Dräger medical
A Dräger and Siemens Company

Technical Documentation

Oxylog 2000 *plus*
Emergency and Transport Ventilator

WARNING!
The proper servicing and testing of this device requires a full understanding of this Technical Documentation. Carefully read this Technical Documentation and any applicable Instructions for Use prior to any use of the device.

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Contents

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Abbreviations

This chapter contains a list of the abbreviations used in this manual.

1 Explanation

Abbreviation	Explanation
BTPS	English acronym for “Body Temperature, Pressure, Saturated” (current conditions in the patient's lung, i.e. body temperature 37 °C, ambient pressure, water-vapor saturated gas).
DC	English acronym for “Direct Current”.
EEPROM	English acronym for “Electrically Erasable Programmable Read-Only Memory”.
EL display	Electroluminescence display.
EPROM	English acronym for “Erasable Programmable Read-Only Memory”.
LED	English acronym for “Light Emitting Diode”.
MV	English acronym for “Minute Volume”.
PC	English acronym for “Personal Computer”.
PEEP	English acronym for “Positive End Expiratory Pressure”.
RAM	English acronym for “Random Access Memory”.
VC-CMV	English acronym for the ventilation mode “Volume Control - Controlled Mandatory Ventilation”.
VC-SIMV	English acronym for the ventilation mode “Volume Control - Synchronized Intermittent Mandatory Ventilation”.
VT	English acronym for “Tidal Volume”.

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General

This chapter contains general notes and definitions that are important for the use of this manual.

1 Symbols and Definitions

WARNING

A WARNING statement provides important information about a potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION

A CAUTION statement provides important information about a potentially hazardous situation which, if not avoided, may result in minor or moderate injury to the user or patient or in damage to the equipment or other property.

NOTE

A NOTE provides additional information intended to avoid inconvenience during operation or servicing of the equipment.

Definitions:

Inspection	=	examination of actual condition
Maintenance	=	measures to maintain specified condition
Repair	=	measures to restore specified condition
Servicing	=	inspection, maintenance, and repair

2 Notes

This Technical Documentation conforms to the IEC 60601-1 standard.

Read each step in every procedure thoroughly before beginning any test. Always use the proper tools and specified test equipment.

CAUTION

If you deviate from the instructions and/or recommendations in this Technical Documentation, the equipment may operate improperly or unsafely, or the equipment could be damaged.

CAUTION

Dräger recommends that only Dräger supplied repair parts be used for maintenance. Otherwise the correct functioning of the device may be compromised.

The maintenance procedures described in this Technical Documentation may be performed by properly trained service personnel only. These maintenance procedures do not replace inspections and servicing by the manufacturer.

This Technical Documentation is for informational purposes only. Product information contained in this Technical Documentation does not supersede Product information provided in the Instructions for Use enclosed with the product at the time of delivery.

NOTE

Unless otherwise stated, reference is made to laws, regulations or standards (as amended) applicable in the Federal Republic of Germany for equipment used or serviced in Germany. Users or technicians in all other countries must verify compliance with local laws or applicable international standards.

NOTE

If the test values are not met, please contact your local service organization.

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Function Description

This chapter contains descriptions of the device's technical functions.

1 General

The Oxylog 2000 plus is a time-cycled, volume controlled emergency and transport ventilator with pressure support for patients requiring mandatory or assisted ventilation with a tidal volume from 100 mL upwards. For use by and under supervision of trained health care professionals.

2 Functional principle

Oxylog 2000 plus primarily comprises the pneumatic components with the connection and metering block and the control and display electronics (Fig. 1).

The connection block supplies a constant pressure to the metering block, contains the safety functions such as the emergency air and safety valves, control the pressure (PEEP) during expiration and, together with the ventilation accessories, provides the interface to the patient.

The metering block passes defined volumes of gas of approx. 40% or 100% oxygen to the connection block.

The control and display electronics evaluate the measurement signals, control the valves and provide the interface to the operator.

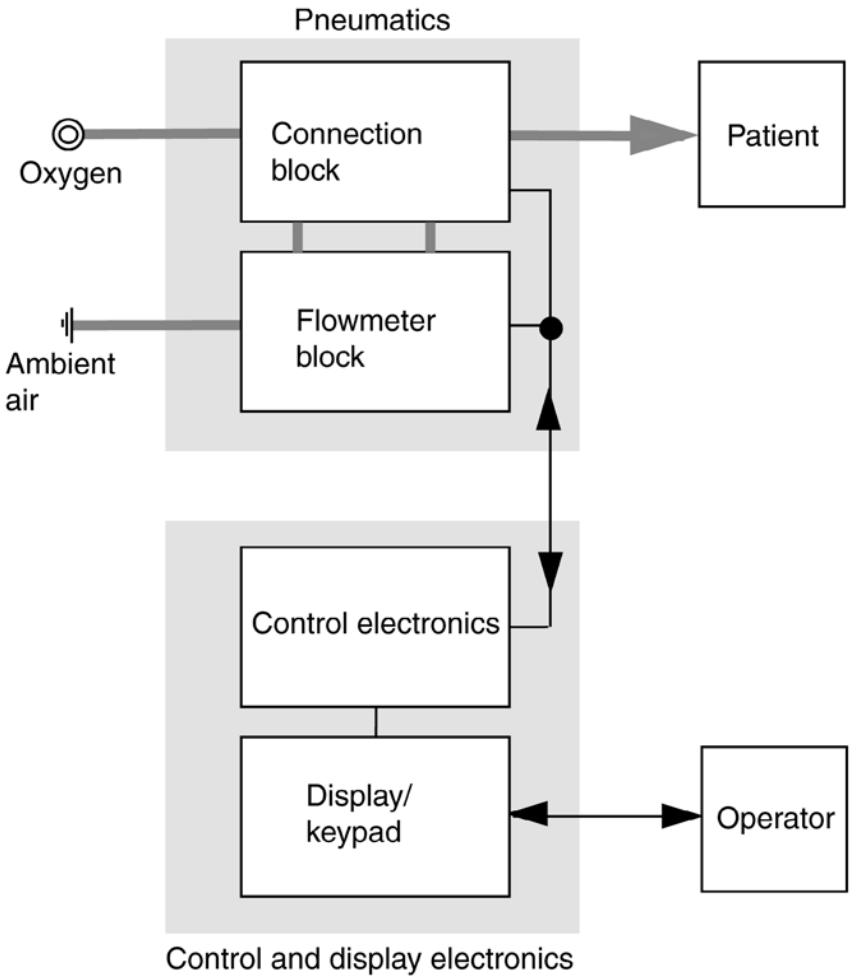

Fig. 1 Functional principle

3 Pneumatic assembly

The following description relates to the pneumatics diagram of the Oxylog 2000 plus. The Control PCB evaluates the measurement signals of the sensors and actuates the valves.

3.1 Inlet

The compressed oxygen passes through the filter F1 and the pressure regulator DR to the valves V1 to V3. The pressure regulator regulates the pressure to 3 bar. This is done to attain a stable flow control. The Control PCB monitors this pressure, which is measured with sensor S3.

3.2 Restrictor

Valves V1 to V3 are proportional valves, each delivering a flow proportional to the overall flow of 0 to 35 L/min. The flow sensor S1 measures the delivered flow and the Control PCB corrects the valve operation as necessary.

Valve V3 comprises two parallel configured valves, to produce a total flow greater than 100 L/min.

With the valve V1 and the ejector E1 ambient air can additionally be drawn in. Valve V1 meters a flow through the ejector. The resultant negative pressure draws ambient air through the filter F2, the flow sensor S2 and the non-return valve V9.

Valve V2 adds oxygen to the ambient air depending on the selected O2 concentration (40 or 100%).

The proportion of ambient air may be a maximum of 75%. The minimum oxygen concentration may thus be 40%.

