

# Enteroport® plus

## Instructions for Use



CE 0123

**GB** Software EPbb

**B | BRAUN**

# Patient Safety

Attention: Consult accompanying documents! 

Read instructions for use prior to use. Use the device only if regular instruction has been performed by specifically trained staff. For assistance in setting up, using, maintaining, to report unexpected operation or report events see contact informations on back page.

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## Operation

- Prior to use check audible and visual alarms during the self-test. Also check the device for possible damage.
- Connect the patient only after switching on the device. To prevent an incorrect dose from being delivered, the administration set must be disconnected when changing the patient tube system.
- Select administration set suitable for the pump and the intended medical application.
- Ensure the tubing is free of kinks to enable proper flow.
- Change disposables every 24h (observe national hygiene regulations).
- Compare displayed value with the entered value. Start pump only if values are consistent.
- Installation in rooms for medical purposes must be compliant with the appropriate regulations (e.g. VDE 0100, VDE 0107 or IEC publications). Observe national specifications and deviations.
- Operation of the device in explosive environments is not allowed.
- Air in line cannot be detected by the air detector if the air inlet occurs between the pump and patient connector (e.g. air inlet through the 3-way stop-cocks, infusion ports and additional administration set components).
- Use only approved combinations of equipment, accessories, working parts and disposables.
- It is recommended to use Enteroport® plus administration sets only.
- The use of unapproved or incompatible disposables may affect the technical data.
- In case of malfunction the selected flow rate and volume to be administered might present deviations.
- Additional drugs must only be administered via injection ports or directly via the feeding tube.
- Mains operation is permitted only with the mains adapter specified for this purpose.
- Only use the mains adapter included. The disconnection of the mains adapter from the device must be effortless and all pieces must be within reach of the patient for the separation of the mains adapter from the device.
- Rollerclamp has to be closed in case of operation stop.
- To avoid strangulation hazards, cable and hoses should not be wrapped around the body.
- In case of allergic reaction use an alternative device.

Please add the sticker with short instructions for use in your language to the top of the pump housing (see chapter Overview).

## Safety Standards

- The Enteroport® plus satisfies all safety standards for medical electrical devices in terms of the IEC 60601-1 and IEC 60601-1-11.
- The EMC-limits (electro-magnetic compatibility) according to IEC 60601-1-2 are maintained. If the equipment is operated in the vicinity of other equipment which may cause high levels of interference (e.g. HF surgical equipment, nuclear spin tomography units, mobile telephones etc.) it may be disturbed. Portable and mobile RF communications equipment can affect MEDICAL ELECTRICAL EQUIPMENT. For separation distances see chapter Technical Data (Electromagnetic Compatibility Guidance and Manufacturers Declaration Table 6).

## Special Safety Instructions

Use of Enteroport® plus with sedated patients:

- For use with sedated patients, patients in a state of shock or in a state similar to shock, the following additional safety instructions have to be observed in addition to the general safety instructions:
- Fix substrate container at patient's level
- Feeding should take place via a percutaneous feeding tube, not via a nasogastric feeding tube
- Re-positioning system components during feeding leads to an increased risk of aspiration!
- Simultaneous therapy with drugs, influencing gastric emptying and peristalsis, also increases the risk of aspiration
- Disease-related gastric emptying disorders (e.g. gastroparesis with Diabetes Mellitus or pyloric stenosis)



### Caution

The Enteroport® plus is not intended for use in neonatology. The Enteroport® plus is not recommended to use in proximity to magnetic resonance imaging (MRI) equipment.

The essential performance is defined as follows:  
Delivery of nutrition with selected rate

- fully functional: 1.400ml/h  $\pm$  10%
- single fault condition: standstill with alarming

# Enteroport® plus

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The Enteroport® plus is an enteral nutrition pump, intended exclusively for enteral nutrition. The Enteroport® plus can be used in hospital care as well as in outpatient or home care.

The Enteroport® plus is easy to use and offers several modes of operation:

1. Continuous nutrition by selection of administration rate
2. Continuous nutrition by selection of volume / time
3. Intermittent Interval nutrition / bolus application



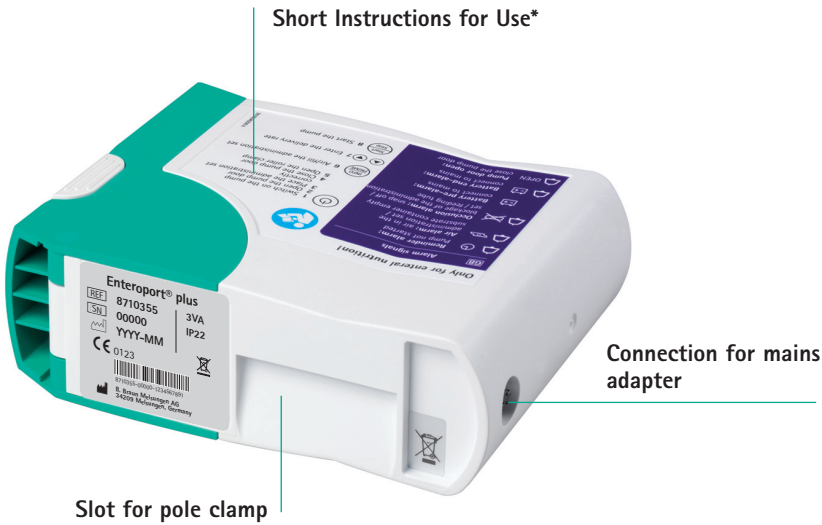
The Enteroport® plus shell not be used

- for intravenous infusions
- if enteral nutrition is contraindicated
- in neonatology

Even with pump-controlled nutrition, problems like diarrhea or a feeling of fullness may arise. The administration rate must be adapted to the individual patient needs. Frequent therapy monitoring is recommended. The medical health care professional must decide if the administration of enteral nutrition via the Enteroport® plus pump is recommended for the specific patient.

