Contents

For Your Safety and that of Your Patients ........................... 5
Observe safety notes ................................................. 5
Intended use ......................................................... 6
Operating Concept .................................................. 7
Device quick check Oxylog 2000 ............................ 8
Operation .............................................................. 9
Using controlled ventilation IPPV .............................. 9
Using SIPPV .................................................. 12
Using SIMV ................................................ 12
Using CPAP .................................................. 14
Displaying settings and measured values ............... 15
In the event of a power failure ...................... 16
Alarms .................................................. 16
Electrical operation time ......................... 17
Shutdown .................................................. 17
Care ............................................................. 18
Stripping down .............................................. 8
Cleaning and disinfecting ......................... 19
Sterilizing ............................................... 20
Preparation .................................................. 22
Assembly .................................................. 22
Connecting power supply ....................... 24
Positioning Oxylog 2000 ......................... 28
Connecting gas supply ......................... 28
Checking readiness for operation ................. 31
Checking ventilation .............................. 32
Checking end expiratory pressure PEEP ......... 33
Checking »Paw high« alarm ..................... 34
Checking »Paw low« alarm ..................... 34
Checking synchronization for SIMV .......... 35
Checking »Upstream pressure low« alarm ... 35
Checking »Main supply down« alarm ......... 36
Fault – Cause – Remedy .............................................. 37
Maintenance intervals .............................. 40
Disposing of the ventilator .................... 40
Disposing of alkaline manganese and NiCd batteries ... 40
Fitting/replacing internal NiCd battery pack . 40
Replacing the fuse ............................... 41
Set language for display messages .......... 41
What's what .................................................. 43
Front view .............................................. 43
Rear view 4 .......................................... 44
Right-hand side view ......................... 45
Technical Data .................................................. 46
Technical documentation for Oxylog 2000 according to EMC standard IEC/EN 60601-1-2: 2001 ..................... 50

Description of operating principles ...................... 53
Symbols for pneumatic components .................... 53
Gas supply ............................................. 54
IPPV/SIMV/SIMV ............................................ 54
CPAP ............................................... 55
Abbreviations and symbols ............................. 56
Appendix .................................................. 57
Principle of flow measurement .................... 57
Pressure effect of tidal volume on operation of »Air Mix« .... 57
Order List .................................................. 58
Index ...................................................... 59
For Your Safety and that of Your Patients

Strictly follow the Instructions for Use
Any use of the apparatus requires full understanding and strict observation of these instructions. The apparatus is only to be used for purposes specified here.

Maintenance
The apparatus must be inspected and serviced by trained service personnel every 2 years and a record kept. Repair and general overhaul of the apparatus may only be carried out by trained service personnel. We recommend that a service contract be obtained with DrägerService and that all repairs also be carried out by them. Only authentic Dräger spare parts may be used for maintenance. Observe chapter “Maintenance Intervals”.

Accessories
Do not use accessory parts other than those in the order list.

Not for use in areas of explosion hazard
This apparatus is neither approved nor certified for use in areas where combustible or explosive gas mixtures are likely to occur.

Liability for proper function or damage
The liability for the proper function of the apparatus is irrevocably transferred to the owner or operator to the extent that the apparatus is improperly serviced or repaired by personnel not employed or authorized by DrägerService or if the apparatus is used in a manner not conforming to its intended use. Dräger cannot be held responsible for damage caused by non-compliance with the recommendations given above. The warranty and liability provisions of the terms of sale and delivery of Dräger are likewise not modified by the recommendations given above. Dräger Medical b.v., Best, the Netherlands

Precautions

Ventilation must be monitored
The ventilator must always be used under the supervision of qualified medical personnel so that remedial action can be taken immediately if a malfunction occurs.

Manual ventilation equipment must be kept ready to hand
If the life-supporting function of the ventilator can no longer be guaranteed on account of a fault, such as a power failure or break in the medical gas supply, ventilation of the patient must be continued without delay using other ventilation equipment with PEEP and/or increased inspiratory O2 concentration if necessary.

Mobile phones must not be used within a radius of 10 metres of the apparatus.
Mobile phones can interfere with the operation of electrical medical apparatus and endanger the patient.

General information on electromagnetic compatibility (EMC) according to the international EMC standard IEC 60601-1-2: 2001
Medical electrical equipment needs special precautions regarding electromagnetic compatibility (EMC) and needs to be installed and put into service according to the EMC information provided in the technical documentation available from Dräger Service upon request.

Portable and mobile RF communications equipment can affect medical electrical equipment.

Pins of connectors identified with the ESD warning symbol shall not be touched and not be connected unless ESD precautionary procedures are used. Such precautionary procedures may include antistatic clothing and shoes, the touch of a ground stud before and during connecting the pins or the use of electrically isolating and antistatic gloves. All staff involved in the above shall receive instruction in these procedures.
Intended Use

Oxylog 2000 is a time-cycled, volume-constant emergency ventilator for patients with a tidal volume from 100 mL upwards.

Ventilation modes
- Controlled ventilation IPPV, with variable Ti : Te, can be set to approx. 60 or 100 vol.% O₂
- Synchronized controlled ventilation SIPPV
- Synchronized intermittent mandatory ventilation SIMV
- Spontaneous breathing with positive airway pressure CPAP

With monitoring
- Airway pressure Paw
- Expiratory minute volume MV

With surveillance
- Airway pressure Paw
- Electric power supply
- Gas supply

Areas of use
- Mobile use for emergency medical care or primary care of emergency patients
- During transport in emergency rescue vehicles or by helicopter
- During transfer by road or air
- When moving ventilated patients around the hospital
- In accident and emergency departments
- During secondary transport from one hospital to another
The most important rotary knobs, namely those for ventilation frequency (Freq.) and tidal volume (Vt) are located in the centre of the front panel. They are larger in diameter than the other rotary knobs. The scale ranges for each patient group are colour-coded for easier pre-setting: infants (green), children (blue), adults (brown).

The smaller rotary knobs for ventilation time ratio (Tt : Te), maximum airway pressure (Pmax) and end expiratory pressure (PEEP), with a mechanical stop for PEEP values above 10 mbar, are grouped together in one area.

Switch for IPPV/SIPPV or SIMV/CPAP ventilation modes. The «Info» and «Reset» keys on the display are used to change from IPPV to SIPPV. The frequency knob is turned to 0 to change from SIMV to CPAP.

The ON/OFF switch O/I is located beside the switch for the ventilation modes. Both switches are protected by guards to prevent them being moved accidentally.

The mixer switch is used to select either 100 vol.% O2 or approx. 60 vol.% O2 during ventilation.

Analog mechanical pressure gauge for continuous indication of inspiratory and expiratory airway pressure – independent of power supply.

The liquid crystal display for the measured MV, PEEP, PEAK, MEAN, Frequency, and Vtexp., as well as for Advisory and Warning messages is located above the two rotary knobs for frequency and tidal volume Vt. Alarms appear on the display as plain text. The red alarm indicator flashes and an acoustic warning sounds at the same time.

Briefly press the «Info» key to display additional settings and measured values. This also illuminates the screen.

Press the key for 3 seconds to test the display, light and alarm tone.

The alarm tone can be muted for approx. 2 minutes by pressing the «Reset» key in the event of an alarm. When the cause of the alarm has been rectified, the warning message can be reset by pressing this key. A new, more important alarm will be displayed immediately.

Supplies
Gas supply
O2 from a cylinder with pressure reducer or from the medical gas pipeline system. Supply with medical air or from an optional O2-air blender in emergencies.

Power supply
Internal rechargeable NiCd battery pack and external power supply if necessary or
Non-rechargeable alkaline manganese battery pack with external power supply if necessary.
Set language for display messages – see page 42

**Device quick check Oxylog 2000**

Before carrying out this device quick check, first check readiness for operation as described on page 31.

The device check must be carried out before each use. Any operation of the device requires thorough knowledge of the Instructions for Use.

**Check before start-up:**
- Cylinder pressure equals at least 100 bar or correct connection to a piped medical gas supply
- Power supply assured:
  - Fully charged pack of rechargeable or new batteries
  - If external power supply:
    - Either connected to mains
    - Or to on-board power supply
  - All tubing connected

**Function check**
Connect test lung to breathing valve

- Rotary knobs:
  - \( V_T \) to 0.5 L
  - \( Freq \) to 12 1/min
  - \( T_i : T_e \) to 1:2
  - \( P_{max} \) to 60 mbar
  - \( PEEP \) to 5 mbar

- Switch for ventilation modes set to \( IPPV \)
- ON/OFF switch to \( I \):

**Display:**
- **Self test**
- SW-version xx.xx
- Red alarm indicator lights up briefly
- Alarm tone sounds twice
- Green LED lights up with external power supply
- After approx. 6 seconds

**Oxylog 2000 ventilates the test lung**

- Test Paw low alarm:
  - Remove test lung, alarm after approx. 20 seconds
- Test Paw high alarm:
  - Keep test lung compressed. Alarm

**For fault messages, see “Fault, Cause, Remedy”, page 37.**

**Device check completed**

Name: 

Date: 

---

8
Operation

Use a machine which has been cleaned and disinfected and is ready for operation.

Care, page 18
Preparation, page 22
Checking readiness for operation, page 31

In order to detect any malfunctions quickly, the following parameters should be monitored during ventilation:

- Check airway pressure, e.g. the PEAK and PEEP parameters, on the pressure gauge or on the display
- Check minute volume (set by means of "Freq." and "VT") on the display.

Using controlled ventilation IPPV

For ventilation frequencies of 5 to 40 1/min.
During IPPV, the minimum ventilation frequency is limited to 5 1/min by Oxylog 2000.

1 Switch for ventilation modes set to IPPV.

To speed up settings, set the scale range to the same colour on the «Freq.» and «VT» knobs. This ensures that the ventilation parameters are set as appropriate to the patient group concerned, namely infants / children / adults.

2 Set «Freq.» and «VT» knobs.

<table>
<thead>
<tr>
<th>Body weight (kg)</th>
<th>Freq. 1/min</th>
<th>VT litres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green range for infants (7.5 to 20)</td>
<td>30 to 40</td>
<td>0.1 to 0.3</td>
</tr>
<tr>
<td>Blue range for children (20 to 40)</td>
<td>20 to 30</td>
<td>0.3 to 0.8</td>
</tr>
<tr>
<td>Brown range for adults (over 40)</td>
<td>5 to 20</td>
<td>0.8 to 1.5</td>
</tr>
</tbody>
</table>
1 Set »Ti : Te« knob to 1 : 1.5.
2 Set »Pmax« knob to 60 mbar initially.
3 Set »PEEP« knob to 0 mbar* initially.
4 Use the mixer switch to set the required O2 concentration:
   Air Mix = 60 vol.% O2**
   or
   No Air Mix = 100 vol.% O2

In air mix mode, the applied tidal volume Vt is reduced in case of high airway pressure, due to the physical properties of the injector used for mixing.
   ● Increase the tidal volume Vt in accordance with the measured minute volume MV.
5 ON/OFF switch set to I.
 Display:
   Self test
   SW-version xx.xx

When the patient is connected:
   ● Check the minute volume MV displayed and adjust settings to suit the patient.

