

# endo

gastroenterology in mind





gastroenterology in mind...

# endo Precision in Endoscopic Procedures

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.



# endo gastroenterology in mind

- 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.

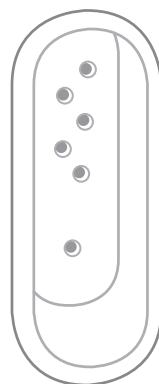
The device detects and recognises all connected instruments. It automatically adjusts the appropriate working mode and output parameters for the instrument, thereby increasing user comfort during work. The surgeon does not need to think about which mode or setting to use for the selected instrument.

Sockets of endo electrosurgical unit feature Smart Device System (SDS) - technology that recognizes connected instrument.

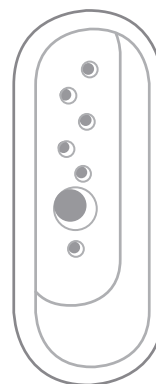
CUT COAG socket is designed for endoscopic instruments.

PLASMA socket is designed for argon instruments and the argon connection is integrated to it.

Connect the instrument and start work.



cut/coag



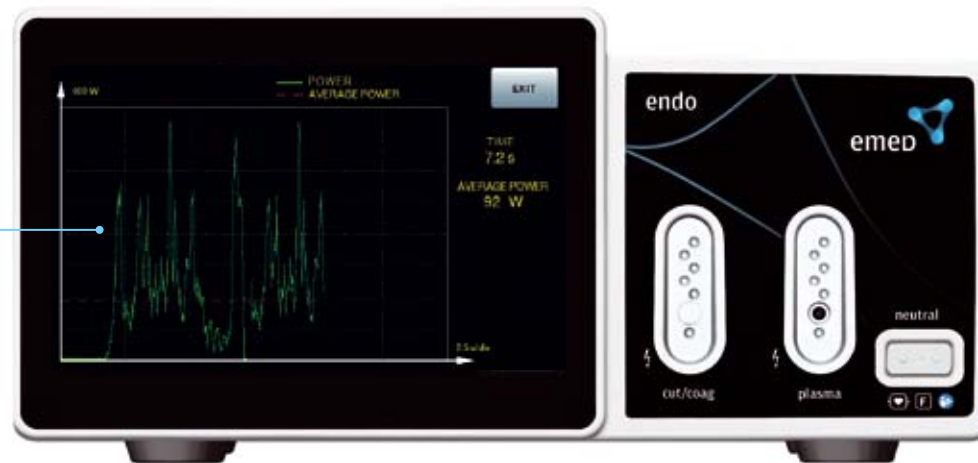
plasma

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



# endo automatic adjustment

Measuring parameters  
in real time



## WORK AUTOMATIC AD USTMENT

**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.

# endo ergonomics and comfort

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.



[Endo](#) is controlled using a specially designed footswitch.

# endo applications

WORKING MODE:



## 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



**WORKING MODE:**

**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:**

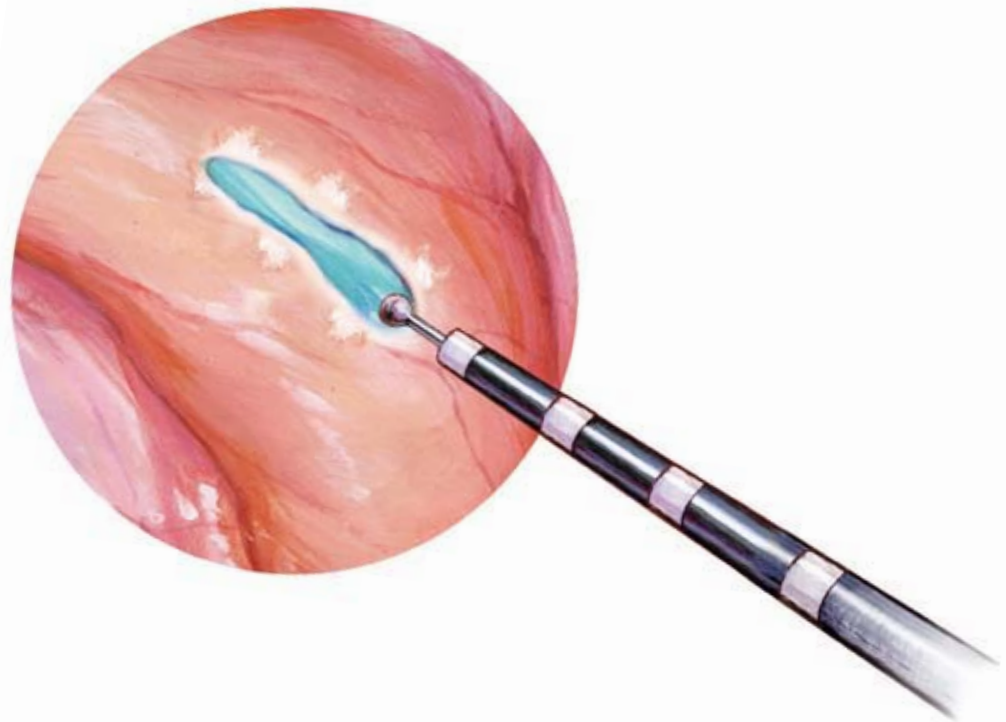
- incision of Oddi's sphincter (sphincterotomy)
- incision of the gallbladder

