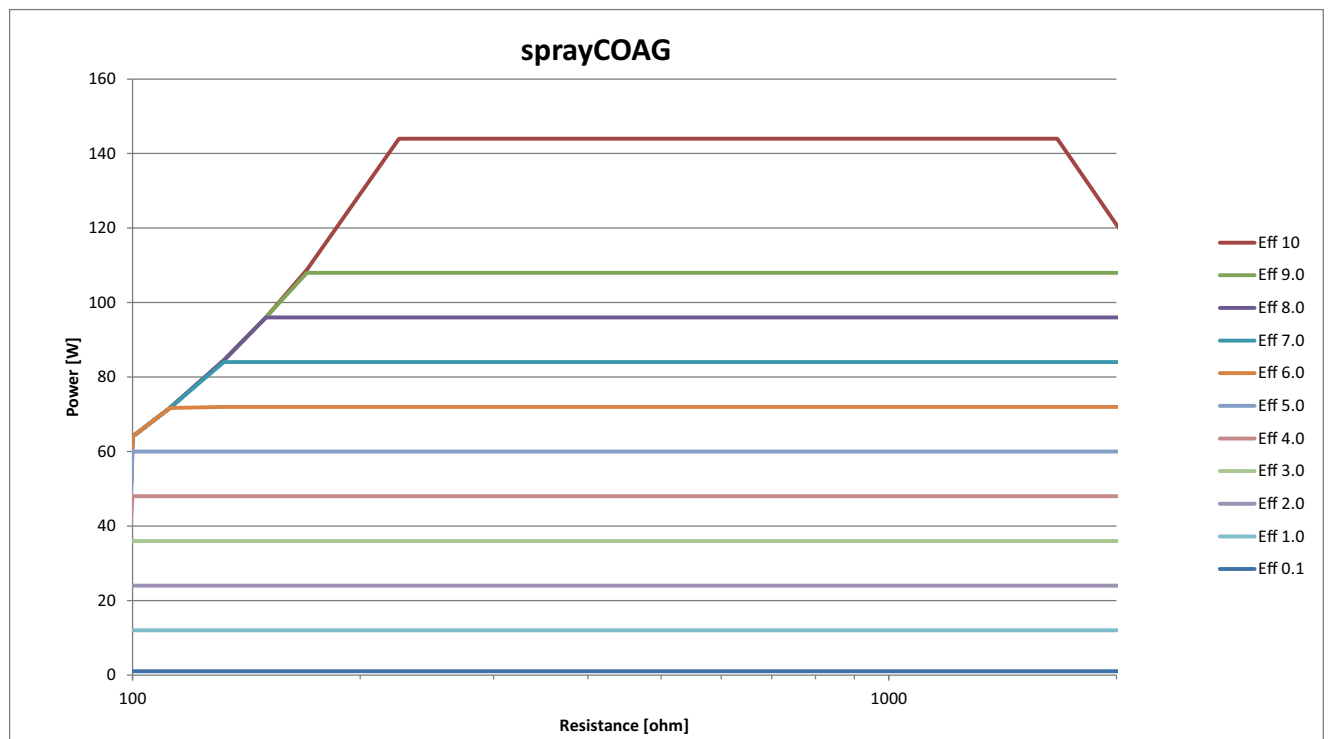|	
Type of HF voltage	Pulse-modulated sinusoidal AC voltage
Nominal frequency	350 kHz (no load) ±10%
Crest factor	6.0 (at R_L = 200 Ohm)
Designed load resistance	200 Ohm
Max. HF peak voltage	2500 V
Number of effects	0.1 – 10.0
Consistency of effects	Automatic control of HF peak voltage
Max. output across the designed load resistor	240 watts

Diagrams

Fig. 9-5

Fig. 9-6

sprayCOAG®

Properties	Contact-free, efficient surface coagulation, with low penetration depth.
Areas of use	Coagulation of diffuse hemorrhage. Only use insulated monopolar metal forceps for clamp coagulation.

Technical data

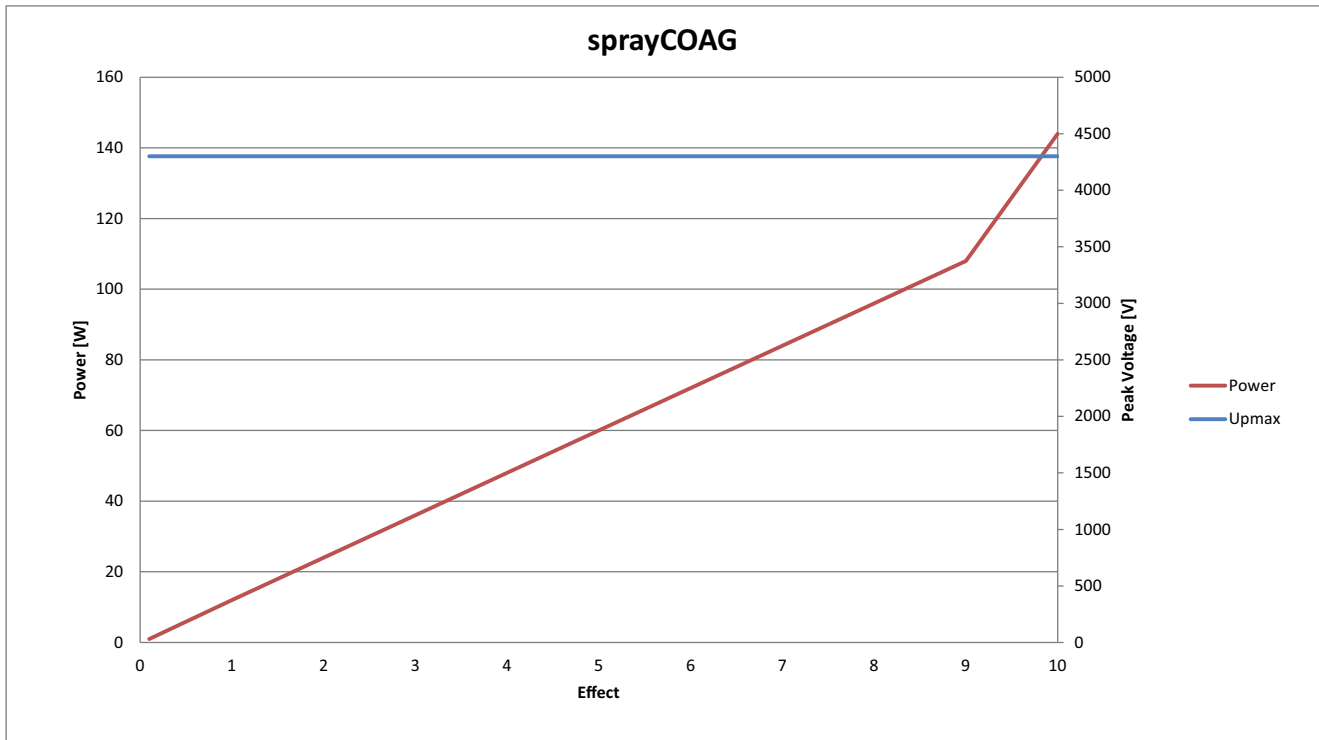| Type of HF voltage	Pulse-modulated sinusoidal AC voltage
Nominal frequency	350 kHz (no load) ±10%
Crest factor	7.74 (at R_L = 500 Ohm)
Designed load resistance	500 Ohm
Max. HF peak voltage	4300 V
Number of effects	0.1 − 10.0
Consistency of effects	Automatic control of HF peak voltage
Max. output across the designed load resistor	175 watts

Diagrams
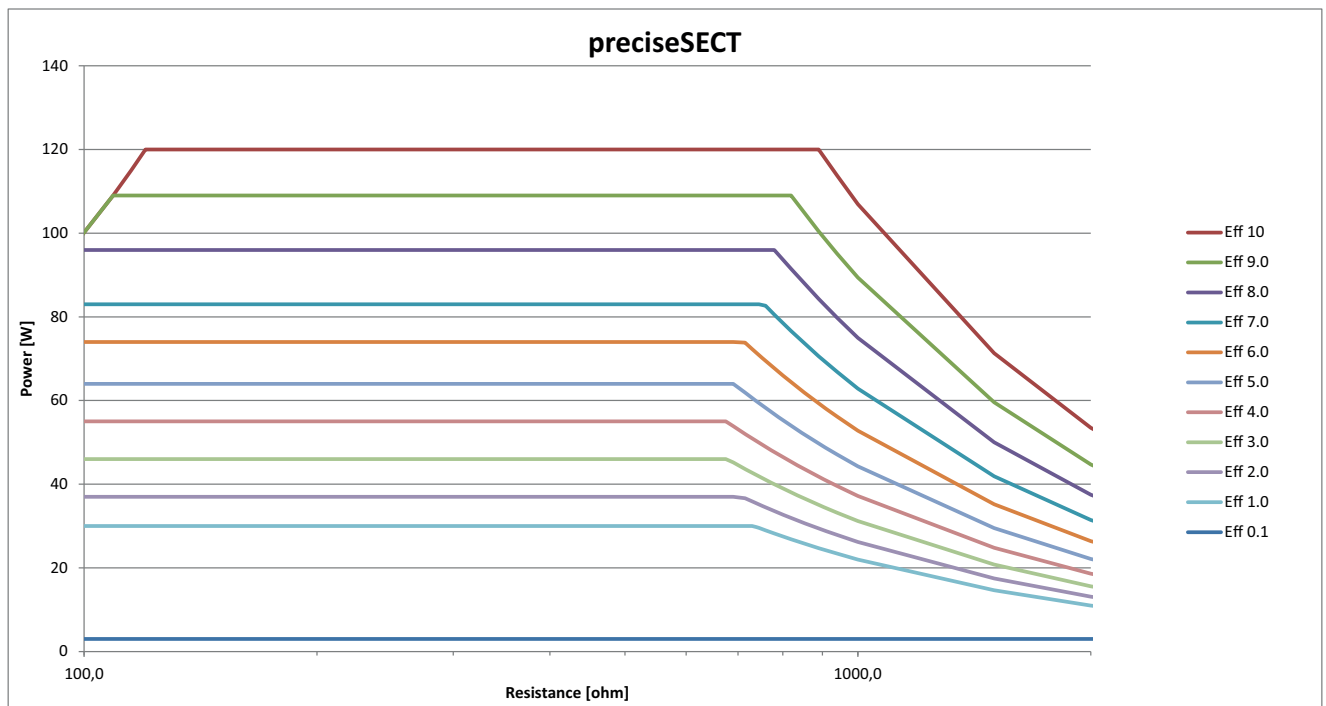

Fig. 9-7

Fig. 9-8

preciseSECT

Properties

Fast, effective coagulation, with limited tissue-cutting property. Optimized preparation characteristics through dynamic adaptation of modulation.

Areas of use

Coagulation, clamp coagulation and preparation

Technical data

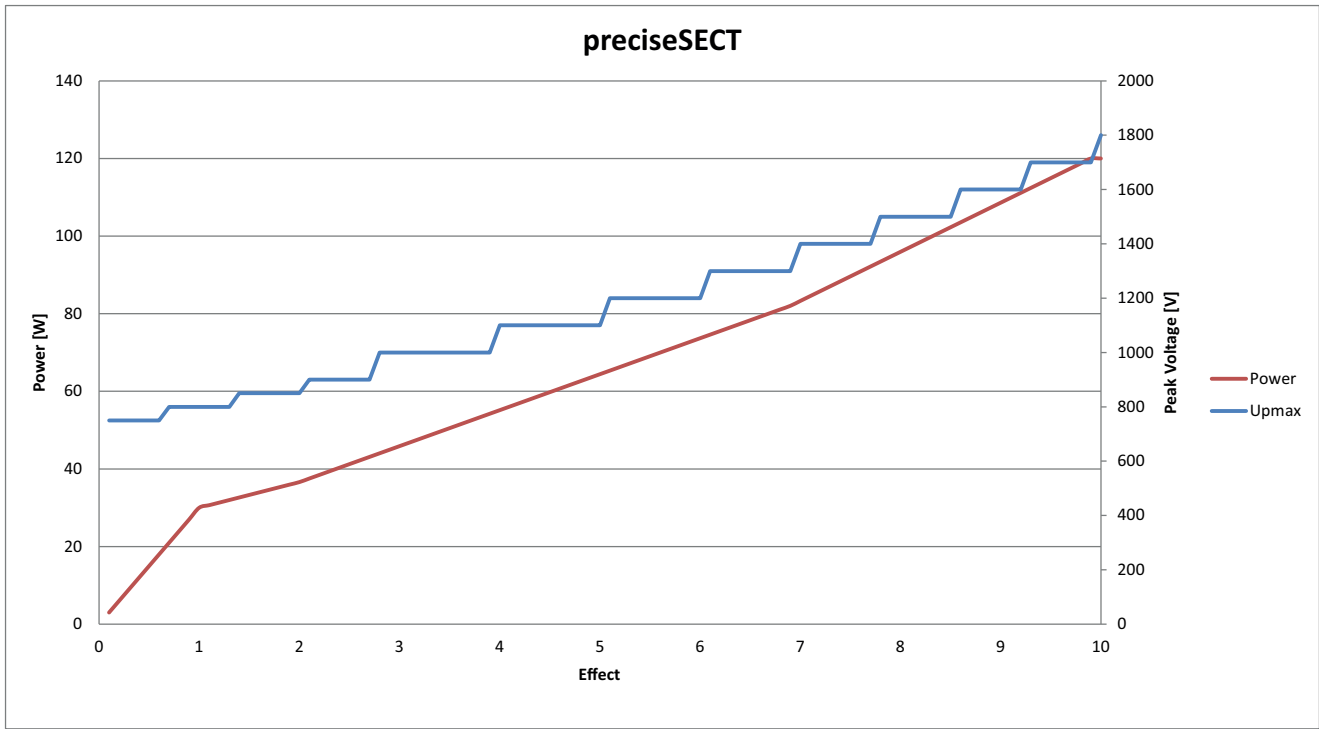|	
Type of HF voltage	Pulse-modulated sinusoidal AC voltage
Nominal frequency	350 kHz (no load) ±10%
Crest factor	4.0 (at R_L = 300 Ohm)
Designed load resistance	300 Ohm
Max. HF peak voltage	1800 V
Number of effects	0.1 – 10.0
Consistency of effects	Automatic control of HF peak voltage
Max. output across the designed load resistor	144 watts

Diagrams

Fig. 9-9

Fig. 9-10

twinCOAG®

Properties

Fast, effective coagulation, which is highly suitable for preparation with high hemostasis owing to its limited tissue-cutting property. Two monopolar instruments can be activated at the same time.

WARNING! In the twinCOAG mode, the output power of any of the active electrodes can change.

Areas of use

Coagulation and preparation with simultaneous activation

Technical data

Type of HF voltage	Pulse-modulated sinusoidal AC voltage
Nominal frequency	350 kHz (no load) ±10%
Crest factor	5.9 (at R_L = 150 Ohm)
Designed load resistance	150 Ohm
Max. HF peak voltage	2000 V
Number of effects	0.1 − 10.0
Consistency of effects	Automatic control of HF peak voltage
Max. output across the designed load resistor	240 watts