The following display appears if the expiratory minute volume is less than 1 L/min:
   IPPV MV = 0

6 Read off the maximum airway pressure Paw on the pressure gauge.
2 Set »Pmax« knob to approx. 10 mbar higher than the maximum airway pressure.

If the airway pressure in the range of settings between 20 and 60 mbar exceeds the maximum airway pressure »Pmax«, the machine immediately switches over to expiration to protect the patient and displays the warning message:
   Paw high

The set tidal volume Vt cannot be fully delivered!

* The end expiratory pressure may equal up to 2 mbar even when PEEP = 0 is set.
** See also page 57, in the Appendix.
If airway pressures are too high and there is a «Paw high» alarm:

- Check position of tube.
- Check patient airways and use suction if necessary.
- Ensure that the ventilation hose is not kinked.

To reset the warning message:
1. Press «Reset» key.
2. Watch the pressure gauge so that faults in ventilation can be detected quickly and danger to the patient averted.

Applying PEEP

3. Set «PEEP» knob to the required value and check on pressure gauge.

To override the mechanical stop for PEEP values greater than 10 mbar:
- Press and hold metal pin in scale and turn dial on knob over pin at the same time.
  Use the reverse procedure to deliver PEEP values below 10 mbar.

For cardio-pulmonary resuscitation

When applying cardiac massage for adults with the aid of an assistant:
4. Set «Freq.» knob to ❤ = 12 1/min.
5. Set «Pmax» knob to ❤ = pressure limited to 80 mbar.
  Display:

  Pmax= 80 mbar CPR

6. Press «Reset» to clear display.

The airway pressure is limited to max. 80 mbar without interrupting inspiration prematurely (ventilation with limited pressure). A single beep is produced to advise that pressure limitation is active.
Using SIPPV

SIPPV = Synchronized controlled ventilation
In SIPPV mode, the controlled ventilation strokes can be triggered within a time period and synchronized with the patient's inspiratory effort!
The ventilation frequency in this mode is higher than that set.
If there is no inspiratory effort by the patient, the ventilation strokes are automatically applied by the machine at the set frequency.

- Set ventilation initially as described for IPPV mode, page 9.
  Then:
  1. Press » Info« key to obtain the display:
     IPPV → SIPPV.
  2. Press » Reset« to confirm and SIPPV mode is applied by the machine.

The maximum inspiration time is always limited to 1.3 seconds.
The following warning message appears if the measured frequency exceeds the set frequency by more than 50%:

Using SIMV

SIMV = Synchronized intermittent mandatory ventilation
SIMV is a combination of mechanical ventilation and spontaneous breathing, with spontaneous breathing possible between the ventilation strokes. If the patient does not breathe spontaneously within a time period, the machine automatically applies a mechanical ventilation stroke.
When mechanical ventilation strokes are being applied at low frequencies, the trigger window should not be more than 6 seconds in order to guarantee a minimum expiration time of 0.5 seconds. The duration of the trigger window decreases as the frequency of mechanical ventilation strokes increases.
With synchronization, the mechanical ventilation stroke is applied during a preset period to coincide with the patient's inspiratory effort. The frequency of the mechanical ventilation strokes remains constant.
Synchronization is briefly indicated by a star (*) appearing in the display.
For frequencies of 5 to 40 1/min:
The mechanical strokes and their time parameters are
determined by the frequency set for SIMV/CPAP:
Rotary knob »Ti : Te« is disabled in SIMV mode.

<table>
<thead>
<tr>
<th>Freq. setting</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>No mechanical strokes  ➔ CPAP (page 14)</td>
</tr>
<tr>
<td>5 to 18.5 1/min</td>
<td>Fixed inspiration time = 1.3 s</td>
</tr>
<tr>
<td>18.5 to 40 1/min</td>
<td>Fixed Ti : Te = 1 : 1.5</td>
</tr>
</tbody>
</table>

1 Switch for ventilation modes set to »SIMV/CPAP«.
Set the ventilation pattern for the mechanical ventilation strokes
2 using the »VT« and »Freq.« knobs.
A frequency of less than 10 1/min should preferably be set to
allow the patient sufficient time for spontaneous breathing.
3 Display:

\[
\text{Tinsp} = 1.3 \text{ s}
\]

if the set frequency is lower than 18.5 1/min
or:

\[
\text{Ti} : \text{Te} = 1 : 1.5
\]

if the set frequency is higher than 18.5 1/min.

To clear the display:
4 Press »\text{Reset}«.

The following message appears if the expiratory minute volume
is less than 1 L/min:

\[
\text{SIMV MV} = 0
\]
During spontaneous breathing, pure oxygen is supplied even when «Air Mix» is set on the machine.
1. Reduce the ventilation frequency via the «Freq.» knob when spontaneous breathing resumes.
2. Change over to CPAP mode at frequency settings of less than 5 1/min.
3. Use the «PEEP» knob to set the positive airway pressure.

Use in toxic surroundings
Use only in SIMV/CPAP mode to protect a patient with spontaneous breathing from toxic ambient air.
- Set mixer switch to «No Air Mix» otherwise toxic ambient air will be drawn into the machine.

Move the patient to an environment with clean air immediately so that toxic air is not entrained when spontaneous breathing recommences!

Using CPAP
CPAP = Spontaneous breathing with positive airway pressure
CPAP mode should only be selected if the patient has sufficient spontaneous breathing!

Check via the pressure gauge:
The patient must be able to produce a negative pressure of at least 2 mbar below PEEP during inspiration.
1. Set «Freq.» knob to 0.
2. Switch for ventilation modes set to «SIMV/CPAP».
3. Set «PEEP» knob to required positive airway pressure.

For CPAP, the spontaneously breathed tidal volume is always applied with 100 vol.% O₂. The position of the «Air Mix/No Air Mix» switch is irrelevant.
When spontaneous breathing is insufficient:
- change to SIMV or IPPV/SIPPV.

The automatic «Paw low» warning for a disconnection and the «Leak» warning are not effective in CPAP mode. Check that connections are tight, and with mask ventilation check that the mask is correctly fitted.

Displaying settings and measured values

The ventilation mode and expiratory minute volume MV are continuously shown in the top line of the display. Specific ventilation parameters appear in the bottom line of the display, depending on the ventilation mode set (examples):

For IPPV/SIPPV

- Inspiration time: $T_{\text{insp}} = 2.0 \text{ s}$
- Inspiratory flow: $FLOW = 30.0 \text{ L/min}$
- Mean pressure: $\text{MEAN} = 15.0 \text{ mbar}$
- End expiratory pressure: $\text{PEEP}^* = 5.0 \text{ mbar}$
- Peak pressure: $\text{PEAK} = 20.0 \text{ mbar}$
- Respiration rate (SIPPV only): Frequency = 10 1/min

For SIMV

- Inspiratory flow: $FLOW = 30.0 \text{ L/min}$
- Mean pressure: $\text{MEAN} = 15.0 \text{ mbar}$
- End expiratory pressure: $\text{PEEP}^* = 5.0 \text{ mbar}$
- Peak pressure: $\text{PEAK} = 20.0 \text{ mbar}$
- Respiration rate: Frequency = 10 1/min
- Tidal volume: $V_T \text{ exp.} = 450 \text{ mL}$

For CPAP

- Pos. airway pressure: $\text{CPAP}^* = 8.0 \text{ mbar}$
- Respiration rate: Frequency = 10 1/min
- Tidal volume: $V_T \text{ exp.} = 450 \text{ mL}$

In the event of an alarm, the parameters displayed in the bottom line will be "overwritten" by the warning messages.

Displaying measured values:
1. Briefly press the » Info « key.

* The criterion for PEEP is the display on the pressure gauge. The electronic display can deviate, as the measuring point is not identical (see description of operating principles on page 53).
In the event of a power failure

Automatic ventilation, volume measurement and alarms do not operate if the power fails!
Spontaneous breathing can continue via the integrated demand valve.
Ventilation must be continued immediately with an independent ventilation device!

Alarms

1 The red alarm indicator lights up / flashes,
   — the alarm tone sounds, either continuously, intermittently or as a single beep (every 30 seconds),
   — the backlit warning message appears on the second line of the display.

• Understanding the alarm tone:
  Continuous or intermittent tone = Urgent! Immediate action is required!
  Single beep (every 30 seconds) = Advisory message.

• Read warning message on the display and remedy the fault with the aid of the table "Fault – Cause – Remedy" on page 37.

The alarm tone can be muted for approx. 2 minutes during an alarm:

2 Press «\textcopyright Reset» key.
   If the alarm situation persists, the alarm tone will resume after 2 minutes – or immediately if a new, more important alarm occurs.

When the fault has been rectified:
1 The red alarm indicator goes out and the alarm tone ceases.

To clear the warning message:

2 Press «\textcopyright Reset» key.

The warning message cannot be reset until the underlying fault has been rectified.

A message which has not been cleared will be replaced by a new, more important message.
**Electrical operation time**

Oxylog 2000 can be used for about six hours with a fully charged pack of rechargeable NiCd batteries. The electrical operation time with NiCd batteries can decline as the battery capacity is reduced with time. Oxylog 2000 can be used for about four hours with new alkaline manganese batteries. The average pneumatic operation time for ventilating adults (minute volume MV = 10 L/min) from a 2.5 L/200 bar cylinder is approx. 45 minutes, see page 29.

The following display appears when the electrical operation time runs down:

- **Charge NiCd**

  or

- **Change bat.**

The remaining electrical operation time equals approx. 10 minutes. The illumination in the display cannot be switched on during this time.

If necessary:

- Continue ventilation with a self-inflating manual ventilation bag.
- Fit a new pack of alkaline manganese batteries, page 26 or connect to the external power supply, page 24.

**Shutdown**

After disconnecting the patient:

1. Set ON/OFF switch to 0.

When O₂ is supplied from a cylinder:

- Close cylinder valve completely.

