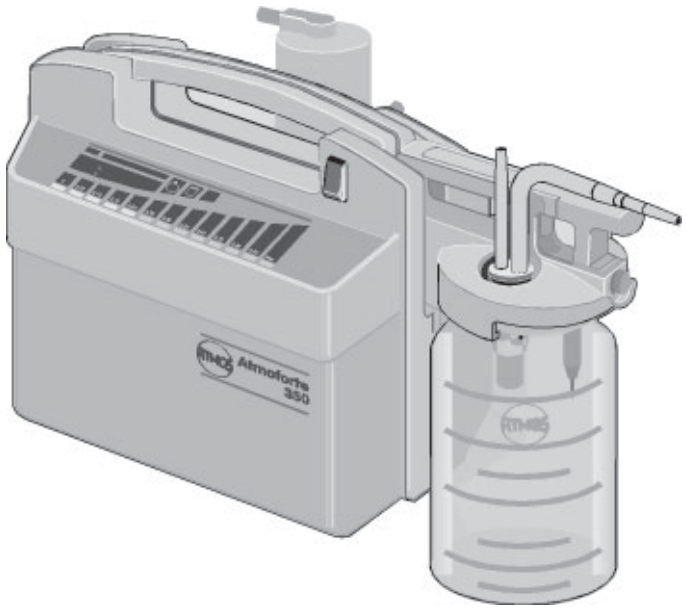
ATMOS
MedizinTechnik

Atmoforte 350
Record 500



Operating instructions

CE 0124

General Information

- The product **Atmoforte 350/Record 500** bears the CE mark CE-0124 in accordance with the Council Directive 93/42/EEC about medical devices and fulfills the essential requirements of Annex I of this directive.

- The product fully complies with the electromagnetic immunity requirements of standard EN 60601-1-2 "Electromagnetic Compatibility - Medical Electrical Equipment".

- These operating instructions are an integral part of the device. They should always be kept near the device. Close observance of these instructions is a prerequisite for applying the device according to its intended use and for correct operation.

- Patient safety and interference-free operation can be guaranteed only if original ATMOS parts are used. Furthermore only the accessories listed in this manual are approved by ATMOS and may be used in conjunction with the device, or else accessories whose use has been expressly permitted by ATMOS. In the event that other accessories or consumables are used, ATMOS does not guarantee the safe operation and reliable performance of the device.

- ATMOS cannot be held liable for any damages resulting from the use of accessories or consumables from other manufacturers.

- **Atmoforte 350** and **Record 500** differ only with regard to pumps, air-flow rates and final vacuum. Operation and design of the units are identical. In following sections, the name **Atmoforte 350/Record 500** is, therefore, used.

- ATMOS considers itself responsible for safety, reliability and perfomance of the device only
  – if assembly, readjustment, modification, extension, or repair is carried out by ATMOS or by persons authorized by ATMOS
  – if the device is used in compliance with these operating instructions.

- ATMOS supplies a service manual containing detailed circuit descriptions and schematics as well as information on adjustment and servicing to the authorized service staff.

- These operating instructions are in conformity with the device specifications and publications on safety of medical electrical equipment valid at printing date. All rights are reserved for circuits, techniques, names, software programs and devices mentioned in this manual.

- The ATMOS quality management system fully complies with the international standards DIN EN ISO 9001 and EN 46001.

- No part of this manual may be reproduced without written permisssion from ATMOS.

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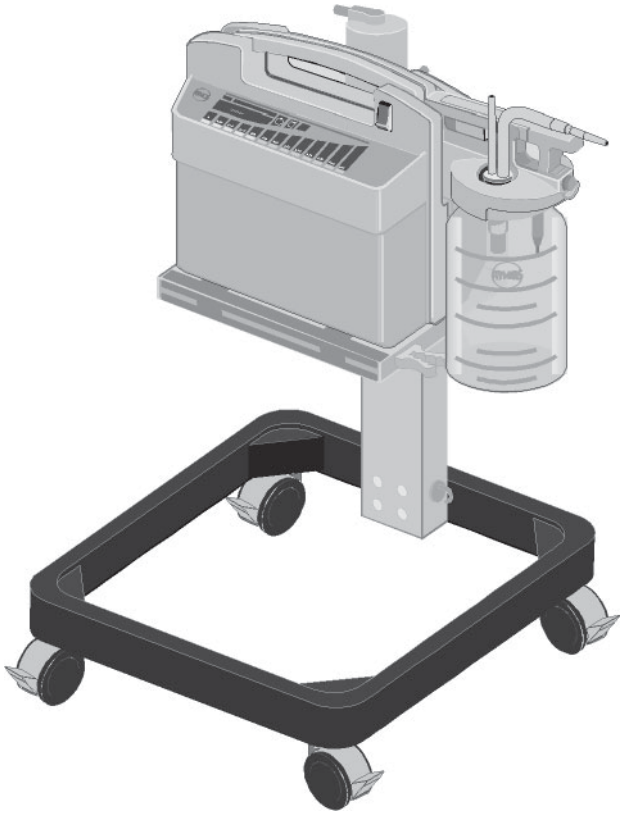


Fig.1. **Atmoforte 350** (with optional trolley)
Record 500 (trolley included in standard equipment of user packages)

1.1 Intended Use

The **Atmoforte 350/Record 500** is a compact suction unit for medical application. It is especially intended for aspiration and collection of secretions, body fluids and tissue. Its main fields of application are:

– **in the OPD, in the OR:** during surgery, e.g. to drain pockets or abscesses

– **in endoscopy:** e.g. to aspirate secretions or rinsing solutions

– **in gynaecology:** for suction curettage and vacuum extraction (obstetrics)

– **in ENT applications:** to aspirate secretions, rinsing solutions, cerumen

– **in the recovery ward and ICU:** for the spontaneous aspiration of body fluids, e.g. from the respiratory tract

– for drainage in the low vacuum range (e.g. thorax drainage)

The **Atmoforte 350/Record 500** must **not** be used :

– in non-medical applications

– to aspirate flammable or explosive fluids or gases.

1.2 Function

☞ Secretions must not be allowed to enter the pump. If this happens in spite of fill-level monitoring and overflow protection (fluid trap), the **Atmoforte 350/ Record 500** must be inspected by a service technical before being used again on a patient.

☞ The suction tube must never come into direct contact with the application site. A suction catheter, suction tip or medical aspiration set must always be connected to the tube.

☞ Excessive vacuum settings may cause lesions in the tissue.

The **Atmoforte 350/Record 500** is a line-power operated suction unit, centering around a silent, maintenance-free diaphragm pump which produces a vacuum inside the collection jar for aspiration and collection of the secretions. The target vacuum is key-selectable in 12 steps. The vacuum build-up is microprocessor-controlled. When the target vacuum has been reached, the pump switches off. A closed-loop control circuit activates the pump only when needed to re-establish the selected vacuum setting.

Electronic fill-level monitoring and a fluid trap with integrated bacterial filter are implemented to prevent that secretions enter the pump. The filter can be cleaned and sterilized.

Several monitoring and control functions enhance the operational ease of the **Atmoforte 350/Record 500** and ensure its safe application. Among these are:

– electronic monitoring of the collection jar fill level: the unit emits audio and visual signals when the max. fill level is exceeded

– automatic standby: when idling, the pump automatically switches to standby (e.g. while the suction cannula is removed from the application site) and resumes when the cannula is in contact again with the substance to be aspirated

– electronic filter monitoring: the unit emits audio and visual signals when the filter is clogged

– automatic mode for vacuum extraction: the required vacuum builds up gradually and is reached within about 2 minutes

– automatic clog detection: interrupts the suction operation when the cannula adheres to the tissue

– regular, automatic performance tests: if malfunctions are detected, the corresponding pilot lamp lights up.

All parts of the system which come into contact with the secretions (tubes, collection jar, cover and lids) can be autoclaved (up to 136°C).

A special equipment trolley can be ordered for mobile application of the **Atmoforte 350** (Fig. 1).
User packages of the **Record 500** are standardly equipped with this trolley.