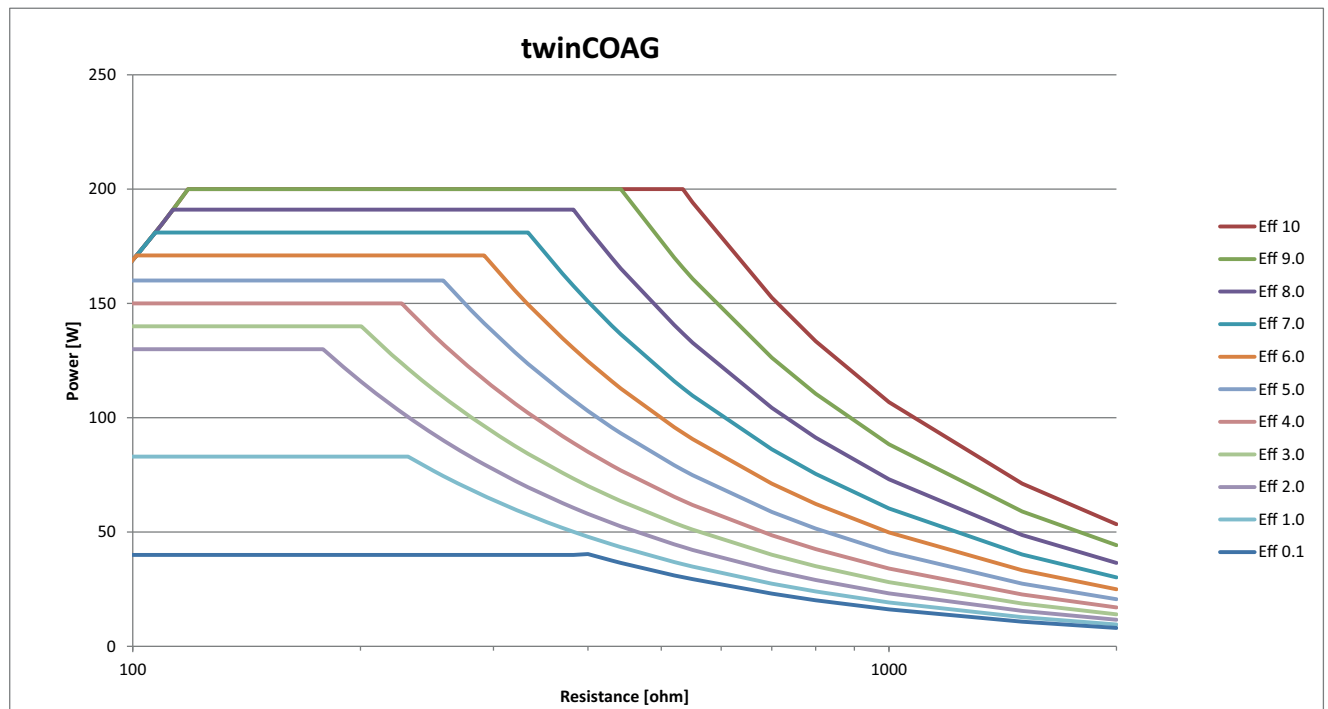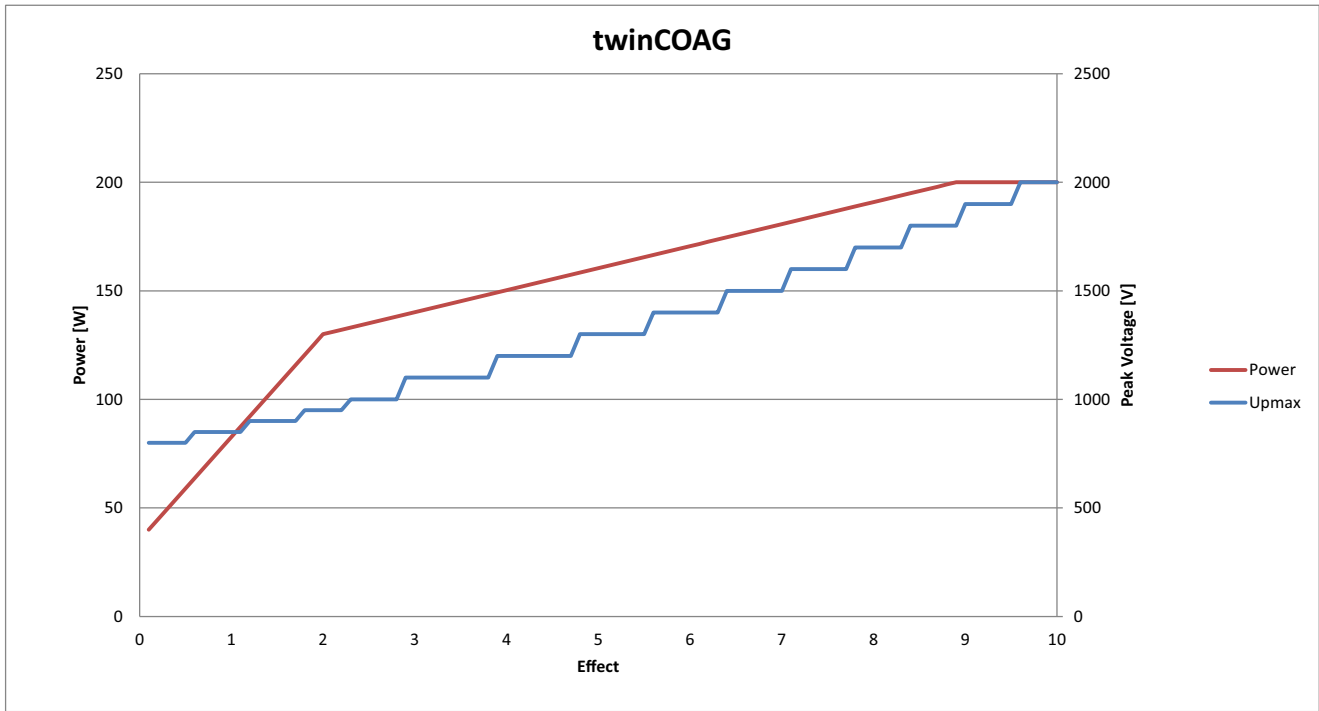**Diagrams**

Fig. 9-11

80114-601
03.16

Fig. 9-12

Chapter 10
Bipolar CUT modes

autoCUT bipolar

Properties Reproducible, smooth cuts, minimal to moderate hemostasis.

Areas of use All cutting procedures in electrically conductive tissue: e.g. muscle tissue and vascular tissue. Dissections and cutting of fine structures.

Technical data

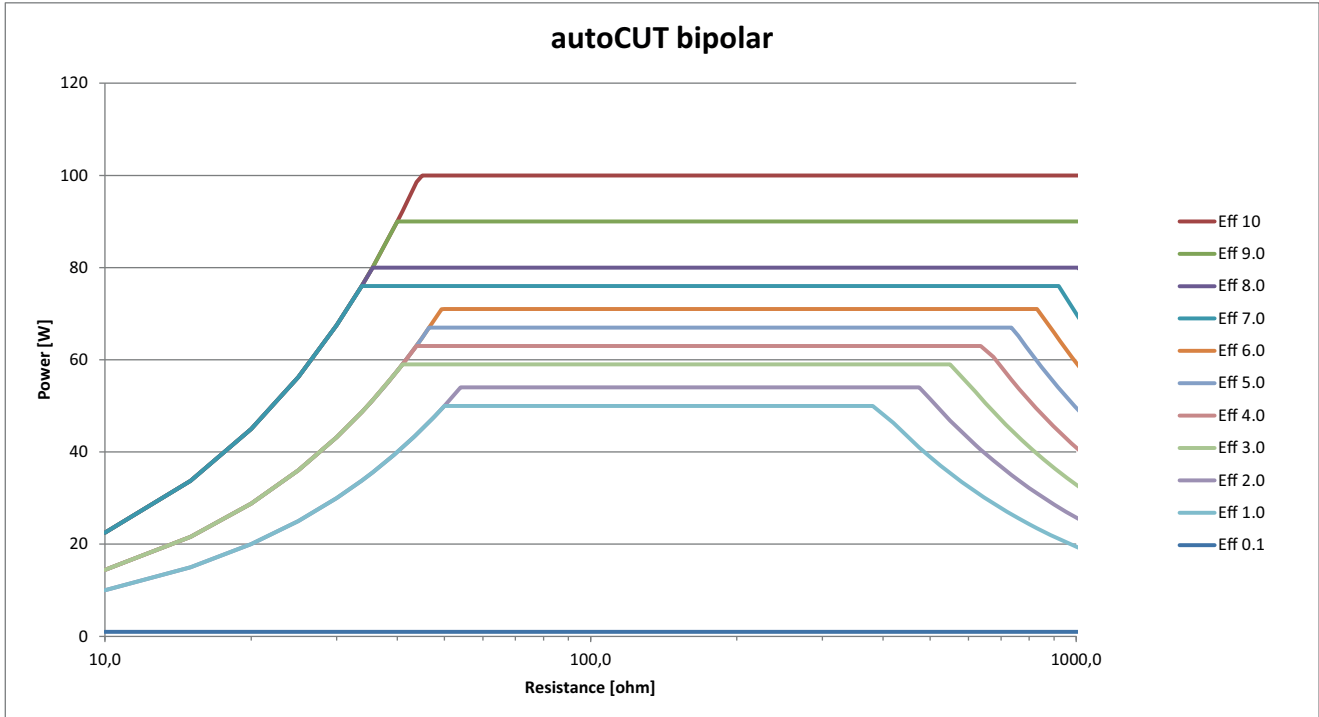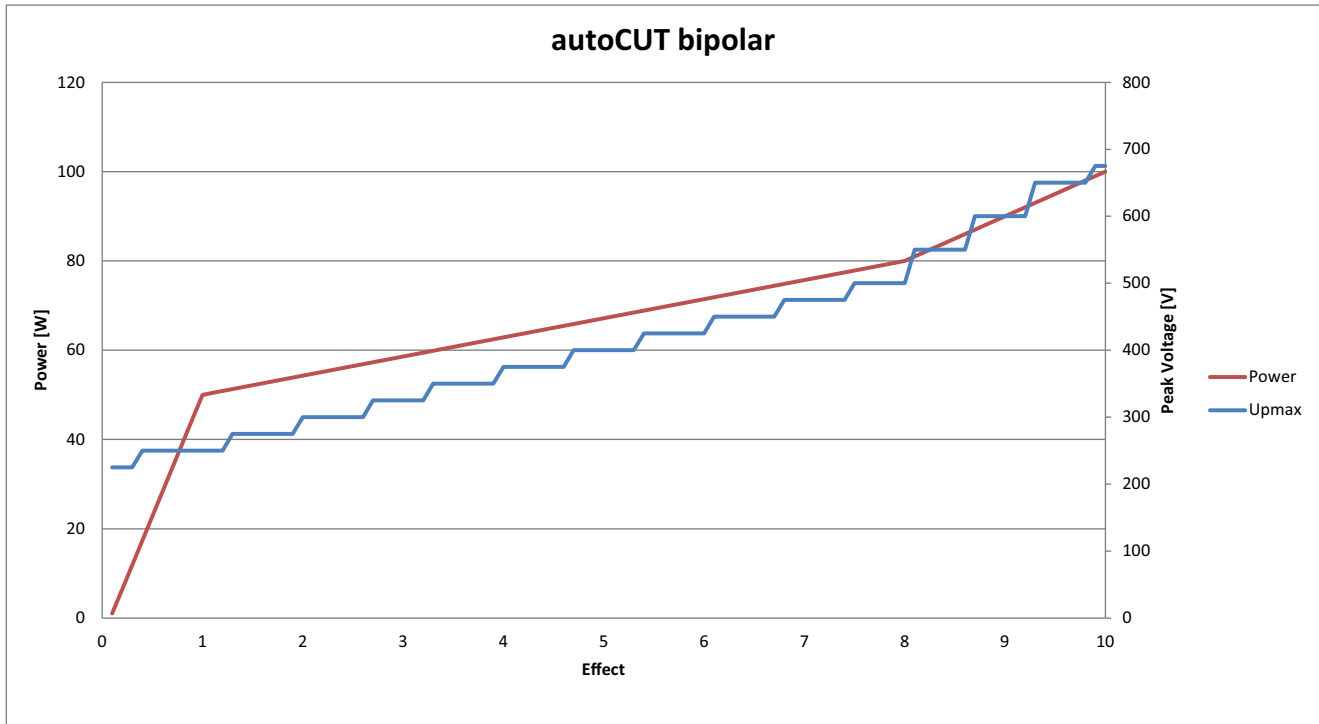| Type of HF voltage	Unmodulated sinusoidal AC voltage
Nominal frequency	350 kHz (no load) ±10%
Crest factor	1.64 (at R_L = 300 Ohm)
Designed load resistance	300 Ohm
Max. HF peak voltage	675 V
Number of effects	0.1 − 10.0
Consistency of effects	Automatic control of HF peak voltage
Max. output across the designed load resistor	120 watts

Diagrams

Fig. 10-1

Fig. 10-2

highCUT bipolar

Properties Reproducible, smooth cuts, low to moderate hemostasis.

PPS (Power Peak System) The highCUT bipolar mode is equipped with PPS.

A special problem during incision may be posed by the initial incision phase, in particular when the cutting electrode is pressed firmly against the tissue to be cut, before activation of the HF generator. The cutting electrode therefore has a relatively extensive, low-resistance contact with the tissue, e.g. in TUR.

In such cases, the HF generator must offer an above-average output so that the initial incision is not delayed, as otherwise an excessive coagulation necrosis may be produced at the point of initial incision.

The VIO 3 is equipped with automatic power control (PPS). PPS detects low resistance loads and controls the HF generator such that it briefly provides sufficient output to ensure the HF voltage necessary or intensity of the electrical arc for the cutting quality selected even with low-resistance loads.

Thanks to PPS, the average output can be limited to relatively low levels, something which represents improved protection from unintentional thermal tissue damage.

Areas of use Cutting procedures in bipolar resection in NaCl.

Technical data

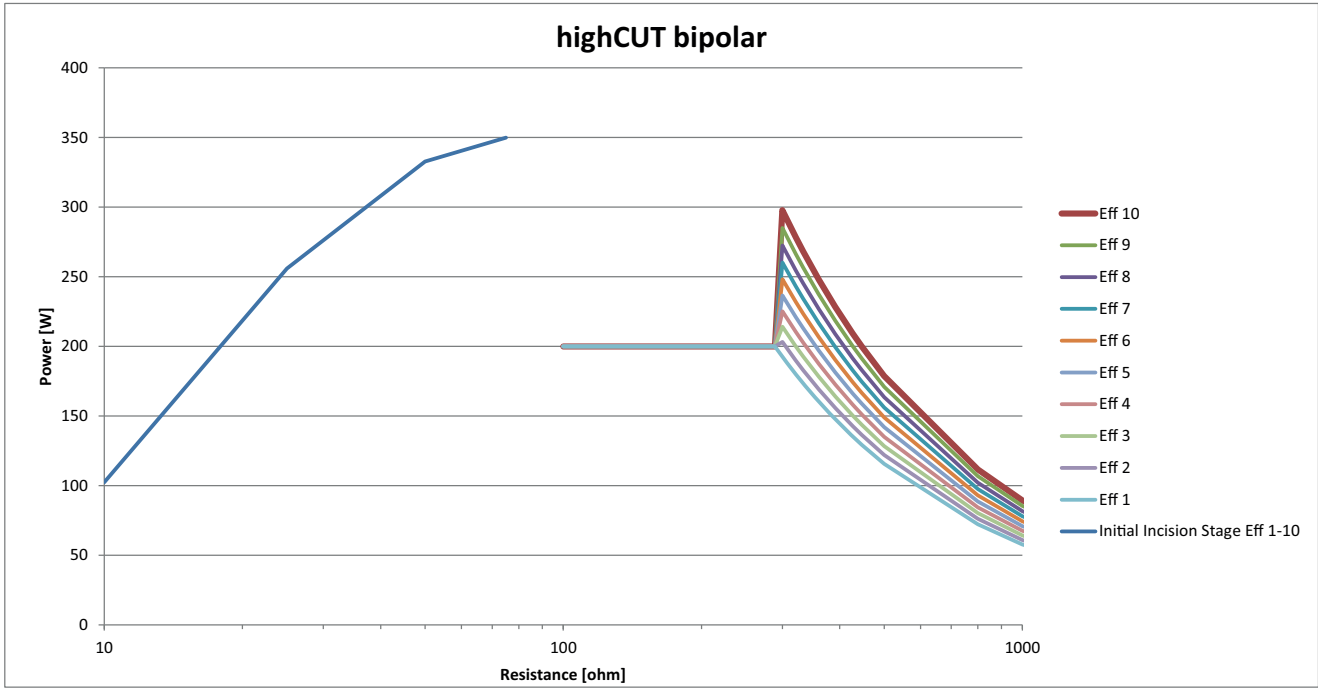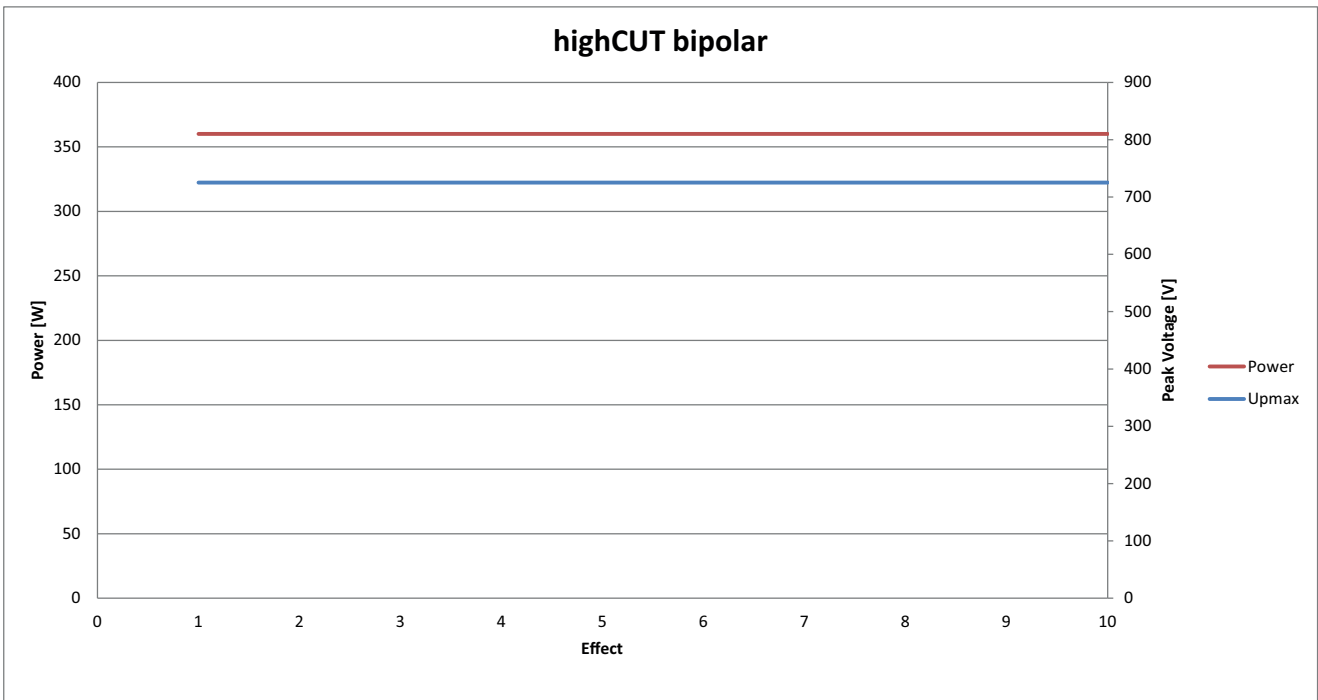| Type of HF voltage	Unmodulated sinusoidal AC voltage
Nominal frequency	350 kHz (no load) ±10%
Crest factor	1.46 (at R_L = 75 Ohm)
Designed load resistance	75 Ohm
Max. HF peak voltage	725 V
Number of effects	1 – 10
Consistency of effects	Automatic control of HF peak voltage
Max. output across the designed load resistor	400 watts

Diagrams

Fig. 10-3

Fig. 10-4

Chapter 11
Bipolar COAG modes

softCOAG® bipolar

Properties	Slow, deep coagulation without spark generation, consequently no carbonization of the tissue. Adhesion of the electrode to the tissue is greatly reduced.
Areas of use	All surgical procedures that call for safe coagulation with bipolar instruments. Coagulation in Bipolar resection.
AUTO START switchable	When the instrument touches tissue, coagulation starts automatically after a specified period of time. AUTO START is not available with bipolar resection.
	Touch the arrow on the lower edge of the main screen if required. The *Assign activation type* field opens. Drag the AUTO START symbol to the docking point of the required instrument.
AUTO STOP switchable	AUTO STOP ends activation automatically on attainment of sufficient desiccation. AUTO STOP is not available with bipolar resection.
	Touch the arrow on the lower edge of the main screen if required. The *Assign activation type* field opens. Drag the AUTO STOP symbol to the docking point of the required instrument.
QuickStart switchable	With QuickStart, a brief voltage pulse is applied to the tissue to attain a tissue effect quicker, without essentially influencing the coagulation result. QuickStart is not available with bipolar resection.
	Touch the COAG effect display on the main screen if required. A window opens in which you can switch on QuickStart.

