



# LYSISTECH<sup>®</sup>

NEUROMEDICINE

RF-PLASMA TREATMENT DIVISION



**ABOUT US:**

Lysistech AG and its partners strive for innovative development, production and marketing of medical equipment, especially laser systems and radio-frequency systems for minimally invasive surgery. Our products range from generators to the corresponding fibre-optic laser probes and radio-frequency (RF) plasma electrodes.

As one of the leading providers of the most diverse and wide-ranging laser and RF therapies, the Lysistech is particularly committed to the constant development and improvement of medical treatment techniques, giving top priority to safety and cost-efficiency.

With premium-quality laser and RF systems and all the related equipment, Lysistech gives you the opportunity to broaden and optimise the range of treatments you offer in order to ensure the highest levels of patient satisfaction. Lysistech offers you unique solutions that allow you to focus fully on the treatment of your patients.

**WHY LYSISTECH?**

*Lysistech stands for the solution (or lysis) of medical challenges.*

-Product Development Team at Lysistech-

Our clients' satisfaction is the main focus of all our actions. Along with our suppliers, we ensure that all our products are always of excellent quality.

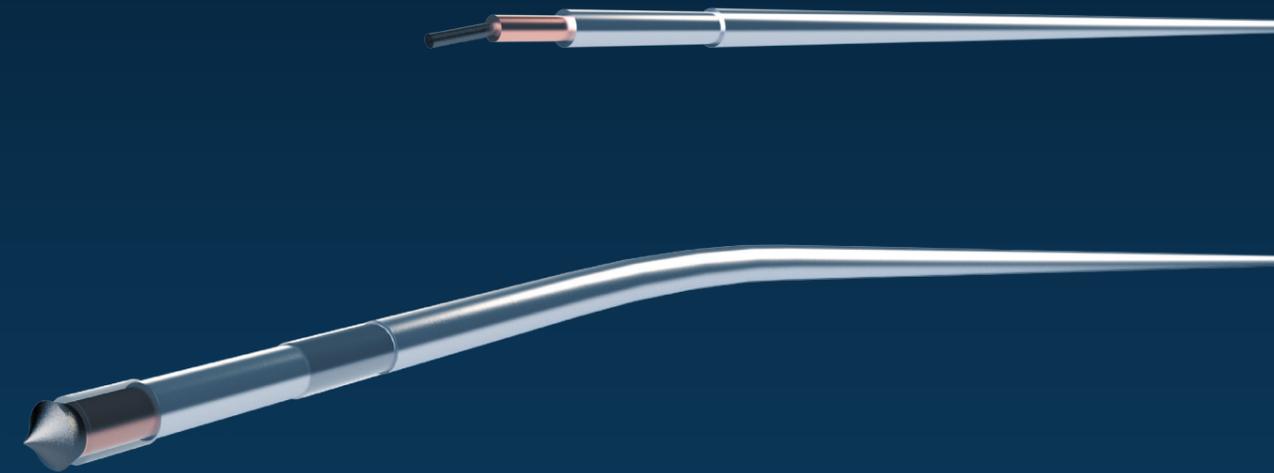
Based on this deep cooperation, we are able to adjust our products to the individual requirements of our partner hospitals, consistently optimising the user-friendliness and effectiveness of our treatments. This approach allows us to continually set new milestones in the area of minimally invasive surgery.

**Spine Medicine with our RF-Plasma Surgery Range**

The Technology ..... 1

Product Range ..... 3

Product Description ..... 4



# The Technology

## HOW PLASMA EXCISION WORKS

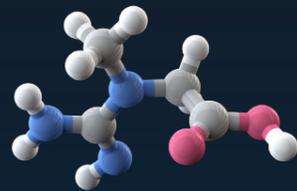
### Low-Temperature Plasma Excision

Plasma excision (RF-plasma ablation) is a controlled, non-thermally regulated procedure. Bipolar radio frequency (RF) energy is transmitted through a conductive medium (e.g. saline solution) to generate a precisely focused, charged plasma field. The plasma field has enough energy to break down the molecular bonds in the tissue. The tissue is disintegrated at relatively low temperatures (40 °C–70 °C).<sup>1</sup>

Since the RF current does not flow directly through the tissue during the ablation procedure, there is only minimal heating of the tissue. The result is volumetric ablation of the target tissue with minimal damage to the surrounding healthy tissue.

