unopex

Operation Manual

Unopex B 45
Dehumidifier

Document No: 521201_121_en

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Foreword

Dear Customer,

Thank you for choosing a Dehumidifier from Unopex. You have made a good choice. Thank you for your trust.

This manual describes the Unopex B 45 Dehumidifier.

Please read this manual carefully, note the safety precautions before installing and putting the Unopex B 45 Dehumidifier into operation. You will find all necessary information for the safe operation of the instrument in this manual.

Follow this manual with regard to installation, start-up, operation, cleaning, maintenance, repair, storage and disposal of the instrument.

Original language version of this manual is in Turkish and serves as basis for all translations into other languages.

The manufacture of any component with the aid of this manual is also prohibited.

Unopex accepts no liability for damage, faults and malfunctions resulting from not following this operation manual.

1. Introduction

1.1 Details on the Declaration of Conformity

CE

The instrument complies with the requirements of the European Directives: 2006/42/EC (Machinery Directive) and 2014/35/EU (Low Voltage Directive).

1.2 Safety

The safety information in this operation manual is designed to protect the responsible body, operator and the instrument from damage.

1.2.1 Symbols Used for Safety Instructions

Safety instructions are marked by the below combinations of pictograms and signal words. The signal word describes the classification of the residual risk when disregarding the operation manual.

DANGER	**Denotes an immediate hazardous situation that will result in death or serious injuries.**
WARNING	**Denotes a general hazardous situation that may result in death or serious injuries.**
CAUTION	**Denotes a hazardous situation that can result in injuries.**
NOTE	**Denotes a situation that can result in property material damage.**
INFORMATION	**Denotes important notes and usable hints.**

Below are the supplementary safety information symbols and meanings used in this manual.

General warning

Electrical hazard

Hot surfaces

Fragile components

Explosive gases,

Explosive environments

Harmful to health and life

Wear protective goggles

Wear protective cloth

Wear protective gloves

Wear protective mask

1.2.2 Proper Use

DANGER

Using the instrument in potentially explosive environments

DEATH OR SERIOUS INJURIES THROUGH EXPLOSION

- The instrument is not for use in areas which require ex-protected instruments
- Do not install or start up the instrument in explosive environments
- Do not operate the instrument with explosive gas mixtures
- Ensure sufficient ventilation to directly withdraw released gases and gaseous substances

WARNING

Improper use

SERIOUS INJURY AND PROPERTY DAMAGE

- Store the operation manual where it is easy to access in close proximity to the instrument.
- Only adequately qualified operators may work with the instrument.
- Operators must be trained before handling the instrument.
- Check that the operators have read and understood the operation manual.
- Define precise responsibilities of the operators.
- Personal protective equipment must be provided to the operators.
- Be sure to follow the responsible body's safety rules.

NOTE

Modifications to the instrument by third-parties

DAMAGE TO THE INSTRUMENT

- Do not allow third parties to make technical modifications to the instrument.
- Modifications to the instrument are only permitted with the written approval of the manufacturer.
- Modifications and upgrades shall only be carried out by an authorized Unopex specialist. The manufacturer will decline any claim resulting from unauthorized modifications.
- In case of any modification of the instrument not approved by the manufacturer, the CE declaration of conformity becomes invalid.
- Only specialists trained by the manufacturer may carry out service, repairs or maintenance work.

The following must be observed without fail:

- Only use the instrument in a fault-free condition!
- Have start-up and repairs carried out only by specialists!
- Do not ignore, bypass, dismantle or disconnect any safety devices!

The technical specifications of the instrument is given in Section-2.

The instrument is designed and built for laboratories.

The instrument can be used to condense water from the drying gas from Unopex B 15 Mini Spray Dryer.

The instrument must be installed and operated according to the instructions in this manual. Failure to comply with the operation manual is deemed improper use.

1.2.3 Improper Use

Unopex B 45 Dehumidifier is permitted only for the purposes for which it was manufactured. Risks to users, property and the environment can arise when the instrument is damaged, used carelessly or improperly.

Use of the instrument for purposes other than the ones mentioned or beyond specified use limits shall relieve the manufacturer of all responsibility in case of damage to persons or things and invalidate the warranty.

The manufacturer accepts no liability for damage caused by technical modifications to the instrument, improper handling or use of if the operation manual is not observed.

