BINDER
Best conditions for your success

Operating Manual

Translation of the Original Operating Manual

ULTRA.Guard™
Ultra Low Temperature Freezers UF V (E2.1)
with RP1 Controller

Model	Model version	Art. No.	Door hinges	Voltage
UF V with RFID				
UF V 500	UFV500-230V-R	9020-0236, 9120-0236	right	230 V
UF V 500	UFV500-230V-L	9020-0213, 9120-0213	left	230 V
UF V 700	UFV700-230V-R	9020-0233, 9120-0233	right	230 V
UF V 700	UFV700-230V-L	9020-0237, 9120-0237	left	230 V
UF V UL with Advanced Voltage Booster and Data Logger				
UF V 500-UL	UFV500UL-120V-R	9020-0235, 9120-0235	right	115 V
UF V 500-UL	UFV500UL-120V-L	9020-0222, 9120-0222	left	115 V
UF V 500-UL	UFV500UL-240V-R	9020-0234, 9120-0234	right	208-240 V
UF V 500-UL	UFV500UL-240V-L	9020-0220, 9120-0220	left	208-240 V
UF V 700-UL	UFV700UL-120V-R	9020-0239, 9120-0239	right	115 V
UF V 700-UL	UFV700UL-120V-L	9020-0218, 9120-0218	left	115 V
UF V 700-UL	UFV700UL-240V-R	9020-0238, 9120-0238	right	208-240 V
UF V 700-UL	UFV700UL-240V-L	9020-0216, 9120-0216	left	208-240 V
UF V with water cooling				
UF V 500	UFV500-230V-RW	9020-0259, 9120-0259	right	230 V
UF V 500	UFV500-230V-LW	9020-0260, 9120-0260	left	230 V
UF V 700	UFV700-230V-RW	9020-0261, 9120-0261	right	230 V
UF V 700	UFV700-230V-LW	9020-0262, 9120-0262	left	230 V

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Contents

Dear Customer,

For the correct operation of the ULTRA.Guard™ ultra-low temperature freezer UF V, it is important that you read this operating manual completely and carefully and observe all instructions as indicated. Failure to read, understand and follow the instructions may result in personal injury. It can also lead to damage to the unit and/or poor equipment performance.

1. Safety

This operating manual is part of the components of delivery. Always keep it handy for reference.

The freezer should only be operated by laboratory personnel especially trained for this purpose and familiar with all precautionary measures required for working in a laboratory. Observe the national regulations on minimum age of laboratory personnel. To avoid injury and damage observe the safety instructions in the operating manual.

WARNING

Failure to observe the safety instructions.

Serious injuries and unit damage.

- Observe the safety instructions in this operating manual
- Carefully read the complete operating instructions for the ultra-low temperature freezer.

1.1 Legal considerations

This operating manual is for informational purposes only. It contains information for installing, start-up, operation and maintenance of the product. Note: the contents and the product described are subject to change without notice.

Understanding and observing the instructions in this operating manual are prerequisites for hazard-free use and safety during operation and maintenance. In no event shall BINDER be held liable for any damages, direct or incidental arising out of or related to the use of this manual.

This operating manual cannot cover all conceivable applications. If you would like additional information, or if special problems arise that are not sufficiently addressed in this manual, please ask your dealer or contact us directly by phone at the number located on page one of this manual

Furthermore, we emphasize that the contents of this operating manual are not part of an earlier or existing agreement, description, or legal relationship, nor do they modify such a relationship. All obligations on the part of BINDER derive from the respective purchase contract, which also contains the entire and exclusively valid statement of warranty administration. The statements in this manual neither augment nor restrict the contractual warranty provisions.

1.2 Structure of the safety instructions

In this operating manual, the following safety definitions and symbols indicate dangerous situations in accordance with the standards ISO 3864-2 and ANSI Z535.6.

1.2.1 Signal word panel

Depending on the probability of serious consequences, potential dangers are identified with a signal word, the corresponding safety color, and if appropriate, the safety alert symbol.

DANGER
Indicates an imminently hazardous situation that, if not avoided, will result in death or serious (irreversible) injury.

WARNING
Indicates a potentially hazardous situation which, if not avoided, could result in death or serious (irreversible) injury

CAUTION
Indicates a potentially hazardous situation which, if not avoided, may result in moderate or minor (reversible) injury

CAUTION
Indicates a potentially hazardous situation, which, if not avoided, may result in damage to the product and/or its functions or to property in its proximity.

1.2.2 Safety alert symbol

Use of the safety alert symbol indicates a **risk of injury**.

Observe all measures that are marked with the safety alert symbol in order to avoid death or injury.

1.2.3 Pictograms

Warning signs			
 Electrical hazard	 Very cold surface	 Explosive atmosphere	 Stability hazard
 CO_2 suffocation hazard	 Gas cylinders	 Pollution Hazard	 Harmful substances
 Biohazard	 Risk of corrosion and / or chemical burns		
Mandatory action signs			
 Mandatory regulation	 Read operating instructions	 Disconnect the power plug	 Lift with mechanical assistance
 Environment protection	 Wear protective gloves	 Wear safety goggles	
Prohibition signs			
 Do NOT touch	 Do NOT spray with water	 Do NOT climb	

	**Information** to be observed in order to ensure optimum function of the product.

1.2.4 Word message panel structure

Type / cause of hazard.

Possible consequences.

∅ Instruction on how to avoid the hazard: prohibition

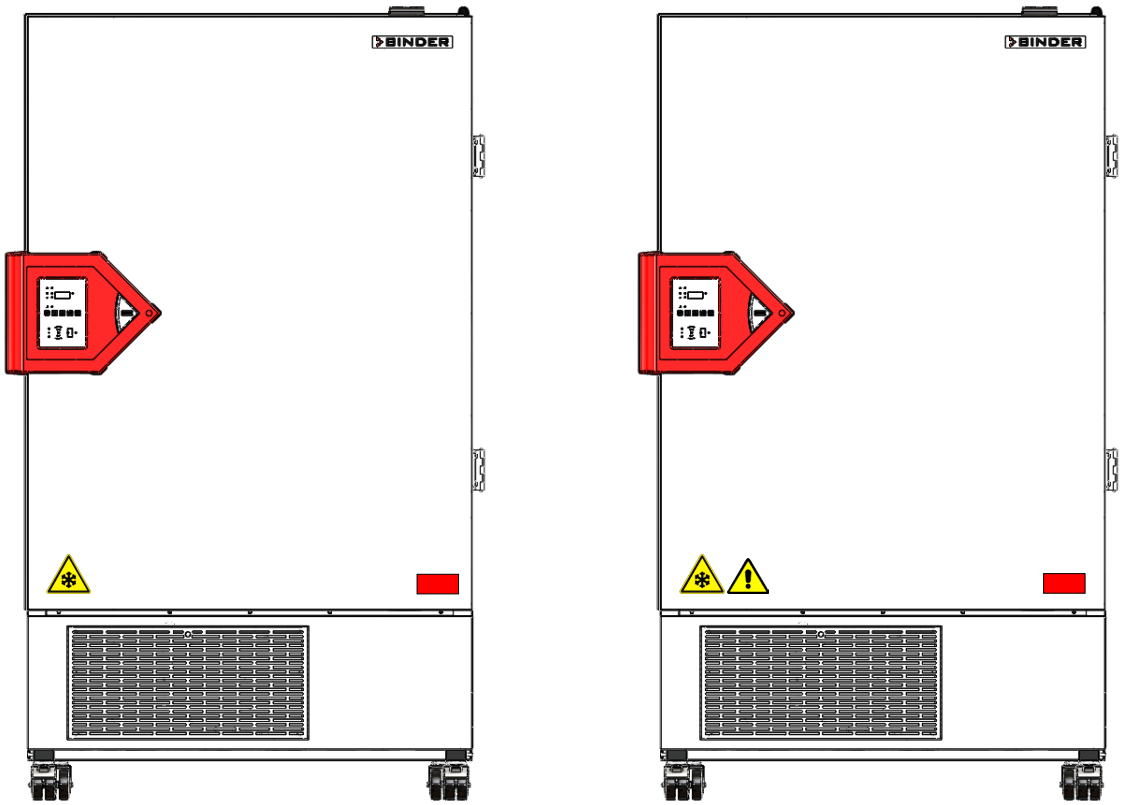
➢ Instruction on how to avoid the hazard: mandatory action

Observe all other notes and information not necessarily emphasized in the same way, in order to avoid disruptions that could result in direct or indirect injury or property damage.

1.3 Localization / position of safety labels at the unit

The following labels are located on the unit:

Pictograms (Warning signs)	
	Very cold surface: Risk of freezing
	Risk of injury. Observe the safety instructions in the operating manual. (only UF V - UL and UF V with optional CO_2 emergency cooling)
Service label	
	



UF V regular unit

UF V-UL and UF V with optional CO_2 emergency cooling

Figure 1: Position of labels on the ultra-low temperature freezer UF V

	Keep safety labels complete and legible.

Replace safety labels that are no longer legible. Contact BINDER Service for these replacements.

1.4 Type plate

The type plate sticks to the left side of the unit, bottom right-hand.

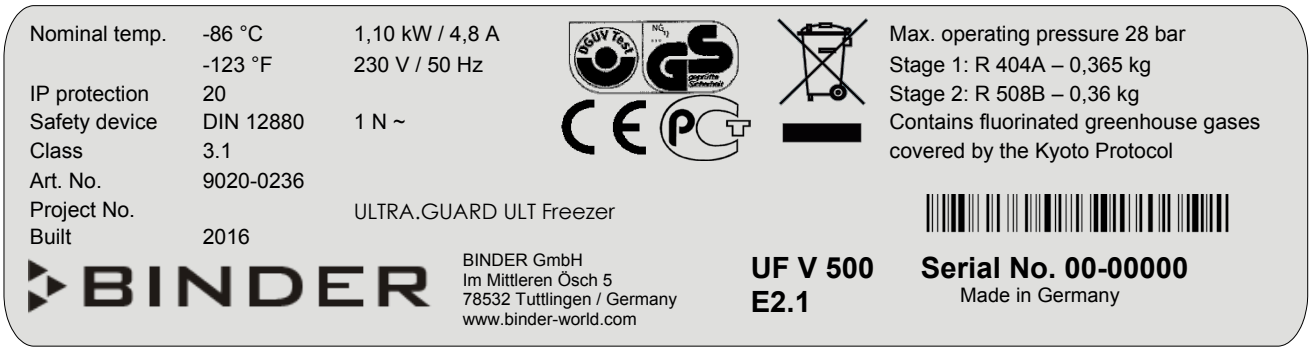
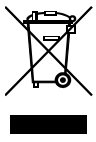


Figure 2: Type plate (example UF V 500 (E2.1) standard unit)

Indications of the type plate (example)		Information
BINDER		Manufacturer: BINDER GmbH
UF V 500		Model designation
ULTRA.GUARD ULT Freezer		Device name: “ULTRA.GUARD” ultra-low temperature freezer
Serial No.	00-00000	Serial no. of the unit
Built	2016	Year of construction
Nominal temperature	-86 °C -123 °F	Nominal temperature
IP protection	20	IP type of protection acc. to standard EN 60529
Temp. safety device	DIN 12880	Temperature safety device acc. to standard DIN 12880
Class	---	Class of temperature safety device
Art. No.	9020-0236	Art. no. of the unit
Project No.	---	Optional: Special application acc. to project no.
1.10 kW		Nominal power
4.8 A		Nominal current
230 V / 50 Hz		Nominal voltage ± 10% at the indicated power frequency
1 N ~		Current type
Max. operating pressure 28 bar		Max operating pressure in the refrigerating system
Stage 1 R 404A – 0,365 kg		Cooling 1st stage: Refrigerant type, filling weight
Stage 2 R 508B – 0,36 kg		Cooling 2nd stage: Refrigerant type, filling weight
Contains fluorinated greenhouse gases covered by the Kyoto Protocol.		Contains fluorinated greenhouse gases covered by the Kyoto Protocol

Symbol on the type plate	Information
CE	CE conformity marking
	Electrical and electronic equipment manufactured / placed on the market in the EC after 13 August 2005 and to be disposed of in a separate collection according to directive 2002/96/EC on waste electrical and electronic equipment (WEEE).

Symbol on the type plate	Information
 or 	The equipment is certified in the GOST R certification system of GOSTSTANDARD Russia. The equipment is certified according to Customs Union Technical Regulation (CU TR) for Russia, Belarus and Kazakhstan
	GS mark of conformity of the “Deutsche Gesetzliche Unfallversicherung e.V. (DGUV), Prüf- und Zertifizierungsstelle Nahrungsmittel und Verpackung im DGUV Test“ (German Social Accident Insurance (DGUV), Testing and Certification Body for Foodstuffs and Packaging Industry in DGUV Test). **Note:** Chambers equipped with the optional CO_2 emergency cooling do not bear the GS mark.
 (UL units only)	The equipment is certified by Underwriters Laboratories Inc.® according to standards CAN/CSA-C22.2 No. 61010-1, 2nd Edition, 2004-07 (Electrical Equipment for Measurement, Control, and Laboratory Use; Part 1: General Requirements); UL 61010-1, 2nd Edition, 2005-07-22 (Electrical Equipment for Measurement, Control, and Laboratory Use; Part 1: General Requirements)

1.5 General safety instructions on installing and operating the UF V freezer

With regard to operating the freezer and to the installation location, please observe the DGUV guidelines 213-850 on safe working in laboratories (formerly BGI/GUV-I 850-0, BGR/GUV-R 120 or ZH 1/119, issued by the employers’ liability insurance association) (for Germany).

BINDER GmbH is only responsible for the safety features of the unit provided skilled electricians or qualified personnel authorized by BINDER perform all maintenance and repair, and if components relating to chamber safety are replaced in the event of failure with original spare parts.

To operate the unit, use only original BINDER accessories or accessories from third-party suppliers authorized by BINDER. The user is responsible for any risk caused by using unauthorized accessories.

CAUTION

Danger of overheating.

Damage to the unit.

∅ Do NOT install the unit in unventilated recesses.

➢ Ensure sufficient ventilation of the installation site for dispersal of the heat.

CAUTION

Leakage of refrigerant in the event of a unit defect.

Danger to the environment.

➢ Ensure sufficient ventilation of the installation site.

Do not operate the freezer in hazardous locations.

DANGER

Explosion hazard.

Danger of death.

∅ Do NOT operate the unit in potentially explosive areas.

∅ KEEP explosive dust or air-solvent mixtures AWAY from the unit.

The freezer does not does not dispose of any measures of explosion protection.

DANGER

Explosion hazard.

Danger of death.

∅ Do NOT introduce any substance into the freezer which is combustible or explosive at working temperature.

∅ NO explosive dust or air-solvent mixture in the inner chamber.

Any solvent contained in the charging material must not be explosive or inflammable. I.e., irrespective of the solvent concentration in the steam room, NO explosive mixture with air must form. The temperature inside the chamber must lie below the flash point or below the sublimation point of the charging material. Familiarize yourself with the physical and chemical properties of the charging material.

Familiarize yourself with any potential health risks caused by the charging material. Take adequate measures to exclude any risk prior to putting the freezer into operation.

WARNING

Contamination with toxic, infectious or radioactive substances.

Danger of intoxication.

Danger of infection.

➢ Protect the interior of the unit against contamination by toxic, infectious or radioactive substances.

➢ Take appropriate measures when bringing in or taking out toxic, infectious or radioactive substances.

DANGER

Electrical hazard.

Danger of death.

∅ The unit must NOT become wet during operation or maintenance.

The freezers were produced in accordance with VDE regulations and were routinely tested in accordance to VDE 0411-1 (IEC 61010-1).

CAUTION

The inner surfaces become very cold during operation.

Danger of injury by freezing on.

∅ Do NOT directly touch the inner surfaces or the charging material during operation.

∅ AVOID skin contact with the inner surfaces and accessory equipment.

➢ Wear protective gloves when opening the inner doors and during manipulation.

WARNING

Stability hazard.

Danger of injury.

Damage to the unit and the charging material.

Housing cover breakaway.

∅ Do NOT climb on the lower housing cover.

∅ Do NOT load the lower housing cover with heavy objects while the unit door is open.

1.6 Intended use

ULTRA.Guard™ ultra-low temperature freezers UF V are technical equipment and intended solely for use at work. They are suitable are designed for safe storage of varied materials at temperatures up to –86 °C / *-122,8 °F*, especially for long-term storage of biological, medical, and chemical samples at constant low temperature. They are suitable for the domains Pharmacy, Medicine, Life Sciences, plastic industry, electronic components, food etc.

Freezers are designed for storage of harmless materials. None of the components of the charging material must be able to form an explosive mixture with air. Any component of the charging material must NOT be able to release toxic gases.

Following the instructions in this operating manual and conducting regular maintenance work (chap. 13) are part of the intended use.

Other applications are not approved.

The chambers are not classified as medical devices as defined by the Medical Device Directive 93/42/EEC.

WARNING: If customer should use a freezer running in non-supervised continuous operation, we strongly recommend in case of inclusion of irrecoverable specimen or samples to split such specimen or samples and store them in at least two chambers, if this is feasible.

The charging material shall not contain any corrosive ingredients that may damage the machine components made of stainless steel. Such ingredients include in particular acids and halides. Any corrosive damage caused by such ingredients is excluded from liability by BINDER GmbH.

In case of foreseeable use of the chamber there is no risk for the user through the integration of the chamber into systems or by special environmental or operating conditions in the sense of EN 61010-1:2010. For this, the intended use of the chamber and all its connections must be observed.

1.7 Operating instructions

Depending on the application and location of the unit, the operator of the chamber must provide the relevant information for safe operation of the unit in a set of operating instructions.

	Keep these operating instructions with the unit at all times in a place where they are clearly visible. They must be comprehensible and written in the language of the employees.

1.8 Measures to prevent accidents

The operator of the chamber must observe the following regulation: Occupational Safety Regulations. Operation of refrigeration units, heat pumps and cooling systems (GUV-R 500 chap. 2.35) (for Germany).

Following measures have been taken by the manufacturer in order to prevent ignition and explosions:

- **Indications of the type plate**

  See operating manual chap. 1.4

- **Operating manual**

  An operating manual is available for each chamber.

- **Temperature monitoring**

  The chamber has a temperature display which can be read from outside.

  An additional temperature safety device is built into the device. A visual and an audible signal (buzzer) show exceeding of the temperature.

- **Safety, measurement and control devices**

  The safety, measuring, and control devices are easily accessible.

- **Electrostatic charge**

  The interior parts are grounded.

- **Non-ionizing radiation**

  Non-ionizing radiation is not intentionally produced, but released only for technical reasons by electrical equipment (e.g. electric motors). The machine has strong permanent magnets. If persons with active implants (e.g. pacemakers, defibrillators) keep a safe distance (distance of field source to implant) of 30 cm, an influence of these implants can be excluded with high probability.

- **Protection against touchable surfaces**

  Tested according to EN ISO 13732-3:2008.

- **Floors**

  See operating manual chap. 3.4 for installation

- **Cleaning**

  See operating manual chap. 13.2.

- **Examinations**

  The chamber has been inspected by the “Deutsche Gesetzliche Unfallversicherung e.V. (DGUV) (German Social Accident Insurance (DGUV)” (German Social Accident Insurance (DGUV), Testing and Certification Body for Foodstuffs and Packaging Industry in DGUV Test) and bears the GS mark.

	Chambers equipped with the optional CO_2 emergency cooling do not bear the GS mark.

2. Unit description

The ULTRA.Guard™ ultra-low temperature freezers UF V were produced with great care using the latest tools for development and production. They were optimized for safe long-term storage of samples in the ultra-low temperature range and reach the minimum temperature of -86 °C / *-122.8 °F* in approx. 9 hours. You can operate the freezer in a temperature range from -86 °C / *-122.8 °F* up to -40 °C / *-40 °F*.

The UF V units are regularly equipped with the progressive RFID system (optional for UF V UL), offering personalized access control. The UF V UL units are regularly equipped with the advanced voltage booster AVC (option for UF V) and a data logger (option for UF V).

The freezers are available with the door hinged on right or left and for several different voltages.

Easy opening and closing door mechanism and access control

A pushbutton permits opening the automatic door mechanism without using your hands. A pull-tight function automatically closes the outer door when slightly open. For personalized access control, the freezer door is RFID controlled (standard with UF V, option for UF V UL) and an optional door locking with key is available.

The freezer is regularly equipped with a key switch (main power switch) to switch on and off the unit.

Controller

For temperature control, the freezer is equipped with the microprocessor controller RP1 with a digital display. The controller keypad can be locked (keyboard locking). Temperature setting is accurate to one degree. The controller is mounted at eye level.

The controller offers an error diagnostics system generating audible and visual warning and alarm messages. During power failure, alarm function and control remain active during 72h. The controller provides password protection for the setting menus. Testing the alarm functions is always possible.

The controller monitors ambient temperature and issues an alarm if it exceeds an adjustable value.

A counter of operating hours / weeks is included.

Housing

The inner chamber and the inside of the insulated outer door are made of stainless steel (German material no. 1.4016, US equivalent AISI 430). The housing is RAL 7035 powder-coated. All corners and edges are also completely coated. The inner surfaces are smooth and therefore easy to clean. Easy front access permits filter cleaning without tools. A 10 mm access port prepared to be finalized by the user and an additional optional access port serves to introduce a cable and sensor of a measuring device.

The buildup of ice in the door area is minimal due to perfect closing of the inner and outer doors and a heating of the outer door gasket. Precise spatial distribution of the cold in the interior ensures storage of all samples at an identical storage temperature. The prevention of thermal bridges protects against defrosting. The combination of vacuum insulation panels (V technology) and CFC-free polyurethane foaming maximizes the cold storage capacity.

The freezer has four compartment doors. You can insert stainless steel shelves are make optimum use of the interior. You can flexibly arrange the shelves to use the interior in a variable and optimum manner. Inventory racks (stainless steel storage racks with cryo boxes, chap. 12.8) are optionally available.

Castors with locks serve to move the freezer.

Cooling system

The powerful, energy-efficient and low-noise refrigerating machine uses the refrigerants R404a and R508b. They are completely free of HCFCs (hydrochlorofluorocarbons) and CFCs (chlorofluorocarbon) and not inflammable.

Control of the two-stage refrigerating machine: The 1st stage cooling immediately turns on. In addition, the 2nd stage cooling turns on depending on the temperature.