At flows less than 9 L/min the volume of intake air is so low that an oxygen concentration of 40% is no longer guaranteed. At flows greater than 35 L/min oxygen is added accordingly. An oxygen concentration of 40% is no longer guaranteed.

In a flow range from 9 to 35 L/min an oxygen concentration of 40% or 100% can be set. The non-return valve V9 prevents oxygen escaping into the ambient air. L1 prevents swirling, and ensures a uniform oxygen concentration.

3.3 Sensors and safety functions

The flow sensor S1 measures the inspiratory flow inside the unit and the Control PCB corrects the operation of valves V1 to V3 as necessary based on the measured value.

The safety valve SV opens at a pressure greater than 80 mbar, to prevent the patient from being exposed to high pressure in the event of unit malfunctions.

The emergency breathing valve NV allows the patient to breathe spontaneously in case the unit fails.

The pressure sensor S4 measures the internal patient pressure inside the unit and the PEEP pressure at the ventilation valve V10.

The pressure sensor S6 measures the differential pressure above the flow sensor S8 located close to the patient (Fig. 2). From it, the Control PCB calculates the flow.

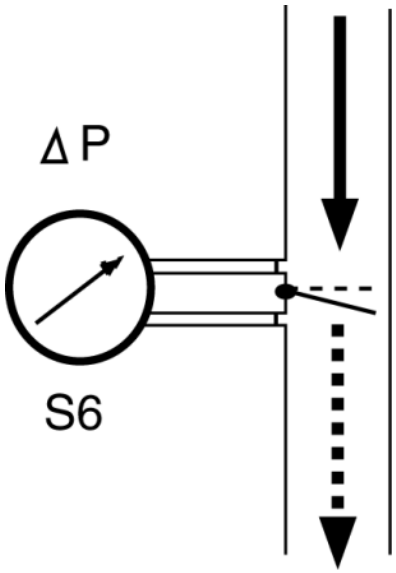

Fig. 2 Functional principle of the external flow sensor

Pressure sensor S5 measures the pressure at the patient. Based on this pressure value, the Control PCB makes calculations including for actuation of the PEEP valve V6.

Valves V7 and V8 switch the connections of S6, S5 against atmosphere at cyclic intervals. The Control PCB calibrates the sensors and any offset drift is prevented.

3.4 PEEP valve

The PEEP valve V6 controls the PEEP setting of the ventilation valve V10.

The Control PCB actuates a coil which delivers a pressure to a diaphragm. The internal tubing system vents to this pre-set PEEP pressure during expiration.

This PEEP pressure also acts on a valve diaphragm in the ventilation valve V10 (Fig. 3/1). On expiration the pre-set PEEP pressure is established at the patient.

During expiration an internal flow of 0.5 L/min flows through the PEEP valve V6 to hold the diaphragm of the PEEP valve still and ensure uniform opening of the PEEP valve.

During inspiration the PEEP valve V6 is closed by an actuation current of 130 mA.

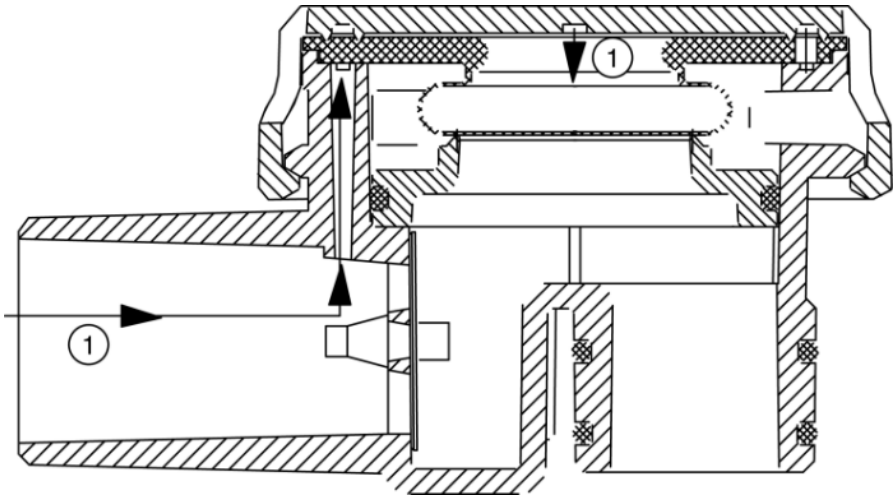

Fig. 3 Ventilation valve

3.5 Ambient pressure conditions

Oxylog 2000 plus meters the tidal volume under BTPS conditions. Sensors S7 and S9 measure the ambient pressure. S5 measures the current pressure level in the lung. In this way the Control PCB can balance fluctuating ambient pressure and the BTPS conditions (Body Temperature, Pressure, Saturated. Measurements referred to conditions of the patient's lung, body temperature 37 °C, ambient pressure, water vapor saturated gas).

4 Electronics

The following description relates to the Electronics block diagram and represents only the principle of operation. The connections of the individual modules are only indicated indirectly, and are made by cable harnesses, connectors and the conductors on the individual PCBs.

4.1 Charging Circuit PCB

The Charging Circuit PCB controls charging of the internal replaceable battery and selection of the voltage supply (mains, on-board system or internal battery).

The Charging Circuit PCB accommodates the input for the external voltage supply. The input is isolated from the remaining electronics by a protective circuit.

The Charging Circuit PCB directly activates the power indicator LEDs. The LEDs are located on the front membrane cover.

The Charging Circuit PCB has its own processor system, and thus its own software. This software is also located on the Control PCB, and is loaded from there onto the Charging Circuit PCB.

The internal replaceable battery has various dummy resistors, depending on the type used. The Charging Circuit PCB detects on the basis of the resistor which type is fitted (nickel metal hydride or lithium ion).

The temperature and charge capacity of the internal replaceable battery is determined by the battery itself. These data are transmitted from the Charging Circuit PCB to the Control PCB.

4.2 Sensor PCB

The Sensor PCB holds all the pressure sensors of the pneumatic system and the internal temperature gauge. The Sensor PCB is the interface for pressure measurement and valve actuation between the pneumatic and electronic systems.

4.3 Front membrane cover

On the front membrane cover are the keys, the LEDs and the rotary knob. Together with the display, the rotary knob and the potentiometers, the front membrane cover is the interface between the unit and the operator. The display is an EL display. EL stands for electroluminescent.

4.4 Control PCB

The Control PCB holds the electronic ON/OFF switch components, the voltage generation of the individual internal operating voltages, and the microprocessor system for control and monitoring of ventilation.

The electronic ON/OFF circuit is directly controlled (switched on or off) by the ON/OFF switch on the device.

If the device is ON and the power fails, an alarm generator generates an audible alarm signal. A Goldcap capacitor delivers the voltage for the signal.

The voltage generator generates the various operating voltages from the supply voltage. For example the +5 V for the microprocessor.

The microprocessor system comprises the microcontroller, an EEPROM, a flash EPROM, a RAM, and a real-time clock (RTC).

The EEPROM holds the calibration data, software options, ID number, unit and service operating hours and the start-up conditions. The flash EPROM holds the medical device software and the software for the Charging Circuit PCB. The real-time clock generates the time and date. The real-time clock's RAM also holds the logs.

The microprocessor system evaluates the measurement signals from the sensors, the settings of the potentiometers and the rotary knob and operates the valves and the display accordingly.

On a change of software the unit no longer needs to be opened. The infrared interface transfers the data from the PC/laptop to the microcontroller and vice versa.

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Maintenance Procedures

This chapter describes the measures required to maintain the specified condition of the device.

1 Replacing the replaceable battery

1. Slacken the screw Fig. 1/1 of the battery compartment cover anti-clockwise until the cover can be opened.
2. Fold the cover Fig. 1/2 down.
3. Pull the replaceable battery Fig. 1/3 forward by its tab and withdraw it.