1.3 For your Safety

- Dispose of the packaging material, observing the applicable waste-control regulations.
- The design of the **Atmoforte 350/Record 500** fulfills the requirements of IEC 601/EN 60601 and of Protection class I. The device must be connected to a properly installed socket with a non-fused earthed wire.
- Before connecting the device to the power line, check that the line voltage and frequency are identical with the ratings specified on the nameplate.
- The use of extension cords with multiple power outlets is not permitted.
- Before putting the device into operation, visually check all connection cables and tubes for signs of damage. Damaged cables and tubes must be replaced immediately.
- When disconnecting the device from the power line, first remove the plug from the wall outlet. Then the power cord may be disconnected from the device. Never touch the plug or cord while your hands are wet.
- The ambient conditions indicated in the Technical Specifications must be strictly observed.
- The air vents on the underside of the device must not be obstructed (do not place the device on soft materials).
- Set up the device so that the operator has a clear, unobstructed view of and easy access to the front panel.
- The **Atmoforte 350/Record 500** is not suitable for operation in areas of medically used rooms where an **explosion hazard** may occur. Explosion hazards may result from the use of flammable anesthetics, skin cleaning agents or disinfectants. Installed on the trolley, the **Atmoforte 350/Record 500** is automatically placed outside the area where an **explosion hazard** may occur (refer to the literature list at the end of this section).
- Install the **Atmoforte 350/Record 500** only on vibration-free surfaces.
- The suction tube must never come into direct contact with the application site. A suction catheter, suction tip or medical aspiration set must always be connected to the tube.
- Liquids must not be allowed to enter the device. Should liquids have penetrated into the device, it must be inspected by a service technician before being used again.
- Before applying the device, the user is obligated to check it for functional safety and proper performance.
- The user must be familiar with the operation of the device.
- Information which is of particular interest to the user is printed in a box throughout this manual.

☞ ATMOS cannot be held liable for injury to persons or damage to property if
– the parts used are not origin ATMOS parts
– the user instructions given in this manual are disregarded.

Literature

Medical Device Directive

IEC 601-1/EN60601-1/1990: Medical electrical equipment. General requirements for safety; section 6: Protection against hazards of ignition of flammable anesthetic mixtures

2. Operating Controls and Indicators

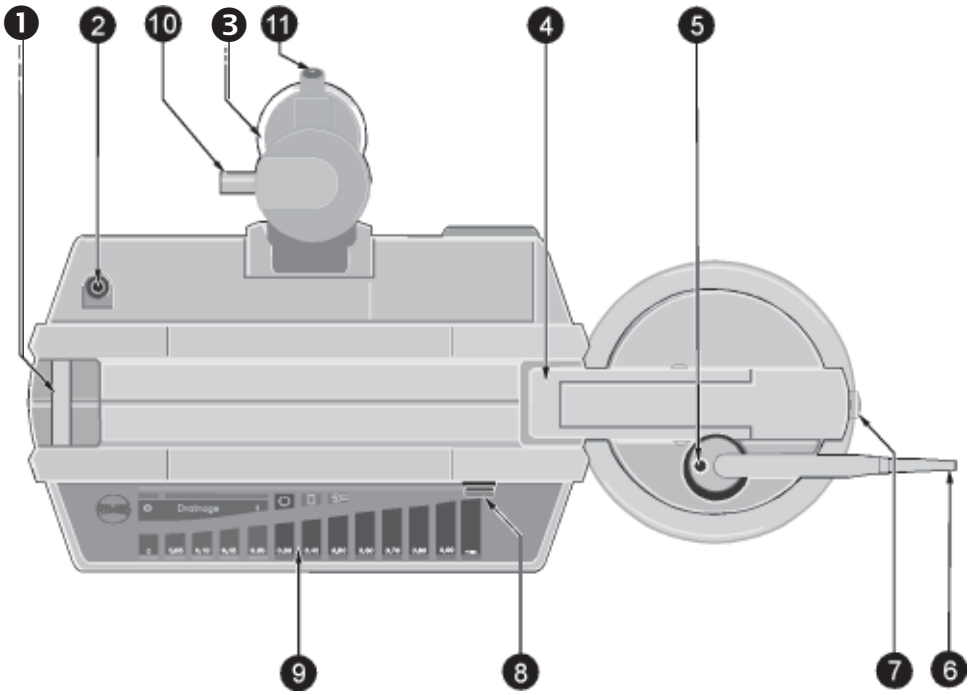


Fig. 2. **Atmoforte 350/Record 500**

❶ Fixation and contact element for collection jar
❷ Connection piece for suction pump
❸ Fluid trap with filter
❹ Fixation for collection jar
❺ Connection piece for tube connecting the fluid trap
❻ Connection piece for suction tube
❼ Lid system release button (for lid of collection jar)
❽ Power switch
❾ Display and control panel
❿ Filter output (to pump connection piece)
⓫ Filter input (from collection jar)

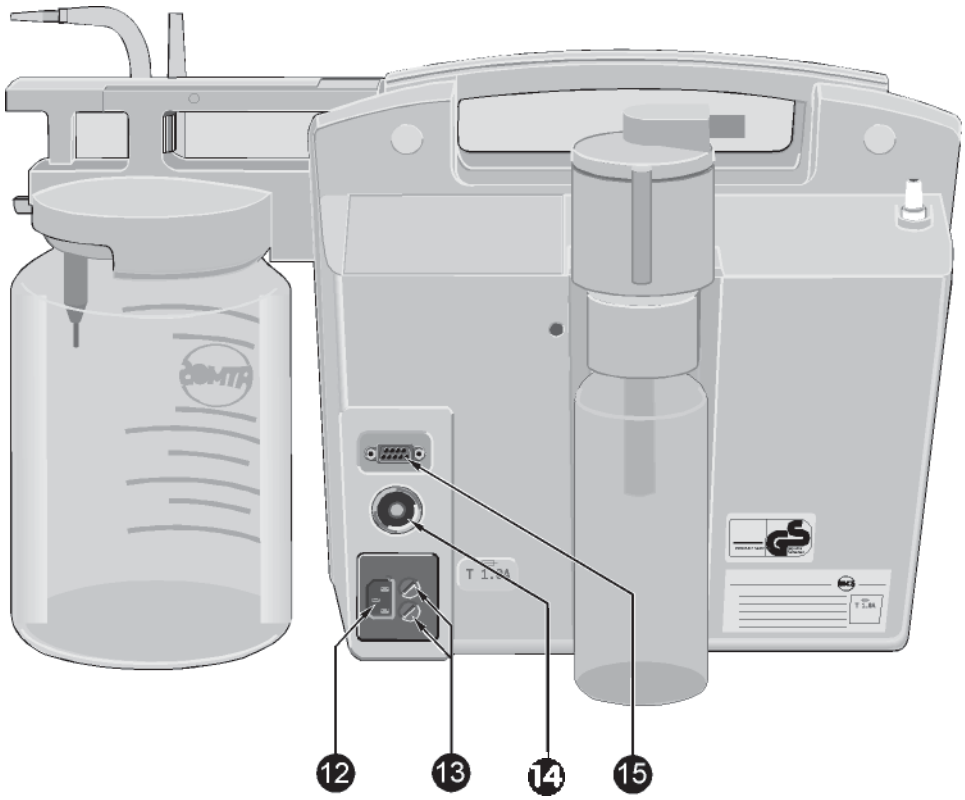


Fig. 3. **Atmoforte 350/Record 500** *(rear view)*

⓬ Power input

⓭ Fuses

⓮ Potential equalization pin

⓯ Pedal regulator port

Explanation of Symbols as Used on the Unit

Caution: Refer to operating instructions

Instrument fuse

Device off

Device on

Automatic standby on/off

"Clogged filter"/Max. fill level exceeded"

Malfunction indicator

3. First-Time Operation

This section decribes

– how to handle the lid system of the collection jar

– how to close and insert the collection jar

– how and where to connect the tubes

– how to connect the **Atmoforte 350/Record 500** to the power line

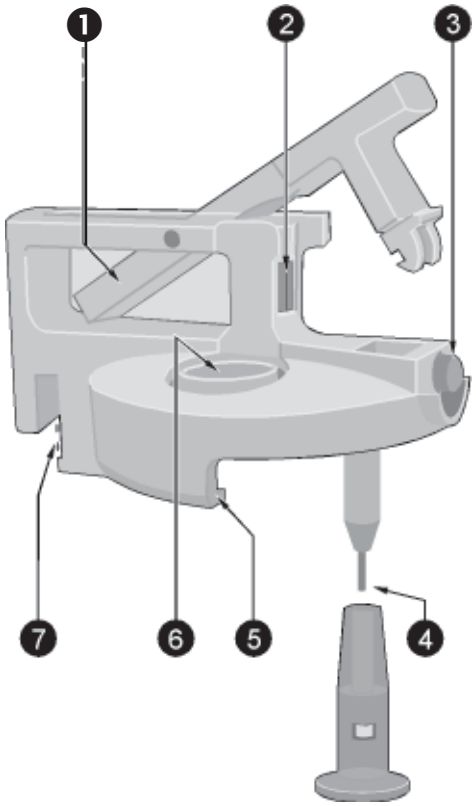


Fig. 4. Lid system

❶ Locking bow
❷ Knurled screw for removal of the lid insert
❸ Release knob
❹ Fill-level sensor with foam protection
❺ Lid rim
❻ Aperture for double socket nipple
❼ Contacts for monitoring of the fill level

☞ Before putting the device into operation for the first time, do not fail to read section 1.3 "For your Safety".

