Instruction Manual
BioSafe 1.2

ID: 807229

Important user information

Please read this entire manual to fully understand the safe and effective use of this product.

In case you have any comments about this manual we will appreciate receiving them at the address below.

Warranty and Liability

Jouan Nordic A/S guaranties that the product delivered has been thoroughly tested to ensure that it meets its published specifications. The warranty included in the conditions of delivery is valid only if the product has been installed and used in accordance with the instructions supplied by Jouan Nordic A/S.

Jouan Nordic A/S shall in no event be liable for incidental or consequential damages, including without limitation, lost profits, loss of income, loss of business opportunities, loss of use, and other related exposures, caused by e.g. incorrect use of the product.

Symbols used in this manual

	**WARNING** Used in case of danger of a serious accident or when documentation needs to be consulted.
	**NOTE** Used to direct attention to a special item.

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1. Introduction

You are now the owner of a high-quality class II safety cabinet, Holten BioSafe 1.2, designed to provide protection of the operator, the environment and the processed product against particles/ microbiological contamination.

The cabinet complies with the requirements stipulated in "NSF Std 49", "Nordiska R3-Föreningens Norm for säkerhetsbänkar", "DIN 12950 Part 10", "NFX 44/201" and BS 5726 (92).

1.1. Features of the new Holten BioSafe 1.2

- Control panel with:
    - Soft touch push buttons.
    - Hour counter.
    - Alarm for any deviation from safe conditions.
- Key-switch for permanent pre-selection of the fan speeds to be used.
- Negative pressure level for maximum operator and product safety.
- Adjustable fan speeds:
- Enables you to select fan OFF, 1/1 or 1/2 speed.

2. Safety Instructions

- In order to avoid unintended or improper operation of the cabinet, please carefully read this manual.
- Also, please pay attention to the short-form operating instructions mounted on the cabinet.
- If you have questions related to the function or control of the cabinet or wish to order spare parts, please always indicate the nameplate data.

WARNING
The proper function and safety of the cabinet are only ensured if required tests are performed and maintenance and repair work is carried out by personnel authorised by us.

The proper function and safety of the cabinet are only ensured if required tests are performed and maintenance and repair work is carried out by personnel authorised by us.

Please also refer to sections: ”Testing after installation prior to initial start-up and after change of location” and ”Maintenance”.

- The following precautions must be taken for operation of the Holten BioSafe 1.2!

WARNING
The safety cabinet must not be used for group 4 pathogens. Please note the risk assessment requirements of the "Control of Substances Hazardous to Health (COSHH) Regulations" I988 (UK).

WARNING
The safety cabinet is not suitable for HIGH-RISK biological agents. HIGH RISK biological agents include all etiologic agents designated Class 4 by CDC and all oncogenic viruses classified as high risk by NCI (USA).

WARNING
Never operate the Holten BioSafe 1.2 safety cabinet when the front cover of the unit is removed. If the front cover is removed, there is no personnel protection, and the fan will run with openly rotating blades. The Holten BioSafe 1.2 class II cabinet will not provide any protection of operators or the environment against hazardous gases or vapours.

WARNING
After the fan has been switched on the air velocity monitoring system needs approximately 15 minutes to warm up and stabilise.

3. Installation

- Ensure that the size of the unit allows free access to the intended place of installation. The safety cabinet may be transported through a door of 760-mm width.

WARNING
The cabinet must not be installed in areas where draughts may occur. Furthermore, it must be avoided that persons frequently pass in front of the work opening

- Adjust the levelling screws in the support stand so that the work surface is horizontal and level.

- Valves for gases or vacuum are installed on the left side. A qualified technician must make the supply connection.

- For connection of the exhaust air to exhaust air systems, special precautions, which must be discussed with the cabinet supplier, must be taken.

4. Power connection

WARNING ELECTRICAL SHOCK
The safety cabinet is provided with a flexible power cord. The connection may be installed hard-wired or by means of a wall outlet with protective earthing.

NOTE
To avoid unintentional contamination of personnel or of the environment of the unit please note:

- If a hard-wired connection is used, a main switch, which will cut off all poles to the unit, must be used. This switch must be lockable both in the ON and OFF positions.

- If the unit is connected through a protective earthed wall outlet, the connector has the all-pole insulator function. The wall outlet with protective earthing is to be installed out of reach of operators and must only be accessible to authorised personnel.

Required fusing:

Circuit breaker 16 A or fuse T 16 A.