Safety

Thanks to the standard overtemperature safety device, the set temperature is maintained also in case of a controller failure.

In case of power failure at -80 °C / -112 °F, a temperature of -60 °C / -76 °F will not be exceeded in an empty freezer for at least 2.5 hours, in a loaded freezer (measured with a 30 kg / 66 lb water load) for approx. 7 hours.

The freezer is equipped with a rechargeable battery (12 V, 7.2 Ah). Battery voltage is regularly monitored. An alarm indicates too low battery voltage. You can check battery voltage in the “USER” menu.

The advanced voltage booster provides automatic voltage compensation through a buck/boost converter (standard with UF V UL, option for UF V, chap. 4.8).

An error diagnostics system monitors the unit functions and generates audible and visual warning and alarm messages. The door is monitored for being closed.

The CO_2 emergency cooling (option, chap. 11) offers additional refrigeration, i.e., following introduction of a heat load, in case of a power failure or failure of the cooling system.

Data monitoring and recording

The chamber is regularly equipped with a zero-voltage relay alarm output (chap. 10.10) and with an analog output (chap. 12.3) for integration into customer systems. An additional independent Pt100 temperature sensor with output on Lemo socket is available (option, chap. 12.4). The freezer can be optionally equipped with an Ethernet interface (option, chap. 12.1) for computer communication, enabling monitoring via a network. The BINDER communication software APT-COM™ 3 DataControlSystem (option, chap. 12.2) permits networking of up to 30 units and connection to a computer, as well as recording and representing temperature data.

A circular chart recorder (option for UF V UL, chap. 12.5) or a data logger with USB port that is independent from the chamber controller (standard with UF V UL, option for UF V, chap. 12.6) serve to independently record the temperature values, data given out in compliance with FDA guideline 21 CFR part 11.

2.1 Unit overview

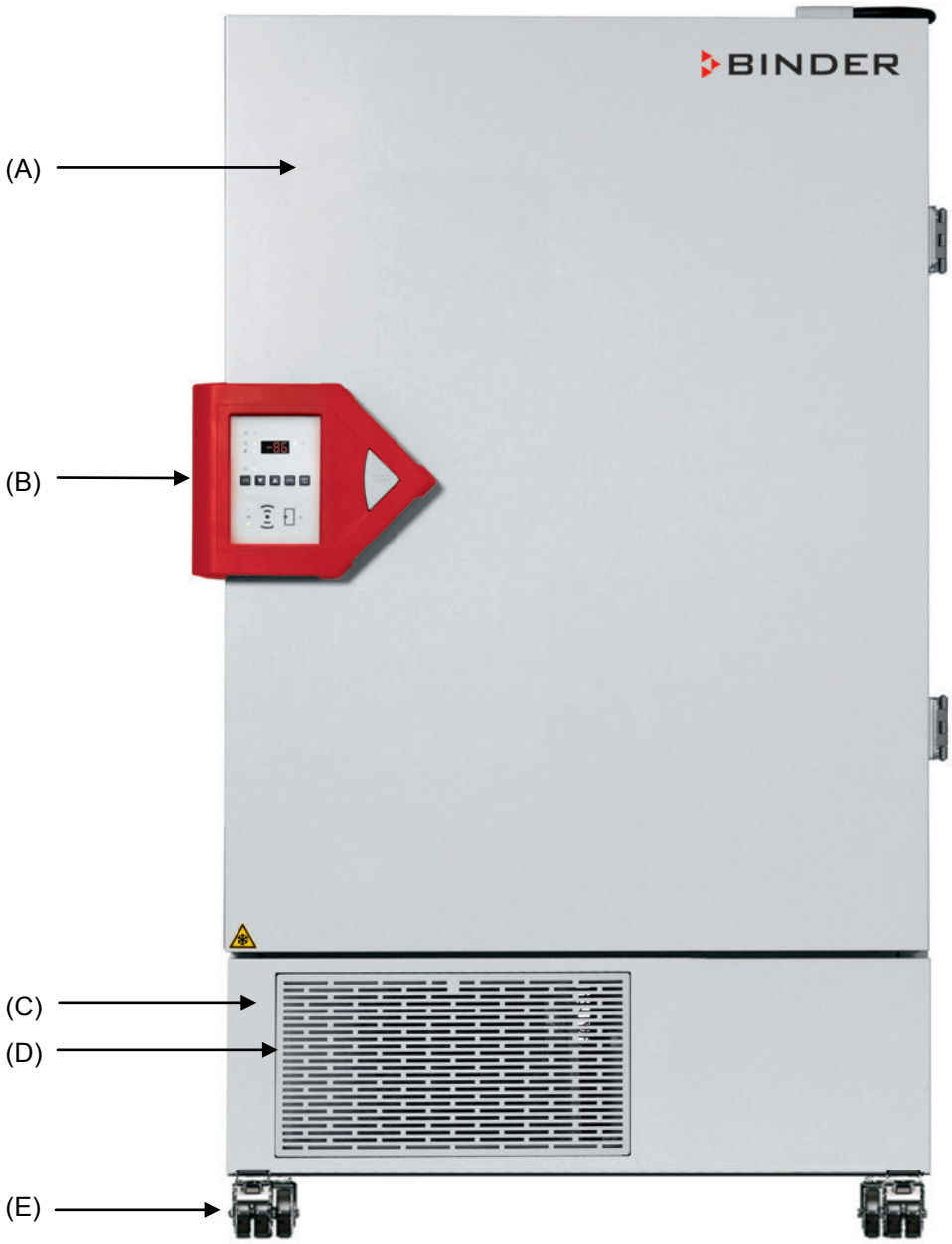


Figure 3: Freezer UF V 700, front view

(A) Outer door

(B) Housing of the automatic door mechanism and controller (description chap. 2.2, for emergency release see chap. 2.6.3)

(C) Compressor housing

(D) Air filter grille (checking and cleaning the filter chap. 13.3.1)

(E) Castors (front castors lockable by breaks)

Figure 4: Freezer UF V 700, with open outer door

(A) Outer door

(B) Housing of the automatic door mechanism and controller (description chap. 2.2, for emergency release see chap. 2.6.3)

(C) Compressor housing

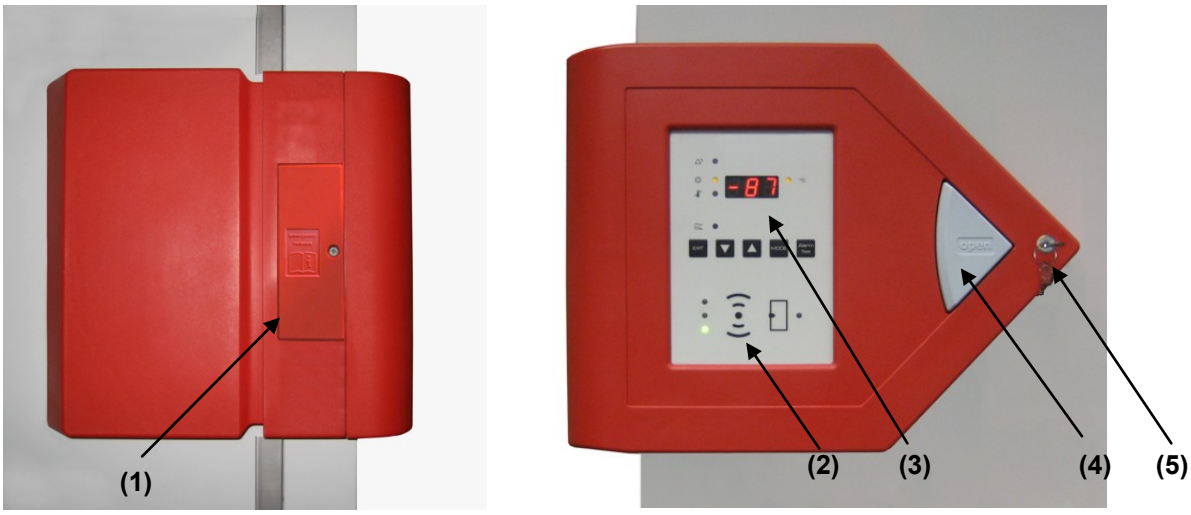
(D) Air filter grille (checking and cleaning the filter chap. 13.3.1)

(E) Castors (front castors lockable by breaks)

(F) Compartment with variable shelf

(G) Compartment door

2.2 Housing of the automatic door mechanism with operator panel



Left unit side Front view

Figure 5: Housing of automatic door mechanism with emergency release cover, operator panel of controller RP1, RFID control of the automatic door mechanism, and door locking with key (option)

(1) Emergency release cover

(2) GUARD.CONTROL: RFID control of the automatic door mechanism (standard with UF V, option for UF V UL, chap. 5.4)

(3) Operator panel of controller RP1

(4) Push-button “OPEN” to open the door

(5) Door locking with key (option for UF V UL, chap. 5.3)

Figure 6: Emergency release cover

	Following power connection / turning on the unit or closing the door, you can open the door again only after approx. 30 seconds. This is to protect the electromechanical door mechanism against damage.

2.3 Key switch (main power switch)

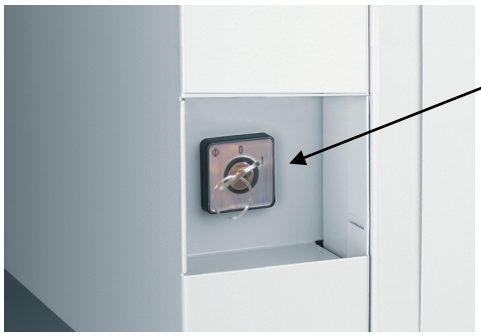


Figure 7: Position of the key switch (6) on the right side of the unit

(6) Key switch (main power switch)

You can remove the key of the key switch (main power switch) in der ON position as well as in the OFF position.

2.4 RP1 controller

The controller RP1 controls the temperature inside the chamber.

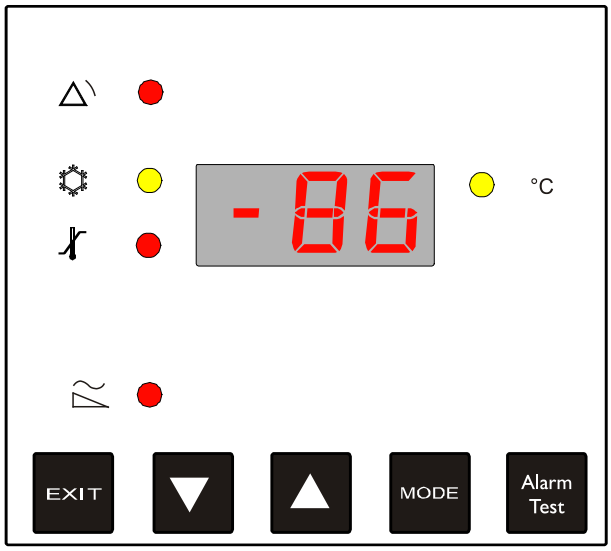


Figure 8: Overview of RP1 controller

Controller alarm and status LEDs

Symbol	LED	Meaning
△	red	General alarm
☼	yellow	Intensive cooling active
	red	Temperature alarm
	red	Power failure, no battery connected, battery voltage too low
°C	yellow	Display of a temperature value in °C

Controller buttons

Button	Function
EXIT	Switch off the alarm sound, reset alarm messages, call up the previous operating function
▼	Reduce value
▲	Increase value
MODE	Confirm entry and call up next operating function
Alarm Test	Switching on / off the alarm test (switching on: press down for 5 sec. switching off: press down briefly)

2.5 Connection panel on the unit rear

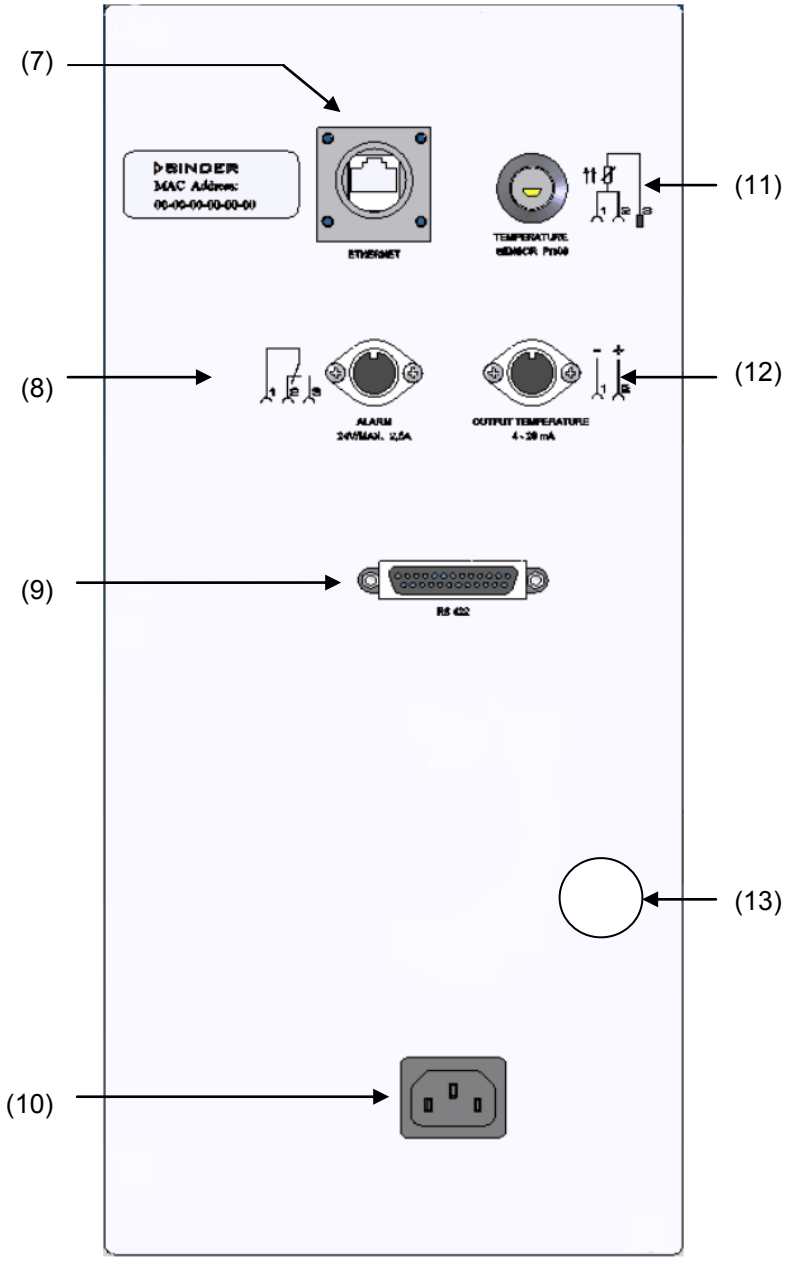


Figure 9: Rear connection panel of the freezer

(7) Ethernet interface for computer communication (option, chap. 12.1)

(8) Connection socket for zero-voltage relay alarm contact (chap. 10.10)

(9) RS 422 interface for computer communication

(10) Connection socket for IEC connector cable with internal locking system

(44) Connection socket for additional Pt 100 temperature sensor (option, chap. 12.4)

(12) Connection socket for analog output 4-20 mA (chap. 12.3)

(13) Connection socket for the electrical connection of the CO_2 emergency cooling (option, chap. 11)

2.6 Unit doors

2.6.1 Outer door

The outer gasket of the freezer outer door is heated. The door must be closed while the unit is operating normally in order to ensure stable conditions in the inner chamber.

You can operate the automatic door mechanism (chap. 5.2) without using your hands:

- Open: Firmly press the push-button “OPEN” e.g. with your elbow
- Close: Firmly press on the door for at least 2 seconds e.g., with your shoulder, until the automatic door lock is activated and closes the door tightly. The door then pulls tight automatically.

	Following power connection / turning on the unit or closing the door, you can open the door again only after approx. 30 seconds. This is to protect the electromechanical door mechanism against damage.

	Delay time for the temperature tolerance range alarm : After closing the outer door, the tolerance range alarm is switched off for a programmable delay time. This prevents alarms being constantly triggered during the unstable operating phase after opening the outer door.

The outer door is available hinged left or right.

	**DANGER** **Risk of locking in a person.** **Danger of death.** ➢ Before closing doors, make sure that nobody is inside. ➢ Pull the power plug before entering the interior (e.g. for cleaning purposes), thereto pull the locking button on the plug (Figure 21).

2.6.2 Compartment doors

The freezer interior is divided into in 4 compartments, which are isolated against the surrounding with doors. This permits bringing in or removing the samples of an individual compartment without remarkably affect temperature in the other compartments.

The compartment doors remain closed by magnetism when opening the outer door without need for closing them mechanically.

Open the inner doors as shortly as possible to avoid a temperature rise inside the freezer. The maximum angle of aperture is 90°.

2.6.3 Emergency release of the outer door

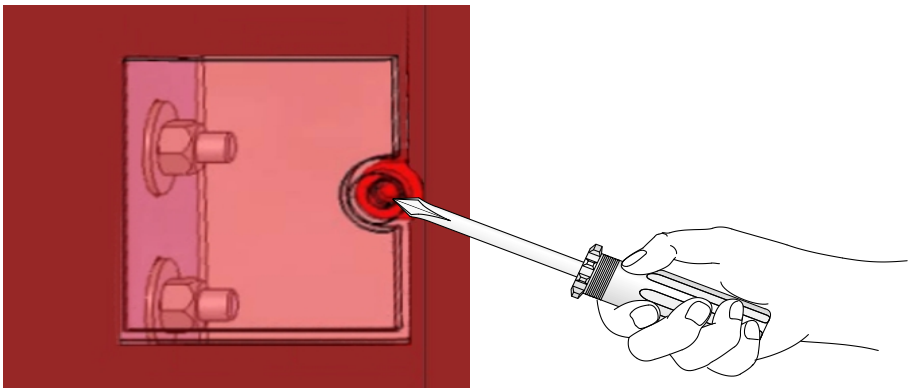
In case of power failure or a motor fault, you can open the unit door using the emergency release cover (1). It is fixed with a cross tip screw.

Following an emergency release, the door can be closed again only by a service technician. Carry out the emergency release only in emergency and make sure that unfreezing of the samples can be prevented.

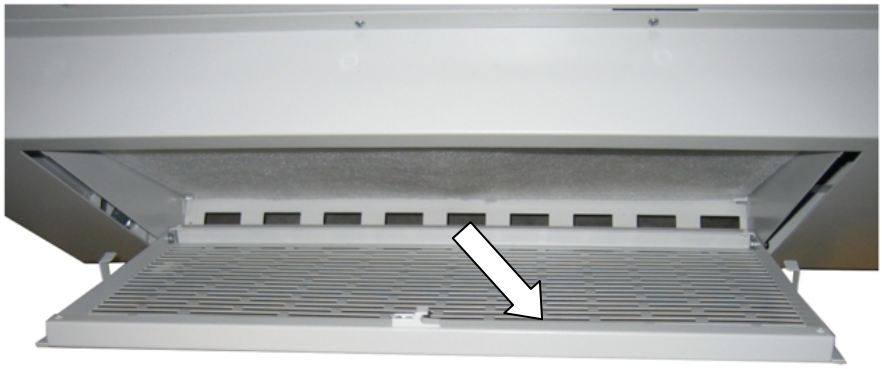
	CAUTION
	Danger of destruction of samples. ➢ Carry out the emergency release only in emergency. ➢ Ensure that a service technician is available and/or that the samples can be stored cold.

Proceeding for emergency release

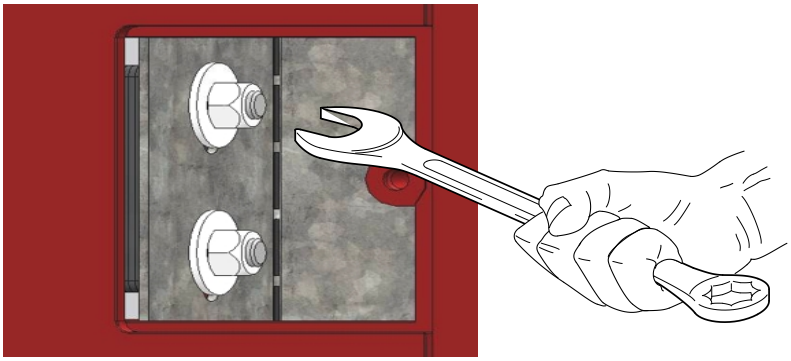
- Turn off the freezer at its main power switch and pull the power plug, thereto pull the locking button on the plug (Figure 21).
- Use a suitable screwdriver to unscrew the Phillips screw of the Emergency release cover
- Remove the emergency release cover



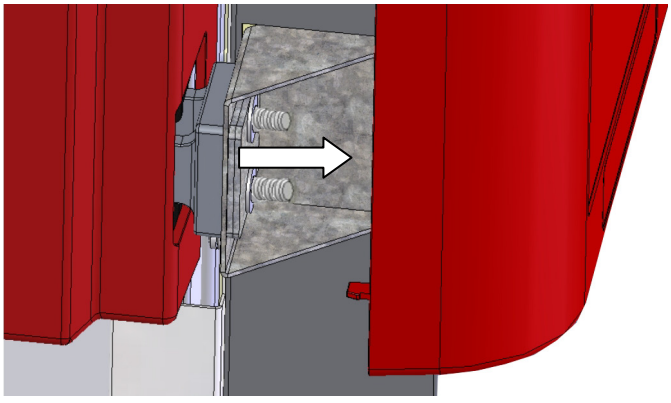
- Use a fork wrench SW8 to unscrew both screw nuts (M5).
- A suitable fork wrench is supplied. It is located at a magnetic holder inside the filter grille (D) behind the upper edge.



- Remove the lock bolt from the door



- Now you can open the unit door.



After the error has been removed, a service technician can close the door. Please contact BINDER Service.

Note: The freezer offers the possibility of an electrical emergency release, which can be performed by a qualified technician. Advantage: With the return of the power supply, operation can continue. Contact BINDER service.

2.7 Drain well for condensate during defrosting (option)

The drain well collects the dripping water when defrosting.

Strong magnets on the drain well sides fix it on the unit.

Attach the drain well to the freezer. Its first level rests on the lower housing panel. The gasket is aligned to the bottom edge of the freezer interior.

