ATMOS®
S 351

Operating Instructions
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1.1 Notes on operating instructions

- These instructions contain important information on how to operate the ATMOS® S 351 safely, properly and efficiently. It should, therefore, not only be used for new operators who have to be instructed, but also as an ongoing source of reference. These instructions will assist in avoiding danger and in reducing repair costs and downtime. In addition, they will increase reliability and the life of the equipment. For these reasons, the operating instructions must always be available near the equipment.

Please read Chapter 2.0 „Safety Information” before initial start-up so that you are prepared for any potentially dangerous situations.

The following applies in all cases:

**Careful and prudent work is the best protection against accidents!**

The operational safety and availability of the equipment depend not only on your ability, but also on care and maintenance of the ATMOS® S 351. For this reason, regular cleaning and maintenance work is essential. Major maintenance and repair work must be carried out only by experts authorised by ATMOS. Please insist that only original spare parts are used for repairs. This will guarantee that operational safety, usability and value of your equipment are preserved.

- The ATMOS® S 351 carries the CE marking CE-0124 in accordance with the EU Council Directive 93/42/EEC on medical products and meets the basic requirements listed in Appendix I of this directive.

- The product ATMOS® S 351 complies with all applicable requirements of the directive 2011/65/EC restricting the use of certain hazardous substances in electrical and electronic equipment (“RoHS”).

- The declaration of conformity can be obtained on our website at www.atmosmed.com.

- The quality management system applied by ATMOS has been certified in accordance with the international standards EN ISO 9001 and EN ISO 13485.

- Authorised service providers are issued by ATMOS with service instructions including detailed circuit descriptions, parameter settings and service information.

- Reproduction – even of excerpts – is permissible only with the written permission of ATMOS.

Abbreviations / symbols in these instructions

- Marks a list
  - Sub-division of a list/activity.

The recommended sequence must be observed!

- Marks particularly important information!
1.2 Function

The ATMOS® S 351 is a mains-operated suction unit. The quiet, maintenance free diaphragm pump forms the core of the ATMOS® S 351. It creates a vacuum in the secretion canister which assists in drawing off and collecting the secretions. The final vacuum required and thus the suction power can be preselected in steps with the press of a button. The ATMOS® S 351 produces this vacuum with the aid of a microprocessor-based controller. The pump switches off when the set value is reached. A control circuit ensures that the pump only runs when the vacuum is less than the value set.

The electronic filling level control, a safety canister and a bacterial filter prevent secretions being sucked into the unit.

Various monitoring and control functions increase the ease of operation of the ATMOS® S 351 and ensure safe use. These are, for example:

- Electronic level control of the secretion canister which provides visual and acoustic signals when the maximum level is exceeded.

Before removing a full secretion canister, switch off the pump and remove the connecting hoses from the canister.

- A standby function switching the unit off when not in use (e.g. open suction cannulae) and automatically on again when the cannulae is inserted into the material to be aspirated.

- Electronic filter monitoring signalling a blocked (clogged) filter audibly and visually.

- A monitor function which checks all main equipment functions at regular intervals and activates a service request indicator if a fault is detected.

All components which come into contact with the secretion, such as hoses, secretion canister, suction hose or lid system can be autoclaved (134 °C, 3 bar, 5 min 3x fractionated pre-vacuum).

A special equipment trolley can be supplied for mobile use.
1.3 **Explanation of symbols**

- **Caution**, observe operating instructions!

- Equipment safety fuse

- Unit off

- Unit on

- "limit" Fine suction

- "max." Maximum vacuum

- Standby function ON/OFF

- Alternating current

- Protective ground terminal

- Trolley

- Foot regulator

- Filter blocked

- Full secretion canister

- Bacterial filter

- Equipotential bonding

- Application part Type B
2.0 Safety Information

- Please dispose properly all packaging.
- The doctor treating the patient is responsible for the proper surgical procedures and technology. A trained doctor has to decide in each case whether the treatment is appropriate and how to carry it out.
- The ATMOS® S 351/S 351 Natal/S 351 Ophthal may be used only by trained staff under supervision (IEC 601-1 / EN 60601-1).
- The ATMOS® S 351/S 351 Natal/S 351 Ophthal meets the requirements of the standard IEC 601-1-2 / EN 60601-1-2 „Electromagnetic compatibility – medical electrical equipment” with regard to resistance to interference.
- Always set up the equipment in such a way that the operator can easily see the front panel and can reach it comfortably. The equipment must be placed on a firm, level surface.
- The ATMOS® S 351/S 351 Natal/S 351 Ophthal has been designed in accordance with IEC 601/ EN 60601. The equipment conforms to VDE Safety Class I. It must only be connected to a properly installed earthed socket.
- Before connecting the equipment, check that the values for voltage and frequency indicated on the equipment correspond to those of the mains supply.
- Use only correctly installed mains sockets and extension cables.
- Check equipment, secretion canister, power cable, accessories, connection cables and hoses for damage before start-up. Damaged cables and hoses must be replaced immediately. Check before use that the unit functions properly.
- To disconnect the equipment from the mains, always pull the plug out of the wall socket first. Only then disconnect the cable from the unit. Never touch plug or cable with wet hands.
- After transport at low temperatures, the equipment must be left at room temperature for up to six hours before initial start-up. If the equipment has not been acclimatised, it must not be operated as the diaphragms of the pump could be damaged.
- When switching on the unit, a high vacuum value might be present.
- The suction hose must never come into direct contact with the patient. A suction catheter, suction attachment or medical suction instruments must always be used.
- Too high vacuum values may lead to tissue damages.
- Only use transparent hoses.
- The environmental conditions listed in the specifications (chapter 10.0) must be observed.
- The ATMOS® S 351 must only be operated in rooms designated for medical use. It is not designed for use in potentially explosive areas (M and G) and in oxygen rich environments. Potentially explosive areas can arise from use of flammable anaesthetic agents and agents used for cleaning and disinfecting skin.
- The footswitch is suitable for use in the above applications.
- If demineralised/slightly mineralised water or tap water is sucked off, the overflow monitor of the ATMOS® S 351 does not function reliably as it works on an electrical basis.
- Do not allow liquid to enter the equipment. If liquid has entered the equipment, it must be inspected by a service engineer before further operation.
- When using on a patient (e.g. during surgery or liposuction), an additional equivalent unit should be ready in case of failure of the unit (backup suction unit).
- The level of vacuum preselected and the selection of additional products must be as instructed by the specialist for all applications on a patient, e.g. for vacuum extraction, drainage of wounds or ophthalmologic surgery.
- These operating instructions correspond to the design of the equipment and the latest version of the safety standards at the time of printing. All property rights are reserved for the circuits, processes, names, software programs and equipment listed.
- Particularly important notes are placed in a frame in these instructions.
- The software detects a full secretion canister or „shorting between the contact terminals” and issues a warning at regular intervals. This does not interrupt the process of vacuum extraction.
- Prior to the wound drainage treatment, check the suction unit for correct function.
- Wound drainage may only be effected under medical supervision.
- When using the equipment to drain a wound, the user (doctor, nursing staff) must continuously monitor the patient’s fluid and electrolyte balance. It is recommended to specify the secretion canister volume on the basis of the medical assessment to prevent excessive removal of fluids in case of insufficient monitoring. This can be implemented by selecting an appropriate secretion canister or limiting the maximum secretion canister level.
- The maximum level can be restricted by, for example, topping up the secretion canister with sterile water. For this, the secretion canister is filled with the difference in volume between secretion canister volume and required drainage volume before start of treatment. Once the quantity is reached, the unit automatically switches off via the level monitor. Check before use on the patient that the level monitor functions properly.
2.0 Safety Information

- Replace or empty the secretion canister when a filling level of 2/3 (incl. foam) is reached.
- Only use appropriate, adaptable wound treatment material and pay attention to manufacturer’s instructions.
- Continuously check tightness of the wound treatment material.
- Prior to and during the wound drainage treatment, make sure that the connection hoses are not kinked or clogged.
- During the wound drainage treatment, continuously check the vacuum value.
- The vacuum must be built up slowly in a controlled manner for vacuum extraction.
- The user must continuously check the vacuum during vacuum extraction.
- If the vacuum cannot be reduced despite correct adjustment of the equipment (defective auxiliary air valve), we recommend closing the suction hose between pump connection and bacterial filter in an air-tight manner (pinch) and then removing the suction hose from the pump connection or cutting through the suction hose on the pump connection with a scalpel. Then carefully let air back into the suction hose (carefully release the pinched suction hose) so that the vacuum is removed as slowly as possible.
- The ATMOS® S 351 version for vacuum extraction on trolley 320.0070.0 must not be used as fluid suction unit for operations as the electronic secretion canister overflow monitor on this trolley does not work.
- The buffer container for vacuum extraction must have a volume of at least 1 litre.
- During vacuum extraction, the automatic mode can be disabled by operation of the foot switch.
- Prior to and during the vacuum extraction resp. keratome treatment, make sure that the connection hoses are not kinked and that the filter is not clogged. Therefore, check, prior to each application, whether the filter is clogged.
- Vacuum extraction resp. keratome treatment may not be possible at elevated altitudes as it may not be possible to achieve the vacuum required. It is at the discretion of the specialist whether an operation using the suction unit can be carried out at the final vacuum obtained.
- The canister overflow safety is not active during vacuum extraction resp. with keratome treatment.
- In case of a failure of the mains power supply or accidental switching off of the equipment during extraction, this must be aborted and production of the vacuum has to be re-started after the equipment has been successfully re-started. The best way to do this is by pinching the suction hose to maintain the vacuum in the cup, venting by pressing the END button and building the vacuum again (pressing the suction cup button) and then applying the vacuum by releasing the pinched hose. No venting must take place while the equipment is switched on again. The control unit continues to build up the vacuum or holds the vacuum.
- Only approved extraction cups with CE marking in accordance with RL 93/42 must be used.
- The system must not be ventilated suddenly with simultaneous pulling on the extraction cup.
- If the final vacuum set is not achieved, the ATMOS® S 351 Natal will not issue an audible signal „final vacuum achieved“.
- The user must continuously check the vacuum prior to and during a keratome treatment.
- The ATMOS® S 351 Ophthal is previously used with a suction ring (keratome) but may also be used for other application ranges.
- The suction ring may only be removed from the eye after complete removal of the vacuum (beep).
- In case of a power failure or an inadvertent switching off of the unit during keratome treatment, this therapy has to be stopped and vacuum must eventually be generated again after a restart of the unit. Best method to do so is by kinking the suction hose in order to hold the vacuum on the suction ring. Ventilation is done by pressing the END button. Vacuum is then generated again by pressing the EYE button. Following, the vacuum is present when having released the kinked hose.
- This product is not re-sterilisable. Repeated reuse of components which are marked with a is forbidden. In case of repeated reuse these components lose their function and there is a high infection risk.