WARNING ELECTRICAL SHOCK
An automatic relay for disconnection of power in case of defect in the electric insulation must be installed, as it is not built-in.

In addition, the applicable safety requirements of the local power Supply Company shall apply.

5. Testing

After installation and prior to initial start-up and after change of location:

WARNING
According to DIN 12950, the following must be tested:

- Leakage test of the main and exhaust air filter.
- Air inlet speed in the work opening.

The test results must be entered in the logbook.

6. Description

Functional principle:

The class 2 safety cabinet manufactured as per DIN 12950 requirements is a modified exhaust unit in the work chamber of which there is a low-turbulence (laminar) displacement flow of air cleaned by means of heavy-duty particle filters, the exhaust air also being cleaned by heavy-duty particle filters. During operation the front cover is partly open; the upper part consists of a front window that can be opened. The work opening is located below the front window.

6.1. Air cleaning

HEPA main filter:

Efficiency is 99.999% at 0.3-µm particles. The air entering the work chamber is cleaned in accordance with the requirements of DIN 12950.

HEPA exhaust air filter:

Efficiency is 99.999% at 0.3-µm particles. Before the air is released back into the room where the unit is installed, it is cleaned in accordance with the requirements of DIN 12950.

6.2. Air monitoring

The low-turbulence displacement flow and the exhaust air flow are monitored by means of air velocity sensors; any malfunction will be signalled optically and acoustically.

7. Design

7.1. The cabinet consists of

- Exterior plastic-coated sheet steel case with adjustable support frame;
- Work chamber of stainless steel;
- Ventilation system as well as control and monitoring system.

The work chamber is formed by the ceiling, floor, rear wall, sidewalls, worktable, and front window.

- The main filter is installed across the entire ceiling surface.
- The floor of polyester-coated steel is also used to collect any fluids that may be generated.
- The stainless steel rear wall has protective-ground sockets for additional auxiliary units.
- The sidewalls are also made of stainless steel. If valves are installed in the left side, the wall is reinforced.
- The tabletop consists of a stainless steel plate, which is easy to remove for cleaning.
- At the bottom of the rear wall and in the front part of the worktable, the vents required for uniform air circulation are installed.
- The windows are made of a UV-resistant, high impact plastic (polycarbonate).

The fan is installed in the top. The exhaust air filter is also installed in the top above the cover.

The mains connection is mounted at the top. Fusing for the control and power modules as well as the power module itself is mounted in the connection space behind the control panel.

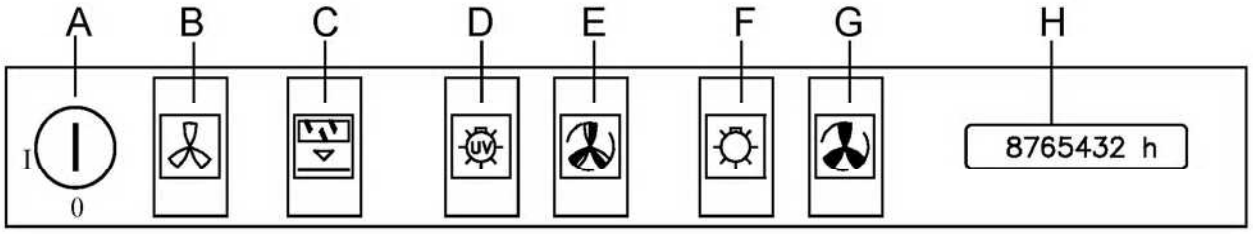
All switch elements required for control, the optical and acoustic signal generators for function and malfunction, as well as the operating hours counter are also grouped on the front panel.

The internal lighting is installed on the front outside the work chamber. This type of installation ensures that it is glare-free and will cause neither turbulence nor unwanted heating.

8. Options

- UV lamp mounted on the front panel.
- Sockets with protective earthing 230 V ~/4 A with fuses installed on the rear wall of the work chamber.
- Valves for various gases, e.g. gas, nitrogen, or vacuum, a maximum of three mounted on the bottom left sidewall of the work chamber.

9. Control panel



A. Key-switch to activate or deactivate the Start/Stop push-button (G), and switch between reduced and normal fan speed (E).

B. Indicator lamp (red) with reset push-button to deactivate the acoustic alarm. Alarm trigger: insufficient airflow.

C. Indicator lamp (red) with reset push-button to deactivate the acoustic alarm. Alarm trigger: window not in proper working position.