During the ablation, high voltage is applied to the electrically conductive fluid (e.g. saline solution), which is located between the electrode and the tissue. The high voltage converts the fluid into an ionised vapour layer (plasma).

The plasma contains ions in excited state that hit the tissue at a high speed and break down the molecular bonds. This results in the formation of simple molecules such as small hydrocarbons and gases, which are drawn off from the operation site through the plasma electrode using suction, effectively removing the tissue.



A typical large organic molecule (protein) before the ablation procedure with RF-plasma



The plasma field breaks breaks down molecular bonds, allowing controlled ablation

## POSSIBLE APPLICATIONS OF THE TECHNOLOGY IN THE SPINE

Over the last 50 years, clinical scientists have been trying to achieve percutaneous decompression in the spine using various techniques. Plasma excision for the volume reduction of the *nucleus pulposus*, aka Nucleoplasty, is a particularly successful treatment technique to relieve cervical and lumbar disc herniations. Based on a success rate of 80% and its 20-year applications, we intergrated our own nucleoplasty into our product range, to offer our clients the full potential of the RF-plasma technology.

CERVICAL DISC HERNIATION



LUMBAR DISC HERNIATION



# The Technology

## WHAT IS NUCLEOPLASTY?

*A proven treatment technique for symptomatic intervertebral disc protrusions*

Extensive studies over a period of almost 20 years have proven the effectiveness of nucleoplasty, which has the following characteristics:

- Controlled and localised ablation
- Tissue removal at low temperatures
- Effective spinal disc decompression
- Facilitates self-healing process through cytokine activation in the spinal disc



Intervertebral disc protrusion



LumbaLance electrode positioned to create ablation channels during lumbar nucleoplasty



The protrusion has reduced in size after the nucleoplasty

## OUR SYSTEM: Efficient 1

The Efficient 1 generator is one of the most dynamic systems on the RF therapy market. The systematic connection between our RF-plasma electrodes and Efficient 1 creates a powerful and responsive plasma layer for rapid ablation, which remains highly precise. The Efficient system provides a unique combination of features, designed for a smooth and trouble-free surgical procedure.

### System features:

- The single-electrode technology with Efficient 1 system generates a stable plasma layer, which allows controlled ablation with high precision.
- Controllable coagulation in the new Efficient range staunches severe haemorrhage sites while allowing better visibility.
- Automatic instrument protection in the new Efficient range automatically cuts off power in the immediate vicinity of metal objects, or in the event of contact with them. RF energy supply is restored only after a safe distance has been established between the instrument and the metal object.



