

# MEDICI



## EQUIPMENT ELECTRONICS



ENDOMED



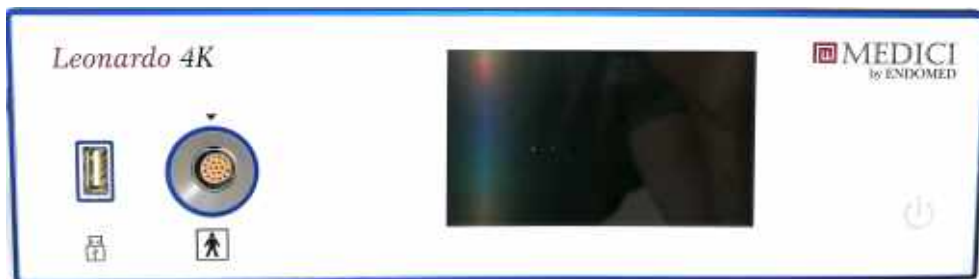


**ENDOMIED**

# LEONARDO 4K 4K VIDEO CAMERA

FULL-HD INTEGRATED RECORDER

## Advanced Image Enhancement



Original Image



Clarity Enhancement



Color Enhancement

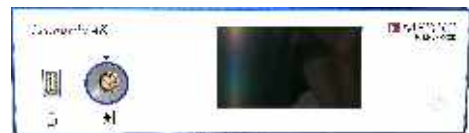


**LEONARDO 4K is the latest version of the ultra high definition endoscopy camera which is able to offer a clear and sharp image. With the native progressive scan the LEONARDO 4K provides the sharpest details with incomparable natural color rendition at the highest spatial and temporal resolution. Even the finest variations in tissue structures are distinguishable. LEONARDO 4K will definitely enhance the capabilities of surgeons performing minimally invasive procedures.**

 **MEDICI**  
by ENDOMED

# LEONARDO 4K

## 4K VIDEO CAMERA



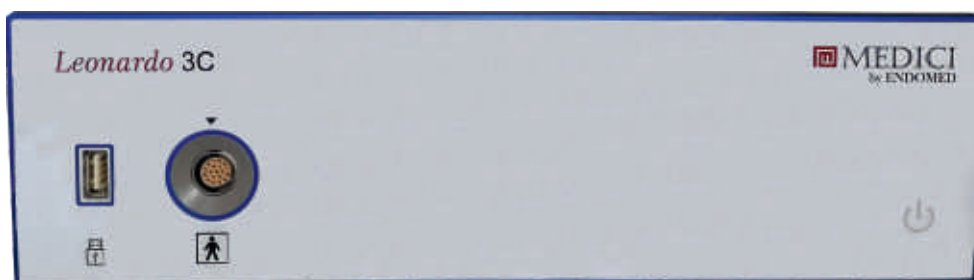
|                                    |  |
|------------------------------------|--|
| MODEL                              | LEONARDO 4K  |
| CAMERA SENSOR                      | 3x1/3" 16:9 image sensors                              |
| IMAGE SIZE (Horizontal x Vertical) | 3840H x 2160V  |
| STANDARD                           | 50Hz OR 60 Progressive                                 |
| MINIMAL ILLUMINATION               | < 3LX  |
| SENSITIVITY                        | F11 standard (2000lx)                                  |
| SHUTTER SPEED                      | AUTO: 1/50s to 1/50000s<br>SHUTTER OFF: 1/50s OR 1/60s |
| HORIZONTAL RESOLUTION              | 1600 TVL LINES   |
| SIGNAL TO NOISE RATIO              | 56 dB (GAIN 0 dB, DNR OFF)                             |
| WHITE BALANCE                      | AWB (Automatic White Balance)                          |
| GAIN CONTROL                       | AUTO (Automatic gain control)                          |
| EXPOSURE CONTROL                   | AUTO   |
| WORKING MODES                      | 5 USERS OR MODES                                       |
| OUTPUT                             | 4x 3G-SDI 2XHDMI (1x4K 1xHD)                           |
| PERIPHERALS CONTROL                | 2xcontrollable peripherals, ACC1/2                     |
| PC COMUNICATION                    | RS-232C  |
| MAIN VOLTAGE                       | 100 - 240 v  |
| MAIN FREQUENCY                     | 50/60Hz  |
| POWER                              | 100 - 240 v, 45-55VA                                   |
| FUSE                               | 2 x T 1,0 A E  |

|                     |                                      |
|---------------------|--------------------------------------|
| CAMERA HEAD         | LEONARDO 4K                          |
| DIMENSIONS (WxHxD)  | 34 X 42 X 58mm                       |
| WEIGHT              | 90gr                                 |
| LENS CONNECTION     | C-MOUNT                              |
| CABLE LENGHT        | < 3mt                                |
| STERILIZZATION      | SOAKABLE, IPX7                       |
| CONTROL BUTTONS     | 3                                    |
| CONTROL UNIT        |                                      |
| DIMENTION (WxHxD)   | 325 x 74 x 365mm                     |
| WEIGHT              | 6,5Kg                                |
| PROTECTION CLASS    | Ip20                                 |
| LINE WOLTAGE        | 100-240VAC@50-60Hz                   |
| FUSE                | 2xT1,0 A E/250V (IEC 127)            |
| POWER TESTED ACC.TO | UL2601-1, EN60601-1,<br>IEC60601-1-2 |
| ORDERING NUMBER     |                                      |
| CAMERA UNIT         | CULEO4K                              |
| CAMERA HEAD         | CHLEO4K                              |

# LEONARDO 3C 3C CMOS VIDEO CAMERA

FULL-HD INTEGRATED RECORDER

## Advanced Image Enhancement



Original Image



Clarity Enhancement



Color Enhancement

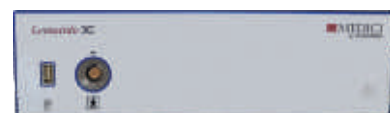
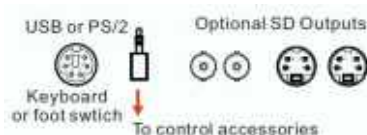
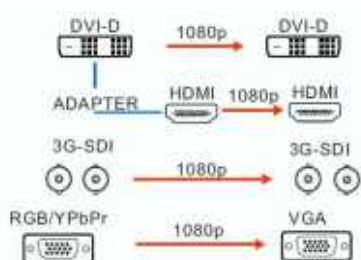