ATMOS do not accept liability for injury to persons or damage to equipment if
- non-original ATMOS parts have been used.
- the information in these operating instructions has not been observed.
- installation, adjustment, changes, extensions and repairs have been carried out by persons not authorised by ATMOS.

References

Medical product law (MPG) of 07.08.2002
Obtainable from: VDE-Verlag GmbH, Bismarckstraße 33, 12157 Berlin, Germany.
Name: ATMOS® S 351

Main functions:
Suction of secretions, rinsing fluids and temporarily collection of body fluids.

Med. indications/ application:
For surgeries e.g. suction of wound cavities, abscesses etc.
For endoscopy e.g. suction of secretions and rinsing fluids.
For cardiological interventions.
For the intermittent suction.

Specification of the main function:
Drainage and temporarily collection of body fluids. By means of a microprocessor controlled, electrical suction pump, a negative pressure will be created. The integrated secretion canister allows a temporarily collection of the derived body fluids. The microprocessor enables an intermittent suction as well as a controlled switch off of the pump.

Application organ:
Natural orifices as well as openings which are created by means of a surgery (whole body)

Application time: Short-term use on the patient (< 30 days)

Application site:
The application site is the clinical, outpatient as well as the practices area.
The application of the device may only be performed by medical trained and introduced staff.

Contraindications:
No application in low-vacuum range e.g. thoracic and wound drainage.
No application outside of the medical sector.
No suction of flammable, corrosive and explosive substances.

The product is: X active  □ not active

Sterility: Not necessary

Single use product / reprocessing:
The device and the accessories are partially reusable. For information on reprocessing, cleaning and disinfection see user manual.

Note: For a professional smoke evacuation we recommend you the AtmoSafe, REF 445.0000.0
4.1 Indicators and controls

Fig. 1. ATMOS® S 351

1. Bracket and contact element for secretion canister
2. Pump connection
3. Safety secretion canister with optional filter
4. Bracket for secretion canister
5. Connection for hose to safety canister
6. Connection for suction hose
7. Release button for locking system (lid of secretion canister)
8. ON / OFF switch
9. Indicators and control panel
10. Safety canister outlet (to pump connection)
11. Safety canister inlet (from secretion canister)
12. 10-6 mm taper adapter
The suction device ATMOS® S 351 is used for sucking off liquids and small particles. During the use of laser, HF respectively radio-frequency (RF) surgical devices, smoke gas is produced which is not kept in the secretion container, but streams towards the pump and then very quickly blocks the integrated bacterial filter which serves as microbiological as well as overflow protection. In order to prolong service life of the bacterial filter, a carbon filter, REF 008.0758.0 can be installed in front of the bacterial filter. The carbon filter extracts the aerosol from the smoke gas and protects the bacterial filter.

Attention! The carbon filter is not a replacement for the bacterial filter! But it prevents from early reduction of suction capacity caused by a quick filter blocking.

**Fig. 2.** ATMOS® S 351 (rear)
- Mains connection
- Equipment safety fuses
- Connection for potential equalization
- Connection for footswitch
- Safety clamp for mains cable
- Vent

**Fig. 2.1**
- Hose piece, diam. 10 mm
  REF 006.0026.0
- Former hose piece connected to the bacterial filter
- Hose connector 8-12
  REF 000.0239.0
- Support for standard rail system for the carbon filter
  REF 444.0660.0
- Bacterial filter in the filter housing
- Carbon filter 008.0758.0

**Flow**
4.0 Installation and commissioning

4.2 Initial start-up

This section will explain
– how to handle the closure system of the collection canister lid,
– how to lock and insert the secretion canister,
– which hoses have to be connected,
– how to connect the ATMOS® S 351 to mains electricity.

Please note the safety information in Section 2.0 before initial start-up.

The closure system must tightly seal the secretion canister so that the vacuum required can build up within. Fig. 3 shows the closure system with the locking handle open.

The anti-foaming device must be placed on the filling level sensor for strongly foaming secretions.

- Push the closure system over the secretion canister in accordance with Fig. 3 (take care that the cap rim (5, Fig. 3) is below the bead of the secretion canister) and press the locking handle downwards until it engages.
- Tension of the lid system can be changed by turning the knurled screw (\(\circ\), Fig. 3).

Fig. 3. Closure system
- 1 Locking handle
- 2 Knurled screw to lock the cap insert and to adjust the contact force
- 3 Release button
- 4 Level sensor with anti-foaming device
- 5 Cap rim
- 6 Opening for double socket nipple
- 7 Contacts for filling level sensor

Fig. 4. Fitting the lid
- 5 Cap rim
4.0 Installation and commissioning

- Attach the 1.5 litre secretion canister either to the lefthand or righthand bracket in accordance with Fig. 5.

- Please do not use the secretion canister brackets on the ATMOS® S 351 and the trolley for any other purposes. This will prevent malfunctions.

Fig. 5. Attaching the 1.5 litre secretion canister

- If you are using a 3 litre or 5 litre secretion canister, attach it to the trolley in accordance with Fig. 6.

- When using the trolley, the ATMOS® S 351 must be firmly connected to the trolley table using the two fixing screws (underside of trolley table) (contacts for level sensor). The following symbol will be shown on the display.

Fig. 6. Attaching the 3 litre or 5 litre secretion canister to the equipment trolley
4.0 Installation and commissioning

- Finally insert the double connecting nipple into the secretion canister cap (Fig. 7). Ensure that it engages by twisting it slightly.

- It is advisable to treat the secretion canister opening with vaseline or silicone so that the sealing rings seal better and are maintained.

Fig. 7. Inserting the double connecting nipple

Hose connections
- Only use transparent hoses to be able to assess condition of the hoses. Replace the hoses when they are contaminated.

- Connect pump connection (1, Fig. 8) and bacterial filter 2 with a short hose. Connect a second short hose to the printed side of the bacterial filter and connect it to the safety canister cap. Connect the longer hose to the vertical connection of the double connecting nipple 3 and the connection 4 of the safety canister.

- When using the optional bacterial filter with the safety canister, bacterial filter 2 is not required. In this case connect the short hose to pump connection 1 and directly to the safety canister lid 5.

- The ATMOS® S 351 must never be used without a bacterial filter.

Fig. 8. Hose connections for suction mode

1 Pump connection
2 Bacterial filter
3 Safety canister lid
4 Connection on safety canister
5 Double connecting nipple
4.0 Installation and commissioning

- Now fit the suction hose to the angled connection of the double connecting nipple.

Fig. 9. Connecting the suction hose

- The 10 mm dia. suction hose is fitted directly to connection (2, Fig. 10) the 6 mm dia. hose is fitted via the hose reducer 3.

Fig. 10. Double connecting nipple

1. Connection for hose to safety canister
2. Connection for suction hose
3. Hose reducer for 6 mm hose
4.0 Installation and commissioning

Check whether the voltage and frequency data listed on the equipment correspond to the power supply and connect the ATMOS® S 351 via the connector (1, Fig. 11) to mains power. Secure the mains cable against accidental removal using safety clamp 3.

If the ATMOS® S 351 is used for surgical procedures, we recommend connecting it to the equipotential bonding connection of the room via connection 2.

If you have a footswitch, connect it to its connection (3, Fig. 11).

The ATMOS® S 351 is now ready for operation.

Fig. 11.

Fig. 12. Indicators and control panel
1 Button for selecting the maximum vacuum
2 Button for increasing the vacuum
3 Button for reducing the vacuum
4 Display (graphics)
5 Button for switching intermittent operating on and off
6 Indicator for intermittent Mode On
7 Button for switching auto standby on and off
8 Indicator for auto standby on
Please ensure that the following parts have been reprocessed before treating a new patient.
- suction hose including suction attachment or suction instrument,
- secretion canister lid and double socket nipple,
- connection hose to safety canister as well as safety canister and bacterial filter.

Check before each use whether the bacterial filter has to be replaced. You must use only a clean and dry filter. The electronic filter monitor signals when the filter is blocked (clogged).

All connections between secretion canister and pump must be absolute dry before being used!

The suction hose must never come into direct contact with the patient. A suction catheter, a suction connector or medical suction instruments must always be used.

5.1 Basic Operation

Switching on

The ATMOS® S 351 always starts the suction process when switched on. The settings are those which were in operation before the last switching off. If the vacuum value had been set to 0 before switching off, it will be set to 0.1 bar on switching on.

Graphics display

All operating states are shown on the graphics display (Fig. 13).