Figure 10: Freezer with drain well (option)

While defrosting use adhesive tape to keep the door above the drain well (drain off position). Now the melted condensate flows into the drain well.

Place a reservoir below the hole at the front left corner of the drain well, so that the water can drain off.

Figure 11: Unit door in drain off position above the drain well

3. Completeness of delivery, transportation, storage, and installation

3.1 Unpacking, and checking equipment and completeness of delivery

After unpacking, please check the unit and its optional accessories, if any, based on the delivery receipt for completeness and for transportation damage. Inform the carrier immediately if transportation damage has occurred.

Caution: The drain well is placed under the unit between the castors. Please remove it before unpacking the freezer!

CAUTION

Sliding or tilting of the unit.

Damage to the unit.

∅ Do NOT lift the unit using the door, the housing of the automatic door mechanism or the lower housing.

∅ Do NOT lift the unit by hand.

∅ Do NOT transport the unit horizontally.

➢ Keep the unit in upright position. Max. angle of inclination during transport: 10°.

➢ Lift the unit using technical devices (fork lifter) from the pallet. Set the fork lifter laterally or from the rear in the middle of the unit. Make sure to place all the lateral supports of the unit on the forks (check: the fork protrudes at the opposite unit side).

➢ Wear suitable shoes (safety shoes).

The final tests of the manufacturer may cause traces of the shelves on the inner surfaces. This has no impact on the function and performance of the unit.

Please remove any transportation protection devices and adhesives in/on the unit and on the doors and remove the operating manuals and accessory equipment.

☞	Remove any protective lamination sheet on the inner metal surfaces prior to commissioning.

☞	Wait at least 8 hours following transport with technical devices (chap. 3.2.2) before start-up.

If you need to return the unit, please use the original packing and observe the guidelines for safe lifting and transportation (chap. 3.2).

For disposal of the transport packing, see chap. 14.1.

Scope of delivery

- Ultra-low temperature freezer UF V
- 2 keys for the main power switch (key switch)
- 3 shelves,12 shelf holders and 3 fixing plates with screws
- DIN plug for the zero-voltage relay alarm output
- Starter set RFID cards (master card, switch-off card, 3 user cards) (standard with UF V, option for UF V UL)
- Data logger (standard with UF V UL, option for UF V)
- 2 spacers for rear wall distance.
- Operating manual

Note on second-hand units (Ex-Demo-Units)

Second-hand units are units that have been used for a short time for tests or exhibitions. They are thoroughly tested before resale. BINDER ensures that the chamber is technically sound and will work flawlessly.

Second-hand units are marked with a sticker on the unit door. Please remove the sticker before commissioning the unit.

3.2 Guidelines for safe lifting and transportation

3.2.1 Moving the freezer inside a building

Before moving the freezer unlock the front castors. The castors are designed only for moving the freezer inside a building. This is possible only on a floor without joints (e.g. no tiles) and when avoiding shocks. In this case, the freezer must not be empty (max. load see technical data, chap. 17.4).

If you want to move the unit across a large door threshold or into an elevator to change the floor, empty the freezer and put all shelves on the bottom of the interior.

If you incline the unit by less than 5°, you can directly turn it on after moving (at least 10 minutes after turning off). Otherwise, wait at least 8 hours until putting it into operation again.

As soon as the unit has reached its destination, lock the front castors.

	Wear suitable shoes (safety shoes) when moving the freezer.

Over very short distances (within reach of the power cable), you can move the freezer while operating.

If you turned off the unit (turning off at the main power switch, pulling the power plug), wait at least 10 minutes after moving until you turn on again the unit in order to protect the refrigeration machine against damage.

	**CAUTION** **Too quick restart of the refrigeration machine.** **Damage to the unit.** ➢ After turning off wait 10 minutes before turning on the freezer again.

To move the freezer through narrow passages (doors, narrow corridors), open the unit door:

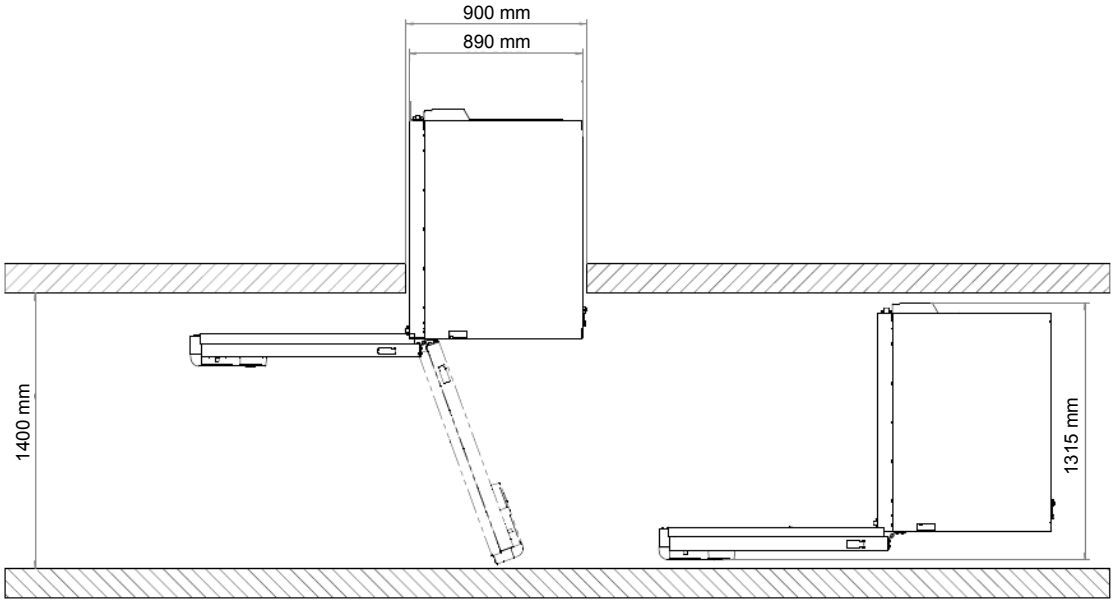


Figure 12: UF V 700 with open unit door

For transport outside a building use technical equipment (chap. 3.2.2).

3.2.2 Transport outside a building

Before moving the freezer unlock the front castors. The castors are designed only for moving the freezer inside a building (respect the information given in chap. 3.2.1).

After operation, please observe the guidelines for temporarily decommissioning the unit (chap. 14.2).

CAUTION

Sliding or tilting the unit.

Damage to the unit.

- ∅ Do NOT lift or transport the unit using the door, the housing of the automatic door mechanism or the lower housing.
- ∅ Do NOT lift the unit by hand
- ∅ Do NOT transport the unit horizontally.
- ➢ Transport the unit only in its original packaging.
- ➢ Secure the freezer with transport straps for transport.
- ➢ Keep the unit in upright position. Max. angle of inclination during transport: 10°.
- ➢ Place the shelves on top of each other on the bottom of the interior.
- ➢ Lift the unit using technical devices (fork lifter) and place it on the transport pallet. Set the fork lifter laterally or from the rear in the middle of the unit. Make sure to place all the lateral supports of the unit on the forks (check: the fork protrudes at the opposite unit side).
- ➢ Transport units ONLY with the original transport pallet. Set the fork lifter only to the pallet. Without the pallet the unit is in imminent danger of overturning
- ➢ Wear suitable shoes (safety shoes).

- Permissible ambient temperature range for transport: -10 °C / *14°F* to +60 °C / *140°F*.

You can order transport packing and rolling pallets for transportation purposes from BINDER Service.

Freezer transport in upright position is mandatory in order to avoid oil running out of the engine casing and resulting damages to the cooling system. Max. angle of inclination during transport: 10°.

	Wear suitable shoes (safety shoes) during transport.

	Following transport, wait at least 8 hours until start-up.

3.3 Storage

Intermediate storage of the unit is possible in a closed and dry room. Observe the guidelines for temporary decommissioning (chap. 14.2).

- Permissible ambient temperature range for storage: -10 °C / *14°F* to +60 °C / *140°F*.
- Permissible ambient humidity: max. 70% r.H., non-condensing

Secure the unit against unintentional rolling by locking the front castors.

When after storage in a cold location you transfer the unit to its warmer installation site, condensation may form in the inner chamber or on the housing. Before start-up, wait at least one hour until the freezer has attained ambient temperature and is completely dry. According to the type of transport that has taken place (chap. 3.2) you may have to wait at least 8 hours until start up.

3.4 Location of installation and ambient conditions

The freezer is designed for setting up inside a building (indoor use). Set up the freezer on a flat, even surface, free from vibration and in a well-ventilated, dry location. Lock the front castors and align the unit using a spirit level. The site of installation must be capable of supporting the unit's weight (see technical data, chap. 17.4).

	**CAUTION** **Danger of overheating.** **Damage to the unit.** ∅ Do NOT set up units in non-ventilated recesses. ➢ Ensure sufficient ventilation for dispersal of the heat.

	**CAUTION** **Leakage of refrigerant in the event of a unit defect.** **Danger to the environment.** ➢ Ensure sufficient ventilation of the installation site.

- Permissible ambient temperature range for operation: +18 °C / *64.4 °F* to +32 °C / *89.6 °F*. At elevated ambient temperature values, fluctuations in temperature can occur.

	The ambient temperature should not be substantially higher than the indicated ambient temperature of +25 °C / *77 °F* to which the specified technical data relate. For other ambient conditions, deviations from the indicated data are possible.

Prevent the freezer from sucking warm air from other devices.

	Avoid direct solar radiation on the unit. Do not place the freezer in direct vicinity of units with a high heat emission.

- Permissible ambient humidity: 70% r.H. max., non-condensing.
- Installation height: max. 2000 m / *6561.7 ft* above sea level.

Minimum distances:

- between several units: 250 mm / 9.84 in
- Wall distance, rear: 100 mm / 3.94 in (spacer is supplied, see chap. 4.2)
- Wall distance, laterally, on the side without door hinge: 100 mm / 3.94 in
- Wall distance, laterally, on the side with door hinge: 240 mm / 9.45 in.
- Spacing above the unit: 100 mm / *3.94 in*

Ventilation openings must not be blocked. Ensure a distance of at least 100 mm / *3.94 in* to the ventilation openings on the freezer's front and rear.

	To completely separate the unit from the power supply, you must disconnect the power plug. Install the unit in a way that the power plug is easily accessible and can be easily pulled in case of danger. To disconnect the connector plug, simultaneously pull the locking button (Figure 21).

With an increased amount of dust in the ambient air, clean the condenser fan (by suction or blowing) several times a year. Check the condenser air filter frequently and clean it if necessary (chap. 13.3.1).

Avoid any conductive dust in the ambiance according to the unit layout complying with pollution degree 2 (IEC 61010-1).

For the user there is no risk of temporary overvoltages in the sense of EN 61010-1:2010.

Do not install or operate the freezer in potentially explosive areas.

EX	**DANGER**
	Explosion hazard. **Danger of death.** ∅ Do NOT operate the unit in potentially explosive areas. ∅ KEEP explosive dust or air-solvent mixtures AWAY from the vicinity of the unit.

For freezers with water cooling:

	To avoid any possible water damage, provide a floor drain at the location of the device. Select a suitable installation site to avoid any consequential damage by splashing water.

4. Installation and connections

4.1 Operating instructions

Depending on the application and location of the unit, the operator of the freezer must provide the relevant information for safe operation of the unit in a set of operating instructions.

	Keep these operating instructions with the unit at all times in a place where they are clearly visible. They must be comprehensible and written in the language of the employees.

4.2 Spacers for rear wall distance

Please fix both spacers with the delivered screws at the unit rear. This serves to ensure the prescribed minimum distance to the rear wall of 100 mm / *3.94 in*.

Figure 13: Spacer for rear wall distance

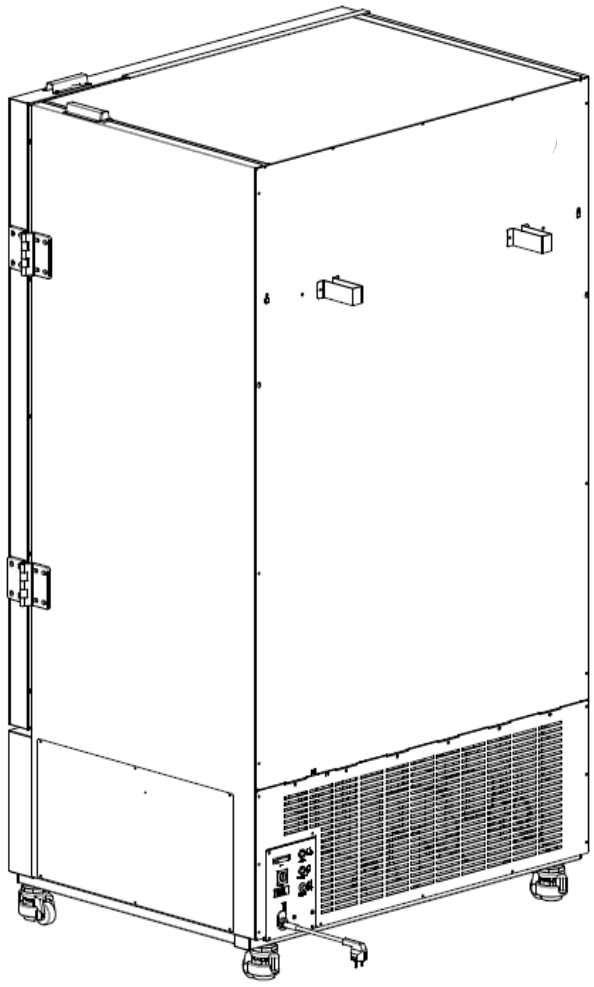


Figure 14: Rear UF V 700 with mounted spacers

4.3 Fixing to achieve earthquake safety (optional)

Two slots on the freezer's rear provide fastening lugs. You can mount a chain or rod to fix the unit at the wall.

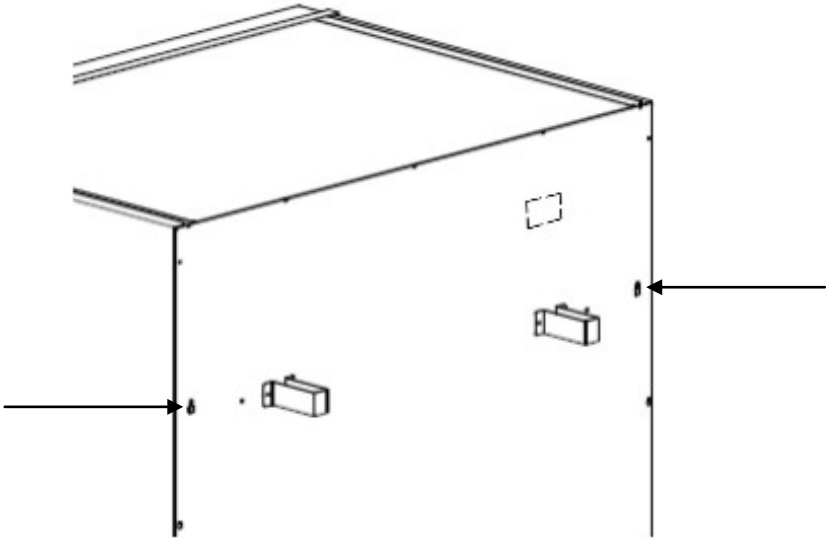


Figure 15: Slots on the freezer's rear to mount a fixing device

4.4 10 mm access port prepared to be finalized by the user

The UF V is equipped with an access port to be finalized by the user for cables with a diameter of up to 10 mm. When finalizing this access port the freezer should be approx. at room temperature.

CAUTION

Works inside the UF V with low inside temperature.

Danger of injury by freezing on.

➢ Turn off the freezer prior to finalizing the access port an let it warm up until approx. room temperature.

To finalize the access port proceed as follows:

- Break out the pre-punched rectangle in the rear wall (Figure 16) with suitable pliers
- Break out the pre-punched rectangle in the inner chamber (Figure 17) with suitable pliers
- Use a screwdriver to pierce the PU foam insulation horizontally from the inside
- Pass the desired cables through the port
- Use the sealing kit (art. no. 8009-0815) for sealing. The included insulation tube is to close the remaining free space after passing the cables. Thoroughly seal both openings of the port with the sealant. This avoids the entry of humidity from the ambient air into the insulation.

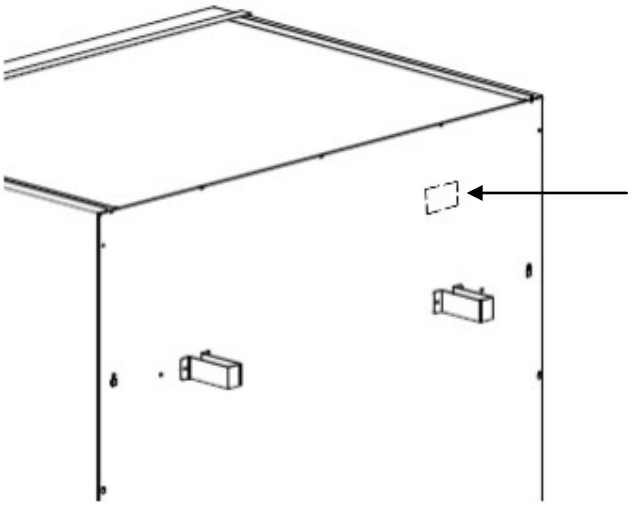


Figure 16: Rear view UF V with pre-punched access port

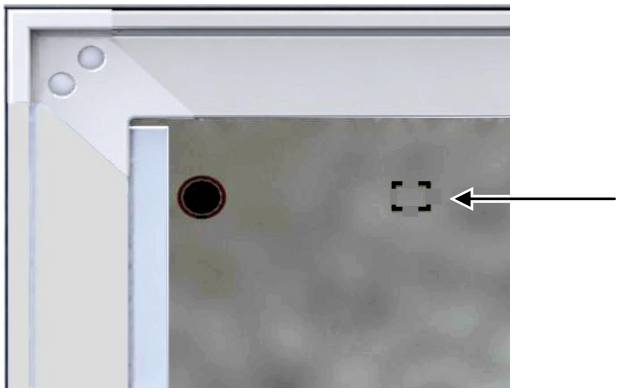


Figure 17: Inner chamber UF V with pre-punched access port

4.5 Adjustable shelves

The scope of delivery comprises three adjustable shelves. You can mount them and further optional shelves in different positions of the lateral walls in 24 mm / *1 inch* steps. In standard position, the shelves are placed with a distance of 310mm / *12.2 in*, forming the bottom of the compartments, thus making available the maximum space for optional inventory systems.

When using the optional shelves for operation at -40 °C / *-40 °F*, leave a free space of 8 cm each on the left and right side when introducing the load.

To remove a shelf, lift and incline it, then pull it forward.

It is required to fix the adjustable shelves in order to avoid that a person could be locked in the freezer. For this purpose, mount the supplied fixing plates as described below for each side:

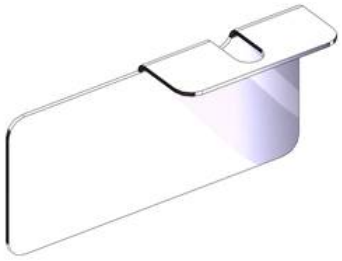


Figure 18: Fixing plate

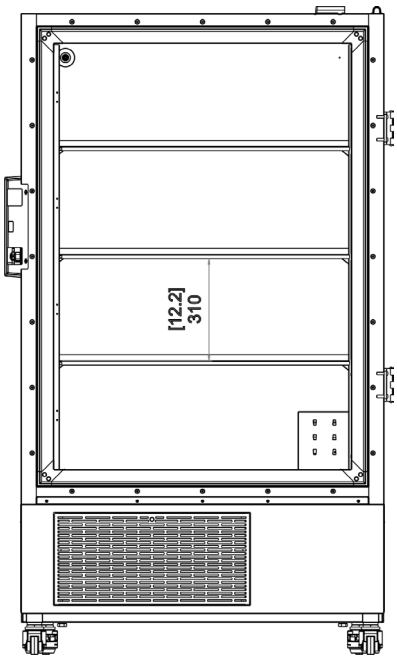
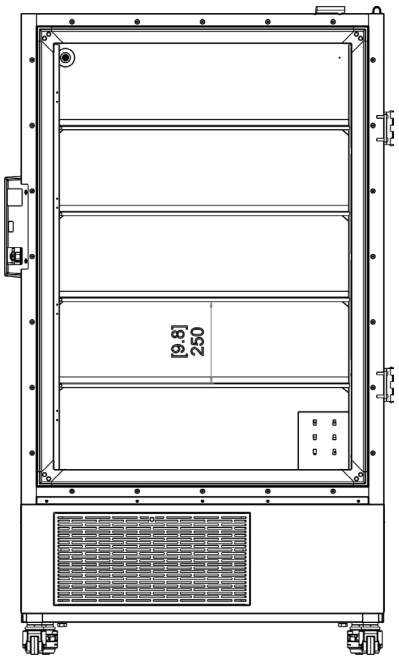
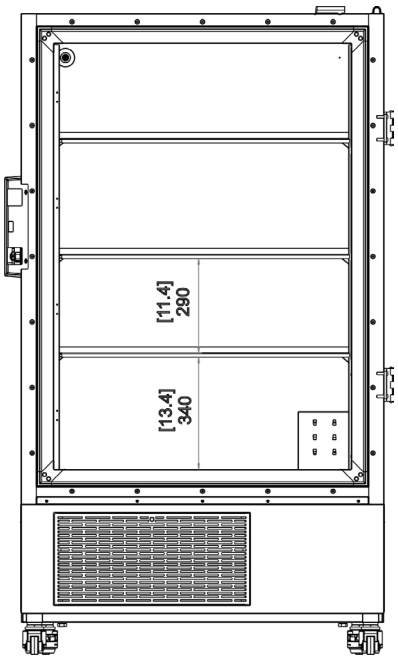
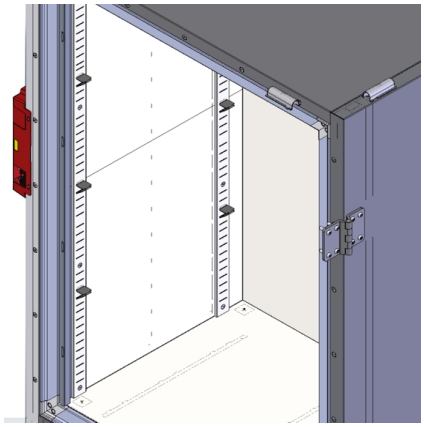
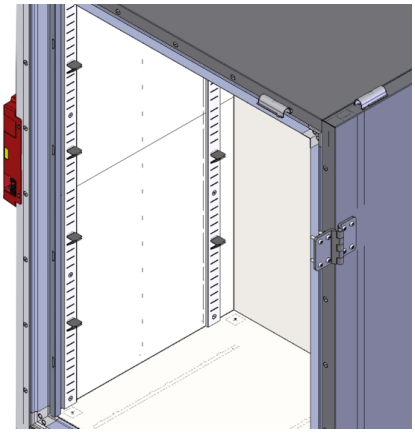
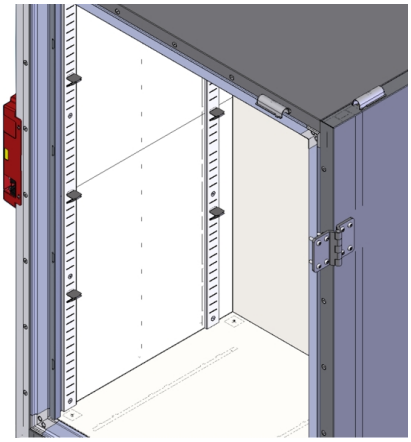
- Use a 4 mm Allen wrench to loosen the screws of the shelf holder bar

- Put the fixing plate below the shelf holder bar

- Screw the fixing plate to the shelf

- Use a 4 mm Allen wrench to fix the screws of the shelf holder bar

For optimal use of space, we recommend the following shelf positions:

Position of 3 shelves to obtain 4 compartments with equal ceiling height	Position of 4 shelves (1 x optional) to obtain 5 compartments with equal ceiling height	Position of 3 shelves to obtain the maximum sample storage space: 2 compartments with a ceiling height of 334 mm / *13.15 in* (for racks 4x6) and 2 compartments with a ceiling height of 279 mm / *11 in* (for racks 4x4)
		
		
Insert the shelf holders into the following positions of the shelf holder bar (starting from the bottom): 13, 25, 37	Insert the shelf holders into the following positions of the shelf holder bar (starting from the bottom): 10, 20, 30, 40	Insert the shelf holders into the following positions of the shelf holder bar (starting from the bottom): 14, 25, 38

Permitted shelf loads:

Unit size		**500**	**700**
Permitted load of individual shelf (regular)	kg / *lbs*	50 / *110*	65 / *143*
Permitted total load of all shelves (regular)	kg / *lbs*	200 / *441*	260 / *573*
Permitted load of individual optional shelf (for operation at -40 °C)	kg / *lbs*	30 / *66*	30 / *66*
Permitted total load of all optional shelves (for operation at -40 °C)	kg / *lbs*	120 / *265*	120 / *265*

4.6 Connections of cooling water for units with water cooling

The water cooling reduces the heat, which is emitted during cooling operation to the ambient air.