When medical gas is supplied from the pipeline system:

- Unplug probe.
Care

– Clean breathing valve and ventilation hoses each time after use.
– Clean ventilator and medical gas hoses if heavily soiled.

Stripping down

● Remove Oxylog 2000 from holder.
1 Disconnect ventilation hose from socket.
2 Disconnect flow measuring hoses from sockets.
3 Unscrew medical gas hose from Oxylog 2000.

● When disconnecting hoses, always grip the sleeve and not the corrugations!
If this is not done, the corrugations or hose may be torn from the sleeve.

4 Disconnect flow sensor from breathing valve – do not twist or use force on the hose nozzles, as this can damage the flow sensor.
5 Carefully detach flow measuring hoses from flow sensor, pulling in the axial direction of the hose nozzles.
6 Detach angled connector from flow sensor.

● Do not allow any objects to enter the flow sensor. Do not purge with compressed air. The wind vane inside may be damaged and cause measuring errors!

● Detach ventilation hose from breathing valve.
Disassembling the breathing valve
1. Turn cover about 90° anticlockwise = unlock and remove.
2. Remove silicone diaphragm.
   ● Do not disassemble breathing valve any further!
   ● Do not allow any objects to enter the housing of the breathing valve!
     Do not damage the silicone diaphragm and other parts.

   ● The rubber disc in the housing should not be removed, damaged or bent, otherwise impaired valve operation will occur, putting the patient at risk.

Cleaning and disinfecting
Use surface disinfectants. To ensure material compatibility, use disinfectants based on:
- Aldehydes
- Alcohol
- Quaternary ammonia compounds

Disinfectants based on:
- Compounds containing phenol
- Compounds releasing halogen
- Strong organic acids
- Compounds releasing oxygen

may cause damage to materials, particularly those used for the breathing valve, flow sensor and angled connector.

Users in the Federal Republic of Germany are recommended to use only disinfectants on the current DGHM list (DGHM: German Society for Hygiene and Microbiology).
The following disinfectants on the DGHM list are recommended:
Dismozon pur, Incidur, Sekusept Powder, Trichlorol

The DGHM list (published by: mhp-Verlag, Wiesbaden) also specifies the active ingredient in each disinfectant.
Disinfectants based on the active ingredients specified above are recommended for users in those countries in which the DGHM list is not available.
Wipe disinfecting
Ventilator and medical gas hose
- Follow the manufacturer’s instructions.
- Remove heavy soiling with a disposable cloth first.
- Do not allow any liquid to enter the ventilator or medical gas hose!

Bath disinfecting
Disassembled parts of the breathing valve, flow sensor, ventilation hose and flow measuring hoses
- Follow the manufacturer’s instructions.
- Agitate parts thoroughly in the solution.
- Do not clean with a hard brush!
- Do not allow any objects to enter the breathing valve or flow sensor!
- Rinse parts thoroughly with distilled water. Disinfectant residues can cause the rubber disc to become jammed in the breathing valve.
- Allow to dry completely.
  The breathing valve and flow measuring hoses may not function correctly if water remains in these parts.

Sterilizing
Sterilize if necessary. Disassemble the breathing valve, flow sensor and angled connector. When disassembling the breathing valve from the flow sensor, pull in one straight line. Do not rotate the parts, this may damage the flow sensor.

The disassembled parts of the breathing valve, the flow sensor, the angled connector, the flow measuring hoses and the ventilation hose
- can be sterilized in hot steam at 134 °C in accordance with EN 285 (Sterilization – Steam sterilization – Large-scale sterilization) for at least 3 minutes, up to 10 minutes

Sterilization longer than 10 minutes is permissible, but will shorten the service life of the hose set.

Only reuse accessory if
- it is undamaged and
- the readiness for operation check has been successfully completed.
Observe accessory service life

The parts of the ventilation valve, flow sensor, angled connector, measuring hoses and ventilation hose are resistant to the recommended disinfectants and are heat-resistant during sterilisation. However, wear occurs each time the parts are disinfected and sterilized. After conditioning, the parts should therefore be examined for cracking and permanent deformation.

- Damaged or deformed parts must be replaced.

After care

- Reassemble, page 22.
- Connect to power supply, page 24 and gas supply, page 28.
- Check readiness for operation, page 31.
Preparation

Assembly
Attaching the breathing valve

1 The rubber disc in the housing should not be removed, damaged or bent, otherwise impaired valve operation will occur, putting the patient at risk.

2 Place diaphragm in breathing valve – ensure that it is inserted correctly.
3 Fit cover and turn approx. 90° clockwise = lock.
4 Plug flow sensor into breathing valve; note preferred position (groove).
5 Push angled connector onto flow valve.

The angled connector must always be used, otherwise the flow measurement may be inaccurate!
When using a bacterial filter

- Always connect the bacterial filter to the angled connector.

1. Connect ventilation hose to breathing valve.

   Do not use electrically conductive hoses, as these can endanger both the ventilator and the assistant during defibrillation!

2. Connect flow measuring hoses to sockets on flow sensor – note different diameters.

3. Screw medical gas hose firmly into place by hand.

   Do not allow pressure to build up at the connector for flow measurement, otherwise the internal sensor may be destroyed!

**Connecting power supply**

Oxylog 2000 is designed to operate on power supplies with different voltages:

**Internal supply**

Internal rechargeable NiCd battery pack

or

alkaline manganese batteries.

**Additional external power supply**

DC voltage from the on-board power supply via DC/DC converter

or

power supply unit.

To recharge the NiCd battery pack

and

to extend the electrical operation time when using NiCd or alkaline manganese batteries.

**A fully charged NiCd battery pack or fresh alkaline manganese batteries must always be installed for safety reasons, even when operating from an external power supply!**

When operating with internal NiCd battery pack

Fit NiCd battery pack, see page 41.

---

**External power supply with DC/DC converter**

- **A DC/DC converter 2M 86 404 must always be used**
  
  when operating the ventilator with external DC voltage (e.g. from the on-board power supply of the vehicle).

  The DC/DC converter should be used to connect the Oxylog 2000 to on-board supplies of different voltages (12 V, 24 V, 28 V). The fluctuations in the on-board supply may be so great that the supply voltage falls below or exceeds the range permitted for the Oxylog 2000.

  The DC/DC converter converts low voltage such as the on-board voltage of a rescue vehicle (12 V or 24 V) or the medical distribution voltage of a rescue helicopter (12 V or 28 V, e.g. Bucher-Wand) into the distribution voltage (12.5 V) of the Oxylog 2000.

  The DC/DC converter switches off automatically if the on-board voltage falls below 10.5 V. The Oxylog 2000 generates a "power supply down" warning. Oxylog 2000 carries on working without interruption using the internal batteries or NiCd batteries. The DC/DC converter switches on again automatically if voltages higher than 10.5 V occur:

- **Connect one side to the on-board power supply of the vehicle and the other to the connector for external DC power at the top of the ventilator.**
Using the converter in combination with the ventilator holder 84 12 069:

- When operating the converter in combination with the ventilator holder, install the converter on the vehicle bracket. Screw the converter firmly on to the bracket using the three screws supplied (2 x M3, 1 x M4). Attach the shorter cable (with angled connector) leading to the Oxylog 2000 to the white cable holder with a cable tie.
- Plug the angled connector into the DC input socket of the Oxylog 2000. Plug the vehicle connector into an on-board socket.

Connecting the converter to the on-board power supply without vehicle connector:

The converter on-board cable can be cut to the required length.

- Connect the on-board cable to the on-board supply as follows:
  - white = positive
  - brown = negative

External power supply from power supply unit

- Only use power supply unit with the corresponding supply voltage and corresponding plug. See Order List on page 58.
- Connect mains plug to mains socket and DC plug to DC socket on Oxylog 2000.
Operation with alkaline manganese batteries

Use battery holder 18 35 505.

Only use alkaline manganese batteries, type IEC LR6 (round cell).

- Undo screw in cover of battery compartment, e.g. with a coin, and remove cover.

- Remove used batteries (or flat NiCd batteries) and disconnect.

- Remove used batteries from battery holder and insert six new batteries. Ensure correct polarity!
- Plug battery holder into socket in battery compartment and insert battery pack in compartment.
- Refit cover and tighten screw.
- **Do not recharge alkaline manganese batteries; they must be disposed of as special waste, page 40.**

The ventilator can be operated for approx. four hours when new batteries have been fitted.

An additional external supply can be connected to extend the electrical operation time:

- Use a DC/DC converter
  or
- use a power supply unit.

If advisory or warning messages are output, see table "Fault – Cause – Remedy" on page 37.
Beware, batteries may become discharged
Even when using an external power supply (e.g. power supply unit), the batteries may self-discharge slightly. It takes about two years for the batteries to become flat.

Charging the NiCd battery pack
The ambient temperature must be between 0 and 35 °C when charging the batteries!

When using an external power supply:
1. The green LED »DC power available« lights up regardless of whether the ventilator is switched on or off. The internal NiCd battery pack is being charged.
   ● Display when ventilator is switched off:
   - Stand-by NiCd charging
   - It takes about 8 hours to recharge a completely flat NiCd battery pack.
   ● Display when ventilator is switched off:
   - Stand-by NiCd charged

The ventilator can operate for approx. 6 hours at room temperature when the internal NiCd batteries are fully charged.
● The following display appears at the end of the electrical operation time:
   - Charge NiCd

Operation will continue for about 10 minutes. The electrical operation time may be reduced by low ambient temperatures and the condition of the rechargeable batteries, see "Technical data", page 46.
Positioning Oxylog 2000

For stationary use:

- Place on a level surface where it cannot slide or fall
- Hang from the headboard of a bed.
- Hang from a wall rail.

For mobile use in vehicles:

- Hang Oxylog 2000 in ventilator holder.
  1. Hang ventilator from the bar on the holder using clamps.
  2. Swing ventilator upwards until it engages.
To remove the ventilator:
  3. Push the release catch upwards.

Connecting gas supply

Take care when handling O₂!

Secure O₂ cylinders so they cannot fall over and keep away from excessive heat.

Do not grease or lubricate O₂ fittings, such as cylinder valves and pressure reducers, and do not handle with greasy hands – fire risk!

Only open / close cylinder valves by hand and rotate smoothly. Do not use tools.

O₂ makes all fires burn more fiercely!
No smoking and no naked lights.
Supply from an O₂ cylinder

Only use compressed gas cylinders which comply with national regulations and have been approved.