Fig. 13. Graphics display
1 Intermittent operation
2 Countdown timer
3 Vacuum set
4 Bar graph display
5 Set value
6 Current value
5.0 Operation

Automatic standby

If automatic standby has been enabled, the ATMOS® S 351 automatically switches off after approx. 20 sec of non-use (open suction connection). The unit switches on again as soon as you hold the suction connector into the material to be aspirated, and the full suction power is available. This avoids unnecessary noise. For certain applications, e.g. vacuum removal with very narrow suction tubes or with suction hoses with several suction openings at the front or when using disposable suction bags with filter stone, use of the standby function is restricted (it may be necessary to switch it off). The Standby function is switched on and off using the button (LED illuminated when On).

When using suction hoses with pool suction tips, the standby function must not be used.

Electronic filling level monitoring

The ATMOS® S 351 has an electronic filling level monitoring which switches off the unit when the maximum filling level is reached. At the same time, an audible alarm sounds and the Secretion canister full display is shown (Fig. 15). The maximum filling level is reached when the liquid comes into contact with the sensor (Fig. 3, page 11) in the closure system. If a large amount of foam is generated, you should fit the enclosed anti-foaming device over the sensor so that the unit does not switch off prematurely. As soon as the sensor is no longer in contact with the liquid (e.g. on replacing the double socket nipple), the unit switches on again.

Electronic filter monitoring

The ATMOS® S 351 has an electronic filter monitoring which monitors whether the filter is blocked. The pump does not switch off when the Filter blocked state is detected so that work can continue. Change the filter as soon as possible or clean the filter in accordance with the instructions in Chapter 6.0 when this message is displayed.

The message is also displayed when the hose is pinched near the unit. This message is also displayed while the drainage accessories are connected. Remove the parts.

Fig. 14. Auto standby display

Fig. 15. Secretion canister full display

Fig. 16. Filter blocked display
5.0 **Operation**

## 5.2 **Intermittent function**

- This function is used for gastric and wound drainage.

### 5.2.1 **Use of the intermittent function**

- The intermittent function has four phases which are repeated at regular intervals. The duration of each phase and the level of vacuum to be built up can be set in the Service 1 menu (see section 5.3, page 22, on settings).

![Diagram of intermittent function](image)

The intermittent function for gastric and wound drainage is factory-set and can be modified on the basis of the medical diagnosis.

- Phase 1: Soft start to a final vacuum value (default build up time = 10 sec)
- Phase 2: Final vacuum value held (default holding time = 60 sec)
- Phase 3: Controlled venting (default release time = 10 sec)
- Phase 4: Pause (default pause time = 60 sec)

When setting up *fine suction* (for protecting delicate tissue), all times are to be set to 0 sec.

### 5.2.2 **Starting the intermittent mode**

- Switch on the ATMOS® S 351. Check that the control lamp in the switch is illuminated.

The switch-on menu (Fig. 17) is shown on the display for about 2 sec.

Then the unit automatically goes into *suction mode*.

*Fig. 17. Display immediately after switching on*
5.0 Operation

Press the intermittent button (Fig. 18).

Fig. 18. The intermittent mode is obtained by pressing the intermittent button.

The unit automatically changes into intermittent mode and starts with phase 1: soft start (Fig. 19). The current phase (phase 1 = 1, phase 2 = 2, ...) and the time remaining (in seconds) to the end of the current phase are displayed at the top left.

Fig. 19. Soft start

In phase 2, the vacuum obtained is held (Fig. 20).

Fig. 20. Display of Phase 2: The final vacuum is reached. The time remaining until the end of phase 2 is shown at the top left (in the example it is 28 sec).
In phase 3, the vacuum is released in a controlled manner (Fig. 21).

In phase 4, the ATMOS® S 351 pauses at a vacuum of 0 kPa (Fig. 22).

**Leaving intermittent mode**

- While in intermittent mode, press the intermittent button (Fig. 18, page 19).

  The unit leaves the intermittent mode and goes into holding mode (Fig. 23).

  In this mode, the intermittent mode can be re-started by pressing the intermittent button or the suction mode can be called up by pressing the arrow buttons (Fig. 24).
5.0 Operation

5.2.3 Additional functions

During intermittent mode, it is possible to change the final vacuum of the ATMOS® S 351 using the arrow buttons (Fig. 24).

Using the arrow buttons (←, →, MAX)

The arrow buttons have the following functions in intermittent mode:

- The final vacuum applied is reduced in 5 kPa steps by pressing the button.
- The final vacuum applied is increased in 5 kPa steps by pressing the button.
- The final vacuum applied is set to the maximum value by pressing the button. The pump runs continuously.

When the final vacuum has been changed with the arrow buttons, the new value continues to be set until the intermittent mode is cancelled. When the intermittent mode is selected again, the final vacuum is again set to the default value (set in the Service 1 menu).

5.2.4 Use of the footswitch in intermittent mode

The footswitch, if connected, is recognised by the intermittent mode. However, it does not have any function.

The ATMOS® S 351 must be switched off before the footswitch is connected or disconnected.
5.2.5 Warning signals

Electronic level monitor:
See page 17

Short circuit between contact terminals:
In case of a short circuit between the contact terminals, a warning is displayed at regular intervals (Fig. 24, page 20). At the same time an audible alarm sounds. This does not affect the vacuum applied (the vacuum is not removed).

Electronic filter monitoring:
See page 17

5.3 Settings

If the auto standby button (Fig. 26) is pressed and held during switching on, the **Service 1 menu** (Fig. 27) is called up.

Various settings can be adjusted in the following sub-menus (Fig. 27).

- Adjust unity
- LCD Brightness
- Adjust intermittent

The **Service 1 menu** is closed by pressing the auto standby button (Fig. 26).

**Changing the settings for intermittent mode:**
The various **intermittent mode** parameters can be set in the sub-menu **Adjust intermittent** (Fig. 28):

- Final vacuum (**Vac Limit**)
- Time for vacuum build-up / vacuum release (**Incr. Decr. Time**)
- Vacuum holding period (**Vac hold**)
- Pause time (**Pause**)

The sub-menu **Adjust intermittent** is closed by pressing the auto standby button (Fig. 26).
5.0 Operation

5.3.1 Final vacuum in Vac Limit menu

- Select the Adjust intermittent menu from the Service 1 menu (Fig. 27) using the arrow buttons.
- The Adjust intermittent menu (Fig. 28) is called up by pressing the MAX button.
- Select the VAC Limit menu in the Adjust intermittent menu using the arrow buttons.
- The VAC Limit menu is called up by pressing the MAX button. The VAC Limit menu is displayed (Fig. 29).
- Set the vacuum value required using the arrow buttons. The vacuum value can be set in 5 kPa steps between 0 kPa and -90 kPa. The default value is -50 kPa.
- Accept the settings by pressing the MAX button and close the VAC Limit sub-menu. This returns you to the Adjust Intermittent menu.

Fig. 29. Vac Limit menu

If the auto standby button is pressed, the VAC Limit sub-menu is closed without saving the changes.

5.3.2 Time for vacuum build-up / vacuum release in the Incr. Decr. Time menu

- Select the Adjust intermittent menu from the Service 1 menu (Fig. 27) using the arrow buttons.
- The Adjust intermittent menu (Fig. 28) is called up by pressing the MAX button.
- Select the Incr. Decr. Time menu in the Adjust intermittent menu using the arrow buttons.
- The Incr. Decr. Time menu (Fig. 28) is called up by pressing the MAX button. The Incr. Decr. Time menu is displayed (Fig. 30).
- Set the values for build-up/release time required using the arrow buttons. The times cannot be set independently of each other. The times can be set in 1 sec steps between 0 sec and 300 sec. The default setting is 10 sec.
- Accept the settings by pressing the MAX button and close the Incr. Decr. Time sub-menu. This returns you to the Adjust intermittent menu.

Fig. 30. Incr. Decr. Time menu

If the auto standby button is pressed, the Incr. Decr. Time sub-menu is closed without saving the changes.
5.0 Operation

5.3.3 Vacuum holding period in the Vac hold menu

- Select the Adjust intermittent menu from the Service 1 menu (Fig. 27, page 22) using the arrow buttons.
- The Adjust intermittent menu (Fig. 28, page 22) is called up by pressing the MAX button.
- Select the Vac hold menu in the Adjust intermittent menu using the arrow buttons.
- The Vac hold menu (Fig. 28, page 22) is called up by pressing the MAX button.
- The Vac hold menu is displayed (Fig. 31).
- Set the value for the vacuum holding time required using the arrow buttons. The times can be set in 5 sec steps between 0 sec and 995 sec.
- Accept the settings by pressing the MAX button and close the Vac hold sub-menu. This returns you to the Adjust intermittent menu.

If the auto standby button is pressed, the Vac hold sub-menu is closed without saving the changes.

5.3.4 Pause time in the Pause menu

- Select the Adjust intermittent menu from the Service 1 menu (Fig. 27, page 22) using the arrow buttons.
- The Adjust intermittent menu (Fig. 28, page 22) is called up by pressing the MAX button.
- Select the Pause menu in the Adjust intermittent menu using the arrow buttons.
- The Pause menu (Fig. 28, page 22) is called up by pressing the MAX button. The Pause menu is displayed (Fig. 32).
- Set the value for the pause time required using the arrow buttons. The times can be set in 5 sec steps between 0 sec and 995 sec. The default setting is 60 sec.
- Accept the settings by pressing the MAX button and close the Pause sub-menu. This returns you to the Adjust intermittent menu.

If the auto standby button is pressed, the Pause sub-menu is closed without saving the changes.
5.0 Operation

5.3.5 Adjust unities

The vacuum unity displayed can be changed for the ATMOS® S 351. To do this, press and hold the Auto Standby button while switching on until Service-1 is displayed on the graphics display.