An enclosure inside the unit contains the connection kit for the cooling water inlet and outlet

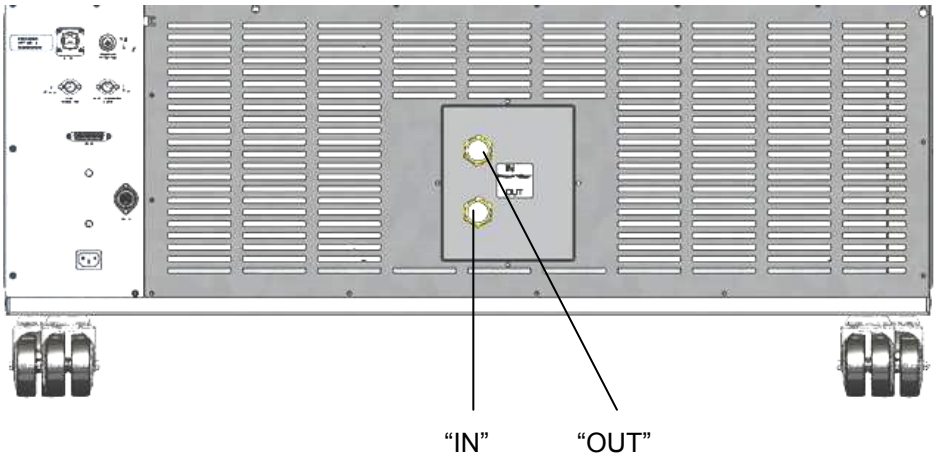


Figure 19: Connections of cooling water on the unit rear (units with water cooling)

“IN” connection for cooling water inlet with external thread 3/4‘‘ and internal thread 3/8‘‘

“OUT” connection for cooling water outlet with external thread 3/4‘‘ and internal thread 3/8‘‘

4.6.1 Connection of cooling water outlet for water cooling

Fasten the 1/2‘‘ cooling hose to the connection of cooling water outlet “OUT” on the unit rear. Observe the following points:

- You can use a part of the supplied water hose for the cooling water outlet. In case another hose is used, it must be permanently resistant against max. 50 °C / *122 °F* and pressure-resistant up to 10 bar.
- Put the hose on the hose nozzle with screwing and secure it with one of the four supplied hose clamps. Connect the hose nozzle to the connection “OUT” and screw on the union nut.
- For the hose connection to the domestic water connection, we recommend to also use the supplied hose nozzle with screwing and secure it with one of the four supplied hose clamps.
- Before turning on the unit, check the connection for leaks.

The temperature of the effluent cooling water is 27 °C up to 29 °C on account of the unit’s construction.

4.6.2 Connection of cooling water inlet for water cooling

	Connect the cooling water outlet **before** connecting the cooling water inlet.

Requirements for the cooling water:

- Water type: cooling water, air conditioning water, tap water
- Water intake temperature: 8 °C / *46.4 °F* up to 23 °C / *73.4 °F*
- pH value 4 up to 8
- Water hardness of max. 142.8 mg/l (ppm) = 10 English (Clark) degrees = 8.32° grains per U.S. gallon = 1.4285 mmol/l.
- Particle size < 100 µm
- Connection pressure 1 bar up to 10 bar overpressure
- Pressure difference between inlet and outlet: at least 0,2 bar; 0,5 bar recommended. A higher pressure difference can result in flow noise.
- The water inlet and outlet should be provided with a shut-off slide or water-tap.

Water demand:

- Average 10-50 l/h, depending on the intake temperature
- Short-term (duration up to 2 minutes) up to 400 l/h

	BINDER GmbH is NOT responsible for the water quality at the user's site. Any problems and malfunctions that might arise following use of water of deviating quality is excluded from liability by BINDER GmbH. This includes in particular a high particle content, which may result in blockage of the water flow control valve. The warranty becomes void in the event of use of water of deviating quality.

Fasten the 1/2‘‘cooling hose to the connection of cooling water outlet “IN” on the unit rear. Observe the following points:

- You can use a part of the supplied water hose for the cooling water inlet. In case another hose is used, it must be pressure-resistant up to 10 bar.
- Put the hose on the hose nozzle with screwing and secure it with one of the four supplied hose clamps. Connect the hose nozzle to the connection “IN” and screw on the union nut.
- For the hose connection to the domestic water connection, we recommend to also use the supplied hose nozzle with screwing and secure it with one of the four supplied hose clamps.
- Before turning on the unit, check the connection for leaks.

Water supply is automatically effected via the water connection “IN”.

4.6.3 Connection kit for cooling water

The ultra-low temperature freezer with water cooling comes with a connection kit. It consists of the following:

- Hose burst protection device
- 4 Hose nozzle with screwing (union nut)
- 4 hose clamps
- 6m water hose 1/2‘‘,divisible for inlet and outlet, approved for max. 15 bar, max. 95 °C

Protection principle of the hose burst protection

The hose burst protection device serves to protect the environment against flooding caused by burst water hoses. It is intended for the operation of the device at a tap water line. If the freezer is operated in a cycle of cooling water or air conditioning water, the user should check whether the hose burst protection device provides sufficient protection. This depends mainly on a sufficient medium pressure in the system.

Whenever a strong water flow of approx. 18 l / min. occurs, e.g. caused by a burst water hose, a valve automatically cuts off the water supply, which can be heard as a clicking noise. The water supply now remains shut until it is manually released.

Assembly:

Screw the hose burst protection device onto a water tap with a G¾ inch right turning thread connection. The connection is self-sealing. Establish the connection between the safety kit and the chamber with a part of the supplied hose. Protect both ends of the hose by the supplied hose clamps.

We recommend connecting the hose as the last step in order to avoid twisting the hose while screwing on the safety kit.

Open the water tap slowly in order to avoid actuating the hose burst protection device.

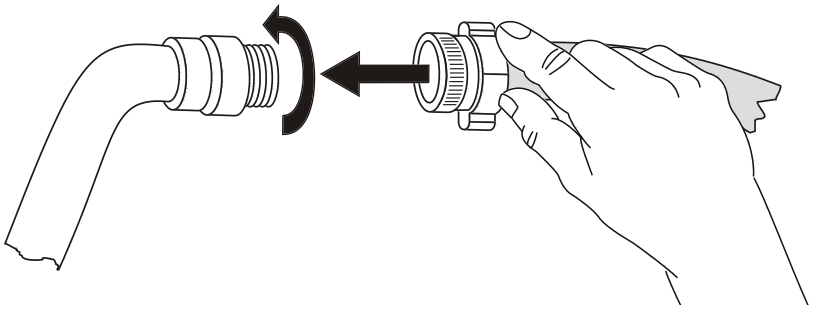


Figure 20: Assembly of the connection kit

Release of the reflux protection device:

In case the burst protection device has interrupted the water supply, first find the reason and remove it as necessary. Close the water tap. Release the valve by a half left-turn of the upper knurled part. You can hear the release of the valve as a clicking noise. Tighten the burst protection device against the water tap by a right turn. Open the water tap slowly afterwards.

Maintenance of the assembly of the hose burst protection device:

Calcification can impair valve function. We recommend an annual inspection by a skilled plumber. The plumber should remove the safety kit to check the valve by hand for proper function and calcification or blockage.

	CAUTION
	Danger of calcification. **Impairment of valve function.** ➢ Have a plumber inspect the valve annually. ➢ Remove calcifications by citric acid or acetic acid solutions. ➢ Continue by testing the function and tightness of the mounted unit.

Check: Quickly open the water tap while there is no chamber connected – the valve should cut off the water flux without any delay.

4.7 Electrical connection

The ULTRA.Guard™ ultra-low temperature freezers UF V are supplied ready for connection.

An internal overload release protects the freezer against excess-current.

Model	Power connection cable	Power plug	Nominal voltage ± 10% at the indicated power frequency	Current type	Fuse
UF V	IEC connector plug and cable 2000 mm	shockproof plug	230 V at 50 Hz	1N~	10 A
UF V UL (115 V)	Fixed power connection cable 1800 mm	NEMA 5-20P	115 V at 60 Hz	1N~	16 A
UF V UL (208-240 V)	Fixed power connection cable 1800 mm	NEMA 6-20P	208 - 240 V at 60 Hz	2~	10 A

- The socket must also provide a protective conductor.
- Prior to connection and start-up, check the power supply voltage. Compare the values to the specified data located on the unit's type plate (located on the left-hand side of the unit, bottom right-hand, chap. 1.4). We recommend the use of a residual current circuit breaker.
- Observe a sufficient current protection according to the number of freezers that you want to operate.
- When connecting, please observe the regulations specified by the local electricity supply company and as well as the VDE directives (for Germany)
- Pollution degree (acc. to IEC 61010-1): 2
- Over-voltage category (acc. to IEC 61010-1): II

CAUTION

Danger of incorrect power supply voltage.

Damage to the equipment.

➢ Check the power supply voltage before connection and start-up.

➢ Compare the power supply voltage with the data indicated on the type plate.

See also electrical data (chap. 17.4).

To completely separate the unit from the power supply, you must disconnect the power plug. Install the unit in a way that the power plug is easily accessible and can be easily pulled in case of danger. To disconnect the connector plug, simultaneously pull the locking button (Figure 21).

- When connecting to power supply pay attention to properly grounding it.

To disconnect the connector plug, simultaneously pull the red locking button on the plug in the arrow direction.

Figure 21: IEC connector plug with internal locking system

4.8 Advanced voltage booster (regular with UF V UL, option for UF V))

With this option, a buck/boost converter automatically compensates for voltage fluctuation.

5. Start up

	Following transport, wait at least 8 hours until start-up.

Check that the interior of the freezer is empty. Prior to starting a new freezer or if you do not know what the freezer was last used for, for hygiene purposes you should clean and disinfect the interior (chap.13.2).

After connecting the supply lines, turn on the unit by the key switch (6) setting it to position 1).

Figure 22: Key switch (position ON)

5.1 Preset factory parameters

The unit is supplied with the following preset parameters:

Temperature set point	-80 °C / *-112 °F*
Safety controller	Set point type “Limit” -60 °C / *-76 °F*
The maximum permitted deviation from the temperature set point for tolerance range alarm	6 K
Delay time tolerance range alarm temperature after closing the door	60 min
Password to lock / unlock the HAND operating functions	0 (no locking)
Password to access operating mode USER	1

5.2 Operating the automatic door mechanism

Opening the door:

Firmly press the one-touch pushbutton “OPEN”. You can now open the door.

Closing the door:

Firmly press on the door for at least 2 seconds until the automatic door mechanism is activated and closes the door tightly.

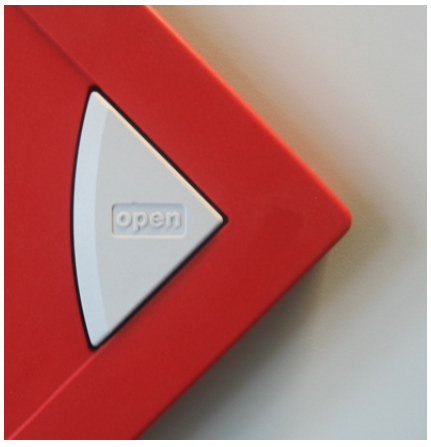


Figure 23: Pushbutton “OPEN” to open the door

	After turning on the freezer, you can open the door after 30 seconds only. Following closing the door, you can open the door again only after approx. 30 seconds due to necessary venting.

DANGER

Risk of locking in a person.

Danger of death.

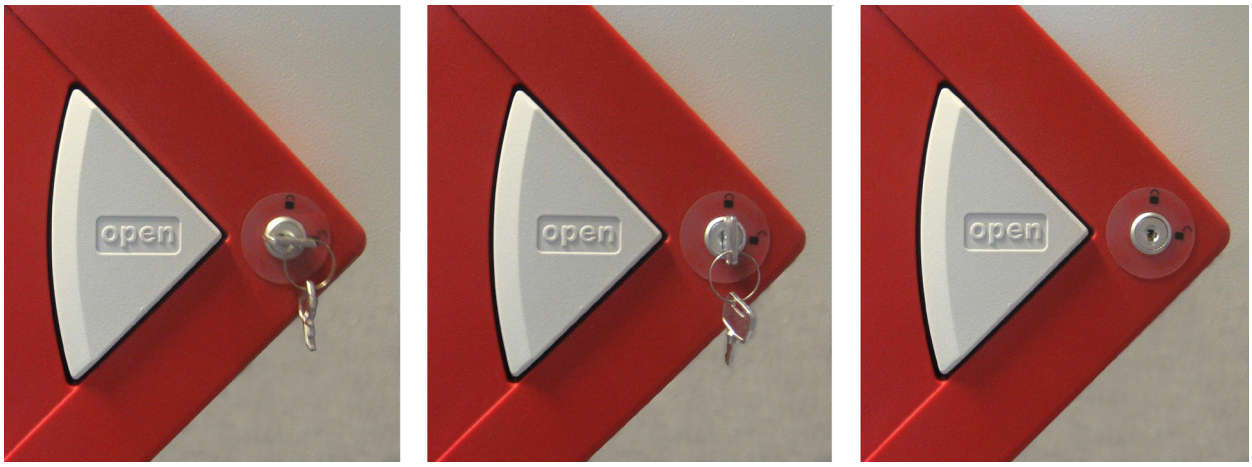
- Before closing doors, make sure that nobody is inside.
- Pull the power plug before entering the interior (e.g. for cleaning purposes) , thereto pull the locking button on the plug (Figure 21).

5.3 Door locking with key (option)

With this option, use a key to operate the door locking (5). In locked condition, the automatic door mechanism is locked, i.e., pushbutton “OPEN” which serves to open the door has no effect.

Automatic door mechanism accessible	Switch position to the right
Automatic door mechanism locked:	Switch position vertical

Only in locked condition, you can remove the key.



Automatic door mechanism accessible | Automatic door mechanism locked | Automatic door mechanism locked

Figure 24: Positions of key with door locking option

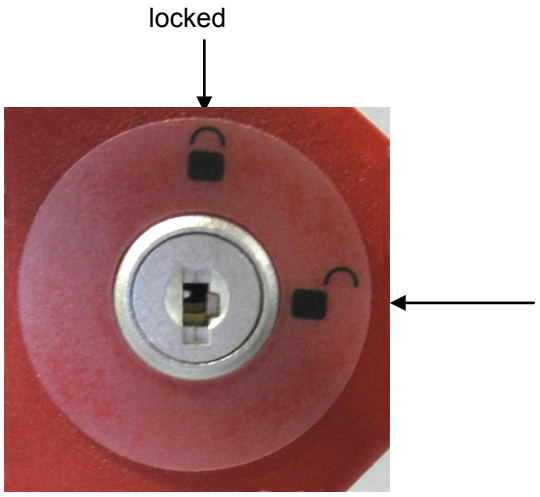


Figure 25: Symbols of the door locking (option)

5.4 GUARD.CONTROL: RFID personal access control of the automatic door mechanism (standard for UF V, option for UF V UL)

GUARD.CONTROL secures the access to the freezer. There is additional logging of the opening events in an access protocol, which contains time, date and duration of the opening and the identification of the user card that had been used.

Access authorization is controlled by means of the supplied access cards. Hold these cards in front of the RFID area in the housing of the door mechanism and controller (max. distance 5 cm / *2 inches*).

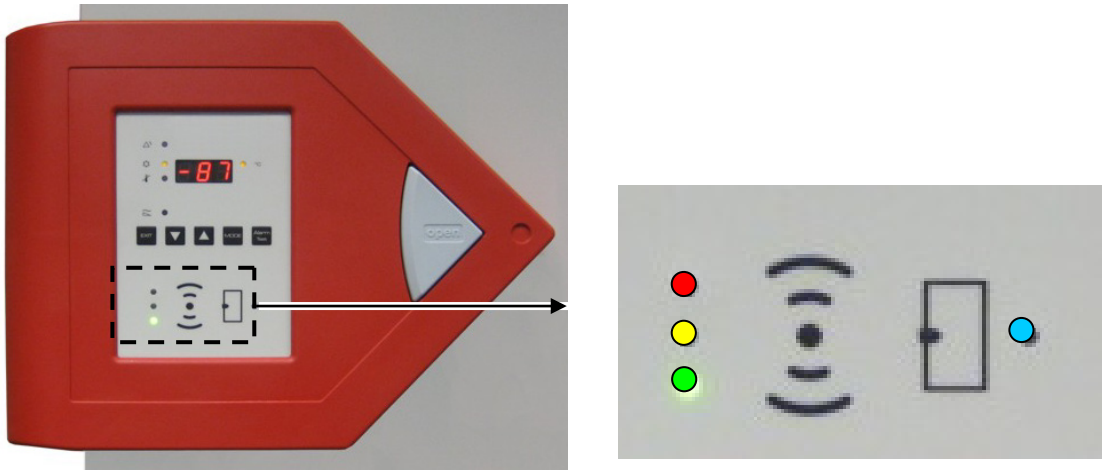


Figure 26: RFID panel for access control of the automatic door mechanism and indication of the door condition

5.4.1 Indication of the door condition

The blue LED indicates the door condition:

○ off	Door open or closed. You can open or close the door.
● lit	Waiting time of 30 Sec. after closing the door or power connection / turning on the freezer
✳ flashing slowly	Door opening or closing
✳ flashing fast	Control error. Contact BINDER Service *or* Mechanical obstruction of the door. Remove icing in the door area or other cause.

If you do not close the door within one minute after opening, a continuous audible signal keeps sounding until closing the door.

☞	Only when the blue LED is off, you can open or close the door.

5.4.2 Overview of LED indications of the RFID personal access control

The red, yellow, and green LEDs indicate the respective RFID control function when using the access cards.

○ ○ ● lit	**Initial state** (RFID inactive). When the blue LED is off, open the door with pushbutton “OPEN”.
○ ● lit ○	**Normal mode** (Master card registered, RFID active)
○ ● lit ● lit	**Switch-off mode** (RFID inactive). When the blue LED is off, open the door with pushbutton “OPEN”. *or* **Opening mode** (user card acknowledged, RFID active). Open the door with pushbutton “OPEN”.
● lit ○ ○	User card refused
○ ✳ flashing 2 sec. ○	**Learning mode** (individual user card can be registered or cleared)
○ ○ ✳ flashing 2 sec.	User card registration
✳ flashing 2 sec. ○ ○	An individual user card is being cleared
● lit ✳ flashing 2 sec. ○	**Clearing mode** (all user cards can be cleared)
✳ flashing 2 sec. ○ ○	All user cards are being cleared

5.4.3 Cards for access control

With each freezer unit, a master card, a switch-off card and 3 user cards (scope of delivery) are available for access control. The system can memorize up to 60 user cards. The cards have a copy protection related to their internal card number.

The **user cards** serve to open the freezer. The user cards release the automatic door mechanism on condition that the card number was registered in the system by means of the master card. You can open the door with pushbutton “OPEN”.

The **master card** serves to registering / clearing the card numbers in the system. A master card will not open the chamber. In case of having lost the master card, the system can be reset to initial state with a service unit and a code exchange with BINDER Service.

The **switch-off card** serves to inactivate the RFID access control. Using the switch-off card is possible only together with the registered master card.

5.4.4 Operating the RFID access control

In the initial state (i.e. no access card has been registered), RFID access control is inactive, i.e., you can open the door with pushbutton “OPEN”.

Opening the door in the initial state

Initial state (green LED is lit)

RFID access control is inactive

⇒ Open the door with pushbutton “OPEN”.

Registering the master card in the Initial state

Initial state (green LED is lit)

⇒ Hold the master card in front of the RFID panel. Card registration takes place.