Below uses are expressly forbidden:

- use of the instrument by insufficiently trained personnel
- use of gases with unknown chemical composition
- use of the instrument in areas which require ex-protected instruments
- use of the instrument without genuine parts and genuine consumables
- use of biohazardous materials or toxic substances
- use of substances which might explode or ignite due to the processing
- use of feeds containing organic solvent in open mode
- use of feeds containing organic solvent without Unopex B 60 Inert Cycle under inertization in closed mode
- use of corrosive samples
- use of samples which might produce oxygen during the processing
- use of the instrument with samples containing peroxides.
- use of the instrument with samples that can form peroxides.
- use of the instrument with corrosive samples in closed mode.
- use of the instrument for processing substances outside of research and development.
- unattended operation

1.2.4 General Hazards and Safety Notices

Inhalation of inert gases

DEATH BY SERIOUS POISONING OR SUFFOCATION

- Only operate the instrument in sufficiently ventilated environments
- Do not inhale inert gases
- Ensure sufficient ventilation to directly withdraw released gases and gaseous substances
- Check all parts, connections and sealings for proper sealing before operation
- Exchange defective or worn out parts immediately

Working with harmful or hazardous substances or with substances of unknown composition

DEATH OR SERIOUS INJURY THROUGH EXPLOSION

DEATH OR SERIOUS POISONING BY CONTACT OR INCORPORATION

- Certain gases in or in the vicinity of the instrument are highly inflammable
- Always be aware of the poisoning and explosion risk when working with harmful or hazardous substances
- Always be aware of the poisoning and explosion risk when working with substances of unknown composition
- Before operation, check the instrument for correct installation and assembling
- Before operation, inspect parts, sealings and tubes for good condition
- Exchange defective or worn out parts immediately
- Only operate the instrument in ventilated environments
- Directly withdraw released gases and gaseous substances by sufficient ventilation
- Check for gas leakages by performing a dry-run without sample material
- Always provide sufficiently ventilated environments to operate the instrument

Incorporation or inhalation of particles

DEATH OR SERIOUS POISONING BY INHALATION OF PARTICLES

- Do not inhale particles
- Wear protective clothing
- Wear protective gloves
- Wear protective eye goggles
- Wear protective mask
- Wear non-slip shoes
- Check all parts for proper sealing before operation
- Only recover particles in sufficiently ventilated areas
- Do not open the drying circuit while drying gas flow continues
- Do not disperse the dried particles
- Do not use compressed air to clean dusty parts

Operation with bent hoses

SERIOUS INJURY AND PROPERTY DAMAGE

- Always inspect the instrument for bends or kinks in hoses
- Eliminate them prior to operation

CAUTION

Inhalation of Ozone

RISK OF POISONING BY INHALATION OF OZONE

- Directly withdraw released gases and gaseous substances by sufficient ventilation
- Always be aware of the minor poisoning risk by inhalation of Ozone

NOTE

Liquid spill

PROPERTY DAMAGE

- Always be aware of the risk of instrument short-circuits and damage by liquids
- Do not put any liquid sample vessel on this instrument without reservoir-plate and ensure safe positioning of the vessel.
- Do not move the instrument when it is loaded with liquid
- Do not spill any liquids over the instrument
- Wipe off any liquids immediately
- Do not let the instrument vibrate

NOTE

Wrong mains supply

PROPERTY DAMAGE

- External mains supply must always meet the instrument specifications
- Check for sufficient grounding

INFORMATION

Always wear the following personal protective equipments when working with the instrument

- protective clothing
- protective gloves
- protective eye goggles
- protective mask

1.3 Staff Qualification

Risks to users, property, and the environment can arise when the instrument is used carelessly or improperly.

1.3.1 Responsible Body

- The head of laboratory is the responsible body.
- This operation manual is to be stored where it is easy to access in close proximity to the instrument and must be made available at all times to the operating personnel.
- Operators must be trained before handling and operating the instrument. The head of laboratory is the responsible for training his personnel. Only adequately qualified operators must be permitted to work with the instrument.
- Check that the operators have read and understood the operation manual. Define precise responsibilities of the operators.
- The instrument meets the recognized safety standards. Integration into a system may give rise to hazards that are characteristic of the other system's design and beyond the control of Unopex. It is the responsibility of the

responsible body to ensure that the overall system, into which this instrument is integrated, is safe.

- The responsible body must check whether local, national and federal regulations require any mandatory installation of further pollution control equipment for the instrument/the entire system.
- Personal protective equipment must be provided to the operators.

