Service and Repair Instructions

VENTImotion
Bilevel-ST Home Ventilation Unit
WM 24800

VENTIlogic
Bilevel-ST Home Ventilation Unit
WM 27000

WEINMANN
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Introduction

The objective of this service and repair guide is to familiarize you, an expert, trained specialist, with the VENTImotion and VENTIlogic in terms of function, technology, servicing and repair. This will enable you to train your customers properly, eliminate faults yourself, perform the function checks specified by the operating instructions and carry out any repairs in accordance with this service and repair guide.

In the event of a claim under warranty, return the devices to Weinmann.

To allow warranty or goodwill applications to be processed, please also send the final customer’s proof of purchase (invoice).

Repairs may be performed only by Weinmann or by expert, trained specialists.

You are responsible for repairs carried out yourself and for their warranty!

Use only original Weinmann spare parts for repair.

Remember: your customer trusts you and is relying on your ability to do the job, just as you rely on Weinmann.

Note

The following information can be found in the operating instructions for the devices:

- safety rules
- setting up device
- operation
- cleaning and disinfecting in use
- warranty
1. Overview

VENTI-motion/VENTI-logic

1. Bacteria filter
2. Power supply cable
3. Handle
4. Serial interfaces
5. Control panel and displays
6. Connection for humidifier
7. Device outlet
8. Sealing plugs (2x)
9. Drying adapter
10. Adapter
11. Pressure measurement hose
12. Hose system
13. Exhalation system
14. Mask
15. Headgear
16. Filter compartment cover, air inlet
17. Supply connection
18. Cable securing clip
19. Connection for rechargeable battery VENTI-power
20. Connection for O₂-supply valve VENTI-O₂
21. Alarm acknowledgement key with LED
22. On/off key
23. Dial
24. Operating keys
25. Menu key
26. Humidifier key with LED
27. Softstart key/manual start of analysis (VENTI-logic only)
28. VENTI-power
29. Rating plate
30. VENTI-click
31. Carrying bag
32. VENTI-O₂

4. Overview
1 Bacteria filter
To protect the device from contamination, especially if the device is being used by several patients.

2 Power supply cable
For connecting the therapy device to the mains power supply.

3 Handle
For transporting the device.

4 Serial interfaces
For connecting to devices, for display, evaluation.

5 Control panel and displays
For controlling and monitoring the therapy device and the connected accessories.

6 Connection for humidifier
For connecting the VENTIclick humidifier available as an accessory.

7 Device outlet
Respiratory air flows out from here to the patient via the hose system and nasal mask.

8 Sealing plugs (2x)
For sealing the pressure measurement hose during cleaning.

9 Drying adapter
Required to dry the hose system with the therapy device and for function check.

10 Adapter
For connecting the hose system to the device outlet.

11 Pressure measurement hose
For measuring the pressure prevailing in the mask.

12 Hose system
The air flows to the mask through the hose system. The hose system consists of creased hose, pressure measurement hose and adapter.

13 Exhalation system
Carbondioxide-enriched expired air escapes here during therapy.

14 Mask
Respiratory air at the necessary therapy pressure is administered to the patient via the mask.

15 Headgear
For correct and secure positioning of the mask.

16 Filter compartment cover, air inlet
For covering and securely positioning the coarse and fine dust filter.

17 Supply connection
This is where the power supply cable is attached to the device.

18 Cable securing clip
Prevents the device being disconnected from the power supply inadvertently.

19 Connection for rechargeable battery VENTIpower
For connecting the VENTIpower mobile power supply available as an accessory.

20 Connection for O₂ supply valve VENTI-O₂
For connecting the VENTI-O₂ oxygen supply valve available as an accessory.

21 Alarm acknowledgement key with LED
The alarm acknowledgement key is for temporarily muting alarms. The LED provides a visual display of alarms.

22 On/off key
For switching the therapy device on and off.

23 Dial
Central control of the therapy device, for navigating in the menu.
<table>
<thead>
<tr>
<th>Operating keys</th>
<th>For rapid setting by a physician, disabled in patient mode.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Menu key</td>
<td>For switching to and fro between the standard display and the menu.</td>
</tr>
<tr>
<td>Humidifier key with LED</td>
<td>For switching the humidifier on and off or for setting humidifier stage. Six levels are available. The LED indicates whether the humidifier is activated.</td>
</tr>
<tr>
<td>Softstart key/manual start of analysis (VENTIlogic only)</td>
<td>For activating Softstart and for setting Softstart time up to the maximum Softstart time set in the menu. In TA mode (VENTIlogic only), this key is used to start an analysis phase manually.</td>
</tr>
<tr>
<td>VENTIpower</td>
<td>Available as an accessory to provide a mobile power source for the therapy device.</td>
</tr>
<tr>
<td>Rating plate</td>
<td>Provides information about the device, such as serial number and year of manufacture.</td>
</tr>
<tr>
<td>VENTIclick</td>
<td>Available as an accessory for humidifying and heating respiratory air.</td>
</tr>
<tr>
<td>Carrying bag</td>
<td>For transporting the therapy device.</td>
</tr>
<tr>
<td>VENTI-O₂</td>
<td>Available as an accessory, for introducing oxygen to the mask.</td>
</tr>
<tr>
<td>Service label</td>
<td>Indicates when maintenance is next due.</td>
</tr>
<tr>
<td>Safety test label (in Germany only)</td>
<td>Indicates when the next safety check in accordance with §6 of the German law relating to owners of medical devices [MedizinprodukteBetreiberverordnung] is due.</td>
</tr>
</tbody>
</table>

**Standard display during therapy**

<table>
<thead>
<tr>
<th>1 Status line</th>
<th>This is where information about the status of the device is displayed, such as filter change or maintenance due.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 Padlock symbol</td>
<td>Indicates whether physician functions are enabled (padlock open) or disabled (padlock closed). The padlock is not displayed in patient mode.</td>
</tr>
<tr>
<td>3 Respiratory phase switch indicator</td>
<td>Indicates whether the current respiratory phase switch is spontaneous or mandatory (spontaneous: S, mandatory: T); the indicator switches from left (inspiration) to right (exhalation) depending on respiratory phase; spontaneous expiration is shown here.</td>
</tr>
<tr>
<td>4 Access to menu</td>
<td>The key next to this menu item is used to switch to and fro between the menu and the standard display.</td>
</tr>
</tbody>
</table>
5 Bar chart for pressure indicator
For graphical display of pressure.

6 Ventilation parameters
The relevant current ventilation parameters are displayed depending on the active mode.

7 Active ventilation mode
The active ventilation mode is displayed at this point in the status line.

Symbols used in the display

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Status line:</td>
<td></td>
</tr>
<tr>
<td>🟢ACTIVE</td>
<td>Softstart active, remaining time faded in</td>
</tr>
<tr>
<td>🥈CHGFILTER</td>
<td>Filter change required</td>
</tr>
<tr>
<td>🠋CHGUNIT</td>
<td>Maintenance required</td>
</tr>
<tr>
<td>🟢ALARM sound</td>
<td>Acoustic signal for the IP/EP/min and V/min alarms mute</td>
</tr>
<tr>
<td>🆕ALARM</td>
<td>Alarm for IP/EP/min and V/min alarms deactivated</td>
</tr>
<tr>
<td>🔖FIBRT</td>
<td>Physician functions enabled</td>
</tr>
<tr>
<td>🔒FIBRT LOCK</td>
<td>Physician functions disabled</td>
</tr>
<tr>
<td>🔞FIBRT OFF</td>
<td>Fan off (with VENTImotion, only available from software version 6.0)</td>
</tr>
<tr>
<td>Main window</td>
<td></td>
</tr>
<tr>
<td>⚠️</td>
<td>Low-priority alarm triggered</td>
</tr>
<tr>
<td>🚨</td>
<td>Medium-priority alarm triggered</td>
</tr>
</tbody>
</table>

Abbreviations used in the display

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Status line:</td>
<td></td>
</tr>
<tr>
<td>TA</td>
<td>TA mode active (VENTIlogic only)</td>
</tr>
<tr>
<td>S</td>
<td>S mode active</td>
</tr>
<tr>
<td>ST</td>
<td>ST mode active</td>
</tr>
<tr>
<td>M</td>
<td>T mode active</td>
</tr>
<tr>
<td>SX</td>
<td>SX mode active</td>
</tr>
<tr>
<td>SXX</td>
<td>SXX mode active</td>
</tr>
<tr>
<td>CPAP</td>
<td>CPAP mode active</td>
</tr>
<tr>
<td>+v</td>
<td>Volume compensation activated (follows mode: e.g. SXX 7)</td>
</tr>
<tr>
<td>Aa</td>
<td>Device in TA mode, automatic analysis phase in progress (VENTIlogic only)</td>
</tr>
<tr>
<td>Am</td>
<td>Device in TA mode, manual analysis phase in progress (VENTIlogic only)</td>
</tr>
<tr>
<td>Main window (monitor)</td>
<td></td>
</tr>
<tr>
<td>IPAP</td>
<td>Inspiration pressure</td>
</tr>
<tr>
<td>EPAP</td>
<td>Expiration pressure</td>
</tr>
<tr>
<td>hPa</td>
<td>Pressure shown in hectopascal; 1.01973 hPa correspond to 1 cm H2O</td>
</tr>
<tr>
<td>Symbol</td>
<td>Significance</td>
</tr>
<tr>
<td>--------</td>
<td>--------------</td>
</tr>
<tr>
<td>F</td>
<td>Respiratory frequency</td>
</tr>
<tr>
<td>S</td>
<td>Spontaneously-triggered respiratory phase switch</td>
</tr>
<tr>
<td>T</td>
<td>Compulsorily-triggered respiratory phase switch</td>
</tr>
</tbody>
</table>

Main window ("Statistics" menu item):

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ap</td>
<td>Maximum rise in pressure due to volume compensation</td>
</tr>
<tr>
<td>V</td>
<td>Volume</td>
</tr>
<tr>
<td>MV</td>
<td>Per minute volume</td>
</tr>
<tr>
<td>Leak</td>
<td>System leak (mask, expiration system, hose system, device)</td>
</tr>
<tr>
<td>f</td>
<td>Respiratory frequency</td>
</tr>
<tr>
<td>Ti/T</td>
<td>Proportion of inspiration time in a respiratory cycle</td>
</tr>
<tr>
<td>Sins</td>
<td>Proportion of spontaneous inspiration (only when mean values displayed)</td>
</tr>
<tr>
<td>Sexs</td>
<td>Proportion of spontaneous expiration (only when mean values displayed)</td>
</tr>
</tbody>
</table>
Menu structure in Physician mode

Overview

Menu structure in Physician mode

Statistics

- Actual values
- Modes
- Appliance usage

Mode

- 5A mode
- S mode
- T mode
- ST mode
- SX mode
- SXX mode
- CPAP mode

Alarms

- On/Off/Sound off
- IPAPmin
- VTmin

Triggers

- Inspiration
- Expiration

Pressure rise

- Inspiration
- Expiration

Volume comp.