### TECHNICAL FEATURES

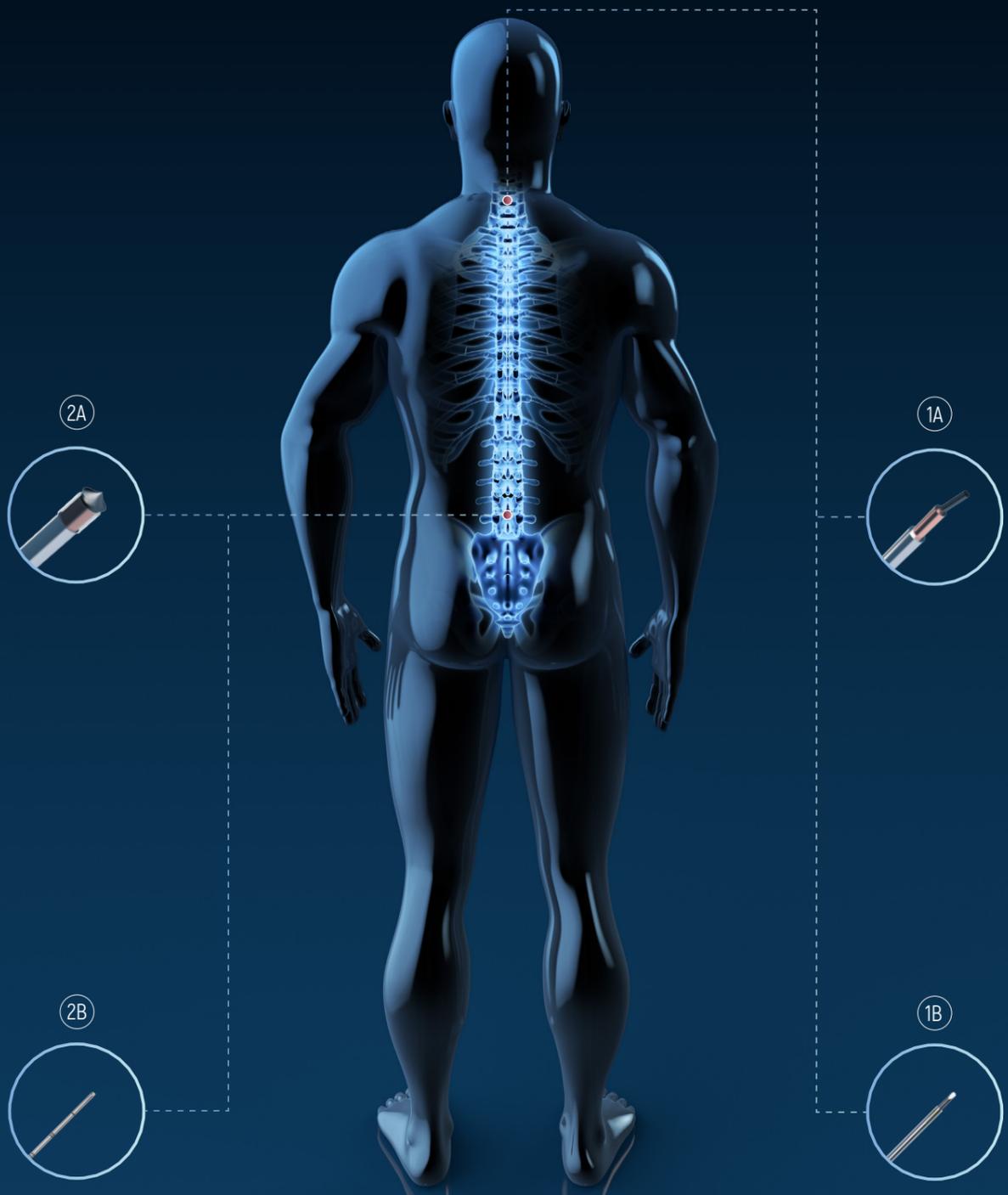
OUTPUT POWER	AC 220V/50 Hz
INPUT POWER	750 VA
POWER SETTINGS	1-10*
CONTROLLABLE COAGULATION	YES

\* For nucleoplasty, power setting 2 is recommended on the Efficient 1 system.

## OUR TREATMENT UNITS FOR THE CERVICAL AND LUMBAR DISCS

Using the slightly angled cervical electrode with a particularly stable active tip, tissue from the *nucleus pulposus* is gently and carefully ablated at low temperature, with limited collateral damage to the surrounding areas.

The patient is operated on in the supine position using an anterolateral approach from the right side.



**1A CervaLance** (Code LAC301)

- Active electrode bending angle: 12°
- Diameter: 0.91 mm
- Working length: 106 mm
- With integrated patient cable
- Designed for cervical disc herniation



**1B Cervical Introducer**

- Introducer Cannula with stylet
- 19 Gauge
- 76.9 mm

The electrode for treating the lumbar spine comes with a shaft diameter of 1.06 mm and a working length of 218 mm. The pressure of the intervertebral disc on the nerve roots is systematically relieved through gentle ablation of the *nucleus pulposus* tissue using plasma exision

The patient is operated on in prone position over a posterolateral approach.