Further technical data and contraindications are described in these instruction for use.

# Overview



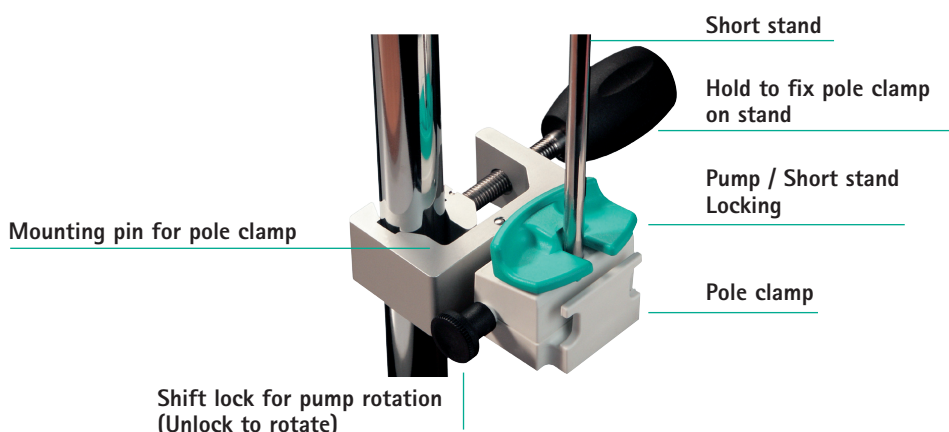
\* Please add the sticker with short instructions for use in your language to the top of the pump housing.

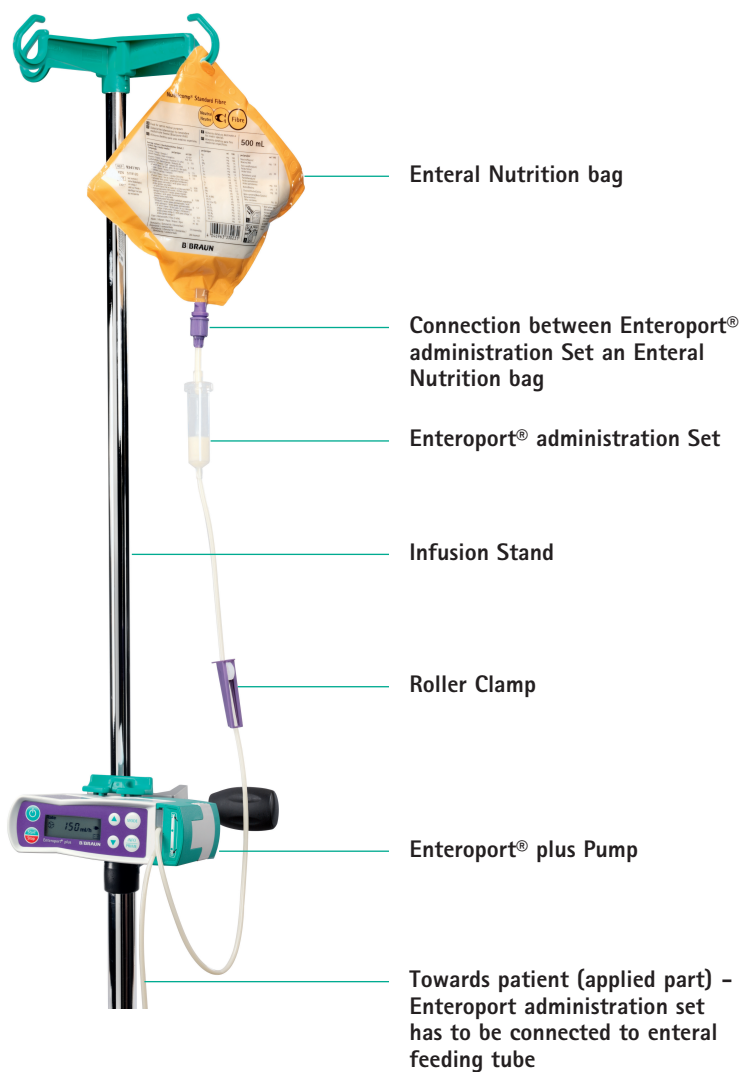


### Pole clamp and short stand

The Enteroport® plus pole clamp can be installed vertically or horizontally on wall rail systems according to EN 12218 or vertical stands  $\varnothing$  16mm – 40mm (e.g. infusion stands). The pole clamp can be rotated by 360° in steps of 90°. This will allow vertical and horizontal installation, e.g. on patients bed.

To fix the Enteroport® plus pump to the Pole Clamp, pull back the green short stand locking and slide the pump from above into the holder. The short stand locking will automatically snap in. Please verify that the pump is firmly fixed to the Pole Clamp.  
If there is no appliance to hang the substrate up, a short stand can be used with the pole clamp.