The lid system must seal the collection jar tight to allow the vacuum to build up inside. Fig. 4 shows the lid system with the locking bow open.

☞ When dealing with heavily foaming secretions, the foam protector should be attached to the fill-level sensor.

* Slide the lid system onto the collection jar as shown in Fig. 5, taking care that the rim of the lid (❺, Fig. 4) is placed below the rim of the jar, and press down the locking bow until you hear it click into place.

Fig. 5. Mounting the lid

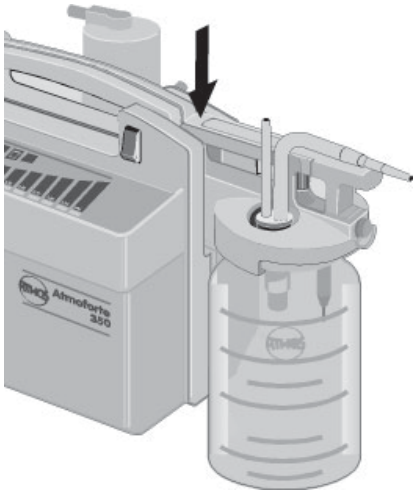


Fig. 6. Suspending the collection jar

- Suspend the collection jar in the fixture on the right or left side of the device as shown in Fig. 6.

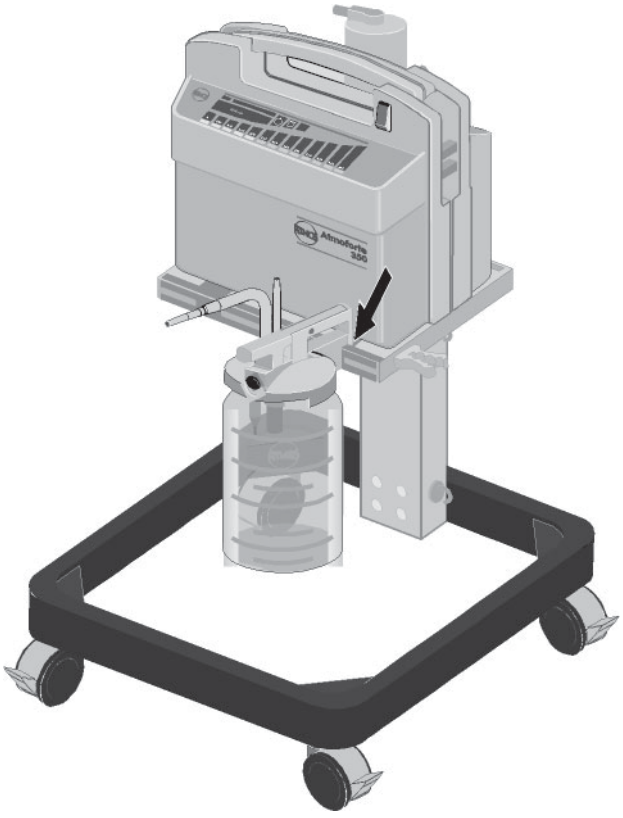


Fig. 7. 3 or 5-liter jar suspended on the trolley

3 or 5-liter jars are suspended on the trolley as per Fig. 7.

☞ When placed on the trolley, the **Atmoforte 350/ Record 500** must be firmly secured to the trolley storage tray by means of the two screws (underside of the tray) to ensure good contact for monitoring of the fill level.

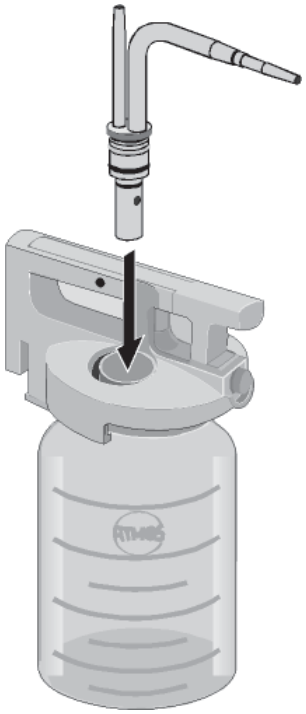


Fig. 8. Inserting the double socket nipple

- Insert the double socket nipple in the lid (Fig. 8). It is important that you hear it lock into place.

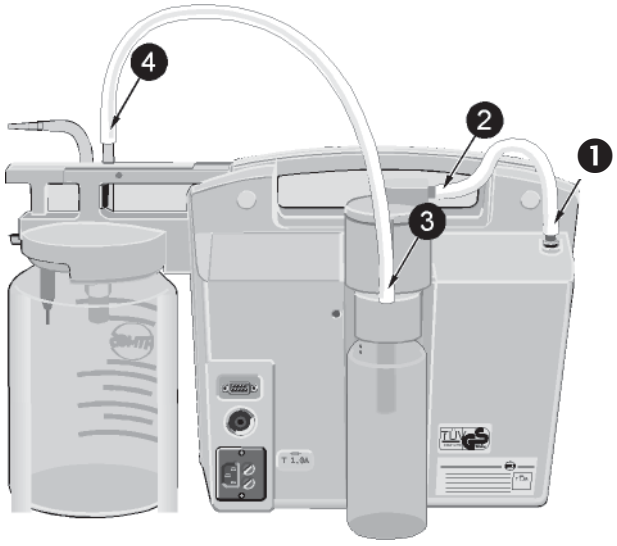


Fig. 9. Connection tubes

- Use the short piece of tubing to connect the pump connection piece ❶ to the nipple of the filter ❷ and, the long tube to connect the vertical connection piece of the double socket nipple ❹ to the nipple of the fluid trap ❸.

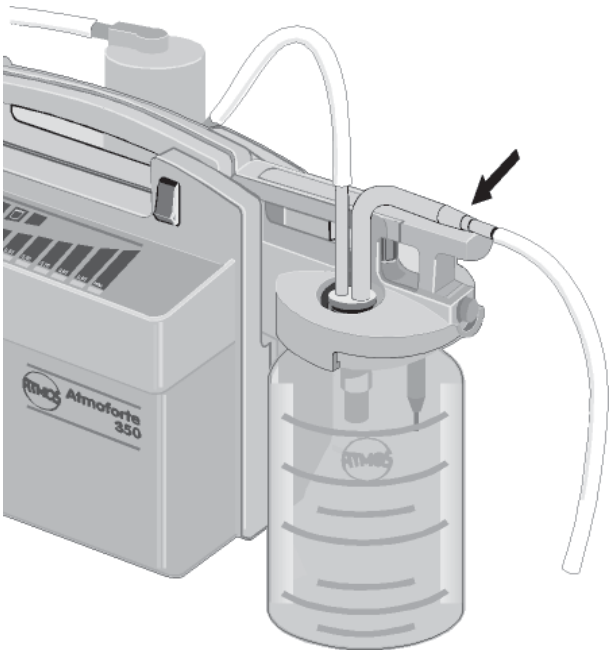


Fig. 10. Connecting the suction tube

- Slide the suction tube onto the horizontal connection piece to the double socket nipple.