- On/Off
- Vt
- Δp

TA statistics (VENTiLogic only)

TA setting (VENTiLogic only)

Softstart

Device configuration

Patient mode

Activate patient mode

Target values

- T
- ΔT

Values to be set:
- Vpp
- Δp

In SX mode:
- T
- ΔT

In SXX mode:

Set date/time

- Reset operating time
- Reset maintenance counter
- Reset device usage
- Reset therapy values

Language

- German
- English
- French
- Italian
- Norwegian

Back

Back to monitor

Back to monitor

Norwegian

German

Italian

French

English

Reset maintenance counter

Reset device usage

Reset therapy values

Reset operating time

Set date/time

Language

Device configuration

Patient mode

Activate patient mode

Target values

Values to be set:

In SX mode:

In SXX mode:

Target values

Values to be set:

In SX mode:

In SXX mode:

Target values

Values to be set:

In SX mode:

In SXX mode:

Target values

Values to be set:
2. Description of device

2.1 Intended use for VENTImotion/VENTIlogic

VENTImotion and VENTIlogic are home ventilation devices for the non-invasive, non-life support ventilation of adult patients with respiratory insufficiency in whom there is evidence of autonomous respiratory drive. This corresponds to the following clinical pictures:

- restrictive and obstructive ventilation disorders like paresis of the diaphragm, OSAS, COPD
- disorders of the respiratory mechanism like scoliosis, deformity of the thorax
- neurological, muscular and neuromuscular disorders
- central respiratory regulation disorders

VENTImotion and VENTIlogic are not suitable for life-support use. Use the device only for the purpose described here.

2.2 Functional description

Provision of therapy pressure

An electronically-controlled fan draws in ambient air through a filter and delivers it to the device outlet. From here, the air flows through the hose system and the mask to the patient.

Sensors detect the pressure in the mask and in the hose system and also the respiratory phase switch (trigger point). The fan accordingly provides the IPAP and EPAP pressures set by the doctor.

Therapy modes

The device can be operated in the following therapy modes: CPAP, S, ST, SX, SXX, TA (TA with VENTIlogic only).

In time-controlled mode T and in assisted-controlled mode ST, your doctor can set respiratory frequency in the range from 6 to 45 breaths per minute and inspiration time in the range from 20 % to 67 % of the respiratory period.

In assisted modes S, SX and SXX and in assisted-controlled mode ST, your doctor can select one of 6 trigger levels for both inspiration and exhalation. Your doctor can switch off the trigger for exhalation. Exhalation is then time-controlled.

In the adaptive, controlled TA mode, the device automatically adapts to your personal breathing rhythm and supplies the therapy pressure in exactly the same rhythm.

If no breath is taken into the device in S mode, pressure is switched at a minimum frequency of 6 breaths per minute.

You can activate volume compensation. Minimum volume and maximum pressure rise are set for this purpose. If the minimum volume is undershot, the device automatically increases pressure continuously until the set maximum pressure (therapy pressure + max. pressure rise) is reached.

Other functions

The Softstart function makes it easier to fall asleep. Your doctor sets initial pressures for inspiration and exhalation which continuously rise to the therapy pressures during the Softstart phase. This function can be disabled by the doctor.

The therapy device has an auto switch-on system. If this is activated, the device can be switched on by a breath being taken into the mask. The device is still switched off using the on/off key.

The display shows therapy mode and, depending on mode, the values currently being applied for CPAP/IPAP and EPAP and for respiratory frequency (f). Spontaneous or mechanical respiratory phase switches are also displayed and the pressure change shown in the form of a graph.
3. Hygiene treatment

3.1 Cleaning and disinfecting in use

Caution!
This item is described in section “5. Hygienic treatment” of the therapy device operating instructions. There follows a description of the hygiene treatment of the device in the event of repair and in the event of a patient change.

3.2 Cleaning and disinfecting on repair

A dealer should perform the following during a repair!

Caution!
It is essential to follow the instructions issued by the manufacturer of the disinfectant (9.3, page 54). It is recommended that you use suitable gloves for disinfecting (e.g. household rubber gloves or disposable gloves).

• Wipe down outer housing and power supply cable with TERRALIN.

• Clean hose, headgear and nasal mask in accordance with the operating instructions or replace with new parts (depending on condition).

• Open device as per item 7.2.

• Replace filters (coarse dust and fine filter).

• Clean out the inside of device housing and filter housing using a vacuum cleaner, clean extremely soiled areas.

• Close device as per item 7.3.

3.3 Cleaning and disinfecting for a patient change

If the device is to be hygiene-treated for another patient, perform the following steps.

Caution!
It is essential to follow the instructions issued by the manufacturer of the disinfectant (9.3, page 54). It is recommended that you use suitable gloves for disinfecting (e.g. household rubber gloves or disposable gloves).

• Wipe down outer housing and power supply cable with TERRALIN. Dispose of hose and mask system, headgear, exhalation system and carrying bag WM 24888 and replace with new parts.

• Open device as per section 7.2.

• Clean out the inside of the device housing, box and filter holder using a vacuum cleaner, clean extremely soiled areas.

• Replace coarse and fine dust filters 39 + 40.

• Open box 58 as per section 7.7.

• Spray-disinfect box, lid, fan, fan flap, motor bearing, fan cable, filter holder 37 and filter compartment cover 16 twice with MIKROZID LIQUID, in each case waiting the prescribed time for the product to take effect. In addition, at the start of the time for the product to take effect, wipe down accessible areas with a cloth wetted in MIKROZID LIQUID.

• Replace the following parts with new parts:
  - hose system WM 24130
  - filters WM 24870 and WM 24880
  - pressure and flow measurement hoses WM 24324, WM 24835
  - hose, pressure side WM 24852
3.4 Clean and disinfect humidifier during use

This item is described in section "4. Hygiene treatment" in the VENTIclick operating instructions.

3.5 Clean and disinfect humidifier on patient change

If the device is to be hygiene-treated for another patient, perform the following steps.

- For hygiene reasons we recommend replacing plastic parts after a maximum period of use of 2 years. The spare parts list can be found in the operating instructions for the VENTIclick.

- If plastic parts and the heating element are heavily soiled or coated in limescale, offer a new device, otherwise proceed in accordance with section "4. Hygiene treatment" in the operating instructions for VENTIclick.

3.6 Clean and disinfect the VENTIpower

This item is described in section "4. Hygiene treatment" in the VENTIpower operating instructions.

3.7 Clean and disinfect the VENTI-\(O_2\)

This item is described in section "4. Hygiene treatment" in the VENTI-\(O_2\) operating instructions.
## 4. Test the device

### 4.1 General

Important!
The device must be subjected to the following test following every repair, maintenance and hygienic treatment in accordance with test instruction WM 24827 and the test protocol. The test can also be used to assist during troubleshooting.

For the therapy device, enter the operating hours and all parameters in your service protocol (see page 59).

If you find faults or deviations from target values during the test, you must not use the therapy device again until the faults are eliminated.

The possible causes of the faults and how you eliminate malfunctions can be found in section "6. Malfunctions and rectification" on page 28.

### 4.2 Test equipment

- Flow measurement device
- Test set WM 23465 incl. 23635 pressure measurement adapter
- PC and PC software VENTIsupport
- Converter box WM 93316
- Connecting cables WM 93312 and WM 96313
- 115 V power source, e.g. travel adapter 230 V/115 V, 200 W
- Test protocol (see "12.2 Test protocol" on page 60)

### 4.3 Preparation for testing

**Check power supply cable**

1. Check the power supply cable 2
   
   Ensure that
   - the insulation is OK,
   - the cable is undamaged
   - and there are no loose contacts.

2. Replace the power supply cable 2 if necessary.

**Check housing**

Check the housing for general condition.

- If the housing is damaged or defective, replace the relevant side of the device (see "7.13 Replace bottom part of housing" on page 46/"7.14 Replace top part of housing" on page 47).
Connection to VENTI support

1. Plug the plug of the power supply cable into a socket.
2. Have the test protocol to hand.
3. Connect the serial interface of the therapy device to the PC via the converter box.
4. Start the VENTI support program.
5. Click on the VENTI adjust item in the menu bar.

<table>
<thead>
<tr>
<th>Therapy parameters</th>
<th>VENTI logic</th>
<th>AF</th>
<th>12</th>
<th>min</th>
</tr>
</thead>
<tbody>
<tr>
<td>Therapy device</td>
<td>Aus</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Therapy mode</td>
<td>ST mode</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Actual pressure</td>
<td>0 mPa</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EPAP pressure</td>
<td>4 mPa</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PAP pressure</td>
<td>6 mPa</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Soft start pressure EPAP</td>
<td>– mPa</td>
<td>VT</td>
<td>300</td>
<td>ml</td>
</tr>
<tr>
<td>Soft start time</td>
<td>– min</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Soft start pressure EPAP</td>
<td>– mPa</td>
<td>Delta P</td>
<td>5</td>
<td>mPa</td>
</tr>
<tr>
<td>Soft start time</td>
<td>– min</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Soft start TiMax</td>
<td>– min</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Soft start disabled</td>
<td>ON</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Humidity</td>
<td>Off</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Humidity stage</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

6. Note the set therapy parameters.

4.4 Enter device data

- Enter the type, number and date of manufacture of the device in the test protocol.

4.5 Test temperature calibration and calibration status

Note
This test is not needed, as it can only be performed on a Weinmann test bench.
4.6 Test battery voltage

1. Plug the red drying adapter into the device outlet of the VENTImotion.
2. Turn on the device.
   Requirement: if battery voltage is sufficient, no maintenance symbol should appear in the display.
3. Replace
4. Turn off the device.
   Note
   If battery voltage is inadequate, replace the battery on the control board (see “7.9 Replace battery on control board” on page 42).

4.7 Test interface with the VENTIclick

- Check the function of the humidifier (see “Check function of humidifier” on page 21).

4.8 Check target pressure values 5, 20 and 35 hPa

1. Connect the hose system and the mask to the therapy device.
2. Pull a plug off the mask.
3. Connect a pressure meter to the opened connector.
4. Turn on the device.
5. Prepare the therapy device for testing by making the following settings in the “Physician” menu:
   - T mode
   - Frequency f = 6/min
   - Ti:T = 50 %
   - EPAP 5 hPA
   - IPAP 35 hPA
6. Read off the pressure displayed by the measurement device and enter it on the protocol in the "Measuring result" column.