Technical data

Type of HF voltage	Unmodulated sinusoidal AC voltage
Nominal frequency	350 kHz (no load) ±10%
Crest factor	1.48 (at R_L = 50 Ohm)
	With bipolar resection: 1.48 (at R_L = 25 Ohm)
Designed load resistance	50 Ohm
	With bipolar resection: 25 Ohm
Max. HF peak voltage	200 V
	450 V QuickStart

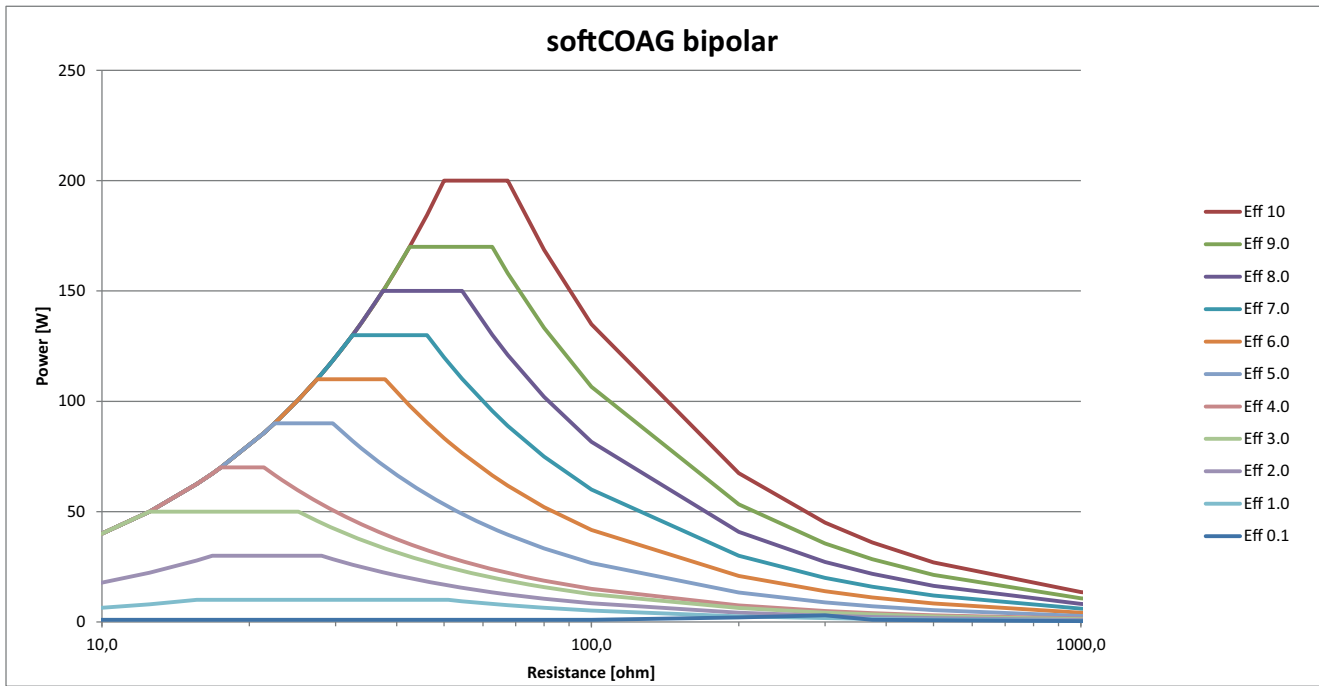| Number of effects	0.1 – 10.0
	With bipolar resection: 1 – 10
Consistency of effects	Automatic control of HF peak voltage
Max. output across the designed load resistor	240 watts

Diagrams

Fig. 11-1

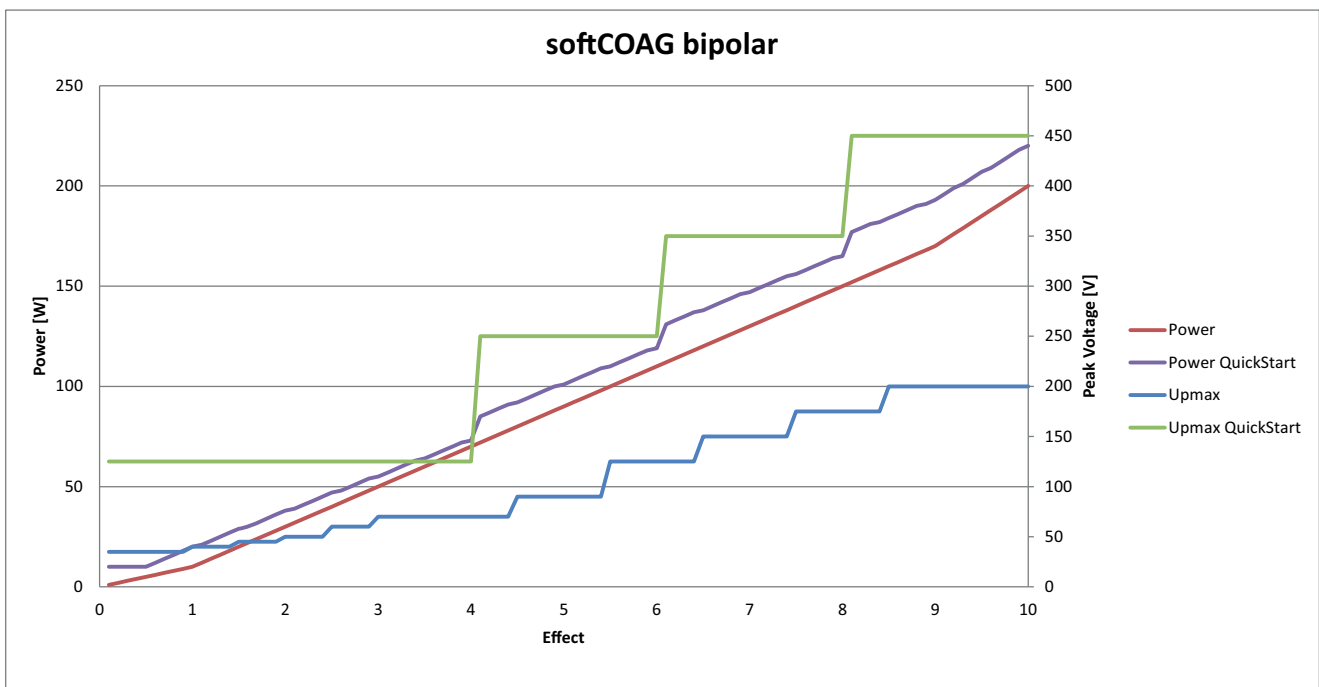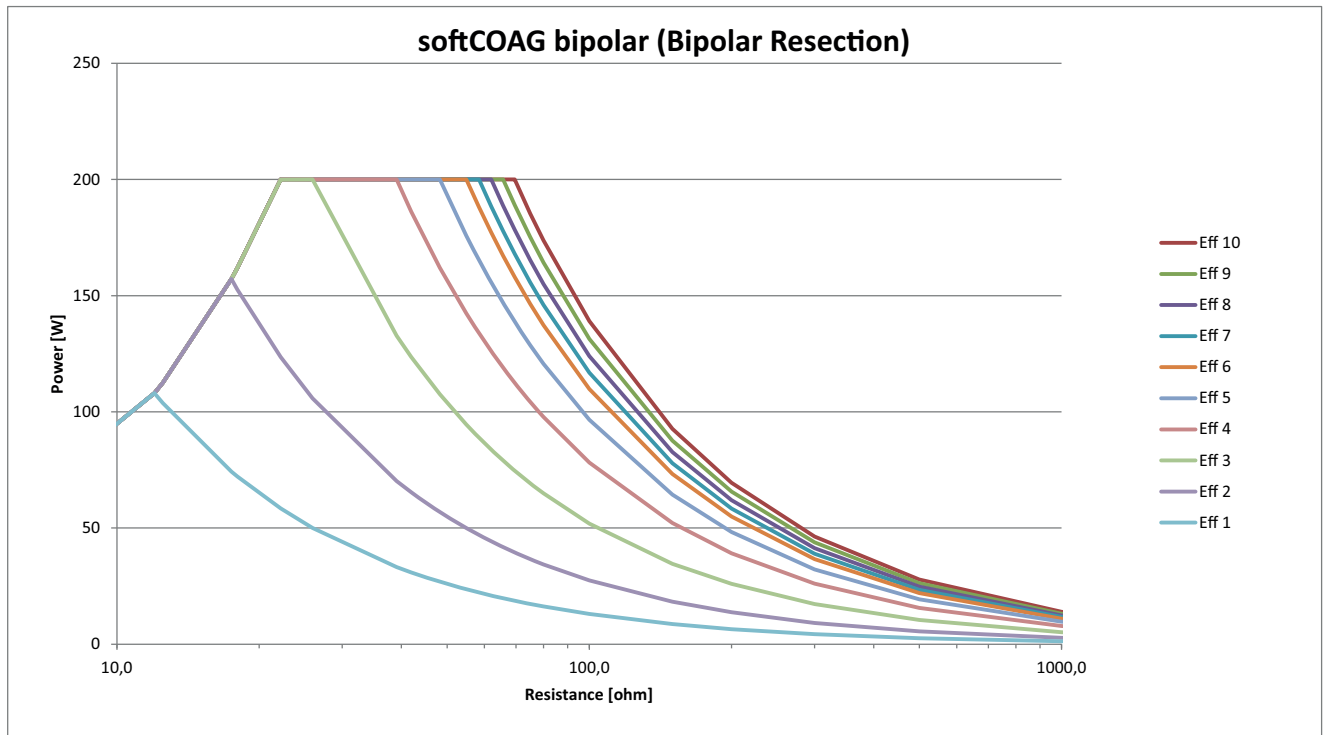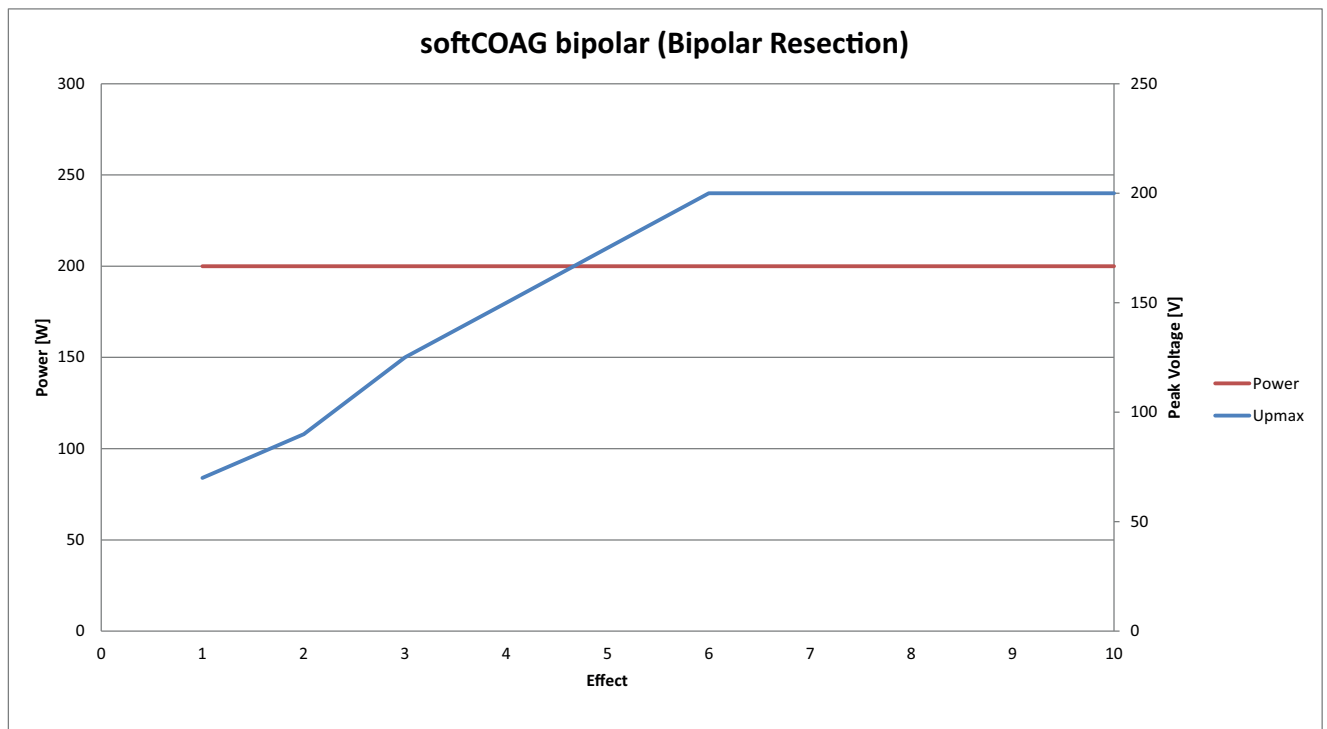Fig. 11-2

80114-601
03.16

Fig. 11-3

Fig. 11-4

forcedCOAG® bipolar

Properties

Fast bipolar coagulation.

Areas of use

All bipolar coagulation procedures in which you want to coagulate vessels fast and effectively or want to replace monopolar forceps coagulation.

AUTO START switchable

When the instrument touches tissue, coagulation starts automatically after a specified period of time.

Touch the arrow on the lower edge of the main screen if required. The *Assign activation type* field opens. Drag the AUTO START symbol to the docking point of the required instrument.

AUTO STOP switchable

On detection of a spark, adhesion of tissue to the instrument and carbonization is significantly reduced by automatically switching off.

Touch the arrow on the lower edge of the main screen if required. The *Assign activation type* field opens. Drag the AUTO STOP symbol to the docking point of the required instrument.

Technical data

Type of HF voltage	Unmodulated sinusoidal AC voltage
Nominal frequency	350 kHz (no load) ±10%
Crest factor	3.8 (at R_L = 100 Ohm)
Designed load resistance	100 Ohm
Max. HF peak voltage	550 V
Number of effects	0.1 – 10.0
Consistency of effects	Automatic control of HF peak voltage
Max. output across the designed load resistor	144 watts