Normal mode (yellow LED is lit)

Registering / clearing of an individual user card

Normal mode (yellow LED is lit)

⇒ Hold the master card briefly (< 2 seconds) in front of the RFID panel.

Learning mode (yellow LED flashes)

⇒ Hold the user card in front of the RFID panel.

- New card: card registration takes place (green LED flashes for 2 seconds)
- Already registered card: card is cleared (red LED flashes for 2 seconds)
- No action during 3 seconds: Learning mode is cancelled

Back to normal mode (yellow LED is lit)

Opening the door with a user card

Normal mode (yellow LED is lit)

⇒ Hold the master card in front of the RFID panel

- Registered card: Door can be opened during 30 sec. (green LED is lit during possible opening)
- New card: Door cannot be opened (red LED is lit for 2 seconds)

Back to normal mode (yellow LED is lit)

Clearing all user cards

Normal mode (yellow LED is lit)

⇒ Hold the master card briefly (< 2 seconds) in front of the RFID panel.

Learning mode (yellow LED flashes)

⇒ Hold the master card > 3 seconds in front of the RFID panel.

Clearing mode (red LED is lit for 2 seconds)

⇒ Hold the master card within 2 seconds again in front of the RFID panel: All user cards are being deleted (red LED flashes)

- Master card not held again within 2 seconds in front of the RFID panel: Clearing mode is cancelled

Back to normal mode (yellow LED is lit)

Switching off the RFID access control

Normal mode (yellow LED is lit)

⇒ Hold the master card briefly (< 2 seconds) in front of the RFID panel.

Learning mode (yellow LED flashes)

⇒ Hold the switch-off card in front of the RFID panel.

Switch-off mode (yellow and green LED are lit). RFID access control is inactive. Open the door with pushbutton “OPEN”.

Switching on again the RFID access control

Switch-off mode (yellow and green LED are lit)

⇒ Hold the master card < 2 seconds in front of the RFID panel.

Learning mode (yellow LED flashes)

After 3 seconds back to normal mode (yellow LED is lit)

5.4.5 Reading out the door opening data with the GUARD.CONTROL Reader Kit (Art. no. 8012-0789)

Place the GUARD.CONTROL Reader in front of the RFID area to have the door opening data transferred to the reader. You can then connect the reader to a computer. Data is collected and stored in the computer using the GUARD.CONTROL software. Without a PC connection the GUARD.CONTROL Reader can read up to 10 devices (data sets). A single data set of a freezer contains the ID of the door lock (device number and name) and 10.000 events maximum (storage capacity of the UF V door lock). If this number of events is exceeded, the new events overwrite the oldest events in the door lock. An event contains a time stamp and the performed action, if appropriate with the card ID (user number).

5.4.6 Resetting the entire system

In case of having lost the master card, BINDER Service can reset the system to initial state together with the operator of the freezer. Please contact BINDER Service.

5.5 Behavior after turning on the unit

During the equilibration phase of 9 hours after turning on the unit, undefined temperature conditions occur within the unit. During this phase, do not place any sample materials in the unit

	CAUTION
	Danger of destruction of samples. ➢ Load the freezer only after equilibration of temperature.

Following turning on the unit with the key switch (6), there is a subsequent brief startup phase in which the display items at the edges of the controller display light up successively.

After a few seconds, the display shows the current interior temperature of the freezer. The lit LED at the right of the display shows that the temperature is displayed in °C.

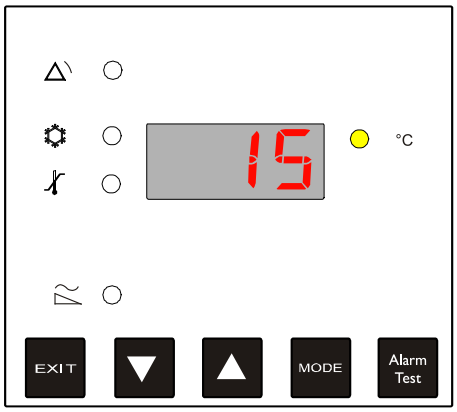


Figure 27: Normal display of controller after turning on the freezer, showing the current temperature value: 15 °C (example)

Set the controller to the desired temperature set point (chap. 6) used to operate the freezer.

	As long as there is a difference between the actual and set value shown in the display, the intended operation of the unit will not be ensured.

6. Setting the temperature set point at the controller RP1

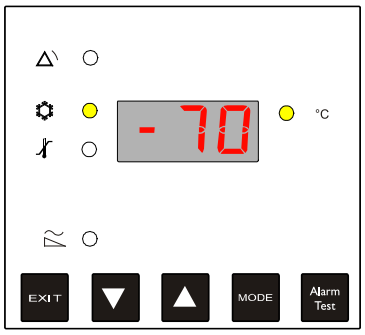


Figure 28: Normal Display

Current temperature value: -70 °C

MODE

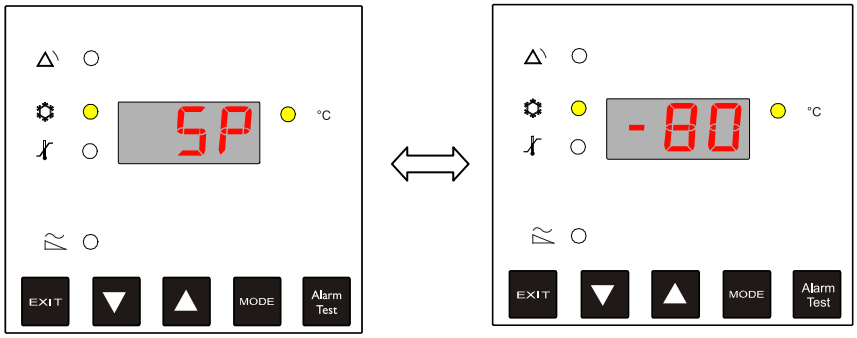


Figure 29: Entry of temperature set point with arrow keys.

Temperature set-point: -80 °C

MODE

Confirm the entry with the “MODE” key.

After 30 seconds the controller reverts to Normal Display automatically.

The yellow LED indicates operation of the 2nd stage cooling.

Only insert samples into the freezer when it has reached its stable operating state.

Temperature equilibrating time to -80 °C / *-112 °F* is approx. 5 hours (UF V 500) / approx. 9 hours (UF V 700).

7. Placing samples in storage in the freezer

Before storing valuable samples, conduct a 10-days test run at the desired temperature. This helps to detect transport damages like capillary cracks. Then you can load the freezer with the precooled samples.

	WARNING: If customer should use a freezer running in non-supervised continuous operation, we strongly recommend in case of inclusion of irrecoverable specimen or samples to split such specimen or samples and store them in at least two chambers, if this is feasible.

During the equilibration phase of 9 hours after turning on the unit, undefined temperature conditions occur within the unit. During this phase, do not place any sample materials in the unit

	**CAUTION** **Danger of samples being destroyed.** ➢ Load the freezer only after equilibration of temperature.

When placing not precooled samples in storage, temperature rises inside the freezer. We recommend to successively load the freezer. The more thermal energy you bring in, the longer it takes until reaching the set-point temperature again.

Do not exceed the maximum load of each compartment and the permitted total load (see chap.17.4).

Always wear protective gloves when opening the freezer and bringing in or removing material.

	**CAUTION** **The inner surfaces become very cold during operation.** **Danger of injury by freezing on.** ∅ Do NOT directly touch the inner surfaces or the charging material during operation. ∅ AVOID skin contact with the inner surfaces and accessory equipment. ➢ Wear protective gloves when opening the inner doors and during manipulation.

8. Controller RP1 operating modes

The controller provides three operating modes HAND (chap. 8.2), USER (chap. 8.3), and LOCK (chap. 8.4). In operating modes HAND and USER, you can call up several operating functions and set / modify their values.

Operating mode USER is password protected. On delivery, the password is set to “1” (factory setting). You can change the password in operating function “**PA.U**” (chap. 8.3).

You can also implement password protection for operating mode HAND (chap. 8.4).

8.1 Selecting and setting the operating functions

The controller's display shows the operating function (e.g. “SP” = temperature set point) and alternately the associated value (e.g. -86).

When the displayed value is the temperature in °C, the yellow LED “°C” to the right of the display lights up.

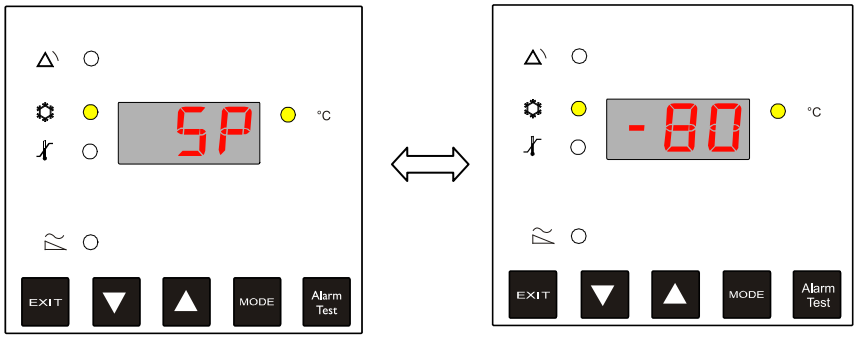


Figure 30: Controller display when setting operating functions, here: setting of temperature set point

“**MODE” key:**

- In operating modes HAND and USER, access the next operating function by pressing “MODE”.
- In the same time, pressing “MODE” confirms the changed value of the current operating function, i.e., the freezer will from now on regulate at the new value.

	If you do not want to accept the modification of a value, wait 30 seconds without pressing any button or press the “EXIT” button. The controller reverts to Normal Display automatically without accepting the modification.

To go back to the Normal display, press “MODE” repeatedly.

“**EXIT” key:**

- In operating modes HAND and USER, go back to the previous operating function by pressing “EXIT”.

Arrow keys:

Use “▲” or “▼” to change the value of the selected operating function or to select between defined values.

In some operating functions, you can read but not change the value (for service and maintenance purposes).

If a button for 30 seconds is not pressed after access to an operating function or changing a value, the controller toggles back to Normal display automatically. If the “MODE” button is not pressed after changing a value in the displayed operating function, the value reverts to its previous value.

8.2 Operating mode HAND

- In Normal display, press button “MODE” to toggle to operating mode HAND.
- Use the “MODE” button to successively call up the operating functions.
- Use “▲” or “▼” to set the values of the operating functions.

Operating functions that can be set in operating mode HAND

Display	Setting range	Operating function
SP	-90 °C to -40 °C	**Temperature set point**
MODE ⇩		
SP.E	-70 °C to -20 °C	**Set-point entry of CO_2 emergency cooling** (only with option CO_2 emergency cooling “On”)
MODE ⇩		
SA.F	-86 °C to -40 °C	**Safety controller set point when set point type is “Limit” (Lit)** Limit value, i.e., maximum permitted absolute temperature value. When exceeded, the safety controller triggers an alarm. Set the limit value by approx. 15 K above the controller temperature set point.
MODE ⇩		
d iU		**Indication of supply voltage** (only with option Advanced voltage booster)
MODE ⇩		
PA.H	0 to 999	Max. 3-digit numeric **password** for locking/unlocking the operating function setting in operating mode LOCK (chap. 8.4) To permit temporary unlocking: select any password other than 0. To permit permanent unlocking: set password to “0”.

☞	Set the safety controller each time the set point for the temperature is changed. Set the safety controller set point by approx. 15 K above the controller temperature set point.

8.3 Operating mode USER: Advanced settings

- In Normal display, press “EXIT” and “MODE” simultaneously for 3 seconds to access the options for selecting the operating modes of the freezer.

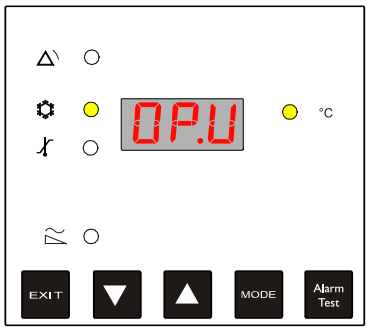


Figure 31: Selecting the operating mode

- Press “▲” or “▼” until the value “OP.U” (operating mode USER) appears in the display.
- Press “MODE”. The display to enter the password appears.

The operating mode USER is password-protected by a number. The password is preset to "1" in factory. You can change the password in operating function “**PA.U**”.

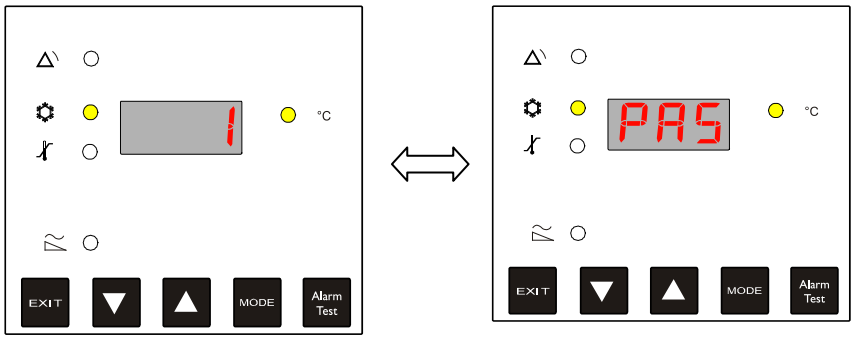


Figure 32: Password request

- Use “▲” or “▼” to enter the password and press “MODE”.
- Use the “MODE” key to successively call up the operating functions. Use the “EXIT” key to go back to the previous operating function.
- Use “▲” or “▼”to set the values of the operating functions.

This menu also offers activating and inactivating the CO_2 emergency cooling (option, chap. 11):

Operating functions in operating mode USER:

Display	Setting range	Operating function
SP	-90 °C to -40 °C	**Temperature set-point**
MODE ⇩		
EnE	On OFF	**Release of CO_2 emergency cooling** Switch on or off CO_2 emergency cooling
MODE ⇩		
SP.E	-70 °C to -20 °C	**Set-point entry of CO_2 emergency cooling** (only with option CO_2 emergency cooling “On”)
MODE ⇩		
t S.E	On	**Switch on the test of CO_2 emergency cooling** (only with option CO_2 emergency cooling “On”) The function automatically turns off after 10 seconds.
MODE ⇩		
SA.F	-90 °C to -40 °C	**Safety controller set point (Limit value)** Limit value, i.e., maximum permitted absolute temperature value. When exceeded, the safety controller triggers an alarm. Set the limit value by approx. 15 K above the controller temperature set point.
MODE ⇩		
EnU	0 °C to 50 °C	**Setting of ambient temperature alarm** (factory setting 33 °C)
MODE ⇩		
n.3 1	On OFF	**Switch on or off ambient temperature alarm**
MODE ⇩		
d i.U		**Indication of supply voltage** (only with option Advanced voltage booster)
MODE ⇩		
PA.H	0 to 999	Max. 3-digit numeric **password** for locking/unlocking the operating function setting in operating mode LOCK (chap. 8.4) To permit temporary unlocking: select any password other than 0. To permit permanent unlocking: set password to “0”.
MODE ⇩		

Display	Setting range	Operating function
PA.U	0 to 999	**Password setting for access to operating mode USER** Remember the modified password or you will no longer be able to access operating mode USER.
MODE		
Ad.r	1 to 254	**Setting the unit address**. Addressing serves for data transfer e.g. via the communication software APT-COM™ 3 DataControlSystem. Do not change standard setting “1”.
MODE		
d i.1		**Firmware revision of main controller** for service / maintenance purposes.
MODE		
d i.2		**Firmware revision of safety controller** for service / maintenance purposes.
MODE		
d i.3		**Data record (year)** for service / maintenance purposes.
MODE		
d i.4		**Data record (month)** for service / maintenance purposes.
MODE		
d i.5		**Data record (day)** for service / maintenance purposes.
MODE		
d i.6		**Data set version** for service / maintenance purposes.
MODE		
Ft.u	0 to 999	**Counter of operating weeks**
MODE		
Ft.h	0 to 168	**Counter of operating hours**, up to one week
MODE		

Display	Setting range	Operating function
bAt		**Indication of battery voltage**
MODE ⇩		
2°C		**Indication of temperature value of cooling system**, for service / maintenance purposes
MODE ⇩		
3.°C		**Indication of temperature value of cooling system**, for service / maintenance purposes
MODE ⇩		
5°C		**Indication of temperature value of cooling system**, for service / maintenance purposes
MODE ⇩		
A°C		**Indication of temperature value of cooling system**, for service / maintenance purposes

8.4 Operating mode LOCK: Locking/unlocking of the operating functions' settings by operating mode HAND

To avoid operating functions being changed by unauthorized persons, you can lock the operating functions' settings.

8.4.1 Locking the operating functions of operating mode HAND

- In operating mode HAND, define a maximum 3-digit numeric password in operating function "**PA.H**".
- Wait 30 seconds. The controller returns to Normal display. Setting the operating functions in operating mode HAND is now locked.
- When trying to enter a setting, the message "loc" appears on the controller. After 30 seconds the controller returns to Normal display

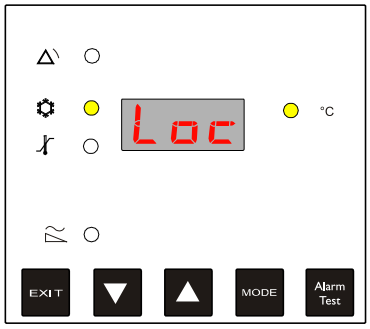


Figure 33: Display when trying to enter a setting in Operating mode LOCK, i.e. with blocked operating functions' settings

8.4.2 Temporally unlocking the operating functions of operating mode HAND

- In Normal display, press "EXIT" and "MODE" simultaneously for 3 seconds to access the operating mode selection. "**OP.L**" (operating mode LOCK) is displayed.

	The menu "**OP.L**" (operating mode LOCK) is only visible if a password has previously been defined in the operating function "**PA.H"** in the operating mode HAND.

- Press "▼"or "▼" to enter operating mode HAND. "**OP.H**" (operating mode HAND) is displayed.
- Press "MODE". The menu to enter the password is displayed.

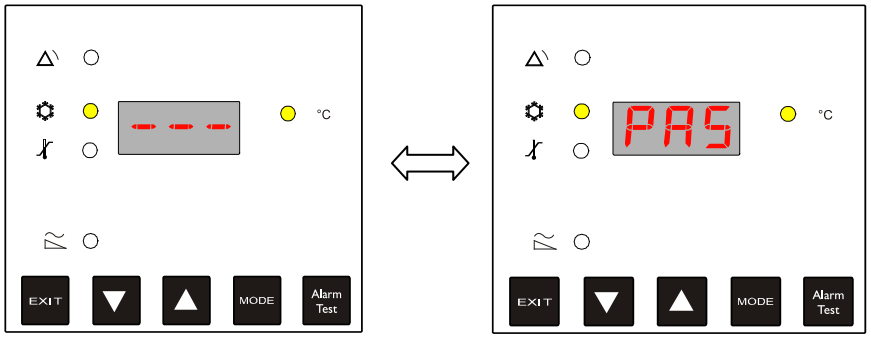


Figure 34: Password request

- Enter the password using the "▲" or "▼"keys.
- Confirm the entry with "MODE". The controller returns to Normal display.

If you have selected any password other than zero, operating mode HAND is temporarily unlocked. Changing the operating functions in operating mode HAND is now possible until a period of 30 sec. has passed with no activity. 30 seconds after the last keypad entry, the operating functions are relocked.

Display	Setting range	Operating function
PAS	0 to 999	**Password request** Entry of the password that has been defined in operating mode HAND in operating function “**PA.H**” (chap. 8.2). The operating functions’ settings in operating mode HAND are temporarily unlocked.

8.4.3 Permanently unlocking the operating functions of operating mode HAND

To permanently unlock the settings, set operating function “**PA.H**” to “0” in HAND mode (chap. 8.2).

8.5 Performance during and after power failure and shut down

In the event of power failure, the battery maintains the controller functions. The controller display is dark and can be activated for 5 seconds by pressing any button. The refrigerating machine is out of operation.. The unit’s refrigerating function can be maintained through the optional CO2 emergency cooling (chap. 11). The zero-voltage relay alarm output (8) (chap. 10.10) is switched for the whole duration of the power failure.

After the power returns, each freezer turns on with an individual firmly assigned delay of max. 180 seconds to prevent current spikes in the customer's electricity supply system by simultaneously switching on several devices.

The controller counts down the time until restart in seconds.

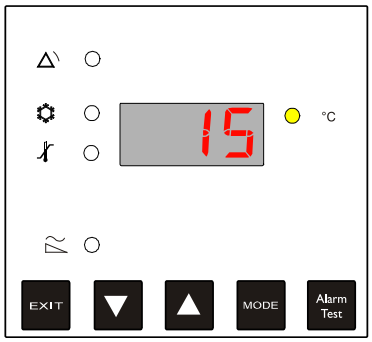


Figure 35: Time until restart

After the power returns or when turned on by hand, the freezer regulates the temperature to the last entered set point.

	All settings and set point values remain in the memory during power failure after power off.

9. Safety controller (temperature safety device)

The freezer is equipped with an over temperature safety device. It is designated as the “safety controller”. This second, electrically independent temperature controller takes over control at a selectable set point in case of fault. It serves to protect the charging material against excessively high temperatures.

The message “**otc**” on the controller display indicates safety controller activity. The red collective alarm LED △\ flashes, the LED “ ” is lit. At the same time there is an additional audible alert (buzzer).Pressing the “EXIT” button switches off the audible alarm. The safety controller regulates the freezer at the entered safety controller set point until the temperature inside the freezer returns below this temperature. Then the alarm message “**otc**” and the LEDs △\ and “ ” go off.

	Regularly check the safety controller setting. Set the safety controller set point by approx. 10 °C above the desired temperature set point.

The safety controller set point is a limit value, i.e. the absolute maximum permitted temperature value.

Example: temperature set point -86 °C / *-122.8°F*, safety controller set point -60 °C / *-76 °F.*

	The settings of the safety controller are inactive during battery operation, open door, power failure, CO_2 emergency cooling (option). They become functional again following restitution of power supply and/or the restart of the unit with the key switch (6).

9.1.1 Setting the safety controller set point

You can check and set the safety controller set point in operating modes HAND (chap. 8.2) or USER (chap. 8.3).