Use a full cylinder (cylinder pressure 200 bar).
- Screw pressure reducer (2.7 to 6.0 bar delivery pressure, 5 bar nominal pressure) to O₂ cylinder.
  Only use a pressure reducer with a vent valve at the outlet to limit the delivery pressure to approx. 10 bar in case of a fault!
- Connect Oxylog 2000 to pressure reducer with medical gas hose.
- Turn cylinder valve slowly and open fully.

Do not fit any flow control valves or flowmeters in the gas supply to Oxylog 2000!
The ventilator may not function properly.

Determining the pneumatic operation time

Example:
Cylinder pressure measured on the pressure gauge of the pressure reducer: 200 bar
Liquid capacity of the O₂ cylinder: 2.5 L
Supply of medical gas: 2.5 L x 200 bar = approx. 500 L

Approximate operation time for Oxylog 2000

Example:
IPPV mode, frequency 10 1/min, VT = 1 L
Minute volume = 10 1/min x 1 L = 10 L/min

Operation time = \( \text{Medical gas supply [L]} \) / \( \text{MV +1*}) [L/min] \)

Operation time = \( \frac{500}{11} \) = approx. 45 minutes

The gas consumption is reduced by approx. 50% and the operation time increases to approx. 90 minutes when Oxylog 2000 is switched to »Air Mix«.

* Gas consumption of ventilator: approx. 1 L/min
Supply from a piped medical gas system
- Screw O₂ medical gas hose into Oxylog 2000 and plug gas probe into O₂ terminal unit until it engages once = parking position.

Supply with Dräger Oxator
- Screw O₂ medical gas hose into Oxylog 2000.
- Firmly plug connector into one of the two O₂ couplings – until it engages.
- Follow Instructions for Use of Oxator.

Caddy and CompactCaddy
The Caddy and CompactCaddy are recommended for mobile and portable use of the Oxylog, in emergency, transport and rescue situations, including oxygen cylinder, pressure reducer, accessory bag and patient ventilation tube.
Checking readiness for operation

— Whenever the breathing valve is changed.
— Whenever the ventilator has been stripped down / assembled.
— At least every six months.

If the readiness for operation check is not carried out, the patient may be placed at risk.

Connecting the test lung 84 03 201

The test lung comprises an elbow connector for connection to the Y-piece, a catheter connector dia. 7 to simulate the resistance of the airways and a 2 L breathing bag to simulate the compliance.

● Detach angled connector from flow sensor.
● Push elbow connector into patient connection of flow sensor.

Connecting the gas supply:

● Open cylinder valve slowly and fully.
or:
● Push gas probe firmly into the terminal unit until it engages.
Checking readiness for operation

Checking ventilation

1. Set »Vr« knob to 0.5 L
2. Set »Freq.« knob to 12 1/min
3. Set »Ti : Te« knob to 1 : 2
4. Set »Pmax« knob to 60 mbar
5. Set »PEEP« knob to 5 mbar
6. Set switch for ventilation modes to »IPPV«
7. Set ON/OFF switch to »I« (ON)

- The ventilator carries out an electrical and pneumatic self test.
- Display:

  Self test
  SW-version xx.xx

  The software version is shown in the bottom line.

- The red alarm indicator and the display illumination light up briefly.
- The alarm tone (beep) sounds twice. For safety reasons, the alarm tone is output on two mutually independent channels. Both are tested in the self test. This is why the alarm tone sounds twice for the same length of time.
- The green LED *DC power available* lights up constantly when an external power supply in the range 11 to 13 V DC is connected.

The self test is complete within no more than 6 seconds.
- Display:

  Self test O.K.

- Oxylog 2000 ventilates the test lung with the set ventilation pattern.
- Alternating between inspiration and expiration, the pressure gauge should indicate a defined inspiratory pressure and the end expiratory pressure of approx. 5 mbar.
- The display shows a minute volume of

  IPPV MV = 6

  with a tolerance of ±1.0 L/min.

If the measured value of MV is only 5 L/min:
- Check that the ventilation hose, breathing valve, flow sensor, elbow connector and test lung are undamaged and connections are tight.

If the measured value of MV = 6 L/min deviates by more than 1 L/min:
- Replace flow sensor.
Checking end expiratory pressure PEEP

1. Set «PEEP» knob to 0 mbar.
2. Pressure gauge display at end of expiration:
   »0 mbar« ± 2 mbar

1. Set «PEEP» knob to 10 mbar.
2. Pressure gauge display at end of expiration:
   »10 mbar« ± 2 mbar
1. Set «PEEP» knob back to 0 mbar.
Checking »Paw high« alarm

1. Set «Vt» knob to 0.5 L
2. Set «Freq.» knob to 12 1/min
3. Set «Ti : Te» knob to 1 : 2
4. Set «Pmax» knob to 40 mbar
   ● Keep test lung compressed and watch pressure gauge:
   ● At an airway pressure of 36 to 40 mbar, the ventilator should switch over to expiration and the test lung deflates.
5. The red alarm indicator flashes and the following message appears on the display:

   Paw high

   The intermittent tone sounds.
   ● Release test lung.
   ● The intermittent tone ceases.
6. Press «/c103 Reset» to clear the display.

Checking »Paw low« alarm

Use the same settings as above.
   ● Disconnect test lung from breathing valve.
5. The red alarm indicator flashes after approx. 20 seconds and the following message appears on the display:

   Paw low

   The intermittent tone sounds.
   ● Reconnect test lung.
   ● The intermittent tone ceases after approx. 25 seconds.
6. Press «/c103 Reset» to clear the display.
Checking readiness for operation

Checking synchronization for SIMV

1. Set switch for ventilation modes to »SIMV«
2. Set »Pmax« knob to 60 mbar.
3. Set »PEEP« knob to 10 mbar.
4. Compress and release test lung several times to simulate spontaneous breathing.
   - A synchronized ventilation stroke must be produced within approx. 5 seconds.
   - Synchronization is only effective if a star (*) briefly appears behind the measured value on the display.
   - Example:

```
SIMV MV = 6.0 *
```

1. Set switch for ventilation modes to »IPPV«
3. Set »PEEP« knob to 0.

Checking »Upstream pressure low« alarm

Cut off gas supply:
- Close cylinder valve or
- Unplug probe.
- Display reads:

```
Ventilation off
Upstream pressure low
```

- The intermittent alarm sounds.
5. Red alarm lamp flashes.
- Reconnect gas supply:
- Unit operates with the parameters set.
6. Press »Reset« to clear the display.
Checking «Main supply down» alarm

Use the above settings.
- Connect external power supply (power supply unit or DC/DC converter).
  1. The green LED lights up.
- Interrupt external power supply:
  2. the red alarm indicator flashes,
  1. the green LED goes out.
  The following message appears on the display:

```
Main supply down
```

The intermittent tone sounds.
The ventilator continues operation with the internal battery pack.
- Press «Reset» to clear the display.
The intermittent tone ceases.
The message «Main supply down» disappears.
- Reconnect external power supply.

The ventilator is ready for operation when all these checks have been completed successfully.
- ON/OFF switch to 0.
- Disconnect test lung, replace angled connector.

Prolonged storage

If Oxylog 2000 is not used for more than 3 months:
- Remove battery pack (alkaline manganese batteries).
The NiCd battery pack can remain in the ventilator.
## Fault – Cause – Remedy

The following table is intended to assist in identifying and rectifying the underlying cause of any faults triggering an alarm. The messages are listed in alphabetical order.