1.3.2 Operators

- Work on the instrument is reserved for appropriately qualified specialists, who have been assigned and trained by the responsible body to do so.
- Operators must be at least 18 years old. Under 18-year olds may operate the instrument only under the supervision of a qualified specialist.
- The operator is responsible vis-a-vis third-parties in the work area.
- Carefully read the operation manual before operating the instrument.
- Legal regulations, such as local, national and federal laws applying to the instrument, installation and working area of the instrument must be strictly followed.
- Ensure that the instrument is operated in proper condition only.
- Observe all safety instructions and do not ignore, bypass, dismantle or disconnect any safety devices.
- When working with the instrument, always wear appropriate personal protective equipments (e.g. protective clothing, protective gloves, protective eye goggles, protective mask, non-slip shoes). Protect yourself from inhalation of fine particles by wearing protective mask. The personal protective equipment must meet all requirements of all data sheets for the chemicals and materials used. Choose and use adequate measures according to the applications, since some additional protective measures might be necessary.
- Modifications to the instrument and modifications to the spare parts used are only permitted with the prior written approval of the manufacturer. The manufacturer will decline any claim resulting from unauthorized modifications. Ensure that modifications and upgrades are carried out by authorized Unopex specialists only.
- Ensure that service, repairs or maintenance work are carried out with care and on schedule and by specialists trained by the manufacturer only.

1.4 Residual risks

The instrument has been developed and manufactured using the latest technological advances. Nevertheless, risks to persons, property or the environment can arise if the instrument is used incorrectly.

Appropriate warnings in this manual serve to alert the user to these residual dangers.

1.4.1 Malfunction of a connected instrument (option)

A MALFUNCTION ON A CONNECTED INSTRUMENT

- Make sure that the connected instrument is prepared and maintained according to the manufacturer's documentation

1.4.2 Incorrect spray drying mode installation

AN INCORRECT INSTALLATION OF CONNECTED INSTRUMENT

- Make sure that the all connected instruments mode are installed in the correct order and correct mode of operation.

2. Technical Specifications

2.1 Scope of Delivery

INFORMATION

The scope of delivery might change according to specific offers/quotations and depends on the configuration of the purchase order..

INFORMATION

For detailed product information, visit www.unopex.com or contact Unopex.

2.2 Technical Data

Model	Unopex B 45 Dehumidifier
Min. outlet temperature	0 °C
Ambient conditions	for indoor use only altitude up to 2000 meters above sea level temperature: 5–40 °C relative humidity up to 31 °C max. 80% and decreasing linearly to 50% up to 40 °C
Filling amount of refrigerant	0.700 kg
Refrigerant	R134A
Safety Group Refrigerants (ASHRAE)	A1 (lower toxicity, no flame propagation)
Minimum clearance on all sides	200 mm
Dimensions (LxWxH)	450x550x700

2.3 Material of Construction for Product Contact Parts

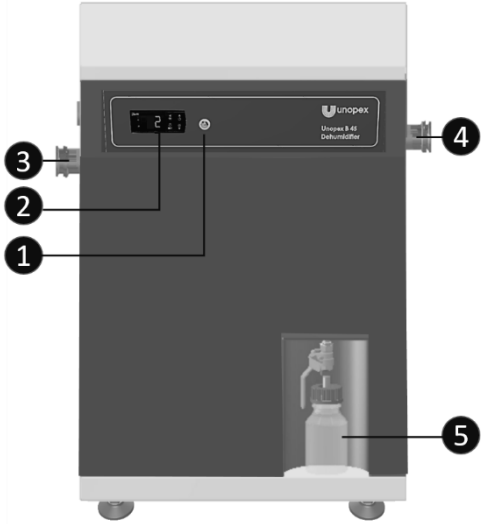
Housing	St, powder coated
Reservoir	stainless steel
Connections	stainless steel
Condense bottle	glass
Hoses	silicone

3. Product Description

3.1 Description of the Instrument

The Dehumidifier is an instrument which can dry gases at constant and reproducible humidity conditions. The humidity condensates while passing the refrigerator and is being collected in a closed condensate bottle.

3.2 Configuration



1	Power	4	Gas outlet
2	Control panel	5	Condense bottle
3	Gas inlet		

INFORMATION

Components, parts and images might change according to specific offers and scope of delivery.

4. Preparations Before Operation

Starting up a damaged instrument

MORTAL DANGER FROM ELECTRIC SHOCK

- Do not operate a damaged instrument
- Please contact the Customer Support

Death or serious injuries by use in explosive environments.