- In operating modes HAND and USER, operating function “**SA.F**” (safety controller set point) is displayed. You can set a limit value.

Normal Display

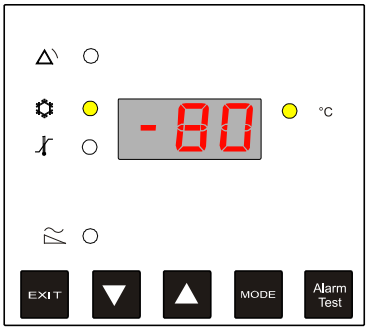
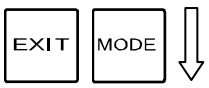


Figure 36: Normal Display



simultaneously for 3 seconds

Operating mode HAND or USER

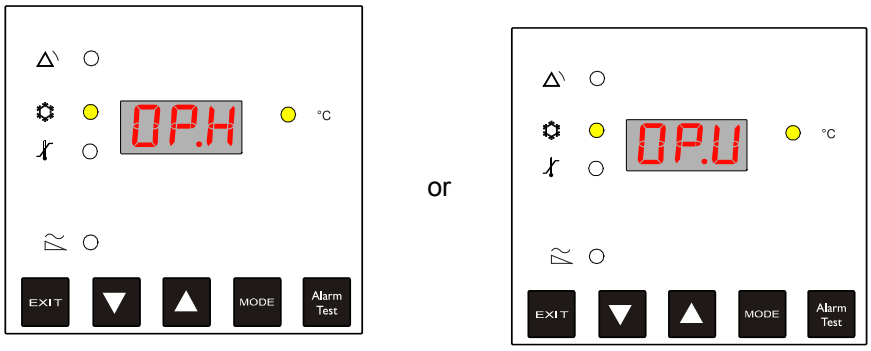
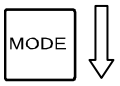


Figure 37: operating mode HAND or USER



(several times if necessary)

Entry of the safety controller limit value

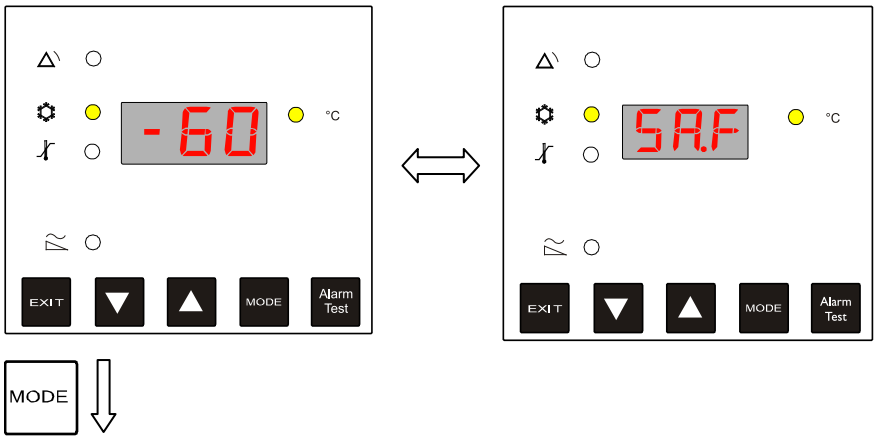


Figure 38: Entry of the safety controller limit value with the arrow keys

After 30 seconds, the controller reverts to Normal Display automatically.

10. Indications and alarm functions (auto-diagnostic system)

10.1 Indications and alarm functions overview

When operational faults occur, the controller triggers visual and audible alarm signals. The red collective alarm LED △\ flashes when an alarm signal is emitted, and an audible alarm (intermittent buzzer) sounds.

A zero-voltage relay alarm output (8) (chap. 10.10) permits transmission of the alarm e.g., to a central monitoring system.

The alarm messages safety controller or tolerance band + door open are displayed cyclically one after the other if they occur simultaneously.

If more than one alarm signal is sent simultaneously, they are displayed in a cycle, except for alarms 997 to 999. These take priority over all other operational displays and alarm signals of the controller.

Except for the tolerance range alarms, all alarms are displayed immediately when the fault occurs. The tolerance range alarms are suppressed for a selected time (delay times set for temperature alarm) after opening the unit door or turning on the freezer.

	Find an overview of all alarm indications on the controller in chap. 16.2.

	WARNING: If customer should use a freezer running in non-supervised continuous operation, we strongly recommend in case of inclusion of irrecoverable specimen or samples to split such specimen or samples and store them in at least two chambers, if this is feasible.

10.2 Resetting the alarm messages

- Eliminate the cause of the alarm or wait until the unit compensates for the error.
- The visual alarm (alarm message and indication by LED) disappears, when the cause of the fault has been remedied or the alarm message has been reset with the “EXIT” key.
- Press the “**EXIT**” button to switch off the audible alarm signals.

10.3 Safety controller temperature alarm

The selected temperature value of the safety controller was exceeded.

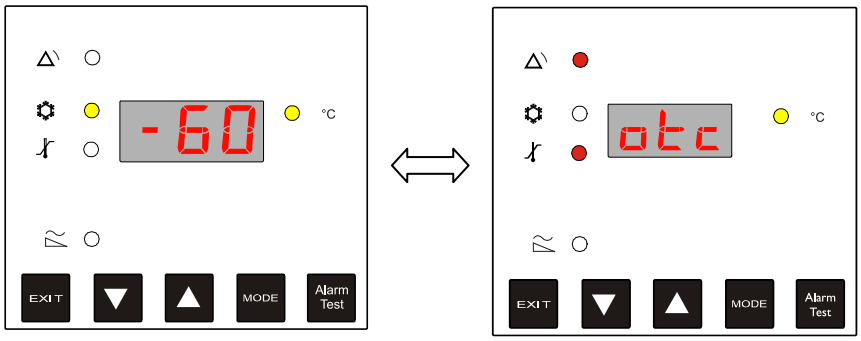


Figure 39: Safety controller temperature alarm

- Alarm message "**otc**" immediately
- LED indication immediately: LED △ flashes, LED continually lit
- Audible alarm: buzzer (ongoing sound) immediately
- Switching the zero-voltage relay alarm output

Actions:

- Check whether the outer door was open for a long time or is not closed properly. Close the door if necessary.
- Check the setting of the operating function "**SA.F**" (limit temperature of the safety controller) in operating modes HAND (chap. 8.2) or USER (chap. 8.3). The limit temperature should be approx. by 15 K above the temperature set point. If necessary, adjust the relevant value.
- Check whether samples were inserted into the freezer that may release heat.
- Check the ambient conditions. Protect the freezer from direct sunlight. Ensure sufficient ventilation around the installation location to prevent any buildup of heat in the unit.
- If these points do not reveal the source of the fault, it may be that the unit is faulty. Please contact BINDER Service.

10.4 Temperature tolerance range alarm (too high and too low temperature)

The temperature has risen above or fallen below the temperature alarm threshold.

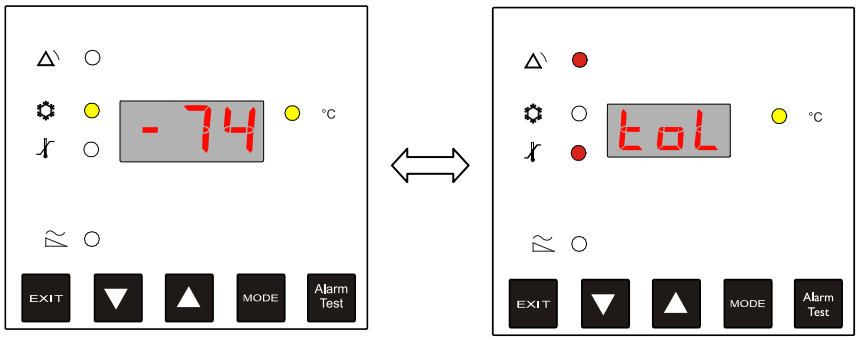


Figure 40: Temperature tolerance range alarm

- Alarm message “**tol**” immediately

	No alarm signal is emitted during the temperature delay time after the outer door is closed

- LED indication immediately: LED flashes, LED flashes
- Audible alarm: buzzer (intermittent sound) immediately
- Switching the zero-voltage relay alarm output

Actions:

- Factory setting of the operating function “AL.1” (temperature alarm threshold) is ±6 K.
- Use the actual temperature displayed on the controller to verify whether the temperature alarm threshold has been breached, i.e., too cold or too warm.

Temperature too low (under temperature alarm):

- Input of large quantities of samples which were precooled with liquid nitrogen. Reset the alarm by pressing "EXIT".
- Possible cause: Continuous operation of the refrigeration machine after failure of a temperature sensor (chap. 10.8). Contact BINDER Service.

Temperature too high (over temperature alarm):

- Check whether the outer door was open for a long time or is not closed properly. Close the door if necessary.
- Check the door gaskets for damage. Replace any damaged gaskets.
- Check whether there is icing around the gaskets. Defrost, if necessary.
- Check whether samples were inserted into the freezer that may release heat.
- Check the ambient conditions. Protect the freezer from direct sunlight. Ensure sufficient ventilation around the installation location to prevent any buildup of heat in the unit.
- If these points do not reveal the source of the fault, it may be that the unit is faulty. Please contact BINDER Service.

	If the same alarm recurs, please contact BINDER Service.

10.5 Door open alarm

The open and closed condition of the unit door is controlled via the door contact switch. When the door is opened, the refrigerating machine turns on.

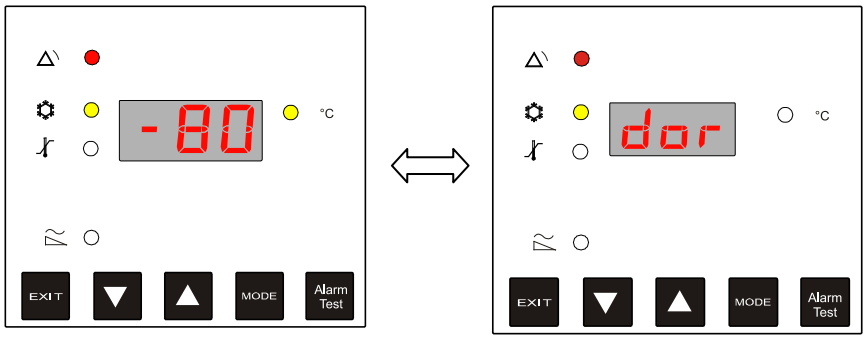


Figure 41: Door open alarm

- Alarm message "**dor**" immediately
- LED indication immediately: LED △ flashes
- Audible alarm: buzzer (intermittent sound, beginning 1 minute after the door is opened) (delay configurable by BINDER Service, factory setting: 1 minute)
- Switching the zero-voltage relay alarm output (beginning 1 minute after the door is opened) (delay configurable by BINDER Service, factory setting: 1 minute)

Actions:

- Close the outer door.
- Use the "**EXIT**" button to switch off the buzzer even when the door is open.
- The alarm message is cancelled.
- The zero-voltage relay alarm output switches off.

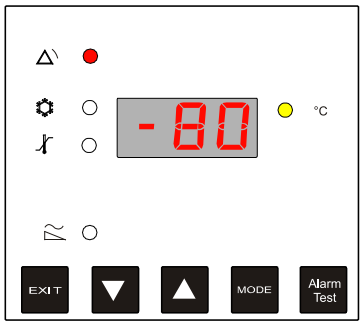
Monitoring of the door condition and alarm suppression:

The door condition is monitored via a door sensor.

- No tolerance range alarm is triggered after door opening.
- After the door is closed the temperature alarm-delay time **dt.d** set in Operating Mode SET (by BINDER Service only) begins to run. No tolerance range alarm is triggered during this period. This prevents alarms constantly being triggered during the undefined operating phase after closing the door

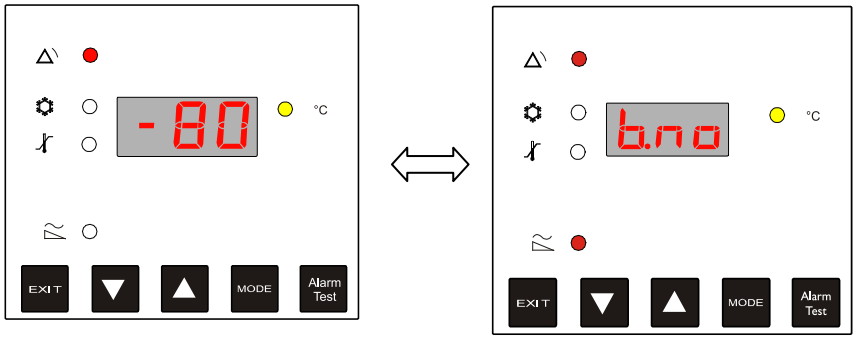
10.6 Messages from the battery management system

Such messages also appear during operation connected to the main power supply network.



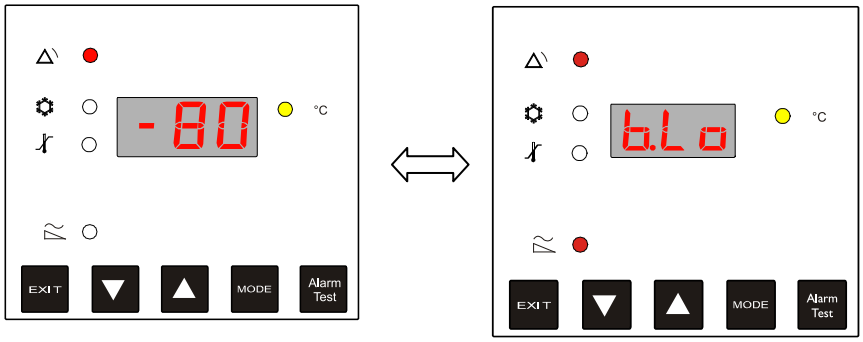
Message on battery power (during power failure) after pressing a button (see chap. 8.5)

Figure 42: Battery operation (sufficient battery voltage)



Message on line power

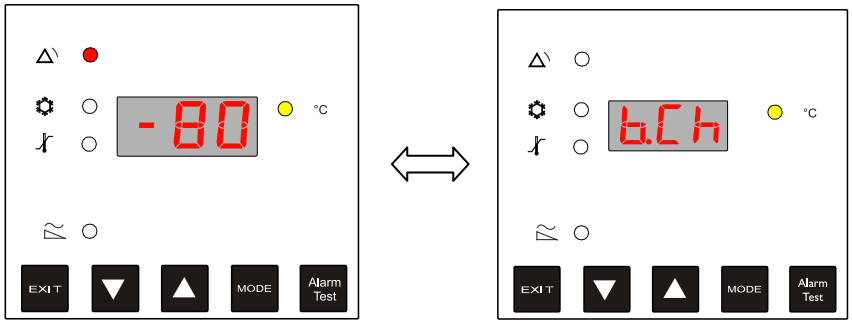
Figure 43: Battery alarm (no battery recognized)



Message on line power and on battery power

Figure 44: Battery alarm (very low battery voltage)

- Alarm message “**b.no**” or “**b.lo**” immediately
- LED indication immediately: LED △ flashes, LED ≈ flashes
- Audible alarm: buzzer (intermittent sound) immediately
- Switching the zero-voltage relay alarm output.



Message on line power and on battery power

Figure 45: Battery charging mode (low battery voltage, battery is charging)

- Message “**b.Ch**” immediately

No alarm message:

Correct battery voltage (between 13 V and 13.5 V)

It is possible to reach the specified work time of an intact battery with correct capacity. It is not possible to predict the real work time.

Alarm message “b.no”:

No battery recognized. Cause: battery missing or defective

Actions:

- With defective battery: replace battery.
- Reset alarm message with button “EXIT”. There is no automatic reset.

Alarm message “b.lo”:

Extremely low battery voltage (between 1 V and 11 V). Cause: battery voltage limit is fallen below the limit of 11V. If this message lasts for more than 2 hours, the battery can be defective

Actions:

- Check the power supply.
- With defective battery: replace battery.
- Reset alarm message with button “EXIT”. There is no automatic reset.

Message “b.Ch”:

Low battery voltage (between 10.8 V and 13.5 V). Battery voltage limit is fallen below the maximum value of 13.5 V. Battery is charging. The maximum charging time is 45 hours (for one rechargeable battery of 7.2 Ah).

This is only an information message.

This message can be displayed up to 45 hours with a new freezer or after a power failure. With a freezer equipped with a CO_2 emergency cooling (option, chap. 11) this message can be displayed up to 8 days.

10.7 Power failure alarm

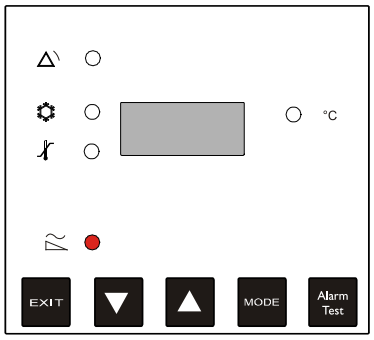


Figure 46: Power failure alarm

- No alarm message (display off)

  You can turn on the display with any key. It turns off automatically after 5 seconds.
- LED indication immediately: LED flashes slowly
- Audible alarm: buzzer (intermittent sound: 1 sec. on, 4 sec. off) immediately
- Switching the zero-voltage relay alarm output.

	WARNING: If customer should use a freezer running in non-supervised continuous operation, we strongly recommend in case of inclusion of irrecoverable specimen or samples to split such specimen or samples and store them in at least two chambers, if this is feasible.

10.8 Temperature sensor failure

A sensor fault alarm display takes priority over all other operational displays and alarm signals on the controller.

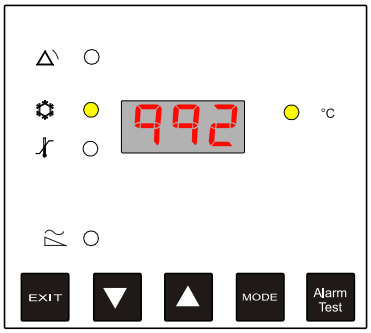


Figure 47: Failure of Pt100 temperature sensor for the refrigerating machine. Refrigeration is turned on permanently

Figure 48: Failure of Pt100 temperature sensors for the refrigerating machine

Figure 49: Failure of Pt100 temperature sensor for ambient temperature or air intake of the 1st stage cooling (refrigerating machine)

Figure 50: Failure of Pt100 temperature sensor for safety controller: refrigeration is turned on permanently

Figure 51: Failure of Pt100 temperature sensor for interior measurement: refrigeration is turned on permanently

- Alarm message “**992**” or “**997**” immediately
- LED indication immediately: LED △ flashes
- Audible alarm: buzzer (intermittent sound) immediately
- Switching the zero-voltage relay alarm output.

Actions:

- Please contact BINDER Service.

- Alarm message “**992**” or “**998**” or “**999**” immediately
- LED indication immediately: LED △ flashes
- Audible alarm: buzzer (intermittent sound) immediately
- Switching the zero-voltage relay alarm output.
- The refrigerating machine is turned on permanently.

Actions:

- Please contact BINDER Service.
- If the temperature rises, i.e. the refrigerating machine is defective (safety controller temperature alarm and / or tolerance range alarm):
  - Transfer the material to another freezer.
  - Turn off the freezer.
  - If necessary, clean and disinfect the freezer.

10.9 Further error messages

While the controller is operating, or when you turn it on or change the operation mode, fault signals may be emitted that are caused by the controller malfunctioning internally.

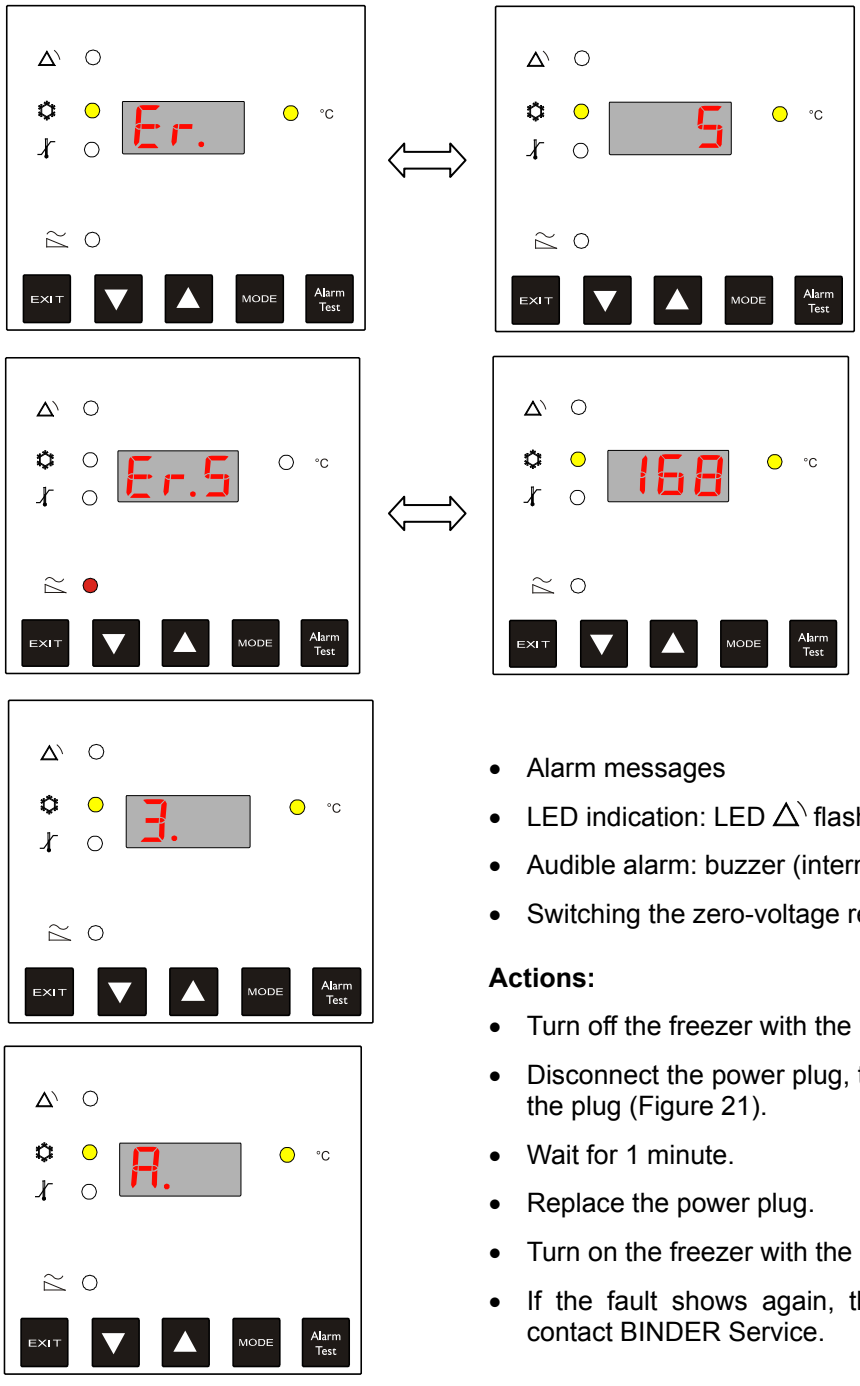


Figure 52: Visual indications (examples)

- Alarm messages
- LED indication: LED △\ flashes
- Audible alarm: buzzer (intermittent sound) immediately
- Switching the zero-voltage relay alarm output.