# Operation

| Button                                                                                      | Operation                                                                                                                          | Functions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|---------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <br>ON/OFF | ON: Press button                                                                                                                   | Pump is switched on; Wait for self-test and check display during self-test.                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|                                                                                             | OFF: Press button for 2 seconds                                                                                                    | Pump is switched off.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|            | START: Press the START/STOP button briefly                                                                                         | Flow will be started                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                                                                                             | STOP: Press the START/STOP button briefly                                                                                          | Flow will be stopped                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|            | Press the MODE button to start the programming of the administration parameters.                                                   | For detailed information see chapter Operation: Volume/Time mode" and „Operation: Bolus application mode"                                                                                                                                                                                                                                                                                                                                                                                                          |
|            | INFO: Press the INFO/PRIME button briefly to display administration parameters, battery charging status or remaining battery time. | <b>INFO/PRIME</b><br>If pump is switched off: Battery charge status is displayed.<br>If pump is switched on and flow is started: Delivered volume is displayed;<br>If button is pressed a second time: Delivery time is displayed;<br>If button is pressed again: Remaining battery operation time is displayed. The display disappears automatically after 5 seconds.                                                                                                                                             |
|                                                                                             | PRIME: Press button for about 5 seconds                                                                                            | Button INFO/PRIME can also be used to vent the administration set after pump is switched on and parameter set up has been completed. By pressing the INFO/PRIME button for approx. 5 sec. the administration set will be filled with substrate (max. 15 ml) at maximum administration rate. By releasing the INFO/PRIME button, the pump will stop. It is recommended to release the INFO/PRIME button when administration set is completely filled.<br>- During priming, all operational alarms are switched off. |
|          | By activating the ARROW UP and ARROW DOWN buttons, parameters can be adjusted to the desired values.                               | Can be used to increase administration parameters.                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|          |                                                                                                                                    | Can be used to decrease administration parameters                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

# Symbols

| Display Symbol                                                                                                                                                      | Operation                                                         | Functions                                                                                                                      |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
|                                                                                    | The Wheel symbol indicates whether the pump is delivering or not. | <b>Wheel rotates:</b> Pump is delivering fluid<br><b>Wheel stopped:</b> Pump has stopped                                       |
|                                                                                    | Administration rate                                               | Rate unit of the delivery protocol; Rate entry                                                                                 |
|                                                                                    | Volume                                                            | Volume unit of the delivery protocol; Volume entry                                                                             |
|                                                                                    | Time                                                              | Time unit of the delivery time and remaining battery operation time; Entry of the delivery time                                |
|                                                                                    | Bolus                                                             | The symbol BOL indicates the interval feeding operational mode (bolus application)                                             |
|   | Rate/Bolus                                                        | The symbol ml/ h followed by BOL indicates the bolus administration rate based on the interval feeding operational mode        |
|   | Volume/Bolus                                                      | The symbol ml followed by BOL indicates the bolus volume to be delivered based on the interval feeding operational mode        |
|   | Cycle time/Bolus                                                  | The symbol h followed by BOL indicates the delivery time including the off time based on the interval feeding operational mode |
|                                                                                  | Bell                                                              | The bell symbol indicates an acoustic alarm                                                                                    |
|                                                                                  | Battery                                                           | The battery symbol indicates that the pump is working with battery and it is not connected to the mains power                  |
|                                                                                  | Connector                                                         | The connector symbol indicates mains operation                                                                                 |

| Product Symbol                                                                      | Operation        | Functions                                                                            |
|-------------------------------------------------------------------------------------|------------------|--------------------------------------------------------------------------------------|
|    | Classification   | Defibrillation-proof Type CF Applied Part                                            |
|    | Protective Class | Class II Equipment                                                                   |
|    |                  | See instructions for use                                                             |
|    |                  | Mandatory action: see instruction for use                                            |
|    |                  | Temperature Limit                                                                    |
|    |                  | Moisture Limit                                                                       |
|    |                  | Limitation of the atmospheric pressure                                               |
|    |                  | General warning sign (e.g. Caution)                                                  |
|    |                  | Batch code                                                                           |
|    |                  | Serial number                                                                        |
|    |                  | Manufacturer                                                                         |
|   |                  | Date of manufacture                                                                  |
|  |                  | Labeling of electric and electronic devices according to directive 2002/96/EC (WEEE) |
|  |                  | CE mark compliant to Directive 93/42/EEC                                             |
|  |                  | Keep dry                                                                             |
|  |                  | Only for indoor use                                                                  |
|  |                  | Direct Current (DC)                                                                  |

## Loading Enteroport® plus administration set

All Enteroport® plus administration sets have an integrated support plate (cassette) on which the tubing system is already fixed in the loading position.

1. Switch on the Enteroport plus with the -button and wait for self-test.

### ! Self-test:



Prior to the self-test, the software version (EPBB) will be displayed when the Enteroport® plus is switched on. While performing the self-test, all symbols will appear and the digital sequence 11:11, 22:22, 55:55.

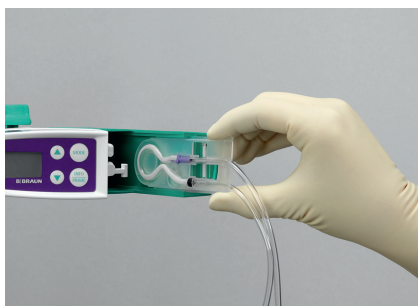
We recommend the user to check during the self-test if there is any defect on the display. All functions of the Enteroport® plus will be tested during the self-test.

The functionality of the audible alarm system will be confirmed by an acoustic signal while switching on the Enteroport® pump. After the self-test, the alarm level will be displayed (AL1 or AL2).

2. Open pump door with usage of the white locking.



3. Slide the cassette of the administration set into the pump door track, check for correct fitting



4. Close the door, close pump door mechanism – it has to engage audibly. Do not force the door closed.



After loading the Enteroport® plus administration set and closing the pump door, the pump starts automatically activating all safety and control functions. This action is indicated on the display by the wheel sign rotating. After the process is completed, the pump can be started according to the (short) instructions for use.



Operating alarms immediately stop the infusion. An audible tone sounds and the reason for the alarm is displayed. The recommended action is described in chapter „Alarm signals“.

## Venting the Enteroport® plus administration set

Before the actual flow starts, the administration set can be filled quickly, safely and under control by using the PRIME-function of the Enteroport® plus pump.

This is done by opening the roller clamp and pressing the -button for 5 seconds. The pump runs at maximum rate for the duration that the button is pressed, up to a maximum volume of 15 ml. The PRIME-function stops automatically after reaching the maximum volume. The PRIME-function is supported by an audible signal.