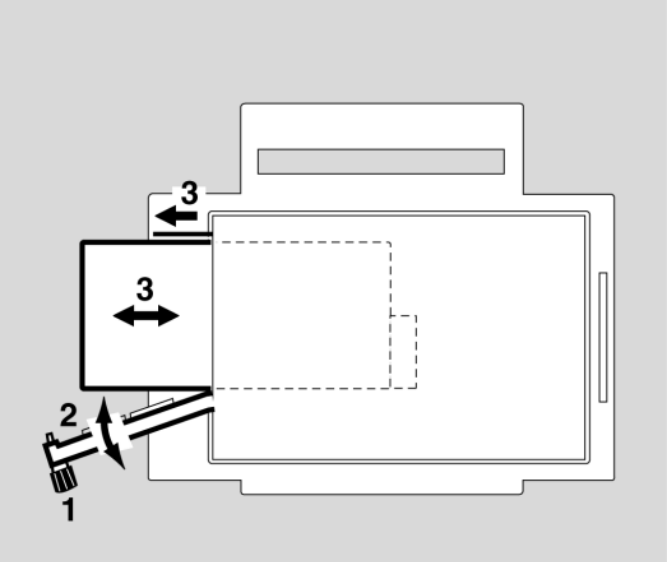

Fig. 1 Removing the replaceable battery

4. Press the button on the new replaceable battery and check the charge.

The LEDs on the replaceable battery indicate the charge condition in percent.

5. Charge the replaceable battery as necessary.

NOTE
The replaceable battery can be charged by the battery charger station or by the external power supply in the Oxylog 2000 plus.

6. Fit the replaceable battery.
7. Switch on the Oxylog 2000 plus and check the battery capacity indicated on the display.

2 Replacing the filter element

1. Switch off the device.
2. Remove screws Fig. 2.

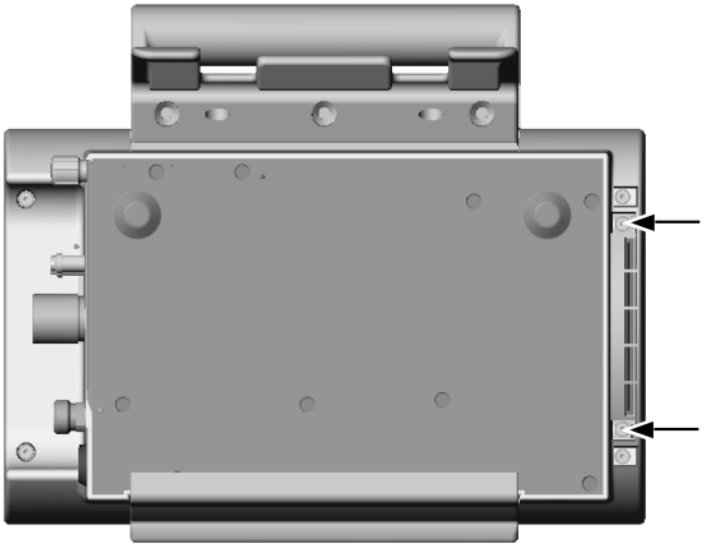

Fig. 2 Removing the filter element

NOTE
Note fitting position of filter element.

3. Remove the filter element.
4. Install the new filter element.
5. Carry out a unit test.
6. Place the fully functional unit at the user's/owner's disposal.

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Schematics and Diagrams

This chapter contains schematics and diagrams that can be of help when servicing the device.

1 General

This section presents the diagrams and overviews of the Oxylog 2000 plus, such as the pneumatic components diagram and the block diagram of the electronics. These schematics and diagrams are partly used as reference to the function description.

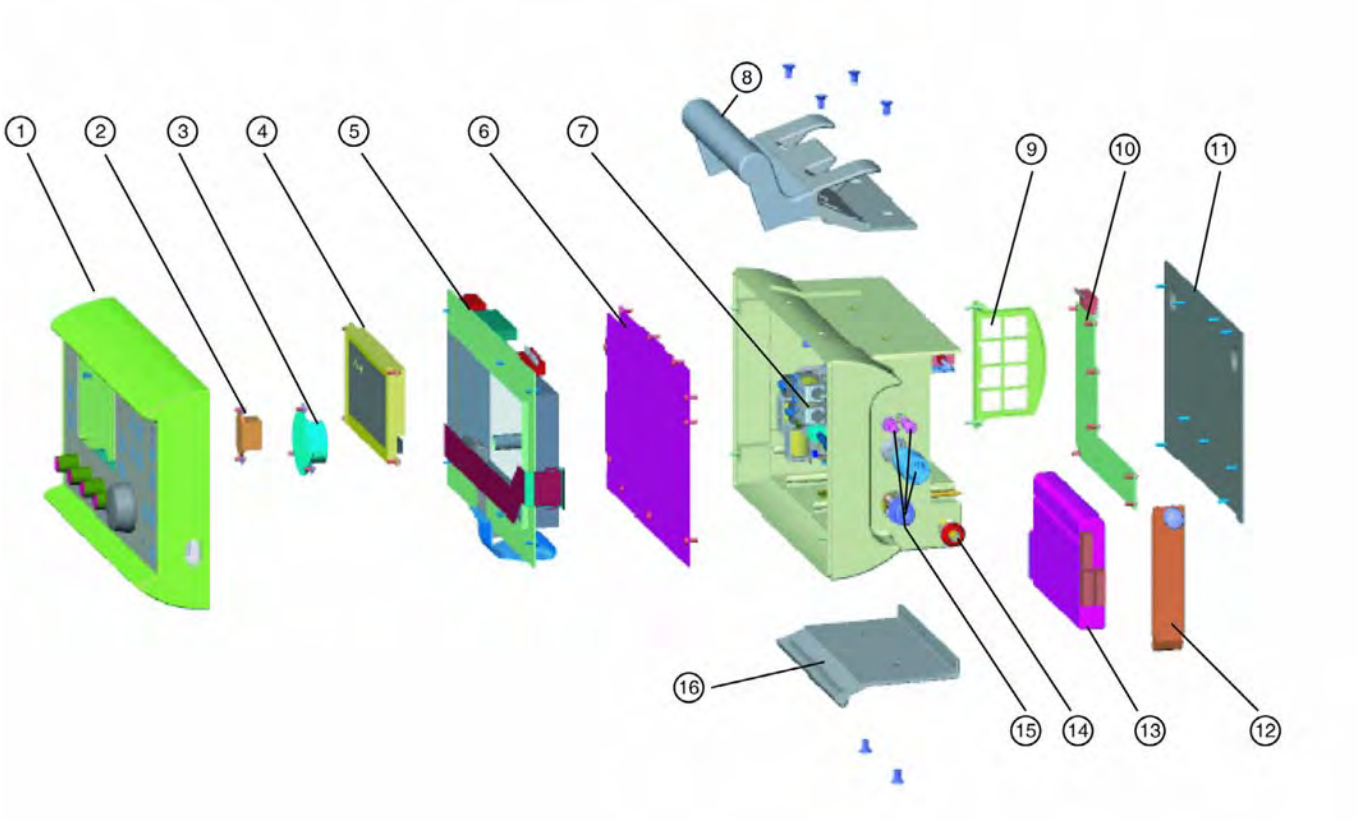

Fig. 1 Overview; for legend see Table 1

Table 1 Legend Fig. 1

Item	Designation
1	Front panel with potentiometers, rotary knob, membrane keypad, and insert strip
2	Signal generator
3	Loudspeaker
4	Display
5	Control PCB (see also Fig. 6)
6	Cover plate for pneumatic assembly
7	Pneumatic assembly and Sensor PCB (see also Fig. 3)
8	Handle
9	Filter element to filter the ambient air intake
10	Charging Circuit PCB
11	Rear panel
12	Battery compartment cover
13	Replaceable battery