<table>
<thead>
<tr>
<th>Fault/Message</th>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Apnea</strong></td>
<td>Spontaneous breathing by patient has failed in CPAP mode.</td>
<td>Change over to IPPV or SIMV.</td>
</tr>
<tr>
<td>Alarm indicator flashes, intermittent tone sounds.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Bat. discharged</strong></td>
<td>Battery pack flat, no external power supply.</td>
<td>Replace alkaline manganese battery pack or connect external power supply.</td>
</tr>
<tr>
<td>Alarm indicator flashes, intermittent tone sounds. Ventilation ceases.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Change bat.</strong></td>
<td>Battery pack will be flat within a few minutes, external power supply not connected.</td>
<td>Replace alkaline manganese battery pack or connect external power supply.</td>
</tr>
<tr>
<td>Alarm indicator flashes, single beep every 30 seconds. Illumination for display cannot be switched on.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Charge NiCd</strong></td>
<td>NiCd battery pack will be completely flat within a few minutes, external power supply not connected.</td>
<td>Replace NiCd battery pack or connect power supply.</td>
</tr>
<tr>
<td>Alarm indicator flashes, single beep every 30 seconds, illumination for display cannot be switched on.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Check settings</strong></td>
<td>Ventilator performance parameters have been exceeded, the effective flow is less than 4 L/min or greater than 60 L/min.</td>
<td>Correct the appropriate setting: e.g. Freq., VT or TI: TE</td>
</tr>
<tr>
<td>Alarm indicator flashes, intermittent tone sounds.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Faulty NiCd</strong></td>
<td>Ventilator connected to external power supply, NiCd battery pack defective.</td>
<td>Replace NiCd battery pack.</td>
</tr>
<tr>
<td>Alarm indicator flashes, intermittent tone sounds.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Flow meas. INOP</strong></td>
<td>Flow measurement faulty. The measured values and alarms based on flow measurement are not valid!</td>
<td>Ventilation can be continued. Observe patient carefully! Call DrägerService after shutdown.</td>
</tr>
<tr>
<td>Alarm indicator flashes, intermittent tone sounds.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>high frequency</strong></td>
<td>Hyperventilation, self-triggering. Measured frequency exceeds set frequency by more than 50 %.</td>
<td>Correct settings, change over to IPPV if necessary.</td>
</tr>
<tr>
<td>Alarm indicator flashes, intermittent tone sounds.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Leakage</strong></td>
<td>The measured expiratory minute volume is approx. 40 % lower than the inspiratory value. Leak in flow measuring hoses.</td>
<td>Remedy leaks in patient system and possibly in tube. Use new flow measuring hoses.</td>
</tr>
<tr>
<td>Alarm indicator flashes, intermittent tone sounds.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Main supply down</strong></td>
<td>Plug connection to external power supply does not make contact. Power supply unit or DC/DC converter defective.</td>
<td>Check plug connection or replace power supply unit or DC/DC converter. Press «Reset» to confirm. Ventilator continues operation with internal power supply.</td>
</tr>
<tr>
<td>Alarm indicator flashes, intermittent tone sounds.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>NiCd discharged</strong></td>
<td>NiCd battery pack flat, no external power supply.</td>
<td>Replace NiCd battery pack or connect power supply.</td>
</tr>
<tr>
<td>Alarm indicator flashes, intermittent tone sounds, ventilation ceases.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fault/Message</td>
<td>Cause</td>
<td>Remedy</td>
</tr>
<tr>
<td>---------------</td>
<td>-------</td>
<td>--------</td>
</tr>
<tr>
<td>No NiCd charge</td>
<td>NiCd battery pack not fitted or alkaline manganese battery pack fitted or ambient temperature when charging the internal NiCd battery pack is outside the range 0 to 35 °C or internal fuse defective.</td>
<td>Charge NiCd battery pack at ambient temperatures between 0 and 35 °C.</td>
</tr>
<tr>
<td>No NiCd or bat.</td>
<td>Ventilator connected to external power supply, internal power supply not available.</td>
<td>Fit fully charged NiCd or new alkaline manganese battery pack.</td>
</tr>
<tr>
<td>Paw high</td>
<td>Stenosis in the airways. Ventilation hose kinked. Reduced lung compliance. The inspiratory flow resulting from the setting for Vt, Freq. and Ti : TE is too high. Patient &quot;fights&quot; the machine.</td>
<td>Clear airways. Ensure ventilation hose is not kinked. Set higher Pmax value. Set a longer inspiration time (smaller flow) with the Ti : TE knob. Change ventilation pattern or ventilation mode. Sedate patient if necessary.</td>
</tr>
<tr>
<td>Paw low</td>
<td>Disconnection / leakage in patient connection, breathing valve or ventilation hose. Diaphragm wrongly fitted in breathing valve or damaged. Breathing valve cover damaged/worn. Leak in cuff.</td>
<td>Ensure connections are tight. Fit diaphragm correctly or replace it. Replace breathing valve. Inflate cuff and check for leaks.</td>
</tr>
<tr>
<td>Supply press. low</td>
<td>O2 cylinder empty, cylinder valve closed, probe not plugged into piped medical gas system.</td>
<td>Check gas supply in O2 cylinder, connect to full O2 cylinder. Open cylinder valve. Check gas pressure in piping system, ensure that system pressure is more than 2.7 bar. Push probe fully into wall socket.</td>
</tr>
<tr>
<td>XX XX XX XX XX</td>
<td>Internal machine fault.</td>
<td>Switch off ventilator and disconnect from external power supply. Switch ventilator on again. If fault recurs: use alternative machine and call DrägerService.</td>
</tr>
<tr>
<td>When switching on: no alarm tones of the same length to be heard.</td>
<td>Internal machine fault.</td>
<td>Switch ventilator off and on again. If fault recurs, use alternative machine and call DrägerService.</td>
</tr>
<tr>
<td>No message. External power supply connected, green LED does not light up.</td>
<td>Output voltage of power supply unit or DC/DC converter outside the range of 11 to 13 V.</td>
<td>Check plug connection or replace power supply unit or converter.</td>
</tr>
<tr>
<td>Fault/Message</td>
<td>Cause</td>
<td>Remedy</td>
</tr>
<tr>
<td>----------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------</td>
</tr>
<tr>
<td>No message, no alarm, ventilator does not work.</td>
<td>No internal or external power supply available.</td>
<td>Fit fully charged NiCd battery pack or new alkaline manganese battery pack. Use alternative machine if applicable. Replace fuse, page 41.</td>
</tr>
<tr>
<td>No message. Continuous tone sounds for at least 7 seconds.</td>
<td>Sudden failure of the internal power supply when external power supply is not connected.</td>
<td>Patient must immediately be ventilated by hand! Connect external power supply. Check internal power supply.</td>
</tr>
</tbody>
</table>
Maintenance intervals

Ventilator and parts must be cleaned and disinfected before starting any maintenance procedures, as well as before returning machine or parts for repairs!

Internal NiCd battery pack
Replace when display shows «Faulty NiCd» during charging, page 41.
Replace every 2 years at the latest.

Internal alkaline manganese battery pack
Replace at the latest when display shows «Bat. discharged» or «Change bat».

Inspection and maintenance
Every 2 years by trained service personnel.

Pressure reducer
Basic overhaul by trained service personnel after 6 years.

Disposing of the ventilator
at the end of its service life

This device is subject to EU Directive 2002/96/EC (WEEE). It is not registered for use in private households, and may not be disposed of at municipal collection points for waste electrical and electronic equipment.

Dräger Medical has authorized a firm to dispose of this device in the proper manner: for more detailed information, please contact your local Dräger Medical organization.

Disposing of alkaline manganese and NiCd batteries

— Do not throw into fire: risk of explosion!
— Do not open by force: risk of cauterization!
— Do not recharge alkaline manganese batteries.

Alkaline manganese and NiCd batteries must be disposed of as special waste:
● in accordance with local waste disposal regulations.

Further information can be obtained from the local environment and public health authorities, as well as from approved waste disposal companies.

If LCD display glass is broken
A liquid chemical may escape.
● Do not allow this liquid to come into contact with the human body.
● Wash affected areas of skin with soap.
Fitting/replacing internal NiCd battery pack

- Before using ventilator for the first time.
- When the following display appears during charging:

  **Faulty NiCd**

  and

- every 2 years as a precautionary measure (check in medicament logbook).

- Undo screw in cover of battery compartment, e.g. with a coin, and remove cover.
- Remove faulty NiCd battery pack and disconnect plug.
- Connect plug of new NiCd battery pack to socket of battery compartment and place battery pack in compartment.
- Refit cover and tighten screw.
- Charge built-in new battery pack:
  - with DC voltage from the on-board supply
  - or with the power supply unit.
- Dispose of the faulty NiCd battery pack as special waste, page 40.
- Charge NiCd battery pack, page 27.
- Screw cover into place.

**Note:** It takes about 8 hours to recharge a completely flat NiCd battery pack.

Replacing the fuse

if operation with NiCd or alkaline manganese batteries is impossible.

- Remove defective fuse with the aid of a screwdriver.
- Press new fuse into terminal.
  Quick-acting fuse: F 1L 250V IEC 127
  Delay-action fuse: T 1L 250V IEC 127
- Screw cover into place.
Set language for display messages

The following languages are available for the display messages:

<table>
<thead>
<tr>
<th>Language</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>International English</td>
<td>(english)</td>
</tr>
<tr>
<td>German</td>
<td>(deutsch)</td>
</tr>
<tr>
<td>French</td>
<td>(français france)</td>
</tr>
<tr>
<td>US English</td>
<td>(american english)</td>
</tr>
<tr>
<td>Dutch</td>
<td>(nederlands)</td>
</tr>
<tr>
<td>Swedish</td>
<td>(svenska)</td>
</tr>
<tr>
<td>Portuguese</td>
<td>(portugues)</td>
</tr>
<tr>
<td>Italian</td>
<td>(italiano)</td>
</tr>
<tr>
<td>Spanish</td>
<td>(espagnol)</td>
</tr>
<tr>
<td>International French</td>
<td>(français)</td>
</tr>
</tbody>
</table>

1. ON/OFF switch to »0« (OFF).
2+3 Turn rotary knobs »Freq.« and »Vt« to right stop.
4+5 Hold down »O Info« and »X Reset« buttons.

Still holding these buttons down:
1. ON/OFF switch to »I« (ON).

Oxylogþ2000 carries out the self-test. Then:
Display:

```
Customer
Service Mode
```

4+5 Release buttons.
Display:

```
Adjust language
<- 001 +>
```

4+5 Confirm = briefly press »O Info« and »X Reset« at the same time.
4/5 Press »O Info« or »X Reset« to select language.
4+5 Confirm language: briefly press »O Info« and »X Reset« at the same time.
What's what

Front view

1 Pressure gauge for airway pressure
2 Rotary knob for ventilation time ratio «Ti : Te», infinitely adjustable from 1 : 3 to 2 : 1
3 Rotary knob for limiting the airway pressure «Pmax», infinitely adjustable from 20 to 60 mbar; can also be set to 80 mbar.
4 Rotary knob for «PEEP», infinitely adjustable from 0 to 15 mbar, with lock for PEEP greater than 10 mbar.
5 Switch for ventilation modes: «IPPV/SIPPV» and «SIMV/CPAP»
6 ON/OFF switch «0 / I»
7 Selector switch for inspiratory oxygen concentration during IPPV/SIPPV and SIMV
«No Air Mix» = 100 vol.% O2
«Air Mix» = 60 vol.% O2
8 Green LED "external power supply available"
9 Red alarm indicator
10 «Reset» key to suppress the alarm tone for approx. 2 minutes and to clear the warning messages
11 Rotary knob for tidal volume VT, infinitely adjustable from 0.1 L to 1.5 L
12 Liquid crystal display for minute volume, warnings and advisory messages
13 Rotary knob for the ventilation frequency «Freq.», infinitely adjustable from 5 to 40 1/min.
0/min position for «CPAP» ventilation mode.
14 «Info» key to display additional settings and measured values, to switch on illumination of the LC display for 30 seconds and to check the displays and alarm tone.
What's what

Rear view

1 Compartment for internal power supply:
   pack of six batteries, either NiCd or alkaline manganese
Right-hand side view

1 Bracket for mounting unit in vehicles and for hanging unit from wall rails and horizontal tubes up to 38 mm diameter
2 Connector for external power supply (power supply unit or on-board supply with converter)
3 Connector for O₂, 2.7 to 6.0 bar
4 Connectors for flow measuring hoses
5 Inspiration connector, 22 mm ISO conical connector
6 Speaker
7 Venting and ventilation – must not be obstructed!
8 Feet, may also be used to secure the carrying strap
Technical Data

Ambient conditions

Operation

Temperature –18 to 50 °C
Atmospheric pressure 600 to 1200 hPa
Humidity 30 to 95 % rel. humidity

Transportation and Storage

Temperature –18 to 70 °C
Atmospheric pressure 600 to 1200 hPa
Humidity 10 to 95 % rel. humidity

Performance data

Operational parameters

Control principle Volume flow control, time-cycled, volume-constant, flow chopper (microprocessor-controlled)
Spontaneous breathing with integrated demand valve (also at PEEP level)

Ventilation modes IPPV/SIPVV, SIMV/CPAP
Ventilation frequency 5 to 40 1/min ±1 1/min, infinitely variable
Tidal volume Vt
Setting accuracy for 10 mbar airway pressure ±10 % of set value, referred to 1013 hPa at least 50 mL
Ventilation time ratio Tt : TE
Inspiratory pressure limitation Pmax
PEEP
Accuracy ±2.0 mbar (measured on the pressure gauge)
Expiratory minute volume MV (at Tt : TE = 1 : 1.5)
with effective flow range
Setting error with 10 mbar airway pressure ±10 % of set value, referred to 1013 hPa
(this tolerance span is only used in “Air Mix” mode. In “No Air Mix” mode, the deviations are smaller)

The applied minute volume MV depends on the atmospheric pressure. If the atmospheric pressure falls from 1000 hPa to 900 hPa (corresponding to an altitude of approx. 1000 m), the dosed tidal volume Vt increases by approx. 10 %, because the quantity of gas dosed occupies a larger space at a lower atmospheric pressure. The increased MV, due to atmospheric pressure changes, are not shown in the display.