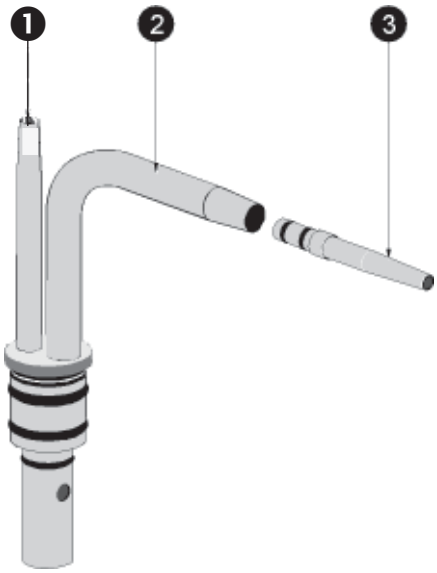


Fig. 11. Double socket nipple

Connect the 10-mm suction tube directly to the connection piece ❷. For the thin 6-mm tube you will have to add the tube adapter ❸.

❶ *Connection piece for fluid trap tube*
❷ *Connection piece for suction tube*
❸ *Adapter for 6-mm tube*

Fig. 12. **Atmoforte 350/Record 500** Rear view.

⑩ Power input
⑫ Potential equalization pin
⑬ Pedal regulator port

- Check that the power ratings marked on the device are identical with those of your local power line. Then connect the **Atmoforte 350/Record 500** on the power line (power input ⑩).

☞ For OR applications, we recommend to connect the **Atmoforte 350/Record 500** to the room´s potential equalization system via pin ⑫ (Fig. 12).

* If you have purchased the optional pedal regulator, connect it to port ⑬ .

The **Atmoforte 350/Record 500** is now ready for operation.

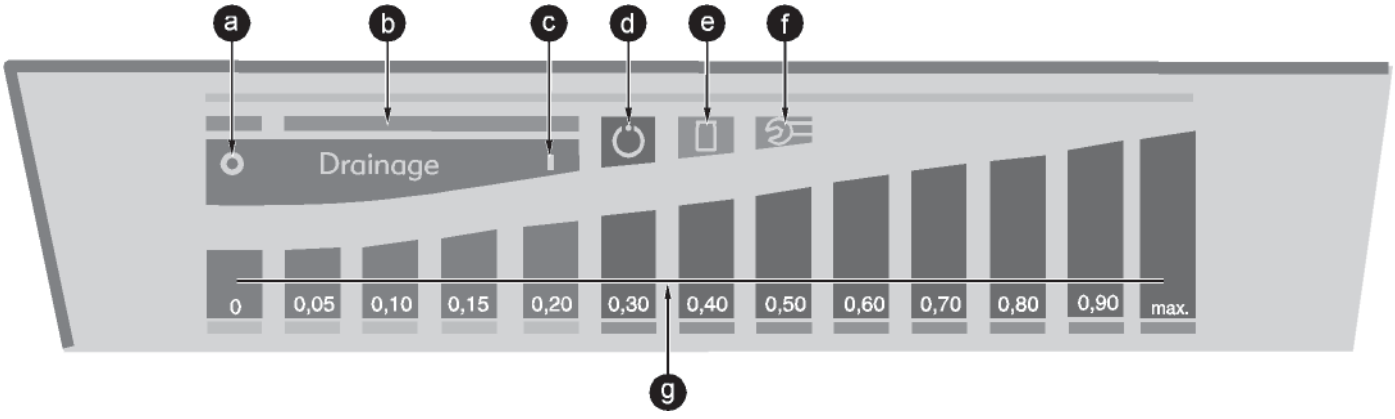


Fig. 13. Display and control panel

ⓐ *Turns off the fine-control suction or longterm drainage mode*
ⓑ *Bar indicator (yellow during drainage application*
ⓒ *Turns on the fine-control suction or longterm drainage mode*
ⓓ *Enables/disables the automatic standby function (inoperative when the pedal regulator is connected.*
ⓔ *Lights up when filter is clogged - blinks when max. fill level has been reached*
ⓕ *Malfunction indicator*
ⓖ *Dual function controls: selection of the target vacuum - indication of the actual vacuum (in bars)*

4. Operation

☞ Before using the device on a new patient, make sure that the following parts have been sterilized:
– the suction tube incl. the suction tip or aspiration set
– the collection jar incl. lid and double socket nipple
– the connection tube to the fluid trap as well as the fluid trap and the bacterial filter.

☞ The bacterial filter can be used up to about 200 times. It can be cleaned and sterilized. The filter is electronically monitored for clogging. The inserted filters must be completely dry.

☞ The suction tube must never come into direct contact with the application site. A suction catheter, suction tip or medical aspiration set must always be connected to the tube.

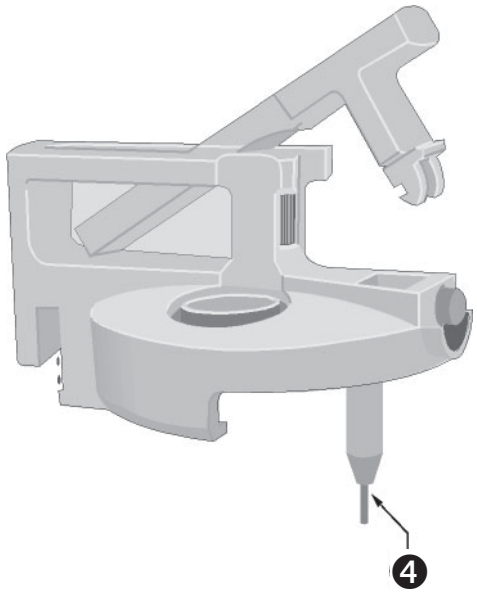


Fig.14. Lid system with fill-level sensor

In this section you will find detailed information on

– how the automatic standby function as well as the electronic fill-level and filter monitoring work

– how to operate the **Atmoforte 350/Record 500** as a suction unit (normal range, low vacuum range) and how to replace and empty the collection jar

– how to perform long-term drainage with the water vacuum gauge

– how to perform vacuum extraction

4.1 General Points to note during Operation

Automatic Standby Function

With the automatic standby function enabled, the **Atmoforte 350/Record 500** will automatically switch to the standby mode when left idle for about 12 seconds (e.g. open suction tip). As soon as the suction tip is reimmersed in the substance to be aspirated, the pump restarts at full capacity. This method prevents unnecessary noise. However, for some special applications, e.g. when using extremely narrow suction cannulae, suction tubes with pool suction tips or disposable suction bags with filter stones, the automatic standby function may have to be disabled. The function is switched on and off with the ◯ key (d), Fig. 13) . The key is lit when the function is enabled.

Electoronic Fill-Level Monitoring

The **Atmoforte 350/Record 500** electronically monitors the fill level in the collection jar. When the max. fill level is reached, i.e., when the fluid level reaches the sensor (4, Fig. 14) the pump switches off, 5 short audio signals sound and the ▯ indicator (e, Fig. 13) starts blinking. When the aspired substance creates large amounts of foam, we recommend to add the foam protection to prevent that the pump shuts off prematurely. As soon as the sensor is no longer in contact with the liquid (e.g. after inserting the double socket nipple in the second collection jar, if present), the pump restarts.

Fig. 15. Turning on the **Atmoforte 350/Record 500**

☞ If, in spite of fill-level monitoring and overflow protection (fluid trap), secretions have entered the pump, the **Atmoforte 350/Record 500** must be inspected by a service technician before being used again on a patient.

4.2 Suction Mode (Standard Mode)

- Connect the suction catheter, the suction tip or the suction set to the pump.
- Turn on the **Atmoforte 350/Record 500**: the indicator in the power switch must light up!
- Push one of keys ⑨, Fig. 16, to select the desired target vacuum (the vacuum is given in bar).

The **Atmoforte 350/Record 500** starts up and begins to build up the vacuum. As the vacuum increases, the indicators ⑨ corresponding to the vacuum attained light up one after the other. When the selected vacuum has been reached, the pump switches off. During operation of the **Atmoforte 350/Record 500**, a control circuit monitors the vacuum and activates the pump only when needed to reestablish the selected vacuum setting.