7. Read off the actual pressure displayed by the therapy device and enter it on the protocol in the "Mask" column.

8. Change the setting from EPAP 5 hPa to EPAP 20 hPa.

9. Read off the pressure displayed by the measurement device and enter it on the protocol in the "Measuring result" column.

10. Read off the actual pressure displayed by the therapy device and enter it on the protocol in the "Mask" column.

11. Turn off the device.

**Requirement:** the values must be within the tolerances quoted in the protocol.

**Note**
If the values are not within the quoted tolerances, replace the control board (see "7.8 Replace control board/display" on page 39).

---

**4.9 Test flow measurement**

1. Connect the device output of the therapy device to the flow measurement device using the short hose.

2. Turn on the device.

3. Prepare the VENTimotion for testing by making the following settings in the "Physician" menu:
   - T mode
   - frequency f = 6/min
   - Ti:T = 50 %

4. Set the two pressures so that the device displays 50 and 100 l/min in the flow window.
   **For example:** IPAP=10 hPa and EPAP=5 hPa
   Call up the flow window by pressing the rotary knob in the "Physician" menu during operation and selecting "Flow curve" in the Display menu.
   Correct the entry for pressures if necessary.

5. Enter the values displayed by the flow measurement device in the protocol.
   **Requirement:** the values must be within the tolerances quoted in the protocol.

6. Turn off the device.
   **Note**
   If the values are outside the tolerances, replace the control board (see "7.8 Replace control board/display" on page 39).
4.10 Test leaktightness

1. Plug the test adapter onto the device outlet.
2. Connect the side connection to the pressure measurement device.
3. Turn on the device. Select CPAP mode in the "Physician" menu and set a pressure of 20 hPa.
4. Read off the pressure displayed by the pressure measurement device and enter it in the protocol.
   Requirement: the values must be within the tolerances quoted in the protocol.
5. Turn off the device.
   Note
   If the value is outside tolerance, dismantle the device (see "7.2 Open device" on page 31) and check for leaks.

4.11 Test clock function

1. Connect the serial interface of the therapy device to the PC via the converter box.
2. Start the VENTIsupport program.
3. Click on the VENTIadjust item in the menu bar.
4. Select the Set technical data tab.
5. Compare "Device time" and "PC time".
   Requirement: the values must change to the same extent.
4.12 Test the interface with the VENTI-O₂

1. Fit a VENTI-O₂ valve to the therapy device so that it is ready to work. The indicator on top of the valve housing does not light up.
2. Close the opening of the nasal mask, using your thumb or hand, for example.
3. Switch on the therapy device first, then your O₂ supply. After the therapy device has been switched on, the valve opens with a soft “click” indicated by the green indicator.
4. You can now set the test flow rate on the flow display of your oxygen system. If this is not possible, first check the function of your oxygen system (is the cylinder empty, for example, or are hoses kinked?).
5. Switch the device off again. The valve audibly switches to “vent”, the indicator goes out.

Note
If the VENTI-O₂ valve does not react as described, perform the following measures in sequence and test again in each case.

- Use a different valve.
- Replace the connecting cable of the power board/mains supply unit (see “7.5 Replace power board” on page 34).
- Replace the power board (see “7.5 Replace power board” on page 34).

4.13 Test interface with the VENTIpower

Note
Before this test is carried out, the therapy device must have been connected to the mains power supply for at least 5 minutes.

1. Fit the VENTIpower to the therapy device so that it is ready to work therapy device. Connect the therapy device to the mains power supply.
2. Switch on the VENTIpower and then the therapy device. VENTIpower is working correctly if its displays go out, in other words, if VENTIpower switches to standby mode.
3. Now disconnect the plug of the therapy device, the device switches off. The power failure alarm sounds.
VENTIpower is working correctly if its displays comes on after approx. 4 seconds and the therapy device starts working again.

4. Now restore the mains power supply to the therapy device. VENTIpower is working correctly if its displays go out, in other words, if VENTIpower switches to standby mode.

5. Switch off both devices.

4.14 Test noise

**Note**
This test is not needed, as it can only be performed on a Weinmann test bench.

4.15 Test all keys, the rotary knob and 115 V mode

1. Plug the red drying adapter into the device outlet.
2. Connect the device to a 115 V power source and switch on the device.

**Requirement:** The device must start working.

3. Press all the keys and the rotary knob to test their function.
4. Turn off the device.

**Note**
If the keys do not work properly, perform the following measures in sequence and test again in each case:

- Check fascia film and replace if necessary (see “7.12 Replace fascia film” on page 45).
- Replace the control board (see “7.8 Replace control board/display” on page 39).

**Note**
If the rotary knob does not work properly, perform the following measures in sequence and test again in each case:

- Change the encoder (see “7.11 Replace encoder (dial)” on page 44).
- Replace the control board (see “7.8 Replace control board/display” on page 39).

**Note**
If 115 V mode does not work properly, replace the mains supply unit (see “7.4 Replace mains supply unit” on page 33).
4.16 Test display incl. backlighting and contrast, the LEDs and the alarm

**Note**
Before this test is carried out, the VENTI motion must have been connected to the mains power supply for at least 5 minutes.

1. Switch on the device.
   A beep sounds. Both LEDs come on briefly.
2. Check whether the display is easy to read with backlighting and that contrast is adequate.

**Set contrast**

1. Disconnect the power supply plug.
2. Press the humidifier key and the Softstart key simultaneously.
3. Connect the power supply plug and the socket again.
4. Turn the rotary knob to select contrast. Activate contrast by pressing the rotary knob.

**Note**
If no beep is heard when you switch on, perform the following measures in sequence and test again in each case.

- Test the buzzer and replace if necessary (see "7.13 Replace bottom part of housing" on page 46).
- Replace the control board (see "7.8 Replace control board/display" on page 39).

**Note**
If the contrast cannot be set, perform the following measures in sequence and test again in each case.

- Check the display cable.
- Replace the display (see "7.8 Replace control board/display" on page 39).
- Replace the control board (see "7.8 Replace control board/display" on page 39).
4.17 Test equipment and accessories (system components)

- Humidifier VENTIclick present
- Hose system present
- Oxygen supply valve VENTI-O₂ present
- Rechargeable battery VENTIpower present
- Medical devices manual present (Germany only)
- Operating instructions present

Check function of humidifier

**Important!**
It is essential to note the heating level set before carrying out this test.

**Caution**
Perform this test even if the patient has not used or will not be using the humidifier.

1. Subject the plastic housing to a visual check: in the event of cracks/damage and severe soiling, the plastic parts or gaskets should be replaced.

2. Fill the humidifier with water up to the mark.

3. Check whether the humidifier is leaktight.

4. Pour out the water.

5. Now pour in 50 ml of water.

6. Click the humidifier onto the therapy device.

7. Plug the red drying adapter (included in the scope of supply of the therapy device) into the outlet connector of the humidifier.

8. Plug the hose system onto the drying adapter.

9. Turn on the therapy device.

10. Turn on the humidifier by pressing the humidifier key on the therapy device.

11. Set heating level 6 on the therapy device.

12. Check whether the humidifier is heating up.

13. Take off the hose system by pushing the locking button of the adapter.

14. Pull the red drying adapter out of the humidifier by twisting it slightly.

15. Set the heating level back to the value you noted.

**Note**
If the humidifier has not heated up, perform the following measures in sequence and test again in each case.

- Use a different humidifier. Is the heating element OK?
- Replace the humidifier socket and cable (see “7.13 Replace bottom part of housing” on page 46).
- Replace the power board (see “7.5 Replace power board” on page 34).
Function check VENTI-O₂

1. Fit the VENTI-O₂ to the therapy device so that it is ready to work. The status display on top of the valve housing does not light up.

2. Attach the test hose supplied (length approx. 48 cm) to the O₂ outlet.

3. First switch on your therapy device and then your O₂ supply. After the therapy device has been switched on, the valve opens with a soft “click”. The green status display lights up.

4. Close the opening of the mask, using a thumb or hand, for example.

5. Set the prescribed flow rate at the flow setting of your oxygen system. If this is not possible, first check the function of your oxygen system (is the cylinder empty, for example, or are hoses kinked?).

6. Hold the free end of the test hose in a glass half-filled with water. VENTI-O₂ is working correctly if bubbles escape from the end of the hose.

7. Switch the therapy device off again. VENTI-O₂ is working correctly if the valve audibly switches to “vent”, the status display goes out and no more bubbles escape from the end of the test hose.

8. Shut off the oxygen supply of your oxygen system.

4.18 Once tests are complete

- Reset the therapy values you noted during preparations.
5. Maintenance

5.1 Intervals

Both filters 39 and 40 must be regularly checked for soiling.

- Coarse dust filter 39 needs to be changed every 6 months.
- Fine filter 40 should be changed after no more than 1000 operating hours (filter change symbol ⚠️ appears in the display).

For reasons of hygiene, we recommend replacing the following parts at the intervals stated:

- pressure measurement hose 11 every 6 months or sooner if soiled.
- complete mask system every 6 to 12 months depending on soiling
- exhalation system in accordance with the relevant operating instructions

See section entitled "Cleaning" in the relevant operating instructions.

Servicing should be carried out at the following intervals as a preventive measure:

1. after every 5,000 operating hours (maintenance symbol ⚠️ appears in the display and should be reset after every service),
2. after no more than 2 years (see service label on rear of device).
3. after 10,000 hours or 4 years, clean or replace all parts in the air flow.
4. Replace service label 71 with one with the new data (see "8. Spare parts" on page 48). Cut out the month at a sharp angle using a punch or nail scissors. Affix the new service label to the left-hand side next to the filter flap.

In Germany, a safety control as laid down in §6 of the German law relating to owners of medical devices [Medizinprodukte-Betreiberverordnung] must also be carried out every 2 years as specified.
5.2 Filter change

Use only original filters made by Weinmann. If third-party filters are used, this will invalidate the warranty and may cause restrictions in terms of function and biocompatibility.

Coarse dust filter

1. If the VENTiClik humidifier is connected, first disconnect it from the device. This will prevent water running into the device when the filter is changed. Please also see the operating instructions for the VENTiClik.
2. Press on the latch of the filter compartment cover and lift it off.
3. Take coarse dust filter 39 out of the filter compartment cover and dispose of it with ordinary domestic waste.
4. Insert clean coarse dust filter 39 in the filter compartment cover.
5. Insert the filter compartment cover into the opening in the housing, bottom edge first. Then push the filter compartment cover into the housing until the latch engages.

Fine filter

The fine filter needs changing when it has turned dark in colour, but in any event, after no more than 1000 operating hours. In the latter case, when VENTiMotion is switched on, the message “Change filter!” appears in the display.