**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 a endoscopic loop is recommended for these types of procedures.

WORKING MODE:



**Indications:**

- endoscopic mucosal resection (EMR)
- endoscopic submucosal dissection (ESD)

Safe and effective  
contact coagulation and contactless  
in gastroenterological procedures.

## 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.



### WORKING MODE:



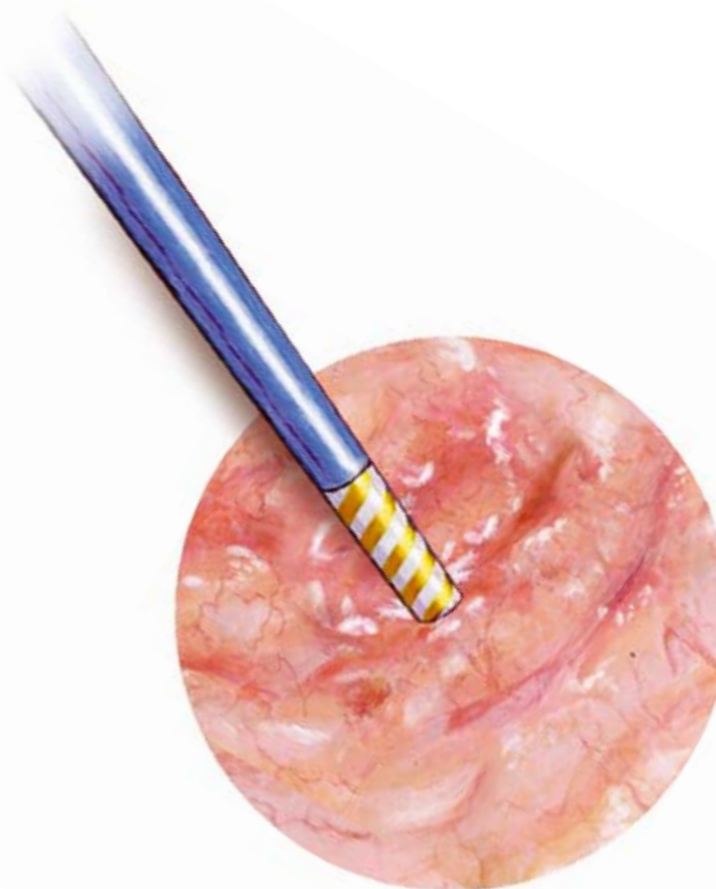
### Indications:

- haemostasis of surface haemorrhage
- marking lesions for resection

**ENDO BI-COAG** is a specialist bipolar coagulation technology.

**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.

WORKING MODE:



**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.



### WORKING MODE:



**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.

#### WORKING MODE:



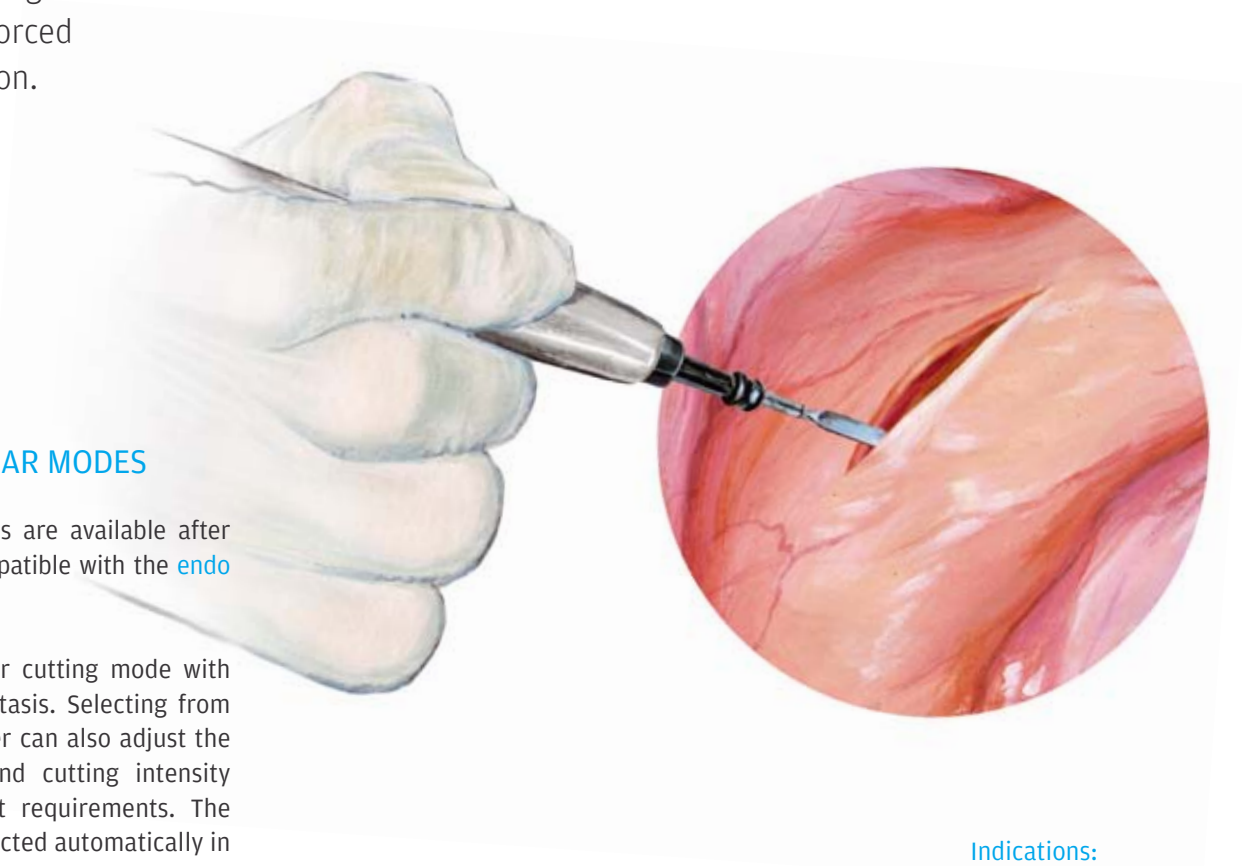
#### STANDARD MONOPOLAR MODES

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.

#### Indications:

- cutting of tissue with simultaneous haemostasis



## WORKING MODE:



**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] $\pm$ 10% 50 [Hz] 110 [V] $\pm$ 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:

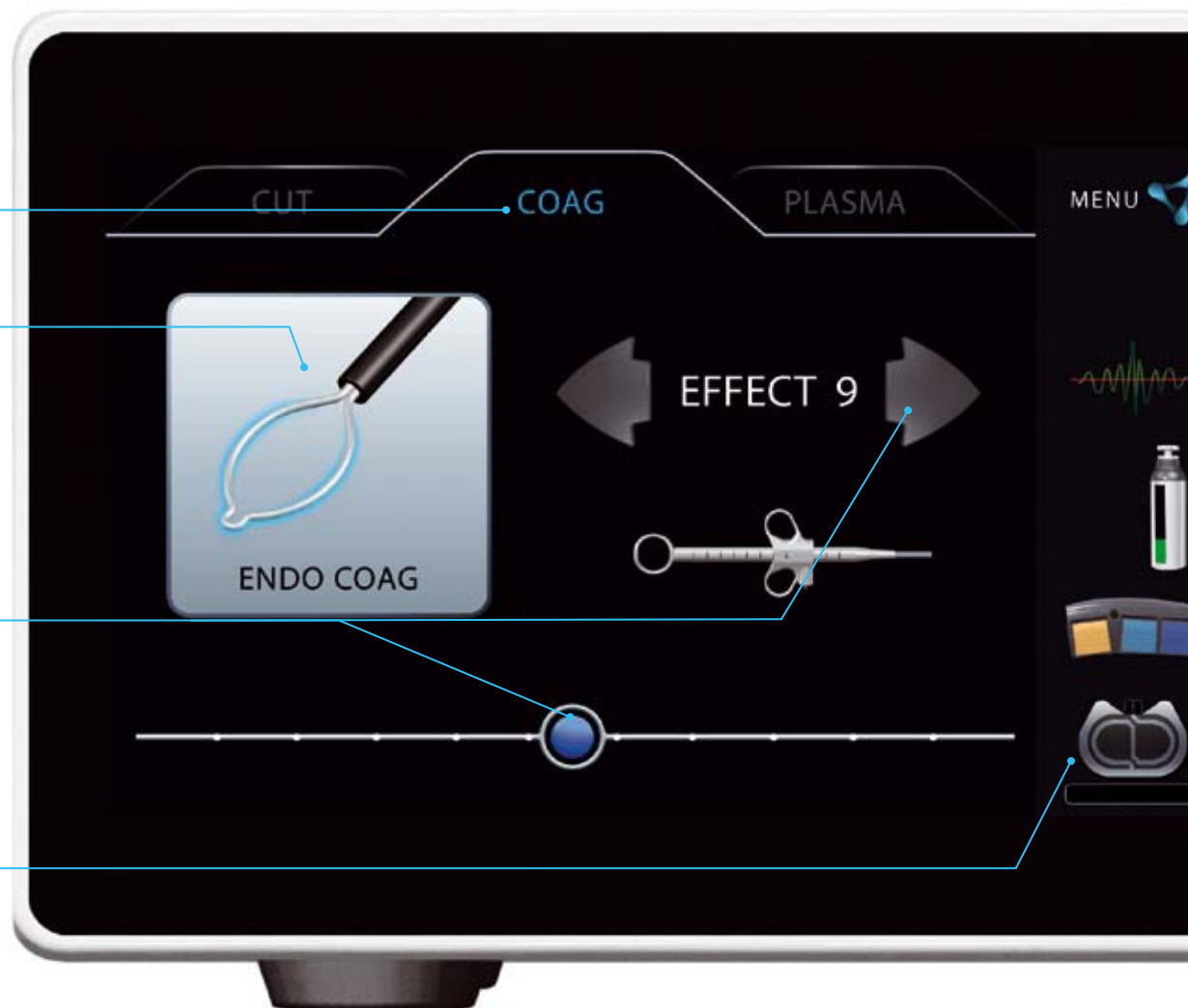
MENU

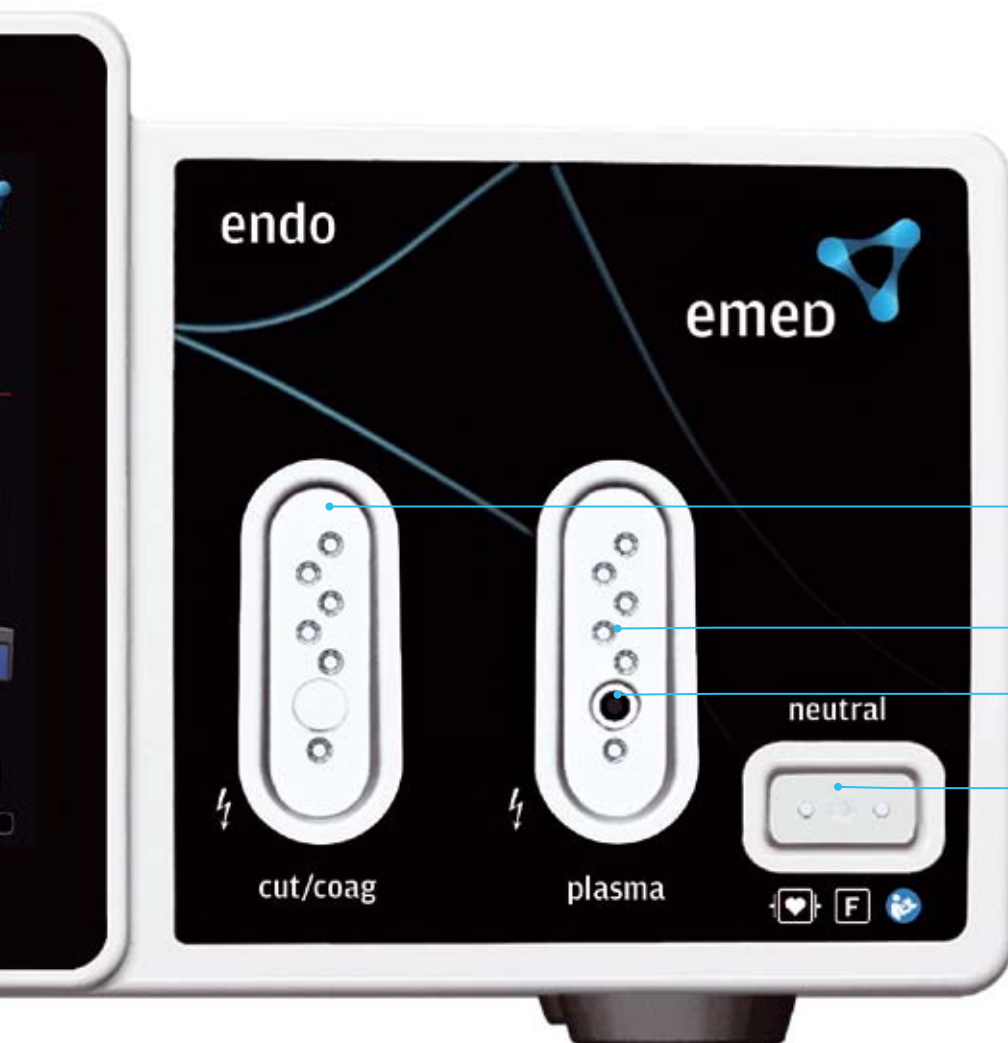
POWER MONITOR

ARGON indicator

FOOTSWITCH icon

NEUTRAL ELECTRODE indicator





**CUT COAG** connection  
- detecting monopolar and bipolar instruments

**PLASMA** connection  
- detecting instruments for the argon plasma modes

**ARGON** connection

**NEUTRAL ELECTRODE** connection

endo : scale

# endo waterfall

## 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.

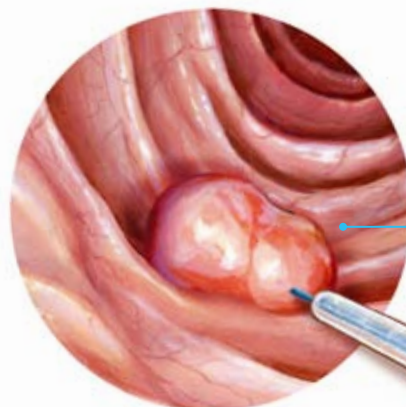


### Advantages of the WATERFALL endoscopic pump:

- 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



080-060 TinyLine trolley for endo, case for 1 argon cylinder (5L/10L), basket



100-051 Argon cylinder 5L (empty/no gas, DIN 477/6)  
100-151 Argon cylinder 10L (empty/no gas, DIN 477/6)