- Then select Adjust unity using the arrow buttons and confirm with the MAX button.
- The selection menu for the unities is displayed. You can choose between mbar, mmHg and kPa.
- Select the unity required using the arrow buttons and confirm with the MAX button.

5.3.6 Brightness of display

The brightness of the graphics display of the ATMOS® S 351 can be adjusted to suit the environment. To do this, press and hold the Auto Standby button while switching on until Service-1 is displayed on the graphics display.

- Then select Adjust LCD Brightness using the arrow buttons and confirm with the MAX button.
- The selection menu for the display brightness is displayed. You can set the brightness of the LCD display using the arrow buttons. When you have adjusted the display confirm the setting with the MAX button.

5.4 Trolley operation

If the ATMOS® S 351 is mounted on a trolley, the trolley symbol (Fig. 33) is shown on the display. The trolley symbol must be displayed during operation on a trolley. If the symbols is not displayed, the liquid level in the secretion canister cannot be detected.

When using old trolleys (earlier than March 2000), this symbol will not be displayed, even if the system is functioning correctly. In this case our service department can convert the trolley for you.

Fig. 33. Trolley connected
5.5 Suction function

- Connect the suction catheter, suction connector or suction instruments.

- Switch on the ATMOS® S 351. Check that the indicator lamp in the switch is illuminated.

- Select the final vacuum required using one of the arrow buttons (2 and 3, Fig. 34). If the button is kept depressed, the value changes more rapidly.

- The maximum vacuum is set by pressing the Max button (1, Fig. 34).

The ATMOS® S 351 starts up and begins to generate the vacuum. The vacuum reached at any time is displayed. The unit switches off when the final vacuum is reached. If the vacuum value exceeds 800 mbar it is possible that the ATMOS® S 351 is automatically vented and the vacuum value is reduced to 800 mbar. A control circuit controls the unit during operation so that it runs only when the vacuum is less than the value set.

Observe the liquid level in the secretion canister during suction. Although the electronic level monitor switches off the unit when the maximum liquid level is reached, you should change the secretion canister or empty it when it is about 2/3 full (including foam head) (Fig. 35).

If liquid has been sucked into the unit despite the level monitor and safety canister, the ATMOS® S 351 must be returned to operation only after examination by a service engineer.

Fig. 34. Indicators and control panel
5.5.1 Changing the secretion canister

Always wear protective clothing (gloves) when changing the secretion canister!

- Stop the suction process and switch off the pump.

- Remove the double connecting nipple from the full secretion canister (Fig. 36). Place it in the second secretion canister, if attached.

- To remove the secretion canister, first tip it slightly away from the unit and then pull it upwards (Fig. 37).

- Either replace it with a new secretion canister or empty it. Press the release button (3, Fig. 37) to open the locking handle. Please dispose properly of aspirated material.

- Insert the double connecting nipple into the empty secretion canister and continue suction.

After use

- Switch off the ATMOS® S 351 and clean unit and accessories as described in chapter 6.0.
5.5.2 Suction with footswitch

The vacuum can be set with the connected footswitch:

- Connect the footswitch to the connection (3, Fig. 11, page 15).
- Connect the suction catheter, suction connector or suction instruments.
- Switch on the ATMOS® S 351. Check that the indicator lamp in the switch is illuminated.
- Select the final vacuum required using one of the arrow buttons (1, 2 and 3, Fig. 40). If button 2 and 3 are kept depressed, the value changes more rapidly.
- You can now vary the vacuum between 0 and the maximum value set using the footswitch.

Only for 1.5 litre secretion canister!

5.6 Faults

5.6.1 Emergency operation

This operating mode is automatically entered if there is a malfunction in the ATMOS® S 351. Please call the service department if this happens. The ATMOS® S 351 functions are restricted in this case. Control of the vacuum is no longer possible. The following functions are still available:

1. Switch on pump
2. Switch on pump
3. Switch off pump
5.6.2 Overheating

The ATMOS® S 351 is designed for continuous operation. If the ventilation louvres are blocked, the unit may overheat. Initially, a warning is given (graphics display flashes):

- Check the ventilation louvres of the ATMOS® S 351.

If the temperature continues to rise, the ATMOS® S 351 will be switched off. If this happens, the overheating display is left on the graphics display. Please call the service department if this happens.

5.6.3 Fault

If the ATMOS® S 351 detects a functional fault, this will be shown on the graphics display. Please call the service department if this happens.

- Please note that the Key Error is also created when a key is pressed for 7 seconds (exception: ◄ ►-keys).
6.1 Reprocessing of hoses and secretion canister

Always wear protective clothing (gloves) when carrying out cleaning work.

Those parts which come into contact with the secretion must be cleaned and disinfected after each use before a new patient is treated. These are:

- Secretion canister including cap and double socket nipple
- Suction hose

- Release all hose connections, remove the double socket nipple from the closure system, empty the secretion canister and dispose properly the aspirated material.

- Unscrew the upper part of the safety canister. Empty the canister, if required.

- Remove the lid from the safety canister and take out the filter (if required).

- Using the cleaning agent neodisher AN or neodisher Mediclean forte (manufactured by Dr. Weigert, Hamburg). Cleaning in an automatic cleaner and disinfector is also possible. Thermal disinfection is carried out at 93°C.

- Thoroughly rinse all parts under running water. For disinfection, you may use all surface and instrument disinfectants listed in chapter 6.4 / 6.5.

- You can remove the lid insert from the closure system so that it can be cleaned thoroughly. To do so, turn the knurled screw counter-clockwise until the insert can be removed.

- Autoclave the lid-container system (134 °C, 3 bar, 5 min 3x fractionated prevacuum)

- Maximum number of reprocessing cycles:
  - Glass secretion canister: 60 cycles.

- Reassemble the parts after reprocessing (chapter 4.1 Initial start-up).

- Ensure that the contacts for the level monitor are not contaminated.

Grease the 'O' rings with vaseline after cleaning.
6.2 Cleaning and disinfecting the outside of the unit

- You must disconnect the mains plug before cleaning and disinfecting the unit casing.

- Wipe over the casing with a cloth moistened with a cleaning agent or disinfectant solution. Do not allow any liquid to enter the equipment. The cleaning agents and disinfectants listed on page 30 are suitable.

⚠️ If liquid has entered into the equipment, it must be inspected by a service engineer before further operation.

⚠️ Please note the instructions by the respective manufacturer, especially with regard to concentrations and application period.
## 6.0 Cleaning and Maintenance

### 6.3 Recommended instrument disinfectants

<table>
<thead>
<tr>
<th>Disinfectant</th>
<th>Contents</th>
<th>(in 100 g)</th>
<th>Manufacturer</th>
</tr>
</thead>
<tbody>
<tr>
<td>GIGASEPT FF (concentrate)</td>
<td>succinic acid dialdehyde, Dimethoxytetrahydrofurane</td>
<td>11 g, 3 g</td>
<td>Schülke &amp; Mayr, Norderstedt</td>
</tr>
<tr>
<td></td>
<td>Corrosion protection agents, non-ionic tensides and perfume</td>
<td></td>
<td></td>
</tr>
<tr>
<td>neodisher MediClean forte (application concentrate)</td>
<td>non-ionic tensides, NTA (nitrilotriacetic acid), enzymes, preservative agent</td>
<td>&lt; 5 g, 5-15 g</td>
<td>Dr. Weigert, Hamburg</td>
</tr>
</tbody>
</table>

### 6.4 Recommended surface disinfectants

<table>
<thead>
<tr>
<th>Disinfectant</th>
<th>Contents</th>
<th>(in 100 g)</th>
<th>Manufacturer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green &amp; Clean SK (application concentrate)</td>
<td>alkyl-dimethyl-benzyl-ammonium chloride, dialkyl-dimethyl-ammonium chloride</td>
<td>&lt; 1 g</td>
<td>Metasys, Rum (Österreich)</td>
</tr>
<tr>
<td>Dismozon pur (application concentrate)</td>
<td>magnesium monoperoxyphthalate, hexahydrate</td>
<td>80 g</td>
<td>Bode Chemie, Hamburg</td>
</tr>
</tbody>
</table>

### 6.5 Recommended cleaning agents

<table>
<thead>
<tr>
<th>Disinfectant</th>
<th>Contents</th>
<th>(in 100 g)</th>
<th>Manufacturer</th>
</tr>
</thead>
<tbody>
<tr>
<td>neodisher MediClean forte (application concentrate)</td>
<td>non-ionic tensides, NTA (nitrilotriacetic acid), enzymes, preservative agent</td>
<td>&lt; 5 g, 5-15 g</td>
<td>Dr. Weigert, Hamburg</td>
</tr>
<tr>
<td>neodisher AN</td>
<td>Phosphate, non-ionic tensides, enzymes</td>
<td>&gt; 30 g, &lt; 5 g</td>
<td>Dr. Weigert, Hamburg</td>
</tr>
</tbody>
</table>
Please clean your ATMOS® S 351 before sending it in for servicing!

- Before putting the device into operation, visually check unit, secretion canister and power cable, accessories, connection cables and hoses for signs of damage. Damaged cables and hoses must be replaced immediately!

- Replace any damaged parts immediately.

- No other regular maintenance work is required.

A regular safety-related inspection is prescribed every 2 years. In the course of the safety-related check we recommend an inspection of the product.

Reprocessing
Handling of the suction device determines to a large extent its reliability and safety. The hygiene measures described in the previous chapters are necessary measures for the protection of patients and users, and to maintain functional reliability.

Repairs
The following may require repairs from the manufacturer or an authorized service partner. Prior to sending in the device, please contact your service partner by phone.

- Liquids have penetrated the device
- Sudden occurrence of unusual noises
- Operational and functional disorders which cannot be resolved by means of the hints described in chapter 8.0 “Trouble shooting”.