D. Push-button with signal lamp (yellow) for UV light. The UV lamp can only be activated when the internal lighting is turned off.

E. Push-button with signal lamp (yellow) for reduced speed. Reduced speed can only be activated when the internal lighting is turned off. At reduced speed, the alarm for insufficient airflow (B) is activated.

F. Push-button with signal lamp (blue) to turn the internal lighting on/off. Activation of the internal lighting deactivates the UV light and switch the fan from reduced to normal fan speed or vice versa.

G. Push-button for Start/Stop of the fan, activation of the alarm circuit and starting of hour counter. Green indicator lamp for indication of safe operation. The green indicator lamp turns off if an alarm condition appears (if B or C are activated).

H. Hour counter.

	**NOTE** At reduced fan speed, microbiological safety is not ensured.

Explanations of the push-buttons:

Re A: The Start/Stop push-button and the switch for normal or reduced fan speed are activated by a 90 degrees clockwise turn of the key-switch. When the setting is completed, the key-switch is turned back and removed.

	**WARNING** **Re B:** Insufficient air velocity in the vertical flow inside the work chamber or in the horizontal flow in the work opening is indicated by a red signal lamp and after 10 - 15 seconds by an acoustic signal. Activation of the alarm at normal fan speed indicates unsafe conditions. At reduced fan speed, the signal lamp for insufficient air velocity is activated indicating that the unit does not provide complete protection of the operator or the product. Switching back to normal fan speed will turn off the alarm.

WARNING
Re C: If the front window is not in work position, e.g. if the window is not completely closed, this is indicated by a signal lamp and an acoustic signal. To cancel the alarm press the push-button. The signal lamp is activated until the front window is properly brought back into work position.

Re D: The UV light can be turned on regardless of the fan setting, provided that the internal lighting is turned off.

Re E: This push-button allows switching between normal and reduced speed. While the unit is working at reduced speed, there is reduced protection of the product and operator. The reduced fan speed is only possible when the internal lighting of the work chamber is turned off.

NOTE
Operation at reduced speed when the safety cabinet is not being used reduces the danger of contamination of the work chamber.

Re F: The internal lighting of the work chamber can be turned off regardless of the fan speed setting.

NOTE
Secondary function: UV light and reduced speed can only be activated when the internal lighting is OFF. Deactivation/activation of this secondary functions from the control panel is however always possible.

Re H: The internal fan of the safety cabinet is turned on and off by means of this push-button. If the safety cabinet is working under safe conditions, the green indicator lamp is lit. If an alarm is activated, the green lamp goes out.

10. Operation

Prior to start-up

- The cabinets are developed and produced for use in clean environments and at temperatures between 15°C and 35°C, maximum 80% relative humidity and at normal air pressures.

- They must not be operated outdoors or in environments with extreme humidity or air pollution. The safety cabinets are not intended to filter vapours containing acids or organic solvents. The safety cabinet must not be used as a fume hood.

- The fan of the unit must be switched on at normal speed approximately 15 minutes prior to start-up.

Activate key-switch A
(Turn the key ninety degrees clockwise).

Press push-button G

- Fan and operating hours counter ON.

Turn the key of key-switch A ninety degrees counter-clockwise and remove it.

After activation, the indicator lamp B and an acoustic signal will briefly indicate insufficient circulation and/or exhaust airflow.

The air velocity monitoring system needs about 15 minutes for warming up and stabilising.

11. Shutdown

Activate key-switch A

(Turn the key ninety degrees clockwise).

Press push-button G

- Fan and hour counter are turned OFF.

Turn the key of key-switch A ninety degrees counter-clockwise and remove it.

12. Safety devices

The cabinet safety is constantly supervised so that any deviation from safe conditions or any fault in the supervision system will be immediately indicated.

Safe conditions are indicated by the green light (G).

Unsafe conditions will be indicated both acoustically and visually by a red light (B or C).

The alarm conditions will be indicated both acoustically and visually by a red light (B or C).

The alarm will be activated if:

- The velocity of the vertical airflow in the workchamber is outside the limits stipulated in the relevant standards.
- The velocity of the horizontal incoming air is below the limit stipulated in the standards.
- The front window is not in correct work position.
- The fan is running at reduced speed.

Activating B or C can silence the acoustic signal.

The red light will not be turned off until all conditions are safe again, or the fan is switched off.