**LEONARDO 3C is the latest version of the ultra high definition endoscopy camera which is able to offer a clear and sharp image. With the native progressive scan the LEONARDO 3C provides the sharpest details with incomparable natural color rendition at the highest spatial and temporal resolution. Even the finest variations in tissue structures are distinguishable. LEONARDO 3C will definitely enhance the capabilities of surgeons performing minimally invasive procedures.**

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# LEONARDO 3C

## 3C VIDEO CAMERA



|                                    |  |
|------------------------------------|--|
| MODEL                              | LEONARDO 3C  |
| CAMERA SENSOR                      | 3x1/3" image sensors   |
| IMAGE SIZE (Horizontal x Vertical) | 1980H x 1080V  |
| SCANNING SYSTEM                    | Progressive  |
| MINIMAL ILLUMINATION               | < 3LX  |
| SENSITIVITY                        | F11 standard (2000lx)  |
| SHUTTER SPEED                      | AUTO: 1/50s to 1/50000s<br>SHUTTER OFF: 1/50s OR 1/60s   |
| HORIZONTAL RESOLUTION              | 1600 TVL LINES   |
| SIGNAL TO NOISE RATIO              | 56 dB  |
| WHITE BALANCE                      | AWB (Automatic White Balance)  |
| GAIN CONTROL                       | AUTO (Automatic gain control)  |
| EXPOSURE CONTROL                   | AUTO   |
| WORKING MODES                      | 5  |
| OUTPUT                             | 2xDVI-D or HDMI - 2xDIGITAL 3G-SDI - 1xANALOG RGB OR Y/Pb/Pr - 2xS-VIDEO on MINI-DIN 4 - 2xCOMPOSITE VIDEO |
| ADVANCED SETTING                   | By ON SCREEN DISPLAY OSD   |
| PC COMMUNICATION                   | RS-232C  |
| MAIN VOLTAGE                       | 100 - 240 v  |
| MAIN FREQUENCY                     | 50/60Hz  |
| POWER                              | 100 - 240 v, 45-55VA   |
| FUSE                               | 2 x T 1,0 A E  |

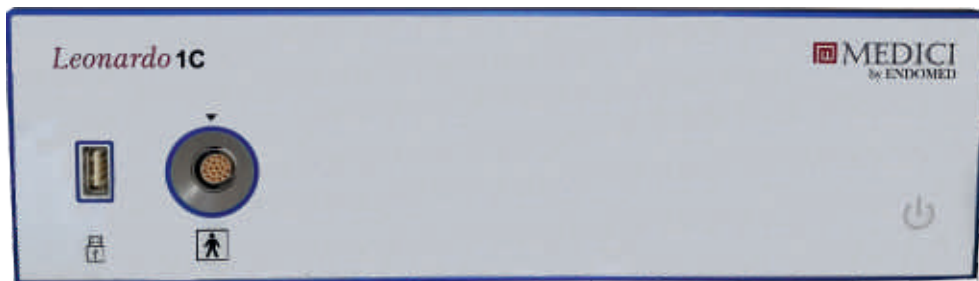
|                     |                                   |
|---------------------|-----------------------------------|
| CAMERA HEAD         | LEONARDO 3C                       |
| DIMENSIONS (WxHxD)  | 34 X 42 X 58mm                    |
| WEIGHT              | 90gr                              |
| LENS CONNECTION     | C-MOUNT                           |
| CABLE LENGTH        | < 3mt                             |
| STERILIZATION       | SOAKABLE, IPX7                    |
| CONTROL BUTTONS     | 3                                 |
| CONTROL UNIT        | LEONARDO 3C                       |
| DIMENTION (WxHxD)   | 325 x 74 x 365mm                  |
| WEIGHT              | 5,1 Kg                            |
| PROTECTION CLASS    | Ip20                              |
| LINE VOLTAGE        | 100-240VAC@50-60Hz                |
| FUSE                | 2xT1,0 A E/250V (IEC 127)         |
| POWER TESTED ACC.TO | UL2601-1, EN60601-1, IEC60601-1-2 |
| ORDERING NUMBER     |                                   |
| CAMERA UNIT         | CULEO3C                           |
| CAMERA HEAD         | CHLEO3C                           |



# LEONARDO 1C 1CMOS VIDEO CAMERA

FULL-HD INTEGRATED RECORDER

**Advanced Image Enhancement**



Original Image



Clarity Enhancement



Color Enhancement

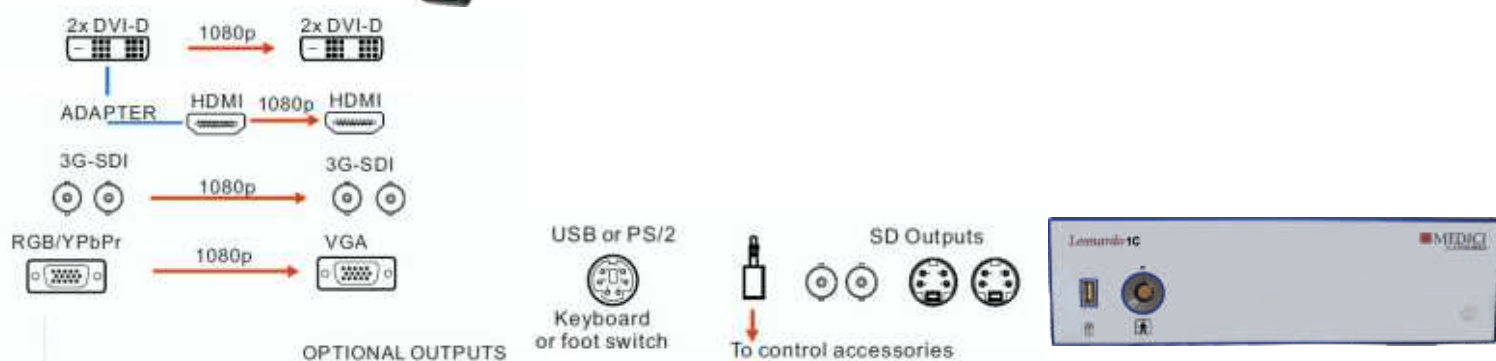


**LEONARDO 1C endoscopy camera is able to offer a clear and sharp image in full high definition standard. With modern image processing technology, it makes the finest variations in tissue structures distinguishable. The camera offers all necessary features for surgical uses such as digital zoom, freeze, digital edge enhancement, and other functions.**