Measures to be taken prior to sending in the device:
If the device has to be sent in for repair after consultation with the manufacturer or an authorized service partner, we ask you to observe the following:

- Please send in the complete device (see scope of delivery).
- Please remove all disposable parts and consumables.
- Thorough cleaning and disinfection
- Airtight packing
- Please enclose a detailed error description.

Warranty
ATMOS cannot guarantee an error-free function nor can ATMOS be held liable for damage to people or goods if

- non-original ATMOS parts are used,
- the information in these operating instructions are disregarded,
- assembly, new installations, modifications, extensions and repairs are done by people who are not authorised by ATMOS.
This section describes how to remove functional faults. Please clean your ATMOS® S 351 before sending in for servicing.

<table>
<thead>
<tr>
<th>Fault</th>
<th>Possible cause</th>
<th>Remedies</th>
</tr>
</thead>
</table>
| Unit does not start up (indicator light in switch not illuminated) | – Mains plug not inserted properly  
– No power | – Check mains plug  
– Check mains power supply in building (fuse)  
– Check equipment fuses |
| Alarm after start up (filter monitor is displayed) | – Secretion canister full  
– Bacterial filter blocked or not completely dry  
– Drainage accessories connected | – Check safety and secretion canisters and empty, if required  
– Replace bacterial filter  
– Remove drainage accessories (thoracic drainage not possible) |
| Alarm after start up (filling level monitor is displayed) | – Secretion canister full  
– Contact element short-circuited | – Empty secretion canister  
– Remove metal connection on contact (possibly also on trolley rail!). Also check the connections for trolley fixation at the bottom of the unit. |
| Alarm during suction (filling level monitor is displayed) | – Secretion canister full  
– Heavy foaming  
– When using the trolley, contact strip may be dirty | – Empty secretion canister  
– Use anti-foaming device  
– Clean contact strip |
| No alarm when secretion canister is full | – Contact fault between secretion canister and the ATMOS® S 351 | – Check whether the secretion canister and its closure system have engaged correctly in the bracket and whether the ATMOS® S 351 has been screwed correctly to the trolley |
| Alarm during suction (filter monitor is displayed) | – Bacterial filter blocked  
– Hose connection to pump kinked | – Clean / replace filter  
– Attach hose in such way that it does not kink |
## 8.0 Trouble-shooting

<table>
<thead>
<tr>
<th>Fault</th>
<th>Possible cause</th>
<th>Remedies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alarm during suction, unit switches off</td>
<td>– Too much foam, foam bubbles close the contact between sensor and double connecting nipple</td>
<td>– Place anti-foaming device on level sensor (REF 444.0064.0)</td>
</tr>
<tr>
<td>No trolley symbol on the graphics display even though the trolley is used</td>
<td>– The connection to the trolley has been interrupted.</td>
<td>– Check the contacts between the trolley and the ATMOS® S 351.</td>
</tr>
<tr>
<td></td>
<td>– The trolley was purchased before March 2000</td>
<td>– Ask the service department to convert the trolley for operation with the ATMOS® S 351</td>
</tr>
<tr>
<td>Incorrect vacuum unity is displayed (mbar / mmHg / kPa)</td>
<td>– The vacuum unity has been set incorrectly</td>
<td>– Set the unity for the vacuum as required and as described in chapter 5.5</td>
</tr>
<tr>
<td>The graphics display is too dark / cannot be read easily</td>
<td>– The brightness of the graphics display is not correctly adjusted</td>
<td>– Set the brightness of the graphics display as required and as described in Chapter 5.3.6</td>
</tr>
<tr>
<td>Spanner displayed on graphics display</td>
<td>– An equipment fault has occurred</td>
<td>– If the display clears, the ATMOS® S 351 was able to remove the fault. However, a service engineer should check the suction unit</td>
</tr>
<tr>
<td></td>
<td></td>
<td>– Only emergency operation is possible as long as the display is shown (chapter 5.6.1). Call the service department</td>
</tr>
<tr>
<td>No vacuum or vacuum low</td>
<td>– The footswitch is connected and inheel stop</td>
<td>– Disconnect the footswitch or depress it with your toes</td>
</tr>
</tbody>
</table>
## 8.0 Trouble-shooting

<table>
<thead>
<tr>
<th>Fault</th>
<th>Possible cause</th>
<th>Remedies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flashing thermometer display in the graphics display (ATMOS® S 351 has overheated)</td>
<td>– Ventilation louvres blocked</td>
<td>– Check the ventilation louvres (bottom of unit). They must not be blocked</td>
</tr>
<tr>
<td></td>
<td>– Excessive ambient temperature</td>
<td>– Only use the ATMOS® S 351 within the temperature range stated. Try and use auto standby (less heat is generated)</td>
</tr>
<tr>
<td></td>
<td>– Fan faulty</td>
<td>– Call the service department.</td>
</tr>
<tr>
<td>Continuous thermometer display in the graphics display (ATMOS® S 351 has overheated)</td>
<td>– See ‘flashing display’</td>
<td></td>
</tr>
<tr>
<td>Only a low vacuum can be set with the footswitch.</td>
<td>– A low vacuum has been set with the buttons.</td>
<td>– Leave the unit switched on so that the fan can blow the hot air out of the unit. Wait until the display clears</td>
</tr>
<tr>
<td></td>
<td></td>
<td>– Set the nominal vacuum to a higher value (or to max.) using the button to obtain a greater control range for the footswitch</td>
</tr>
</tbody>
</table>
9.0 Spare Parts and Accessories

9.1 Spare Parts

<table>
<thead>
<tr>
<th>Description</th>
<th>REF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety canister, standard</td>
<td>000.0504.0</td>
</tr>
<tr>
<td>(without filter, without lid)</td>
<td></td>
</tr>
<tr>
<td>Safety canister, compl. with filter</td>
<td>444.0080.0</td>
</tr>
<tr>
<td>Silicone hose</td>
<td></td>
</tr>
<tr>
<td>- f. safety canister - secretion canister</td>
<td>443.0046.0</td>
</tr>
<tr>
<td>- f. connecting nipple - filter</td>
<td>320.0044.0</td>
</tr>
<tr>
<td>- f. safety canister - secretion canister (trolley)</td>
<td>444.0118.0</td>
</tr>
<tr>
<td>- f. filter - safety canister</td>
<td>999.0128.0</td>
</tr>
<tr>
<td>Double socket nipple</td>
<td>444.0012.0</td>
</tr>
<tr>
<td>Reduction piece</td>
<td>444.0013.0</td>
</tr>
<tr>
<td>Bacterial filter (normal)</td>
<td>444.0628.0</td>
</tr>
<tr>
<td>Bacterial filter for safety canister (option)</td>
<td>444.0082.0</td>
</tr>
<tr>
<td>Lid system, complete</td>
<td>444.0015.0</td>
</tr>
<tr>
<td>Lid insert</td>
<td>444.0052.1</td>
</tr>
<tr>
<td>Gasket</td>
<td>055.0070.0</td>
</tr>
<tr>
<td>Foam protection</td>
<td>444.0064.0</td>
</tr>
</tbody>
</table>

Fig. 43.

Fig. 44.
9.0 Spare Parts and Accessories

**Fig. 45. Double connecting nipple**

<table>
<thead>
<tr>
<th>Description</th>
<th>REF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Double connecting nipple, compl. ..................</td>
<td>444.0012.0</td>
</tr>
<tr>
<td>O-ring 6 mm dia. (at least 5 pcs.) ...............</td>
<td>055.0069.0</td>
</tr>
<tr>
<td>Hose reducer .......................................</td>
<td>444.0013.0</td>
</tr>
<tr>
<td>O-ring 23 mm dia. (at least 5 pcs.) ..............</td>
<td>055.0073.0</td>
</tr>
<tr>
<td>O-ring 14 mm dia. (at least 5 pcs.) ..............</td>
<td>055.0072.0</td>
</tr>
<tr>
<td>Contact spring washer ................................</td>
<td>444.0079.0</td>
</tr>
</tbody>
</table>

**Spare parts (not shown)**

- Fuse 230 V T 1 A/H .................................| 008.0471.0 |
- Fuse 115 V T 2 A/H .................................| 008.0738.0 |
- Power cord ...........................................| 008.0629.0 |

**Replacement bag for Receptal® Secretion canister set I**
- Receptal® 1.5 l suction bag without integral overflow valve filter, 50 pcs. ..........| 310.0221.1 |
- Receptal® 1.5 l suction bag with integral overflow valve filter, 50 pcs. ..........| 310.0221.2 |

**Replacement bag for Receptal® Secretion canister set II**
- Receptal® 2 l suction bag without integral overflow valve filter, 50 pcs. ..........| 443.0257.0 |
- Receptal® 2 l suction bag with integral overflow valve filter 50 pcs. ..........| 443.0257.2 |

**Replacement bag for Receptal® Secretion canister set III**
- Receptal® 3 l suction bag without integral overflow valve filter, 50 pcs. ..........| 443.0153.0 |
- Receptal® 3 l suction bag with integral overflow valve filter, 50 pcs. ..........| 443.0154.0 |

- Cannula sleeves for instrument deposit ..........| 443.0017.0 |

**Spare parts for safety canister**

- Safety canister complete with filter ...............| 444.0080.0 |
- Safety canister (glass) ................................| 000.0504.0 |
- Gasket for safety canister, O-ring .................| 055.0071.0 |
- Gasket for lid of safety canister ..................| 055.0088.0 |
- Bacterial filter for safety canister ................| 444.0082.0 |
## 9.2 Accessories