Item	Designation
14	DC voltage socket
15	Sockets for flowmeter tubes, ventilation tube and compressed gas tube
16	Base plate

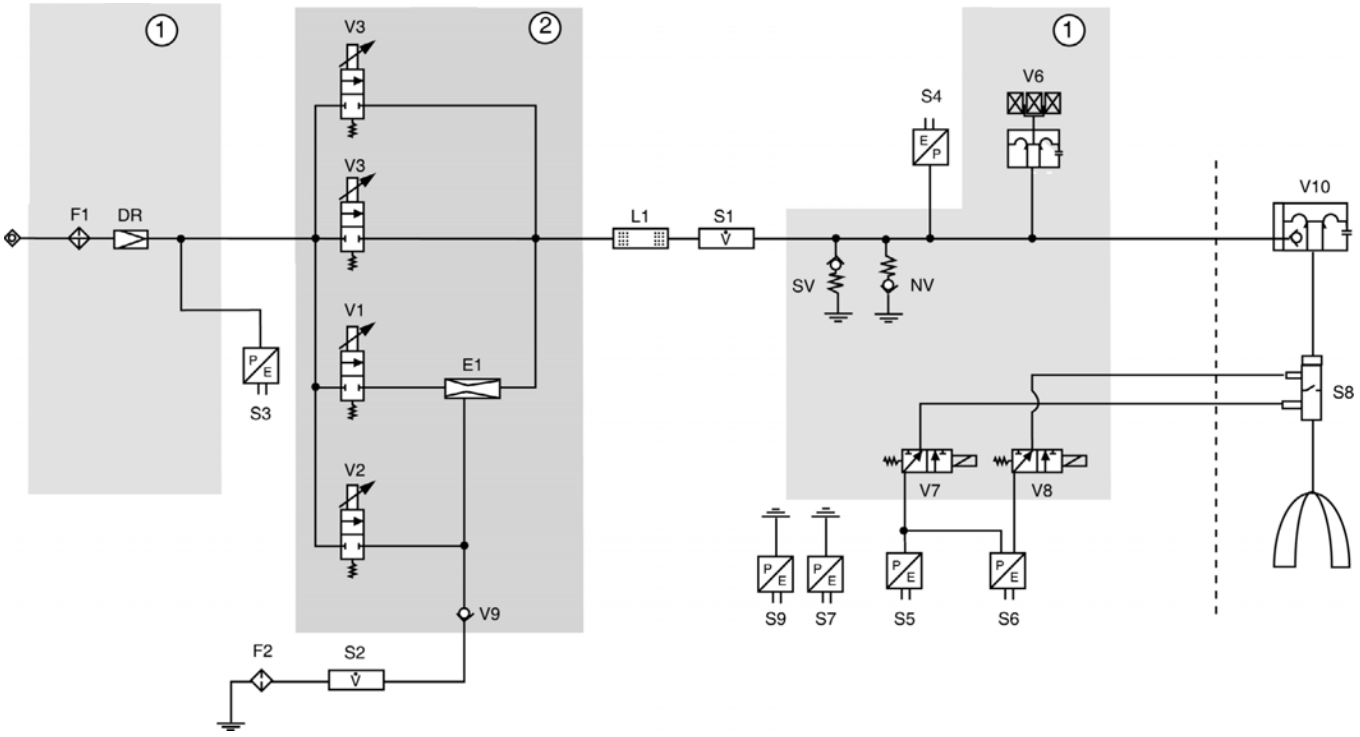

Fig. 2 Pneumatic components diagram, for legend, see Table 2

Table 2 Legend Fig. 2 and Fig. 3

Item	Designation
1	Connection block
2	Metering block
DR (PR)	Pressure regulator
E1	Ejector
F1	Filter in O2 compressed gas connection port
F2	Filter for intake air
L1	L1 makes sure there is an even flow
NV	Emergency-air valve
S1	Flow sensor to measure internal inspiratory flow
S2	Flow sensor to measure the ambient air intake
S3	Pressure sensor (Pv) to measure supply pressure for valves V1 to V3
S4	Pressure sensor (Pint) to measure unit-internal patient pressure

Item	Designation
S5	Pressure sensor (Paw) to measure pressure close to patient
S6	Pressure sensor (delta P) to measure differential pressure at external flow sensor
S7 and S9	Pressure sensors to measure ambient pressure
S8	External flow sensor
SV	Safety valve
V1 to V3	Metering valves
V10	Ventilation valve
V6	PEEP valve
V7 and V8	Switching valves to calibrate pressure sensors S5 and S6
V9	Non-return valve

