EN

OPERATING INSTRUCTIONS
OXYGEN GENERATOR FOR NON-PRESSURIZED AIRCRAFT

OXYFLY
FLY ON TOP

CE

9000-607-80EN/05.14

The present operating instructions give you all the necessary advice for the proper and safe handling of the appliances.

Please read and carefully observe the operating instructions to avoid mistakes and dangerous situations.

The operating instructions are arranged as follows:

Chapter	Planned purpose	Target group
Chapter 1	Gives you safety advice and important general information for the products.	Installer, operator, qualified personnel, user
Chapter 2	Contains detailed instructions and advice for the transport, storage, installation and the initial operation of the products.	Installer, operator, qualified personal
Chapter 3	Contains instructions and advice for safe technical handling of the products.	User
Chapter 4-6	Gives detailed instructions for cleaning, maintenance and servicing the product.	Operator, qualified personnel
Appendix	In the appendix you will find important technical information, e.g. drawings, circuit diagrams etc..	Qualified personal

PREFACE

This operating instruction is valid for the oxygene generator for airplanes with an unpressurized cabin, hereinafter called device/product.

The operating instruction is only valid as far as your device/product complies with the status described therein.

This manual includes all details, which are necessary for transportations, assembly, maintenance and decommissioning of the devices.

Therefore please read the operating instructions carefully prior to the first operation, thus ensuring the safe and economic application of the products.

When a fault occurs or maintenance is required which is not dealt with in the operating manual, you should contact our qualified personnel.
Please keep the correct device designation at hand.
(see type plate after REF)

All service and maintenance work must be carried out by qualified personnel.
If service and maintenance work is neglected or carried out improperly, our warranty will be invalidated.

Should you have any problems in understanding the operating instructions, our qualified personnel will be pleased to help you.

The company management

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1. INTRODUCTION AND GENERAL ADVICE

1.1 Symbol explanation and definition

1.1.1 Symbol explanation

In the operating instructions the hand symbols and pictograms are used which meaning you should memorize very well. These symbols help you to understand the information of this manual quicker and draw your attention on risks or important advice.

Attention! Danger sign. It points out danger as well as rules and bans to prevent personal and /or danger to property.

Advice! Attention is brought to advise on the handling and economic use of product.

Warning against electric energy! Your life could be in danger! Make sure that all electrical work is carried out by a qualified electrician.

Warning advice. The product can start without warning!

There are special indicating labels and safety signs on the product and in the operating instruction with the following meaning:

Warning of hot surfaces! There is a danger of burns! Observe especially that these surfaces may still be hot after the product has been switched off. Work near these surfaces only after they have cooled off.

1.1.2 Definitions

User, Operator: The responsible Person who has the authorisation to use the product. The user must have been given instructions on the safe handling of the unit from the appropriate authority.
Operator Authority: Responsible for the safe installation, regular servicing and cleaning of the product.
Qualified personnel: Trained by the operating authority or by authorised Dürr Technik personnel who are aware of the dangers of the product and familiar with the technical aspects of the product. Qualified personnel are trained to carry out service and repair on the product
Product: General term used for oxygen generator.

1.2 General safety advice

During use, care and maintenance of the product, the following fundamental safety measures must be observed for the protection of the operator, maintenance and service engineers as well as the product:

During the development and manufacture of the product , the recognized regulations of the technical aspects, as well as the recognized valid standards and guidelines were taken into account and used.
In addition the product has been de-signed and constructed in such a way that endangerment through the agreed use are minimized. Nonetheless we feel obliged to describe the following safety measures so the remaining dangers can also be minimized.

Warning! When electrical equipment is being used, the basic safety precautions must be followed, to prevent risk of fire, electric shock and personal injury.

Therefore please read the manual to hand, prior to starting work. Keep this manual within reach for the engineer and the operator. The information should be passed on to any successor.

During operation of the products the relevant laws and regulations for the place of deployment must be observed! In the interest of safe operations the authorised operator and the supervisory personnel are responsible for keeping within the regulations.

Check during all work on the product for possible dangers. All parts must be correctly fitted and all requirements fulfilled to ensure safe operation. Should the product be damaged in any way, the product should no longer be used. The product should only be repaired by experts. Mark the defect clearly and pull out the mains plug, so that until the repair is effected, no accidents or damage can occur through the defective product.

Take account of **environmental influences!** Do not operate the product in a wet or damp environment.

Do not use the power connection line for purposes it was not meant for. Do not pull the plug out of the socket by the cable. Only pull the plug from the socket by pulling the plug casing. Protect the cable against heat, oil and sharp edges.

