endo

gastroenterology in mind
gastroenterology in mind...
When designing endo, we focused on the specific requirements of endoscopic procedures performed in the gastrointestinal tract that pose a challenge to electrosurgery.

Our aim was to design an electrosurgical device that enables efficient work during endoscopic procedures and at the same time is very easy to use.

The result of our work is endo. It is a compact device that offers functionality which so far was available only in large, complicated electrosurgical equipment.

Endo makes it possible to perform all endoscopic procedures that require specialised cutting modes, monopolar and bipolar endoscopic coagulation.
An integrated argon module makes it possible to employ all the advantages of argon plasma in endoscopic procedures.
• advanced endoscopic cutting modes for polypectomy, sphincterectomy, mucosectomy
• special monopolar coagulation modes for endoscopic procedures
• argon plasma coagulation in standard and pulse mode
• automatic regulation of working parameters on the basis of real-time measurements
• instantaneous and average power monitor that enables the operator to control the device’s working parameters
• colour touch screen and system for recognition of connected instruments, SDS
• control system for the neutral electrode, NEM, and the EMED SAFE electrode that guarantee safety of the procedure
• tri-pedal footswitch to activate cutting, coagulation and argon plasma modes
• dedicated trolley with case for argon cylinder and handy basket for accessories and cables ensure comfort and ergonomic conditions in the surgery theatre.
SDS - Smart Device System

Endo is ready for work immediately after surgical instruments are connected.

The device detects and recognises all connected instruments. It automatically adjusts the appropriate working mode and output parameters for the instrument, thereby increasing user comfort during work. The surgeon does not need to think about which mode or setting to use for the selected instrument.

Sockets of endo electrosurgical unit feature Smart Device System (SDS) - technology that recognizes connected instrument. CUT/COAG socket is designed for endoscopic instruments. PLASMA socket is designed for argon instruments and the argon connection is integrated to it.

Connect the instrument and start work.

SDSA argon socket with integrated argon connection makes plugging the argon cables very convenient and user-friendly.
**endo automatic adjustment**

**WORK AUTOMATIC ADJUSTMENT**

*Endo* is based on automatic adjustment of working parameters. The user does not have to correct or select settings. The device selects working parameters for the connected instrument. *Endo* recognises the instrument and automatically selects the appropriate working mode and electrical parameters.

Using the SpectrumResult technology, *endo* monitors all working parameters in real time: actual power, current intensity and voltage applied. Thanks to continuous monitoring of all parameters, the user always obtains the best result regardless of the working conditions during the procedure.

*Atom* is equipped with a power monitoring system which shows the diagram of instantaneous output power and the average power value after the cutting or coagulation process is completed.
A tri-pedal, footswitch was designed especially for endo. The three independent pedals enable immediate activation of the cutting, coagulation or argon plasma modes without changing the footswitch option.

The endo tri-pedal footswitch is also available in wireless version. This innovative solution eliminates the additional cables from the operating theatre or procedure room. The endo footswitch communicates with the device using wireless data transfer. The state-of-the-art technology used in the wireless module guarantees data transfer without undue delay and without interference in functions of other equipment in the operating theatre.

The footswitch is equipped with a long-life battery. The footswitch does not require any complicated configuration to be used with the endo device. All the user must do is connect the wireless unit to the device and start work.
**ENDOSCOPIC CUTTING**

**POLIPO CUT** enables alternating cutting and coagulation of tissues. The output parameters are adjusted to minimise the risk of bleeding in case of insufficient coagulation, and to avoid perforation in case the coagulation is too deep. In this mode, maintaining the appropriate current parameters is crucial in order to obtain cutting with the optimum amount of coagulation. The hardest moment for the generator is initiating the cutting process. The initial demand for power is greater than that needed to continue cutting.

**Endo** is equipped with an automatic power adjustment system. It supplies the required power in the initial phase to begin cutting without undue delay or coagulation. It then automatically adjusts the power depending on the conditions of the surgery. The power is adjusted on the basis of continuous measurements of tissue impedance. **Endo** adjusts power to obtain a continued and repeatable tissue effect.

**Indications:**
- polyp resection
- resection of elevated flat lesions
PAPILLO CUT is an endoscopic cutting mode for sphincterectomy. In this mode, the device alternately supplies power for coagulation and cutting. PAPILLO CUT limits the risk of uncontrolled cutting of Oddi’s sphincter, which may cause intense bleeding. This is avoided by delivering the power for cutting and coagulation in short impulses. The device operator is able to adjust the intensity of the cutting process depending on the current requirements. Regulation of the cutting intensity provides greater control over the entire incision process. The output power is selected automatically on the basis of real-time measurements. Current parameters are adjusted to provide optimal coagulation during sectioning of tissue. The PAPILLO CUT mode can also be used to make incisions on, for example, the gallbladder to remove the stones.

Indications:
• incision of Oddi’s sphincter (sphincterotomy)
• incision of the gallbladder
MUCO CUT is a mode for endoscopic removal of flat lesions in the endothelial and endomucosal tissue in the gastrointestinal tract.