While at work, keep an eye on the fill level in the collection jar. Even though the electronic fill-level sensor switches off the pump when the max. fill level has been reached, the jar should be exchanged or emptied at 2/3 of its max. fill level (incl. foam) (Fig. 17).

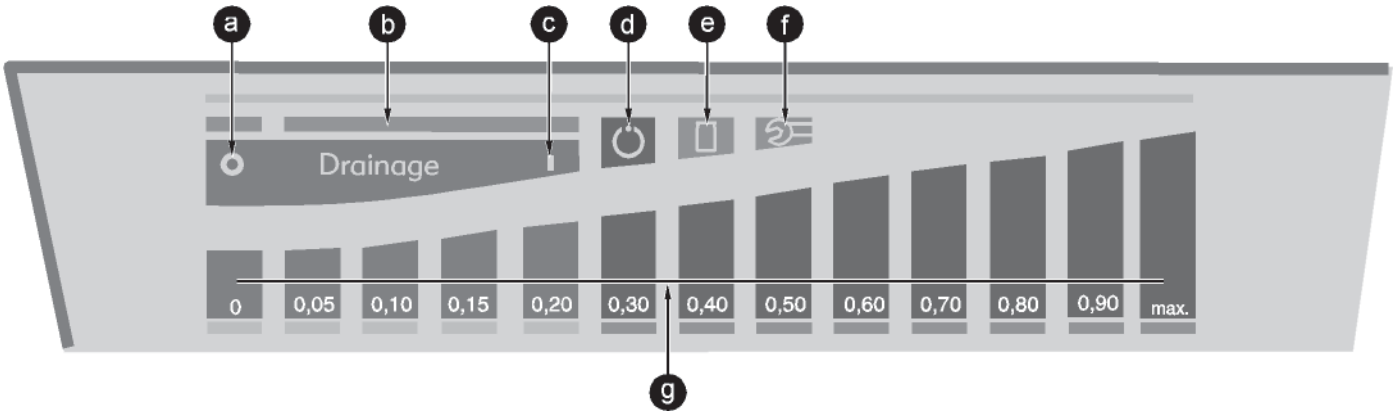


Fig. 16. Display and control panel

- ⓐ *Turns off the fine-control suction or longterm drainage mode*
- ⓑ *Bar indicator (yellow during drainage application*
- ⓒ *Turns on the fine-control suction or longterm drainage mode*
- ⓓ *Enables/disables the automatic standby function*
- ⓔ *Lights up when filter is clogged - blinks when max. fill level has been reached*
- ⓕ *Malfunction indicator*
- ⓖ *Dual function controls: selection of the target vacuum - indication of the actual vacuum (in bars)*

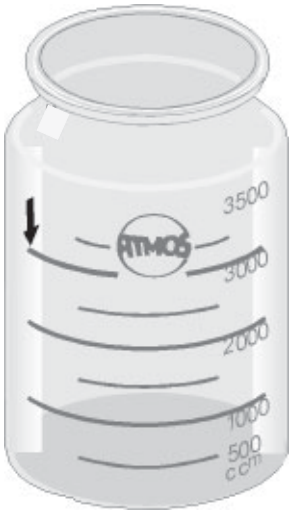


Fig. 17. Recommended max. fill level

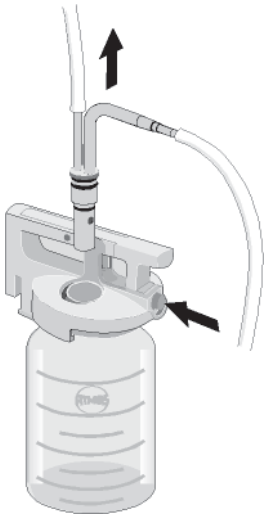


Fig. 18. Removing the double socket nipple

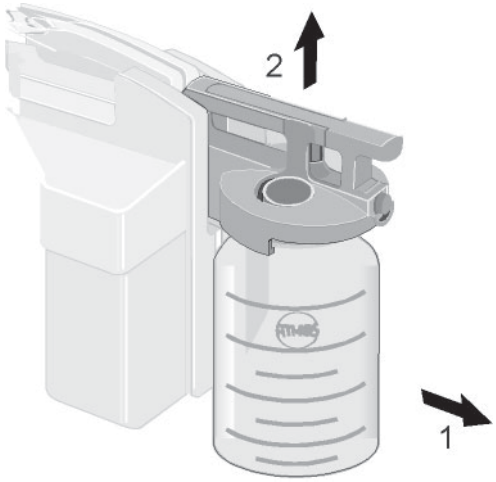


Fig. 19. Removing the collection jar

Exchanging the Collection Jar

- Interrupt the procedure and switch off the pump.
- Remove the double socket nipple from the jar (Fig. 18). If a second collection jar has been installed, insert the double socket nipple there.
- The jar is easy to remove if you tilt it a little away from the device and then lift it off (Fig. 19).
- Either insert a new jar or empty the one that you just removed. Press the release button to open the locking bow (Fig. 18). Dispose of the contents of the collection jar, observing the applicable waste control regulations.
- Insert the double socket nipple in the empty jar and continue the procedure.

After Use

- At the end of the procedure, switch off the **Atmoforte 350/Record 500** and clean the device and the accessories as desribed in section 5 "Cleaning and Maintenance".

4.3 Suction Mode (Low Vacuum Range)

For applications requiring a low vacuum, you can choose between two operating modes.

– **fine-control suction**, a method which protects delicate tissue by combining a low vacuum (-0,2 bar max.) with optimal suction capacity

– **long-term drainage** with the optional water vacuum gauge, e.g. for thorax drainage.

Fine-Control Suction

The fine-control suction mode, at settings between 0.05 and -0,2 bar, is ideal for applications involving delicate tissue. In this mode the automatic clog detection briefly suspends system operation when the suction tip adheres to the tissue. The suction process continues when the cannula has been disengaged from the tissue.

- Connect the suction catheter, the suction tip or the suction set.
- Turn on the **Atmoforte 350/Record 500**: the power switch must light up!
- Press the "0" key ⓗ to enable selection of the fine-control suction mode ("drainage" displays).
- Activate the fine-control suction mode with ⓒ. **The bar indicator** ⓑ lights up yellow.
- Push one of the yellow keys ⓖ to select the desired target vacuum.

The **Atmoforte 350/Record 500** starts up and begins to build up the vacuum. As the vacuum increases, the indicators ⓖ corresponding to the vacuum attained light up one after the other. Whenever the suction cannula adheres to the tissue, the pump interrupts the suction process, allowing you to disengage the tip from the tissue.

- To turn off the fine-control suction mode, press the ”0” ⓗ first, then "Drainage o” ⓐ (the color of the bar indicator ⓑ changes to grey).

Long-Term Drainage (Thorax Drainage)

In long-term drainage the vacuum is adjusted by means of the water vacuum gauge. To keep down the noise level, the pump is intermittently activated. The required suction capacity can be selected with keys "0,05" ..."0,2" (which is equivalent to 1,8 ... 3,5 liters/min).

The vacuum and, hence, the suction is adjusted by means of the immersion tube of the water vacuum gauge: the deeper the tube is immersed in the water, the higher the vacuum.

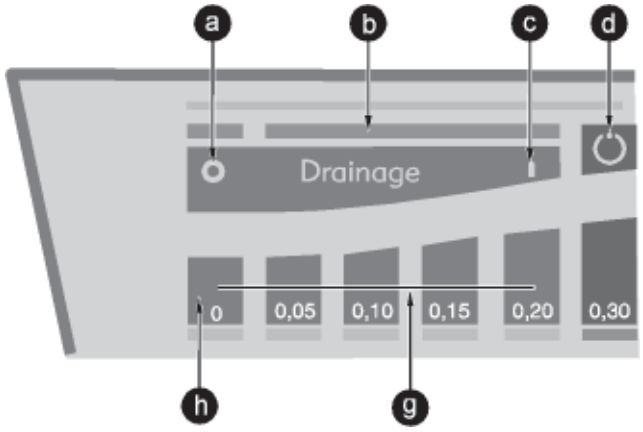


Fig. 20. Dispaly and control panel

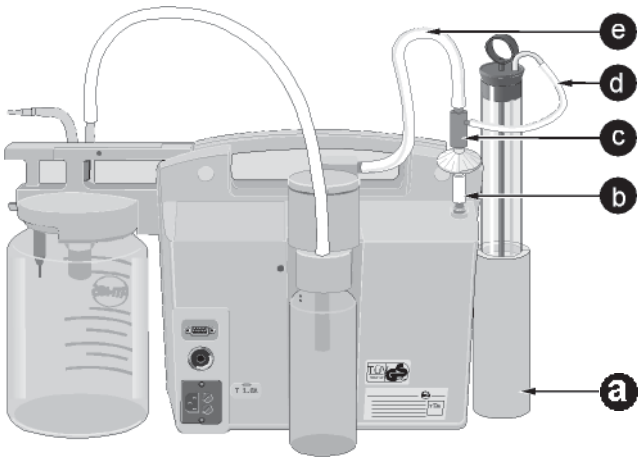


Fig. 21. Mounting the water vacuum gauge

☞ The suction tube between patient and collection jar should descend a little towards the jar. Furthermore, sags in the tubing are to be avoided.