80114-601
03.16

Diagrams
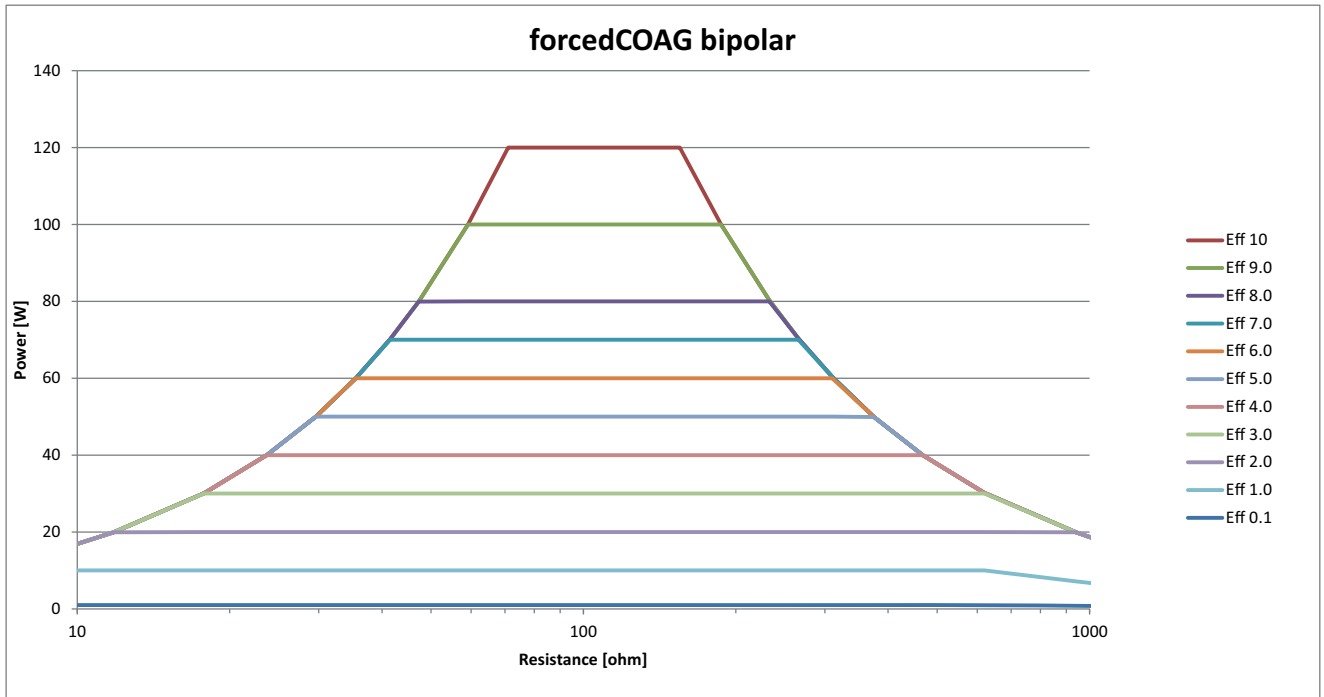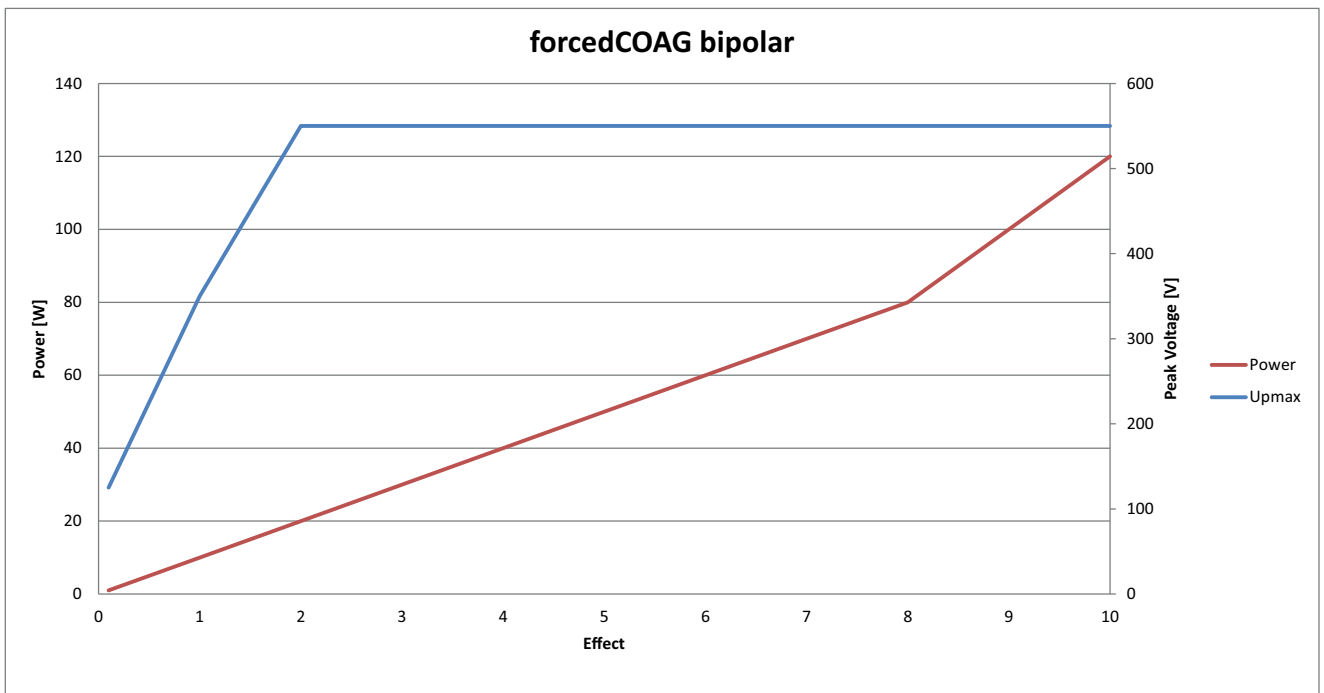

Fig. 11-5

Fig. 11-6

thermoSEAL®

Properties

Special COAG mode to seal vessels up to 7 mm diameter or to coagulate vascularized tissue, without changing the settings. The appropriate Erbe instruments are required to seal vessels up to 7 mm diameter.

Operating principle: The mode adapts the HF voltage and activation time to the amount of tissue and the instrument used.

Areas of use

All surgical procedures that call for sealing vessels and tissue bundles. Only use with vessel sealing instruments (e.g. Erbe BiClamp).

AUTO START switchable

When the instrument touches tissue, coagulation starts automatically after a specified period of time.

Touch the arrow on the lower edge of the main screen if required. The *Assign activation type* field opens. Drag the AUTO START symbol to the docking point of the required instrument.

AUTO STOP

The AUTO STOP function is matched to the thermoSEAL mode.

If the user grips the tissue with the jaws and presses the branches together firmly, the AUTO STOP function stops the activation automatically as soon as the necessary tissue dessication is achieved.

If the user only presses the branches together lightly, e.g. in coagulation of vascularized tissue, no AUTO STOP occurs. In this case, the user ends the activation.

Technical data

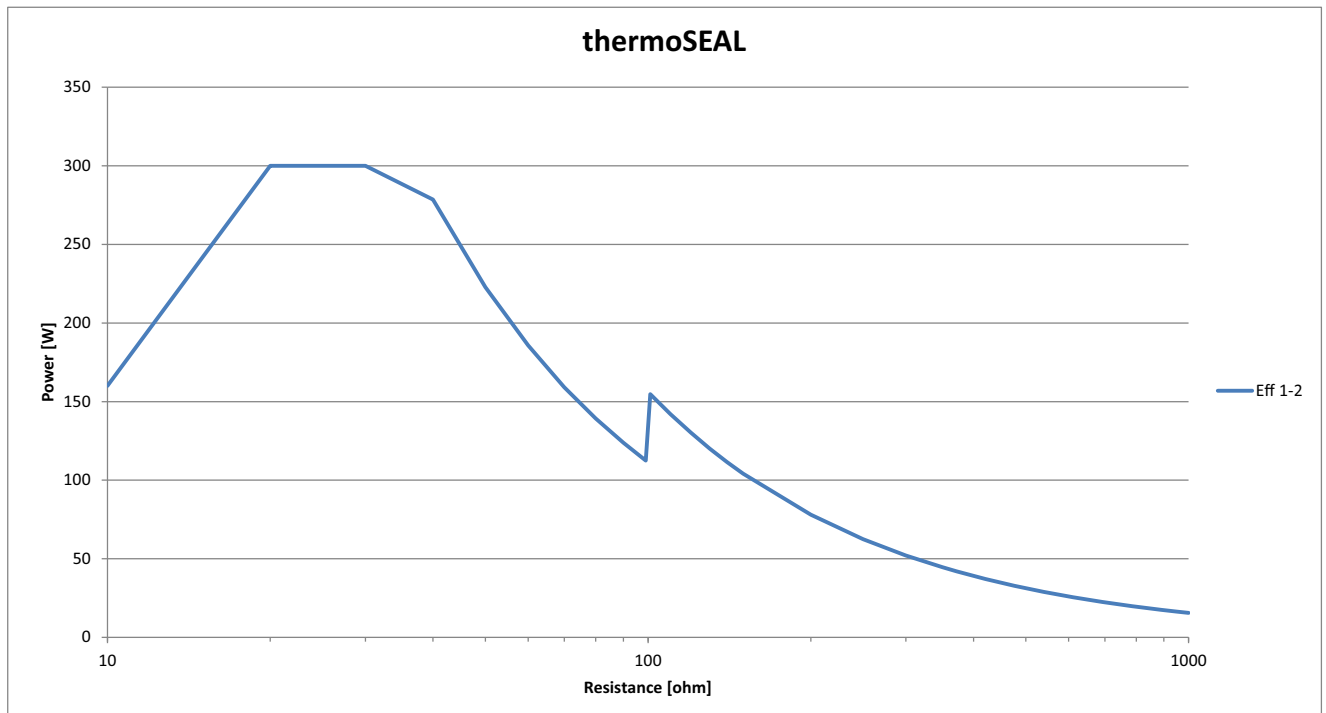| Type of HF voltage	Unmodulated sinusoidal AC voltage
Nominal frequency	350 kHz (no load) ±10%
Crest factor	1.45 (at R_L = 25 Ohm)
Designed load resistance	25 Ohm
Max. HF peak voltage	200 V
Number of effects	1 – 2
Consistency of effects	Automatic control of HF peak voltage
Max. output across the designed load resistor	360 watts

Diagram

Fig. 11-7

80114-601
03.16

Chapter 12
APC modes (only available with the APC module)

forcedAPC

Properties Effective, fast, "standard" argon plasma coagulation with ignition assistance for safe ignition of the plasma.

Areas of use Hemostasis of diffuse areas of bleeding, devitalization and reduction of tissue.

Technical data

Type of HF voltage	Pulse-modulated sinusoidal AC voltage
Nominal frequency	350 kHz (no load) ±10%
Crest factor	7.65 (at R_L = 500 Ohm)
Designed load resistance	500 Ohm
Max. HF peak voltage	4300 V
Number of effects	0.1 – 10.0
Consistency of effects	Automatic control of HF peak voltage
Max. output across the designed load resistor	144 watts

Diagrams
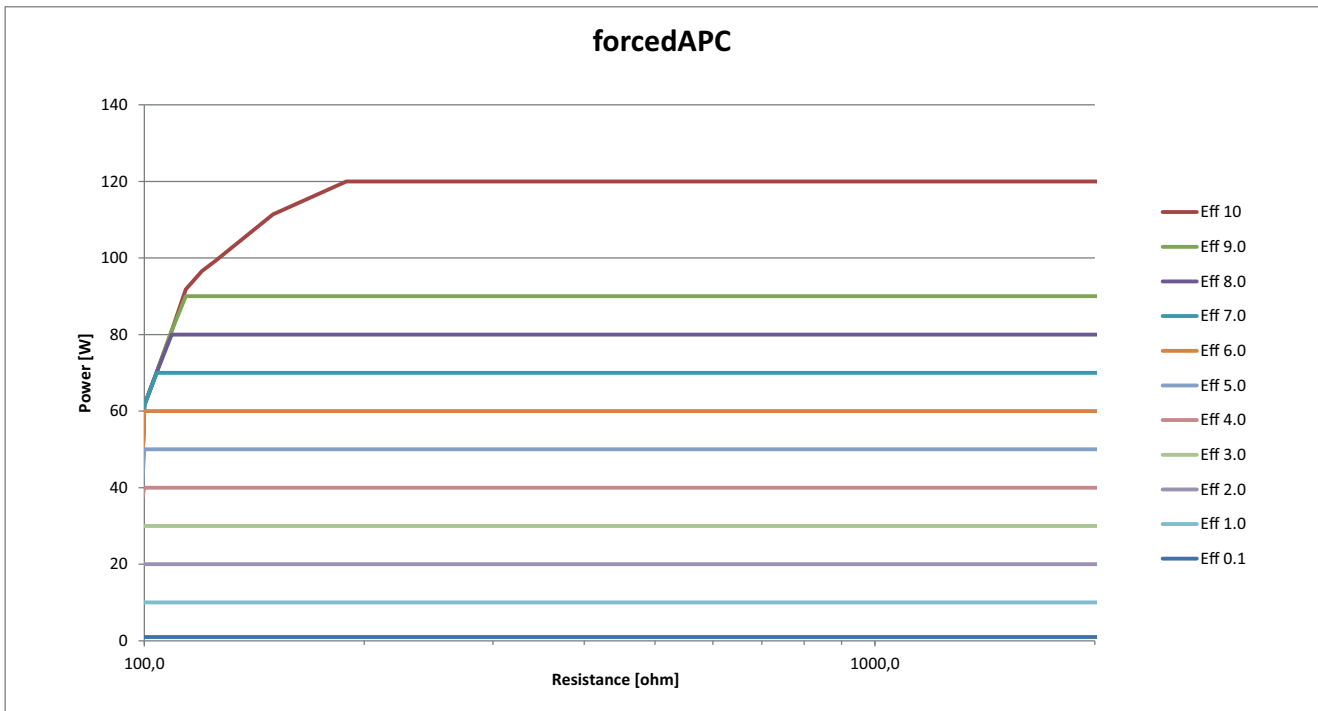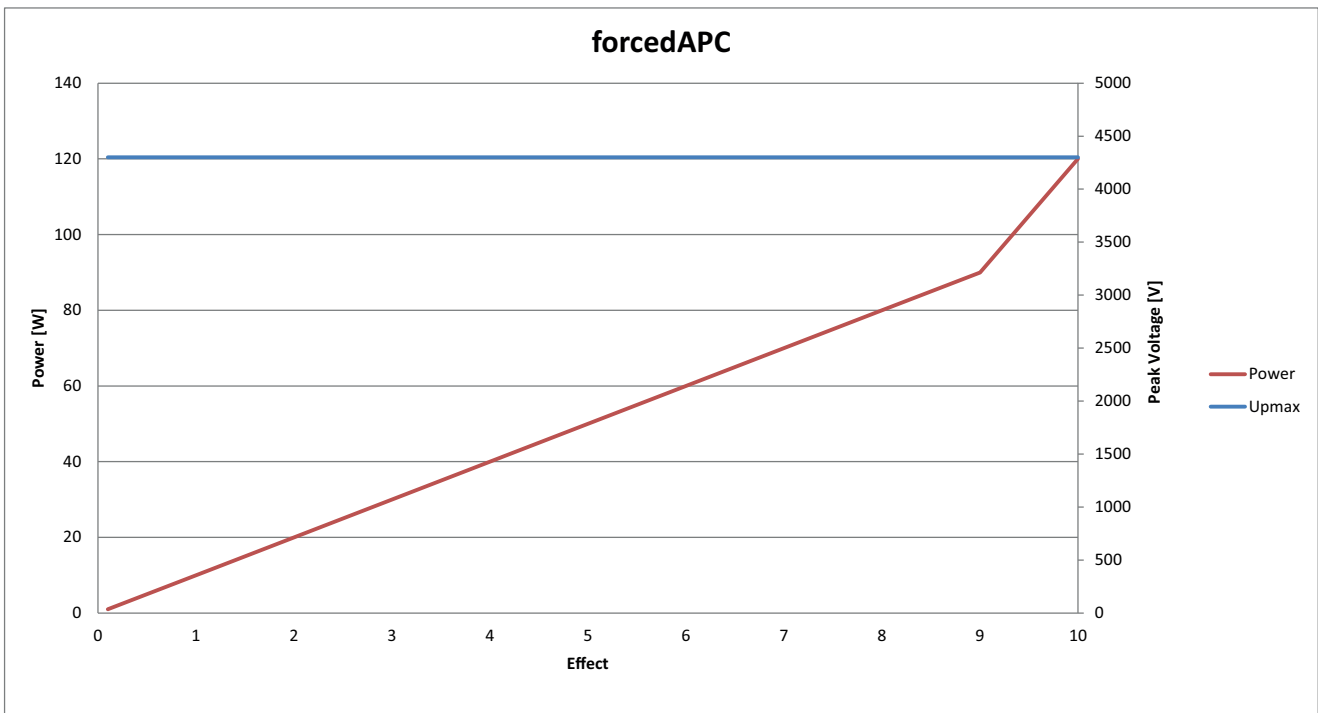

Fig. 12-1

Fig. 12-2

preciseAPC®

Properties	Fine argon plasma coagulation with well controllable hemostasis at the tissue surface, largely independent of the distance between applicator and tissue.

Areas of use   Targeted, superficial coagulation for discrete findings in temperature-sensitive areas.

Technical data

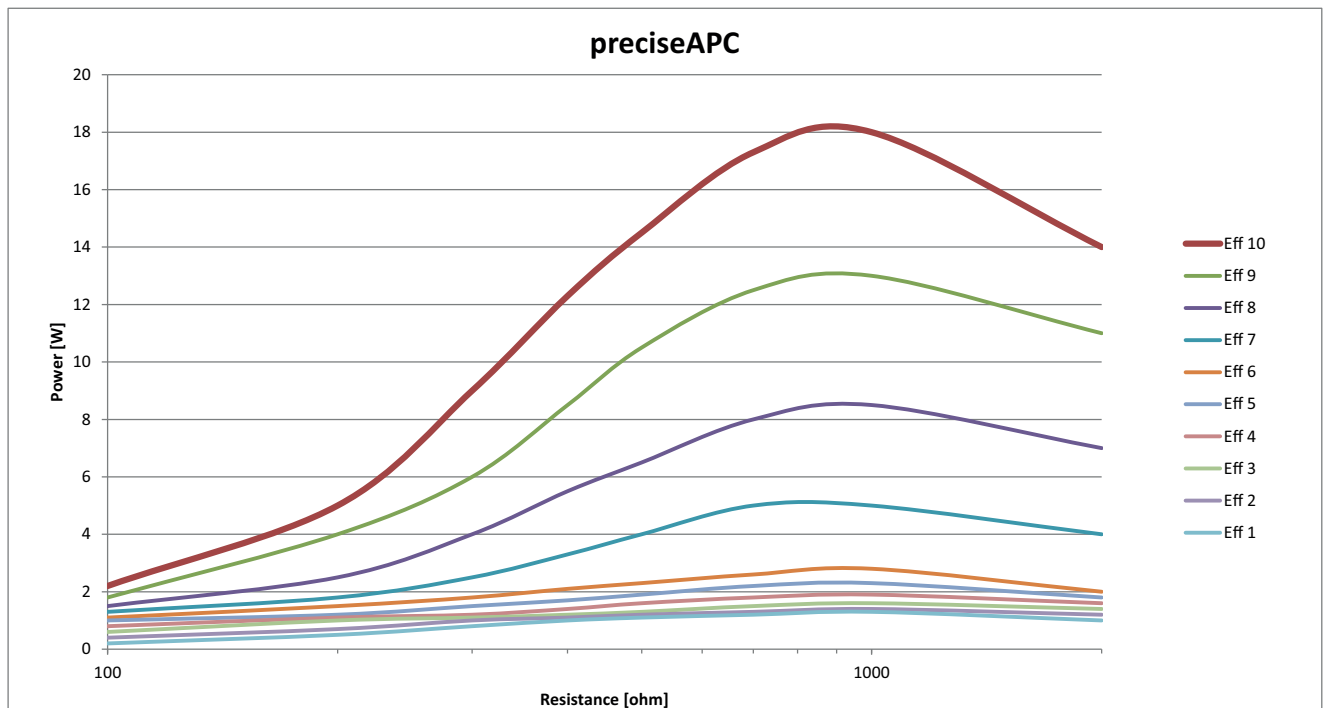| Type of HF voltage	Pulse-modulated sinusoidal AC voltage
Nominal frequency	350 kHz (no load) ±10%
Crest factor	7.76 (at R_L = 1000 Ohm)
Designed load resistance	1,000 ohms
Max. HF peak voltage	4950 V
Number of effects	1 – 10
Consistency of effects	Automatic control of HF peak voltage
Max. output across the designed load resistor	25 watts