In dangerous situations or during technical problems, separate the product at once from the power supply (pull the plug).

Check regularly the power supply line and the casings of electrical components and if they are damaged, have them repaired by a qualified electrician.
Check the electrical equipment for external damage before work starts. Check thoroughly whether lines or cables are damaged.

If there is damage, do not operate the product.
Pull out mains plug!

For all maintenance and repair work the mains plug must be pulled out.

Attention! Work on electrical equipment must only be carried out by a qualified electrician.

Only original spare parts must be used. Otherwise there may be injury to the user.

Warning! The use of other spare parts and other accessories, as stated in this manual, can cause personal injury. Only use spare parts permitted by the manufacturer!

Warning of hot surfaces! There is a danger of burns! Observe especially that these surfaces may still be hot after the product has been switched off.

1.3 Product Descriptions

1.3.1 Agreed application

The product is intended for the generation of oxygen in non-pressurized aircraft.
The product is designed for **breathing in high altitudes.** It is not constructed for applications in altitudes above 18 000 ft approx. 5 500 meters!

Attention:
The product is not applicable for an altitude above 18 000 ft (approx. 5 500 m) !

Attention:
The product is constructed and defined for an operating temperature of + 4°C up to + 50°C !

The suction of liquids/fluids, agressive or explosive gases is forbidden!
It will cause danger to health and the possible danger of explosion or fire!

The product is designed for the operation in dry, well-ventilated and non-pressurized aircraft and rooms. Never expose the product to rain. The product should not operate in a damp or wet environment. In addition, operating near gases or flammable fluids is forbidden.
Smoking, open fire or open light in the proximity is forbidden. Products and tubing are free from oil and grease.

1.3.2 Function description

The product consists of a piston compressor aggregate, an oxygen module, a safety valve, restrictor, pre-, sterile - and odour filter, electronic components as well as a control panel with LED-display.

The logic of the product is taken over by a control system. The electrical connection takes place via a direct connection to the on-board power system via a safety plug.

Via the suction filter atmospheric air is aspirated. This air is compressed by the piston in the cylinder and in the first instance lead through the cooler and thereafter through the prefilter with condensate-drain. Finally the compressed air will be transported into the oxygen module. The oxygen separated therein will be filtered by a sterile filter and then choked at a nozzle. The filtered oxygen can be taken out off the hose nozzle at the product. The oxygen flows into the oxygen supply of the non-pressurized aircraft by connecting the oxygen hose with the hose nozzle of the product.

2. TRANSPORT, STORAGE, FIRST OPERATION

2.1 Transport and storage

The products are sent from the factory in a specially padded transport carton. With this the equipment is safe against transit damage. Always use the original packaging of the product if possible.

Attention:
The product has to be operated and transported in an upright position.

Protect the equipment during transport and storage against damp and extreme temperatures. Take special care that the electrical equipment does not get damp or wet.

The products are designed for immediate operation / plug & play. Products which are still in the original packing can be stored in warm, dry and dust free rooms. If the products should be stored long term, e.g. as a replacement product, it must be protected against dust and damp.

Keep packaging if at all possible.

Environmental rules regarding the disposal of the packaging must be observed and to assist this, please note the labels on the packaging.

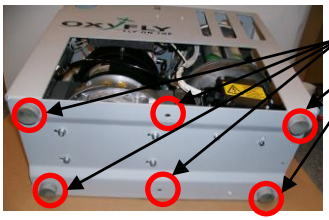
2.2 Transport- and storage conditions

Temperature range: -40 °C to +60 °C
Relative humidity: 5% to 90%
(without condensation)

2.3 Assembly advice and first operation

The installation and initial operation must only be carried out by a specialist familiar with the handling of the product.

Installation of OXYFLY:



2.3.1 Environmental conditions

The product must only be installed and operated in dry, well ventilated and dust free aircraft cabins.

Pay attention when selecting the place for the installation that the product is easily accessible for operating, cleaning and maintenance. Especially the connection piece and the operational parts must be easy to reach.
When the product is build into a housing or into a machine, it should be paid attention to the legibility of the type plate, without having to dismount the product. Furthermore please see to the easy accessibility of the connection terminals when taking off/opening the housing inlet.

Please make sure that the suction sides of the airfilter and the air cooler are freely accessible.

Furthermore the air inlets of the product have to be freely accessible and must have a sufficient wall distance (approx. 20 cm).

Make sure the supply cable and the air hoses are not kinked.
The operating temperature must not fall below +4 °C, otherwise a faultless operating of the product controls cannot be guaranteed.
The room temperature must not exceed +50 °C.
Room temperatures above 40°C will require additional ventilation. **Most suitable ambient temperatures are from +10 °C up to +25 °C.**

Attention: Approx. 70% of the products induced electrical energy is converted into heat and is given off to the surrounding area. The ventilators of the device provide an effective, intensive cooling of the product.