Mounting the Water Vacuum Gauge

- Suspend the support for the glass cylinder on the left side of the unit (ⓐ Fig. 21).
- Fill 2/3 of the glass cylinder with purified or sterilized water.
- Close the cylinder with a rubber stopper.
- Slide the short end of the bacterial filter tubing onto the pump connection piece ⓑ, observing the proper orientation (as indicated).
- Attach the choke coil to the filter ⓒ and connect the exit on its side to the curved connection piece of the rubber stopper (thin silicon tube ⓓ).
- Connect the straight end of the choke resistor to the connection piece at the side of the fluid trap ⓔ.
- Connect the aspiration set to the suction tube.

Operation

- Turn on the **Atmoforte 350/Record 500**: the indicator in the power switch must light up!
- Press the ”0”key ⓗ (Fig. 20) to enable selection of the fine-control suciton mode ("drainage"displays).
- Activate the fine-control suction mode at ⓒ.The bar indicator lights up yellow.
- Push one of the yellow keys ⓖ to turn on the pump.
- Using the immersion tube, select the required vacuum (the deeper you immerse the tube, the higher the resulting vacuum.
- Using the yellow keys ⓖ, determine the optimal motor performance (indicated by only sporadically rising bubbles).
- Push the ”0” ⓗ to switch off the pump.
- To terminate the fine-control mode, press the ”0” key ⓗ first and then the "Drainage o" key ⓐ (the color of the bar indicator ⓑ changes to grey).

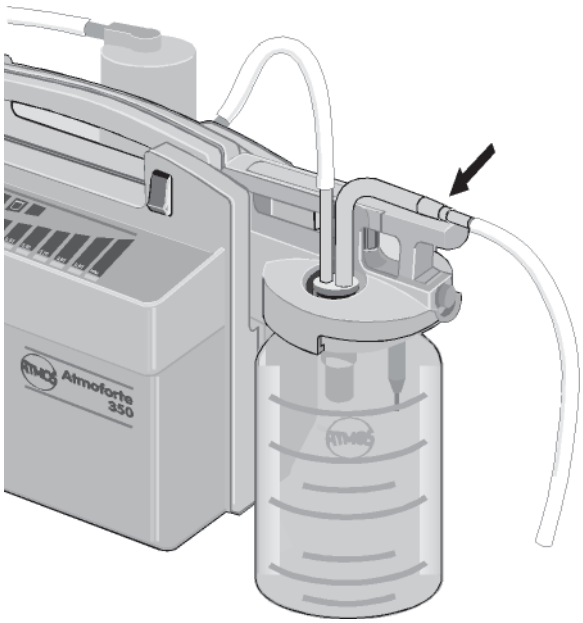


Fig. 22. Attaching the vacuum extraction tube

Fig. 23. Connecting the pedal regulator

Fig. 24. Enabling "automatic vacuum build-up" and selecting the target vacuum

4.4 Vacuum Extraction

For vacuum extraction we recommend the use of a small collection jar (1,5 l) where the vacuum builds up much faster. The target vacuum is preset on the control panel. Vacuum production can be controlled either via a pedal regulator or automatically by the device.

- Slide the green vacuum extraction tube on the horizontal connection piece of the double socket nipple.
- Connect the extraction cup to the other end of the tube.

User-controlled vacuum build-up

- Connect the pedal regulator to port ⑬ (Fig. 23) .
- Turn on the **Atmoforte 350/Record 500 :** the indicator in the power switch must light up !
- Adjust pedal regulator to full heel stop.
- Push one of keys ⑨ to select the desired target vacuum (the vacuum is given in bars).
- Attach the extraction cup and increase the vacuum step by step with the pedal regulator. The pedal will remain in the position in which you remove your foot.

Automatic vacuum build-up

In the automatic mode, the **Atmoforte 350 / Record 500** builds up the vacuum at an even pace, so that the target vacuum is reached in approx. 2 minutes. An audio signal indicates that the selected vacuum has been attained. It is possible to switch to the user-controlled vacuum build-up at any time either by actuating the pedal regulator or by selecting another vacuum setting.

- Turn on the **Atmoforte 350/Record 500** : the indicator in the power switch must light up!
- Adjust pedal regulator to full toe stop.
- Push the "0" key and, holding the key depressed, select the desired target vacuum (e.g. 0.8 bar).
- Attach the extraction cup.

Beginning at -0,2 bar, the **Atmoforte 350/Record 500** starts producing the vacuum step by step. An audio signal sounds when the selected vacuum has been attained after approx. minutes.

5. Cleaning and Maintenance

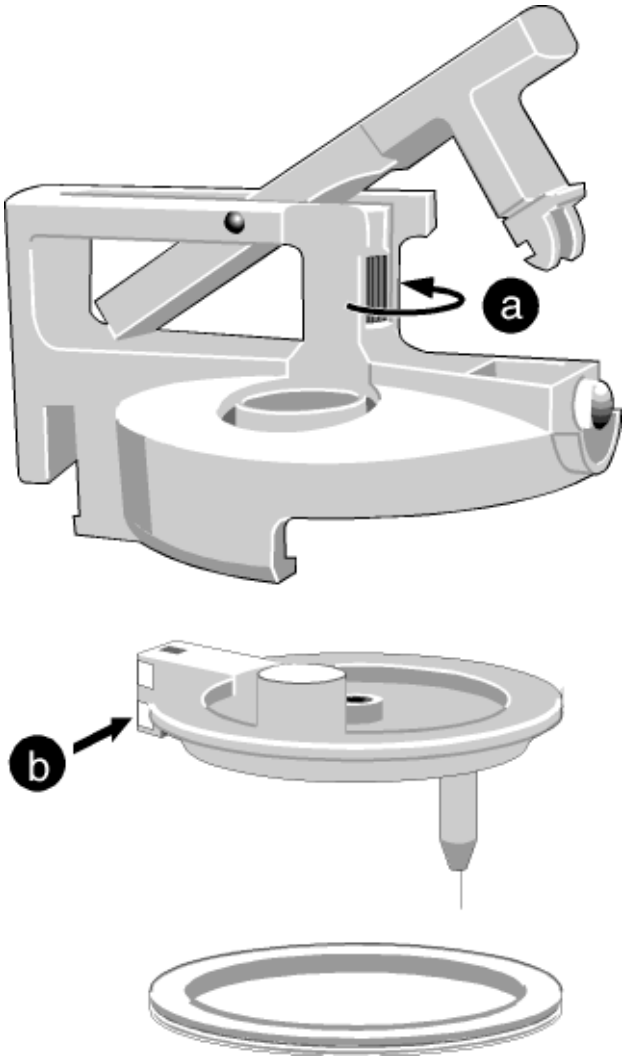


Fig . 25 ⓐ = *Knurled screw for removal of the lid insert*
ⓑ = *Contacts for fill-level monitoring*

☞ Use only the cleaning agents and disinfectants specified on page 22.