Diagrams

Fig. 12-3

80114-601
03.16

Fig. 12-4

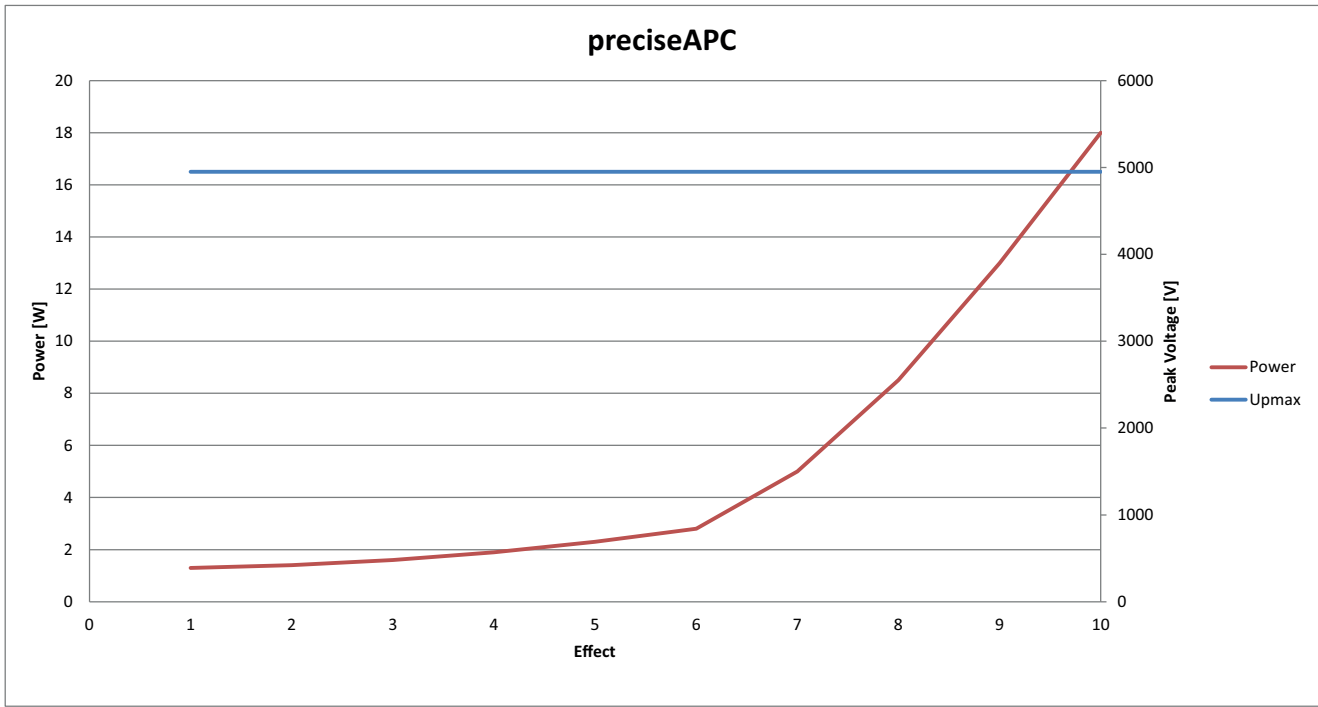80114-601
03.16

pulsedAPC®

Properties		Controlled argon plasma coagulation with reduced energy input from pulses.
Areas of use		Hemostasis of diffuse areas of bleeding. Devitalization and reduction of tissue with emphasis on controlled power output.

Technical data

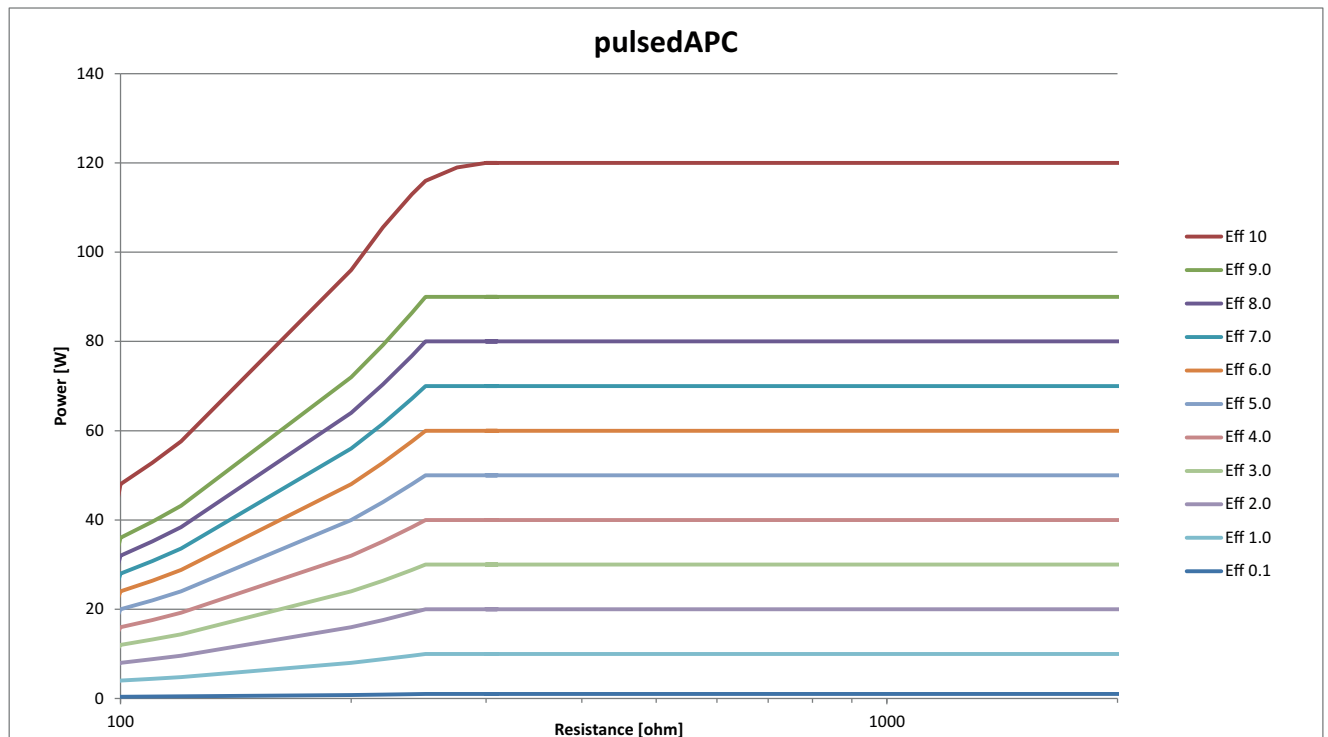| Type of HF voltage	Pulse-modulated sinusoidal AC voltage
Nominal frequency	350 kHz (no load) ±10%
Crest factor	7.73 (at R_L = 500 Ohm)
Designed load resistance	500 Ohm
Max. HF peak voltage	4950 V
Number of effects	0.1 − 10.0
Consistency of effects	Automatic control of HF peak voltage
Max. output across the designed load resistor	144 watts

Diagrams

Fig. 12-5
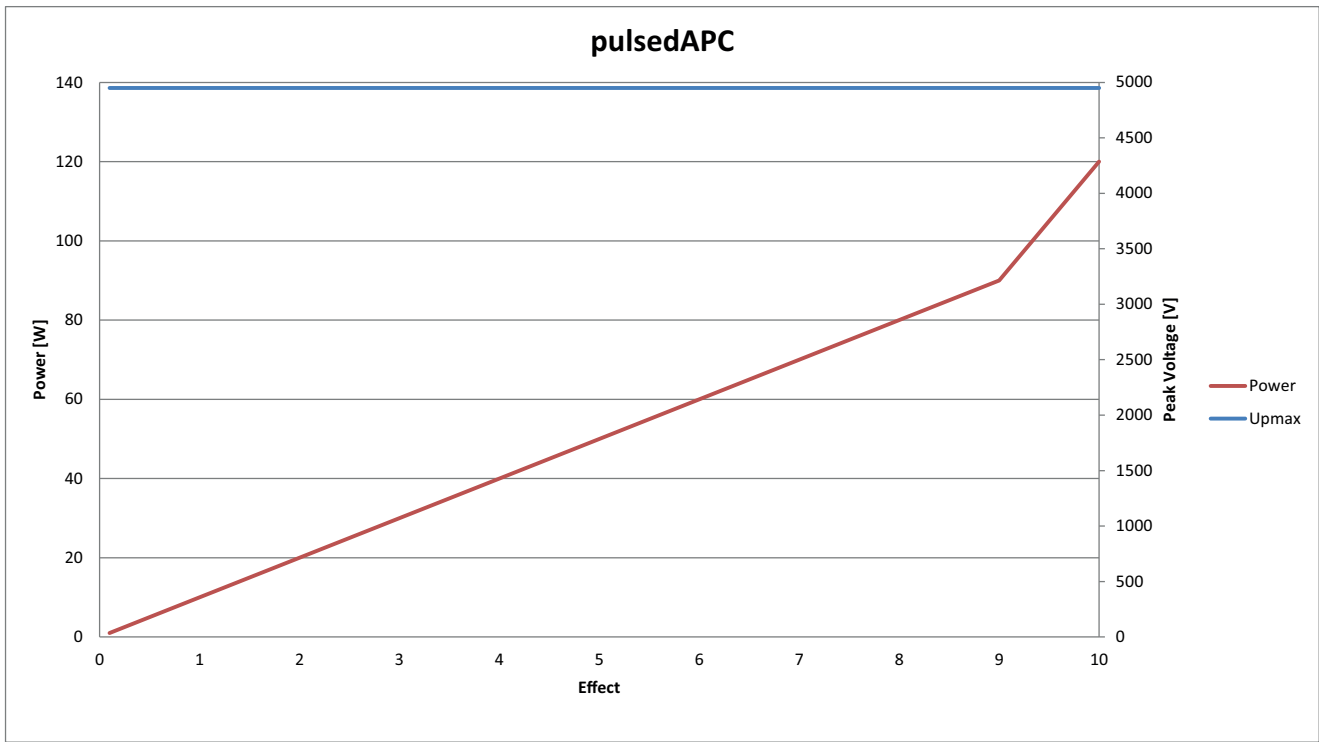
Fig. 12-6

80114-601
03.16

Chapter 13
Argon-supported modes (only available with the APC module)

autoCUT

Properties	Reproducible, smooth cuts, minimal to moderate hemostasis.
PPS (Power Peak System)	The autoCUT mode is equipped with PPS.

A special problem during incision may be posed by the initial incision phase, in particular when the cutting electrode is pressed firmly against the tissue to be cut, before activation of the HF generator. The cutting electrode therefore has a relatively extensive, low-resistance contact with the tissue, e.g. in TUR.

In such cases, the HF generator must offer an above-average output so that the initial incision is not delayed, as otherwise an excessive coagulation necrosis may be produced at the point of initial incision.

The VIO 3 is equipped with automatic power control (PPS). PPS detects low resistance loads and controls the HF generator such that it briefly provides sufficient output to ensure the HF voltage necessary or intensity of the electrical arc for the cutting quality selected even with low-resistance loads.

Thanks to PPS, the average output can be limited to relatively low levels, something which represents improved protection from unintentional thermal tissue damage.

Areas of use All cutting procedures in electrically conductive tissue: e.g. muscle tissue and vascular tissue. Dissections and cutting of fine structures.

Technical data

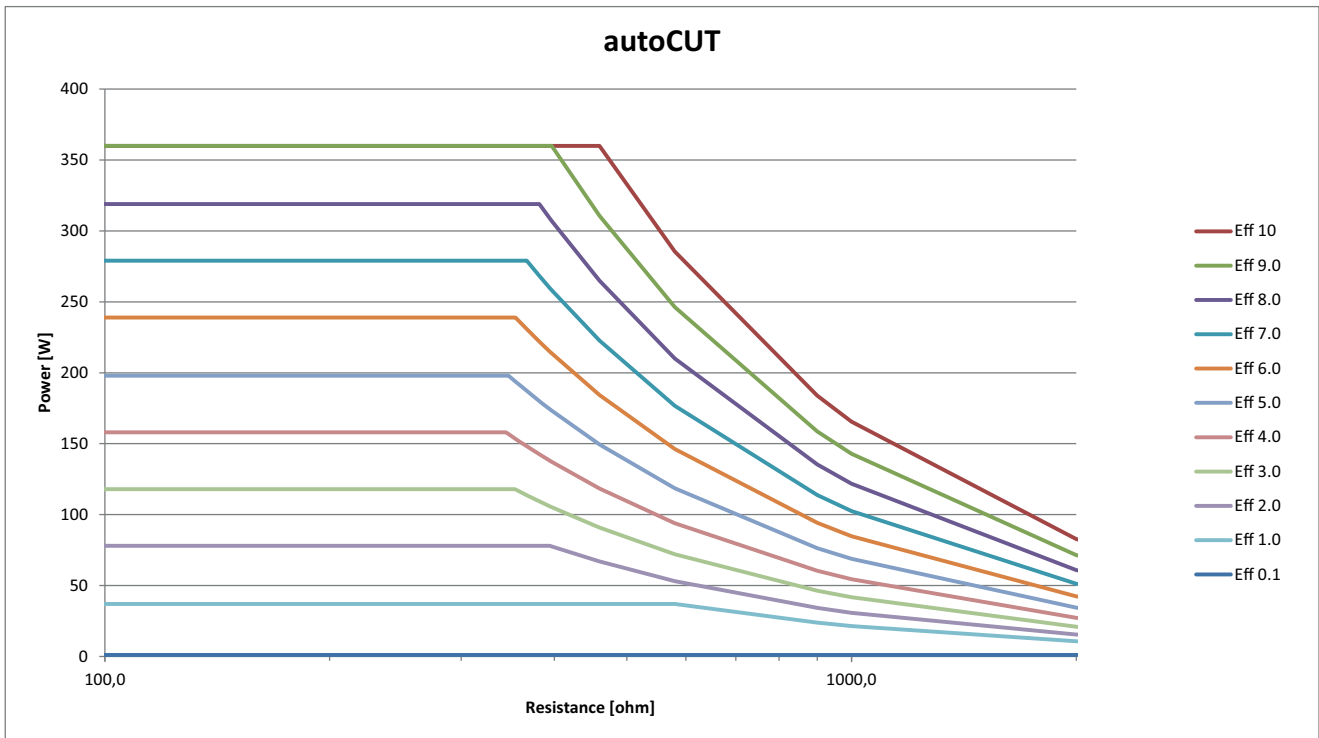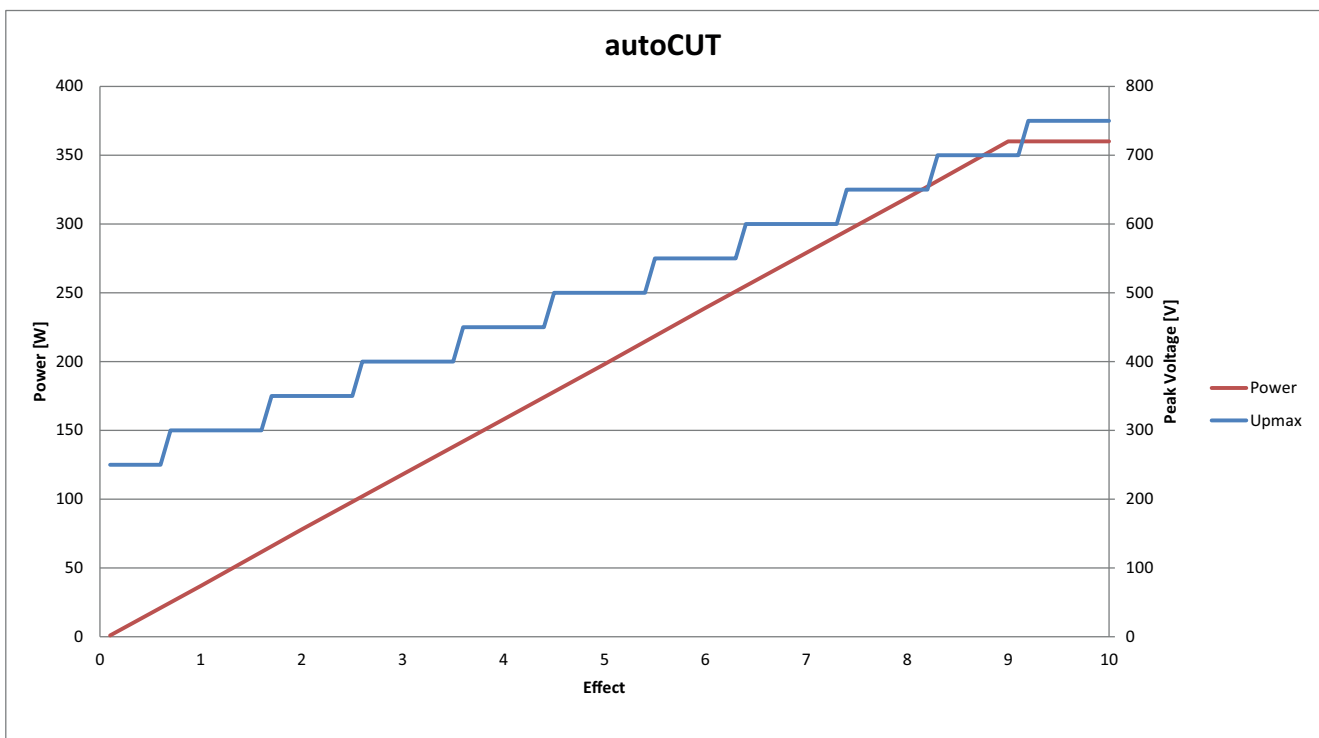|	
Type of HF voltage	Unmodulated sinusoidal AC voltage
Nominal frequency	350 kHz (no load) ±10%
Crest factor	1.62 (at R_L = 300 Ohm)
Designed load resistance	300 Ohm
Max. HF peak voltage	750 V
Number of effects	0.1 − 10.0
Consistency of effects	Automatic control of HF peak voltage
Max. output across the designed load resistor	400 watts

80114-601
03.16

Diagrams

Fig. 13-1

Fig. 13-2

80114-601
03.16

highCUT

Properties	Reproducible, smooth cuts, in particular in poorly conductive and varying tissue.
PPS (Power Peak System)	The highCUT mode is equipped with PPS.