 **MEDICI**  
by ENDOMED



# LEONARDO 1C 1C VIDEO CAMERA



|                                    |   |
|------------------------------------|---|
| MODEL                              | LEONARDO 1C   |
| CAMERA SENSOR                      | 1/3" HD CHIP  |
| IMAGE SIZE (Horizontal x Vertical) | 1980H x 1080V   |
| SCANNING SYSTEM                    | Progressive   |
| USER SETTINGS                      | 5   |
| FRAME RATE                         | 50p EU - 60p US   |
| KEYBOARD SUPPORT                   | by USB  |
| FOOT SWITCH SUPPORT                | OPTIONAL  |
| HORIZONTAL RESOLUTION              | 1600 TVL LINES  |
| ACCESSORIES CONTROL                | by 3.5MM Jack   |
| WHITE BALANCE                      | AWB (Automatic White Balance)   |
| ADVANCED SETTING                   | By ON SCREEN DESPLAY OSD  |
| OUTPUT                             | 2xDVI-D - 2xDIGITAL DH/3G-SDI - 1xANALOG RGB OR Y/Pb/Pr - 2xS-VIDEO on MINI-DIN 4 - 2xCOMPOSITE VIDEO |
| ADVANCED SETTING                   | By ON SCREEN DESPLAY OSD  |
| PC COMUNICATION                    | RS-232C on request  |
| MAIN VOLTAGE                       | 100 - 240 v   |
| MAIN FREQUENCY                     | 50/60Hz   |
| POWER                              | 100 - 240 v, 45-55VA  |
| CLASSIFICATION                     | CLASS I/BF  |

|                     |                                   |
|---------------------|-----------------------------------|
| CAMERA HEAD         | LEONARDO 1C                       |
| DIMENSIONS (WxHxD)  | 33 X 35 X 83mm                    |
| WEIGHT              | 100gr                             |
| LENS CONNECTION     | C-MOUNT                           |
| CABLE LENGHT        | < 3mt                             |
| STERILIZZATION      | SOAKABLE, IPX7                    |
| CONTROL BUTTONS     | 3                                 |
| CONTROL UNIT        | LEONARDO 1C                       |
| DIMENTION (WxHxD)   | 325 x 74 x 365mm                  |
| WEIGHT              | 5,1 Kg                            |
| PROTECTION CLASS    | Ip20                              |
| LINE VOLTAGE        | 100-240VAC@50-60Hz                |
| FUSE                | 2xT1,0 A E/250V (IEC 127)         |
| POWER TESTED ACC.TO | UL2601-1, EN60601-1, IEC60601-1-2 |
| ORDERING NUMBER     |                                   |
| CAMERA UNIT         | CULEO1C                           |
| CAMERA HEAD         | CHLEO1C                           |

# MEDICI LIGHT SOURCE LSLED1600

## SUPER SILENT LED OPTICAL-FIBER LIGHT SOURCE



\* LED: Light-Emitting Diode

LED endoscopy light source has a very high efficiency and a long life expectancy. It is intended to substitute halogen lamp or xenon optical fiber illuminators. The unparalleled long life time (>50.000 hours, longer than 250 halogen lamps or 100 xenon lamps) makes LED light source the most cost-efficient illuminator, and changing lamp is never needed. LED light source is a Super Silent product. LED light source generates no more than 30dB(A) airborne noise, 4 times quieter than other traditional products. The airborne noise is hardly audible, preventing noise in operation room and providing a comfortable operating environment.

| MODEL                 | LSLED1600  |
|-----------------------|--|
| Color temperature     | 6000K  |
| Lamp Life time        | > 50,000 hours   |
| Dimming method        | Auto or Manual   |
| Video input           | Via BNC Connector  |
| Video format          | Composite Video (SD)<br>Y Component (SD or D)                  |
| Light guide connector | Storz type (standard)<br>ACMI, Olympus,<br>and Wolf (optional) |
| Advanced settings     | External Triggering (optional)                                 |
| Environment           | 0°C - +40°C temperature<br>less than 75% relative humidity     |
| Classification        | CE Class I / BF  |
| Dimensions (W×H×D)    | 325 × 74 × 365 mm  |
| Weight                | 6,5 KG   |
| Power consumption     | 100W max.  |
| Line voltage          | 100 -240VAC @ 50-60 Hz   |
| Fuse                  | 2 × T 1.6 A E / 250V<br>(IEC 127)                              |
| Tested according to   | En60601, IEC60601-1<br>Directive 93/42/EEC                     |

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# MEDICI LIGHT SOURCE LSLED1600

## **High intensity illumination**

With cutting-edge LED technology and innovative optical fibers design, LED light source can deliver much more light than a 250W halogen lamp and is comparable to 180W even 300W xenon lamp. With this light intensity, light source can be used in several endoscopy applications. This energy saving illumination product will definitely be the future golden standard.

## **Unparalleled long life time of LED lamp**

LED lamp has more than 50,000 hour life time, longer than 250 halogen lamps or 100 Xenon lamps. Unparalleled long life LED solves the problem that many sellers have to spend a lot on traveling just for changing a tiny lamp for the anxious waiting doctors. LED lamp will emit endless high intensity light without any pause or interruption, and never be burns out suddenly as a halogen lamp. This advantage reduces the chance of accidents caused by illuminating interruptions during operation.

## **Super Silent product**

Airborne noise in operation and examination room generated by traditional light sources sometimes becomes a very annoying problem. This noise pollution may bring a potential risk to influence the operation and diagnosis. With its unique design, 100 light source operates at a very quiet condition. The generated noise is lower than 30dB(A), four times lower than other traditional products. Noise level is doubled when increasing 6dB.

## **Manual or automatic light intensity adjustment**

LED light source provides two means of dimming, by manual adjustment with control button on the front panel; alternatively, the output light intensity can be adjusted automatically depending on the input composite video signal of standard definition or Y signal of high definition video through the BNC connector on the rear panel of the light source.

## **Consistent color temperature when dimming**

In contrast to an halogen lamp, color temperature of LED light source does not change when the light is dimmed or as the LED ages, resulting in a consistent visual appearance.

## **Exchangeable light guide adapter**

Light source is equipped with a Storz compatible light guide connector. Optionally, ACMI, Olympus, and Wolf light guide connectors are available.

## LED LIGHT SOURCE



Big TFT display



Comfy menu



Modern tech.