Cleaning and Sterilizing the Tubes and the Collection Jar

All parts of the suction system which come into contact with the secretions must be cleaned and sterilized after each application and before being used again on a new patient. These parts are

– the suction tube including the suction tip or aspiration set

– the collection jar including the lid and the double socket nipple

– the tube connecting the fluid trap (fluid trap and bacterial filter, next page)

- Disconnect all tubes, remove the double socket nipple from the lid system, empty the jar and dispose of the collected material, observing the applicable waste control regulations.
- Open the fluid trap (screw top) and empty the trap, if needed.
- Remove the top of the filter housing and pull out the filter.
- Rinse all parts thoroughly with running water. You may add a detergent, if you wish, or wash all components in a machine.
- For thorough cleaning and for sterilization, the lid insert may be detached from the lid system. To do so, turn the knurled screw ⓐ counterclockwise until the insert ca be removed (Fig. 25).
- Autoclave all of the parts referred to above (136°C max.) or disinfect them, using the products listed on page 22.
- After sterilization, reassemble all parts (section 3 "First-Time Operation").
- Check the contacts for fill- level monitoring. They must always be clean (ⓑ, Fig. 25).

☞ After cleaning, grease the O-rings with Vaseline.

Cleaning and Disinfecting the Device Surface

- Always disconnect the device from the power line, before cleaning and disinfecting the surface.
- Wipe the surface clean with a cloth moistened with a cleaning solution or disinfectant. Liquids must not enter the device. All of the cleaning solutions and disinfectants listed on the next page can be used.

☞ Should liquids have penetrated into the device, it must be inspected by a service technician before being used again.

Cleaning an Sterilizing the Bacterial Filter

The bacterial filter does not come into contact with the patient. Its purpose is to prevent contamination of the pump and moisture from penetrating into the device.

The frequency of sterilization and the application time affect the filter`s service life. The filter is electonically monitored for clogging; the unit emits audio and visual signals to alert the user to a clogged filter.

- A clogged filter (electronically monitored and indicated) can be reconditioned by cleaning it before sterilization. To do so, immerse it briefly in an alcohol solution, then rinse its outside with a strong water jet.
- Dry and remove remaining drops of water as best you can, or let the filter dry at room air.
- Then steam sterilize (autoclave) the filter.

  Autoclaving without vacuum:
  121 °C, 60 min
  130 °C, 45 min

  Autoclaving with Vacuum or fractional vacuum:
  121 °C, 30 min
  126 °C, 20 min
  134 °C, 15 min
- After sterilization, place the filter on a sterile cloth and let it dry to some hours.
- Then reinsert the dry filter in the filter housing, which you have previously sterilized as well.
- The filter housing, the tubing and the collection jar must be free from disinfectants containing alcohol.

☞ Always have spare filters at hand (Order No. 444.0082.0).

Maintenance

- Visually inspect the device, tubes, collection jar and power cord before each use.
- Parts which are damaged must be replaced immediately.
- The system does not require any further maintenance.

Recommended desinfectants for instruments

Produt	Ingredients	(in 100 g)	Manufacturer
GIGASEPT FF	succinic acid dialdehyde	11 g	Schülke & Mayr, Norderstedt
(conc.)	dimethoxy-tetrahydrofurane	3 g	
	anticorrosive components		
	non-ionogenic tensides and perfumes		
PRONTOCID	formaldehyde	4,5 g	Braun, Melsungen
(conc.)	glutaric dialdehyde	3,5 g	
	glyoxal	2,5 g	
	quaternary ammonium compounds	7,0 g	
Sekusept PLUS	glycoprotamine	25 g	Henkel, Düsseldorf
(conc.)	non-ionogenic tensides		
	solvents, complexing agents		
Mucozit-T	(3-aminopropyl)laurylamine	8,0 %	Merz & Co., Frankfurt/Main
(conc.)	alkyldimethylbenzylammoniumchloride	19,0 %	
	coco-propylene diamine 1,5-guanidine acetate	7,0 %	

Recommended disinfectants for the device surface

Product	Ingredients	(in 100 g)	Manufacturer
TERRALIN	benzalkonium chloride	20 g	Schülke & Mayr, Norderstedt
(conc.)	phenoxypropanole	35 g	
QUATOHEX	didecyl dimethy		Braun, Melsungen
(conc)	ammonium chloride		
	benzalkonium chloride	14 g	
	bi-guanidine cetate	10 g	
	bi-guanidiniumacetat	7,5 g	
	polymeric diguanide	0,5 g	
Incidin Plus	glycoproitamine	26,0 g	Henkel, Düsseldorf
(conc)	non-ionogenic tensides		
	solvents, complexing agents		
Pursept-A	ethanol	38,9 g	Merz & Co., Frankfurt/Main
(spray or tissues)	glyoxal	0,1 g	
	quaternary ammonium compounds	0,05 g	

6. Troubleshooting

The table below will help you to correct system malfuntions.

Problem	Possible cause	Remedy
Unit does not start up (power switch is not lit)	– power connector not properly inserted – no power	– check power connector – check power supply of the building (fuses) – check instrument fuses
Alarm upon power up (Fill level control is lit)	– fluid trap full – bacterial filter clogged or not completely dry – choke coil in place, althrough drainage mode is not selected	– check fluid trap and empty, if needed – replace bacterial filter – select drainage mode
Alarm upon power up (fill-level monitoring is lit) **Atmoforte 350/Record 500** switches off	– collection jar full – contacts short-circuited	– empty collection jar – remove metal connections of the contact element (also check rails on trolley)
Alarm during suction application (fill-level monitoring is lit)	– collection jar full – bacterial filter clogged – excessive foam – unit mounted on trolley and contaminated contacts	– empty collection jar – clean or replace filter – install foam protection – clean contact bar

Problem	Possible cause	Remedy
No alarm, even though collection jar is full	– poor contact between collection jar and **Atmoforte 350/Record 500**	– check whether collection jar incl. lid system are properly locked into place in the support and/or whether the **Atmoforte 350/ Record 500** is correctly screwed onto the trolley
Alarm during suction application, unit switches off	– excessive foam, foam bubbles trip contact between sensor and double socket nipple	– attach foam protection to fill level sensor (Art.No. 444.0064.0)
No or poor suction performance Automatic standby function does not work (unit does not start up when suction tube is immersed in liquid)	– leak in suction system for leaks, please check	
	a) silicone gasket between collection jar and lid system	a) reattach lid system, taking care that it is seated in a center position on the collection jar; replace silicone gasket, if necessary; Art.No. 055.0070.0
	b) O-ring at double socket nipple	b) check O-ring at double socket nipple for signs of damage; properly insert double socket nipple and check for tightness
	c) O-ring at fluid trap screw connection	c) check O-ring in screw connection of fluid trap, screw tight and check for tightness
	d) O-ring at fluid trap lid	d) check O-ring in lid of fluid trap for signs of damage; replace, if necessary

7. Spare parts and Accessories

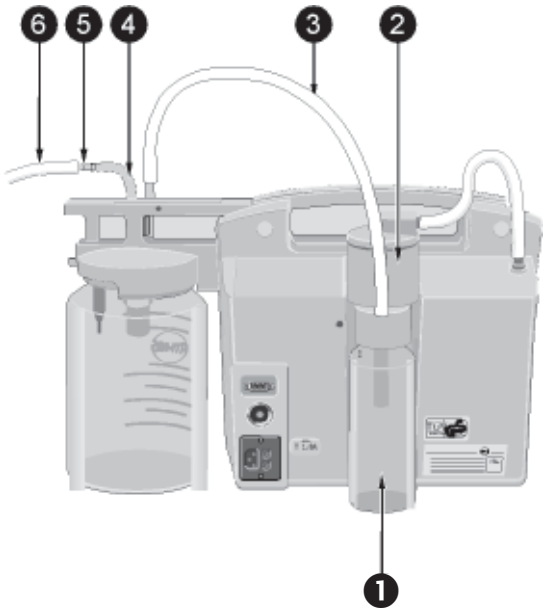
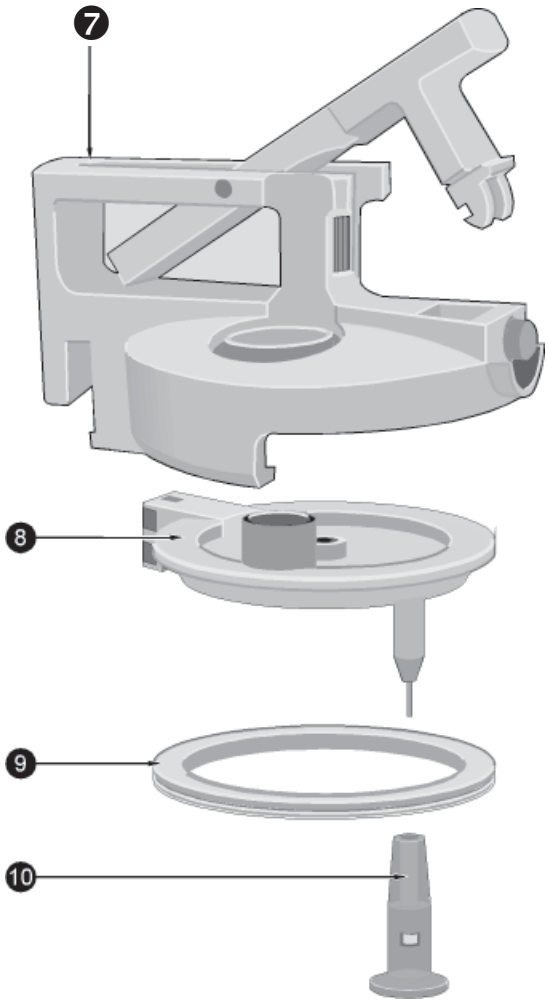