A special problem during incision may be posed by the initial incision phase, in particular when the cutting electrode is pressed firmly against the tissue to be cut, before activation of the HF generator. The cutting electrode therefore has a relatively extensive, low-resistance contact with the tissue, e.g. in TUR.

In such cases, the HF generator must offer an above-average output so that the initial incision is not delayed, as otherwise an excessive coagulation necrosis may be produced at the point of initial incision.

The VIO 3 is equipped with automatic power control (PPS). PPS detects low resistance loads and controls the HF generator such that it briefly provides sufficient output to ensure the HF voltage necessary or intensity of the electrical arc for the cutting quality selected even with low-resistance loads.

Thanks to PPS, the average output can be limited to relatively low levels, something which represents improved protection from unintentional thermal tissue damage.

Areas of use

For example, for cutting fat-containing structures, cutting under water, e.g. with TUR-P.

Technical data

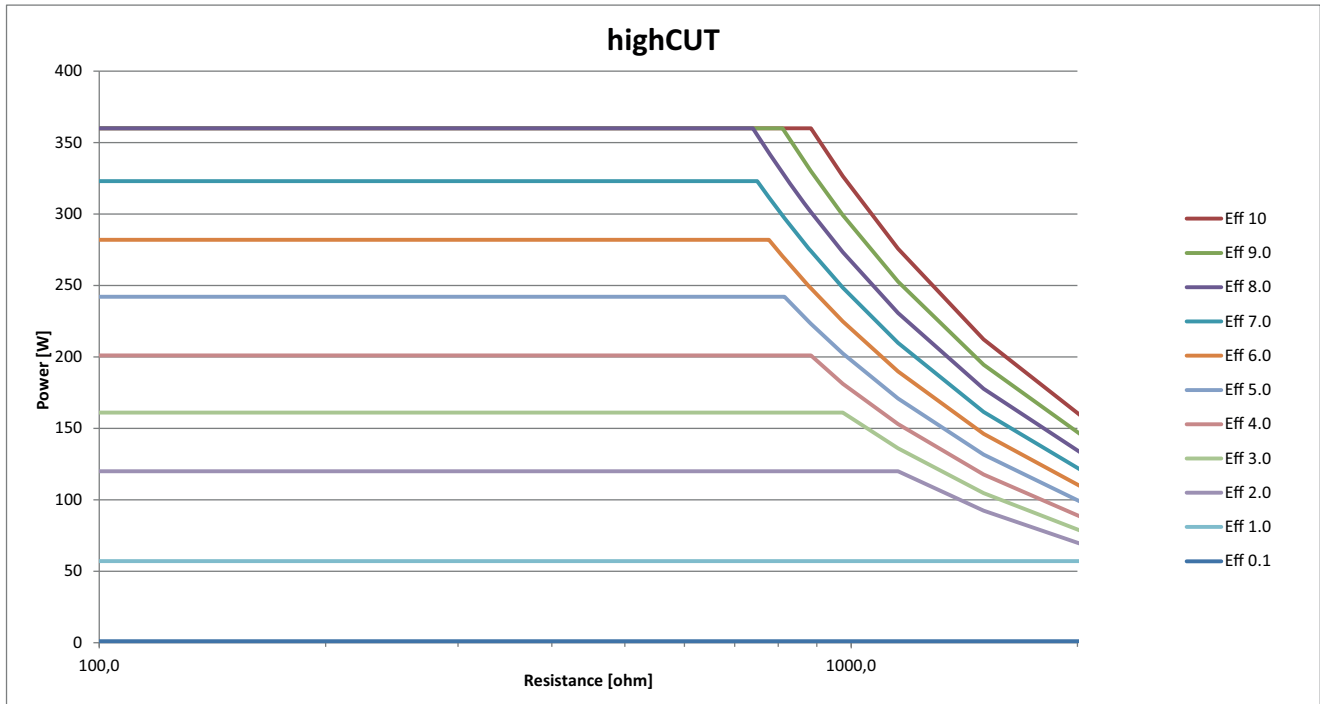| Type of HF voltage	Unmodulated sinusoidal AC voltage
Nominal frequency	350 kHz (no load) ±10%
Crest factor	1.62 (at R_L = 300 Ohm)
Designed load resistance	300 Ohm
Max. HF peak voltage	1100 V
Number of effects	0.1 – 10.0
Consistency of effects	Automatic control of arc intensity
Max. output across the designed load resistor	400 watts

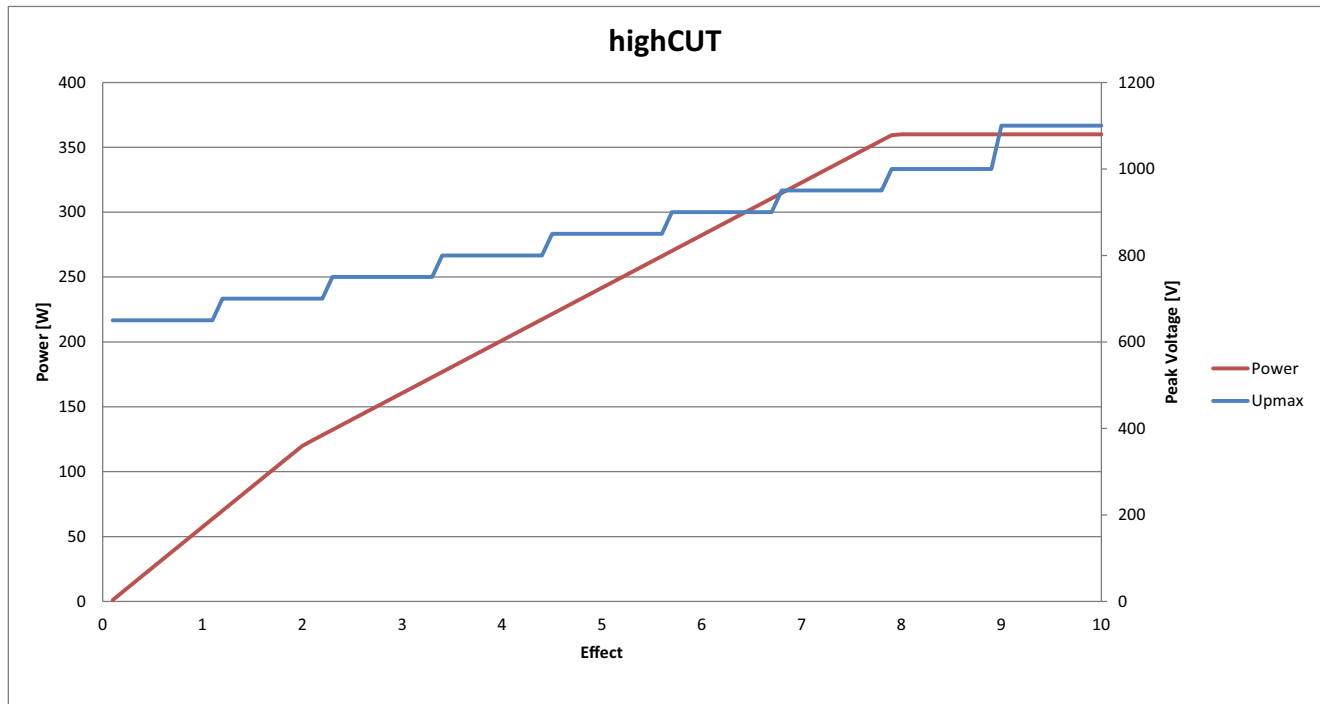## Diagrams

Fig. 13-3

Fig. 13-4

80114-601
03.16

dryCUT®

Properties Reproducible, slightly slower cut with pronounced hemostasis.

Areas of use For example, cuts in "open surgery" and cuts in endoscopic operations that require very good primary hemostasis during the cut and require a somewhat slower cutting speed.

Technical data

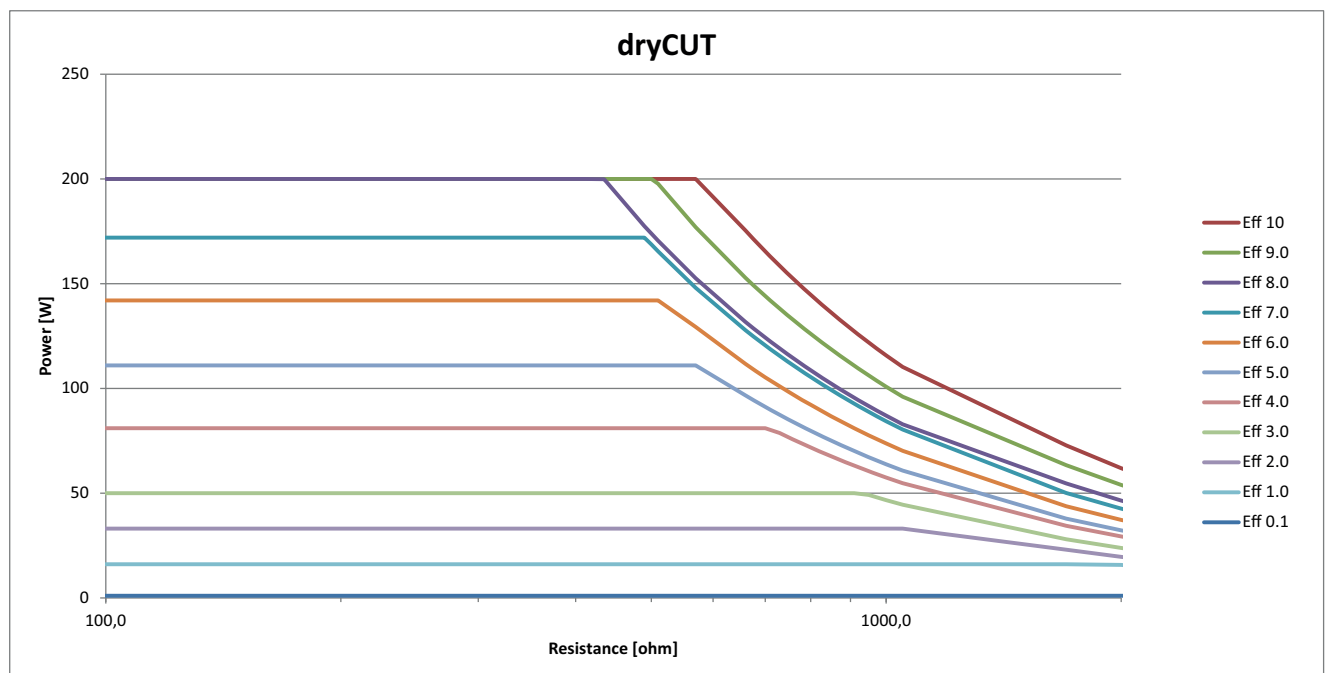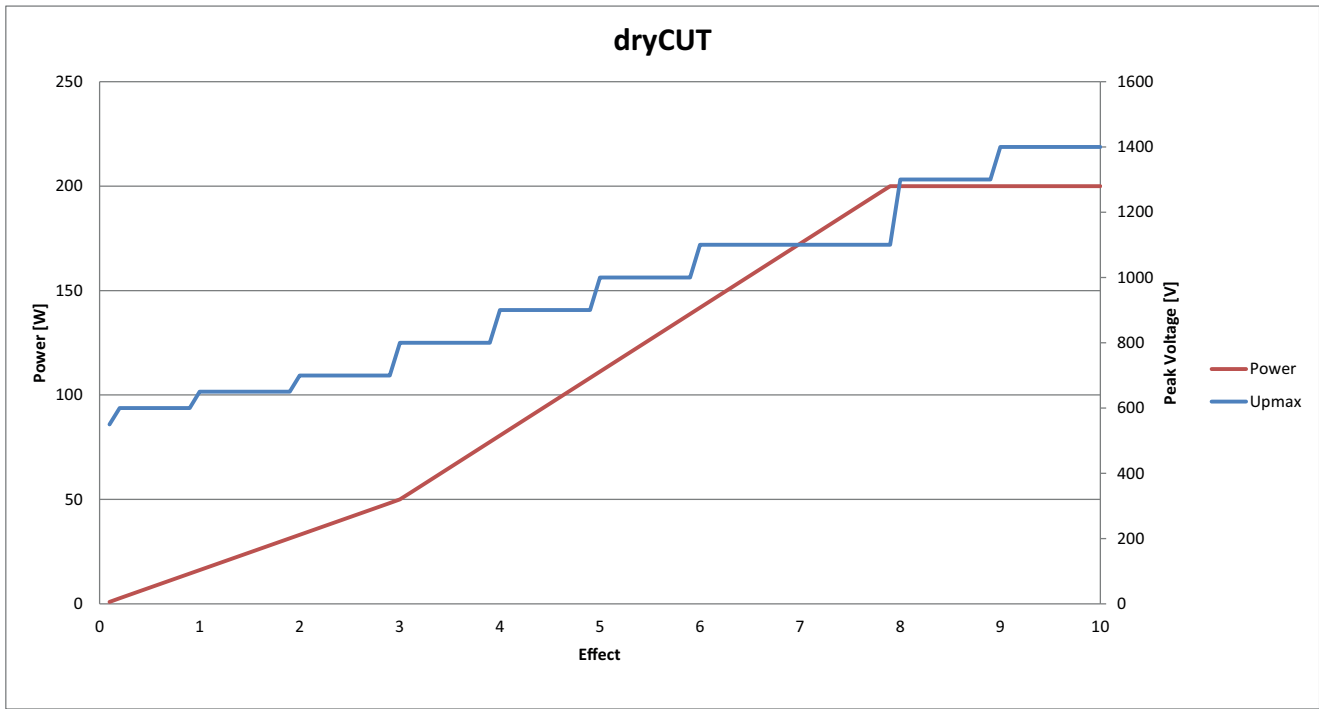| Type of HF voltage	Pulse-modulated sinusoidal AC voltage
Nominal frequency	350 kHz (no load) ±10%
Crest factor	Effect: 0.1 − 4.9: 3.1 (at R_L = 300 Ohm)
	Effect: 5.0 − 7.9: 3.38 (at R_L = 300 Ohm)
	Effect: 8.0 − 10.0: 3.8 (at R_L = 300 Ohm)
Designed load resistance	300 Ohm
Max. HF peak voltage	1400 V
Number of effects	0.1 − 10.0
Consistency of effects	Automatic control of HF peak voltage
Max. output across the designed load resistor	240 watts

Diagrams

Fig. 13-5

Fig. 13-6

softCOAG®

Properties	Slow, deep coagulation without spark generation, consequently no carbonization of the tissue. Adhesion of the electrode to the tissue is greatly reduced.
Areas of use	All surgical procedures that call for safe, "deep" coagulation or in which adhesion of the electrode would have a negative effect on the coagulation process.
AUTO STOP switchable	AUTO STOP ends activation automatically on attainment of sufficient desiccation. Touch the arrow on the lower edge of the main screen if required. The *Assign activation type* field opens. Drag the AUTO STOP symbol to the docking point of the required instrument.
QuickStart switchable	With QuickStart, a brief voltage pulse is applied to the tissue to attain a tissue effect quicker, without essentially influencing the coagulation result.