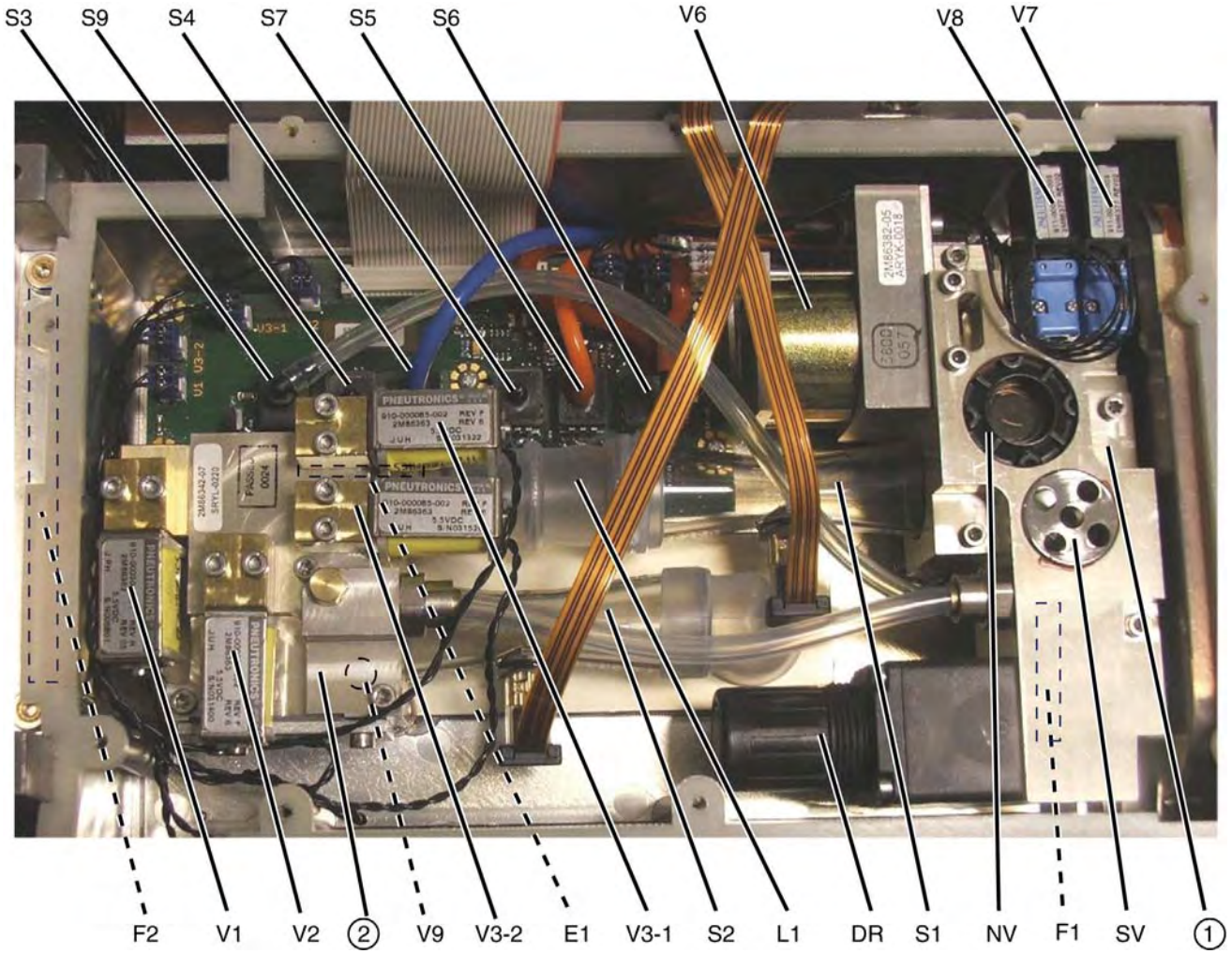

Fig. 3 Overview of pneumatic components, for legend see Table 2

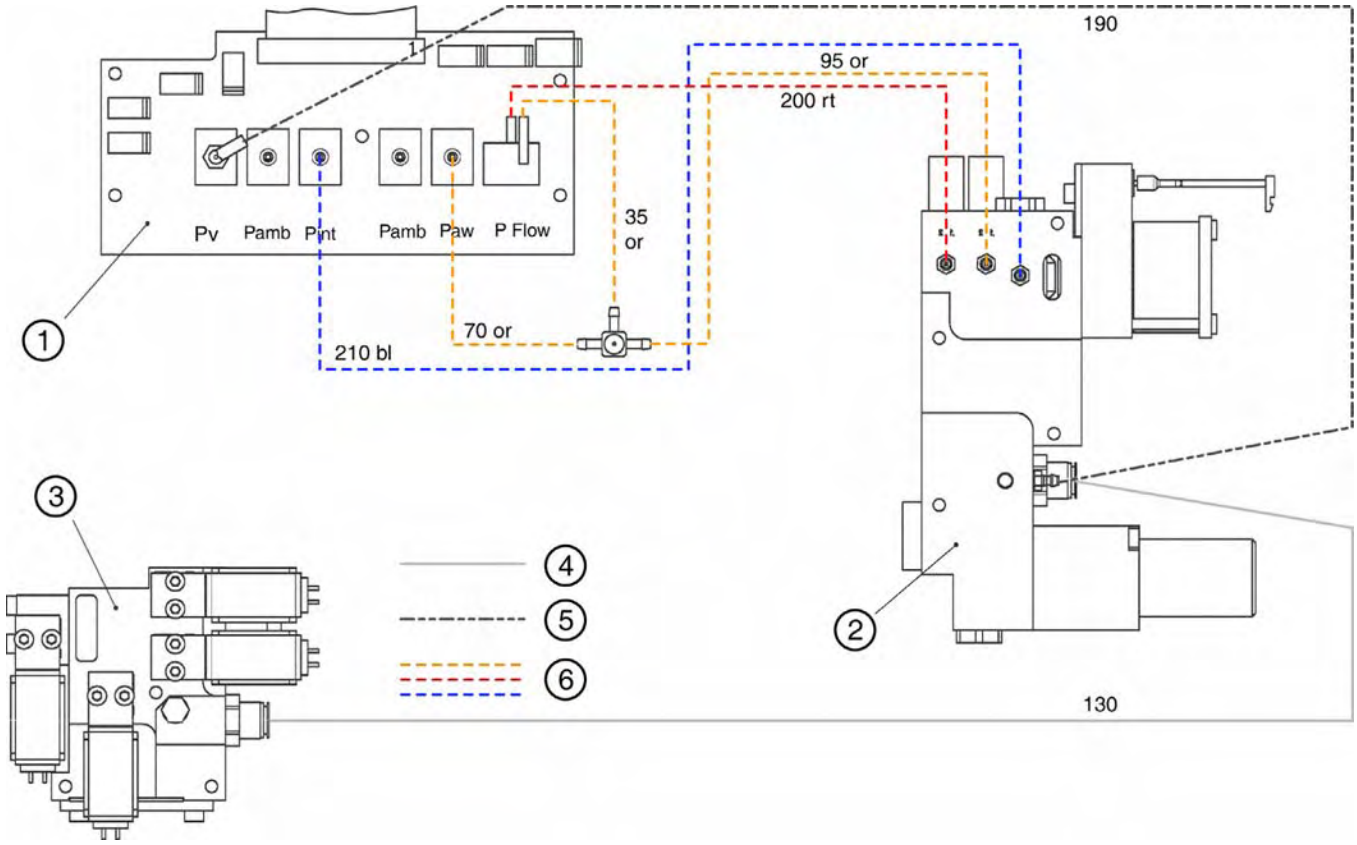

Fig. 4 Tubing diagram, for legend, see Table 3

Table 3 Legend Fig. 4

Item	Designation
1	Sensor PCB
2	Connection block
3	Metering block
4	Tube 4x1 PAE not colored (nc)
5	Tube 2x1.5 Si not colored (nc)
6	Tube 2x1 Si blue (bu), red (rd), orange (og)