Fig. 26.

7.1 Spare Parts

	Designation	*Art.-No.*
❶	Fluid trap (glass)	000.0504.0
❷	Fluid trap (assembled)	444.0080.0
❸	Silicone tube	443.0046.0
❹	Double socket nipple	444.0012.0
❺	Tube adapter	444.0013.0
❻	Suction tube 6 mm, 1,25 m	000.0013.0
	Suction tube 6 mm, length to order	006.0009.0
❻	Suction tube 10mm, 1,25 m	000.0243.0
	Suction tube 10 mm, length to order	006.0026.0



❼	Lid system (assembled)	444.0015.0
❽	Lid insert	444.0052.1
❾	Gasket	055.0070.0
❿	Foam protection	444.0064.0

Fig. 27.

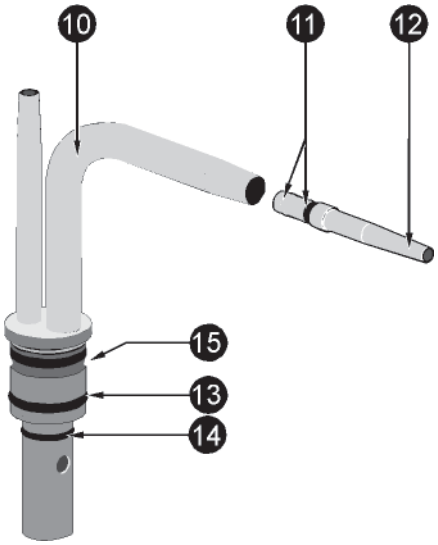


Fig. 28.

	Designation	*Art.No.*
⑩	Double socket nipple (assembled)	444.0012.0
⑪	O-ring 6 mm Ø (min. 5/order)	055.0069.0
⑫	Tube adapter	444.0013.0
⑬	O-ring 23 mm Ø (min. 5/order)	055.0073.0
⑭	O-ring 14 mm Ø (min. 5/order)	055.0072.0
⑮	Contact spring washer	444.0079.0

Spare Parts (not shown)

Fuse 230 V, slow blow, 1 A/H	008.0471.0
Fuse 115 V, slow blow, T 1 A/H	088.0080.0
Power cord	008.0629.0
Spare bags for Receptal® container set I	
– Receptal® suction bags 1.5 l w/o. integrated overflow valve filter, 50/cs.	310.0221.1
– Receptal® suction bags, 1.5 l with integrated overflow valve filter, 50/cs.	310.0221.2
spare bags for Receptal® container set II	
– Receptal® suction bags, 2 l, w/o. integrated overflow valve filter, 50/cs.	443.0257.0
– Receptal® suction bags, 2 l, with integrated overflow valve filter, 50 /cs.	443.0257.2
Cannula sleeve for intrument tray	443.0017.0

Spare parts for Water Trap

Fluid trap, assembled	444.0080.0
Fluid trap (glass)	000.0504.0
Tube, length 200 mm	999.0128.0
Gasket for water trap, O-ring	055.0071.0
Gasket for lid of water trap (filter housing)	055.0088.0

7.2 Accessories and Supplies

Collection Jars

Collection jar, with scale 1.5 l	444.0032.0
Collection jar, with scale 3 l	444.0033.0
Collection jar, with scale 5 l	444.0034.0
Collection jar, polysulphone plastic, 1.5 l	444.0036.0
Collection jar, polysulphone plastic, 3 l	444.0037.0
Collection jar, polysulphone plastic, 5 l	444.0038.0

Disposable Suction Systems

Receptal®container set I, comprising 2 collection containers KG 1600 C, 2 Receptal® collection bags (1 x with/1 x w/o overflow valve filter)	444.0022.0
Receptal®container set II, comprising 2 collection containers KG 2100 C, 2 Receptal® collection bags (1 x with/1 x w/o. overflow valve filter) 1 x Receptal®-suction bags 2,0 l	444.0023.0
Trolley Equipment trolley with two locking castors, accommodates 2 collection jars, electrical connection with unit	444.0020.0
Drainage Set for thorax drainage, incl. water vacuum gauge, support, choke coil, filter and tube connections	444.0026.0
Pedal Regulator AP-tested, for continuous adjustment of the vacuum	444.0010.0
Extraction Tube connection tube for vacuum extraction cups, green silicone, 6.5 mm, length 1.5 m	404.0146.0
Catheter Container can be suspended on the trolley	444.0140.0
Tissue Trap stainless steel strainer, can be inserted in all collection jars, for use during curettage	444.0080.0
Container Holder, assembled can be suspended in accessory trail or trolley or on the side of the unit	444.0145.0

8. Technical Specifications

Air flow rate	**Atmoforte 350** 36 ±2 l/min **Record 500** 45 ±2 l/min
Max. vacuum	**Atmoforte 350** approx. 80 kPa max. (= 0.8 bar = 600 mmHg) **Record 500** approx. 90 kPa max. (= 0.9 bar = 675 mmHg)
Fine-control suction	up to -0.2 bar
Drainage	1 cm to 30 cm water column
Vacuum readout	between 0.05 and 0.2 mbar in steps of 0,05 (5 %) between 0.3 and 0.8 mbar in steps of 0.1 (10 %) internal resolution: 0.005 bar (0.5 %) internal accuracy: 0.01 bar (1 %)
Collection jar	1.5 and 5-liter jars made of glass, polysulphone or Receptal® containers for 1.6 liters or 2.1 liters
Suction tube	silicone, steam sterilizable (up to 136°C) Ø 6 mm, 1.25 m length Ø 10 mm, 2.0 m length
Rated voltage	230 VAC ±10 %, 50 Hz or 110 VAC ±10 %, 50/60 Hz
Power consumption	max. 190 W
Protection class (IEC 601)	I, type B
Protection category	IP 20
Ambient conditions:	
Transport/storage	-10 to +60 °C
Operation	+10 to +35 °C 30 to 95% humidity, non-condensing

Dimensions	H 300 x W 350* x D 200 mm (w/o.trolley)
Weight	w/o. trolley 10.5 kg* with trolley 25 kg* *w/o. collection jar
Data retention in case of line failure	> 3 days
Interface	RS232 9600 baud, 8 bit timeout 1 second, electrically isolated according to IEC
Fine-control suction	vacuum control up to -0,2 bar automatic clog detection after approx. 1 second
Long-term drainage (thorax drainage)	pump performance selectable in 4 steps from approx. 0.2 liters/minute to 2.5 liters/min automatic clog detection after approx. 1 minute, max. vacuum 0.05 bar, regulation between 1 cm and 30 cm water column (only in conjunction with original water vacuum gauge with choke resistor)
Vacuum extraction	automatic vacuum build-up between 0,3 bar and 0,8 bar in steps of 0,005 bar starting at 0.2 bar, build-up time approx. 100 s up to 0.7 bar
Pedal regulator (optional)	via RS232 interface, AP-tested