Acknowledge the message by pressing the alarm acknowledgement key. The filter change symbol then appears continuously in the status line. To change the fine filter, proceed as follows:

1. Press on the latch of the filter compartment cover and lift it off.
2. Take out fine filter 40 and dispose of it with ordinary domestic waste.
3. Insert a new fine filter 40 WM 15026.
4. Insert the filter compartment cover into the opening in the housing, bottom edge first. Then push the filter compartment cover into the housing until the latch engages.
5. Reset the filter change indicator (see “Reset filter change indicator” on page 25).
Reset filter change indicator

1. To reset the filter change indicator, press menu key with the device switched on and use the dial to select the item Filter change in the Patient menu or in Physician mode, select the menu item Device configuration and then Filter change. Push the dial to call up the “Filter change” menu.

2. The question “Reset filter change?” appears. Use the dial to select YES and confirm your selection by pressing the dial.

If you wish to cancel the process, use the dial to select NO and press the dial. The process is aborted.

Once you have selected and confirmed YES with the dial, the message “Filter change reset!” appears for about 3 seconds.

Bacteria filter

If bacteria filter WM 24148 is used, change the particle filter in the bacteria filter in accordance with the relevant operating instructions.

5.3 Device cleaning

The parts in the air flow should all be cleaned and disinfected every 10,000 hours or every 4 years. This should be performed in accordance with section “3.3 Cleaning and disinfecting for a patient change” on page 11.

After every maintenance operation, perform a test according to section “4. Test the device” on page 13.
5.4 Reset maintenance symbol

After every service/repair performed, the maintenance indicator must be set to "0", or the maintenance symbol which has appeared in the display deleted. In addition, a new service label (current year + 2 years) should be affixed to the rear of the device.

1. Enable Physician functions. Hold down the IPAP and EPAP keys for 4 seconds to do so. The message "This is a physician function!" appears in the display. The display then returns to Monitor. The status line of the display shows the symbol \[ \text{®} \]. The Physician functions are now enabled.

2. In the menu, select the sub-menu Device configuration.

3. Use the dial to select the menu item Maintenance. Confirm your selection by pressing the dial.

The Maintenance sub-menu is displayed.

If you wish to reset the indicator, use the dial to position the selection bar on YES. Confirm your selection by pressing the dial.

4. A display appears in which you are asked again whether you wish to reset the symbol. If you are sure, select YES here too and confirm your selection by pressing the dial. The message: "Maintenance reset!" appears for approx. 2 seconds.

5. To exit the menu, press the menu key (back) until the Monitor is displayed. You can also select back with the dial and then press the dial.

[Images of the display screens showing the process of resetting the maintenance symbol]

26 Maintenance
5.5 Check the maintenance sticker

When you have maintained the device, a new maintenance sticker (current year + 2 years) must be attached to the rear of the device.

- Replace maintenance sticker 71 with one showing the new data (see "8. Spare parts" on page 48). Cut out the month using punch pliers or the tip of a nail cutter. Affix the new maintenance sticker to the left of the filter flap.

5.6 Disposal

Do not dispose of the device with domestic waste. To dispose of the device properly, please contact a licensed, certified electronic scrap disposal merchant. This address is available from your Environment Officer or from your local authority.
## 6. Malfunctions and rectification

### 6.1 General faults

<table>
<thead>
<tr>
<th>Malfunction</th>
<th>Cause</th>
<th>Rectification</th>
</tr>
</thead>
<tbody>
<tr>
<td>No running noise, standby and operating displays do not light up.</td>
<td>No power supply.</td>
<td>Check connection of power supply cable in device socket. Replace power supply cable if necessary.</td>
</tr>
<tr>
<td></td>
<td>Mains supply unit defective.</td>
<td>Replace mains supply unit (7.4, page 33).</td>
</tr>
<tr>
<td></td>
<td>Cable come loose or defective.</td>
<td>Check all cable connections in the device; replace if necessary.</td>
</tr>
<tr>
<td></td>
<td>Control board defective.</td>
<td>Replace control board (7.8, page 39).</td>
</tr>
<tr>
<td></td>
<td>Power board defective.</td>
<td>Replace power board (7.5, page 34). Send defective board to the manufacturer for fault analysis.</td>
</tr>
<tr>
<td>Faulty displays or none at all</td>
<td>Display defective.</td>
<td>Replace display (7.8, page 39).</td>
</tr>
<tr>
<td></td>
<td>Cable come loose or defective.</td>
<td>Check all cable connections in the device; replace if necessary.</td>
</tr>
<tr>
<td></td>
<td>Control board defective.</td>
<td>Replace control board (7.8, page 39).</td>
</tr>
<tr>
<td>Tolerance of therapy pressures is &gt; 0.6 hPa after 1 minute.</td>
<td>Control board defective.</td>
<td>Replace control board (7.8, page 39).</td>
</tr>
<tr>
<td></td>
<td>Sensor hoses defective or soiled.</td>
<td>Check hoses, lay correctly (7.8, page 39).</td>
</tr>
<tr>
<td>In Automatic mode, device cannot be switched on by a breath being taken in.</td>
<td>Automatic system not active.</td>
<td>Activate auto switch-on/switch-off (see 4.1 of operating instructions).</td>
</tr>
<tr>
<td></td>
<td>Power board defective.</td>
<td>Replace power board (7.5, page 34).</td>
</tr>
<tr>
<td></td>
<td>Control board defective.</td>
<td>Replace control board (7.8, page 39).</td>
</tr>
<tr>
<td>Device is running but does not reach the lower pressure limit set.</td>
<td>Filter soiled.</td>
<td>Change both filters (5.2, page 24).</td>
</tr>
<tr>
<td></td>
<td>Nasal mask leaking.</td>
<td>Adjust headgear/headband so that the mask is tight.</td>
</tr>
<tr>
<td></td>
<td>Leak in device.</td>
<td>Check if all hoses and gaskets are properly located.</td>
</tr>
<tr>
<td>Maintenance display active.</td>
<td>Maintenance interval exceeded.</td>
<td>Perform maintenance.</td>
</tr>
<tr>
<td></td>
<td>Internal battery discharged.</td>
<td></td>
</tr>
<tr>
<td>Status display of the VENTI-O2 lights up intermittently or not at all.</td>
<td>No power.</td>
<td>Check that plug contact is properly located.</td>
</tr>
<tr>
<td></td>
<td>Nasal mask leaking.</td>
<td>Adjust headgear/headband so that the mask is tight or use another mask if necessary.</td>
</tr>
<tr>
<td></td>
<td>Hose leaking.</td>
<td>Check breathing hose and pressure measurement hose.</td>
</tr>
<tr>
<td>The prescribed O₂ flow is not reached.</td>
<td>O₂ supply hoses kinked.</td>
<td>Check all hose connections.</td>
</tr>
<tr>
<td></td>
<td>Too high a resistance in the hose system.</td>
<td>Shorten O₂ supply hoses.</td>
</tr>
<tr>
<td></td>
<td>Output pressure of oxygen system too low.</td>
<td>If necessary, use another oxygen system, e.g. OXYMAT 3.</td>
</tr>
<tr>
<td>Water in humidifier is not heating up.</td>
<td>Humidifier defective.</td>
<td>Test with a different humidifier, if device is defective, return humidifier to the manufacturer.</td>
</tr>
<tr>
<td></td>
<td>Power board defective.</td>
<td>Replace power board (7.5, page 34). Send defective board to the manufacturer for fault analysis.</td>
</tr>
<tr>
<td>Power supply cable damaged.</td>
<td></td>
<td>Replace power supply cable.</td>
</tr>
</tbody>
</table>
6.2 Internal faults

The therapy device performs a self-test of the sensor system when the on/off switch is pressed briefly, checking the function of the alarm. If a fault occurs during the self-test, an error message appears in the main screen (see also “6.2 Internal faults” on page 29).

Fault output in clear text

<table>
<thead>
<tr>
<th>Display</th>
<th>Cause</th>
<th>Rectification</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Battery discharged!&quot;</td>
<td>Internal battery of the device is discharged.</td>
<td>Change the battery (7.9, page 42).</td>
</tr>
<tr>
<td>&quot;Clock not set&quot;</td>
<td>Time not set on device following battery change</td>
<td>Set clock as described in VENTipmotion hospital manual.</td>
</tr>
<tr>
<td>Device error; excessive pressure (Code 32)</td>
<td>Pressure at mask or fan has exceeded maximum permitted limit value.</td>
<td>Check ventilation and pressure measurement hose system for blockages/leaks.</td>
</tr>
<tr>
<td>Device error, Upper temperature limit exceeded (Code 64)</td>
<td>The temperature on the power board has reached a critical value, e.g. as a result of operation in the bag or being in direct sunlight.</td>
<td>Leave device to cool down and operate it in the permitted ambient temperature range.</td>
</tr>
</tbody>
</table>

Coded error messages

For faults which are not displayed with a clear text message, the therapy device issues a fault code.

- A number appears in the first line.
- The appropriate 16-digit fault code appears in the second line. Each of the 16 digits has the value “0” or “1”. The position of the 1 indicates the kind of fault involved.

A description of the cause of the fault and how to rectify it can be found in the table below.