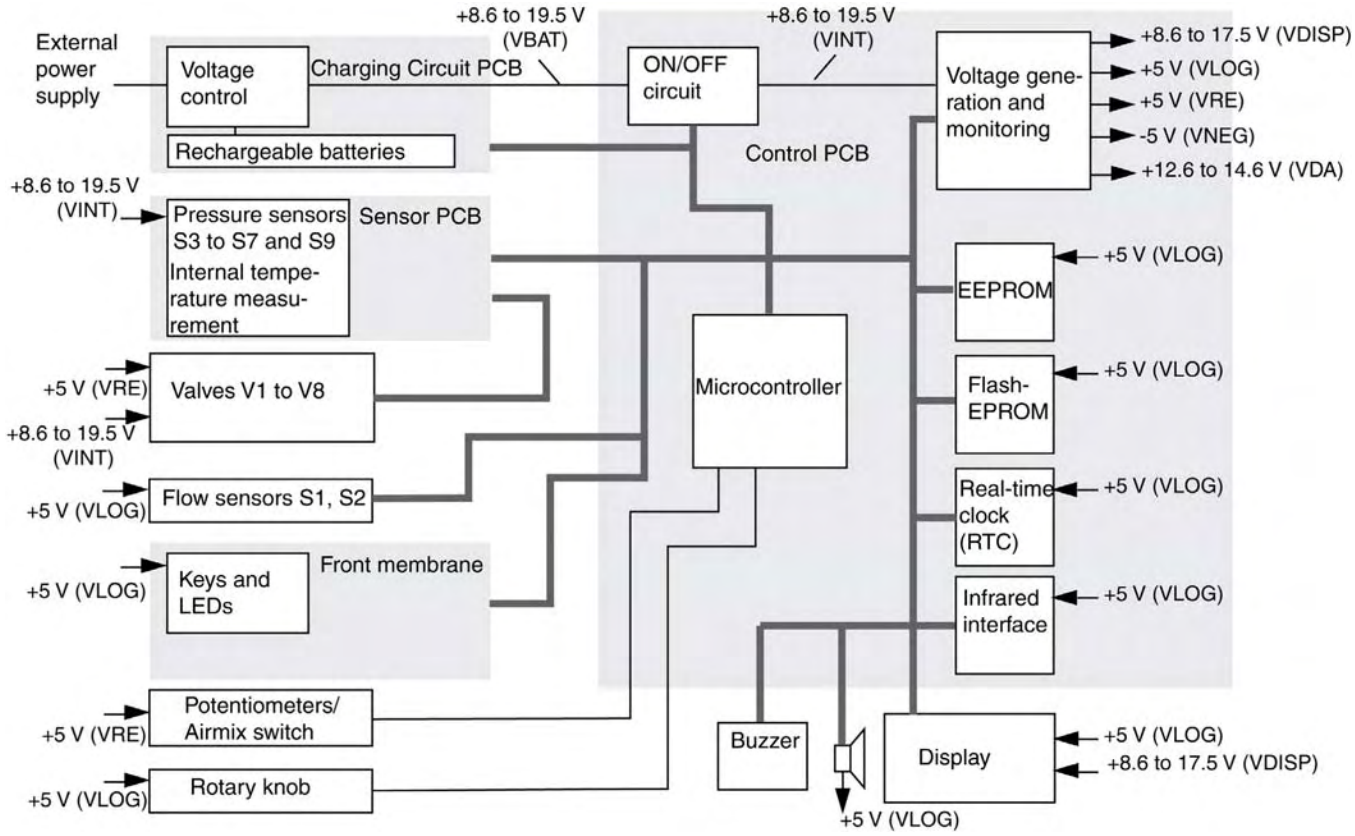

Fig. 5 Electronics block diagram

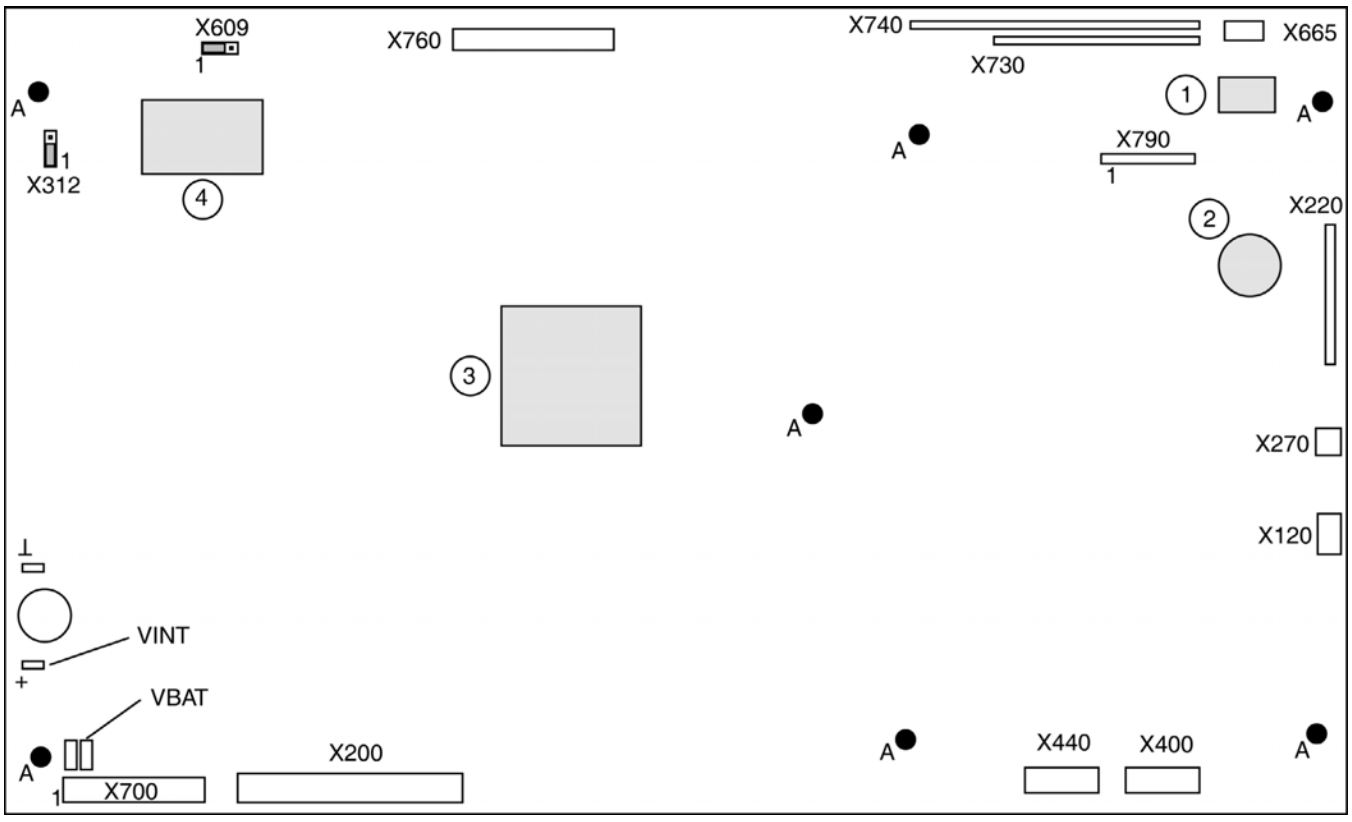

Fig. 6 Control PCB, for legend, see Table 4

Table 4 Legend Fig. 6

Item	Designation
1	EEPROM
2	Goldcap capacitor
3	Microcontroller
4	Real-time clock with battery
A	Control PCB mounting screws
X120	Connection to signal generator
X200	Connection to Sensor PCB
X220	Connection to potentiometers
X270	Connection to loudspeaker
X312	Jumper to trigger a reset
X400	Connection to flow sensor S1
X440	Connection to flow sensor S2
X609	Jumper to perform bootstrap download
X665	Connection to rotary encoder
X700	Connection to Charging Circuit PCB
X730	Connection to front membrane (keys).
X740	Connection to front membrane (LEDs)
X760	Connection to display
X790	Pin strip for bootstrap download

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Annex

Parts Catalog

This chapter contains a list of the device's orderable parts.

Test instructions

This chapter contains the measures required to determine the actual condition of the device.

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Parts catalog

Oxylog 2000 plus

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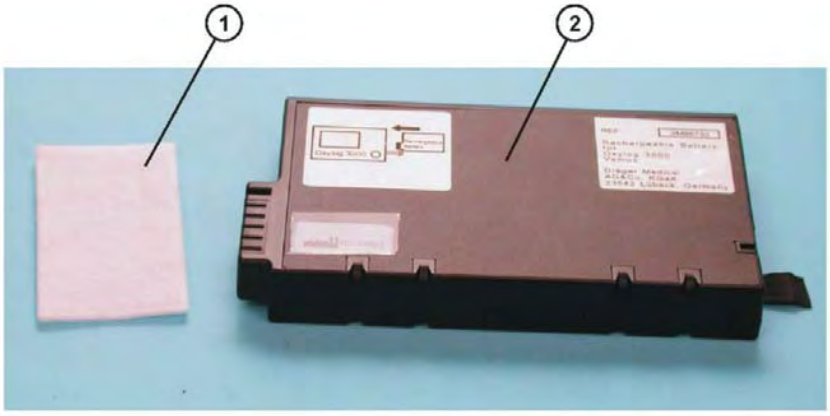
Item No.	Order No.	Description	Qty.	Qty.unit	Remark

Items that are shown in the illustration but are not listed below the illustration are not available as spare parts



Item No.	Order No.	Description	Qty.	Qty.unit	Remark
1	2M86341	Filter Mat	1.000	St	
2	2M86733	Battery Lithium-Ionen	1.000	St	

Items that are shown in the illustration but are not listed below the illustration are not available as spare parts

Item No.	Order No.	Description	Qty.	Qty.unit	Remark
	1824481	Power Cable CE,3m,10A,C13L,bk	1.000	St	
	1868160	Cable TH/BR,3m,C13,black RoHS	1.000	St	
	1844342	Power cable DK, 3 m, 10 A	1.000	St	
	1844369	Power cable Great Britian 3m black	1.000	St	
	1844377	POWERCORD CH 3M	1.000	St	
	1851705	Cable Australia,3m,10A,C13	1.000	St	
	1859706	Power cable 10A,3m,black,China	1.000	St	
	2M86729	Battery Charger	1.000	St	
	2M86730	AC/DC power pack	1.000	St	
	2M86731	DC/DC Converter	1.000	St	
	2M86733	Battery Lithium-Ionen	1.000	St	
	ME05133	Conversion kit reusable	1.000	St	
	ME05134	Conversion Kit Disposable	1.000	St	
	5703307	Carrying Belt	1.000	St	
	5704216	All-round Wall Holder	1.000	St	
	5704217	Quick Power Connector	1.000	St	
	5704218	Wall Holder Adaptation Plate	1.000	St	
	5704641	All round Wall Holder USA	1.000	St	
	2M86900	Equipment holder	1.000	St	
	5704640	Equipment Holder USA	1.000	St	

