

WATERJET SURGERY

ERBEJET® 2

**A NEW DIMENSION IN WATERJET SURGERY:  
THE ERBEJET® 2 IN THE VIO SYSTEM.**



**ERBE**

JET 2



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*Perfection for Life*

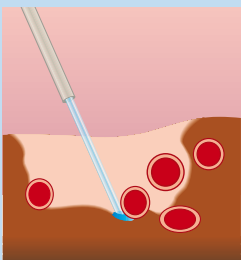
# WATERJET SURGERY – A SPARING OPERATIVE PROCEDURE.



Biological tissue such as organs, connective tissue, vessels or nerves can have very different cellular structures. Waterjet surgery, a new form of dissection which has been successfully used since several years, separates the different tissue types with their varying elasticity and firmness, with the help of precisely adjusted water pressure. The kinetic energy of the waterjet carefully separates the layers of tissue.

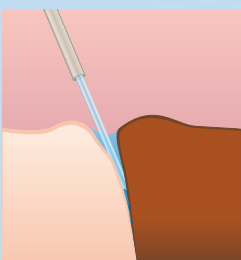
In hepatic surgery, for example, the procedure selectively differentiates between liver parenchyma, blood vessels and bile ducts. Soft parenchymal tissue is washed out, while the network of blood vessels is preserved and can be subsequently treated with little loss of blood. The operative time is reduced. In urology the selectivity of the waterjet is used to dissect the prostate from its surrounding tissue. Due to the physical properties of biological tissue the jet dissects precisely and anatomically along the margins between the different tissue structures.

The advantages of the waterjet procedure which range from tissue selectivity to minimal blood loss open up many different areas of application in almost all surgical specialties (cf. pages 4 and 5).



## Selectivity

Blood vessels and nerves are preserved due to predefined water pressures, while the surrounding tissue is selectively dissected (example taken from hepatic surgery).



## Expansion effect

Separation of tissue layers, e.g. in radical prostatectomies.



## Advantages of waterjet surgery at a glance



- ✦ Shorter operating times
- ✦ Spares blood vessels, nerves and organs
- ✦ Minimized bleeding, controlled management of bleeding
- ✦ High degree of tissue selectivity during preparation and dissection of tissue layers
- ✦ Precise and intact margins along the line of dissection, no necrosis of the margins
- ✦ Good visibility at the operative site due to integrated irrigation and suction

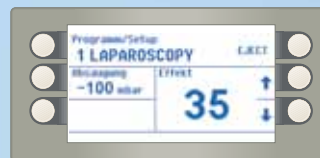
# ERBEJET® 2 – THE NEW SYSTEMS CONCEPT.



## A powerful team – The waterjet and the electrosurgical workstation

The ERBEJET 2 was developed to be compatible with the ERBE VIO, with respect to both its size and functionality. It can be utilized either as a module of the VIO system or as an autonomous unit on a cart or on suspension arm system to save space in the operating room. A combination of the two surgical procedures both electrosurgery and waterjet surgery offers the following advantages

- ✦ Shorter operating times as no change of instruments is required
- ✦ Both systems can be accommodated within a very small space
- ✦ Transfer of data via the ECB (ERBE Communication Bus)



### Simple operation via the display

The ERBEJET 2 has an easy-to-operate user interface. The parameters can be adjusted according to the individual indications and saved in 9 different program settings. The impact of the waterjet is available as finely adjustable steps which create reproducible dissection results. And the setting can even be altered during activation. The interface of the ERBEJET 2 is also used to enter the settings for the suction module ESM 2.



The **pump unit** of the ERBEJET 2 allows continuous application of the waterjet.



### Separating medium

The separating medium is a sterile saline solution. It is connected to the system in the form of standard infusion containers.

### ESM 2 Suction module

The type of activation and the degree of suction of the ESM 2 are adjusted via the interface of the ERBEJET 2. Activation occurs either simultaneous to the application of the waterjet or is switched on as required using the foot switch. The suction pump can be programmed to continue running for a certain time after waterjet is no longer activated. This ensures a good visibility at the operative site even after the waterjet has been deactivated.

Activation is carried out via the foot switch with the ReMode function, which allows the unit settings to be controlled straight from the operating table.

# RANGE OF APPLICATIONS FOR THE ERBEJET® 2.



## HEPATIC SURGERY



During resection of the liver the blood vessels and bile ducts are prepared and washed free of surrounding tissue. Depending on their size, they can then be either coagulated or selectively treated using a ligature/clip. The time required for the intervention is shorter than that of comparable surgical interventions and is reduced even more by the simultaneous use of electrosurgery. The intraoperative blood loss is also reduced and thus the transfusion requirements are also lower. A cross-clamping of the blood supply to the organ (Pringle maneuver) is generally not necessary.

### Additional advantages:

- ✦ Intact, precise margins of dissection
- ✦ Application possible in both laparoscopic and open surgery

## UROLOGY



The selectivity of the waterjet reduces the risk of sexual dysfunction and/or urinary incontinence in prostatectomy procedures. Blood vessels and nerve cords remain largely intact during resection of the prostate.