Spontaneous breathing data

Response pressure of demand valve approx. –1 mbar
Max. delivery at –4 mbar 100 L/min
Sensitivity of synchronization for SIMV 4 L/min
for SIPVV 3 L/min
### Technical Data

**Compliance**
- with 1.5 m ventilation hose: <1.0 mL/mbar
- with 3.0 m ventilation hose: <1.2 mL/mbar

**Inspiratory resistance**: <6 mbar/L/s

**Expiratory resistance**: <4 mbar/L/s

**Dead space volume incl. flow sensor**: approx. 28 mL

**Measuring range**
- **Pressure gauge**: –10 to 80 mbar
- **Display accuracy**: ±2 mbar
- **Max. permissible differential pressure for flow measurement**: ±4 mbar
- **Resistance of flow sensor**: 3 mbar at 100 L/min

**Minute volume measurement**
- **Range**: 2 to 40 L/min
- **Accuracy (with O₂, at 1013 hPa, 20 °C, 50 % rel. humidity)**:
  - for 1 to 5 L/min: ±1 L/min
  - for 5 to 40 L/min: ±12 % of measured value, but at least ±1 L/min

**Patient connection**: 22 mm ISO conical connector

**O₂ concentration of the ventilation gas (with O₂ supply)**
- **Switch set to »Air Mix«**
  - for MV less than 7 L/min: O₂ concentration can increase to 90 vol.%
  - for MV greater than 7 L/min: 60 vol.% O₂ ±10 %
- **Switch set to »No Air Mix«**: 100 vol.% O₂

**Response in extreme conditions**:
- **when supply pressure is 10 bar**: The applied tidal volume Vₜ additionally increases by approx. 5 % of the set value

**Warnings**
- **Supply press. low**: Warning when supply pressure drops below approx. 2.0 bar.
- **Paw high**: Set via »Pmax« knob. Warning when set value for Pmax is reached.
- **Paw low**: Warning when a pressure difference >10 mbar is not built up over a time of >20 s in IPPV/SIPPV or SIMV mode.
- **Leakage**: Warning when the expiratory tidal volume drops below 60 % of the inspiratory tidal volume. The »Leakage« warning is not active in CPAP mode.
- **Apnea**: Only active in CPAP mode. Alarm is activated if no change in breathing phases is detected within a 25 second time span.
- **Check settings**: Warning when the inspiratory flow due to the combination of Vₜ, Freq., Tᵢ: Tₑ is above or below the range 4 to 60 L/min. This warning is important for the performance range of the flow valve. It does indicate an operator error and need not be reset.
- **Warnings**: are indicated visually and acoustically. The acoustic alarm ceases automatically when the fault has been remedied. The text on the display must be cleared = reset.
Technical Data

Self-test performed automatically at regular intervals during operation and in standby mode.

Volume of the alarm tone 75 dB (A) at a distance of 1 m

Supply gas Oxygen for medical use, medical air in emergencies

Quality of the supply gas Dry, oil-free and dust-free

Supply From a pipeline system or from medical gas cylinders

Supply pressure 2.7 to 6.0 bar at 80 L/min

Gas cylinders and pressure reducers must comply with national regulations and be officially approved

Pressure reducers must have a vent valve on the output side to limit the delivery pressure to approx. 10 bar in the event of a fault.

O2 supply connection either:
- DIN to DIN 13252
- NIST* to EN 739
- DISS** to CGA V5-1989
- NF*** 590-116/1987

The gas must be dry, oil-free and dust-free.

Gas consumption for internal control Approx. 1.0 L/min
for »Air Mix« Approx. 50 % of the effective minute volume
for »No Air Mix« Approx. 100 % of the effective minute volume

Typical pneumatic operation time at a minute volume of 10 L/min

11 L O2 cylinder Approx. 200 minutes without mixing (No Air Mix)
Approx. 400 minutes with mixing (Air Mix)

2,5 L O2 cylinder Approx. 45 minutes without mixing (No Air Mix)
Approx. 90 minutes with mixing (Air Mix)

Input voltage for Oxylog 2000 12 V ±1 V DC with DC/DC converter

Connection for external power supply 12 V / 24 V / 28 V DC

Fuse (behind the cover of the battery compartment) F 1L 250V IEC 127 or T 1L 250V IEC 127

Current consumption for high-speed charging of the NiCd battery pack

Ventilator OFF 300 mA (for 8 hours, then switches automatically to trickle charging)
Ventilator ON 530 mA
Current for trickle charging 30 mA

Permissible ambient temperature during charging 0 to 35 °C

Electrical operation time with internal NiCd battery pack
Max. 6 hours at 5 to 50 °C
Max. 3 hours at temperatures below 5 °C

Alkaline manganese batteries
Max. 4 hours at 5 to 50 °C
Max. 2 hours at temperatures below 5 °C with typical settings

* NIST = Non Interchangeable Screw Thread connection
** DISS = Diameter Index Safety Systems
*** NF = French standard
Protection class Type BF (body floating)
Type of protection IP X4 (splash proof)
Protection class of power supply unit II in accordance with EN 60601-1
Operating noise Sound pressure level 48 dB (A) at a distance of 1 m
Dimensions (W x H x D) mm 215 x 123 x 208 (without handle)
Weight
- O₂ cylinder, 2.5 L, full 4.2 kg
- O₂ cylinder, 2.0 L, full 3.5 kg
- Pressure reducer Alduk 1 0.9 kg
- NiCd battery pack 0.15 kg

DC/DC converter
Operating environment To be used only according to installation class 0, EN 61000-4-5
Electrical safety All voltages are in the SELV range, EN 60601-1
Input voltage 10.5 V DC to 30.0 V DC
Output voltage 12.5 V DC (+0.5 V/-1.0 V)
Current consumption 700 mA to 1600 mA
Operating temperature range – 20 °C to +50 °C
Humidity 0 to 95 % rel. humidity (non-condensing)

Electromagnetic compatibility EMC
Tested to EN 60601-1-2: 2001, EN 784-3 (36.101) 10 V/m and UN Regulation nr. 10, revision 2, with respect to EMC for use in motor vehicles, equivalent to Commission Directive 95/54/EC

Classification
according to Directive 93/42/EEC
Appendix IX
UMDNS-Code
Universal Medical Device Nomenclature System 18-098

Materials used
Ventilator housing Impact-proof acrylonitrile butadiene styrene (ABS)
Ventilation hose Silicone rubber
Flow measuring hoses Silicone rubber
Flow sensor housing Polysulphone (PSU)
Wind vane in flow sensor Stainless steel
Housing of breathing valve Polysulphone (PSU)
Diaphragms in breathing valve Silicone rubber
Touch-sensitive keypad on ventilator Polyester film

General Information
The EMC conformity of the Oxylog 2000 includes the use of following external cables, transducers and accessories

Additionally, accessories may be used which do not affect EMC compliance, if no other reasons interdict the use of them. The non-observance may result in increased emissions or decreased immunity of the Oxylog 2000.

The Oxylog 2000 should not be used adjacent to or stacked with other equipment; if adjacent or stacked use is inevitable, the Oxylog 2000 should be observed to verify normal operation in the configuration in which it will be used.

Electromagnetic emissions

<table>
<thead>
<tr>
<th>Emissions</th>
<th>Compliance according to</th>
<th>Electromagnetic environment</th>
</tr>
</thead>
<tbody>
<tr>
<td>RF emissions (CISPR 11)</td>
<td>Group 1</td>
<td>The Oxylog 2000 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>Harmonic emissions</td>
<td>Class A</td>
<td>The Oxylog 2000 is suitable for use in all establishments including domestic establishments and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.</td>
</tr>
<tr>
<td>Voltage fluctuations / flicker</td>
<td>Complies</td>
<td></td>
</tr>
</tbody>
</table>

Information re electromagnetic emissions (IEC 60101-1-2: 2001, table 201)
Electromagnetic Immunity

<table>
<thead>
<tr>
<th>Immunity against</th>
<th>IEC 60601-1-2 test level</th>
<th>Compliance level (of the Oxylog 2000)</th>
<th>Electromagnetic environment</th>
</tr>
</thead>
<tbody>
<tr>
<td>electrostatic dis-charge, ESD</td>
<td>contact discharge: 6 kV</td>
<td>6 kV</td>
<td>Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.</td>
</tr>
<tr>
<td>(IEC 61000-4-2)</td>
<td>air discharge: 8 kV</td>
<td>8 kV</td>
<td></td>
</tr>
<tr>
<td>electrical fast transients / bursts</td>
<td>power supply lines: 2 kV</td>
<td>2 kV</td>
<td>Mains power quality should be that of a typical commercial or hospital environment.</td>
</tr>
<tr>
<td>(IEC 61000-4-4)</td>
<td>longer input / output lines: 1 kV</td>
<td>1 kV</td>
<td></td>
</tr>
<tr>
<td>surges on AC mains lines</td>
<td>common mode: 2 kV</td>
<td>2 kV</td>
<td>Mains power quality should be that of a typical commercial or hospital environment.</td>
</tr>
<tr>
<td>(IEC 61000-4-5)</td>
<td>differential mode: 1 kV</td>
<td>1 kV</td>
<td></td>
</tr>
<tr>
<td>power frequency magnetic field 50/60 Hz</td>
<td>3 A/m</td>
<td>3 A/m</td>
<td>In close vicinity to the Oxylog 2000, no equipment with extraordinary power frequency magnetic fields (power transformers, etc.) should be operated.</td>
</tr>
<tr>
<td>(IEC 61000-4-8)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>voltage dips and short interruptions on AC mains</td>
<td>dip &gt;95%, 0.5 periods</td>
<td>&gt;95%, 0.5 per.</td>
<td>Mains power should be that of a typical commercial or hospital environment. If user requires continued operation during power mains inter-ruptions, it is recommended to power the Oxylog 2000 from an uninterruptible supply or a battery.</td>
</tr>
<tr>
<td>input lines (IEC 61000-4-11)</td>
<td>dip 60%, 5 periods</td>
<td>60%, 5 per.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>dip 30%, 25 periods</td>
<td>30%, 25 per.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>dip &gt;95%, 5 seconds</td>
<td>&gt;95%, 5 sec.</td>
<td></td>
</tr>
<tr>
<td>radiated rf (IEC 61000-4-3)</td>
<td>80 MHz - 2.5 GHz: 10 V/m</td>
<td>10 V/m</td>
<td>Recommended separation distance from portable and mobile rf transmitters with transmission power $P_{EIRP}$ to the Oxylog 2000 including its lines: $1.84 \times \sqrt[3]{P_{EIRP}}$ (X1)</td>
</tr>
<tr>
<td>rf coupled into lines (IEC 61000-4-6)</td>
<td>150 kHz - 80 MHz: 10 V</td>
<td>10 V</td>
<td></td>
</tr>
<tr>
<td></td>
<td>within ISM bands, 3 V</td>
<td>10 V</td>
<td></td>
</tr>
<tr>
<td></td>
<td>outside ISM bands (X2)</td>
<td>3 V</td>
<td></td>
</tr>
</tbody>
</table>