### NOTE:

If the Enteroport® plus administration set is vented by gravity prior loading it into the pump, the administration set must be pre-filled up to 2-3 cm before the distal cone/Luer-Lock connector. This is necessary due to the automatic start of the pump and the related short-term delivery. The administration set must be changed every 24 h due to performance reasons.

## Operation modes

The Enteroport® plus is delivered in "continuous" administration mode by selection of "rate" as pre-selected operation mode.

Other operation modes, which can be chosen by pressing the MODE button, are:

- Continuous administration mode by selection of Volume/Time
- Intermittent Interval Administration/Bolus application.
- Continuous administration mode by selection of rate

After the Enteroport® plus is switched on with the ON/OFF button and the self-test is successfully completed, the administration set has to be loaded and vented accordingly.

By using the - and -buttons, the intended rate can be selected in the range of 1-400 ml/h in variable increments of 1 ml/h. The flow rate can be increased/decreased by continuously pressing the - and -buttons.

After the rate has been entered, the administration can be started by pressing the -button.

The administration can be stopped by pressing the -button.

The pump is switched off by pressing the -button for approx. 2 seconds.

# Configuration mode

|                                                                                                                                                                                                                                                                    |                               |                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <br>                                                                                             | Configuration mode            | To start the configuration mode the pump must be switched off! Simultaneously press MODE and ON/OFF buttons (in the sequence MODE, ON/OFF) for at least 2 seconds | The configuration mode enables the selection of alarm level, data lock and operation mode.                                                                                                                                                                                                                                                                                                     |
| <br>                                                                                             | Alarm level selection         | Select alarm level by using the arrow up/arrow down buttons                                                                                                       | <p>AL1:<br/>All alarms are activated</p> <p>AL2:</p> <ul style="list-style-type: none"><li>• Stand-by alarm inactive</li><li>• Battery low alarm via staff call and display only, not audible</li><li>• Volume-end alarm is inactive, instead of an audible alarm operation is continued with Keep Open Rate (KOR) (5ml/h).</li><li>• Alarmvolume L01..2</li><li>• Airvolume 2..25ml</li></ul> |
| <br><br><br> | Activate/Inactivate Data lock | Press the MODE button, then activate the desired data lock level by using the arrow up/arrow down buttons                                                         | <p>OPEN:<br/>All operating parameters can be changed any time.</p> <p>SAFE:<br/>Operating Parameters can be changed only once, until the next start of the pump. Further changes can be made only after activating "OPEN" in configuration mode.</p>                                                                                                                                           |
|                                                                                                                                                                                 | Data lock selection           | After choosing the data lock level, press the MODE button twice to lock data selection                                                                            | Provides safety against unintentional change of delivery parameters.                                                                                                                                                                                                                                                                                                                           |

|                                                                                     |                          |                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                |
|-------------------------------------------------------------------------------------|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    | Operation mode selection | Press MODE button to activate<br><b>Rate selection</b><br>- Rate selection<br>(  flashes)                                                                                                                                                                                     | Select administration mode by using UP/DOWN buttons. The select operation mode will be described with "ON" at the pump display                                                                 |
|    | Operation mode selection | Press MODE button to activate<br><b>Volume/Time selection</b><br>- Volume/Time selection<br>(  ,  ,  flash) | The status of the operation mode can only be changed from OFF to ON, not the other way around. The activation of one operation mode results in the deactivation of all other operations modes. |
|    | Operation mode selection | Press MODE button to activate<br><b>Bolus application</b><br>- Bolus application<br>(  flashes)                                                                                                                                                                               |                                                                                                                                                                                                |
|    | Alarm level adjustment   | Press the MODE button to activate alarm level adjustment, select alarm level by using UP/DOWN button                                                                                                                                                                                                                                                           | The loudness of the alarm level is adjustable in 2 steps:<br>Level "L01"<br>Level "L02"                                                                                                        |
|  | Air alarm volume         | Press the MODE button to activate Air alarm volume adjustment, select level of air volume by using UP/DOWN button                                                                                                                                                                                                                                              | The air alarm volume is adjustable from 2-25 ml                                                                                                                                                |
|  | Exit configuration mode  | Press ON/OFF button for at least 2 seconds                                                                                                                                                                                                                                                                                                                     | Pump is switched off                                                                                                                                                                           |

# Operation: Volume/Time mode

## Continuous nutrition by selection of Volume / Time

After the Enteroport® plus is switched on with the -button and the self-test is successfully completed, the administration set has to be loaded and vented accordingly.

The symbols  and  flash,  will be shown on the top of the display to request entry of the volume.

By using the - and -buttons, the flow volume required can be entered in the range of 1 – 5,000 ml in variable increments of 1 ml (in the range of 1– 49 ml) or 50 ml (in the range of 50 – 5,000 ml).

The time definition can be activated by using the -button. The  symbol will then disappear,  symbol will flash and the  symbol will be shown continuously in the top line of the display to request entry of the flow time.

The time can be selected in the range of 15 min – 24 h by using the - and -buttons, variable in 15 min intervals.

The selection of volume and time can be adjusted by continuously pressing the - and -buttons.

By pressing the -button again, the  symbol disappears and  symbol appears continuously. The calculated rate is displayed.

The pump can be started up by pressing the -button.

### NOTE:

The programmed parameters will be validated by the pump. Therefore, it may happen that certain volume/time combinations are not possible i.e. not within the upper/lower limits. This is shown by a short audible signal. If larger or smaller volumes/times are desired, it is necessary to adjust the different parameters by scrolling through the list of parameters in the display and adjusting the values for the volume and time accordingly.

To start the pump, at least two parameters must be defined, i.e. the volume and one additional parameter (the third parameter is calculated automatically). The third parameter must be validated/viewed by pressing the -button. If the entry is incomplete, a short audible signal will sound.