In the MUCO CUT mode, the cutting current is supplied as impulses. A nine-degree scale makes it possible to adjust the cutting process to the lesion and user’s working method. MUCO CUT ensures high-precision in terms of cutting depth and direction. In the MUCO CUT mode, the power is selected automatically on the basis of real-time measurements.

This mode was designed with ESD and EMR procedures in mind. A marked and elevated lesion can thus be safely removed using the MUCO CUT current. A specialist knife for mucosectomy or an endoscopic loop is recommended for these types of procedures.

Indications:
• endoscopic mucosal resection (EMR)
• endoscopic submucosal dissection (ESD)
ENDOSCOPIC COAGULATION

**ENDO COAG** is a soft, monopolar coagulation mode designed for endoscopic procedures. It enables contact coagulation and haemostasis of small haemorrhages using the endoscopic snare. This mode can be also used for marking pathological changes for later removal.

**ENDO SPRAY** is a very efficient mode for gentle, monopolar spray coagulation. The current parameters were selected to ensure quick and safe haemostasis of surface haemorrhage in the gastrointestinal tract. When using the **ENDO SPRAY** mode, the user can coagulate bleeding areas, for example post polypectomy, without replacing the instrument.

**Indications:**
- haemostasis of surface haemorrhage
- marking lesions for resection

Safe and effective contact coagulation and contactless in gastroenterological procedures.
ENDO BI-COAG is a gentle, bipolar coagulation mode. It is designed for specialist bipolar endoscopic probes, also with the irrigation function. In this mode, the bipolar current flows between two poles located on the working tip of the bi-polar probe. Haemostasis is achieved by heating the tissue in direct contact with the bipolar probe tip. Irrigation using saline solution facilitates the flow of the bipolar current, which in turn enhances the electrosurgical effect. This also reduces tissue adhesion on the probe tip. In the ENDO BI-COAG mode, the user can select from nine various haemostatic effects. In this mode, power is adjusted automatically in order to obtain the desired effect regardless of the surgical conditions. The bipolar probe is connected to the device using a special SDS plug. When the bipolar instrument is connected using the SDS plug, the device will switch to bipolar mode and display the suggested work settings.

Indications:
• haemostasis of small haemorrhage along the entire gastrointestinal tract
ENODOSCOPIC ARGON PLASMA

Endo is equipped with an internal module that enables efficient coagulation using argon plasma. The absence of any external devices greatly facilitates preparation for the procedure as well as the course of the surgery. The argon plasma technology is especially recommended in areas and sites with high risk of perforation.

Advantages of argon plasma coagulation:
- Immediate haemostasis helps to efficiently and quickly coagulate large areas of bleeding surface
- Constant coagulation depth limited to 3 mm minimises the risk of perforation
- No smoke ensures good visibility of operated site
- No contact between the applicator and tissue means no tissue adhesion
- Precise application of coagulation

PLASMA is a gentle argon coagulation mode designed for endoscopic procedures. The application of argon plasma enables highly effective coagulation at lower power settings. In the argon plasma mode, tissue carbonisation is greatly reduced. PLASMA always ensures great visibility of the surgical site as it minimises smoke during coagulation.

PULSE PLASMA is designed for sites where there is a serious risk of perforation. Current is delivered in short impulses, which lowers the amount of energy delivered to the tissue. Coagulation using PULSE PLASMA is shallower in comparison with continuous coagulation in the PLASMA mode. The impulse delivery also facilitates a more precise application.

Indications:
- Bleeding from angiodysplastic lesions
- Bleeding post polypectomy
- Residual tissue removal after polypectomy
- Bleeding from cancerous lesions in the stomach and colon
- Erosion, oozing ulcers
- Devitalisation of tumours obstructing intestinal lumen
Endo makes it possible to use standard, monopolar cutting with varying degree of haemostasis and forced monopolar coagulation.

**STANDARD MONOPOLAR MODES**

Standard monopolar modes are available after the monopolar handle compatible with the endo device is connected.

**MONO CUT** is a monopolar cutting mode with varying degree of haemostasis. Selecting from 9 available effects, the user can also adjust the degree of haemostasis and cutting intensity depending on the current requirements. The output parameters are selected automatically in order to obtain the chosen effect regardless of working conditions.
**MONO COAG** is a forced contact coagulation mode. This enables quick and efficient haemostasis of localised bleeding. It is designed for open surgery. MONO COAG causes surface carbonisation of the tissue. In this mode, the thermal effect does not extend deep into the tissue structure.

The user can adjust the coagulation intensity by selecting one of the nine available tissue effects. In this mode, power is adjusted automatically in order to obtain a constant and repeatable haemostatic effect.

**Indications:**
- contact coagulation of localised bleeding
endo safety and ergonomics at work

AUTOTEST
Each time the power is switched on, the system conducts an internal test of all the device components and any instruments and auxiliary devices that may be connected. The result of the AUTOTEST is displayed on the screen as a message.

MENU
Endo provides additional adjustment options of such parameters as: activation signal volume, screen brightness and language selection.

FOOTSWITCH
Endo automatically identifies the type of footswitch connected to the device.