Information re electromagnetic immunity (IEC 60601-1-2: 2001, tables 202, 203, 204)

x1) For PEIRP the highest possible "equivalent isotropic radiated power" of the adjacent rf transmitter has to be inserted (value in Watt). Also in the vicinity of equipment marked with the symbol interference may occur. Field strengths from fixed, portable or mobile rf transmitters at the location of the Oxylog 2000 should be less than 3 V/m in the frequency range from 150 kHz to 2.5 GHz and less than 1 V/m above 2.5 GHz.

x2) ISM bands in this frequency range are: 6.765 MHz - 6.795 MHz, 13.553 MHz - 13.567 MHz, 26.957 MHz - 27.283 MHz, 40.66 MHz - 40.70 MHz.
Recommended separation distances

<table>
<thead>
<tr>
<th>max. $P_{EIRP}$ (W)</th>
<th>3 V/m distance* (m)</th>
<th>1 V/m distance* (m)</th>
<th>Hint</th>
</tr>
</thead>
<tbody>
<tr>
<td>0,001</td>
<td>0,06</td>
<td>0,17</td>
<td></td>
</tr>
<tr>
<td>0,003</td>
<td>0,10</td>
<td>0,30</td>
<td></td>
</tr>
<tr>
<td>0,010</td>
<td>0,18</td>
<td>0,55</td>
<td></td>
</tr>
<tr>
<td>0,030</td>
<td>0,32</td>
<td>0,95</td>
<td>e.g. WLAN 5250 / 5775 (Europe)</td>
</tr>
<tr>
<td>0,100</td>
<td>0,58</td>
<td>1,73</td>
<td>e.g. WLAN 2440 (Europe), Bluetooth</td>
</tr>
<tr>
<td>0,200</td>
<td>0,82</td>
<td>2,46</td>
<td>e.g. WLAN 5250 (not in Europe)</td>
</tr>
<tr>
<td>0,250</td>
<td>0,91</td>
<td>2,75</td>
<td>e.g. DECT devices</td>
</tr>
<tr>
<td>1,000</td>
<td>1,83</td>
<td>5,48</td>
<td>e.g. GSM 1800- / GSM 1900- / UMTS- mobiles, WLAN 5600 (not in Europe)</td>
</tr>
<tr>
<td>2,000</td>
<td>2,60</td>
<td>7,78</td>
<td>e.g. GSM 900 mobiles</td>
</tr>
<tr>
<td>3,000</td>
<td>3,16</td>
<td>9,49</td>
<td></td>
</tr>
</tbody>
</table>

Information re separation distances (IEC 60601-1-2: 2001, tables 205 and 206)

* 3 V/m distance to transmitters with frequencies from 150 kHz to 2.5 GHz, otherwise 1 V/m distance.
Description of operating principles

Symbols for pneumatic components

- Filter
- Non-return check valve
- Pressure regulator
- Pressure limiting valve, variable
- Pressure limiting valve, with fixed setting
- 2/2-way valve, pneumatically controlled
- 3/2-way valve, electrically controlled
- Injector
- Pressure gauge
- Pressure sensor
- Differential pressure sensor
- Air inlet
Gas supply

The O₂ gas supply (or medical gas) is purified by filter 1 and regulated by pressure regulator 2 to a constant pressure. The 3/2-way solenoid valve »Insp./Exp.« 3 releases the inspiratory gas flow in IPPV/SIMV in time with ventilation frequency. Flow is regulated by the electrically controlled flow valve 10.

The gas supply is routed to the 3/2-way solenoid valve »Insp./Exp.« 3 and to demand valve 6 via the 3/2-way valve »IPPV/CPAP« 4. The system pressure is routed via solenoid valve 7 to PEEP valve 8 and monitored by pressure sensor 9.

IPPV/SIMV/SIMV

Inspiration

The 3/2-way solenoid valve »Insp./Exp.« 3 releases the gas flow. Flow is regulated by the electrically controlled flow valve 10 and reaches ventilation hose 13 via the 2/2-way valve 11 or injector 12, as well as the patient connection via breathing valve 14 and flow sensor 15. Depending on the switching position of the 3/2-way valve 16, 100 % O₂ is applied or the gas supply is diluted to 60 % O₂. For this purpose, injector 12 takes in ambient air via non-return valve 17, the 2/2-way valve 18 and air inlet 19. The position of the »Air Mix/No Air Mix« switch is monitored by pressure sensor 20.

Expiration/PEEP

The gas in the ventilation hose 13 is released via the 2/2-way valve 21 to the end expiratory pressure set on the PEEP valve 8. The patient can exhale into the ambient air via flow sensor 15 and breathing valve 14. The PEEP pressure set on PEEP valve 8 is superimposed by the breathing valve 14.

The controlled 2/2-way valve 21 prevents the inspiratory gas from escaping to the mechanical PEEP valve 8. The pressure limiting valve 22 limits the inspiratory pressure to a maximum value independently of the Pmax regulating unit. Ambient air can be drawn in additionally via the extra valve 23 if the gas supply fails. The airway pressure is measured by pressure gauge 24 and pressure sensor 25. The expiratory flow generates a proportional differential pressure on flow sensor 15, which is measured by differential pressure sensor 26 and used to determine the minute volume. Automatic zero calibration of differential pressure sensor 26 is carried out with 3/2-way valve 27. The 3/2-way solenoid valve »Insp./Exp.« 3 interrupts the gas flow either time-cycled – at the end of the inspiration time determined by the ventilation frequency and ratio Tᵢ: Tₑ – or pressure-controlled when the set pressure Pmax is reached.
Description of operating principles

CPAP
The gas flow to demand valve 6 is released by the 3/2-way valve 4 and monitored by pressure sensor 5.

Inspiration / Expiration
Controlled by the patient's inspiratory effort, demand valve 6 supplies the appropriate volume to the patient. This supply is stopped when the patient wishes to start expiration. The demand valve generates the desired CPAP pressure in the breathing system using PEEP/CPAP set on the PEEP valve 8.
Abbreviations and symbols

Air Mix  Mixture of O₂ and ambient air
(≈ approx. 60 vol.% O₂)

CPAP  Continuous Positive Airway Pressure
– Breathing with positive airway pressure

CPR  Cardio-pulmonary resuscitation

IPPV  Intermittent Positive Pressure Ventilation

KG  Body weight in kg

MV  Minute volume, L/min

No Air Mix  O₂ is not mixed with ambient air
(≈ 100 vol.% O₂)

Paw  Airway pressure

Paw high  Upper alarm limit for airway pressure

Paw low  Lower alarm limit for airway pressure

PEEP  Positive End Expiratory Pressure

Pmax  Setting for upper alarm limit for airway pressure
«Paw high»

Reset  Reset = clear

SIMV  Synchronized Intermittent Mandatory Ventilation

SIPPV  Synchronized Intermittent Positive Pressure Ventilation

Ti : Te  Ratio of inspiration time to expiration time

*  Synchronized ventilation stroke for SIPPV and SIMV

Setting symbol for ventilation frequency 12 1/min and
Pmax 80 mbar for cardio-pulmonary resuscitation

Key to suppress alarm tone for approx. 2 minutes and to
reset the alarm message when the fault has been rectified
= clear

Alarm indicator, lights up red in the event of an alarm

LED for «external DC power available», lights up green

Observe Instructions for Use

Protection class BF (body floating)

Safety transformer, short-circuit proof

For indoor use only

Thermal fuse

Protective insulation (protection class II)

The device complies with UN Regulation nr. 10, revision 2
with respect to EMC for use in motor vehicles.
Appendix

Principle of flow measurement

The inspiratory and expiratory flow both stream through the flow sensor positioned at the patient connection of the breathing valve. The flow generates a pressure drop in the sensor which is measured via two pressure measuring hoses in Oxylog 2000. The pressure drop is proportional to the flow. The expiratory minute volume is calculated from the measured expiratory flow and indicated. The inspiratory volume supplied is calculated from the measured inspiratory flow and then compared with the expiratory volume to calculate the leakage, which is then displayed. The inspiratory flow measurement is also used to synchronize the mandatory strokes in SIMV ventilation mode.