### 9.2.1 Canisters and hoses

<table>
<thead>
<tr>
<th>Description</th>
<th>REF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Secretion canister, glass, with graduation 1.5 l</td>
<td>444.0032.0</td>
</tr>
<tr>
<td>Secretion canister, glass, with graduation 3 l</td>
<td>444.0033.0</td>
</tr>
<tr>
<td>Secretion canister, glass, with graduation 5 l</td>
<td>444.0034.0</td>
</tr>
<tr>
<td>Secretion canister, polysulfone, 1.5 l</td>
<td>444.0036.0</td>
</tr>
<tr>
<td>Secretion canister, polysulfone, 3 l</td>
<td>444.0037.0</td>
</tr>
<tr>
<td>Secretion canister, polysulfone, 5 l</td>
<td>444.0038.0</td>
</tr>
<tr>
<td>Canister lid</td>
<td>444.0015.0</td>
</tr>
<tr>
<td>Double socket nipple for canister lid (incl. distal hose reduction Ø 10 mm / Ø 6 mm)</td>
<td>444.0012.0</td>
</tr>
<tr>
<td>Safety canister complete, incl. large-size filter</td>
<td>444.0080.0</td>
</tr>
<tr>
<td>Large-size filter for safety canister, hydrophobic</td>
<td>444.0082.0</td>
</tr>
<tr>
<td>Inline bacterial filter (connections hose/hose or hose/vacuum attachment)</td>
<td>443.0738.0</td>
</tr>
<tr>
<td>Disposable suction system Receptal® set I with holder and 2 collection containers 1.5 l</td>
<td>444.0022.0</td>
</tr>
<tr>
<td>Spare suction bags Receptal® 1.5 l with integral overflow valve filter (50 pcs.)</td>
<td>310.0222.2</td>
</tr>
<tr>
<td>Receptal® replacement suction bag 1.5 l without integral overflow valve filter (50 pcs.) for tandem hose connection</td>
<td>310.0222.1</td>
</tr>
<tr>
<td>Disposable suction system Receptal®–canister set II with holder and 2 collection containers 2.0 l</td>
<td>444.0023.0</td>
</tr>
<tr>
<td>Spare suction bags Receptal® 2 l with integrated overflow valve filter (50 pcs.)</td>
<td>443.0257.2</td>
</tr>
<tr>
<td>Spare suction bags Receptal® 2 l without integrated overflow valve filter (50 pcs.) for tandem hose connection</td>
<td>443.0257.0</td>
</tr>
<tr>
<td>Disposable suction system Receptal®–canister set III with holder and 2 collection containers 3.0 l</td>
<td>444.0024.0</td>
</tr>
<tr>
<td>Spare suction bags Receptal® 3 l with integrated overflow valve filter (50 pcs.)</td>
<td>444.0154.0</td>
</tr>
<tr>
<td>Spare suction bags Receptal® 3 l without integrated overflow valve filter (50 pcs.)</td>
<td>444.0153.0</td>
</tr>
<tr>
<td>Standard rail holder for Medi-Vac® disposable system</td>
<td>444.0451.0</td>
</tr>
<tr>
<td>External 1 l Medi-Vac® canister</td>
<td>312.0473.0</td>
</tr>
<tr>
<td>1 l Medi-Vac® bag (50 pcs.)</td>
<td>312.0474.0</td>
</tr>
<tr>
<td>Suction hose, silicone, 10 mm dia., 2 m long</td>
<td>000.0243.0</td>
</tr>
<tr>
<td>Suction hose, silicone, 6 mm dia., 2 m long</td>
<td>000.0361.0</td>
</tr>
<tr>
<td>Suction hose, silicone, 6 mm dia., 1.3 m long</td>
<td>000.0013.0</td>
</tr>
</tbody>
</table>
9.2.2 Accessories to simplify handling

<table>
<thead>
<tr>
<th>Description</th>
<th>REF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hose bracket, for attachment on unit or trolley</td>
<td>444.0450.0</td>
</tr>
<tr>
<td>Trolley with antistatic castors (for surgery)</td>
<td>444.0020.0</td>
</tr>
<tr>
<td>Trolley (for obstetrics); kit (does not provide electronic overflow monitor facility)</td>
<td>320.0070.0</td>
</tr>
<tr>
<td>Foot regulator, electronic, waterproof IP X8, AP protected</td>
<td>444.0452.0</td>
</tr>
<tr>
<td>Catheter basket for flexible catheters, attached to trolley</td>
<td>444.0140.0</td>
</tr>
<tr>
<td>Catheter holder, with standard rail bracket for attachment to unit and trolley; transparent plastic, resistant to disinfectants; internal dia. 82 mm; L = 400 mm</td>
<td>443.0780.0</td>
</tr>
<tr>
<td>Handle quiver, small; small; incl. standard rail holder</td>
<td>444.0145.0</td>
</tr>
</tbody>
</table>

9.2.3 Accessories for General Surgery, Anaesthesia, Intensive

<table>
<thead>
<tr>
<th>Description</th>
<th>REF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yankau OT suction cannula L = 270 mm</td>
<td>401.0610.0</td>
</tr>
<tr>
<td>Yankau OT suction cannula, L = 250 mm (disposable, sterile), 50 pcs.</td>
<td>401.0611.0</td>
</tr>
<tr>
<td>Poole OT suction cannula</td>
<td>401.0608.0</td>
</tr>
<tr>
<td>Poole OT suction cannula L = 280 mm (disposable, sterile), 50 pcs.</td>
<td>401.0609.0</td>
</tr>
<tr>
<td>Suction catheter, flexible CH12, L = 50 cm (disposable) sterile</td>
<td>000.0294.0 (100pcs.)</td>
</tr>
<tr>
<td>Suction catheter, flexible CH14, L = 50 cm (disposable) sterile</td>
<td>000.0295.0 (100pcs.)</td>
</tr>
<tr>
<td>Suction catheter, flexible CH16, L = 50 cm (disposable) sterile</td>
<td>000.0296.0 (100pcs.)</td>
</tr>
<tr>
<td>Hose connector (finger tip) for suction catheter</td>
<td>000.0347.0 (10pcs.)</td>
</tr>
<tr>
<td>Hose connector (finger tip) same as 000.0347.0, but sterile</td>
<td>000.0347.1 (100pcs.)</td>
</tr>
</tbody>
</table>
9.0  Spare Parts and Accessories

9.2.4  Cannulae, Cardiovascular/Thoracic Surgery

<table>
<thead>
<tr>
<th>Description</th>
<th>REF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cooley OP suction cannula L = 350 mm¹</td>
<td>401.0612.0</td>
</tr>
</tbody>
</table>

9.2.5  Cannulae, ENT

<table>
<thead>
<tr>
<th>Description</th>
<th>REF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frazier ENT cannula 8 CH¹</td>
<td>401.0606.0</td>
</tr>
<tr>
<td>Frazier ENT cannula 10 CH¹</td>
<td>401.0607.0</td>
</tr>
</tbody>
</table>

¹with suction interruption opening

9.2.6  Aesthetic / Plastic Surgery

*See separate brochure!*
# 10.0 Technical specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air flow rate</td>
<td>36 ± 2 l/min.</td>
</tr>
<tr>
<td>Max. vacuum</td>
<td>-90 kPa**</td>
</tr>
<tr>
<td>Vacuum readout</td>
<td>Digital numeric, resolution 10 mbar / 10 mmHg / 1 kPa and quasi analog via bar graph; accuracy ± 2%</td>
</tr>
<tr>
<td>Auxiliary air control</td>
<td>Electronically controlled magnetic valve</td>
</tr>
<tr>
<td>Fine- suction</td>
<td>Up to -0.3 bar (can be set between -0.2 bis -0.5 bar by service engineer)</td>
</tr>
<tr>
<td>Secretion canisters</td>
<td>1.5 l / 3 l / 5 l glass or polysulfone or 1.5 l / 2 l / 3 l Receptal® secretion canister, bracket for Medi-Vac available</td>
</tr>
<tr>
<td>Suction hoses</td>
<td>6 mm dia., 1.30 m long; 10 mm dia., 2 m long</td>
</tr>
<tr>
<td>Voltage</td>
<td>230 V ~ 50/60 Hz</td>
</tr>
<tr>
<td>Current consumption (max.)</td>
<td>0.6 A</td>
</tr>
<tr>
<td>Power consumption</td>
<td>Max. 135 W</td>
</tr>
<tr>
<td>Mains cable</td>
<td>5 m</td>
</tr>
<tr>
<td>Operating period</td>
<td>Continuous operation</td>
</tr>
<tr>
<td>Fuse</td>
<td>T 1.0</td>
</tr>
<tr>
<td>Interface</td>
<td>Foot switch</td>
</tr>
<tr>
<td>Protective earth conductor resistance</td>
<td>&lt; 0.1 Ω</td>
</tr>
<tr>
<td>Earth leakage current</td>
<td>&lt; 500 µA NC</td>
</tr>
<tr>
<td>Casing leakage current</td>
<td>&lt; 100 µA</td>
</tr>
<tr>
<td>Patient leakage current</td>
<td>&lt; 10 µA</td>
</tr>
<tr>
<td>Heat emission</td>
<td>135 J/s</td>
</tr>
<tr>
<td>Noise level</td>
<td>43.9 dB (A) @ 1m (as per ISO 7779)</td>
</tr>
<tr>
<td>Ambient conditions Transport/storage</td>
<td>-10 to +60°C; 30 to 95 % humidity, non-condensing at a pressure of 700...1060 hPa</td>
</tr>
<tr>
<td>Operation</td>
<td>+10 to +40°C; 30 to 95 % humidity, non-condensing at a pressure of 700...1060 hPa</td>
</tr>
<tr>
<td>Dimensions H x W x D</td>
<td>300 x 330 x 200 mm, without trolley; 840 x 490 x 520, with trolley</td>
</tr>
<tr>
<td>Weight</td>
<td>10.2 kg, without secretion canister, without trolley; with trolley 24.7 kg</td>
</tr>
<tr>
<td>Protection class (EN 60601-1)</td>
<td>I</td>
</tr>
<tr>
<td>Applied Part</td>
<td>Type B</td>
</tr>
<tr>
<td>Degree of protection</td>
<td>IPX 0</td>
</tr>
<tr>
<td>Classification as per Appendix IX of EC Directive 93/42/EEC</td>
<td>IIa</td>
</tr>
<tr>
<td>CE Mark</td>
<td>CE 0124</td>
</tr>
<tr>
<td>UMDNS Code</td>
<td>10-217</td>
</tr>
<tr>
<td>Article-No. (basic unit without accessories)</td>
<td>444.0405.0</td>
</tr>
</tbody>
</table>
10.0 Technical specifications

All values are quoted with a tolerance of ± 5 %, unless separately specified.