- Do not install or operate the instrument in explosive environments
- Do not install or operate the instrument with explosive gas mixtures without inertization
- Check all gas connections for correct installation before operation,
- Withdraw released gases and gaseous substances directly by sufficient ventilation

Unsuitable ambient conditions/unsuitable installation

SERIOUS INJURY DUE TO CRUSHING

- Comply with the all requirements

Risk of minor or moderate injury by heavy weight of the instrument

- Get help from others where you need
- Do not drop the instrument
- Place the instrument and accessories/units on stable, horizontal and vibration-free surface
- Keep limbs out of crushing zone
- Do not move the instrument and accessories/units with glass parts assembled

Risk of minor or moderate cuts by sharp edges.

- Check for damages to glass parts
- Do not touch defective or broken glassware or thin metal edges

4.1 Un-packing

- Check for damage to the packaging. Damage can indicate property damage to the instrument.
- Check for any transport damage when unpacking the instrument.
- If necessary, prepare a status report immediately and always contact your forwarding agent regarding the settlement of claims.
- Follow the instructions under “Chapter 8.2” for the disposal of packaging material.
- Keep the original packaging for future transportation.

4.2 Ambient & Installation Conditions

Consider the ambient conditions under "Chapter 2.2".

Take into consideration of the dimensions and weight of the instrument, accessories/units.

Maintain wall and ceiling clearance for adequate air exchange (dissipation of waste heat, supply of fresh air for the instrument and work area). Do not operate the instrument in an inadequately dimensioned area.

Install the instrument upright on a stable, horizontal surface where you can easily reach.

INFORMATION

Use required sealing rings and gaskets for each connection and consider the correct mounting directions

Screw all threaded connections tightly

For disassembling proceed in reverse order

4.3 Installation

4.3.1 Before installation

NOTE

Instrument damaged if switched on too early.

➢ After transporting, wait twelve hours before switching on the instrument. The fluid in the cooling system requires twelve hours to collect in the refrigerant compressor.

4.3.2 Installations for a spray drying mode

For installations for a spray drying mode, see separate installation manuals.

- B 15 Mini Spray Dryer in open mode with Dehumidifier
- B 15 Mini Spray Dryer in open mode with Dehumidifier and Spray Chilling
- B 15 Mini Spray Dryer in closed mode with Dehumidifier and Inert Cycle

4.3.3 Installing the condensate bottle

Put the condensate bottle in front the condensate vessel area. Attach the cap nut to the bottle.

5. Operation

5.1 Installation Check Before Operation

Carry out an installation check after a successful installation and prior to process.

- All commissioning operations have been completed. See Chapter 4.3 “Installation”.
- The condensate bottle is empty.
- Check the electrical connections.
- Make sure that the aspirator of B 15 Mini Spray Dryer is running.

DANGER

Inhalation or incorporation of dried particles process.

DEATH OR SERIOUS POISONING

- Wear appropriate personal protective equipments (e.g. protective clothing, protective gloves, protective eye goggles, protective mask, non-slip shoes).
  The personal protective equipment must meet all requirements of all data sheets for the chemicals and materials used. Choose and use adequate measures according to the applications, since some additional protective measures might be necessary.
- Check for proper sealing before use
- Do not inhale dried particles
- Stop drying gas flow before opening the drying circuit

WARNING

Contact or incorporation of harmful substances at use.

DEATH OR SERIOUS POISONING

- Exchange clogged filters immediately
- Operate the instrument in only ventilated environments
- Directly withdraw released gases and gaseous substances by sufficient ventilation
- Check for gas leakages by performing a dry-run without sample material

5.2 Starting the Dehumidifier

1. Power on the instrument.
   - The Dehumidifier is starting up.
   - The outlet hose get cold.
2. Set the output value by pressing the “Set” button on the control panel. If necessary, set the output value using the up and down arrow keys, then press the "Set" button and save. The default output value is 3.0°C.

INFORMATION

Check the condensate bottle at regularly, if necessary, empty the liquid inside.

5.3 Finishing

1. Power off the instrument.
2. Wait until the instrument is the same as the ambient temperature.
3. Empty the condensate bottle.

INFORMATION

For environmentally friendly disposal, do comply with all local, regional and federal disposal regulations applicable for you.

6. Cleaning - Maintenance and Repairs

Inhalation or incorporation of dried particles during cleaning, maintenance and repairs

DEATH OR SERIOUS POISONING

- Wear appropriate personal protective equipments (e.g. protective clothing, protective gloves, protective eye goggles, protective mask, non-slip shoes).