If the rate is changed after the volume and time have been entered, the flow time will be adjusted automatically. The -symbol will flash in the top display line. The volume is kept constant by the pump. The time parameter must be checked/validated again (-button) to check for plausibility before the pump can be started up with the -button.

Within the operation mode Volume/Time selection, a "Keep Open Rate" (KOR) of 5 ml/h is integrated. The administration rate will be automatically adjusted to the KOR at the end of the volume to be infused until the pump is switched off. This enables feeding during the night without the necessity of flushing the administration set/feeding tube after application (this step can be done later during the following morning, so there is no need to wake up the patient).

# Operation: Bolus application mode

## Intermittent interval nutrition (bolus application)

After the Enteroport® plus is switched on with the -button, the self-test is successfully completed and the administration set has been loaded and vented accordingly the symbols  and  will flash in the top line of the display. The  and  symbols appear continuously to request entry of the bolus rate.

By using the - and -buttons, the bolus rate can be selected in the range of 1 – 400 ml/h variable in increments of 1 ml/h. Selection of the bolus rate can be adjusted by continuously pressing the - and -buttons.

The bolus volume definition can be selected by pressing the -button. The  symbol disappears, the  symbol flashes and the  and  symbols appear continuously to request the entry of the bolus volume.

By using the - and -buttons, the bolus volume required can be set up in the range of 1 – 1,000 ml in variable increments of 1 ml (in the range of 1 – 49 ml) or 50 ml (in the range of 50 – 1,000 ml).

The bolus time entry is called up by pressing the -key once. The  symbol disappears,  and the  symbol appear continuously to request the entry of the bolus time. The pump software calculates the bolus time limits always with a 15 min minimum off time. If necessary, the bolus time will be adjusted automatically.

The cycle time can be selected in the range of 30 min – 24 h with the - and -buttons, variable in 15 min intervals. If necessary, the bolus time will be adjusted automatically.

The cycle time can be selected in the range of 30 min – 24 h with the - and -buttons variable in 15 min intervals.

Pressing the -button starts the pump.

### NOTE:

To start the pump, all parameters must be selected. As long as a parameter is not selected or validated, the parameters symbol flashes. During the off time, a Keep Open Rate (KOR) of 5ml/h is activated to prevent possible blockage of the administration set or feeding tube. The individual bolus delivery setting operates continuously until either the substrate container is empty, or until the flow is ended by pressing the  button.

### EXAMPLE:

Bolus rate = 200 ml/h

Bolus volume = 400 ml

$$\text{ApplicationTime} = \frac{\text{BolusVolume}}{\text{BolusRate}} = 2\text{h}$$

A minimum cycle of 2 h and 15 min will be calculated by the pump, which is equivalent to an application time of 2 hours plus 15 min off time.

The default value for the "off time" can be adjusted by activating the - and -buttons.

If a cycle time of 5h is set up in this example, the application time would be 2 h and the off time 3 h. This means that the pump would administer the solution for 2 h with an infusion rate of 200 ml/h, and after these 2 hours the infusion rate would be decreased to 5 ml/h (KOR mode).

# Alarm signals

## 1. Supported optical signals

The alarm signals are visualized on the LCD display in the front of Enteroport plus device.



| Name                | Symbol | Name           | Symbol |
|---------------------|--------|----------------|--------|
| Alarm symbol (Bell) |        | Air symbol     |        |
| Pressure symbol     |        | Battery symbol |        |
| Mains symbol        |        | Value display  |        |
| Unit display        |        | Rotating wheel |        |
| Bolus symbol        |        | Clock symbol   |        |
| Volume symbol       |        | Rate symbol    |        |

## 2. Alarm signal

All alarm conditions are technical, there are no physiological alarm conditions.

### 2.1. Device Alarms

When a device alarm occurs the infusion and battery charging is immediately stopped and display indicates the Bell-Symbol with a code number and a audible alarm (Periodic buzzer activation, 1sec on, 5sec off) is given. First, close the roller clamp for precaution reasons. Secondly, press the ON/OFF button to switch off

the device. Then switch the device on again. In the case of a repeated device alarm the pump must be sent for service.

**NOTE:** The symbols will flash if nothing else is displayed. The intensity of the audible alarm signals will increase automatically after 25 sec. All alarms can be confirmed by pressing any button, except from the ⏻-button.

## 2.2. Operational Alarms

### 2.2.1. Pre-alarms

Pre-alarms occur a few minutes prior to operating alarms. During pre-alarms an audible tone sounds, a staff call is activated (optional) and the reason for the alarm is displayed. Pre-alarms do not stop the infusion.

| Alarm Condition   | Alarm reason/<br>recommended action                                             | Alarm level | Optical alarm symbol | Audible alarm tone                             |
|-------------------|---------------------------------------------------------------------------------|-------------|----------------------|------------------------------------------------|
| Battery pre-alarm | The battery is almost discharged. Plug in power supply to recharge the battery. | AL1         | Bell and Battery     | Periodic buzzer activation (1sec on, 9sec off) |
|                   |                                                                                 | AL2         |                      | No alarm                                       |

### 2.2.2. Operating alarms

Operating alarms immediately stop the infusion. An audible tone sounds, and the reason for the alarm is displayed. The alarm tone and message are turned off with any button. Recommended action depends on the reason of the alarm.