Easy to clean





**LSLEDTS**



**LSLED**

- latest LED technology
- extremely long LED service life - more than 50 000 hrs.
- high intensity light output (equivalent to 300W Xenon)
- low noise, low heat conduction
- electronic light control via touch screen
- menu language selection
- pure daylight quality
- waterproof touch control panel
- non-volatile memory user settings
- display the current settings on the color 7" TFT monitor

- latest LED technology
- high intensity light output (equivalent to 300W Xenon) at low power consumption
- extremely long LED service life - more than 50 000 hrs.
- low noise, low heat conduction
- electronic light control via buttons
- pure daylight quality
- waterproof control panel

| <b>SPECIFICATIONS</b>                | <b>LSLEDTS</b>                                      | <b>LSLED</b>   |
|--------------------------------------|---|----------------|
| Light source lifetime, hrs           | 50 000  | 50 000         |
| Light source power (LED or Xenon), W | 90  | 90             |
| Light color temperature, K           | 5600  | 5600           |
| Adjustment of light intensity, %     | 0 ... 100   | 10 ... 100     |
| Intensity adjustment                 | Electronically                                      | Electronically |
| Controls                             | Touch Screen  | Pushbuttons    |
| Protection class                     | I   | I              |
| Applied part                         | BF  | BF             |
| Standard                             | EN 60601-1; classification acc. to MDD 93/42/EEC: I |                |
| Dimensions, mm                       | 350x150x350   | 350x150x350    |
| Weight, kg                           | 6,4   | 7,1            |
| Mains voltage, V                     | 230   | 230            |

## Co2 INSUFFLATOR



Big TFT display



Comfy menu



Modern tech.



Easy to clean





### INS30H

- very smooth insufflation algorithm allowing to avoid sharp abdominal pressure changes
- audible and visual alarm signaling system in case of a failure (hose rupture/pinching, intra-abdominal overpressure etc.)
- display of all current and preset insufflation parameters: set/current pressure, gas flow speed, volume of gas supplied
- device can be used with gas bottles or central gas supply systems - input pressure range 4 ... 10 bars
- insufflator is available with a highly efficient gas heating subsystem (option)
- automatic self-check is activated each time the unit is switched on to ensure that all electronic and pneumatic components are in good running order

### INS40H

- INS40H is a high-performance insufflator with friendly user interface.
- stable pressure balance in the abdomen is guaranteed by high gas flow performance (40 liters per minute) and low insufflation pressure)
- patient safety is ensured by the system of protective valves, by microprocessor control with audible and visual signaling
- device can be used with gas bottles or central gas supply systems - input pressure range 4...10 bars
- big TFT display gives a quick overview of the rated and actual values of gas pressure and gas flow
- setting of the working parameters is made by touching controls on touchscreen multilanguage menu
- for eliminating of post-surgery problems, the insufflator is equipped with a highly efficient gas heating subsystem

| SPECIFICATIONS                               | INS30H  | INS40H              |
|--|---|---------------------|
| Insufflation pressure, mm Hg                 | 1 ... 30  | 1 ... 30            |
| Maximum gas flow rate, l/min                 | 30  | 40                  |
| Range of the gas temperature maintenance, °C | 33...36 (option)                                      | 33...36             |
| Gas cylinder pressure indicator              | Yes   | Yes                 |
| Safety exsufflation valve                    | Yes   | Yes                 |
| Display                                      | LED   | 7" TFT Touch Screen |
| Protection class                             | I   | I                   |
| Applied part                                 | BF  | BF                  |
| Standard                                     | EN 60601-1; classification acc. to MDD 93/42/EEC: IIa |                     |
| Mains voltage, V                             | 230   | 230                 |
| Dimensions, mm                               | 350x140x350   | 350x140x350         |
| Weight, kg                                   | 7,8   | 8,3                 |

# MEDICI

by ENDOMED

## Co2 INSUFFLATOR



High performance



Smart Continuous Flow Algorithm



Gas heating system



High level of patient safety



Smoke evacuation







## INS45HS

### Safety

- automatic computer-supported check on device soft- and hardware when turning the unit on
- internal gas exsufflation valve is activated for automatic reduction of dangerous intraabdominal overpressure

### Ergonomic design

- big 7" TFT display gives a quick overview of the rated and actual values of gas pressure, gas flow, alarms etc.
- setting of the working parameters is made by touching controls on touchscreen multilanguage menu

### Performance

- high flow rate capacity of 45 l/min quickly compensates for even big gas losses
- insufflator's Smart Continuous Flow algorithm ensures insufflation depending on the filling

level of the body cavity, thus an optimized filling speed is achieved with fully automatic, situation-related insufflation pressure values. A continuous gas flow provides a filling procedure with small pressure fluctuations in the body cavity and a high average insufflation performance

### Gas heating

- for eliminating of post-surgery problems, the insufflator is equipped with a highly efficient gas heating subsystem

### Smoke evacuation

- evacuation of smoke and mist generated during electrosurgery, and ultrasonic procedures can be made by pressing the footswitch

### Gas supply

- device can be used with gas bottles or central gas supply systems - input pressure range 4...100 bars

## SPECIFICATIONS

## INS45HS

|  |   |
|--|---|
| Insufflation pressure, mmHg .....                  | 1 ... 30 .....  |
| Maximum gas flow rate, l/min .....                 | 45 .....  |
| Range of the gas temperature maintenance, °C ..... | 33...36 .....   |
| Gas cylinder pressure indicator .....              | Yes .....   |
| Active exsufflation, Smoke evacuation .....        | Yes / Yes .....   |
| Display .....                                      | 7" TFT Touch Screen .....                                   |
| Protection class .....                             | I .....   |
| Applied part .....                                 | BF .....  |
| Standard .....                                     | EN 60601-1; classification acc. to MDD 93/42/EEC: IIa ..... |
| Mains voltage, V .....                             | 230 .....   |
| Dimensions, mm .....                               | 350x140x350 .....   |
| Weight, kg .....                                   | 7,8 .....   |



**SUC-IRR.1**

- based on a high performance pump
- minimal level of acoustic noise
- aspirates out not only liquid components but small blood conglomerations as well
- controlled by footswitch
- special spike enables quick irrigation bottle replacement



**SUC-IRR.2**

- based on a high performance pump
- minimal level of acoustic noise
- aspirates out not only liquid components but small blood conglomerations as well
- special spike enables quick irrigation bottle replacement
- suction or irrigation modes are activated by an instrument (Auto mode) or footswitch (Footswitch mode)
- automatic standby function keeps the pressure available and reduces the noise if the system is in use