Note: several errors may occur simultaneously. In this case, a “1” will then appear at several points in the second line. The number in the first line is the total of all the numbers for individual faults.
<table>
<thead>
<tr>
<th>First line: code number</th>
<th>Second line: at position ...</th>
<th>Cause</th>
<th>Rectification</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>Clock not responding or battery discharged</td>
<td>Replace battery on control board (see section 7.9 on page 42).&lt;br&gt;If fault occurs again, replace control board (see section 7.8 on page 39).&lt;br&gt;Replace fan or fan box. (see section 7.7 on page 37).&lt;br&gt;Replace power board (see section 7.5 on page 34).</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>EEPROM not responding</td>
<td>Replace control board (see section 7.8 on page 39).</td>
</tr>
<tr>
<td>4</td>
<td>3</td>
<td>Transmitting fault at the serial connections.</td>
<td>Replace control board (see section 7.8 on page 39).&lt;br&gt;Replace control board (see section 7.8 on page 39).&lt;br&gt;Replace control board (see section 7.8 on page 39).&lt;br&gt;Replace control board (see section 7.8 on page 39).</td>
</tr>
<tr>
<td>8</td>
<td>4</td>
<td>Sensor measurement has failed plausibility test</td>
<td>Replace control board (see section 7.8 on page 39).</td>
</tr>
<tr>
<td>16</td>
<td>5</td>
<td>Fan has failed or fan not starting up. Either there is no 40 V supply or there is a defect on the fan.</td>
<td>Check cable connections between fan, power board and control board.&lt;br&gt;Replace fan or fan box (see section 7.7 on page 37).&lt;br&gt;Replace power board (see section 7.5 on page 34).</td>
</tr>
<tr>
<td>128</td>
<td>8</td>
<td>Humidifier current is outside permitted values.</td>
<td>Replace power board (see section 7.5 on page 34).</td>
</tr>
<tr>
<td>256</td>
<td>9</td>
<td>EEPROM has failed checksum test</td>
<td>Replace control board (see section 7.8 on page 39).</td>
</tr>
<tr>
<td>512</td>
<td>10</td>
<td>Sensor calibration data in EEPROM invalid</td>
<td>Replace control board (see section 7.8 on page 39).</td>
</tr>
<tr>
<td>1024</td>
<td>11</td>
<td>Pressure sensor measured values outside tolerance</td>
<td>Check external and internal pressure measurement hoses for blockages.&lt;br&gt;Replace control board (see section 7.8 on page 39).&lt;br&gt;Replace control board (see section 7.8 on page 39).</td>
</tr>
<tr>
<td>2048</td>
<td>12</td>
<td>There are invalid therapy parameter values in the EEPROM.</td>
<td>Replace control board (see section 7.8 on page 39).&lt;br&gt;Replace control board (see section 7.8 on page 39).&lt;br&gt;Replace control board (see section 7.8 on page 39).&lt;br&gt;Replace control board (see section 7.8 on page 39).</td>
</tr>
<tr>
<td>4096</td>
<td>13</td>
<td>Data inconsistency, possibly battery discharged</td>
<td>Replace battery on control board (see section 7.9 on page 42).</td>
</tr>
<tr>
<td>8192</td>
<td>14</td>
<td>No communication with EEPROM</td>
<td>Replace control board (see section 7.8 on page 39).</td>
</tr>
<tr>
<td>16384</td>
<td>15</td>
<td>Communication with watchdog failed</td>
<td>Replace control board (see section 7.8 on page 39).</td>
</tr>
<tr>
<td>32768</td>
<td>16</td>
<td>Software fault</td>
<td>Replace control board (see section 7.8 on page 39).</td>
</tr>
</tbody>
</table>
7. Repairguide for VENTImotion/VENTIlogic

7.1 General

Perform repairs on the VENTImotion or VENTIlogic exclusively at an ESD protected work-station!

- Follow the safety rules in the operating instructions for the therapy device.
- Any handling of the device assumes accurate knowledge and observance of the operating instructions and the service and repair guide.
- Only perform repairs which are described in this service and repair guide. This is the only way to guarantee that the therapy device continues to function properly.
- Ensure that your hands and your work-station are clean during repair work.
- Perform a function check after every repair (see "4. Test the device" on page 13).
- If you replace components or individual parts, use only original Weinmann parts.
- When ordering the bottom part of the housing 35, quote the type, year of manufacture and number of the device as well.

Note
The item numbers listed in the text which follows are identical to the item numbers in the spare parts list on page 48 and in the overview on page 4.

7.2 Open device

Tools and equipment required

- ESD protected work-station
- 3 mm Allen key

Caution!
Open the device only with the power supply plug disconnected.

1. Place the device on a non-slip surface with the top facing downwards.
2. Remove the filter cassette from the top part of the housing.
3. Undo and remove the 6 screws 34.
4. Open the bottom part of the housing 35 away to the side.
5. Undo the connecting cables for the humidifier 42 and the alarm 43.
6. You can now put the bottom part of the housing 35 to one side.

7.3 Close the device

Tools and equipment required
• ESD protected work-station
• 3 mm Allen key

1. Hold the bottom part of the housing 35 up to the side of the top part of the housing 36.
2. Plug the connecting cables for the humidifier 42 and the alarm 43 onto the relevant connectors.
3. Check that all hoses and cables are plugged on firmly. If necessary, carefully plug these fully onto the connections (hoses) or slots (cables).
4. Place the bottom part of the housing 35 on the top part of the housing 36.
   Ensure that no cables or hoses are trapped or bent.
5. Now screw the top part of the housing tight using the 6 screws 34.
6. Then turn the device back over.
7.4 Replace mains supply unit

Tools and equipment required
- ESD protected workstation
- 3 mm Allen key

1. Open the device (see "7.2 Open device" on page 31).

2. Disconnect the power board/mains supply unit connecting cable 45 from the power board (wide connector).

3. Slightly lift mains supply unit 44 and disconnect the mains input connector from the mains supply unit 44.

4. Lift the mains supply unit out of the top part of the housing.

5. Disconnect the power board/mains supply unit connecting cable from the mains supply unit and plug into the new mains supply unit.

6. Position the new mains supply unit in the top part of the housing. Plug the mains input connector onto the new mains supply unit in the process.

7. Plug the power board/mains supply unit connecting cable 45 onto the power board (wide connector).

   **Caution!**
   Be absolutely sure that power board/mains supply unit connecting cable 45 is between the head of the screw and the box as well as in the groove of the power board. Ensure that the rechargeable battery cable is in the groove. Otherwise the cable may be trapped and damaged when the device is closed.

8. Close the device (see "7.3 Close the device" on page 32).

9. Test the device (see "4. Test the device" on page 13).
7.5 Replace power board

Tools and equipment required
- ESD protected workstation
- 3 mm Allen key

1. Open the device (see “7.2 Open device” on page 31).
2. Disconnect the power board/mains supply unit connecting cable 45 from the power board 41 (wide connector).
3. Disconnect the motor cable.
4. Disconnect the O₂ valve/power board connecting cable 70 from the power board.
5. Disconnect all connecting cables from the control board.
6. Remove the power board from the top part of the housing.
7. Take the rechargeable battery connecting cable 48 out of the groove and disconnect it from the power board 41.

8. Disconnect the cables of the old power board and plug them into the appropriate slots of the new power board 41:
   - power board/control board connecting cable 46 (wide connector)
   - rechargeable battery connecting cable 48
   - earth cable 47
9. Connect the power board/mains supply unit connecting cable 45 to the power board.
10. Position the new power board in the top part of the housing.
11. Restore the connections to the control board.
12. Connect the O₂ valve connecting cable to the new power board.
13. Plug the motor cable back on.
14. Insert the rechargeable battery connecting cable into the groove on the power board.

   Caution!
   Be absolutely sure that the power board/mains supply unit connecting cable 45 is between the head of the screw and the box as well as in the groove of the power board. Ensure that the rechargeable battery cable is in the groove. Otherwise the cable may be trapped and damaged when the device is closed.

15. Close the device (see "7.3 Close the device" on page 32).

16. Test the device (see "4. Test the device" on page 13).

### 7.6 Replace box and filter holder

#### Tools and equipment required

- ESD protected workstation
- 3 mm Allen key

1. Open the device (see "7.2 Open device" on page 31).

2. Remove the power board (see "7.5 Replace power board" on page 34).

3. Remove the mains supply unit (see "7.4 Replace mains supply unit" on page 33).

4. Release the pressure-side hose 74 (connection to device outlet) from the box.

5. Lift box 58 and filter holder 37 out of the top part of the housing together.

6. Disconnect the box and the filter holder from one another by undoing the intakeside hose 73 from both parts.
7. Dispose of the foam 38 from the expansion space and replace box 58.
   or:
   Replace the complete filter holder 37.
8. If you have not replaced the filter holder, insert a new piece of foam 38 in the expansion space.

9. Connect box and filter holder. To do so, insert the intake-side hose in both parts. The smooth part of the hose must be inserted in the filter holder in each case.
10. Insert the box and the filter holder back in the device (steps 4 to 6 in reverse sequence). To facilitate assembly of the intake-side hose 73, apply a little 70 % isopropanol to the circumference.
11. Refit the mains supply unit (see “7.4 Replace mains supply unit” on page 33).
12. Refit the power board (see “7.5 Replace power board” on page 34)
13. Close the device (see “7.3 Close the device” on page 32).
14. Test the device (see “4. Test the device” on page 13).
7.7 Replace fan

Tools and equipment required
- ESD protected workstation
- 3 mm Allen key

1. Open the device (see “7.2 Open device” on page 31).
2. Remove the power board (see “7.5 Replace power board” on page 34).
3. Remove the mains supply unit (see “7.4 Replace mains supply unit” on page 33).
4. Remove box and filter holder (see “7.6 Replace box and filter holder” on page 35).
5. Open the box. To do so, lift the lid using a slot screwdriver. Then remove the lid of the box.
6. Lift fan 63 up and disconnect decoupling tube 66 from the bore of the motor frame.
7. Remove fan 63 from box 58.
   If the same patient is going to be using the device, continue the repair from step 15.
   If box 58 is to be treated for a new patient or be subjected to cleaning in the course of the 10,000-hour/4-year service, then proceed as follows.

8. Remove motor frame 60 and the labyrinths 59 from the box and dispose of them.
9. Remove lid cushioning insert 61 and box cushioning insert 62 from the box and dispose of them.
10. Clean out the box using a vacuum cleaner and clean extremely soiled areas.
11. Disinfect the box using MIKROZID LIQUID (follow the manufacturer’s instructions for use).
12. Insert a new lid cushioning insert 61 and box cushioning insert 62 as shown, as well as the two new labyrinths 59 and motor frame 60 in box 58.
   Take care with the assembly position.
   - Insert the labyrinths as shown.
   - Insert motor frame 60 so that the cutout for the fan cable is flush with the cutout in the box. Otherwise the fan cable might be damaged when the box is closed.

13. **Tip!**
   Put motor frame 60 and labyrinths, 59 together with box cushioning insert 62 in box 58.
   Clean the fan and then disinfect it using MIKROZID LIQUID (follow the manufacturer's instructions).

14. Fit the fan flap with two new screws 68 from the maintenance kit.

15. Insert fan 63 in motor frame 60.

16. Apply a little 70 % isopropanol to the circumference of decoupling tube 66 and fit it in the appropriate bore of motor frame 60.
   The groove of the hose must engage right round the circumference of the bore.

17. Put the lid on box 58.
   Ensure that the lid is fitted in the correct position.
   The cable harness of the fan must run through the cutout in the lid and may not be trapped! The cable must protrude between 265 and 270 mm.

18. Refit the box and filter holder (see “7.6 Replace box and filter holder” on page 35)

19. Refit the power board (see “7.5 Replace power board” on page 34).

20. Refit the mains supply unit (see “7.4 Replace mains supply unit” on page 33).

21. Close the device (see “7.3 Close the device” on page 32).

22. Test the device (see “4. Test the device” on page 13).
7.8 Replace control board/display

Perform repair

Tools and equipment required

- ESD protected work-station
- 3 mm Allen key
- Phillips screwdriver, size 1

1. Open the device (see “7.2 Open device” on page 31).
2. Remove the power board (see “7.5 Replace power board” on page 34).
3. Disconnect the encoder connector 82 and the connectors of interfaces 84 and 85 of the control board.
4. Disconnect the ribbon cable of the display and the fascia film: to do so, pull the latch out until you feel resistance. You can then pull out the ribbon cable.
   Caution! If the latch has not been opened correctly, the ribbon cable may be damaged when it is pulled out.
5. Pull flow measurement hoses 56 off the flow sensor.
6. Pull pressure measurement hoses 57 off the pressure sensors.
7. Undo the four screws 51 and remove control board 50.