The product ventilators/fans ensure an effective forced cooling of the product. For that purpose the air has to be able to flow in and out without check. Moreover the air inlets and outlets have to be big enough. In unfavourable cases, a separate ventilation will be necessary when assembling the product.

2.3.2 Compressed air connection

The product is fitted as standard with a control panel consisting of an on/off-switch with LED and hose connection.
The oxygen connection is fitted with a ø of 7 mm at the hose nipple. A plug-and-socket connection is available as accessory, if not included in the delivery programme. Fix the oxygen hose at the hose nipple by means of a hose clamp.

For sealing of screw fittings use an anaerobe glue (for example Loctite®) or a PTFE-sealing band.

The installation of a flexible feed hose between hose nozzle of the product and the consumer is recommended, in order to avoid the transmission of vibrations.

2.3.3 Electrical installation

The connection to the power supply must be carried out by a qualified electrician (with the exception of stations delivered ready to plug for connection to a socket).

Please comply with the regulations of the power supply in the aviation sector.

If the product is installed permanently to the power supply, a disconnecting device with a minimum distance of 3 mm contact opening width has to be stipulated (for example a circuit breaker).

If the product is connected to the power supply with the aid of a plug, the socket must be easily accessible for safety reasons, so that in the event of danger the equipment can be isolated from the power supply.
Please make sure that the connection cable does not run across the machine. The hot surface of the compressor station could damage the insulation of the cable.
Prior to making the electrical connection, check the mains voltage and frequency. They should correspond with the specifications on the model label.

2.4 Initial Operation

- Position the **OXYFLY** safely onto a support plate and strap it tightly**!**
- Make sure that the connecting cables and pressure hoses are not loose.
- Make sure that all components of the generator are mounted correctly and stable with the housing.
- Check the correct connection of the power supply to the product (hose socket).
- Make sure that the product is in an upright position.
- Make sure the machine is correctly connected to the power supply .
- Make sure that the suction holes (fan) are free.
- Switch the machine on by pressing the On/Off-switch, hereby the integrated blue LED in On-operation.
- Listen during operation for unusual noises.
- Check/Control your oxygen saturation in the blood with a Pulsoxymeter, (available as accessory).

Attention: When falling below 90% blood saturation, please descent to a safe altitude and check your oxygen concentration.

Advice! Write down the correct operation in the equipment log book.

Attention:
Operation of product only in upright position!

Device - Connection

The product is equipped standardly with a terminal box for connecting the device with the power supply, via the connecting cable.

Contact assignment: Ⓐ →+ Pole, Ⓑ →- Pole!

The connecting cable (Part No. 0635 2100, 0635 2110 or 0635 2120) should be used to tie up the voltage supply! Alternatively it can be used an adequate wire with correct connections.

3. OPERATION

The operation of the product is quite simple and is mostly automatic.

3.1 Test Run-Check

A test run of the product should be carried out on the ground before every flight, by switching it on for some minutes and testing it of functionality!
Checklist:

- Check electrical installation
- Check pneumatic installation
- Check loose parts
- Visual inspection
- Check for free intake filter

Warning! The product has hot surfaces. There is a risk of burns if these surfaces will be touched.

In dangerous situations or during technical problems, separate the product immediately from the power.

3.2 Switching on the product

The product will be switched on with the On/Off-switch by clicking into place and flashing up of the blue LED. The product starts with a short delay and the pressure is built up in the system. The oxygen module generates the oxygen by reaching the inlet pressure and ends up filtered via the hose socket into the oxygen supply of the non-pressurized aircraft. The safety-valve releases and reduces the system pressure if the permitted operation pressure will be exceeded. Please inform the responsible qualified personnel about unusual noise and loose cables and parts.

3.3 Switching off the product

Switch off the product by pressing the On/Off-switch (LED goes out) on the control panel or the main switch.

3.4 Switching on of the product after a power supply interruption

If the product dropped out by a power failure, the device will not start automatically after the voltage supply is granted.

Advice: The products do not basically start against pressure. Therefore they are equipped as standard with a mechanical release- respectively safety-valve.

For restarting switch on/off on the control panel or turn main switch on/off.

4. PRODUCT CARE AND MAINTENANCE

The paragraph 4 includes all details, which are necessary for the settlement of maintenance measures. When faults appear or a repair is needed, please inform our authorised engineers.