**SPECIFICATIONS**

|  | <b>SUC-IRR.1</b>                                      | <b>SUC-IRR.2</b>      |
|--|---|-----------------------|
| Max vacuum in aspiration channel, mmHg       | 700   | 700                   |
| Max overpressure in irrigation channel, mmHg | 300   | 300                   |
| Maximal liquid outgo, l/min                  | 5   | 5                     |
| Controls                                     | footswitch  | footswitch, automatic |
| Protection class                             | I   | I                     |
| Applied part                                 | BF  | BF                    |
| Standard                                     | EN 60601-1; classification acc. to MDD 93/42/EEC, IIa |                       |
| Mains voltage, V                             | 230   | 230                   |
| Power consumption, W, max.                   | 70  | 70                    |
| Dimensions, mm                               | 325 x 85 x 350  | 325 x 85 x 350        |
| Weight, kg                                   | 5.3   | 5.6                   |



 **MEDICI**  
by ENDOMED

# ALLINONE SISTEMA VIDEO HD INTEGRATO

VIDEOCAMERA FULL-HD  
FONTELUCE MONITOR

NAIO1000

- USB Full HD image storage, Photo capture and Video recording function
- 19-inch high-definition monitor
- High definition imaging workstation
- Sony CMOS HD camera
- LED cold light source
- Integrated design of LED cold light source and CMOS camera



# ALLINONE SISTEMA VIDEO HD INTEGRATO

## Technical Data

|  |  |
|--|--|
| Camera head:                                     | <ul style="list-style-type: none"><li>- Full HD imaging (1920 x 1080)</li><li>- 1/2.8" SONY CMOS</li><li>- IPX8 waterproof</li><li>- Full HD optical coupler C-mount standard</li></ul>  |
| Voltage range (current consumption):             | - 100-240 V (50 VA)  |
| Frequency:                                       | - 50-60 Hz   |
| Device protection:                               | - 2x T3,15 A   |
| Video system:                                    | <ul style="list-style-type: none"><li>- Image resolution: Full HD 1920 x 1080</li><li>- Horizontal resolution: ≥900 TVL</li><li>- SNR: 50dB, Tolerance 20%</li><li>- Scanning system: Progressive Scanning</li><li>- White balance automatically</li></ul> |
| Monitor:   | - 19 inch  |
| Light source:                                    | - Built-in 80W LED cold light source   |
| Recording (optional)                             | <ul style="list-style-type: none"><li>- Image format: JPG 1920 x 1080</li><li>- Video format: Full HD 1920 x 1080; Mpeg-4 (H.264 Codec); Image rate 60fps</li><li>- Connection: USB</li></ul>  |
| Connections                                      | Video out terminal: <ul style="list-style-type: none"><li>- 1x DVI</li><li>- 1x HDMI</li><li>- 1x CVBS</li></ul>   |
| Protection class (acc.to IEC 60601-1):           | - I  |
| Safety class:                                    | - BF   |
| Standard:  | - IEC 60601-1-2  |
| Device classification (EU) 2017/745, annex VIII: | - I  |
| Features:  | <ul style="list-style-type: none"><li>- White balance</li><li>- Freeze function</li><li>- Zoom in/Zoom out</li><li>- Touch Buttons</li><li>- USB storage</li><li>- Photo capture/Video recording</li></ul>   |
| Language:  | - Chinese/English/Japanese   |
| Dimensions:                                      | - 461(L)x395(W)x163(H)   |

### OPTIONAL

Built-in imaging work-station(optional)

## Camera head



## Options

|                  |   |
|------------------|---|
| Features:        | <ul style="list-style-type: none"><li>- Photo capture, video recording</li><li>- Zoom in/Zoom out</li></ul> |
| Waterproof level | - IPX 8   |

# Vitruvio 200

ELECTROSURGICAL UNIT FOR  
MONOPOLAR AND BIPOLAR USE  
WITH 7.0" TOUCH-SCREEN



*New dimension of surgery*

VITRUVIO200 is provided with all the technical features, and monopolar and bipolar currents needed to perform the most advanced electrosurgery

 **MEDICI**  
by ENDOMED

# VITRUVIO 200 is provided with all the technical features, and the monopolar and bipolar currents needed to perform the most advanced electrosurgery

## VITRUVIO 200 is provided with 10 currents for the monopolar cutting

|                       |  |
|-----------------------|--|
| Pure Cut              | Pure cut without coagulating effect.<br>For open or laparoscopic surgery and for under liquid endoscopy (TURP, TURV).  |
| Blend Cut 1           | Cut blended with a medium coagulating effect.<br>For open or laparoscopic surgery and for under liquid endoscopy (TURP, TURV).   |
| Blend Cut 2           | Cut blended with a very high coagulating effect.<br>For open or laparoscopic surgery.  |
| Pure Cut Pulsed       | Pulsed pure cut without coagulating effect.<br>For open or laparoscopic surgery.   |
| Blend Cut Pulsed      | Pulsed cut blended with a medium coagulating effect.<br>For open or laparoscopic surgery.  |
| Auto Pure Cut Micro   | "Constant voltage" delicate pure cut without coagulating effect.<br>For open or laparoscopic surgery and for under liquid endoscopy (TURP, TURV).  |
| Auto Blend Cut Micro  | "Constant voltage" delicate cut blended with a medium coagulating effect.<br>For open or laparoscopic surgery and for under liquid endoscopy (TURP, TURV).   |
| Auto Papillo Pure Cut | "Constant voltage" pure cut, without coagulating effect, for flexible endoscopy.<br>With four modes of delivery: continuous and pulsed (slow, medium, fast).   |
| Auto Polipo Blend Cut | "Constant voltage" cut, blended with a medium coagulating effect, for flexible endoscopy.<br>With four modes of delivery: continuous and pulsed (slow, medium, fast).  |
| Auto EndoCut          | "Constant voltage" cut with alternating phases of cutting and blended cut, for flexible endoscopy.<br>With four modes of delivery: 90% Coagulation and 10% Cut, 80% Coagulation and 20% Cut, 75% Coagulation and 25% Cut, 50% Coagulation and 50% Cut. |