Pressure effect of tidal volume on operation of »Air Mix«

The air and oxygen are mixed by an injector which additionally takes in air to produce an air/oxygen mixture containing approx. 60 vol.% O₂ (Air Mix). For physical reasons, the suction performance of the injector decreases as the back-pressure increases. At high airway pressures, the set tidal volume V_t may be reduced and the O₂ concentration increased when using the »Air Mix« function. At airway pressures between 20 and 30 mbar, the set tidal volume is the same as the applied tidal volume V_t. The O₂ concentration is around 60 vol.% O₂. The set tidal volume V_t must be increased accordingly with the aid of the measured minute volume at higher airway pressures.
## Order List

<table>
<thead>
<tr>
<th>Name</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Oxylog 2000</strong></td>
<td>2M 86 200</td>
</tr>
<tr>
<td>comprising:</td>
<td></td>
</tr>
<tr>
<td>Oxylog 2000 basic unit</td>
<td></td>
</tr>
<tr>
<td>NiCd battery pack</td>
<td>84 11 599</td>
</tr>
<tr>
<td>with ventilation accessories:</td>
<td></td>
</tr>
<tr>
<td>Breathing valve</td>
<td>84 12 001</td>
</tr>
<tr>
<td>Flow sensor</td>
<td>84 12 034</td>
</tr>
<tr>
<td>Angled connector</td>
<td>84 12 235</td>
</tr>
<tr>
<td>Ventilation hose 1.5 m</td>
<td>84 12 068</td>
</tr>
<tr>
<td>with measuring hoses</td>
<td></td>
</tr>
<tr>
<td>(silicone)</td>
<td></td>
</tr>
<tr>
<td>or</td>
<td></td>
</tr>
<tr>
<td>Ventilation hose 3.0 m</td>
<td>84 12 913</td>
</tr>
<tr>
<td>with measuring hoses</td>
<td></td>
</tr>
<tr>
<td>(silicone)</td>
<td></td>
</tr>
<tr>
<td><strong>Power supply</strong></td>
<td></td>
</tr>
<tr>
<td>for operation and for charging</td>
<td></td>
</tr>
<tr>
<td>the ventilator:</td>
<td></td>
</tr>
<tr>
<td>DC/DC converter</td>
<td>2M 86 404</td>
</tr>
<tr>
<td>AC/DC power supply 230 V; 50 Hz</td>
<td>84 12 074</td>
</tr>
<tr>
<td>(Europe) Mains plug: IEC 83 ;</td>
<td></td>
</tr>
<tr>
<td>1975</td>
<td></td>
</tr>
<tr>
<td>AC/DC power supply 120 V; 60 Hz</td>
<td>84 12 709</td>
</tr>
<tr>
<td>(USA) Mains plug: ANSI C.73.10</td>
<td></td>
</tr>
<tr>
<td>AC/DC power supply 100 V; 50 Hz</td>
<td>84 12 711</td>
</tr>
<tr>
<td>(Japan) Mains plug: ANSI C73 5-15P</td>
<td></td>
</tr>
<tr>
<td>AC/DC power supply 230 V; 50 Hz</td>
<td>84 12 856</td>
</tr>
<tr>
<td>(UK) Mains plug: BS1363</td>
<td></td>
</tr>
<tr>
<td>AC/DC power supply 240 V; 50 Hz</td>
<td>84 12 828</td>
</tr>
<tr>
<td>(Australia) Mains plug: AS C112-1964 Ap</td>
<td></td>
</tr>
<tr>
<td><strong>Battery holder</strong></td>
<td></td>
</tr>
<tr>
<td>for alkaline manganese batteries:</td>
<td></td>
</tr>
<tr>
<td>Battery holder</td>
<td>18 35 505</td>
</tr>
<tr>
<td>Connecting lead for battery holder</td>
<td>84 12 072</td>
</tr>
<tr>
<td>Alkaline manganese battery</td>
<td>13 35 804</td>
</tr>
<tr>
<td><strong>Supply Hoses</strong></td>
<td></td>
</tr>
<tr>
<td>with screw fittings at both ends:</td>
<td></td>
</tr>
<tr>
<td>O2/Air pressure connecting hose 0.5 m</td>
<td>2M 86 930</td>
</tr>
<tr>
<td>NIST</td>
<td></td>
</tr>
<tr>
<td>O2/Air pressure connecting hose 1.5 m</td>
<td>M 17 616</td>
</tr>
<tr>
<td>NIST</td>
<td></td>
</tr>
<tr>
<td>O2/Air pressure connecting hose 3 m</td>
<td>2M 86 687</td>
</tr>
</tbody>
</table>

### Optional Accessories

<table>
<thead>
<tr>
<th>Name</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>O2 cylinder, fibreglass reinforced plastic, 2 L/200 bar G 3/4&quot;, filled</td>
<td>B 10 205</td>
</tr>
<tr>
<td>O2 cylinder, fibreglass reinforced plastic, 2 L/200 bar, PIN Index, filled</td>
<td>B 10 208</td>
</tr>
<tr>
<td>O2 cylinder, steel, 2 L/200 bar G 3/4&quot;, filled</td>
<td>B 02 352</td>
</tr>
<tr>
<td>O2 cylinder, steel, 2.5 L/200 bar G 3/4&quot;, filled</td>
<td>B 03 580</td>
</tr>
<tr>
<td>O2 cylinder, steel, 3 L/200 bar G 3/4&quot;, filled</td>
<td>B 02 533</td>
</tr>
<tr>
<td>O2 cylinder, steel, 2 L/200 bar PIN Index, filled</td>
<td>B 02 351</td>
</tr>
<tr>
<td>O2 cylinder, steel, 2.5 L/200 bar PIN Index, filled,</td>
<td>B 03 582</td>
</tr>
<tr>
<td>or</td>
<td></td>
</tr>
<tr>
<td>O2 cylinder, steel, 3 L/200 bar PIN Index, filled</td>
<td>B 02 531</td>
</tr>
<tr>
<td>O2 cylinder, steel, 2 L/200 bar G 3/4&quot;, filled</td>
<td>B 02 352</td>
</tr>
<tr>
<td>O2 cylinder, steel, 2.5 L/200 bar G 3/4&quot;, filled</td>
<td>B 03 580</td>
</tr>
<tr>
<td>O2 cylinder, steel, 3 L/200 bar G 3/4&quot;, filled</td>
<td>B 02 533</td>
</tr>
<tr>
<td>O2 cylinder, steel, 2 L/200 bar PIN Index, filled</td>
<td>B 02 351</td>
</tr>
<tr>
<td>O2 cylinder, steel, 2.5 L/200 bar PIN Index, filled,</td>
<td>B 03 582</td>
</tr>
<tr>
<td>or</td>
<td></td>
</tr>
<tr>
<td>O2 cylinder, steel, 3 L/200 bar PIN Index, filled</td>
<td>B 02 531</td>
</tr>
<tr>
<td>Pressure-reducing valve Alduk I G 3/4&quot;</td>
<td>2M 86 631</td>
</tr>
<tr>
<td>Pressure-reducing valve Alduk II G 3/4&quot;</td>
<td>2M 86 632</td>
</tr>
<tr>
<td>Pressure-reducing valve Alduk I PIN index</td>
<td>2M 86 677</td>
</tr>
<tr>
<td>Pressure-reducing valve Alduk II PIN index</td>
<td>2M 86 678</td>
</tr>
<tr>
<td>Adapter DIN / DIN for pressure-reducing valve</td>
<td>86 02 728</td>
</tr>
<tr>
<td>Test lung</td>
<td>84 03 201</td>
</tr>
<tr>
<td>Vehicle bracket</td>
<td>84 12 069</td>
</tr>
<tr>
<td>Carrying belt</td>
<td>84 12 073</td>
</tr>
<tr>
<td>Caddy &amp; CompactCaddy</td>
<td>57 03 300</td>
</tr>
<tr>
<td><strong>Oxylate</strong></td>
<td></td>
</tr>
<tr>
<td>For simultaneous connection of the cylinder and the central supply</td>
<td></td>
</tr>
<tr>
<td>Oxylate</td>
<td>84 12 830</td>
</tr>
<tr>
<td>Connection hose cylinder Oxylate</td>
<td>84 12 716</td>
</tr>
<tr>
<td>Central Gas hose Oxylate</td>
<td>84 10 884</td>
</tr>
<tr>
<td>or</td>
<td></td>
</tr>
<tr>
<td>Spiral Hose Oxylate</td>
<td>2M 86 681</td>
</tr>
<tr>
<td>Adapter AIR/O2 NIST/DIN</td>
<td>M 32 497</td>
</tr>
<tr>
<td>Adapter AIR/O2-O2 NIST/DIN</td>
<td>M 36 042</td>
</tr>
</tbody>
</table>

With M15x1 screw fitting and plug-in connector for central supply socket:

According Hose Configuration Set | 86 01 697 |
Set of Spiral Hoses              | 2M 86 686 |
Index

Abbreviations .................................................... 56
Accessories ...................................................... 5
Alarm »Main supply down« ............................... 36
Alarm »Paw high« .............................................. 34
Alarm »Paw low« ............................................... 34
Alarm »Upstream pressure low« ....................... 35
Alarms ............................................................. 16
Alkaline manganese and NiCd batteries, disposal 40
Alkaline manganese battery ................................ 40
Ambient conditions ............................................. 46
Angled connector .............................................. 22
Assembly .......................................................... 22
Bacterial filter .................................................... 23
Cardio-pulmonary resuscitation ......................... 11
Checking readiness for operation ....................... 31
Cleaning and disinfecting .................................... 19
Controlled ventilation IPPV ................................... 9
CPAP, using ...................................................... 14
DC/DC converter .................................................. 24
Device quick check ............................................. 8
Electrical operation time ...................................... 17
Explosion hazard areas ....................................... 5
Fault – Cause – Remedy ....................................... 37
Front view .......................................................... 43
Fuse ................................................................. 41
Gas supply ........................................................ 54
Gas supply, connecting ....................................... 28
Inspection and maintenance ............................... 40
Intended Use ...................................................... 6
LCD display ........................................................ 40
Maintenance ...................................................... 5
Maintenance intervals ........................................ 40
Manual ventilation equipment ............................. 5
Materials ............................................................ 49
Medical gas cylinders ........................................ 28
Messages .......................................................... 37
NiCd battery pack .............................................. 40
NiCd battery pack, charging ............................... 27
NiCd battery pack, fitting ..................................... 40
Observe safety notes ............................................ 5
Operating principles, description ....................... 53
Operating Concept .............................................. 7
Operation with alkaline manganese batteries .......... 26
Order List .......................................................... 58
PEEP, applying .................................................... 11
PEEP, checking ................................................... 33
Performance data ................................................ 46
Piped medical gas system .................................... 30
Pneumatic operation time ..................................... 29
Power supply ..................................................... 24
Power supply unit .............................................. 25
Precautions ....................................................... 5
Pressure reducer ................................................ 29
Quick check ........................................................ 8
Rear view .......................................................... 44
Set language ....................................................... 41
Shutdown ........................................................... 17
SIMV, using ........................................................ 12
SIPPV, using .................................................... 12
Sterilizing .......................................................... 20
Stripping down .................................................. 18
Symbols ............................................................ 56
Synchronization for SIMV ................................. 35
Technical Data ..................................................... 46
Test lung, connecting .......................................... 31
Toxic surroundings .............................................. 14
Ventilation, checking .......................................... 32
Ventilator holder ............................................... 28
Weight ............................................................... 49
Wipe disinfecting ............................................... 20
These Instructions for Use apply only to Oxylog 2000 3.n with Serial No.:
If no Serial No. has been filled in by Dräger these Instructions for Use are provided for general information only and are not intended for use with any specific machine or device.

Directive 93/42/EEC concerning Medical Devices

Dräger Medical b.v.
Kanaaldijk 29
5683 CR BEST
The Netherlands
+31 499 331 331
+31 499 331 333
medical.best@draeger.com
www.draeger-medical.com