5501640 Argon pressure regulator, P300-P40EMED, DIN 477/6 (Europe) without pressure sensor

5501565 Argon pressure regulator, P300-P40EMED, DIN 477/6 (Europe) with pressure sensor



Ø 1.5 mm

[932-148](#) Flexible argon probe, reusable, TBS, dia. 1,5mm, 1,5m long



Ø 2.3 mm

[932-149](#) Flexible argon probe, reusable, GIT, dia. 2,3mm, 2,2m long



Ø 3.2 mm

[932-150](#) Flexible argon probe, reusable, GIT, dia. 3,2mm, 2,2m long

[932-151](#) Flexible argon probe, reusable, TBS, dia. 1,5mm, 3m long

[932-152](#) Flexible argon probe, reusable, GIT, dia. 2,3mm, 3m long



[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



R1-100

Handle for endoscopic snares  
E17/x, E18/x, E19/x, E20/x

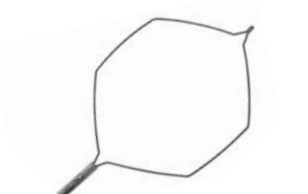


R2-50

Papillotomy handle



**E17** Polypectomy snare, oval



**E18** Polypectomy snare, hexagonal



**E19** Polypectomy snare, asymmetrical



**E20** Polypectomy snare, oval with teeth

No.	Tube diameter (mm)	Snare diameter (mm)	<b>E17</b> Code	<b>E18</b> Code	<b>E19</b> Code	<b>E20</b> Code
1	1,8	15	E17/2	E18/2	E19/2	E20/2
2		20	E17/3	E18/3	E19/3	E20/3
3		25	E17/4	E18/4	E19/4	E20/4
4		30	E17/5	E18/5	E19/5	E20/5
5		35	E17/6	E18/6	E19/6	E20/6
6		40	E17/7	E18/7	E19/7	E20/7
7		45	E17/8	E18/8	E19/8	E20/8
8	2,0	15	E17/11	E18/11	E19/11	E20/11
9		20	E17/12	E18/12	E19/12	E20/12
10		25	E17/13	E18/13	E19/13	E20/13
11		30	E17/14	E18/14	E19/14	E20/14
12		35	E17/15	E18/15	E19/15	E20/15
13		40	E17/16	E18/16	E19/16	E20/16
14		45	E17/17	E18/17	E19/17	E20/17
15	2,3	15	E17/20	E18/20	E19/20	E20/20
16		20	E17/21	E18/21	E19/21	E20/21
17		25	E17/22	E18/22	E19/22	E20/22
18		30	E17/23	E18/23	E19/23	E20/23
19		35	E17/24	E18/24	E19/24	E20/24
20		40	E17/25	E18/25	E19/25	E20/25
21		45	E17/26	E18/26	E19/26	E20/26



**E30** Papillotomy snare loop



**E32** Papillotomy needle knife

No.	Tube diameter (mm)	Tip length (mm)	Loop length (mm)	Shaft length (mm)	Catalogue number
1	2,3 tapered to 1,8	1 - 30	20		<b>E30/1</b> Tip length
2			25		<b>E30/2</b> Tip length
3			30		<b>E30/3</b> Tip length
4	1,8			1 - 10	<b>E32</b> Shaft length





E53 Endoscopic needle in Teflon tube

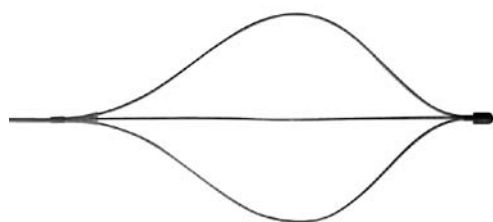


E54 Endoscopic needle in metal tube

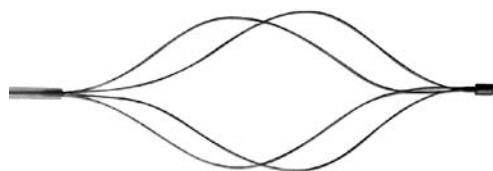


E56 Endoscopic needle in Teflon tube, disposable





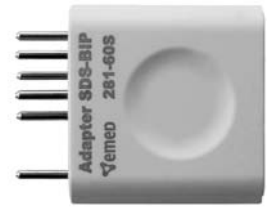
**E40** Dormia hexagonal snare



**E41** Dormia spiral snare

No.	Tube diameter (mm)	Snare diameter (mm)	<b>E40</b> Code	<b>E41</b> Code	<b>ES40</b> Code	<b>ES41</b> Code
1	1,8	10	E40/1	E41/1	ES40/1	ES41/1
2		15	E40/2	E41/2	ES40/2	ES41/2
3		20	E40/3	E41/3	ES40/3	ES41/3
4		25	E40/4	E41/4	ES40/4	ES41/4
5		30	E40/5	E41/5	ES40/5	ES41/5
6		35	E40/6	E41/6	ES40/6	ES41/6
7		40	E40/7	E41/7	ES40/7	ES41/7
8	2,0	10	E40/8	E41/8	ES40/8	ES41/8
9		15	E40/9	E41/9	ES40/9	ES41/9
10		20	E40/10	E41/10	ES40/10	ES41/10
11		25	E40/11	E41/11	ES40/11	ES41/11
12		30	E40/12	E41/12	ES40/12	ES41/12
13		35	E40/13	E41/13	ES40/13	ES41/13
14		40	E40/14	E41/14	ES40/14	ES41/14
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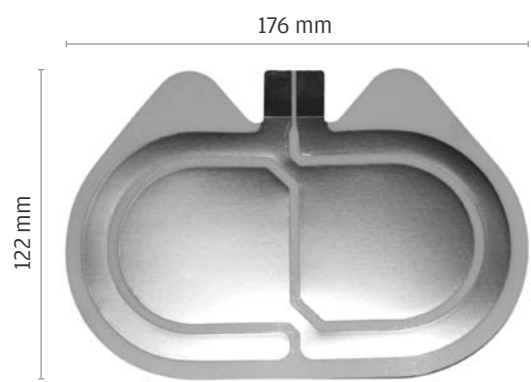




281-60S      Adaptor for bipolar endoscopic hemostasis probe, for endo unit



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 cm<sup>2</sup>, 10 x 5 pcs per pack.





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