  The personal protective equipment must meet all requirements of all data sheets for the chemicals and materials used. Choose and use adequate measures according to the applications, since some additional protective measures might be necessary.
- Clean all parts and components
- Do not inhale dried particles
- Stop drying gas flow before opening the drying circuit
- Only maintain the instrument in sufficiently ventilated environments

Burning by electric current

DEATH OR SERIOUS BURNING

- Switch off the instrument, disconnect the power cord and prevent unintentional restart before removing housing or parts of it
- Do not spill any liquids over any electronic parts or components
- Do not touch the instrument with wet hands
- Do not squeeze cables, tubes or other items at reassembling
- Exchange defective cabling or tubing before reassembling

Risk of instrument damage by internal overpressure

- Carry out only the service and cleaning operations described in this section.
- Do not carry out any servicing and cleaning operations that involve opening the housing.
- Use only genuine spare parts in order to ensure correct operation and preserve the warranty.
- Carry out the service and cleaning operations described in this section to extant the lifetime of the instrument.

6.1 Emptying the condensate vessel

Carry out this action before every instrument use.

- Open the cap nuts.
- Remove the bottle.
- Empty the bottle in compliance with local regulations and legal requirements for waste disposal.

6.2 Cleaning the housing

- Wipe down the housing with a damp cloth.
- If heavily soiled, use ethanol or a mild detergent.

6.3 Cleaning the ventilation slots

- Remove dust and foreign objects from the ventilation slots using compressed air or a vacuum cleaner.

6.4 Customer service

Service and repair work on the instrument must be performed with care by authorized personnel only. These authorized personnel have a comprehensive technical training and knowledge of possible dangers which might arise from the instrument.

Contact Unopex customer service for spare parts delivery, repairs or technical advice. Contact information is given on the website www.unopex.com

7. Troubleshooting

7.1 Malfunctions and Remedy

Malfunction	Possible cause	Remedy
Instrument cannot be switched on	No voltage	Insert mains plug
The compressor does not start up.	Compressor is broken Wrong connection voltage	Contact the Unopex customer service.
The outlet hose does not get cold	Compressor is broken Wrong connection voltage	Contact the Unopex customer service

8. Taking out of operation

WARNING

Death or serious poisoning by contact or incorporation of harmful substances

- Wear appropriate personal protective equipments (e.g. protective clothing, protective gloves, protective eye goggles, etc).
- Remove all liquids and dusty residues from the instrument to remove possibly dangerous substances
- Do not use compressed air for removing dusty residues

8.1 Storage, Packing and Transport

Switch off the instrument, remove the power cord, clean the instrument thoroughly.

Store the instrument in a dry location.

The original packaging has been designed for the transportation of the instrument as well as the glass parts and accessories. Only the original packaging must be used for any possible further transport.

INFORMATION

When returning the instrument to the manufacturer for repair work, visit www.unopex.com and download the safety clearance form, then complete and send it with the instrument.

8.2 Disposal

For environmentally friendly disposal of the instrument, construction materials of the most important parts are specified under Chapter 2.3. So that the parts can be properly separated and recycled.

Do comply with all regional and local disposal regulations applicable for you.

INFORMATION

Contact your local authorities for any questions concerning disposal

8.3 Refrigerant

CAUTION

The instrument uses refrigerant. See Chapter 2.2

Potential environmental hazard.

- Dispose of the appliance properly, if necessary using a professional disposal service.

9. Declaration of Conformity

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Declaration of Conformity

Directives	2006/42/EC (machinery directive) 2014/35/EU (low voltage directive) 2014/30/EU (EMC directive)
Manufacturer	BAKON PROSES MAKİNALARI ANONİM ŞİRKETİ Izmir / Turkiye
Certification	FQC STANDARD UYGUNLUK DEĞERLENDİRME A.Ş. İçerenköy Mah. Bahçelerarası Sk. No: 43 Kat 14/A Ataşehir/İSTANBUL
Equipment	Mini Spray Dryer - Unopex B 15 Unopex B 15-C, Unopex B 45, Unopex B 60 Unopex B 70, Unopex B 90, Unopex B 92
Standards	EN ISO 12100:2010 Safety of machinery - General principles for design - Risk assessment and risk reduction EN 60204-1:2018 Safety of machinery - Electrical equipment of machines - Part 1: General requirements EN IEC 61326-1:2021 Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 1: General requirements

We hereby certify under our sole responsibility that the equipment described herein has been manufactured and tested in accordance with the above directives and standards.

Izmir, October 19th, 2023

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Quality Management

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