8. Remove spring 54 from the control board and remove battery 52 (see "7.9 Replace battery on control board" on page 42). You need the metal spring for the new control board.
   If it is unnecessary to replace the display, continue from step 11.

9. Remove display 49.

10. Insert a new display 49.
    
    **Caution:**
    The display may not tilt and must be straight in the guides.

11. Insert a new battery 52 in the appropriate holder of the new control board and screw on spring 54 (see "7.9 Replace battery on control board" on page 42).

12. Put the control board in the top part of the housing and attach it with the four screws 51.

13. Reattach the pressure measurement hoses 57 to the pressure sensors.

    **Ensure that you do not switch the hoses:** connect the connection of the flow sensor marked **Hi** to the hose connector marked **Hi** at the device outlet.

14. Attach the flow measurement hoses 56 to the flow sensor.

    **Ensure that you do not switch the hoses:** connect the connection of the flow sensor marked **Lo** to the hose connector marked **Lo** at the device outlet.

15. To prevent hoses kinking, position flow measurement hoses 56 and pressure measurement hoses 57 as shown.
16. Connect the ribbon cable for the fascia film and the display to the control board again:
   - pull the latch upwards.
   - push the ribbon cable into the connector.
   - press the latch back down.

17. Plug the connectors of the interfaces and the rotary knob into the appropriate slots of the control board.
18. Refit the box and filter holder (see “7.6 Replace box and filter holder” on page 35).

19. Refit the power board (see “7.5 Replace power board” on page 34).
20. Close the device (see “7.3 Close the device” on page 32).
21. Check contrast and adjust if necessary (see “4.16 Test display incl. backlighting and contrast, the LEDs and the alarm” on page 20).
22. Reset the date and time, as described in the VENTImotion/VENTIlógic hospital manual.
   Caution!
   After changing the control board, always set the date in the following sequence: 1. YEAR, 2. MONTH, 3. DAY, otherwise you may get a faulty display.
23. Test the device (see “4. Test the device” on page 13).
7.9 Replace battery on control board

Tools and equipment required

- ESD protected work-station
- 3 mm Allen key
- Phillips screwdriver, size 1

1. Open the device [see “7.2 Open device” on page 31].
2. Undo the screw 53 on the battery holder and take spring 54 and seal 55 off control board 50. Put the parts on one side.
3. Take battery 52 out of the holder on the control board.
4. Put in a fresh battery 52.
5. Insert spring 54 and seal 55 on the battery holder on control board 50 and fit both parts with screw 53.
6. Close the device [see “7.3 Close the device” on page 32].
7. Reset the date and time as described in the VENTImotion/VENTIlogic hospital manual.

Caution!
After changing the control board, always set the date in the following sequence: 1. YEAR, 2. MONTH, 3. DAY, otherwise you may get a faulty display.
8. Test the device [see “4. Test the device” on page 13].

7.10 Dismantle device outlet

Tools and equipment required

- ESD protected work-station
- 3 mm Allen key
- Phillips screwdriver, size 1

1. Open the device [see “7.2 Open device” on page 31].
2. Remove the mains supply unit [see “7.4 Replace mains supply unit” on page 33].
3. Remove the power board [see “7.5 Replace power board” on page 34].
4. Remove box and filter holder (see "7.6 Replace box and filter holder" on page 35).

5. Remove the control board (see "7.8 Replace control board/display" on page 39).

6. Pull the pressureside hose off device outlet 90. Dispose of the pressureside hose (only when servicing or changing patients).

7. Pull flow measurement hoses off the flow sensor. Dispose of flow measurement hoses 56.

8. Pull pressure measurement hoses 57 off the device outlet. Dispose of pressure measurement hoses.

9. Remove device outlet 90 from the top part of the housing 36. To do so, lift the tab slightly using a screwdriver and take out the device outlet.

10. Remove any adhesive residues from the housing.

11. Place a spot of glue on the lock: Ø ≤ 1 mm; glue WM 14946 (Loctite 4601) or WM 14952 (Loctite 4031).

12. Fit a new device outlet 90 in the top part of the housing 36.

13. Put new pressure measurement hoses 57 on the relevant connectors of device outlet 90.

14. Put new flow measurement hoses 56 on the relevant connectors of device outlet 90.

15. Refit the control board (see section 7.8 on page 39).

16. Refit the box and filter holder (see section 7.6 on page 35).

17. Refit the power board (see section 7.5 on page 34).

18. Refit the mains supply unit (see section 7.4 on page 33).

19. Close the device (see section 7.3 on page 32).

20. Test the device [see "4. Test the device" on page 13].
7.11 Replace encoder (dial)

Tools and equipment required

- ESD protected work-station
- 3 mm Allen key
- 11 mm Allen key adapter

Note
If you only want to replace the dial knob, simply pull it off the spindle of the encoder and replace it by a new one. To replace the entire encoder, proceed as described below.

1. Open the device (see section 7.2 on page 31).
2. Pull dial 83 off the spindle of encoder 82.
3. Unscrew the hexagon nut on the outside of the top part of the housing 36.
4. Pull the cable of encoder 82 off control board 50.
5. Take the encoder out of the top part of the housing from the inside.
6. Insert the new encoder in the top part of the housing.
7. Screw the hexagon nut onto the spindle of the encoder from the outside. Tighten up the nut. Ensure that the spindle of the encoder turns easily.
8. Plug the cable of the encoder onto the control board.
9. Push the dial onto the spindle of the encoder up to the stop. Check whether the dial turns easily.
10. Close the device (see section 7.3 on page 32).
11. Test the device (see “4. Test the device” on page 13).
7.12 Replace fascia film

Tools and equipment required
- ESD protected work-station
- 3 mm Allen key
- Phillips screwdriver, size 1
- Knife with a smooth, flat blade

1. Open the device (see section 7.2 on page 31).
2. Remove the mains supply unit (see section 7.4 on page 33).
3. Remove the power board (see section 7.5 on page 34).
4. Remove box and filter holder (see section 7.6 on page 35).
5. Remove the control board and the display (see section 7.8 on page 39). Undo fascia film 33 using a knife-blade and carefully peel it off. Use a little 70 % isopropanol to degrease this part of the housing.

6. Peel the protective film off the inside of the new fascia film and affix fascia film 33 to this area of the housing. Ensure that the ribbon cable is pushed cleanly through the opening in the housing without any kinks.
7. Carefully pull the outer protective film off the new fascia film using a fingernail.
8. Refit the display and the control board (see section 7.8 on page 39).
9. Refit the box and filter holder (see section 7.6 on page 35).
10. Refit the power board (see section 7.5 on page 34).
11. Refit the mains supply unit (see section 7.4 on page 33).
12. Close the device (see section 7.3 on page 32).
13. Test the device (see “4. Test the device” on page 13).
7.13 Replace bottom part of housing

Tools and equipment required
- ESD protected work-station
- 3 mm Allen key
- Phillips screwdriver, size 1
- Torque wrench 20 – 120 Ncm

1. Open the device (see section 7.2 on page 31).
2. Undo screws 87 of the humidifier socket and the ferrite core.
3. Pull connecting cable 70 for the humidifier out upwards.
4. Undo screws 86 and remove the alarm (piezo buzzer).
5. Remove the foam for the expansion space.
6. Remove the plug locators for the O₂ valve.
You have now dismantled all parts. Now start assembling into the new bottom part of the housing 35.
7. Insert the plug locators for the O₂ valve in the new bottom part of the housing.
8. Put the foam for the expansion space back in.
9. Refit the alarm (piezo buzzer) and fix it in position with the two screws 86. Tighten the screws with a torque of 47 Ncm.
10. Put connecting cable 70 into the plug locator with the radius of the plug side facing downwards. Both webs of the plug must be located within the plug locator for this.
11. Fix connecting cable 70 in position with lock washer 69 and screws 87 and 88.
12. Close the device (see section 7.3 on page 32).
13. Test the device (see “4. Test the device” on page 13).
7.14 Replace top part of housing

Tools and equipment required
- ESD protected work-station
- 3 mm Allen key
- Phillips screwdriver, size 1

1. Open the device (see section 7.2 on page 31).
2. Remove the mains supply unit (see section 7.4 on page 33).
3. Remove the power board (see section 7.5 on page 34).
4. Remove box and filter holder (see section 7.6 on page 35).
5. Remove the control board (see section 7.8 on page 39).
6. Remove the device outlet (see section 7.10 on page 42).
7. Remove the lock washers from pins 79.
8. Push pins 79 out of the hinges and take handle 78 off the top part of the housing.
9. Remove mains input connector 80 and cable securing clip 81.

You have now dismantled all parts. Now start assembling into the new top part of the housing 36.
10. Take the new top part of the housing 36 in your hand and insert handle 78 in the top part of the housing.
11. Push pins 79 into the hinges and fit the lock washers.
12. Fit the device outlet (see section 7.10 on page 42).
13. Refit the display and the control board (see section 7.8 on page 39).
14. Refit the box and filter holder (see section 7.6 on page 35).
15. Refit the power board (see section 7.5 on page 34).
16. Refit mains input connector 80 and cable securing clip 81.
17. Refit the mains supply unit (see section 7.4 on page 33).
18. Close the device (see section 7.3 on page 32).
19. Test the device (see “4. Test the device” on page 13).
8. **Spare parts**

### 8.1 List of spare parts for VENTImotion/VENTIlogic

**Note**
The item numbers in the table are identical to the numbers in the text of this service and repair guide. There are gaps in the numbering because the numbers were assigned in the operating instructions, but not all parts are spare parts.