Actions:

- Turn off the freezer with the key switch (6).
- Disconnect the power plug, thereto pull the locking button on the plug (Figure 21).
- Wait for 1 minute.
- Replace the power plug.
- Turn on the freezer with the key switch (6).
- If the fault shows again, the unit could be faulty. Please contact BINDER Service.

	Only qualified service personnel authorized by BINDER must perform repair. Repaired units must comply with the BINDER quality standards.

For further error messages see chap. 16.2.

10.10 Zero-voltage relay alarm output

Collective alarm output via the zero-voltage relay alarm contact

The freezer is equipped at the rear with a zero-voltage relay output (8), which permits the transmission of alarms to an external monitoring system in order to monitor and record the alarm signals.

The zero-voltage relay alarm output switches immediately, as soon as the red LED △\ lights up on the controller display. The zero-voltage relay alarm output switches for alarm instances listed in chap. 16.2 and in case of a power failure.

If the external alarm monitor is connected via the contacts C and NO, alarm monitoring will take place with protection against short-circuiting, i.e., if the connection between the freezer and the external alarm monitor is interrupted, an alarm is triggered. In this case, power failure will also trigger the alarm.

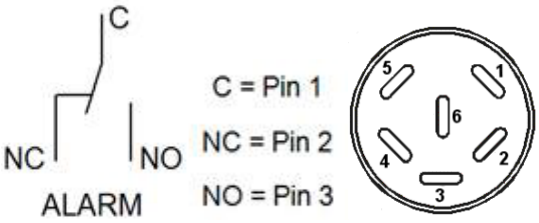


Figure 53: Zero-voltage contacts circuit diagram and pin allocation of DIN socket (8)

In case of no alarm, contact C closes with contact NO.

Closing contact C with contact NC switches the zero-voltage relay alarm output.

Maximum loading capacity of the switching contacts: 24V AC/DC – 2.0 Amp.

DANGER

Electrical hazard.

Danger of death.

Damage to switching contacts and connection socket.

∅ Do NOT exceed the maximum switching load of 24V AC/DC – 2.0 Amp.

∅ Do NOT connect any devices with a higher loading capacity.

The alarm message on the controller display remains displayed during transmission of an alarm via the zero-voltage relay outputs. As soon as the cause of the alarm is rectified, or the alarm message has been reset with the “EXIT” key, the alarm transmission via the zero-voltage relay outputs is reset together with the alarm message on the controller display.

In case of power failure, transmission of the alarm via zero-voltage relay outputs remains active for the duration of the power failure. Afterwards, the contact closes automatically.

Connection to an external monitoring system

To ensure short-circuit-proof alarm monitoring that will trigger the alarm when the freezer is connected to an external alarm monitor, connect the external alarm monitoring system to the freezer via the connection socket (8) of the zero-voltage relay output.

Connection of the BINDER GSM box for remote alarms (option)

This option allows forwarding the alarm messages, which are transmitted via the zero-voltage relay alarm contact, to the mobile network and to receive defined messages as a text message (SMS) on mobile phones.

The installation and operation of the BINDER GSM box are described in the manual (Art. No. 7001-0236) which is included with the GSM box.

11. CO_2 emergency cooling (option)

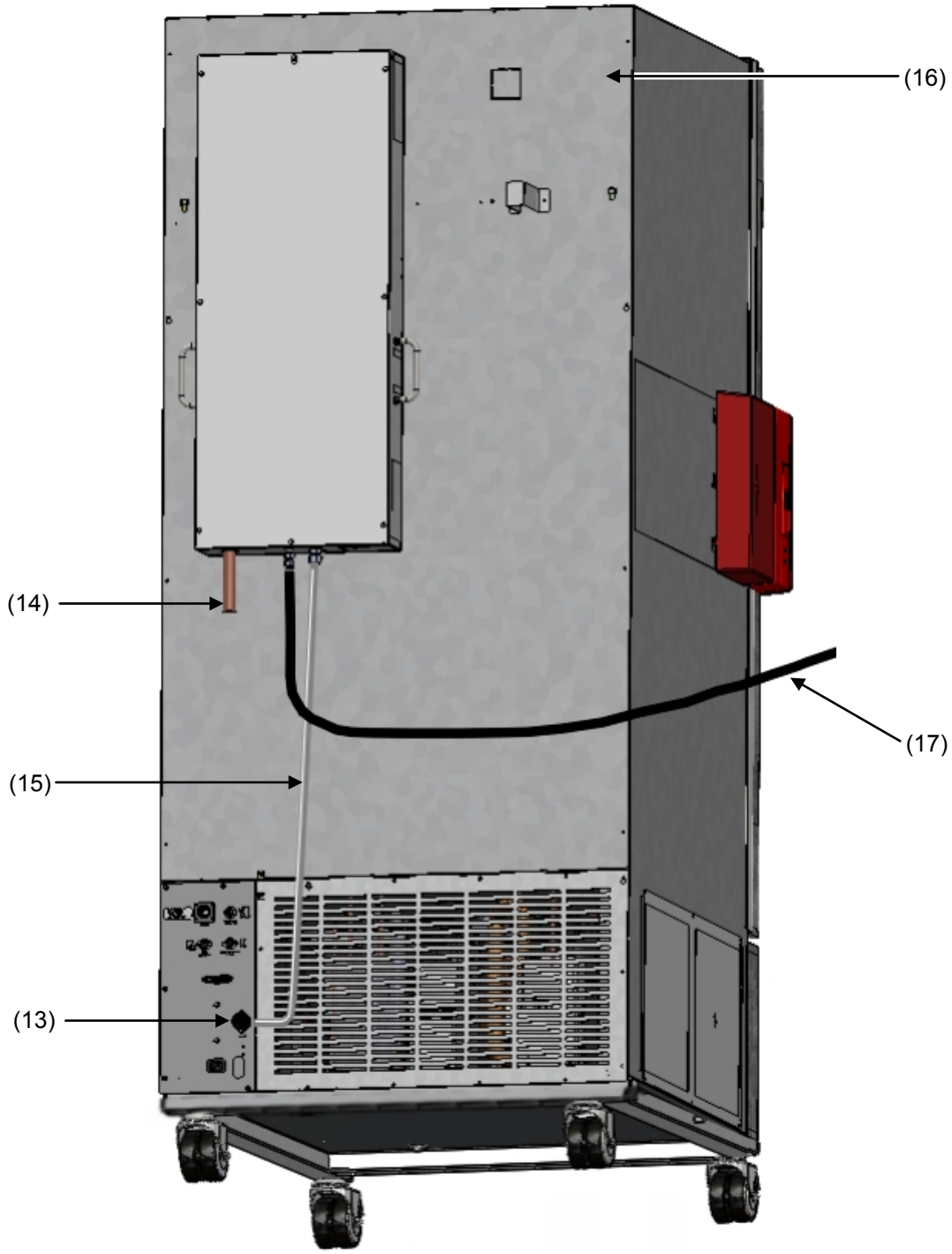


Figure 54: Rear view UF V with CO_2 emergency cooling system

(13) Connection socket for the electrical connection of the CO_2 emergency cooling

(14) CO_2 discharge outlet to connect a discharge hose

(15) Cable to connection socket (13) for the electrical connection of the CO_2 emergency cooling

(16) Pressure compensation opening (visible from the inside). Here CO_2 will also escape.

(17) Gas hose to connect the pressurized CO_2 cylinders

	The optional CO_2 emergency cooling is intended only for the use with a BINDER ultra-low temperature freezer UF V.

The CO_2 emergency cooling offers additional refrigeration when the inner chamber temperature increased up to the pre-set emergency cooling temperature. This may become necessary, following introduction of a heat load, in case of a power failure or failure of the cooling system.

Principle: CO_2 is taken from the gas bottle in liquid form and introduced into the freezer UF V when required. There the gas expands and cools off intensely, forming a mixture of CO_2 gas and CO_2 snow. The CO_2 snow provides the required cooling capacity through the transition into the gaseous state.

The emergency cooling system is integrated into the safety chain of the unit. In case of power failure, rechargeable batteries supply the CO_2 emergency cooling power supply, during normal operation power is supplied by a power supply unit 24V DC. The rechargeable battery is designed for an interruption of the external power supply of 72 hours maximum. Therefore, if pressurized CO_2 cylinders are available in sufficient quantity, functioning of the CO_2 emergency cooling should last through a week-end.

You can set the CO_2 emergency cooling system between -40 °C / *-40 °F* and -70 °C / *-94 °F*. In order to ensure an emergency cooling time as long as possible with a given CO_2 stock, select the highest possible emergency cooling temperature.

The optional CO_2 emergency cooling system is also available as a retrofit kit. Please contact BINDER Service.

	The option CO_2 emergency cooling is incompatible with the option access port 30 mm, rear. The UF V is regularly equipped with a rear access port 10 mm, prepared to be finalized by the user (chap. 4.4).

	When mounting the optional CO_2 emergency cooling, the GS mark is no longer valid.

11.1 Connecting and exchanging the pressurized CO_2 cylinder

	The CO_2 emergency cooling system works exclusively with liquid CO_2. Use CO_2 dip tube cylinders. The dip tube inside enables almost complete liquid withdrawal. CO_2 dip tube cylinders must stand upright during withdrawal.

Note regarding the installation site of the gas cylinder:

The cooling power decreases with increasing temperature of the liquid CO_2. Do not install the gas cylinder in the exhaust airflow of the UF V.

The supplied gas hose (17) is already connected with the CO_2 emergency cooling system. The user shall not remove this connection. When replacing the gas hose is required, please contact BINDER Service. To connect the pressurized CO_2 cylinder, connect the free end of the gas hose to the gas cylinder (wrench size A/F 30 mm / *1.2 in*). Then open the valve of the gas cylinder.

Before changing the gas cylinder, first close the valve of the empty gas cylinder. Perform a test run of the CO_2 emergency cooling to reduce the CO_2 pressure in the emergency cooling system. Only then unscrew the gas hose.

	After connecting the gas cylinder, check the hose connection with a soap solution for gas leaks. The hose connection must be tight

The valve of the gas cylinder **always** must be closed before screwing on or unscrewing the gas hose

WARNING

Opening the cylinder valve when the cylinder is not connected.

Sudden release of the stored pressure energy.

Risk of injury.

➢ Close the gas cylinder valve before connecting or removing the gas hose.

Secure the pressurized gas cylinder against falling and other mechanical damage.

WARNING

Safety valve tearing off.

Sudden release of the stored pressure energy.

Risk of injury.

➢ Secure gas cylinders against falling (chaining).

➢ Transport gas cylinders with a cylinder cart.

General information for safe handling of pressurized CO_2 cylinder:

- Open the gas cylinder valve slowly to avoid pressure surges.
- Secure gas cylinders during storage and use against falling (chaining).
- Transport gas cylinders with a cylinder cart, do not carry, roll, or throw them.
- Always close the valve even with apparently empty cylinders; screw on the cap when not in use. Return gas cylinders with the valve closed.
- Do not open gas cylinders by force. Mark them when damaged.
- Protect gas cylinders against fire, e.g. do not store together with flammable liquids.
- Observe relevant regulations for dealing with pressurized CO_2 cylinder.

Information for the operator concerning requirements and regulations for use of pressurized gas cylinders in the laboratory (not exhaustive):

A **storage** of pressurized gas cylinder (stockholding, no connection for emptying, storing for later use or for supply to others) in a laboratory without a storage cabinet is generally prohibited. The requirements for fire-protected pressurized gas cylinder cabinets are described in DIN EN 14470-2:2006.

Provisioning (reserve cylinders connected to the points intended for emptying or provided for imminent connection) and **using** (provisioning, operating, emptying) of pressurized gas cylinders may also take place outside storage cabinets or storage rooms, provided that the safety requirements are met. This applies to the operation of the CO_2 emergency cooling system.

- Observe all relevant regulations, in particular the requirements for provisioning / emptying the pressurized gas cylinders given in the Technical Regulations TRBS 3145 / 725
- If there are more than 6 cylinders in the laboratory, they must be placed in cylinder cabinets, special installation rooms or outdoors. After work (UF V turned off) store the cylinders in a safe storage location.
- Perform leakage tests
- Fire extinguishers must be available in order to protect the gas cylinders against heating in case of fire

- Make sure that operating instructions on the connection and exchange of the pressurized gas cylinders are attached in the vicinity of the pressurized gas cylinders. The instructions shall contain all required safety-related information in an intelligible form.
- Laboratories in which compressed gas cylinders are installed must be labeled with the warning sign W019 “Warning of gas cylinders”.

- In areas with increased risk of fire, if possible set up gas cylinders outside the rooms and install fix tubing.

Carbon dioxide (CO_2) in high concentrations (> 4 Vol.-%) is hazardous to health. It is colorless and almost odorless and therefore practically imperceptible. Escaping CO_2 gas is heavier than air and accumulates at the ground or possibly in lower-lying parts of the building. There is danger of suffocation and poisoning. Hazards due to uncontrolled gas release must be effectively avoided.

WARNING

High concentration of CO_2 (> 4 vol.-%).

Risk of death by suffocation.

Danger of poisoning.

- ➢ Operate the CO_2 emergency cooling only in a well-ventilated room.
- ➢ Ensure technical ventilation measures. Install a suitable conduct at the CO_2 discharge outlet of the emergency cooling system.
- ➢ Observe the relevant regulations for handling CO_2.

When installing pressurized CO_2 cylinders take into account the **structure of the building**.

- The installation site must be in a well ventilated area (**natural ventilation**). For rooms with a with a floor area of ≤ 12 m^2 with solid walls without openings on all sides there are further regulations (max. two 14 liter CO_2 cylinders, Label “suffocation” and prohibition to close the door after entering).
- The installation site must be technically ventilated (**technical ventilation**) with a CO_2 alarm system (**gas warning device**)

We strongly recommend continuous monitoring of the CO_2 concentration in the ambient air of the CO_2 emergency cooling. It must be permanently ensured that the **occupational exposure limit OEL** (formerly maximum permitted workplace concentration) of 0.5 Vol.-% CO_2 is not exceeded.

11.2 Operating the CO_2 emergency cooling system

When operating the CO_2 emergency cooling system, the freezer’s interior is flooded with CO_2. CO_2 in high concentrations (> 4 vol.-%) is hazardous to health. It is colorless and almost odorless and therefore practically imperceptible. Operate the CO_2 emergency cooling system only in a well-ventilated room. Released CO_2 gas muss must be safely led out via good room ventilation or a suitable connection to an exhaust system and through a conduct at the CO_2 discharge outlet (14) on the rear of the emergency cooling system. Observe the occupational exposure limit for CO_2 set by the national authorities. We recommend installing a CO_2 warning system.

Even when CO_2 or systems operated with CO_2 are handled carefully and appropriately, a residual risk remains, which can lead to life-threatening situations under certain circumstances. Therefore we strongly recommend continuous monitoring of CO_2 concentration in the ambient air of CO_2 emergency cooling. It must be durable to ensure that the maximum permissible occupational exposure limit for CO_2 (0.5 vol -% CO_2 for Germany) is not exceeded. "

WARNING

High concentration of CO_2 (> 4 vol.-%).

Risk of death by suffocation.

Danger of poisoning.

- Operate the CO_2 emergency cooling only in a well-ventilated room.
- Ensure technical ventilation measures. Install a suitable conduct at the CO_2 discharge outlet of the emergency cooling system.
- Observe the relevant regulations for handling CO_2.

We recommend connecting an exhaust hose to the CO_2 discharge outlet (14) and to conduct it to the outside or to an exhaust system. Since the CO_2 emergency cooling system is also effective in case of a power failure, an uninterruptible power supply is recommended for the exhaust system.

The controller RP1 measures and controls the temperature value inside the useable volume. Depending on the increase or decrease of temperature, the controller RP1 controls the CO_2 emergency cooling in standard operation and during power failure. As soon as the preselected emergency cooling temperature is reached inside the useable volume, the solenoid valve of the emergency cooling system opens, and liquid CO_2 from the pressurized CO_2 cylinder is injected at intervals into the useable volume. The liquid CO_2 expands until ambient pressure and evaporated into the useable volume. This results in cooling-down the useable volume to the pre-set emergency cooling temperature.

When opening the outer door, CO_2 injection is interrupted. This prevents potential cold burns / frostbite by inflowing CO_2 gas at manipulation inside the freezer.

After turning on the freezer, the CO_2 emergency cooling is inactivated for 60 minutes. Only after this time, the CO_2 emergency cooling – when switched on – is activated.

To prevent activating the CO_2 emergency cooling at too high temperature after turning on the unit, release in the menu in the menu “OP.U” (Operating Mode USER) should take place only after reaching the temperature set-point for the first time.

When operating the CO_2 emergency cooling, the temperature distribution may deviate from the technical data valid at -80 °C (chap. 17.4).

Activating the CO_2 emergency cooling

1. Open the valve of the CO_2 gas cylinder
2. Release the CO_2 emergency cooling at the controller: Set the parameter “**En.E**” in the menu “OP.U” (Operating Mode USER, chap. 8.3) to “On” and confirm with “MODE”.
2. Select the emergency cooling temperature at the controller: Set the parameter “**SP.E**” in the menu “OP.U” (Operating Mode USER, chap. 8.3) to the desired value (range -40 °C up to -70 °C) and confirm with “MODE”.

Test run

Activate an emergency cooling test run at the controller: Set the parameter “**tS.E**” in the menu “OP.U” (Operating Mode USER, chap. 8.3) to “On” and confirm with “MODE”. The emergency cooling turns on for 10 seconds. The parameter “**tS.E**” then automatically resets to “OFF”.

Inactivating the CO_2 emergency cooling

1. Inactivate the CO_2 emergency cooling at the controller: Set the parameter “**En.E**” in the menu “OP.U” (Operating Mode USER, chap. 8.3) to “OFF” and confirm with “MODE”.
2. Close the valve of the CO_2 gas cylinder.

Note: When activating or deactivating the CO_2 emergency cooling you need to restart the controller. Turn off the main switch (key switch) for 10 seconds and then turn it on again.

11.3 Alarm messages

The alarm messages which occur simultaneously during operation with CO_2 emergency cooling are cyclically displayed one after the other.

CO_2 emergency cooling system activated

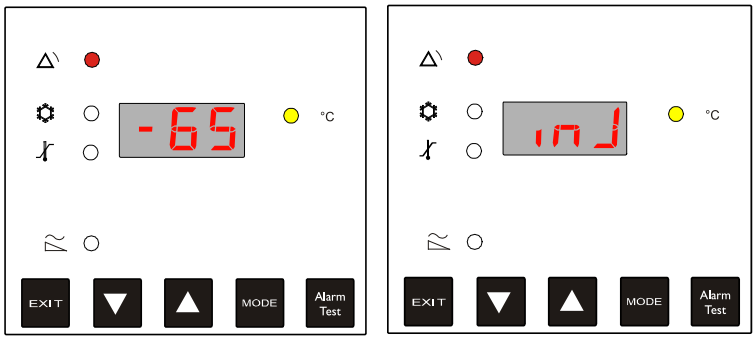


Figure 55: CO_2 emergency cooling system activated

- Alarm message "**inJ**" immediately
- LED indication immediately: LED △ flashes
- Audible alarm: buzzer immediately
- Switching the zero-voltage relay alarm output.

Note: Since the clocking of the CO_2 emergency cooling system always triggers the alarm again, you cannot permanently reset the buzzer.

Insufficient CO_2 supply of the emergency cooling system

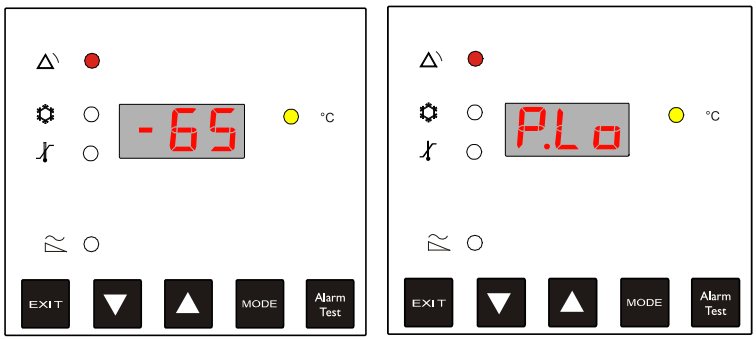


Figure 56: Alarm CO_2 supply of emergency cooling system

- Alarm message "**P.lo**" immediately
- LED indication immediately: LED △ flashes
- Audible alarm: buzzer immediately
- Switching the zero-voltage relay alarm output.

Actions:

- Check if the CO_2 gas supply is open
- Connect a new pressurized CO_2 cylinder

	It is not possible to determine the filling level of a pressurized CO_2 cylinder from the cylinder pressure. Weigh the bottle regularly in order to replace it in time

Low battery voltage during CO_2 emergency cooling with battery operation

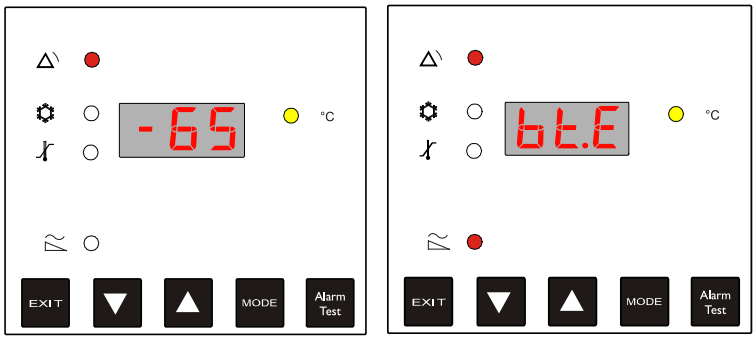


Figure 57: Alarm low battery voltage during CO_2 emergency cooling with battery operation

- Alarm message “**bt.E**” immediately
- LED indication immediately: LED flashes, LED flashes
- Audible alarm: buzzer immediately
- Switching the zero-voltage relay alarm output.