13. Working rules

Before starting work:

- Switch on the fan at normal speed.
- Bring the front window in to correct work position.
- Clean and disinfect the work chamber and tabletop. Use only lint-free materials.
- Do not use explosive disinfectants.
- The front window may be treated with anti-static spray. Do not use agents containing chloroform for disinfecting. Disinfect only with the cabinet fan turned on.
- Bring in and keep the cleaned and disinfected objects and appliances ready. Do not bring in pens stationery, packing material etc.
- Ensure appropriate personal protection (e.g. gloves, clothes etc.).

- While working:

- The efficiency of the laminar airflow in the work chamber is essential for personnel and product protection. Negative influences of the flow conditions must therefore be avoided. They primarily arise due to:

- Rapid movements of the operator's hand, arm, or body both in and in front of the work chamber.

- Covered perforations in the tabletop as well as covered perforation at the bottom of the rear wall of the work chamber.

- Large objects and apparatus.

- Devices making rapid movements, e.g. agitators and centrifuges.

- Devices developing strong heat, e.g. burners. If burners cannot be avoided, use safety burners
- Operate heat sources only with the fan at normal speed.

- Do not damage the main filter in the ceiling of the work chamber with mechanical objects or heat sources, otherwise the microbiological safety will no longer be ensured.

- The acoustic and optical monitoring devices of the fan and front window must not be deactivated.

After work:

Remove objects and appliances from the work chamber.
Clean the work chamber, remove fluids, if any, from the trough and dry it. Disinfect if required.
Leave the cabinet fan in operation for about another 15 minutes at normal speed.

WARNING

Important for work with environmentally noxious substances!

- Do not perform work while the fan is running at reduced speed.
- The front window must be in work position during working hours.
- Place the product behind the perforated area of the table top.
- Work with calm, smooth movements.
- Never overload the work chamber.
- Reduce the number of transfers into and out of the work chamber.
- Avoid products or agents with high heat emission.

Avoid placing the cabinet where personnel frequently goes by, and avoid draughts.

14. Technical specifications

	BIOSAFE 1.2
External dimensions of standard model DxWxH	760x1305x2025
Working chamber D x W x H	580x1190x680
Weight	200 kg
Volume of trough	> 10 litres
Exhaust air flow	400 m^3/h
Voltage	230 V~
Frequency	50 Hz
Required fusing	T 16 A/ circuit-breaker 16 A
Power	3 A
Power consumption	0.6 kW
HEPA filter efficiency	99.999 %
Noise level (ISO)	58 dBA
Light intensity	>800 lux
Airspeed down-flow	0.4 m/sec ± 20%
Airspeed inflow	≥ 0.4 m/sec
Noise level max.	60 dBA
Voltage/frequency	230V/50 Hz
Protective-ground sockets*)	230 VN ~N 4 A
Maximum leakage current for outlets	2.5 mA

*) The individual sockets are rated for 4 A and fused for 6.3 A. If all sockets are used, the maximum load may also be 6.3 A maximum.

Material properties		
Components	Material	Treatment
Front window	Polycarbonate PC	
Window frames	Stainless steel AISI 304	Polished
External surfaces, return duct, and trough	Steel plate 1203	Polyester-coated
Stand	Steel plate 1203	Polyester-coated
Work surface and work chamber	Stainless steel AISI 304	Polished

15. Maintenance and cleaning

- **Daily**

The work surface must be disinfected daily. Also lift the table top and carefully wipe the rear wall and the trough.

- **Weekly**

Wipe the outside of the unit with a mild household cleaner. Anti-static spray may be used to clean the front window.

- **Regularly**

Reliable function of the cabinet and compliance with standards are based on the following:

1. Correct air velocities.
2. Efficiency of the HEPA filters installed.
3. Correctly adjusted alarm limits.
4. Tightness of the construction.

16. Maintenance and replacement

Maintenance:

	**WARNING** Every 5000 operating hours or at least once every year.

- Measure the retention rate and air velocity at the work opening in accordance with DIN 12950.
- General function and safety tests in accordance with local requirements.

For this purpose, we recommend a maintenance agreement.

Repair and filter change:

	**WARNING** Before repair work is carried out inside the contaminated and/or infected cabinet, prior to filter replacement, and upon change of location, proper cleaning and disinfecting by the operator is required. The operator must confirm this in writing to service personnel. For the appropriate form, refer to the annex.

After completion of work, the following tests according to DIN 12950 are required:

- Leakage test of main and exhaust air filter
- Measurement of air velocity in the work chamber and in the work opening.