As with hepatic surgery, when the waterjet is used to carry out a partial nephrectomy this does not lead to necrosis of the resection margins. This helps retain as much of the organ's functionality as possible. The renal blood vessels are selectively dissected and can subsequently be treated individually.

### Additional advantages:

- ✦ Minimized blood loss, less transfusion requirements
- ✦ Distinctly shorter operating times
- ✦ Lower rate of complications

## COLON SURGERY



Total mesorectal excision (TME) is another procedure which benefits from the advantages of conserving tissue structures. The selective vessel-sparing dissection of the mesorectum layer by layer reduces postoperative urinary incontinence and sexual dysfunction.

### Additional advantages:

- ✦ Preservation of blood vessels and nerve structures
- ✦ Better visibility in situ due to gentler preparation

## GASTROENTEROLOGY



- \* Endoscopic submucosal dissection
- \*\* Endoscopic mucosal resection

More safety during ESD\* and EMR\*\* procedures with waterjet elevation of the mucosa. The separation medium creates a submucosal fluid cushion, elevating the mucosal lesion (e.g. early carcinoma). This tissue elevation offers both mechanical and thermal protection during resection.

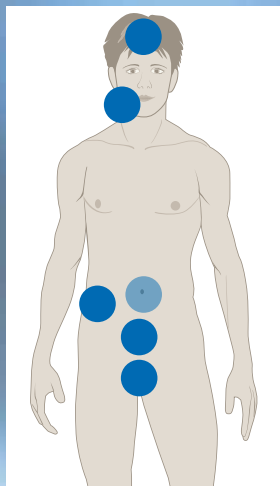
The instrument for ESD procedures: HybridKnife – offering both electrosurgical and waterjet surgery functions. All four steps of the resection procedure: marking of the lesion, elevation, incision/dissection, and coagulation – can be performed without a change of instruments.

### Additional advantages:

- ✦ Safe resection, as the separation medium can be replenished at any time
- ✦ Selective elevation of mucosal layers

### The advantages of the ERBEJET 2

- ✦ Simple, handy and easy-to-use system
- ✦ Easy to integrate, compatible with existing systems
- ✦ Can be combined with the VIO electro-surgical system
- ✦ No thermal trauma to the margins of the incision, the surrounding tissue is left intact
- ✦ Extremely uniform waterjet; delicate, precise and reproducible effects
- ✦ Integrated suction with individually adjustable run-on time
- ✦ Ergonomically designed single-use instruments for immediate use in the operating room
- ✦ Foot switch with ReMode function: remote control straight from the operating table
- ✦ Programs can be individually stored



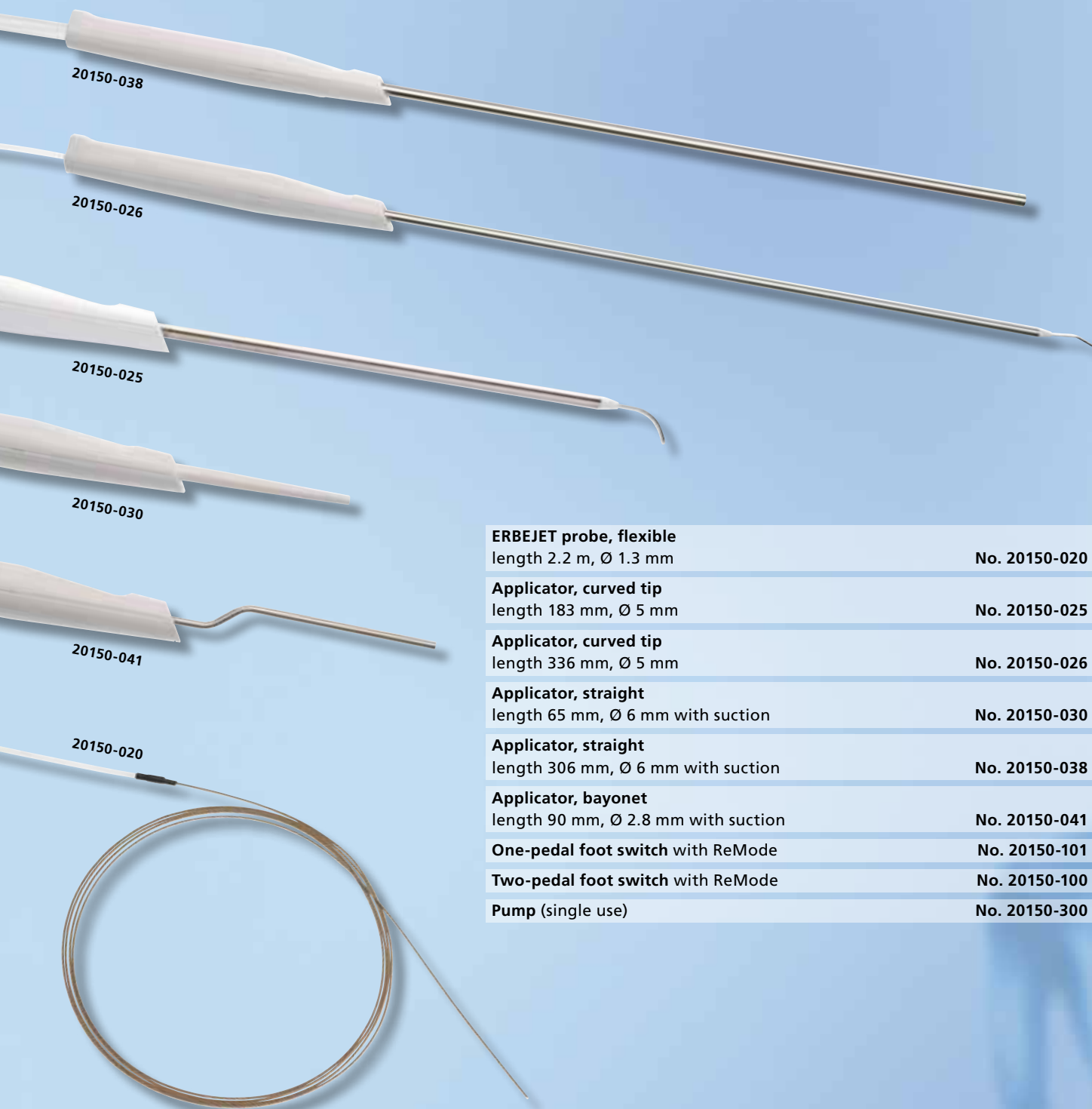
Areas of application for the ERBEJET 2.