**2A LumbaLance** (Code LAC302)

- Bending angle: 4°
- Diameter: 1.06 mm
- Working length: 218 mm
- With integrated patient cable
- Designed for lumbar disc herniation

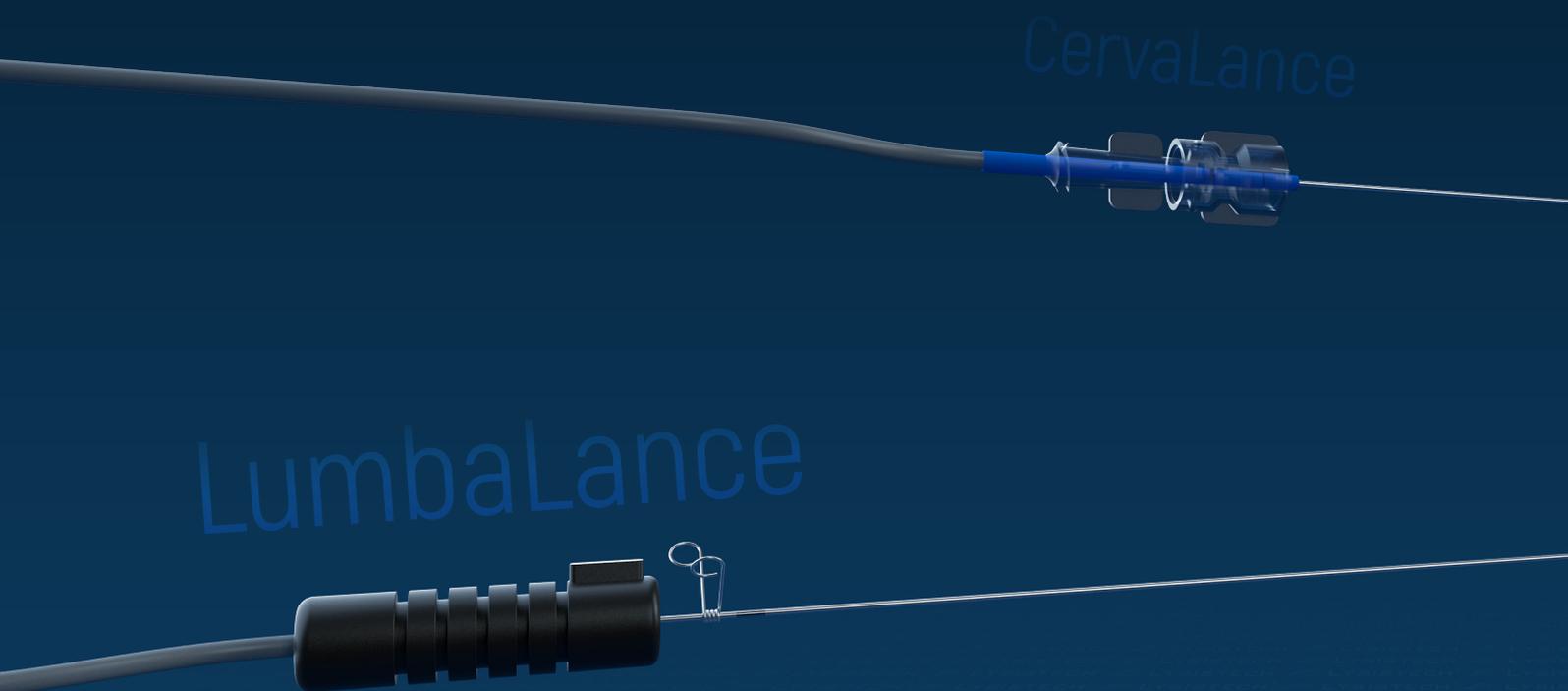


**2B Lumbar Introducer**

- Introducer Cannula with stylet
- 17 Gauge
- 152 mm

## References

1. Woloszko J, Stalder K, Brown I. Plasma Characteristics of Repetitively-Pulsed Electrical Discharges in Saline Solutions Used for Surgical Procedures. IEEE Trans Plasma Science, 30, 1376-1382, 2002.
2. Eichen, P. M., Achilles, N., Konig, V., Mosges, R., Hellmich, M., Himpe, B., & Kirchner, R. (2014). Nucleoplasty, a minimally invasive procedure for disc decompression: a systematic review and meta-analysis of published clinical studies. Pain Physician, 17(2), E149-E173.



### Lysistech AG

Lettenstr. 39 | 9491 Ruggell | Liechtenstein

Tel.: +423 230 20 22 | Fax: +423 230 20 23

E-Mail: [kontakt@lysistech.li](mailto:kontakt@lysistech.li) | Web: [www.lysistech.com](http://www.lysistech.com)