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<td>75</td>
<td>Bacteria filter, complete</td>
<td>WM 24148</td>
</tr>
<tr>
<td>76</td>
<td>Hose system, sterilizable</td>
<td>WM 24120</td>
</tr>
<tr>
<td>77</td>
<td>Fine filter, packed</td>
<td>WM 13026</td>
</tr>
<tr>
<td>78</td>
<td>Handle</td>
<td>WM 24190</td>
</tr>
<tr>
<td>79</td>
<td>Pin</td>
<td>WM 24210</td>
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*When ordering, quote type, device no. and year of manufacture
<table>
<thead>
<tr>
<th>Item no.</th>
<th>Name</th>
<th>Article no.</th>
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<tr>
<td>80</td>
<td>Mains input plug</td>
<td>WM 24853</td>
</tr>
<tr>
<td>81</td>
<td>Cable securing clip, strain relief</td>
<td>WM 24317</td>
</tr>
<tr>
<td>82</td>
<td>Encoder</td>
<td>WM 24090</td>
</tr>
<tr>
<td>83</td>
<td>Dial</td>
<td>WM 24101</td>
</tr>
<tr>
<td>84</td>
<td>Western socket, 6-pin</td>
<td>WM 24508</td>
</tr>
<tr>
<td>85</td>
<td>Western socket, 4-pin</td>
<td>WM 24854</td>
</tr>
<tr>
<td>86</td>
<td>Screw WN5412 (for piezo buzzer)</td>
<td>WM 50553</td>
</tr>
<tr>
<td>87</td>
<td>Tallow-drop screw KB 30 x 20</td>
<td>WM 22597</td>
</tr>
<tr>
<td>88</td>
<td>Tallow-drop screw KB 30 x 6</td>
<td>WM 22597</td>
</tr>
<tr>
<td>89</td>
<td>Washer</td>
<td>WM 24088</td>
</tr>
<tr>
<td>90</td>
<td>VENTI support, complete</td>
<td>WM 93340</td>
</tr>
<tr>
<td></td>
<td>VENTI support, software</td>
<td>WM 93350</td>
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<tr>
<td></td>
<td>Converter box</td>
<td>WM 93360</td>
</tr>
<tr>
<td></td>
<td>VENTI-O₂, packed</td>
<td>WM 24200</td>
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<tr>
<td></td>
<td>Operating instructions VENTI motion DE</td>
<td>WM 16836</td>
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<td></td>
<td>Operating instructions VENTI motion FR, NL, IT</td>
<td>WM 16837</td>
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<td>Operating instructions VENTI motion SE, DK, NO</td>
<td>WM 16839</td>
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<td>Operating instructions VENTI motion FI, GR, RU</td>
<td>WM 16882</td>
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<td>Service and repair guide VENTI motion VENTI logic DE</td>
<td>WM 16831</td>
</tr>
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<td></td>
<td>Service and repair guide VENTI motion VENTI logic GB</td>
<td>WM 16832</td>
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<td></td>
<td>Service and repair guide VENTI motion VENTI logic FR</td>
<td>WM 16866</td>
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<tr>
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<td>CD-ROM hospital manual for VENTI motion VENTI logic including</td>
<td>WM 24805</td>
</tr>
<tr>
<td></td>
<td>- hospital manual DE</td>
<td>WM 16915</td>
</tr>
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<td>- hospital manual GB</td>
<td>WM 16916</td>
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<td></td>
<td>- hospital manual FR</td>
<td>WM 16917</td>
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<td></td>
<td>- hospital manual IT</td>
<td>WM 16918</td>
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<td></td>
<td>- hospital manual NL</td>
<td>WM 16990</td>
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<tr>
<td></td>
<td>Operating instructions VENTI-O₂ DE</td>
<td>WM 16849</td>
</tr>
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<td>Operating instructions VENTI-O₂ FR, NL, IT</td>
<td>WM 16874</td>
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<td></td>
<td>Operating instructions VENTI-O₂ GB, ES, PL</td>
<td>WM 16875</td>
</tr>
<tr>
<td></td>
<td>Operating instructions VENTI-O₂ DK, SE, NO</td>
<td>WM 16876</td>
</tr>
<tr>
<td></td>
<td>Operating instructions VENTI-O₂ FI, GR, RU</td>
<td>WM 16889</td>
</tr>
</tbody>
</table>
8.2 Spare parts required for servicing

Set for changing patients
Set WM 15263
consisting of:
• 1 coarse dust filter
• 1 fine filter
• 2 silicone hoses, 2.5 x 1.25 SI NF, 200
• 2 silicone hoses 3/7 I 130
• 1 hose, pressure side
• 2 labyrinths
• 1 decoupling tube
• 1 motor frame
• 1 cushioning insert for fan box
• 1 fan box gasket
• 1 filter holder gasket
• 1 hose, intake side
• 1 foam for expansion space
• 1 foam for filter holder
• 1 device outlet, complete
• 2 countersunk screws ISO 7045-M4x6
• 1 control board, replacement
• 1 "reconditioned" label

Important!
The removed control board must be returned to Weinmann, otherwise you will be billed the full price!

Maintenance kit 5,000 hours or 2 years
Set WM 15684
consisting of:
• 1 coarse dust filter
• 1 fine filter
• 1 battery 3 V
Maintenance kit 10,000 operating hours or 4 years

Set WM 15679 consisting of:

- 1 coarse dust filter
- 1 fine filter
- 2 silicone hoses, 2.5 x 1.25 SI NF, 200
- 2 silicone hoses 3/7 130
- 1 hose, pressure side
- 2 labyrinths
- 1 decoupling tube
- 1 cushioning insert for box
- 1 fan box gasket
- 1 filter holder gasket
- 1 hose, intake side
- 1 foam for expansion space
- 1 foam for filter holder
- 1 device outlet, complete
- 2 countersunk screws ISO 7045-M4x6
- 1 motor frame
- 1 battery 3 V
9. Tools, test equipment and disinfectants

Below is a list of all the tools and test equipment mentioned in this service and repair guide. The tools and test equipment required in detail can be found in the respective chapter.

9.1 Tools

- Phillips screwdriver size 1
- Phillips screwdriver size 2
- Slot-head screwdriver 0.5 x 3 x 100
- 11 mm Allen key adapter
- 2 mm Allen key
- 3 mm Allen key
- Knife with smooth, flat blade for loosening fascia film
- Nail scissors or punch to mark the service label

9.2 Test equipment and fixtures

- Manual pressure gauge, accuracy ± 0.25 % e.g. Digma premo SR type with pressure sensor 0–50 hPa to order from Special Instruments Henkersgasse 2; 86720 Nördlingen, Germany Postfach 1451; 86714 Nördlingen, Germany Tel.: +49 9081/220-61 or -62, Fax: +49 9081/220 63.
- Torque wrench 20 – 120 Ncm to order from: Hoffmann GmbH Herbert-Ludwig-Straße 4 D-28832 Achim, Germany Tel.: +49 4202/5 27-0 Fax: +49 4202/5 27-15
- PC and PC software VENTIsupport WM 93340
- Test set WM 23465 incl. 23635 pressure measurement adapter
- 115 V power source, e.g. travel adapter 230 V/115 V, 200 W
- ESD protected work-station
• Flow measurement device

Flow and pressure gauge PF-300
to order from:
imtmedical ag
Gewerbestrasse 8
CH-9470 Buchs, Switzerland
Phone: +41 81 750 66 99
Fax: +41 81 750 66 95
www.imtmedical.com

or

Type RT 200 (Timeter)
to order from:
Allied Healthcare Products Inc.
1720 Sublette Avenue
St. Louis, Missouri, MO 63110
USA
Phone: 001-800-444-3954
Fax: 001-314-771-5183

or

Type EKU VIP ventilator tester
to order from:
EKU Elektronik GmbH
Feldstraße 9a
D-56291 Leiningen
Phone: +49 6746-1018
Fax: +49 6746-8484
www.eku-elektronik.de

or

Flow metering pipes
Rotameter 120 l/min, class 1.6 in operating mode (1013 hPa, 20 °C) with stand, hose liners, plug-in dial and titanium floats
to order from:
Yokogawa Deutschland GmbH
Broichhofstr. 711
D-40880 Ratingen
Phone: +49 2102-49 83-0
Fax: +49 2102-49 83-22
E-mail: info@de.yokogawa.com
http://www.yokogawa.com/de

9.3 Disinfectants

• TERRALIN
• MIKROZID LIQUID
• GIGASEPT FF
to order from:
Schülke & Mayr GmbH
Robert-Koch-Str. 2
D-22851 Norderstedt, Germany
Tel.: +49 40 / 52 100 - 0
Fax: +49 40 / 52 100 - 318
Internet: www.schuelkenayr.de
## 10. Technical data

<table>
<thead>
<tr>
<th>Parameter</th>
<th>VENTỉmotion/VENTỉlogic</th>
<th>VENTỉmotion/VENTỉlogic with VENTỉclock</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product class as per EC directive 93/42/EEC</td>
<td>IIa</td>
<td></td>
</tr>
<tr>
<td>Dimensions WxHxD in cm</td>
<td>23 x 12.5 x 34</td>
<td>23 x 12.5 x 45.5</td>
</tr>
<tr>
<td>Weight</td>
<td>approx. 4.5 kg</td>
<td>approx. 4.8 kg</td>
</tr>
<tr>
<td>Temperature range</td>
<td></td>
<td></td>
</tr>
<tr>
<td>– operation</td>
<td>+5 °C to +35 °C</td>
<td></td>
</tr>
<tr>
<td>– storage</td>
<td>–40 °C to +70 °C</td>
<td></td>
</tr>
<tr>
<td>Air pressure range</td>
<td>750 – 1100 hPa (corresponds to a height of approx. 2500 metres)</td>
<td></td>
</tr>
<tr>
<td>Max. respiration pressure at an air pressure of 600 hPa</td>
<td>25 hPa</td>
<td></td>
</tr>
<tr>
<td>Electrical rating</td>
<td>115 – 230 V AC, 50–60 Hz</td>
<td></td>
</tr>
<tr>
<td>Power consumption during</td>
<td></td>
<td></td>
</tr>
<tr>
<td>– operation</td>
<td>230 V 0.2 A</td>
<td>230 V 0.35 A</td>
</tr>
<tr>
<td>– standby</td>
<td>115 V 0.4 A</td>
<td>115 V 0.7 A</td>
</tr>
<tr>
<td>Classifi...</td>
<td></td>
<td></td>
</tr>
<tr>
<td>– type of protection against electric shock</td>
<td>Protection class II</td>
<td></td>
</tr>
<tr>
<td>– degree of protection against electric shock</td>
<td></td>
<td></td>
</tr>
<tr>
<td>– radio interference suppression</td>
<td></td>
<td></td>
</tr>
<tr>
<td>– radio interference immunity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EN 55011</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EN 61000-3-2, EN 61000-3-3, EN 61000-4-2 to 6, EN 61000-4-8, EN 61000-4-11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean sound pressure level/oper...</td>
<td></td>
<td></td>
</tr>
<tr>
<td>– at a distance of 1 m from the device in the patient position</td>
<td>approx. 35 dB (A) at 20-35 hPa</td>
<td>approx. 31 dB (A) at 20 hPa</td>
</tr>
<tr>
<td>– at 20 hPa</td>
<td>approx. 29 dB (A) at 15 hPa</td>
<td>approx. 27 dB (A) at 12 hPa</td>
</tr>
<tr>
<td>– at 10 hPa</td>
<td>approx. 25 dB (A) at 7 hPa</td>
<td>approx. 23 dB (A) at 7 hPa</td>
</tr>
<tr>
<td>Sound pressure level, alarm</td>
<td>approx. 62 dB (A)</td>
<td></td>
</tr>
<tr>
<td>FEP pressure range</td>
<td>6 to 35 hPa</td>
<td></td>
</tr>
<tr>
<td>EPAP pressure range</td>
<td>4 to 20 hPa</td>
<td></td>
</tr>
<tr>
<td>CPAP pressure range</td>
<td>4 to 20 hPa</td>
<td></td>
</tr>
<tr>
<td>Pressure accuracy</td>
<td>± 0.6 hPa</td>
<td></td>
</tr>
<tr>
<td>Increment</td>
<td>± 0.2 hPa</td>
<td></td>
</tr>
<tr>
<td>Minimum stable limit pressure (P(LSmin)) (min. pressure in the event of a fault)</td>
<td>0 hPa</td>
<td></td>
</tr>
<tr>
<td>Maximum stable limit pressure (P(LSmax)) (max. pressure in the event of a fault)</td>
<td>± 60 hPa</td>
<td></td>
</tr>
<tr>
<td>Respiratory frequency</td>
<td>6 to 45 l/min</td>
<td></td>
</tr>
<tr>
<td>Accuracy</td>
<td>± 0.5 l/min</td>
<td></td>
</tr>
<tr>
<td>Increment</td>
<td>1 l/min</td>
<td></td>
</tr>
</tbody>
</table>
### Technical data