Technical data

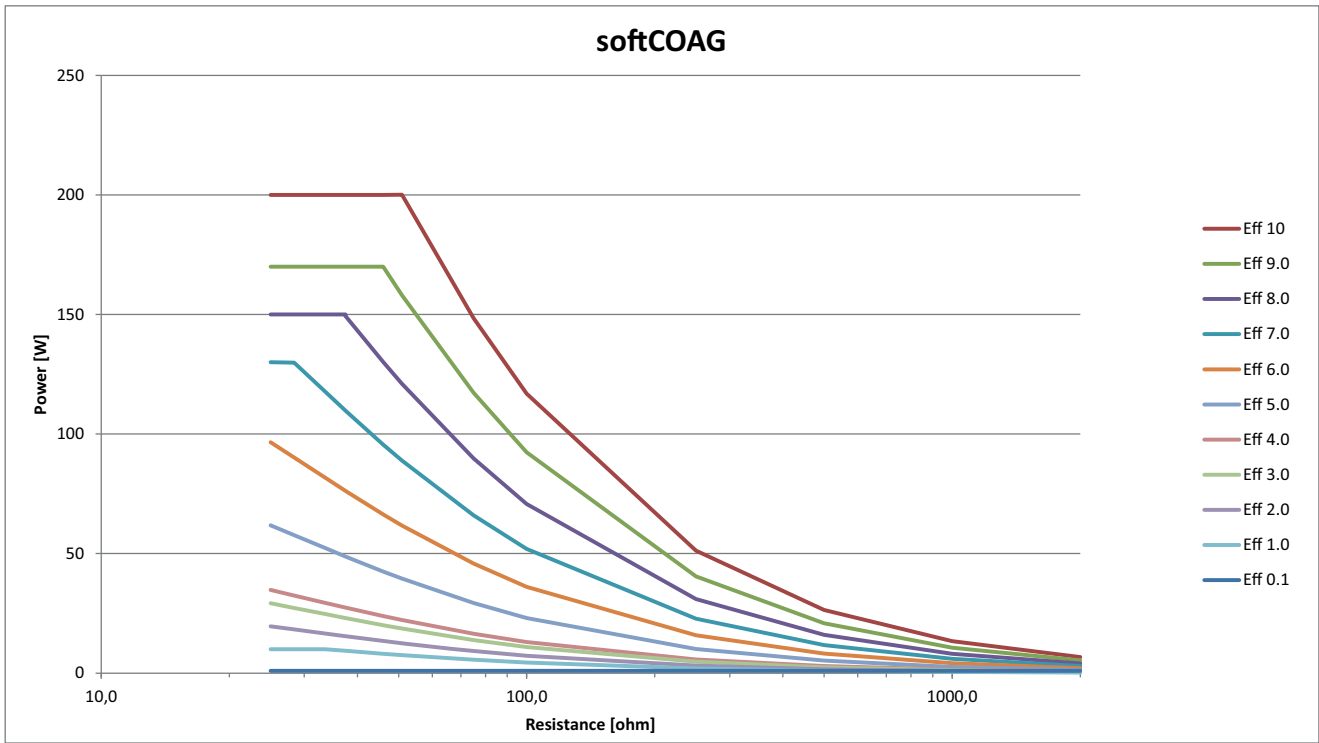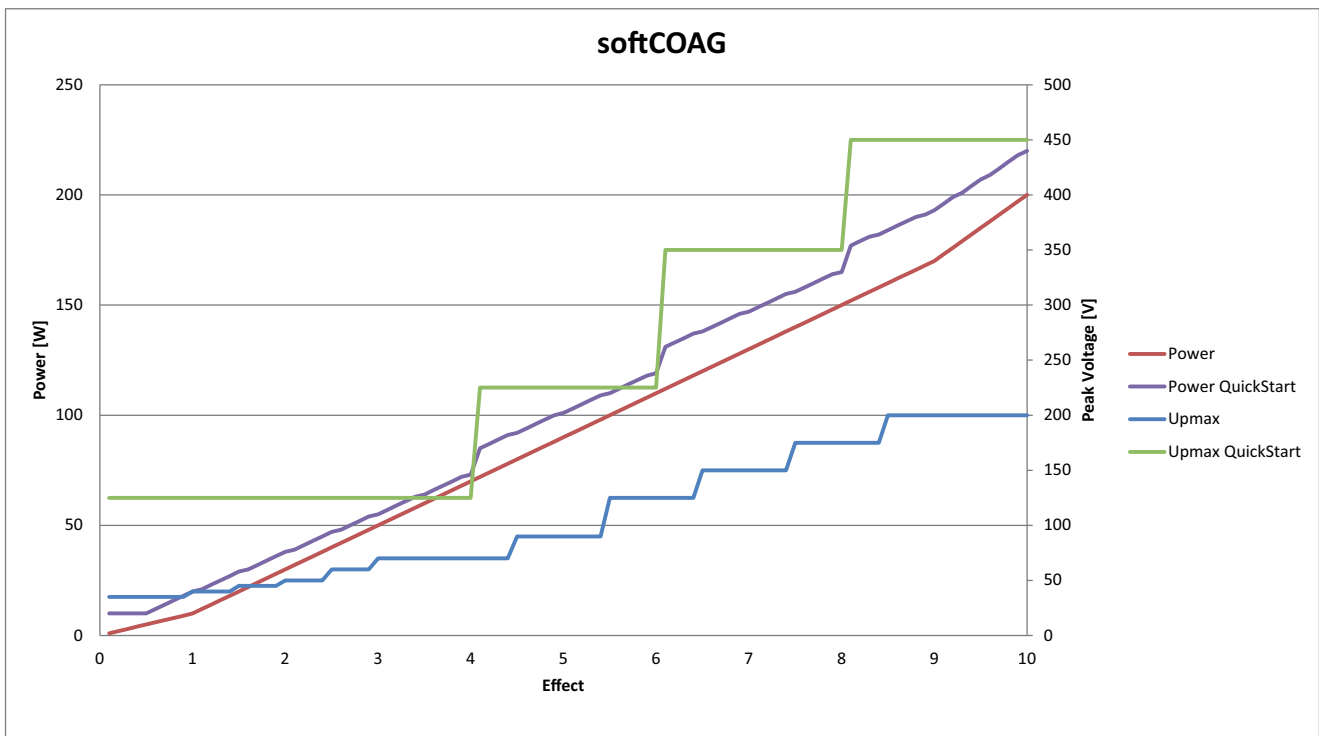| Type of HF voltage	Unmodulated sinusoidal AC voltage
Nominal frequency	350 kHz (no load) ±10%
Crest factor	1.52 (at R_L = 25 Ohm)
Designed load resistance	25 Ohm
Max. HF peak voltage	200 V 450 V QuickStart
Number of effects	0.1 − 10.0
Consistency of effects	Automatic control of HF peak voltage
Max. output across the designed load resistor	240 watts

Diagrams

Fig. 13-7

Fig. 13-8

forcedCOAG®

Properties	Effective, fast "standard" coagulation.
Areas of use	Contact coagulation, clamp coagulation, e.g. via insulated monopolar forceps.
AUTO STOP switchable	On detection of a spark, adhesion of tissue to the instrument and carbonization is significantly reduced by automatically switching off.
	Touch the arrow on the lower edge of the main screen if required. The *Assign activation type* field opens. Drag the AUTO STOP symbol to the docking point of the required instrument.

Technical data

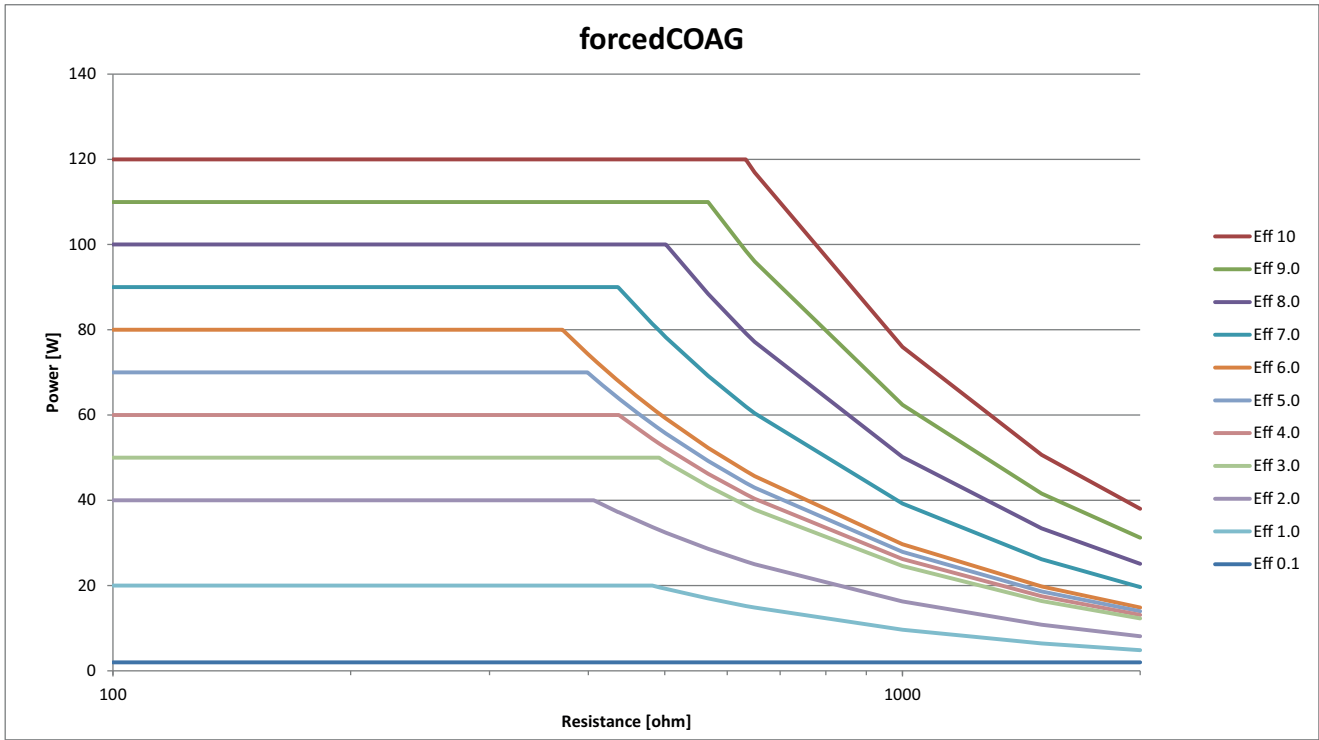| Type of HF voltage	Pulse-modulated sinusoidal AC voltage
Nominal frequency	350 kHz (no load) ±10%
Crest factor	5.8 (at R_L = 300 Ohm)
Designed load resistance	300 Ohm
Max. HF peak voltage	1800 V
Number of effects	0.1 − 10.0
Consistency of effects	Automatic control of HF peak voltage
Max. output across the designed load resistor	144 watts

Diagrams

Fig. 13-9
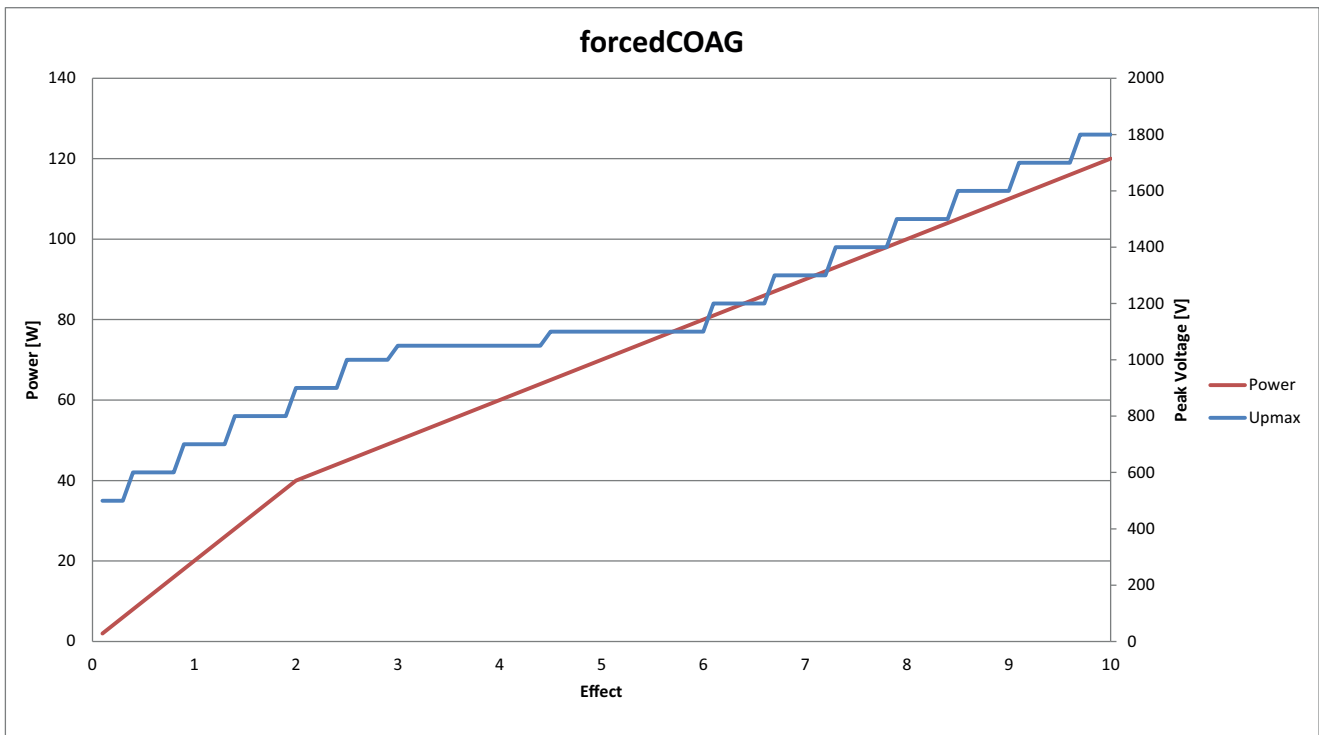

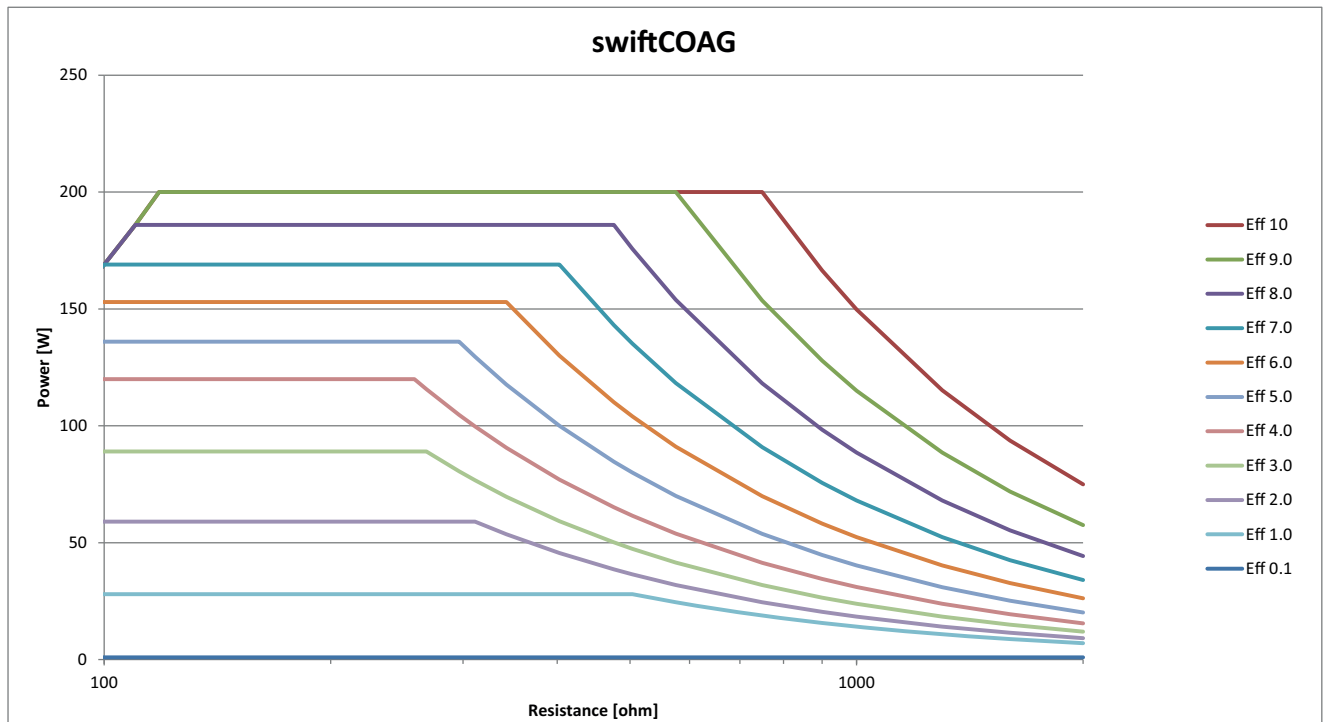Fig. 13-10

swiftCOAG®

Properties Fast, effective coagulation, which is highly suitable for preparation with high hemostasis owing to its limited tissue-cutting property.

Areas of use Coagulation and preparation.