| Alarm Condition     | Alarm reason / recommended action                                                                                                                                       | Alarm level | Optical alarm symbol | Audible alarm tone                             |
|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|----------------------|------------------------------------------------|
| Standby Alarm       | Pump is switched on and not started. Start pump or switch off.                                                                                                          | AL1         | Bell and Clock       | Periodic buzzer activation (1sec on, 5sec off) |
|                     |                                                                                                                                                                         | AL2         |                      | No alarm                                       |
| Battery empty alarm | The battery is discharged. The battery alarm will be on for 3 min. Then the pump will automatically turn off. Immediately plug in power supply to recharge the battery. | AL1<br>AL2  | Bell and Battery     | Periodic buzzer activation (1sec on, 5sec off) |
| VTBD alarm          | The programmed volume was infused. Start new infusion or switch of pump.                                                                                                | AL1         | Bell and "VOL"       | Periodic buzzer activation (1sec on, 5sec off) |
|                     |                                                                                                                                                                         | AL2         |                      | No alarm                                       |
| Open door alarm     | The pump door is opened during delivery. Close roller clamp and check door.                                                                                             | AL1<br>AL2  | Bell and "OPEN"      | Periodic buzzer activation (1sec on, 5sec off) |
| Air alarm           | The accumulated air volumes exceeds the limits. Check tubing and reservoir.                                                                                             | AL1<br>AL2  | Bell and Air         | Periodic buzzer activation (1sec on, 5sec off) |
| Pressure alarm      | The pressure level was exceeded. Check administration set.                                                                                                              | AL1<br>AL2  | Bell and Pressure    | Periodic buzzer activation (1sec on, 5sec off) |

### 2.3. Information signals

When operating the device additional acoustic hint signals are given.

| No. | Condition           | Description                                                 | Optical symbol          | Audible tone                                                                       |
|-----|---------------------|-------------------------------------------------------------|-------------------------|------------------------------------------------------------------------------------|
| 1   | Prime signal        | Audible feedback that a prime is active                     | Rotating wheel          | Periodic buzzer activation (0,5sec on, 2sec off)                                   |
| 2   | Self-test signal    | Self test of the audible alarm system.                      | Software version number | Buzzer activation (0,25sec on, 0,5sec off) for 3 times with lowest loudness level. |
| 3   | Action not allowed  | Illegal attempt to adjust the parameters of a secured pump. | "SAFE"                  | Buzzer activation for 50ms                                                         |
| 4   | Action not allowed  | Limit of the parameter adjustment reached.                  | ---                     |                                                                                    |
| 5   | Button click signal | Audible feedback for pressed button                         | ---                     | Short buzzer pulse                                                                 |

### 2.4. Alarm level

The alarm loudness is adjustable in 2 levels, L01 45..60dB(A) or L02 60..75dB(A). The real alarm loudness depends on the environmental conditions.

# Power supply

## Power supply

The Enteroport® plus nutrition pump can be operated from the mains supply as well as independently from the mains with the included battery. When operating for the first time, the Enteroport® plus should be connected to the mains supply to charge the battery. During mains operation, the battery is automatically charged within about 3.5 hours.

## Mains operation

For in-patient application, it is advisable to connect the pump to the mains supply via the charger supplied with the Enteroport® plus. Do this by inserting the charger connector into the socket provided on the left-hand side of the pump, and then connect the mains adapter to the mains supply. During mains operation, the green indicator lamp on the mains adapter lights up. At the same time, the connector symbol on the pump display is lit. The battery charging process is signaled by the lighting of the yellow indicator lamp on the mains adapter and the -symbol on the pump display.

## Battery operation

The Enteroport® plus pump is delivered with an integrated, rechargeable NiMH battery. The pump is automatically switched to battery operation when it is not operated with the mains supply. During battery operation, the -symbol is shown on the display.

With a fully charged battery, the Enteroport® plus will allow a mains independent operation for up to 35 hours at an average rate of 200ml/h (see table). During mains operation, the

battery is automatically charged within about 3.5 hours.

After approx. 4 years, the battery may have a reduced capacity due to aging.

| Infusion Rate (ml/h) | Operating time (h) |
|----------------------|--------------------|
| 50                   | 55                 |
| 100                  | 46                 |
| 200                  | 35                 |
| 300                  | 28                 |
| 400                  | 24                 |

Table: Average battery operating time at different infusion rates

To get an information about the remaining battery operation time please do following steps: Switch pump on, press 3 times the INFO/PRIME button. Then the remaining battery operation time is displayed. The display disappears automatically after 5 seconds.

# Technical Data

## Type of unit

Classification

Protective Class

Humidity Protection

Internal power supply

Charging time

Power rating

Current input

Administration Rate

Volume (Volume mode)

Volume (Bolus mode)

Flow time

Flow rate tolerance

Occlusion detection pressure

Air detection

Operating conditions

- Temperature
- Atmospheric pressure
- Relative humidity

## Enteral nutrition pump

 defibrillation-proof, Type CF

II

IP 22 (Liquid ingress protection, dripping water tilted up to 15°)

NiMH rechargeable battery, 2.4 V; 1900 mAh

approximately 3.5 h

3 VA (charging)

600 mA (charging)

1 – 400 ml/h, increments of 1 ml/h

1 ml – 5,000 ml

| Volume range     | increments |
|------------------|------------|
| 1 ml – 49 ml     | 1 ml       |
| 50 ml – 5,000 ml | 50 ml      |

1 ml – 1,000 ml

| Volume range     | increments |
|------------------|------------|
| 1 ml – 49 ml     | 1 ml       |
| 50 ml – 1,000 ml | 50 ml      |

15 min – 24 h, variable in 15 min intervals

± 10%

max. 150 kPa (1.5 bar)

Ultrasonic detector

+5°C ... + 40°C

700 ... 1060 mbar

15% ... 93% (without condensation)

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Storage conditions:

- Temperature - 20°C ... + 50°C
- Atmospheric pressure 500 ... 1060 mbar
- Relative humidity 10 % ... 93 % (without condensation)

Weight approx. 450 g

Dimensions (W x H x D) 140 x 45 x 115 mm

EMC IEC 60601-1-2

Flow principle swash plate

Display LCD, illuminated

## Enteroport plus Mains adapter

Rated Voltage 100 ... 240 V AC~ ; 50 ... 60 Hz

No load voltage 5,8 V DC  $\pm$  5 %

Charging current 600 mA  $\pm$  50 mA

Humidity protection IP 67 (Liquid ingress protection, Immersion of water up to 1 meter depth)

Protective Class 

For detailed, technical informations see service manual.