SUPPLEMENTAL DEVICES
Connected endoscopic irrigation pump

POWER MONITOR
Endo unit automatically adjusts the output power to achieve desired effect on tissue, analyzing conditions of operating area. Power monitor shows current power output during cutting.

ARGON RATE
Shows the status of argony argon cylinder.

NEM SYSTEM
The endo device is equipped with the NEM system which controls the adhesion quality of the neutral divided EMED SAFE electrode. Application of the electrode is monitored throughout the whole procedure. In combination with the EMED SAFE electrodes, the NEM system maximises safety during the procedure.
endo Technical Specification

**TECHNICAL DATA**

- **Voltage**: 230 [V] ± 10% 50 [Hz] 110 [V] ± 10% 60 [Hz]
- **Nominal power input**: 770 [VA]
- **Control unit**: 32-bit processor
- **Measurements**: real-time monitoring of output parameters
- **Power output**: automatic output parameters adjustment. Max 400W

**WORKING MODES**

- **Monopolar**: cutting, coagulation
- **Bipolar**: coagulation
- **Argon**: argon module integrated

**SAFETY CONDITIONS**

- **Electric shock protection**: Class / Grade I / CF, Protection class IP2X
- **Low frequency leakage current**: as per EN 60601-1
- **High frequency leakage current**: as per EN 60601-2-2
- **Generator frequency**: 333 [kHz]
- **Defibrillation impulse resistance**: as per EN 60601-1

**DIMENSIONS AND WEIGHT**

- **Length**: 385 [mm]
- **Height**: 141 [mm]
- **Width**: 305 [mm]
- **Weight**: 7 [kg]
endo Easy Use

3 work panels:
- **CUT, COAG, PLASMA**

**selected working mode icon**

**settings values icon**

sidebar:
- **MENU**
- **POWER MONITOR**
- **ARGON indicator**
- **FOOTSWITCH icon**
- **NEUTRAL ELECTRODE indicator**
ARGON connection
- detecting instruments for the argon plasma modes

PLASMA connection
- detecting instruments for the argon plasma modes

CUT/COAG connection
- detecting monopolar and bipolar instruments

NEUTRAL ELECTRODE connection
endowaterfall
endoscopic irrigation pump

Good visibility and clean operating site are of prime importance in all types of surgery.

In endoscopic procedures, the operation site may be contaminated with chime or blood residue in the gastrointestinal tract.

The possibility of irrigating the operating site is a very important element of any endoscopic procedure. The WATERFALL endoscopic irrigation pump was designed to ensure full comfort and safety during surgeries.

The pump makes it possible to quickly rinse the gastrointestinal tract using physiological saline directly through the endoscope's rinsing opening or by using endoscopic instruments.

Advantages of the WATERFALL endoscopic pump:

- good visibility and clean operating site
- less tissue adhesion on endoscopic instruments
- irrigation using physiological saline increases tissue conductivity - faster electrosurgical effects
- possibility of adjusting the saline flow
- possibility of activation using the footswitch or from the control panel
- low-noise, does not cause nuisance in the procedure room
- small size and possibility of mounting of the device on the endo trolley, which gives access to the pump during the procedure
WATERFALL enables quick and easy cleaning of blood and chime residue from the surgery site.

WATERFALL, connected to an endoscopic needle, facilitates elevating of flat lesions before resection.
Accessories for endo

100-600  Electrosurgical system endo

020-100  WATERFALL endoscopy irrigation pump, set of drains, single-pedal footswitch

100-316  Endo three-pedal footswitch, 5 m cable, 6-pin connection

100-336  Endo three-pedal footswitch, wireless
TinyLine trolley for endo, case for 1 argon cylinder (5L/10L), basket

- **case for argon cylinder**
- **basket for accessories**

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**432-46A** Monopolar cable for argon flexible electrode, flat connector, L: 3.5m, SDSA plug
281-03S  Monopolar cable for endoscopic instruments, 3 m length, female connection 3mm, SDS plug
Ø 3 mm

RI-100  Handle for endoscopic snares E17/x, E18/x, E19/x, E20/x

R2-50  Papillotomy handle
### Accessories for Endo

#### E17

- Polypectomy snare, oval

#### E18

- Polypectomy snare, hexagonal

#### E19

- Polypectomy snare, asymmetrical

#### E20

- Polypectomy snare, oval with teeth

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### Papillotomy Snare Loop

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### Papillotomy Needle Knife

**E32**

- **E30/1** Tip length
- **E30/2** Tip length
- **E30/3** Tip length
- **E32** Shaft length
E53  Endoscopic needle in Teflon tube

E54  Endoscopic needle in metal tube

E56  Endoscopic needle in Teflon tube, disposable
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281-60S  Adaptor for bipolar endoscopic hemostasis probe, for endo unit

380-030  Length 3 m  Cable for disposable neutral electrode, flat plug

380-050  Length 5 m

812-80H  Disposable neutral electrode EMED SAFE, hydrogel, divided, for adults and children, 176 x 122 mm, 110 cm², 10 x 5 pcs per pack.
gastroenterology in mind...