## VITRUVIO 200 is provided with 5 currents for monopolar coagulation

|                        |   |
|------------------------|---|
| Fulg Forced Coag       | High voltage, contact free coagulation.<br>For open or laparoscopic surgery, for under liquid endoscopy (TURP, TURV) and for flexible endoscopy.      |
| Spray Coag             | Very high voltage, contact free coagulation.<br>For open or laparoscopic surgery, for under liquid endoscopy (TURP, TURV) and for flexible endoscopy. |
| Pulsed Spray Coag      | Identical to the Spray coag current, but pulsed and more delicate.  |
| Pin Point Contact Coag | Medium voltage, contact coagulation.<br>For open or laparoscopic surgery, for under liquid endoscopy (TURP, TURV) and for flexible endoscopy.         |
| Soft Micro Coag        | Delicate, low voltage coagulation.<br>For open or laparoscopic surgery.   |

## VITRUVIO 200 is provided with 4 currents for bipolar cutting

|                    |  |
|--------------------|--|
| Standard Bicut     | Cut for open or laparoscopic surgery.  |
| Blend Bicut        | Cut blended with a very high coagulating effect (Coagulation = 95%) for open or laparoscopic surgery.  |
| Saline Uro-Gyn Cut | Cut for endoscopy in saline (TURPis, TURVis) with two modes of delivery: continuous and pulsed.<br>For urology and gynecology.<br>Continuous delivery is suitable to perform the vaporization. |
| Saline Arthro Cut  | Cut for arthroscopy in saline with two modes of delivery: continuous and pulsed.<br>For arthroscopy.<br>Continuous delivery is suitable to perform the vaporization.                           |

## VITRUVIO 200 is provided with 3 currents for bipolar coagulation and 2 currents for bipolar vessel sealing

|                        |   |
|------------------------|---|
| Soft Micro Bicoag      | Very precise and delicate coagulation.<br>For open or laparoscopic surgery, for endoscopy in saline (TURPis, TURVis) and for flexible endoscopy.  |
| Forced Macro Bicoag    | Fast coagulation.<br>For open or laparoscopic surgery.  |
| Auto Soft Micro Bicoag | Identical to the Soft Micro Bicoag, but with Impedance sensing automatic activation/deactivation.<br>It is not suitable for the endoscopy in saline.<br>Activation with delay adjustable from 0 to 5 seconds and deactivation with bitonal, grave, acoustic signal. |
| Sealing                | Current to coagulate/seal vessels up to 8 mm in open and laparoscopic surgery.<br>Activation with pedal and automatic Impedance sensing deactivation with bitonal, acute, acoustic signal.  |
| Auto Sealing           | Identical to the Sealing, but with Impedance sensing automatic activation/deactivation.<br>It is not suitable for endoscopy in saline.<br>Activation with delay adjustable from 0 to 5 seconds and deactivation with bitonal, grave, acoustic signal.               |

## Technical features of all models

|  |   |
|--|---|
| <b>HF generator</b>  | Meets IEC 60601-1 and IEC 60601-2-2 (Latest editions). Supply section <i>“switching”</i> type.  |
| <b>EMC compatibility</b>   | Meets IEC 60601-1-2 (Latest edition).   |
| <b>EC Classification and approval</b>                                | Class IIB according to 93/42/CEE (and its revised version) – Certificate nr. 187/MDD (IMQ 0051).  |
| <b>ALSA quality system</b>   | Meets ISO 9001 and ISO 13485 (Latest editions). Certificates 9120.ALSA and 9124.ALS2 (IMQ 0051).  |
| <b>Classification according to IEC 60601-1</b>                       | Class I, CF type with the following typical low frequency leakage currents (all cables tied together):<br>On the patient: 4µA = 0,004mA / Into the enclosure: 1µA = 0,001mA / To earth: 30µA = 0,03mA.  |
| <b>Output circuit according to IEC 60601-2-2</b>                     | <b>FLOATING</b> (Isolated at high and low frequencies) and protected against the use of the defibrillator.<br>Typical HF leakage currents measured at the unit: Monopolar currents = 90mA, Bipolar currents = 60mA.   |
| <b>Working frequency</b>   | Monopolar and bipolar currents: 440kHz ± 5%.  |
| <b>Functioning control</b>   | <b>Computerized MASTER/SLAVE SYSTEM</b> <ul style="list-style-type: none"> <li>• It performs a <i>Main Auto-check</i> at the switching ON (repeated every 30 minutes of operation) and the continuous <i>Standard Auto-check</i> during use.</li> <li>• It stops the power activation in case of hardware/software failures, mistakes of use, an anomalous power delivery, and it signals them by acoustic and visual <b>Error Codes</b>.</li> <li>• It memorizes all <b>Error Codes</b> to help the check and the technical assistance.</li> </ul>   |
| <b>Self-adjusting of output powers</b>                               | <b>Computerized self-adjustment with PER (Power Efficiency Rating &gt; 98%) according to the impedances of tissues (Feed-back in real time - 7000 times/sec) by two different systems:</b> <ul style="list-style-type: none"> <li>• <b>ADC System – Dynamic self-adjustment with constant power</b><br/>The powers have a progressive setting (Micro and Macro setting with steps from 0,1 to 10W).<br/>Monopolar currents (from 1 to 10W), Bipolar currents (from 0,1W to 5W).</li> <li>• <b>APC System - Fully automatic control</b><br/>The powers have a setting with 10 effects (the unit shows, for each effect, the maximum delivered power).</li> </ul> |
| <b>Control of the HF leakage currents</b>                            | By a specific computerized circuit with alarms.   |
| <b>Memorization of programs</b>                                      | 100 programs identifiable by number and text (Surgical use or Name of the surgeon).   |
| <b>Usable pencils or instruments</b>                                 | <b>All models allow the following use of the monopolar and bipolar accessories:</b> <ul style="list-style-type: none"> <li>• One/two either hand-switched or foot-switched monopolar pencils or instruments.<br/>Two monopolar pencils can be used simultaneously according to IEC 60601-2-2.</li> <li>• One/two bipolar instruments by foot-switch activation (When selecting the <b>Auto Soft Micro Bicoag</b> or the <b>Auto Sealing</b> currents, an instrument is usable by the <b>Impedance sensing</b> automatic activation/deactivation).</li> </ul>  |
| <b>Twin foot-switches</b>  | <b>The unit can be used by either one or two waterproof (IPN8) twin foot-switches.</b> <ul style="list-style-type: none"> <li>• Only with one twin foot-switch (DS/Esw or DS/Eswl, large model for the use in endoscopy) with a Foot-selector to activate either the monopolar or the bipolar currents.</li> <li>• Only with one twin foot-switch (DS/B) to activate the bipolar currents only.</li> <li>• With both twin foot-switches, one to activate the monopolar currents and one to activate the bipolar ones.</li> </ul>  |
| <b>Control circuit of the neutral electrode</b>                      | <b>NPCC System with double circuit: Contact quality monitor and Continuity monitor with four progressive alarm lights and stop of the power delivery. The circuit operates as follows:</b> <ul style="list-style-type: none"> <li>• It checks all kinds of neutral electrode, both “split” double area and “non split” single area.</li> <li>• It has two modes of use: Large electrodes for adults and Small electrodes for paediatrics and new-born.</li> <li>• It allows the use of cables with both European “Ø 6,35mm” and USA “2 pins” connectors.</li> </ul>   |
| <b>Luminous and acoustic signals of activation and alarm</b>         | They meet IEC 60601-2-2 (Latest edition).<br>Lights: Cutting = yellow, Coagulation = blue, Alarms and Error codes = red<br>Activation sounds: Continuous (acute for the cut and grave for the coagulation, with level adjustable from 45 to 65dB), including a bitonal sound to indicate the power deactivation when using the currents: Auto Soft Micro Bicoag, Sealing and Auto Sealing. Alarm sound: Intermittent (High >65dB and not adjustable).   |
| <b>Mains supply and consumption, Mains switch, Fuses and Standby</b> | 100 / 230V ± 10% ~ 50/60Hz (Consumption: Max. 3,6A = 828VA, Standby 0,4A = 92VA).<br>Bipolar switch (green), Two fuses 8A, Standby mode selectable on the touch-screen.   |
| <b>Equipotential connection</b>                                      | Standard DIN 42801 plug.  |
| <b>Enclosure, Cooling</b>  | Metal painted case, protected against the spilling of liquids according to IEC 60601-2-2. Cooling by convection (No fan).   |
| <b>Software updating and calibration</b>                             | Updating by a serial port connected to a PC, calibration on-site.   |
| <b>Dimensions and weight (LxWxH)</b>                                 | NHP/T-400 and T-200: 38x35x19cm - 10Kg – NHP/TA-400 and TA-200: 38x38x19cm - 10,5Kg.  |