4.1 Product care „Cleaning“

For the proper and safe function of the product, regular cleaning and rotational maintenance is required.

When faults appear or a repair is needed, please inform an authorised engineer immediately.
Before any cleaning work is carried out the product must be switched off and separated from the mains power supply (pull out mains plug).

The product has hot surfaces. Please let the product cool down before starting any cleaning work.

Clean the surfaces of the product with a dust free cloth. Take special care to keep the ventilation openings of the product free from dust and dirt.

4.2 Maintenance

It is recommended to send the oxygen generator after approx. 3 years or approx. 4000 operating hours, whichever occurs first, for a product inspection to Dürr Technik in Germany.

The indicated maintenance periods are standard values for normal operating conditions. On extreme operating conditions (for example long operating hours under full load, high ambient temperature, very dusty ambient air, high air humidity), the maintenance intervals have to be shortened.
The whole product should be send to us completely for inspection.

The product has hot surfaces. Please let the product cool down before starting any cleaning work.

Required maintenance	Chapter	Time interval
Cleaning of the Oxygen generator	4.1	After every use
Maintenance and service – Repair ONLY carried out at DT factory!	4.2	After 3 years or 4,000 hours
Shutdown		**After 6 years or 8.000 hours running time**

Chart maintenance intervals

5. SHUTDOWN AND DISPOSAL

If the product is not in operation over a longer period, it is recommended to pull out the mains plug and clean the product afterwards. The product should be stored dry and dust-free and if possible kept in the original packing.

The disposal has to be appropriately disposed. The national laws and regulations have to be observed. For any questions please contact the experts at Dürr Technik.

APPENDIX

Appendix 1: Technical Data

	Oxygen generator
Dimensions L x H x W in mm	490 x 430 x 230 mm
On-board voltage	28 V DC
Power / Current	675 W / 10 – 24 A
O_2 - Flow-volume at 90 %	4 – 6 L/min
Output oxygen concentration	up to 95 %
Total weight	approx. 22 kg

As our products are subject to a continuous improvement process, alterations of technical data are possible. If you use this operating instruction for plannings, please clarify the current technical data and dimensions with us once again.

Appendix 2: Declaration of conformity

CE	**DECLARATION OF CONFORMITY FOR MACHINES 2006/42/EEC**
Manufacturer:	Dürr Technik GmbH & Co. KG
Adress:	Pleidelsheimer Str.30 D-74321 Bietigheim- Bissingen
Reference number:	**0635**
Product name:	**OXYFLY – oxygen generator for non-pressurized aircraft**
Starting with serial number:	**C 000100**

The following harmonized standards are applied:

DIN EN 1012-1:2011-02
DIN EN 60034-1:2011-02
DIN EN 60034-5: 2007-09
DIN EN 60335-1:2010-11
DIN EN 61000-6-2:2006-03
DIN EN 61000-6-3:2011-09
DIN EN 60204-1:2007-06
DIN EN ISO 12100:2011-03

Bietigheim- Bissingen, 23.05.12

A. Ripsam
General Manager

Signatures registered with original document
Dürr Technik archive

Appendix 3: Trouble Shooting

The following descriptions for trouble shooting are exclusively for qualified personnel. Repairs must only be carried out by qualified personnel!

Fault	Possible cause	Remedy
Product/ Device does not start	• Power supply missing • Pressure switch „On/Off“ not pressed (not locked into place!) • Motor defective	• Check mains voltage • Press „On/Off“ respectively lock into place (blue LED lights up) • Exchange the product
Declining delivery rate/ flow rate	• Lines, hoses or connections leaky • Suction filter extremely dirty • Defective seal	• Check the lines, hoses or connections • Repair on factory site Dürr Technik • Repair on factory site Dürr Technik
Product/ Device is too noisy	• Damage on bearings • Vibrations are transmitted on to the housing • Defective vibration dampers	• Repair on factory site Dürr Technik • Repair on factory site Dürr Technik • Repair on factory site Dürr Technik

Appendix 4: Addresses

Technical Advice
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eMail: service@ duerr-technik.de

Spare Parts Service
Telefon (+49) 71 42 / 9022 - 19
Telefax (+49) 71 42 / 9022 – 99
eMail: office@ duerr-technik.de

For ordering spare parts the following details are required:

- **Type number and serial number**
- **Order number as per parts list**
- **required quantity**
- **exact shipping address**
- **Dispatch details**

Repairs / Return shipment
For return shipments of oxygen generators use the original packing (carton and pallet) if possible. Pack the device always into a plastic bag. Use recyclable packing/padding material.

Return shipment address
Dürr Technik GmbH + Co. KG
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Appendix 5: Index

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