* NN = 1013 mbar ambient pressure
** 1 bar = 750,06 mm Hg = 1000 hPa / dependent on daily air pressure

Canadian Classification

<table>
<thead>
<tr>
<th>Device Group</th>
<th>General &amp; Plastic Surgery</th>
</tr>
</thead>
<tbody>
<tr>
<td>PNC</td>
<td>79QBU</td>
</tr>
<tr>
<td>Risk Class</td>
<td>2</td>
</tr>
<tr>
<td>Description</td>
<td>ASPIRATOR, SURGICAL</td>
</tr>
</tbody>
</table>

Issue of Technical Specifications: 18.07.2017
11.0 Disposal

- Pay attention to country-specific regulations for disposal (e.g. waste incineration).
- Device and accessories must be decontaminated prior to disposal as secretion residuals could lead to danger of a third party.
- The materials must be separated carefully.
- The materials of the housing can be recycled completely.

Disposal within the EU

The suction device described above is a high-quality medical product with a long service life. After its life cycle it must be disposed of professionally. According to the EU directives (WEEE and RoHS) the device may not be disposed in domestic waste. Please observe existing national laws and rules for disposal of old devices.

Disposal within the Federal Republic of Germany

In the Federal Republic of Germany the law for electrical devices (ElektroG) rules the disposal of electrical devices. It must be assumed that those suction devices could be contaminated. Therefore, this type of device is excluded from the law for electrical devices. In order to guarantee a proper disposal of your old device, please either pass on your old device to your specialised dealer or send it directly to ATMOS MedizinTechnik GmbH & Co. KG for a professional disposal. Prior to disposal respectively before transport all secretion canisters and tubes must be removed. The device surface must be disinfected.
12.0 Notes on EMC

- Medical electrical equipment is subject to special precautions with regard to EMC and must be installed acc. to following EMC notes.
- Portable and mobile HF communication facilities can influence medical electrical equipment.
- The use of other accessories, other converters and cables than stated may lead to an increased emission or a reduced interference immunity of the equipment or system.

12.1 Guidelines and Manufacturer’s Declaration - Emissions

The ATMOS® S 351 is intended for use in the electromagnetic environment specified below. The customer or user of the ATMOS® S 351 should ensure that it is used in such an environment.

<table>
<thead>
<tr>
<th>Emissions Test</th>
<th>Compliance</th>
<th>Electromagnetic Environment - Guidance</th>
</tr>
</thead>
<tbody>
<tr>
<td>RF Emissions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CISPR 11</td>
<td>Group 1</td>
<td>The ATMOS® S 351 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.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RF Emissions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CISPR 11</td>
<td>Class B</td>
<td>The ATMOS® S 351 is suitable for use in all establishments, including domestic, and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.</td>
</tr>
<tr>
<td>Harmonics IEC 61000-3-2</td>
<td>Class B</td>
<td></td>
</tr>
<tr>
<td>Flicker IEC 61000-3-3</td>
<td>Is conform</td>
<td></td>
</tr>
</tbody>
</table>

The device may not be used directly next to other devices or piled up with other devices. If operation next to or piled with other devices is necessary, please watch the device to check its intended operation in this arrangement.

12.2 Guidelines and Manufacturer’s Declaration - Immunity

The ATMOS® S 351 is intended for use in the electromagnetic environment specified below. The customer or user of the ATMOS® S 351 should ensure that it is used in such an environment.

<table>
<thead>
<tr>
<th>Immunity Test</th>
<th>IEC 60601-Test Level</th>
<th>Compliance Level</th>
<th>Electromagnetic Environment - Guidance</th>
</tr>
</thead>
<tbody>
<tr>
<td>ESD IEC 61000-4-2</td>
<td>± 6 kV Contact</td>
<td>± 6 kV Contact</td>
<td>Floors should be wood, concrete, or ceramic tile. If floors are synthetic, the relative humidity should be at least 30%.</td>
</tr>
<tr>
<td></td>
<td>± 8 kV Air</td>
<td>± 8 kV Air</td>
<td></td>
</tr>
<tr>
<td>EFT IEC 61000-4-4</td>
<td>± 2 kV Mains</td>
<td>± 2 kV Mains</td>
<td>Mains power quality should be that of a typical commercial or hospital environment.</td>
</tr>
<tr>
<td></td>
<td>± 1 kV I/Os</td>
<td>Inapplicable</td>
<td></td>
</tr>
<tr>
<td>Surges IEC 61000-4-5</td>
<td>± 1 kV Differential</td>
<td>± 2 kV Differential</td>
<td>Mains power quality should be that of a typical commercial or hospital environment.</td>
</tr>
<tr>
<td></td>
<td>± 1 kV Common</td>
<td>± 1 kV Common</td>
<td></td>
</tr>
<tr>
<td>Power Frequency</td>
<td>3 A/m</td>
<td>Inapplicable</td>
<td>Power frequency magnetic fields should be that of a typical commercial or hospital environment.</td>
</tr>
<tr>
<td>50/60 Hz Magnetic field IEC 61000-4-8</td>
<td>3 A/m</td>
<td>Inapplicable</td>
<td>Power frequency magnetic fields should be that of a typical commercial or hospital environment.</td>
</tr>
</tbody>
</table>
### 12.3 Guidelines and Manufacturer’s Declaration - Immunity

The ATMOS® S 351 is intended for use in the electromagnetic environment specified below. The customer or user of the ATMOS® S 351 should ensure that it is used in such an environment.

<table>
<thead>
<tr>
<th>Immunity Test</th>
<th>IEC 60601-Test Level</th>
<th>Compliance Level</th>
<th>Electromagnetic Environment - Guidance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage Dips / Dropout</td>
<td>IEC 61000-4-11</td>
<td>&lt; 5 % (U_r) (&lt; 95 % Dip of the (U_r)) for 0.5 Cycles</td>
<td>&lt; 5 % (U_r) (&lt; 95 % Dip of the (U_r)) for 0.5 Cycles</td>
</tr>
<tr>
<td></td>
<td></td>
<td>40 % (U_r) (60% Dip of the (U_r)) for 5 Cycles</td>
<td>40 % (U_r) (60% Dip of the (U_r)) for 5 Cycles</td>
</tr>
<tr>
<td></td>
<td></td>
<td>70 % (U_r) (30 % Dip of the (U_r)) for 25 Cycles</td>
<td>70 % (U_r) (30 % Dip of the (U_r)) for 25 Cycles</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&lt; 5 % (U_r) (&gt;95 % Dip of the (U_r)) for 5 sec</td>
<td>&lt; 5 % (U_r) (&gt;95 % Dip of the (U_r)) for 5 sec</td>
</tr>
</tbody>
</table>

**NOTE** \(U_r\) is the mains alternating current prior to application of the test levels.

**12.3 Guidelines and Manufacturer’s Declaration - Immunity**

The ATMOS® S 351 is intended for use in the electromagnetic environment specified below. The customer or user of the ATMOS® S 351 should ensure that it is used in such an environment.

<table>
<thead>
<tr>
<th>Immunity Test</th>
<th>IEC 60601-Test Level</th>
<th>Compliance Level</th>
<th>Electromagnetic Environment - Guidance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conducted RF</td>
<td>IEC 61000-4-6</td>
<td>3 (V_{eff}) 150 kHz to 80 MHz</td>
<td>3 V</td>
</tr>
<tr>
<td>Radiated RF</td>
<td>IEC 61000-4-3</td>
<td>3 V/m 80 MHz to 2.5 GHz</td>
<td>3 V/m</td>
</tr>
</tbody>
</table>

**Recommended distances:**

\[
d = (3.5 / V1) * \sqrt{P}
\]

\[
d = (3.5 / E1) * \sqrt{P}
\quad 80-800 MHz
\]

\[
d = (7 / E1) * \sqrt{P}
\quad 0.8-2.5 GHz
\]

where \(P\) is the max. power in watts (W) and \(D\) is the recommended separation distance in meters (m).

Field strengths from fixed transmitters, as determined by an electromagnetic site (a) survey, should be less than the compliance level (b). Interference may occur in the vicinity of equipment containing following symbol.
12.4 Recommended separations between portable and mobile RF communications equipment and the ATMOS® S 351

The ATMOS® S 351 is intended for use in electromagnetic environment in which radiated disturbances are controlled. The customer or user of the ATMOS® S 351 can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment and the ATMOS® S 351 as stated below, according to the maximum output power of the communications equipment.