All maintenance and repair work performed, as well as filter replacements and the required tests, must be documented in the logbook.

Replacement of filters

Remove the complete front-cover with control panel, installed electrical equipment, lighting, and front window.

☞	**NOTE** In order to ease disconnection of the front cover a multiple connector plug and a protective earthed connector are placed on top of the electricity compartment inside the front cover. Only the two cables from the air velocity sensors are connected directly to the alarm PCB inside the electricity compartment.

Remove the pressure chamber above the filters (main or exhaust air filter) by unscrewing the clamps. Both filters are now accessible and can be removed.

Place removed filters immediately in suitable containers - marked as hazardous biological waste - and dispose of these.

For requirements for disposal, refer to DIN 58959, Part 4.

Install new filters and fasten to the pressure chamber by means of the clamps.

Reinstall the front cover. Install sensor cables, plug, and connectors. Fasten the front cover and check proper function of the front window.

17. Spare filters

Main filter:		**Item no.**
1 filter Type	Cofim AB9-LPD-LV	95700004
Retaining rate	99.999% at 3 µm - 610 x 1219 x 68 mm	

Exhaust air filter:		**Item no.**
1 Filter Type	Cofim AB41-LPD	95700520
Retaining rate	99.999% at 0.3 µm - 610 x 457 x 68 mm	

18. Replacement of electric parts

To access the fluorescent lamp and the starter, open the front window into vertical position.

To access the fuses for mains and electric outlets, remove the front plate holding the control panel.

19. Electric parts

		Item no.
Fluorescent lamp	36 W/83 250 V	844027
UV lampe (Philips)	Type TUV, 30 W, 250 V	844031
Starter	For both Types FS-U 4-80 W	844086
G Fuse	5 x 20 mm T10A, 250 V for mains.	841274
G Fuse	5x20 mm T6, 3A, 250 V for socket.	88851096

Statement regarding Personnel Safety for Repair/Inspection at customer.

JOUAN NORDIC A/S is legally obliged to protect its employees from all dangers.
We therefore kindly ask you to complete this statement before work is commenced.

Subject: Service report no. _____ Service agreement no. _____

The undersigned hereby declares that the above repair/inspection will not expose the service technician to hazardous biological, chemical or radioactive agents. Reservations, if any, may be indicated here (e.g. uses of gloves, respiratory gear, etc.).

Date	Name in block letters	Signature

List of recommended disinfectants:

☞	**NOTE** Most disinfectants are mixtures containing various substances.

☞	**NOTE** Avoid using products containing iodine, chloramine, chlorine dioxide, hypochlorite, phenol and perchloric acid.

Disinfectants that may be used contain:

alcohol or aldehyde.

The recommended disinfectants are:

Ethanol

Or

2% (volume) gluteraldehyde

or

15% (volume) formaldehyde

The use of other disinfectants cannot be recommended. Jouan Nordic A/S cannot take any responsibility for the effectiveness of the disinfectants used or the possible damage caused by these to the materials of the class II cabinets.

LOGBOOK

Type :	Product name :	Serial no. :	Supplier :

Service interval : _____ *Laboratory :* _____

Service/ repair	Fault occurred on	Notified / date	Repaired / date	Remark / fault	Caused by / action	Service internal/external	Carried out by

Service/ repair	Fault occurred on	Notified / date	Repaired / date	Remark / fault	Caused by / action	Service internal/external	Carried out by

DC 81-66
Revision 1

EC-Declaration of conformity

Jouan NORDIC

We:

Jouan Nordic A/S
Gydevang 17-19, DK-3450 Allerød
Denmark

declare under our sole responsibility that the product

Model: **Holten Biosafe 1.2**

to which this declaration relates is in conformity with the following standard(s) or other normative document(s):

EN 292-1:1991 - Safety of machinery.
Basic concepts - General principles for design.
(Basic terminology, methodology).

EN 292-2:1991 - Safety of machinery.
Basic concepts - General principles for design.
(Technical principles and specifications).

EN 60204-1:1999 - Safety of machinery - Electrical equipment of machines.
(General requirements).

EN 61010-1: 2001 - Safety requirement for electrical equipment for measurement, control and laboratory use.
(General requirements).

following the provisions of:

Directive **98/37/EEC** Machinery

Directive **73/23/EEC** Low voltage

Directive **89/336/EEC** Electromagnetic compatibility

Allerød, 2003.04.24

Jan Bøger, Managing Director