# RIGID AND FLEXIBLE APPLICATORS. FOR OPEN SURGERY AND LAPAROSCOPIC INTERVENTIONS.



The applicators of the ERBEJET 2 are available as sterile single-use instruments. They can be used immediately and offer consistently high standards of quality and safety. Their ergonomic shape and the length of the tubing allow the physician to operate comfortably with a great degree of freedom.

The range of instruments includes both instruments for open surgery and for laparoscopic surgery – with different shaft lengths and shapes.



<b>ERBEJET probe, flexible</b> length 2.2 m, Ø 1.3 mm	<b>No. 20150-020</b>
<b>Applicator, curved tip</b> length 183 mm, Ø 5 mm	<b>No. 20150-025</b>
<b>Applicator, curved tip</b> length 336 mm, Ø 5 mm	<b>No. 20150-026</b>
<b>Applicator, straight</b> length 65 mm, Ø 6 mm with suction	<b>No. 20150-030</b>
<b>Applicator, straight</b> length 306 mm, Ø 6 mm with suction	<b>No. 20150-038</b>
<b>Applicator, bayonet</b> length 90 mm, Ø 2.8 mm with suction	<b>No. 20150-041</b>
<b>One-pedal foot switch with ReMode</b>	<b>No. 20150-101</b>
<b>Two-pedal foot switch with ReMode</b>	<b>No. 20150-100</b>
<b>Pump (single use)</b>	<b>No. 20150-300</b>

# TECHNICAL DATA.



<b>ERBEJET 2</b>	<b>No. 10150-000</b>
Supply voltage	120–240 V
Mains current	0,4–1,2 A
Frequency	50 Hz/60 Hz
Mains fuse	2 x T 3,15 A
Pressure generation	Sterile single-use double piston pump
Pressure range with 120µm jet nozzle (± 20%)	1–80 bar (100–8000 kPa)
Volume flow (±10%)	1–55 ml/min
Effect settings	Parameters adjusted according to individual specifications with storage space for 9 program settings
Activation	Foot switch
Width x Height x Depth	410 mm x 130 mm x 370 mm
Weight	11 kg
Separation medium	Sterile physiological saline solution
Jet nozzle diameter of the applicators	120 µm

<b>ESM 2 Suction module</b>	<b>No. 10340-000</b>
Max. negative pressure (± 50 mbar)	Adjustable from –100 to –800 mbar (sea level)
Suction capacity (± 10%)	Depends on the setting of max. negative pressure max. 25 l/min

<b>Classification of ERBEJET 2 and ESM 2</b>	
Protective class acc. to EN 60 601-1	I
Type acc. to EN 60 601-1	CF
Class acc. to the EC-Directive 93/42/EEC	IIb



**ELECTROSURGERY**  
**VESSEL SEALING**  
**ARGON-PLASMA COAGULATION**  
**CRYOSURGERY**  
**WATERJET SURGERY**

**ERBE Elektromedizin GmbH**  
**Waldhoernlestrasse 17**  
**72072 Tuebingen**  
**Germany**  
**Phone +49 7071 755-0**  
**Fax +49 7071 755-179**  
**[sales@erbe-med.de](mailto:sales@erbe-med.de)**  
**[www.erbe-med.com](http://www.erbe-med.com)**



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