Technical data

Type of HF voltage	Pulse-modulated sinusoidal AC voltage
Nominal frequency	350 kHz (no load) ±10%
Crest factor	6.0 (at R_L = 200 Ohm)
Designed load resistance	200 Ohm
Max. HF peak voltage	2500 V
Number of effects	0.1 − 10.0
Consistency of effects	Automatic control of HF peak voltage
Max. output across the designed load resistor	240 watts

Diagrams

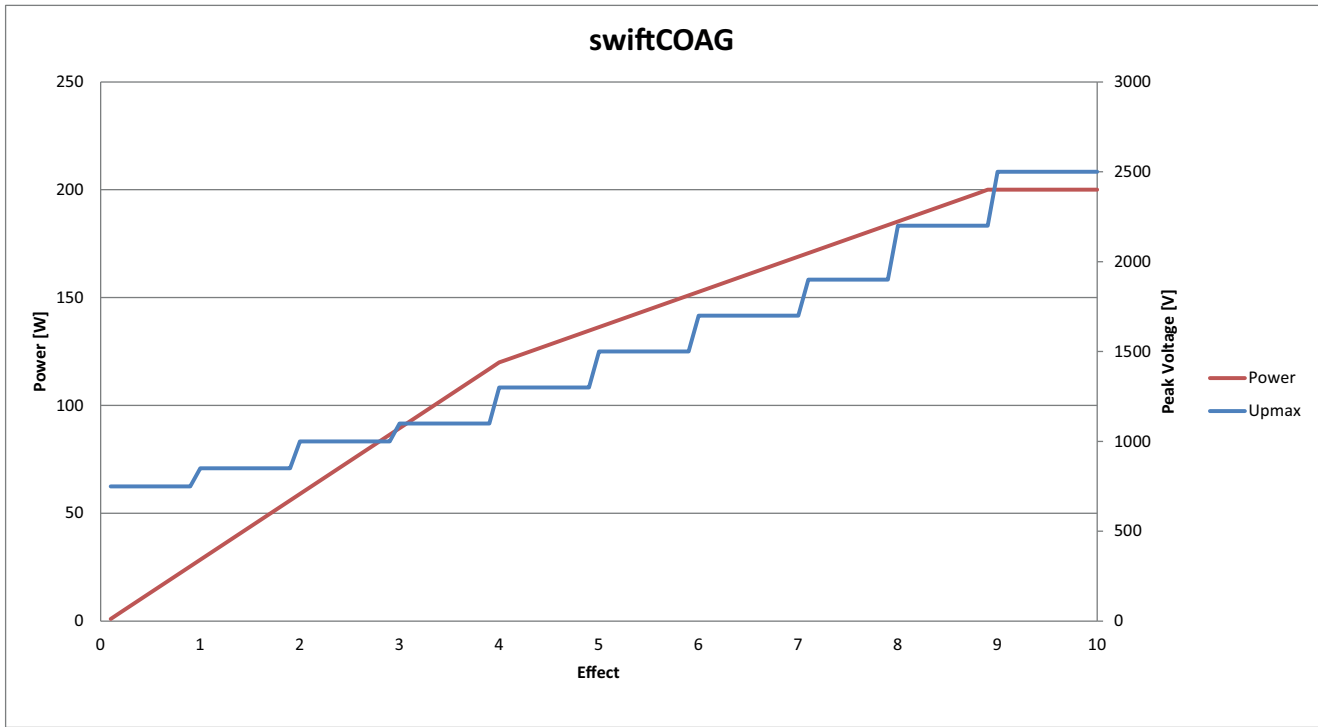Fig. 13-11

Fig. 13-12

80114-601
03.16

preciseSECT

Properties	Fast, effective coagulation, with limited tissue-cutting property. Optimized preparation characteristics through dynamic adaptation of modulation.
Areas of use	Coagulation, clamp coagulation and preparation

Technical data

Type of HF voltage	Pulse-modulated sinusoidal AC voltage
Nominal frequency	350 kHz (no load) ±10%
Crest factor	4.0 (at R_L = 300 Ohm)
Designed load resistance	300 Ohm
Max. HF peak voltage	1800 V
Number of effects	0.1 − 10.0
Consistency of effects	Automatic control of HF peak voltage
Max. output across the designed load resistor	144 watts

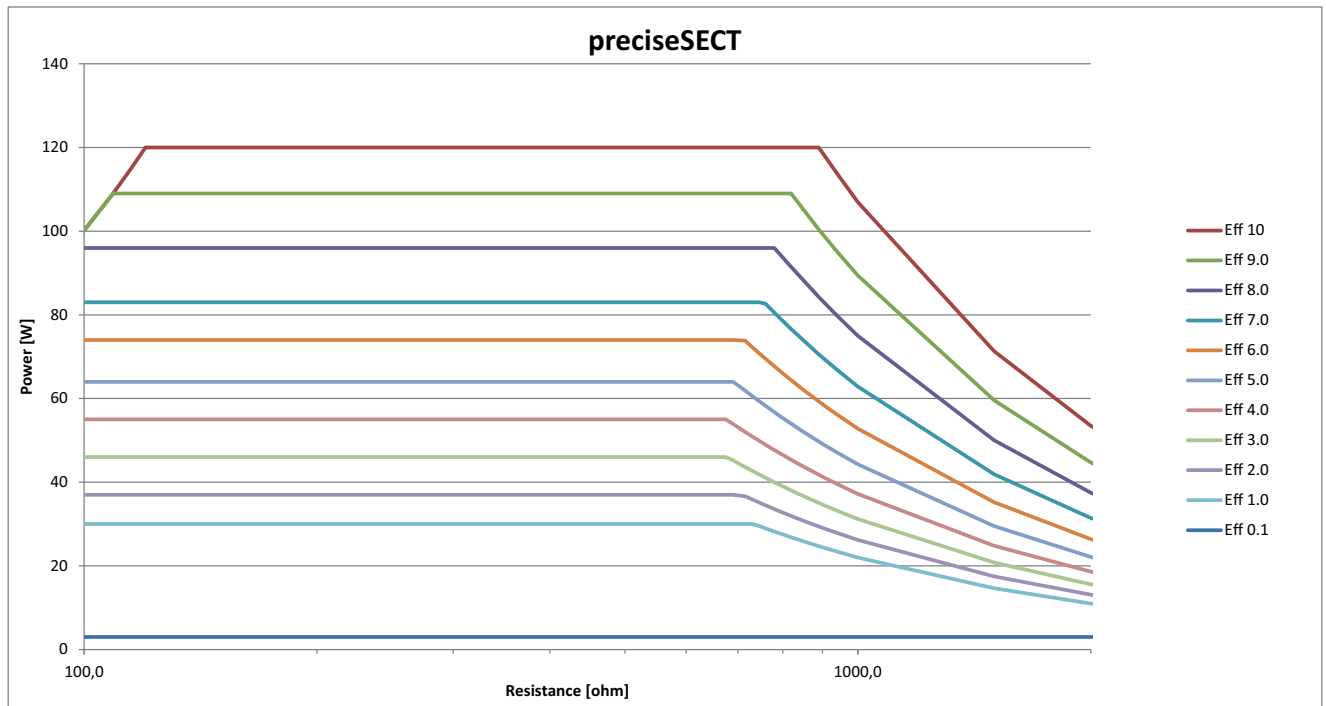**Diagrams**

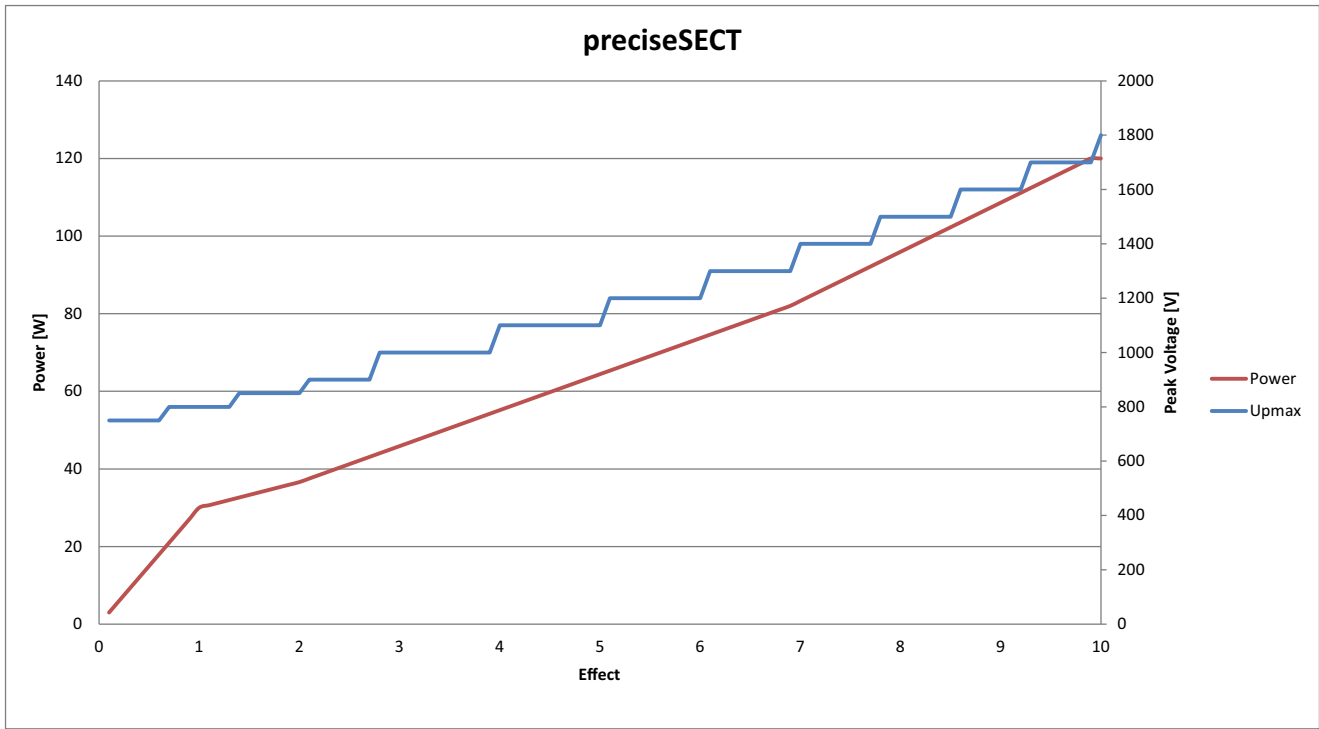

Fig. 13-13

80114-601
03.16

Fig. 13-14

80114-601
03.16

twinCOAG®

Properties

Fast, effective coagulation, which is highly suitable for preparation with high hemo-stasis owing to its limited tissue-cutting property. Two monopolar instruments can be activated at the same time.

WARNING! In the twinCOAG mode, the output power of any of the active electrodes can change.

Areas of use

Coagulation and preparation with simultaneous activation

Technical data

Type of HF voltage	Pulse-modulated sinusoidal AC voltage
Nominal frequency	350 kHz (no load) ±10%
Crest factor	5.9 (at R_L = 150 Ohm)
Designed load resistance	150 Ohm
Max. HF peak voltage	2000 V
Number of effects	0.1 − 10.0
Consistency of effects	Automatic control of HF peak voltage
Max. output across the designed load resistor	240 watts

Diagrams

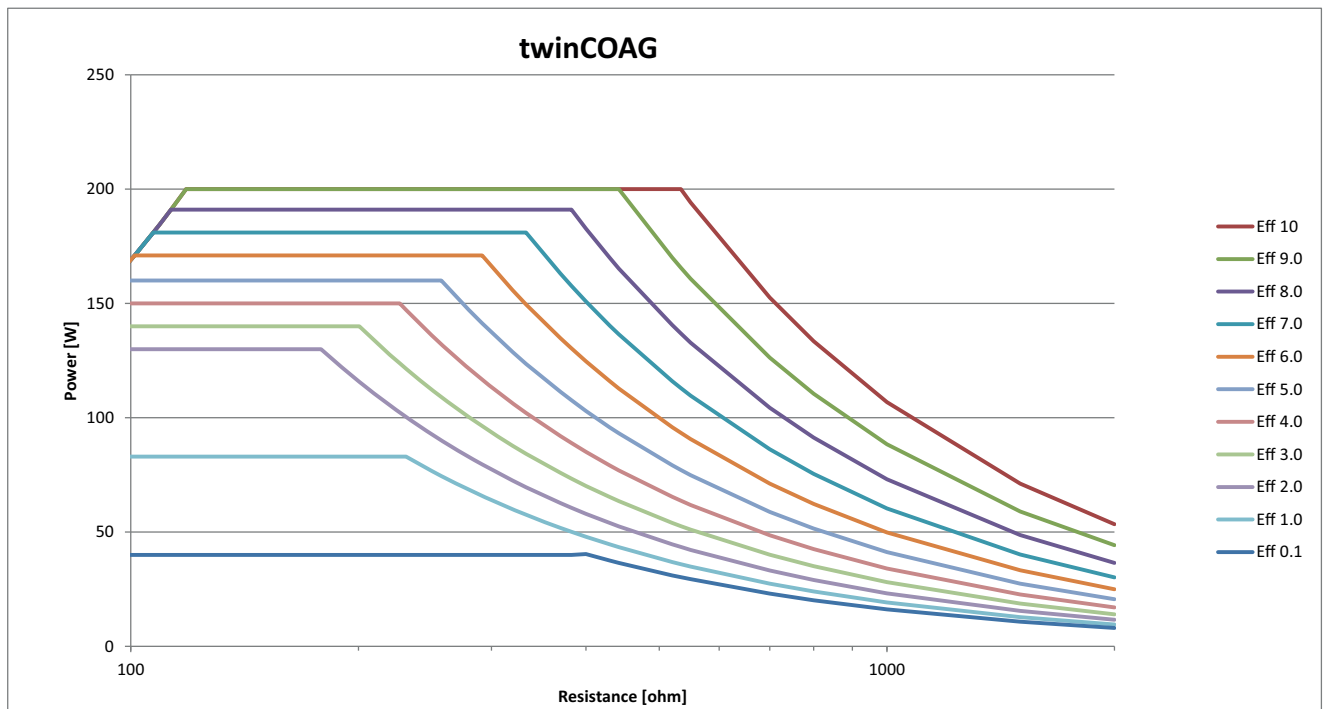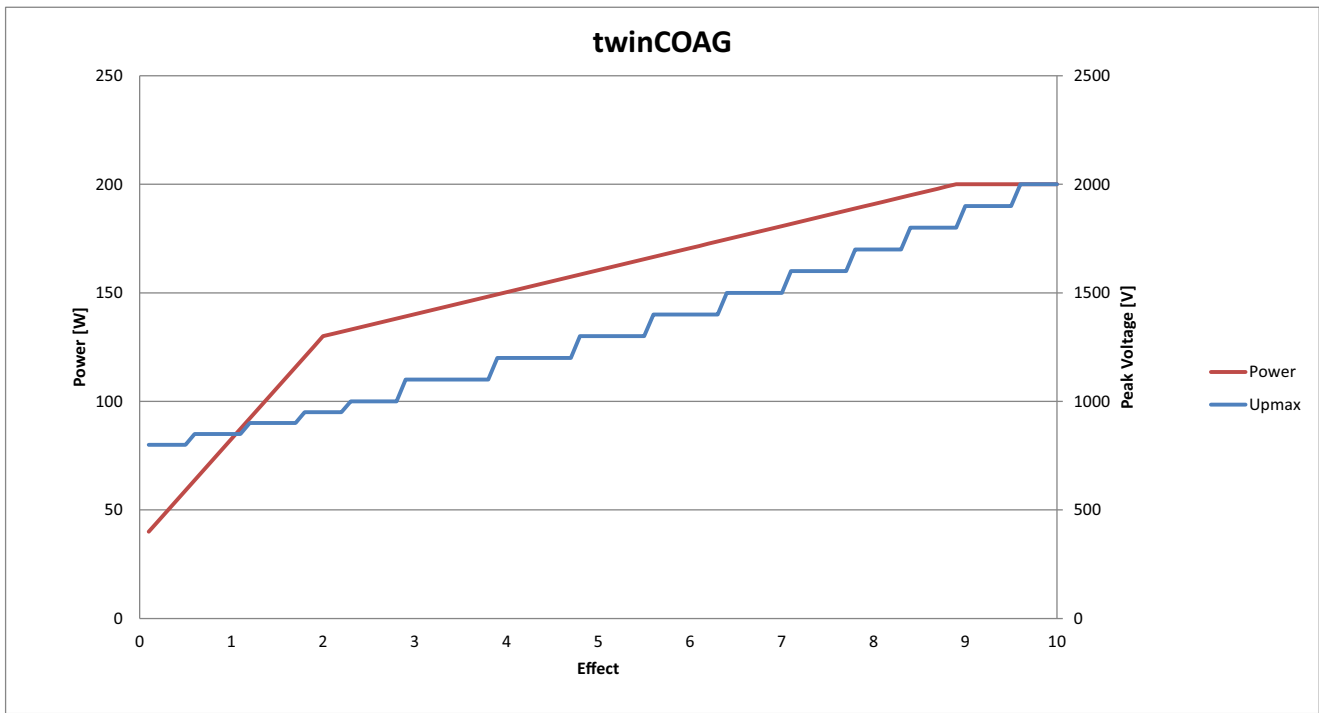Fig. 13-15

80114-601
03.16

Fig. 13-16

Chapter 14
Installation

Ambient conditions

⚠ WARNING

Ignition of anesthetics, skin cleansers, and disinfectants in potentially explosive atmospheres

If you place the device in a potentially explosive atmosphere, anesthetics, skin cleansers, and disinfectants can ignite.

Risk of fire and explosion to the patient and medical personnel! Risk of damage to property.

⇨ Do not place the device in potentially explosive atmospheres.

NOTICE

Interference with the unit by portable and mobile HF communication devices (e.g. mobile phones, WLAN equipment)

Electromagnetic waves emitted by portable and mobile HF communication devices can effect the unit.

The unit may fail or not perform properly.

⇨ Please see the table "Recommended separation distances between portable and mobile HF communications equipment and the equipment" at the end of this User Manual.

NOTICE

Unsuitable temperature or level of humidity during operation

If you operate the equipment at an unsuitable temperature or level of humidity, it may sustain damage, fail, or not perform properly.

⇨ Operate the equipment at a suitable temperature and level of humidity. You will find the tolerances for temperature and humidity in the Technical Data.

⇨ If other ambient conditions must be observed for operation of the equipment, you will also find them in the Technical Data.

NOTICE

Unsuitable temperature or humidity in transit or storage

If you transport or store the equipment at an unsuitable temperature or level of humidity, it may sustain damage and fail.

⇨ Transport and store the equipment at a suitable temperature and level of humidity. You will find the tolerances for temperature and humidity in the Technical Data.

⇨ If other ambient conditions must be observed for transport and storage of the equipment, you will also find them in the Technical Data.

NOTICE

Insufficient acclimatization time, unsuitable temperature during acclimatization

If the device was stored or transported below or above a certain temperature, it will take a certain time and temperature to acclimatize.

If you do not observe the rules, the device can sustain damage and fail.

⇨ Acclimatize the device according to the rules in the Technical Data.

NOTICE

Overheating of the device due to poor ventilation

If ventilation is poor, the device can overheat, sustain damage, and fail.

⇨ Install the device in such a way that there is an unobstructed circulation of air around the housing. Installation in confined wall recesses is prohibited.

NOTICE

Penetration of liquid into the device

The housing is not absolutely watertight. If liquid penetrates, the device can sustain damage and fail.

⇨ Make sure no liquid can penetrate the device.

⇨ Do not place vessels containing liquids on top of the device.

Electrical installation

⚠ WARNING

Defective grounded power outlet, power supply network without proper grounding, inferior-quality power cord, incorrect line voltage, multiple power outlets, extension cords

Risk of electric shock and other injuries to the patient and medical personnel! Risk of damage to property.

⇨ Connect the unit / the equipment cart to a properly installed grounded power outlet.

⇨ Only connect the unit to a power supply network with proper grounding.

⇨ Only use the Erbe power cord or an equivalent power cord for this purpose. The power cord must bear the applicable national test symbol.

⇨ Check the power cord for damage. You must not use a damaged power cord.

⇨ The supply voltage must match the voltage specified on the unit's rating plate.

⇨ Do not use multiple power outlets.

⇨ Do not use extension cords.

80114-601
03.16