<table>
<thead>
<tr>
<th>Nominal output of the transmitter</th>
<th>Separation distance, depending on transmit-frequency m</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>150 kHz bis 80 MHz</td>
</tr>
<tr>
<td>0.01</td>
<td>0.12</td>
</tr>
<tr>
<td>0.1</td>
<td>0.37</td>
</tr>
<tr>
<td>1</td>
<td>1.2</td>
</tr>
<tr>
<td>10</td>
<td>3.69</td>
</tr>
<tr>
<td>100</td>
<td>11.66</td>
</tr>
</tbody>
</table>

For transmitters for which the maximum nominal output is not indicated in the above table, the recommended separation distance \( d \) in meters (m) can be determined using the equation belonging to the respective column whereas \( P \) is the maximum nominal output of the transmitter in watts (W) acc. to manufacturer’s specification.

**NOTE 1** With 80 MHz and 800 MHz the higher frequency range applies.

**NOTE 2** These guidelines are not applicable in any case. The propagation of electromagnetic sizes is influenced by absorptions and reflections of buildings, objects and people.
We do not take over any warranty and liability in the case of missing inscriptions. Subject to modifications and amendments.

2. Proposal - Order Confirmation

Our proposals are subject to change without notice unless otherwise stated in our order confirmation. Each order is only accepted by us following our written order confirmation.

3. Orders

Every order requires an exact description of all of our product’s details. We assume no liability for errors and damage caused by inaccurate or incomplete ordering details.

4. Prices

Unless otherwise stated in the order confirmation, our prices in the order confirmation are ex factory prices and exclude packaging and value added tax. Packaging is charged separately at cost price in the invoice. Value added tax is charged separately in the invoice according to the legal rate on the invoice date. We reserve the right to change prices appropriately should price reductions or increases, especially due to changes in exchange rates, changes in the price of materials or currency fluctuations, be incurred. Proof of such changes will be provided for the client on request.

5. Payment Conditions - Balancing

Unless otherwise stated in the order confirmation, our invoices are payable with a 3% discount within 10 days (except for repair and assembly services) or within 21 days from the invoice date net cash; money receipts are decisive for complying with this term. We are entitled to charge interest after the due date at a rate 2% above the relevant basic interest rate of the German Federal Bank. Should the client have payment arrears, we are entitled to charge interest on arrears at a rate 5% above the relevant basic interest rate of the German Federal Bank. Should we be able to prove higher damages due to arrears, we are also entitled to claim these. The client only has the right to balance invoices against its own claims should such claims be confirmed in a court of law or recognised by us. The client does not have the right of retention due to disputed counterclaims.

6. Delivery Periods

Fulfillment of our delivery duties requires the punctual and proper fulfilling of the client’s duties. The right to defense on the grounds of an unfulfilled contract is reserved. Should the client default in accepting the goods or breach other cooperation duties, we are entitled either to withdraw from the contract or claim compensation for any increased costs incurred up to that time without setting a further deadline. The right to make further claims is reserved. Furthermore, in such cases, the risk of co-insidental destruction or a coincidental deterioration in the quality of the delivered goods is transferred to the client in the case of default in accepting such goods or payment arrears. Acts of God or stoppages (due to insufficient supplies of material, industrial disputes etc.) entitle us either to demand an appropriate extension of delivery periods or to partly or entirely dissolve the delivery contract. This does not give the client the right to claim damages. We have fulfilled delivery periods if the delivery goods have left our factory or the client has been informed of the goods' readiness for delivery within such delivery periods. Delivery periods stipulated by the client are not recognised by us unless they form part of our order confirmation. We adhere to legal terms and conditions in the case of delivery delays for the delivery for which we are liable, the client is entitled to claim that his interests in a continued fulfillment of the contract have ceased. We also adhere to legal terms and conditions should a delay in delivery be caused by deliberate or grossly negligent action by us or our representatives for which we are responsible. We are also responsible for such actions by our representatives or agents. Should the delivery delay not be caused by our deliberate infringement of contractual duties for which we are responsible, our liability is limited to damage which is regarded as typical for that case. We are liable according to the legal terms and conditions if and in so far as the delivery delay for which we are responsible is caused by an infringement of a substantial contractual duty. In such cases, our liability is also limited to damage which is regarded as typical for that case. Should the delivery delay be caused by a culpable infringement of non-substantial contractual duties, our client is also entitled to claim a one-off damage compensation worth 3 percentage points of the delivery value of the goods for each week's delay, up to a maximum which is no higher than 15 percentage points of the delivery value of the goods

7. Delivery - Familiarisation

In the case of the delivery of devices for the medico-technical industry which require assembly and/or familiarisation for the final customer using specialist trade personnel (such as Ear, Nose and Throat Apparatus and Suction Units), we reserve the right to deliver the goods exclusively to the relevant specialist traders. Should the trader not carry out assembly and/or familiarisation for the final customer, this is carried out by us. In such cases, we reserve the right to charge the client for the additionally created costs. Our specialist traders operate a recording system so that, if necessary, our products can be traced to the final customer. The specialist trader undertakes to immediately report to us at all events and risks which must be reported in connection with our products.

8. Passage of Risk - Packaging

Unless otherwise stated in our order confirmation, delivery is agreed ex factory. The risk of the goods' damage or loss is therefore transferred to the client as soon as the goods leave the factory or the client is in default of acceptance of the goods. This also applies to cases where we confirm prepaid carriage. Transport packaging and all other packaging according to the packaging regulations is not returnable. Our client is responsible for the disposal of the packaging at its own cost. Our deliveries are insured by us at the client’s expense unless explicitly otherwise agreed. No insurance is arranged in the case of goods which are collected by our clients. In the case of transport damage, claims are only handen if the client receives confirmation of any damage, reduced weight or loss by the shipping company before accepting the delivery.

9. Warranty

The client is responsible for examining the delivered goods immediately after receiving them to determine any eventual deficiencies or delivery errors, and to report these immediately. Should the client fulfill this examination and reporting responsibility, and should payment conditions be fulfilled, we shall be liable to the client within the scope of legal regulations. Our period of warranty shall in all cases be two years. Our client can make use of the warranty as follows, so long as he can provide first buyer proof (in the form of an invoice or delivery note) and provided that the product still has the original, unchanged serial number

a. We choose whether to fulfill our guarantee by providing repair services free of charge - either on the client's premises or in our factory - or replacing the product. We can also provide these guarantee services through an authorized company; 

b. Should a product be returned to us, the client agrees to send the product in its original or similar packaging, offering the same protection as the original packaging, to our address or any address notified by us.

c. Our guarantee ceases to apply if changes of any kind have been made to our product, unless such changes have been made by us or a company authorised by us, or have been previously agreed upon in writing by us. Our guarantee ceases to apply if third parties have carried out repairs to our products or replaced parts thereof. This applies regardless of the fact whether these measures individually or collectively led to a deficiency of the product;

d. We accept no responsibility for damage caused by - operational wear and tear; - incorrect installation or incorrect or insufficient maintenance; - incorrect operation of the product (in contradiction to the operating instructions delivered with the product); - improper use or operating faults; - inappropriate or negligent handling and care, especially with respect to storage, dirt, dust, soil of fluids, improper cleaning and sterilisation; - using accessories and/or replacement parts which are not explicitly approved;

- incorrect assembly and/or initial operation by the client or third parties; - the client's negligence in handling the product; - unacceptable operating conditions, such as humidity, temperature, the power supply, vibrations.

- accidents, acts of God, especially lightening, water, fire, public unrest and similar catastrophes; - faults caused by disposal of the product to other objects apart  from our product itself, except in the case of any deliberate or grossly negligent actions by us or our representatives or agents. Should no deliberate breach of contract be claimed, our liability is limited to damage which is regarded as typical for that case. This also applies in the case of our culpable infringement of substantial contractual duties. The indispensable conditions of German Liability Law remain unaffected thereby. - For second-hand equipment, the period of warranty shall be reduced to a period of twelve months.

10. Reservation of Ownership

We retain ownership of our goods until the receipt of all payments arising from the business relationship, including all demands arising from installation orders, subsequent orders, repairs, accessory deliveries and replacement orders. Should we have agreed upon payment on the basis of cheque and bill transactions, the ownership reservation applies until the cheque received by us has been paid, and does not expire through our credit upon receiving the client's cheque. In the case of a breach of contract by the client, especially payment arrears, we are entitled to repossess our goods. Repossession of our goods repre-sents a withdrawal from the contract, unless explicitly declared in writing by us. We have the right to utilise the product after its repossession, whilst the income form such use is balanced against the client's arrears, after deducting appropriate utilisation costs.

The client is responsible for handling the goods with care. Should maintenance and inspection work be necessary, the client must carry these out punctually at his own cost. Our client is entitled to sell the goods he has bought from us in a proper sale transaction. However, he must immediately assign all outstanding claims to the value of the final invoice sum (including value added tax) of our claims to his customers or third parties. The client is entitled to collect this claim even after such assignment. Our right to collect the claim ourselves remains unaffected thereby. We undertake to release the securities to which we are entitled if requested to do so by the client should the realisable value of our securities be more than 10 percentage points higher than the outstanding claims. We reserve the right to choose the securities to be released.

11. Plans and Illustrations

We retain ownership of and copyrights to all plans, illustrations, calculations and other documents which are attached to our proposals. The client must receive explicit written permission before passing these on to third parties. Initiating our legally patented products is forbidden and will be prosecuted.

12. Jurisdiction and Place of Performance

Our central office is the place of performance for all disputes in connection with these General Standard Terms and Conditions and the contracts closed with clients under them. This jurisdiction excludes other jurisdiction relating to persons or subject-matter. Furthermore, our client is not entitled to bring charges against us in another court should he file counter-charges, carry out counterbalancing or declare retention. We, however, are entitled to bring charges against our client at their general place of jurisdiction or at another relevant court recognised by German or foreign law. Unless otherwise stated in the order confirmation, our central office is the place of performance.

Lenzkirch, September 2008

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