# VITRUVIO 200 – THE CURRENTS

## MONOPOLAR CUTTING

|                  | Pure Cut  | Blend Cut 1 | Blend Cut 2 | Pure Cut Pulsed | Blend Cut Pulsed | Auto Pure Cut Micro | Auto Blend Cut Micro                                      | Auto Papillo Pure Cut | Auto Polipo Blend Cut | Auto Endocut |  |
|------------------|---|-------------|-------------|-----------------|------------------|---------------------|---|-----------------------|-----------------------|--------------|--|
| Max Output Power | 200 W   | 200 W       | 200 W       | 200 W           | 200 W            | 200 W               | 200 W   | 200 W                 | 200 W                 | 200 W        |  |
| Rated load       | 400 Ω   | 400 Ω       | 400 Ω       | 400 Ω           | 400 Ω            | 300 Ω               | 300 Ω   | 300 Ω                 | 300 Ω                 | 300 Ω        |  |
| Vpp              | 2550  | 3390        | 3330        | 2640            | 3330             | 1137                | 1500  | 1140                  | 1490                  | 1670         |  |
| Crest factor     | 1,46  | 1,94        | 2,29        | 2               | 3,2              | 1,5                 | 1,98  | 1,5                   | 1,98                  |              |  |
| Modulation       | 0   | 17 kHz      | 17 kHz      | 3 Hz            | 50 Hz            | 0                   | 17 kHz  | 0                     | 17 kHz                | -            |  |
| Duty Cycle       | 100%  | 95%         | 65%         | 50%             | 50%              | 100%                | 90%   | 100%                  | 95%                   |              |  |
| Power setting    | Progressive with steps from 1 to 10 W                   |             |             |                 |                  |                     | 10 Effects  |                       |                       |              |  |
| Power control    | ADC System – Dynamic self-adjusting with constant power |             |             |                 |                  |                     | APC System - Totally self-adjusting with constant voltage |                       |                       |              |  |

## MONOPOLAR COAGULATION

|                  | Fulg Forced Coag  | Spray Coag | Pin Point Contact Coag | Pulsed Spray Coag | Soft Micro Coag   |
|------------------|---|------------|------------------------|-------------------|---|
| Max Output Power | 150 W   | 200 W      | 200 W                  | 200 W             | 200 W   |
| Rated load       | 300 Ω   | 700 Ω      | 400 Ω                  | 700 Ω             | 300 Ω   |
| Vpp              | 4500  | 7750       | 3700                   | 7850              | 2875  |
| Crest factor     | 6,4   | 7,75       | 2,2                    | 11,54             | 2,1   |
| Modulation       | 60 kHz  | 30 kHz     | 17 kHz                 | 3 Hz              | 17 kHz  |
| Duty Cycle       | 18%   | 7%         | 85%                    | 50%               | 75%   |
| Power setting    | Progressive with steps from 1 to 10 W                   |            |                        |                   | 10 Effects  |
| Power control    | ADC System - Dynamic self-adjusting with constant power |            |                        |                   | APC System - Totally self-adjusting with constant voltage |

## BIPOLAR CUTTING

|                  | Saline Uro-Gyn Cut                                      | Saline Arthro Cut | Standard Bicut                         | Blend Bicut |
|------------------|---|-------------------|--|-------------|
| Max Output Power | 350 W   | 230 W             | 200 W                                  | 160 W       |
| Rated load       | 350 Ω   | 350 Ω             | 300 Ω                                  | 200 Ω       |
| Vpp              | 1070  | 1070              | 1070                                   | 740         |
| Crest factor     | 1,5   | 1,5               | 1,5                                    | 1,57        |
| Modulation       | 0   | 0                 | 0                                      | 17 kHz      |
| Duty Cycle       | 100%  | 100%              | 100%                                   | 95%         |
| Power setting    | 10 Effects  |                   | Progressive with steps from 0,1 to 5 W |             |
| Power control    | ADC System – Dynamic self-adjusting with constant power |                   |  |             |

## BIPOLAR COAGULATION AND VESSEL SEALING

|                  | Soft Micro Bicoag   | Auto Soft Micro Bicoag | Sealing    | Auto Sealing  | Forced Macro Bicoag                    |
|------------------|---|------------------------|------------|---|--|
| Max Output Power | 140 W   | 140 W                  | 320 W      | 320 W   | 200 W                                  |
| Rated load       | 100 Ω   | 100 Ω                  | 50 Ω       | 50 Ω  | 100 Ω                                  |
| Vpp              | 460   | 460                    | 780        | 780   | 550                                    |
| Crest factor     | 1,56  | 1,56                   | 2,47       | 2,47  | 1,6                                    |
| Modulation       | 0   | 0                      | 0          | 0   | 0                                      |
| Duty Cycle       | 100%  | 100%                   | 100%       | 100%  | 100%                                   |
| Power setting    | Progressive with steps from 0,1 to 5 W                    |                        | 10 Effects |   | Progressive with steps from 0,1 to 5 W |
| Power control    | APC System - Totally self-adjusting with constant voltage |                        |            | ADC System - Dynamic self-adjusting with constant power |  |

**HF LEAKAGE CONTROL**



Continuous check of any high frequency leakage to earth. If the system identifies potentially dangerous situations such as patient contact with metal parts of the operating table, it automatically reduces the power supplied eliminating risks such as burns on the patient and informs the operators by means of an alarm signal.