Items that are shown in the illustration but are not listed below the illustration are not available as spare parts

Item No.	Order No.	Description	Qty.	Qty.unit	Remark
	5704441	Hose O2 DISS-DISS gr 1,5m	1.000	St	
	5704447	Hose O2 DISS-DISS gr 3 m	1.000	St	
	5704440	Hose O2 DISS-DISS gr 1,5m spr	1.000	St	
	5704442	Hose O2 DISS-DISS gr 3 m spr	1.000	St	
	2M86975	Carrying System	1.000	St	
		CP-Catalog Accesso./Consumabl.	1.000	St	

Items that are shown in the illustration but are not listed below the illustration are not available as spare parts

Item No.	Order No.	Description	Qty.	Qty.unit	Remark
2	8412716	O2-Connector Tube 0,5m	1.000	St	

Items that are shown in the illustration but are not listed below the illustration are not available as spare parts

Item No.	Order No.	Description	Qty.	Qty.unit	Remark
5	5704500	Gas Supply System	1.000	St	
6	5704216	All-round Wall Holder	1.000	St	

Items that are shown in the illustration but are not listed below the illustration are not available as spare parts

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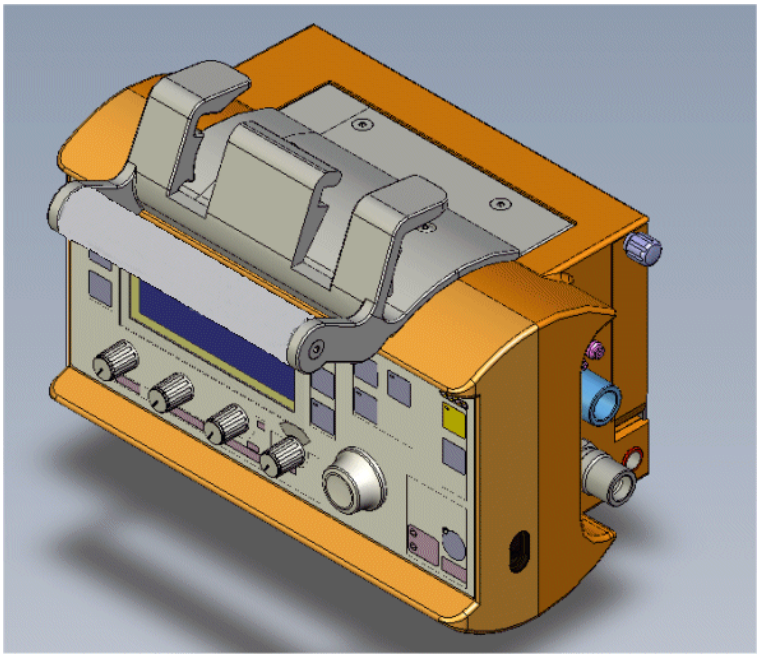
Test instructions (TL)
Oxylog 2000 plus

NOTE
The procedures described in this Test List can be carried out using commercially available test equipment and tools; however, this Test List does not replace inspections and maintenance by the manufacturer.

General:

All results must be documented in the Test Report.



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1 Device configuration

1.1 Oxylog 2000 plus device configuration

1.1.1 Serial number of the Oxylog (if not otherwise recorded)

Action
- Read the serial number on the Oxylog 2000 plus (the serial number is located on the name plate).

Entry Oxylog 2000 plus serial number

[_____txt]

1.1.2 Serial number of the power supply unit (if not otherwise recorded)

Action
- Read the serial number on the power supply unit.

Entry Serial number of the power supply unit

[_____txt]

1.1.3 Software version

Action
- Read out and enter the software version later under „Function and condition test“ (the software version is displayed immediately after power-on).

Entry Software version Oxylog 2000 plus

[_____txt]

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2 Electrical safety

2.1 Electrical safety according to VDE 0751/IEC 60601-1

2.1.1 Oxylog 2000 plus - not applicable -

2.1.2 Power supply unit visual check

Test The power supply unit, the power supply cord, and the connecting cable to the Oxylog are neither damaged nor contaminated.

Result Condition checked.

[_____OK]

2.1.3 Protective earth conductor of power supply cord

NOTE
The power supply unit (2M86730) conforms to the requirements of protection class 2.

Test The value of the protective earth conductor resistance must not exceed **0.1** ohms.

Result Protective earth conductor resistance

[_____Ohm]

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3 Function and condition test

3.1 Condition test

Prerequisites The device is fully assembled.

3.1.1 Labels and Instructions for Use

Test
- Labels and markings are complete and legible.
- The Instructions for Use are available (according to user/owner).
- Only applicable in Germany: The medical product log is available (according to user/owner).

Result Condition checked.

[_____OK]

3.1.2 Basic unit, outside

Test
- The housing, connections, front membrane, control elements, and handle are neither contaminated nor damaged.
- The ventilation tube and ventilation valve are not hardened or damaged.

Result Condition checked.

[_____OK]

3.1.3 Carrier system and accessories

Test
- The carrier system and accessories are not damaged.
- The connecting cables are not porous, severely kinked or damaged.
- Check that the wall mount (if present) is attached securely.

Action
- Latch the Oxylog onto the wall mount (if present).

Test
- The „external mains power“ LED lights up.

Result Condition and function checked.

[_____OK]

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3.2 Basic unit function

3.2.1 Unit test

Action
- Connect the unit to the electrical power and to the O2 compressed gas supply.
- Connect the ventilation tube and the ventilation valve to the flow sensor and the flowmeter tubes.
- Connect the test lung (test thorax).
- Switch on the unit and press and hold down the rotary knob until the menu for selection of the unit test appears.
- Select and activate the unit test.
- Follow the on-screen instructions.

Test The unit test runs without error.

Result Function checked.

[_____OK]

3.2.2 Buttons and potentiometer

Action
- Switch the unit to Customer Service Mode.
- Activate „Test buttons and potentiometer" test step.
- Press all buttons on the unit one after the other.

Test When a button is pressed a corresponding „X" appears on-screen. If the button has an integral LED, the LED lights up while the button is being pressed. If there is no LED, the yellow warning LED is lit.

Action
- Turn the potentiometer to various settings and compare them against the values displayed on-screen.

Test The pre-set and displayed values are identical.

Result Function checked.

[_____OK]

3.2.3 Loudspeaker, buzzer, LEDs and display

Action
- Activate „Test loudspeaker, buzzer, LEDs and display" test step.
- Run the complete test.

Test The tests of the loudspeaker, the buzzer, the LEDs and the display were successful.

Result Function checked.

[_____OK]

3.2.4 Voltage supply

Action
- Switch off the device.
- Connect the ventilation tube instead of the manometer.

Test The „external mains power" LED lights up green.

The “charge” indicator LED of the internal replaceable battery lights up in the following colors:

– yellow: when the replaceable battery is charging

– green: when the replaceable battery is fully charged,

– red: when no functional replaceable battery is inserted or the replaceable battery cannot be charged, such as because the unit is being used outside the temperature range of 0 to 35 °C.

Action • Switch on the device.

• Set ventilation mode VC-CMV.

• Remove internal replaceable battery.

Test The unit continues ventilating. The display shows the message „No battery“. The charge indicator LED is lit red. An audible alarm sounds.