Electromagnetic Compatibility Guidance and Manufacturers Declaration



Only original spare parts and components must be used to succeed the following compliance level.

In case of using the Enteroport plus or any component in the environment of additional devices (i.e. HF-surgery device) the user should observe this arrangement to secure the function as specified.

Use of accessories and cables other than those specified, with the exception of parts sold by the manufacturer as replacement parts for internal components, may result in increased emissions or decreased immunity.

Do not use adjacent to or stacked with other equipment. If adjacent or stacked use is necessary, observe and verify normal operation of the pump.

Table 1

| Guidance and manufacturer's declaration – electromagnetic emission                                                                                                                                                 |                |                                                                                                                                                                                          |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| The Enteroport plus is intended for use in the electromagnetic environment specified below. The customer or the user of the Enteroport plus or any component should assure that it is used in such an environment. |                |                                                                                                                                                                                          |
| Emissions test                                                                                                                                                                                                     | Compliance     | Electromagnetic environment – guidance                                                                                                                                                   |
| RF emissions<br>CISPR 11                                                                                                                                                                                           | Group 1        | The Enteroport plus uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment. |
| RF emissions<br>CISPR 11                                                                                                                                                                                           | Class B        |                                                                                                                                                                                          |
| Harmonic emissions<br>IEC 61000-3-2                                                                                                                                                                                | not applicable |                                                                                                                                                                                          |
| Voltage fluctuations /flicker<br>emissions IEC 61000-3-3                                                                                                                                                           | complies       |                                                                                                                                                                                          |

Table 2

| Guidance and manufacturer's declaration – electromagnetic immunity                                                                                                                                                 |                                |                                                  |                                                                                                                                                            |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|--------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| The Enteroport plus is intended for use in the electromagnetic environment specified below. The customer or the user of the Enteroport plus or any component should assure that it is used in such an environment. |                                |                                                  |                                                                                                                                                            |
| Immunity test                                                                                                                                                                                                      | test level<br>IEC 60601-1-2    | Compliance level                                 | Electromagnetic<br>environment – guidance                                                                                                                  |
| Electrostatic discharge (ESD)<br>according IEC 60601-4-2                                                                                                                                                           | contact<br>±6KV<br>air<br>±8KV | ±6KV no disturbances<br><br>±8KV no disturbances | Floors should be wood, concrete<br>or ceramic tile.<br>If floors are covered with<br>synthetic material, the relative<br>humidity should be at least 30 %. |

|                                                                                                               |                                                                                                                                                                                                      |                                       |                                                                                                                                           |
|---------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| Electrostatic transient / burst according IEC 61000-4-4                                                       | ± 2 kV for power supply lines<br>± 1 kV for input/output lines                                                                                                                                       | ±2KV<br>±1KV                          | Mains power quality should be that of a typical commercial or hospital environment.                                                       |
| Surge according IEC 61000-4-5                                                                                 | ±1KV differential mode<br>±2KV common mode                                                                                                                                                           | ±1KV<br>±2KV                          |                                                                                                                                           |
| Voltage dips, short interruptions and voltage variations on power supply input lines according IEC 61000-4-11 | < 5 % UT (>95 % dip in UT ) for 0,5 cycle<br>40 % UT (60 % dip in UT ) for 5 cycles<br>70 % UT (30 % dip in UT ) for 25 cycles<br>< 5 % UT (>95 % dip in UT ) for 5 sec<br><5% UT for 5 s (>95% dip) | complies by using of internal battery |                                                                                                                                           |
| Power frequency (50/60 Hz) magnetic field according IEC 61000-4-8                                             | 3 A/m                                                                                                                                                                                                | 30 A/m                                | Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment. |

**Table 4**

| Guidance and manufacturer's declaration – electromagnetic immunity                                                                                                                                                 |                                       |                     |                                                                                                                                                                                                                                                                                                                                                                         |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| The Enteroport plus is intended for use in the electromagnetic environment specified below. The customer or the user of the Enteroport plus or any component should assure that it is used in such an environment. |                                       |                     |                                                                                                                                                                                                                                                                                                                                                                         |
| Immunity test                                                                                                                                                                                                      | test level IEC 60601-1-2              | Compliance level    | Electromagnetic environment – guidance                                                                                                                                                                                                                                                                                                                                  |
| radiated electromagnetic HF fields according IEC 61000-4-6                                                                                                                                                         | 3 V <sub>eff</sub><br>150KHz to 80MHz | 10 V <sub>eff</sub> | Portable and mobile RF communications equipment should be used no closer to any part of the Enteroport plus or it's components, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. Recommended separation distance<br><br>d = 0,35 √P<br>Field strengths should be less then 10V/m |
| radiated electromagnetic HF fields according IEC 61000-4-3                                                                                                                                                         | 3 V/m<br>80 MHz to 2,5 GHz            | 10 V/m              |                                                                                                                                                                                                                                                                                                                                                                         |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |  | <p>where p is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in meters (m).</p> <p>Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey<sup>a)</sup>, should be less than the compliance level in each frequency range<sup>b)</sup>.</p> <p>Interference may occur in the vicinity of equipment marked with the following symbol: </p> |
| <p>NOTE 1: At 80 MHz and 800 MHz, the higher frequency range applies.</p> <p>NOTE 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.</p> <p>a) Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the Enteroport plus is used exceeds the applicable RF compliance level above, the Enteroport plus should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as re-orienting or relocating the Enteroport plus.</p> <p>b) Over the frequency range 150 kHz to 80 MHz, field strengths should be less than [V1] V/m.</p> |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