All values determined under ATPD conditions (ambient temperature and pressure, dry).

The right to make design modifications is reserved.

<table>
<thead>
<tr>
<th></th>
<th>VENTimotion/VENTiLogic</th>
<th>VENTimotion/VENTiLogic with VENTiClick</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Inspiration time</strong></td>
<td>20% to 67% of respirator period</td>
<td></td>
</tr>
<tr>
<td><strong>Increment</strong></td>
<td>1%</td>
<td></td>
</tr>
<tr>
<td><strong>Accuracy</strong></td>
<td>±1%</td>
<td></td>
</tr>
<tr>
<td><strong>Trigger level</strong></td>
<td>can be adjusted in 6 levels, separately for inspiration and expiration; in ST mode, expiration trigger can be switched off</td>
<td></td>
</tr>
<tr>
<td><strong>Speed of pressure rise</strong></td>
<td>adjustable in 6 levels</td>
<td></td>
</tr>
<tr>
<td><strong>Speed of pressure drop</strong></td>
<td>adjustable in 6 levels</td>
<td></td>
</tr>
<tr>
<td><strong>Accuracy of volume measurement</strong></td>
<td>at 23 °C: ±15%</td>
<td></td>
</tr>
<tr>
<td><strong>Flow at max. speed at 0 kPa</strong></td>
<td>300 l/min. ±15 l/min.</td>
<td>275 l/min. ±15 l/min.</td>
</tr>
<tr>
<td><strong>Flow at max. speed with bacteria filter at 0 kPa</strong></td>
<td>270 l/min. ±15 l/min.</td>
<td>250 l/min. ±15 l/min.</td>
</tr>
<tr>
<td><strong>Heating of respirator air as per HMV</strong></td>
<td>2.5 °C</td>
<td>depending on heating level</td>
</tr>
<tr>
<td><strong>Pressure constant measured to DIN EN ISO 17510 in CPAP mode</strong></td>
<td>at 20 kPa: Δp &lt; 1 kPa</td>
<td>at 14 kPa: Δp &lt; 1 kPa</td>
</tr>
<tr>
<td></td>
<td>at 10 kPa: Δp &lt; 1 kPa</td>
<td>at 7 kPa: Δp &lt; 0.5 kPa</td>
</tr>
<tr>
<td><strong>Fine filter separation level up to 2 µm</strong></td>
<td>≥ 99.7%</td>
<td></td>
</tr>
<tr>
<td><strong>Fine filter service life</strong></td>
<td>1000 hours assuming normal ambient air</td>
<td></td>
</tr>
<tr>
<td><strong>Permitted humidity in operation and storage</strong></td>
<td>≤ 95 % rh (no condensate formed)</td>
<td></td>
</tr>
</tbody>
</table>

System resistance at an air flow of 60 l/min at patient connection opening:

<table>
<thead>
<tr>
<th></th>
<th>VENTimotion with hose system WM 24130 and Silentflow WM 23600</th>
<th>VENTimotion with O₂ hose system WM 23737, VENTiClick WM 24365 and bacteria filter WM 24148</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.19 kPa · s</td>
<td>0.29 kPa · s</td>
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</tbody>
</table>

0197
10.1 Diagram of pneumatic system

10.2 Safety distances

<table>
<thead>
<tr>
<th>Rated output of HF device in W</th>
<th>Safe distance as a function of transmission frequency in m</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>150 KHz - 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>1.17</td>
</tr>
<tr>
<td>10</td>
<td>3.69</td>
</tr>
<tr>
<td>100</td>
<td>11.87</td>
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</tbody>
</table>

Further technical data are obtainable from the manufacturer, WEINMANN, on request.

The right to make design modifications is reserved.
11. Technical amendments

<table>
<thead>
<tr>
<th>Technical amendment</th>
<th>From device no.</th>
<th>Date</th>
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</table>
### 12. Protocols

#### 12.1 Repair and service protocol

**Device master data**

<table>
<thead>
<tr>
<th>Manufacturer: Weinmann GmbH + Co. 22525 Hamburg</th>
</tr>
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<tbody>
<tr>
<td><strong>Device type:</strong></td>
</tr>
<tr>
<td>- [ ] VENTImotion</td>
</tr>
<tr>
<td>- [ ] VENTIlogic</td>
</tr>
<tr>
<td><strong>IPAP as per patient record:</strong> _______ hPa</td>
</tr>
<tr>
<td><strong>EPAP as per patient record:</strong> _______ hPa</td>
</tr>
<tr>
<td><strong>Frequency f:</strong> _______ l/min</td>
</tr>
<tr>
<td><strong>Initial Softstart pressure:</strong> _______ hPa</td>
</tr>
<tr>
<td><strong>Softstart time:</strong> _______</td>
</tr>
<tr>
<td><strong>Speed of pressure rise, insp.</strong> _______</td>
</tr>
<tr>
<td><strong>Speed of pressure rise, exp.</strong> _______</td>
</tr>
<tr>
<td><strong>Humidifier stage:</strong> _______</td>
</tr>
<tr>
<td><strong>Mode:</strong> _______</td>
</tr>
<tr>
<td><strong>Device no.:</strong> _______</td>
</tr>
<tr>
<td><strong>Inspiration trigger:</strong> _______</td>
</tr>
<tr>
<td><strong>Expiration trigger:</strong> _______</td>
</tr>
<tr>
<td><strong>Target values:</strong></td>
</tr>
<tr>
<td>- $T_n$ _______</td>
</tr>
<tr>
<td>- $\Delta T_n$ _______</td>
</tr>
<tr>
<td>- $T_n$ _______</td>
</tr>
</tbody>
</table>

**Maintenance and repairs carried out as per service records**

<table>
<thead>
<tr>
<th>Total operating hours</th>
<th>Comparative measurement (hPa) as per patient record</th>
<th>Measures/Comments</th>
<th>Maintenance carried out as per VENTImotion/VENTIlogic service guide</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Company</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Date Signature</td>
</tr>
</tbody>
</table>

|                        |                                 |                 | Company                                                        |
|                        |                                 |                 | Date Signature                                                |

|                        |                                 |                 | Company                                                        |
|                        |                                 |                 | Date Signature                                                |

|                        |                                 |                 | Company                                                        |
|                        |                                 |                 | Date Signature                                                |

**Owner/operator:**

______________________________

______________________________

______________________________

______________________________

______________________________

______________________________

______________________________

______________________________

______________________________
# 12.2 Test protocol

## Test protocol Ventimotion/Ventilogic

<table>
<thead>
<tr>
<th>Device:</th>
<th>VENTimotion WM 24810</th>
<th>VENTilogic WM 27005</th>
<th>Device no.:</th>
<th>Device no.:</th>
<th>Software version:</th>
</tr>
</thead>
</table>

## Test equipment
- as per service and repair instructions for Ventimotion WM 16832

## Preparation for testing
- as per service and repair instructions for Ventimotion WM 16832

## Enter device data

<table>
<thead>
<tr>
<th>Measured value</th>
<th>OK</th>
<th>not OK</th>
</tr>
</thead>
</table>

## Test for correctness of temperature calibration and calibration status

## Test of battery voltage
- Battery voltage is ≥ 2.9 V, not service key sign shown on display

## Test of interface to VENTiflick
- VENTiflick is working correctly

## Check the target pressure values at 5, 20, and 35 hPa
- Target value: ± 0.5 hPa
  - Mask pressure: ± 0.5 hPa

<table>
<thead>
<tr>
<th>Target value</th>
<th>Test bench</th>
<th>Mask</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 hPa</td>
<td></td>
<td>Pa</td>
</tr>
<tr>
<td>20 hPa</td>
<td></td>
<td>Pa</td>
</tr>
<tr>
<td>35 hPa</td>
<td></td>
<td>Pa</td>
</tr>
</tbody>
</table>

## Test of flow measurement
- Flow is 50 ± 10 l/min
- Flow is 100 ± 12 l/min

## Leak test
- Measured pressure is ≥ 35 hPa

## Test of clock function
- Clock is working correctly

## Test of interface to VENTI-O
- Interface is working correctly

## Test of interface to VENTIPower
- Interface is working correctly

## Noise test

## Test all keys, encoder and 115 V mode
- Device is working correctly with 115 V power supply
- Keys are detected correctly
- Encoder is working correctly

## Test of display including backlight and contrast, LEDs and alarm
- LEDs light up correctly
- Display segments light up correctly, backlight is working correctly
- Contrast is set correctly
- The alarm generates the correct alarm sound sequence and can be heard without distortion

## Check of maintenance sticker
- Maintenance sticker data updated and applied correctly

<table>
<thead>
<tr>
<th>present</th>
<th>yes</th>
<th>no</th>
</tr>
</thead>
</table>

Maintenance performed: yes □ no □
Final test carried out: □

<table>
<thead>
<tr>
<th>date</th>
<th>name</th>
</tr>
</thead>
</table>

* Test points only feasible with Weinmann test bench.
For decades Weinmann has been developing, producing and marketing medical devices for markets around the world. In cooperation with our partners we design economic health systems for diagnosis and therapy in Sleep Medicine, Home Mechanical Ventilation, Oxygen Medicine and Emergency Medicine.