Action • Fit the internal replaceable battery.

Test The charge indicator LED is lit green. The audible alarm is deactivated.

Action • Press the „Alarm Reset“ button.

Test The „No battery“ message is no longer displayed.

Action • Remove external power supply.

Test The unit continues ventilating. The „external mains power “ LED is off. The „charge status“ LED of the internal replaceable battery is off. An audible alarm sounds. The display shows the message „Battery operating“.

Action • Press the „Alarm Reset“ button.

Test The „Battery operating“ message is no longer displayed.

Action • Remove internal replaceable battery.

Test Ventilation stops. An acoustic alarm sounds for at least 7 seconds.

Action • Fit the internal replaceable battery.

• Connect the external power supply.

Test Ventilation is resumed with the previous settings.

Result Function checked.

[_____OK]

3.2.5 Supply pressure/emergency air valve

Action • Remove compressed gas supply.

Test – An audible alarm sounds.

– The display shows the message „!!Supply pressure low“.

– The yellow alarm LED comes on.

– Ventilation stops.

Action • Simulate spontaneous breathing with the test thorax.

Test Ventilation through the emergency air valve is possible.

Action • Connect the compressed gas supply.

Test – The audible alarm stops.

– The yellow alarm LED is no longer lit.

– Ventilation is resumed with the previous settings.

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Action • Press the „Alarm Reset“ button.

Test – The „!!Supply pressure low“ message is no longer displayed.

Result Function checked.

[_____OK]

3.2.6 Safety valve

Action • Set Pmax and PEEP to maximum.

• Set the frequency to 10 1/min.

• Connect a manometer instead of the ventilation tube (the connection must be tight).

Test – The maximum pressure is 85 mbar (110 mbar for the USA unit).

Result Function checked.

[_____OK]

Action • Disconnect the manometer and reconnect the ventilation tube.

3.3 Ventilation

Prerequisites
- Unit is connected to electrical power and to O2 compressed gas supply.
- Ventilation tube, ventilation valve with flow sensor and flowmeter tubes are connected.
- Test lung (breathing bag and catheter connector) is connected to flow sensor with elbow adapter.
- Unit is switched on.

3.3.1 Volume-controlled ventilation

Action
- Make the following settings:
- Ventilation mode = VC-CMV
- Frequency = 10 1/min
- Alarm limit Pmax = 60 mbar (Oxylog 100 cmH2O - USA = 100 mbar)
- PEEP = 5 mbar
- FiO2 = O2Airmix
- I/E = 1:1
- Tplat = 50%
- Trigger = off
- VT = see table
- Using the „Values 1“ button, select the VT or MV measured value, as applicable, and set and check the following values:

Test

VT	MV
200 mL	1.3 L/min to 2.3 L/min
500 mL	3.7 L/min to 5.3 L/min
1000 mL	8 L/min to 10.3 L/min

Result Measured values checked.

[_____OK]

3.3.2 Trigger function

Action
- Connect the test thorax instead of the test lung.
- Change or set, as applicable, the following values:
- Ventilation mode = VC-SIMV
- Frequency = 5 1/min
- PEEP = 10 mbar
- VT = 500 mL
- Ti = 1 second
- Flow trigger = 3 L/min
- Flow ramp = not applicable, or standard

Test The test thorax inflates to a PEEP pressure of 10 mbar.

No self-triggering occurs.

Action
- Trigger using the test thorax, see the following figure.

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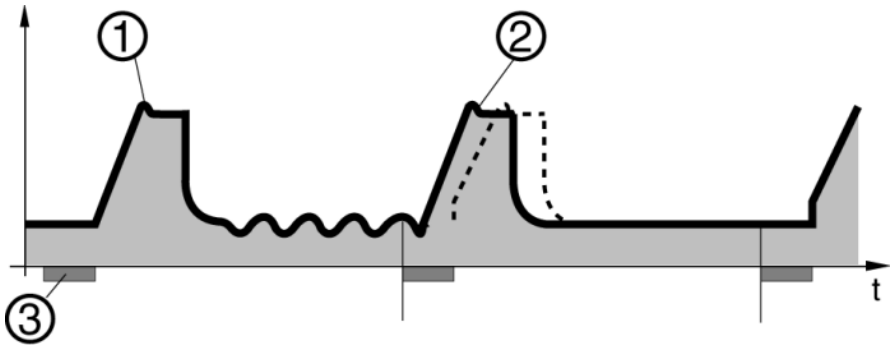

Fig. 1 Trigger

Item	Designation
1	Unsynchronized mandatory breath
2	Synchronized mandatory breath
3	Trigger window

Test The unit triggers and activates a mandatory breath.

At the same moment a „star“ appears on the top line of the display.

Result Function checked.

[_____OK]

3.4 Device handover

Entry Place fully functional device at the user's/owner's disposal.

[_____OK]

4 Test equipment

4.1 Test equipment list

Test equipment
Digital manometer up to 1000 mbar
Test lung (test thorax)
Breathing bag, 2-liter
Catheter connector 7 mm
Tester for electrical safety test

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5 Annex

5.1 Accessing service mode

5.1.1 Accessing the Customer Service Mode

Action

- Turn the controls Fig. 2/1 fully clockwise.
- Switch on the unit by the key Fig. 2/3 and at the same time press and hold down the keys Fig. 2/2 until Customer Service Mode appears.

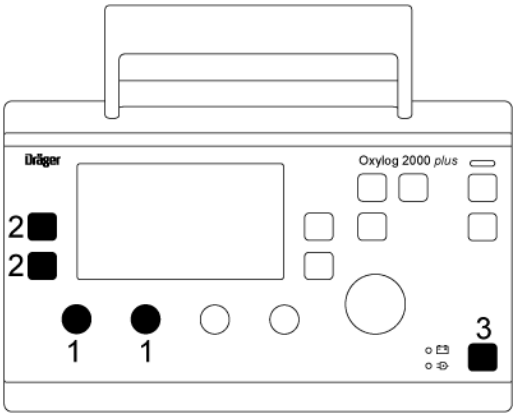

Fig. 2 Accessing the Customer Service Mode

- Now the appropriate test can be selected and activated. To quit service mode switch off the unit. The values set in Customer Service Mode are retained and reactivated every time ventilation is started following power-up.

Test Report (TL)

Institution: _____ **Delivery date:** _____

Serial no.: _____ **Other:** _____

OK	Para	Name	Result
1		**Device configuration**	
1. 1		**Oxylog 2000 plus device configuration**	
☐	1. 1. 1	Serial number of the Oxylog (if not otherwise recorded)	
☐	1. 1. 2	Serial number of the power supply unit (if not othe	
☐	1. 1. 3	Software version	
2		**Electrical safety**	
2. 1		**Electrical safety according to VDE 0751/IEC 60601-1**	
☐	2. 1. 2	Power supply unit visual check	
☐	2. 1. 3	Protective earth conductor of power supply cord	Ohm
3		**Function and condition test**	
3. 1		**Condition test**	
☐	3. 1. 1	Labels and Instructions for Use	
☐	3. 1. 2	Basic unit, outside	

OK	Para	Name	Result
☐	3. 1. 3	Carrier system and accessories	
3. 2		**Basic unit function**	
☐	3. 2. 1	Unit test	
☐	3. 2. 2	Buttons and potentiometer	
☐	3. 2. 3	Loudspeaker, buzzer, LEDs and display	
☐	3. 2. 4	Voltage supply	
☐	3. 2. 5	Supply pressure/emergency air valve	
☐	3. 2. 6	Safety valve	
3. 3		**Ventilation**	
☐	3. 3. 1	Volume-controlled ventilation	
☐	3. 3. 2	Trigger function	
☐	3. 4	Device handover	

Report:

Test has been performed according to the test instructions (TL).

Name: _____

Date/signature: _____

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