Table 6

| Recommended separation distances between portable and mobile RF communications equipment and the Enteroport plus                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                           |                             |                             |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|-----------------------------|-----------------------------|
| The Enteroport plus is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the Enteroport plus or component can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the Enteroport plus as recommended below, according to the maximum output power of the communications equipment                                                                                                                                                                 |                                                           |                             |                             |
| rated power of the radio transmitter<br>W                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Separation distance according to frequency of transmitter |                             |                             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 150 kHz to 80 MHz<br>0,35√P                               | 80 MHz to 800 MHz<br>0,35√P | 800 MHz to 2,5 GHz<br>0,7√P |
| 0,01                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0,035                                                     | 0,035                       | 0,07                        |
| 0,1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 0,11                                                      | 0,11                        | 0,22                        |
| 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 0,35                                                      | 0,35                        | 0,7                         |
| 10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1,1                                                       | 1,1                         | 2,2                         |
| 100                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 3,5                                                       | 3,5                         | 7                           |
| <p>NOTE 1: For transmitters rated at a maximum output power not listed above, the recommended separation distance d in meters (m) can be determined using the equation applicable to the frequency of the transmitter, where (P) is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.</p> <p>NOTE 2: At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies.</p> <p>NOTE 3: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.</p> |                                                           |                             |                             |

# Warranty / Cleaning

## Responsibility of the Manufacturer

The manufacturer, assembler, installer or importer considers himself responsible for the effects on safety, reliability and performance of the equipment only if:

- assembly operations, extensions, re-adjustments, modifications or repairs are carried out by persons authorized by him,
- the electrical installation of the relevant room complies with the appropriate requirements (e.g. VDE 0100, 0107, and/or the IED-publications resp. the national requirements),
- the equipment is used in accordance with the instructions for use and
- the technical safety checks are carried out regularly.

The CE mark confirms that this medical product complies with the "Council Directive on Medical Devices 93/42/EEC" dated 14<sup>th</sup> June 1993.

B. Braun Melsungen AG

## Warranty

B. Braun provides a 24 month warranty, as from the date of delivery. This covers repair or replacement of parts damaged as a result of design/manufacturing errors or material defects. Modifications or repairs to the unit undertaken by the owner or by third parties invalidate the warranty.



Symbol indicating separate collection for electrical and electronic equipment (2002/96/EC)

B. Braun offers, after the expected eight-years lifetime of the device, a disposal service for used devices.

## Regular checks

Check for cleanliness, completeness and damage. Use only according to instructions for use. Check each time when switching on: self-test, audible alarm, completeness of display symbols, operation and alarm control indication.

## Changing the battery

The battery can only be changed by the technical service agency responsible for the Enteroport® plus nutrition pump.

A battery change is recommended every 4 years.

## Cleaning

Within every tubing change clean external surface of pump using mild soap suds. Do not use spray disinfectants at the mains power connection. Recommended: disinfectant for wiping available from B. Braun: Meliseptol® Foam pure, Melsitt 10% and Melsept SF 10%. After cleaning, allow the device to vent for at least 1 min prior to use. Do not spray into openings in the device. Be sure to observe the instructions provided concerning waste disposal and hygiene for batteries and disposables. Wipe magnifying- and displayglas on front of pump door only with a soft cloth. Do not use Hexaquart® or other alkylamine containing disinfectants.

## Disposal

The pumps as well as battery packs can be returned to B. Braun for further disposal. When taking care of disposing of disposables as well as infusion solutions, please consider the applicable hygiene and disposal regulations.



- "Caution: No modification of this equipment is allowed."
- "Caution: Do not modify this equipment without authorization of the manufacturer."
- "Caution: If this equipment is modified, appropriate inspection and testing must be conducted to ensure continued safe use of the equipment."

## Inspection on Delivery

Despite careful packaging, the risk of transport damage cannot be entirely prevented. Upon delivery, please check that nothing is missing. Do not use a damaged device! Contact the service department.

## Items included

Enteroport® Plus, Pole Clamp, Short Instructions for Use, Instructions for Use.

# Ordering Information

---

## **Enteroport® plus, incl.**

Art. No.  
871 0355

- Pole clamp
- Short instructions for Use
- Instructions for Use

## **Enteroport® plus Mains adapter**

|                                            |         |
|--------------------------------------------|---------|
| Power Supply Enteroport plus Euro - Plug   | 8710360 |
| Power Supply Enteroport plus UK - Plug     | 8710361 |
| Power Supply Enteroport plus US - Plug     | 8710362 |
| Power Supply Enteroport plus Brazil - Plug | 8710363 |
| Power Supply Enteroport plus AU - Plug     | 8710364 |
| Short stand for pole clamp                 | 8721670 |
| Pole clamp                                 | 8721061 |

## **Enteroport® plus administration sets**

|                                                       |         |
|-------------------------------------------------------|---------|
| Enteroport® plus Set bottle connection                | 8721688 |
| Enteroport® plus Set with 500 ml empty nutrition bag  | 8721726 |
| Enteroport® plus Set with 1000 ml empty nutrition bag | 8721734 |
| Enteroport® plus Set with 2500 ml empty nutrition bag | 8721742 |
| Enteroport® plus Set Multispike bottle connector      | 8721750 |

## **Enteroport plus administration sets with safety, inverse Luer Lock Y-Port**

|                                                     |         |
|-----------------------------------------------------|---------|
| Enteroport plus Set with 1000ml empty nutrition bag | 8721735 |
| Enteroport plus Set Multispike bottle connector     | 8721745 |



**Manufactured by**  
**B. Braun Melsungen AG**  
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