**2 DOUBLE FOOTSWITCH CONTROLS**

Can be used for mono or bipolar functions on the same pedal by foot selector or by using two pedals at the same time (mono and bipolar). Pedals are protected against accidental use, they are watertight to the dive (IPX7) and are powered by medical safety voltage (12VDC).



**2 MONOPOLAR and 2 BIPOLAR SIMULTANEOUS OUTPUTS**



The outputs can be used simultaneously by two surgeons using handles with manual controls (international 3-pin connectors), one with manual controls and the other one with a normal monopolar handle by the double pedal control. To use monopolar instrument cables, with a single connector other than the standard one, an adapter is needed.

**CONTROL OF THE NEUTRAL ELECTRODE**



Neutral electrode control circuit checks the cable, its connection and the contact between electrode and the patient's tissues. Stops the delivery of power, with an acoustic and visual alarm if:

- the cable is damaged or isn't well connected
- the electrode contact is insufficient

Bipolar double control footswitch



Wide double control footswitch for endoscopy



Bipolar adapter Martin / Erbe



Bipolar adapter 4mm female



Monopolar adapter



|   | <b>Codici</b> |
|---|---------------|
| Vitruvio 200 Generator  | VTR200        |
| Cable for neutral electrodes  | 449195        |
| Neutral silicon electrode, autoclavable for adult 25x12cm, cable 2,5m | 801420        |
| Neutral silicon electrode autoclavable for kids 19x8cm, cable 2,5m    | 801419        |
| Double Monopolar footswitch   | 416101        |
| Double large footswitch, 30x18 cm, Monopolar/Bipolar for Endoscopy    | 416105        |
| Double bipolar footswitch 25x12cm.                                    | 416102        |
| Bipolar cable adapter Medici/Martin                                   | 2370017       |
| Bipolar cable adapter Medici/Erbe                                     | 2370018       |
| Bipolar cable adapter Medici/4mm                                      | 2370019       |
| Monopolar cable adapter from Ø2-8mm                                   | 2370016       |

POWERSONIC  
INTEGRATE SYSTEM  
FOR ELECTROSURGERY

ULTRASOUND GENERATOR





## GENERATOR

- ITM - Intelligent Tissue Monitoring
- Built-in dual core high-speed DSP, which can intelligently monitor the characteristics and changes of the shear tissue, accurately adjust the output of energy, and ensure the best sealing effect and reduce the thermal damage when processing different tissues



## Safety Insurance

- Passed USA 510K vessel sealing test in 2016. Sealing the vessel up to 5mm



## Data Storage

- Perform power-on self-test, monitor the running state of the system, and update the system log in real time for query at any time
  - Reorganize the shear automatically, and record the usage times and working status of the hand piece
- 



## HANDLE

### Original design

- High efficiency hand piece, no over heat occur even in long time use
- Autoclavable
- Can be used under sterile bag
- Soft and flexible wire



HPT25

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## SHEAR



**Balance** design tip provides better hemostatic effect, less lateral thermal damage

- Strong clamps provides stable performance on cutting and sealing
- Beautiful integrative structure
- Embedded tissue pad, strong and stable



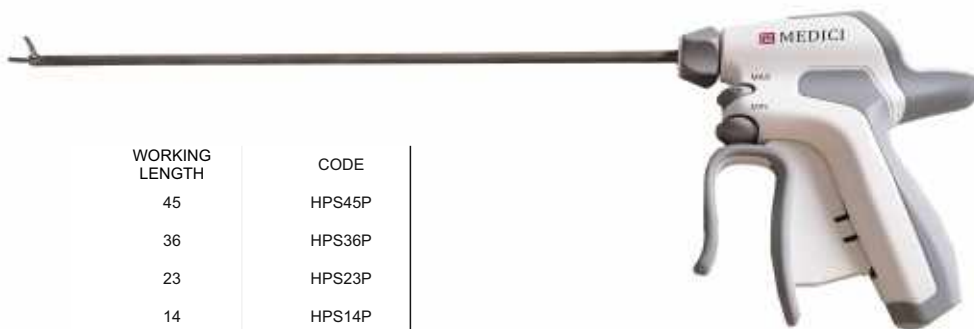
**Ergonomic handle** makes the holding more comfortable



### Various styles

USE Serial -- Pistol Style Shear

Applications: Laparoscope, Open surgery, Superficial Surgery.



| WORKING LENGTH | CODE   |
|----------------|--------|
| 45             | HPS45P |
| 36             | HPS36P |
| 23             | HPS23P |
| 14             | HPS14P |

USS Serial -- Scissors Style Shear

Application: Open surgery Superficial Surgery



| WORKING LENGTH | CODE   |
|----------------|--------|
| 9              | HPS09S |
| 17             | HPS17S |



## Generator Specifications

|  |                  |
|--|------------------|
| Code                                   | GEN10PLUS        |
| Voltage                                | 100-240V         |
| Frequency                              | 50/60Hz          |
| Screen size                            | 7 inches         |
| Screen color                           | TFT              |
| Generator size                         | 360*340*135mm    |
| Ambient temperature                    | 10 - 30 °C       |
| Ambient humidity                       | no more than 70% |
| Storage temperature                    | -35 - 55 °C      |
| Storage humidity                       | no more than 90% |
| Working noise level                    | below 90dB       |
| Electrical safety classification       | class IIb        |
| Application part safety Classification | CF               |
| Water-proof class                      | Footswitch IPX8  |



## Foot-Switch



FSW01



# MEDICI

**Company:**

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