Actions:

- Check the battery connections
- Charge the battery (charging mode: current, approx. 160 mA)
- If it is defective, replace the battery. Contact BINDER Service
- Reset the alarm message with the “EXIT“ key.

12. Data monitoring and recording

12.1 Ethernet interface (option)

The freezer can optionally be equipped with an Ethernet interface (7) for computer communication, that can connect the user-friendly communication software APT-COM™ 3 DataControlSystem (option, chap. 12.2). The unit address (setting in the USER menu) must be set to “1” (factory setting). The MAC Address is indicated below the Ethernet interface. For further information, please refer to the operating manual of the BINDER communication software APT-COM™ 3.

The additional RS422 interface (9) is only used for service purposes. Do NOT connect it to any network. The interface is labeled accordingly.

12.2 Communication software APT-COM™ 3 DataControlSystem (option)

You can connect the BINDER communication software APT-COM™ 3 DataControlSystem via the optional Ethernet interface (7).

The APT-COM™ System permits the networking of up to 30 units and connection to a PC for controlling and programming, as well as recording and representing temperature data. The actual temperature values are given at adjustable intervals. Programming can be performed graphically via PC. Up to 30 chambers with RS 422 interface can be cross-linked. For further information, refer to the operating manual of the BINDER communication software APT-COM™ 3.

12.3 Analog output for temperature

The freezer is equipped with an analog output 4-20 mA for temperature. This output permits transmitting data to external data registration systems or devices.

The connection is realized as a DIN socket (12) in the rear connection panel as follows:

ANALOG OUTPUT 4-20 mA DC

PIN 1: Temperature –
PIN 2: Temperature +

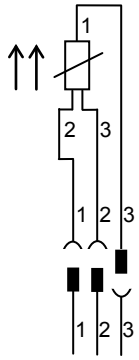
Temperature range: +40 °C / *104°F* to -100 °C / *-148°F*

A suitable DIN plug is enclosed.

Figure 58: Pin allocation of DIN socket (12) for option analog output

12.4 Additional Pt 100 temperature sensor (option) with output to Lemo socket

An additional temperature sensor Pt100 allows measuring the temperature of the charging material by means of an independent measuring system with Pt 100 entry.



Lemo socket (11)

Lemo plug

Technical data of the Pt100 sensor:

- Three-wire technique
- Class B (DIN EN 60751)
- Temperature range up to 200 °C / *392°F*
- Stainless steel protective tube, material no. 1.4501

Figure 59: Pin allocation of Lemo socket (11) in the connection panel at the rear of the unit

A suitable Lemo plug is enclosed.

12.5 Circular chart recorder (option)

The freezer can be equipped with a circular chart recorder, which continuously records the actual temperature value. In addition, date and time are recorded. The values of 7 days are presented on a circular chart. With UF V 500 and 700, the circular chart recorder is built-in on the freezer front. For UF V 300, an external circular chart recorder is available.

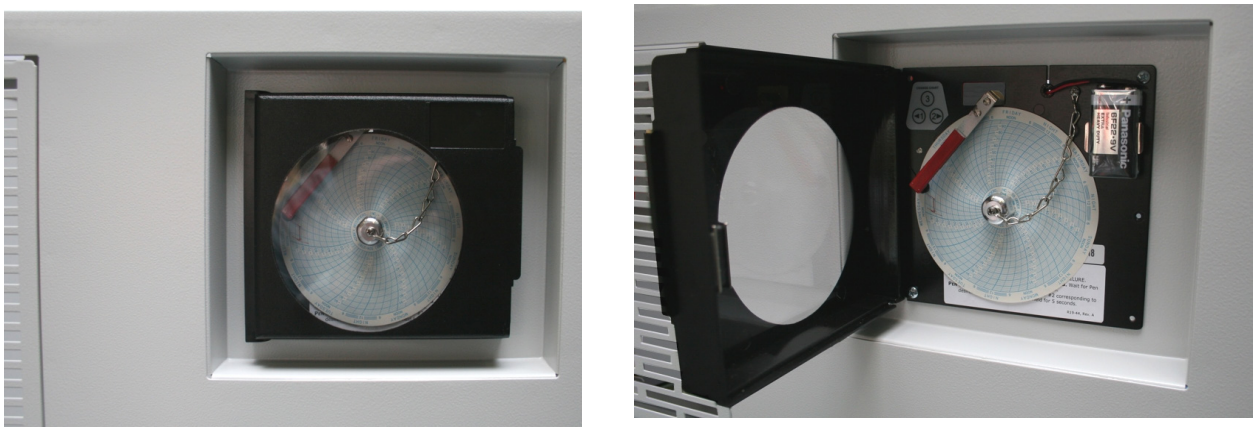


Figure 60: Circular chart recorder on the right side at the bottom of the freezer front

	The original instructions delivered with the circular chart recorder (Art. no. 8012-0741) describe its installation and operation.

12.6 Data logger (standard with UF V UL, option for UF V)

The freezer UF V UL is supplied with a data logger (optional for UF V), which records the actual temperature values. Also date and time are recorded. Insert the data logger into a holder in the control panel on the right side of the freezer.

The data logger reads one record every 4 minutes (temperature / time) and can store up to 16,000 records (corresponding to a recording time of 44 days). Then the oldest data will be overwritten. The data can be read out via the USB interface of the data logger and given out in pdf format.

The battery of the data logger enables recording data during three years.

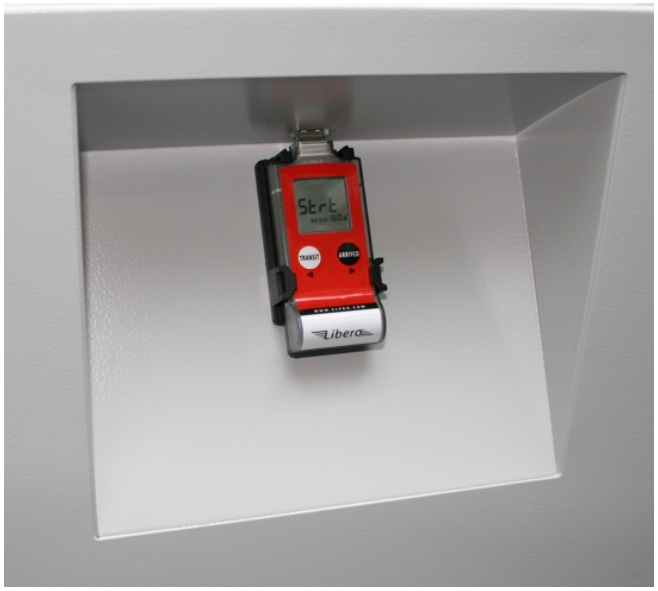


Figure 61: Data logger position on the right side at the bottom of the freezer front

	The quick reference guide and the original instructions delivered with the data logger describe its installation and operation.

The displays of the controller and the data logger can slightly vary. This is because slight fluctuations (+/- 2 K) around the set inner chamber value occur due to operating of the refrigeration machine. The controller displays a mean value, whereas the data logger directly shows this fluctuation. In addition, there is the temperature exactitude of the data logger (see its data sheet).

12.7 BINDER GSM Box for remote alarms (option)

This option allows forwarding the alarm messages, which are transmitted via the zero-voltage relay alarm contact, to the mobile network and to receive defined messages as a text message (SMS) on mobile phones.

	The installation and operation of the BINDER GSM Box are described in the manual (Art. No. 7001-0236) which is included with the GSM Box.

12.8 Unit inventory: Storage rack systems and cryo boxes (option)

12.9 Storage rack systems with or without cryo boxes

For optimum use of the available space of the freezer compartments, the following racks are available:

- Side access racks, aluminum or stainless steel
- Sliding drawer racks, stainless steel

Side access racks with cryo boxes

Sliding drawer racks with smoothly running drawers and cryo boxes

Figure 62: Storage rack systems and cryo boxes

All racks are available in two different heights:

- 280 mm / *11 in* height for 5 standard cryo boxes (50 mm / *2 in*) stacked
- 330 mm / *13 in* height for 6 standard cryo boxes (50 mm / *2 in*) stacked

Racks are optionally empty or filled with standard cryo boxes

The cardboard cryo boxes come with a divider (9 x 9 grid for 81 samples).

Rack height	No. of sections for cryo boxes (height x depth)	Cryo boxes	Side access rack, stainless steel Art. no.	Side access rack, aluminum Art. no.	Sliding drawer, stainless steel Art. no.
280 mm / *11 in*	5 x 4	empty	6017-0043	6017-0041	6017-0045
280 mm / *11 in*	5 x 4	with boxes	6017-0044	6017-0042	6017-0046
330 mm / *13 in*	6 x 4	empty	6017-0049	6017-0047	6017-0051
330 mm / *13 in*	6 x 4	with boxes	6017-0050	6017-0048	6017-0052

12.9.1 Cryo boxes

Set of 36 standard cryo boxes, cardboard, white, height 50 mm / *2 in* with 9 x 9 grid

Figure 63: Cryo boxes with dividers, Art. no. 6017-0053

13. Maintenance, cleaning, and service

13.1 Maintenance intervals, service

DANGER

Electrical hazard.

Danger of death.

∅ The unit must NOT become wet during operation or maintenance works.

∅ Do NOT remove the rear panel of the unit and the maintenance flap on the right unit side.

➢ Before conducting maintenance work, turn off the unit at the main power switch (key switch). Disconnect the power plug, thereto pull the locking button on the plug (Figure 21).

➢ General maintenance work must be conducted by licensed electricians or experts authorized by BINDER.

➢ Maintenance work at the refrigeration system must only be conducted by qualified personnel who underwent training in accordance with EN 13313:2010 (e.g. a refrigeration technician with certified expert knowledge acc. to regulation 303/2008/EC). Follow the national statutory regulations.

Ensure regular maintenance work is performed at least once a year and that the legal requirements are met regarding the qualifications of service personnel, scope of testing and documentation. All work on the refrigeration system (repairs, inspections) must be documented.

The warranty becomes void if maintenance work is conducted by non-authorized personnel.

With an increased amount of dust in the ambient air, clean the condenser fan (by suction or blowing) several times a year. Check the condenser air filter frequently and clean it if necessary (chap. 13.3.1).

We recommend taking out a maintenance agreement. Please consult BINDER Service.

BINDER telephone hotline:	+49 (0) 7462 2005 555
BINDER fax hotline:	+49 (0) 7462 2005 93555
BINDER e-mail hotline:	service@binder-world.com
BINDER service hotline USA:	+1 866 885 9794 or +1 631 224 4340 x3 (toll-free in the USA)
BINDER service hotline Asia Pacific:	+852 390 705 04 or +852 390 705 03
BINDER service hotline Russia and CIS	+7 495 98815 16
BINDER Internet website	http://www.binder-world.com
BINDER address	BINDER GmbH, post office box 102, D-78502 Tuttlingen

International customers, please contact your local BINDER distributor.

13.2 Cleaning and decontamination

Clean the unit after each use to avoid potential corrosion damage by ingredients of the charging material.

During operation: Wipe only the outer surfaces with a humid cloth and then dry it thoroughly.

DANGER

Electrical hazard.

Danger of death.

∅ Do NOT spill water or cleaning agents over the inner and outer surfaces

➢ Before cleaning, turn off the unit at the main power switch (key switch) and disconnect the power plug, thereto pull the locking button on the plug (Figure 21).

➢ Completely dry the freezer before turning it on again.

13.2.1 Cleaning

Disconnect the chamber from the power supply before cleaning. Disconnect the power plug, thereto pull the locking button on the plug (Figure 21).

	The interior of the unit must be kept clean. Thoroughly remove any residues of the charging material.

Wipe the surfaces with a moistened towel.

	For a thorough and mild cleaning, we recommend using BINDER Freezy Clean (Art. no. 1002-0038).

In case of light to normal soiling, we recommend:

- Cleaning with BINDER Freezy Clean
- "Final rinsing" with a clean humid wiping cloth

In case of heavier soiling of the interior (except the surrounding ledge made of polycarbonate), we recommend preliminary cleaning with a standard commercial cleaning detergents free from acid or halides.

Alternatively, you can use the following cleaning agents (apply on a cloth):

Exterior surfaces, housing of the automatic door mechanism and controller with controller panel, interior (stainless steel)	Standard commercial cleaning detergents free from acid or halides. Alcohol based solutions.
Compartment doors	Standard commercial cleaning detergents free from acid or halides. Alcohol based solutions max. 10%
Outer door gasket (PVC) and inner door gasket (silicon)	Alcohol based solutions
Surrounding ledge in the interior (polycarbonate)	Only use BINDER Freezy Clean (Art. no. 1002-0038)
Zinc coated hinge parts rear unit wall	Standard commercial cleaning detergents free from acid or halides. Do NOT use a neutral cleaning agent on zinc coated surfaces.

Do not use cleaning agents that may cause a hazard due to reaction with components of the device or the charging material. If there is doubt regarding the suitability of cleaning products, please contact BINDER service.

	For surface protection, perform cleaning as quickly as possible. After cleaning completely remove cleaning agents from the surfaces with a moistened towel.

	Soapsuds may contain chlorides and must therefore NOT be used for cleaning.

	Do NOT use acetone and other organic solvents for cleaning.

	We recommend using BINDER Freezy Clean Art. Nr. 1002-0038 for a thorough and mild cleaning. Any corrosive damage that may arise following use of other cleaning agents is excluded from liability by BINDER GmbH.

DANGER

Risk of locking in a person.

Danger of death.

- Before closing doors, make sure that nobody is inside.
- Pull the power plug before entering the interior (e.g. for cleaning purposes), thereto pull the locking button on the plug (Figure 21).

13.2.2 Decontamination

The operator must ensure that proper decontamination is performed in case a contamination of the chamber by hazardous substances has occurred.

Disconnect the chamber from the power supply prior to chemical decontamination. Disconnect the power plug, thereto pull the locking button on the plug (Figure 21).

Do not use decontamination agents that may cause a hazard due to reaction with components of the device or the charging material. If there is doubt regarding the suitability of cleaning products, please contact BINDER service.

In case of contamination of the interior by biologically or chemically hazardous material, we recommend decontamination of the interior with BINDER Freezy Decon (Art. Nr. 1002-0032) (apply on a cloth).

	Follow the operating instructions and safety hints labeled on the BINDER Freezy Decon bottle.

Recommended precautions: wear light protective clothing. To protect the eyes use sealed protective goggles. Do not inhale vapors (When exceeding the limit values, use a self-contained breathing apparatus). Suitable protective gloves with full contact: butyl or nitrile rubber, penetration time >480 minutes. May cause sensitization by inhalation and skin contact.

CAUTION

Contact with skin, ingestion and inhalation.

Skin and eye damage due to chemical burns.

∅ Do not ingest. Keep away from food and beverages.

∅ Do NOT inhale vapors.

∅ Do NOT empty into drains.

➢ Wear protective clothing, gloves and goggles.

➢ Avoid skin contact.

➢ Use only in well ventilated areas.

Alternatively you can use the following disinfectants (apply on a cloth):

Interior (stainless steel)	Standard commercial surface disinfectants free from acid or halides (not dripping). Alcohol based solutions.
Compartment doors	Standard commercial surface disinfectants free from acid or halides (not dripping). Alcohol based solutions max. 10%
Outer door gasket (PVC) and inner door gasket (silicon)	Alcohol based solutions
Surrounding ledge in the interior (Polycarbonate)	Only use BINDER Freezy Decon (Art. Nr. 1002-0032).

Following use, completely remove any disinfectant with a sterile moistened towel from the surfaces.

Before start-up, the unit must be absolutely dry and ventilated, as explosive gases may form during the decontamination process.

With every decontamination method, always use adequate personal safety controls.

CAUTION

Danger of corrosion.

Damage to the unit.

∅ Do NOT use acidic or chlorine cleaning detergents.

We recommend using BINDER Freezy Decon (Art. no. 1002-0032) for decontamination.

Any corrosive damage that may arise following use of other cleaning agents is excluded from liability by BINDER GmbH.

13.3 Maintenance work by the customer

13.3.1 Checking and cleaning the condenser air filter

The condenser air filter prevents accumulation of dust on the condenser. If the filter is blocked by dust this may cause decrease or failure of refrigeration.

Check the air filter visually for soiling every month. Especially with the alarm message “A52” (chap. 16.2) the filter may be soiled. You can rinse the filter and use it again.

	Regularly check the filter visually for soiling.

The filter is located behind a grille (D) in the lower housing cover. You can easily take it out for cleaning.

Open the grille by pushing the provided recess.

Figure 64: Opening the filter grille

Pull out the filter upward straightly out of the grille.

Figure 65: Taking out the filter

Wash the filter with water and let it dry.

	Fix the filter correctly following cleaning.

13.3.2 Cleaning the condenser

Every 6 months remove by suction any visible dust on the condenser lamellas with a vacuum cleaner. If appropriate, blow through the lamellas with compressed air.

With an increased amount of dust in the ambient air, clean the condenser several times a year. In this case we recommend to weekly check the condenser lamellas (behind the filter grille (D). If soiling is visible, turn off the freezer and remove the dust by suction from the condenser lamellas.

13.3.3 De-icing and defrosting

	We recommend for material that could be damage already by slight warming, to provide adequate storage facilities (e.g., in a second unit / with liquid nitrogen).

Ice may form at the upper part of the chamber and on the inner doors. Excessive frost may lead to increasing the inner chamber temperature. Remove the frost on the doors with the supplied ice scraper.

	Regularly (recommendation: every month) remove the frost on the doors with the supplied ice scraper

After an extended period of operation, defrosting may become necessary:

To defrost the entire unit, proceed as follows:

- Turn off external protocol systems (option) if applicable.
- Place the stored material in another freezer or in a container refrigerated by dry ice or liquid carbon dioxide.
- Turn off the freezer at its key switch (6) and disconnect it from the power supply.
- Open the outer door and all inner doors.
- Place absorbent towels on the bottom of the inner chamber or mount the optional drain well (chap. 2.7) and allow the frost to melt.

	**CAUTION** **Scraping and piercing with a sharp instrument.** **Damage to the freezer.** ∅ NEVER use tools with a sharp edge to remove the frost. ➢ Use the supplied ice scraper only.

- Wipe up the accumulated water with absorbent towels
- Let the interior of the freezer dry. Clean and decontaminate it as described in chap. 13.2

	When taking the unit into operation again, please follow the hints given in chap. 5.5.

- Connect the freezer to the power supply and turn it on with the key switch (6).
- Operate the unit for at least 9 hours. Then introduce the material into the freezer.
- Turn on external protocol systems (option) if applicable.

When defrosting, water may accumulate on the shelves and the bottom. Procedure to remove it:

- Carry the water from the freezer shelves and bottom with the wiper into the drain well (option, chap. 2.7).
- Then dry all inner chamber equipment with an absorbent towel.

13.4 Sending the unit back to BINDER GmbH

If you return a BINDER product to us for repair or any other reason, we will only accept the product upon presentation of an **authorization number** (RMA number) that has previously been issued to you. An authorization number will be issued after receiving your complaint either in writing or by telephone **prior** to your sending the BINDER product back to us. The authorization number will be issued following receipt of the information below:

- BINDER product type and serial number
- Date of purchase
- Name and address of the dealer from which you bought the BINDER product
- Exact description of the defect or fault
- Complete address, contact person and availability of that person
- Exact location of the BINDER product in your facility
- A contamination clearance certificate (chap. 18) must be faxed in advance

The authorization number v to the packaging in such a way that it can be easily recognized or be recorded clearly in the delivery documents.

	For security reasons we cannot accept a unit delivery if it does not carry an authorization number.

Return address: BINDER GmbH
Abteilung Service
Gänsäcker 16
78502 Tuttlingen
Germany

14. Disposal

14.1 Disposal of the transport packing

Packing element	Material	Disposal
Straps to fix packing on pallet	Plastic	Plastic recycling
Wooden transport box (option)	Non-wood (compressed match-wood, IPPC standard)	Wood recycling
with metal screws	Metal	Metal recycling
Pallet	Solid wood (IPPC standard)	Wood recycling
with foamed plastic stuffing	PE foam	Plastic recycling
Transport box	Cardboard	Paper recycling
with metal clamps	Metal	Metal recycling
Top cover	Cardboard	Paper recycling
with foamed plastic stuffing	PE foam	Plastic recycling
Bag for operating manual	PE foil	Plastic recycling
Insulating air cushion foil (packing of optional accessories)	PE foil	Plastic recycling

If recycling is not possible, all packing parts can also be disposed of with normal waste.

14.2 Decommissioning

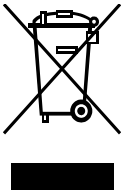
- Turn off the unit with the key switch (6). Disconnect the unit from the power supply.
- Let the unit defrost (chap. 13.3.3)
- Temporal decommissioning: See indications for appropriate storage, chap. 3.3.
- Final decommissioning: Dispose of the unit as described in chap. 14.3 to 14.5.

When restarting the unit, please pay attention to the corresponding information in chap. 5.5.

14.3 Disposal of the unit in the Federal Republic of Germany

According to directive 2002/96/EC of the European Parliament and of the Council on waste electrical and electronic equipment (WEEE), BINDER devices are classified as “monitoring and control instruments” (category 9) only intended for professional use“. They must not be disposed of at public collecting points.

The chamber bears the symbol for the marking of electrical and electronic equipment manufactured / placed on the market in the EC after 13 August 2005. It must be disposed of in separate collection according to the directive 2002/96/EC on waste electrical and electronic equipment (WEEE) and German national law for electrical and electronic equipment (Elektro- und Elektronikgerätegesetz, ElektroG). WEEE marking: crossed-out wheeled bin with solid bar under. A significant part of the materials must be recycled in order to protect the environment.



At the end of the device’s service life have the device disposed of according to the German national law for electrical and electronic equipment (Elektro- und Elektronikgerätegesetz, ElektroG) from 23 March 2005, BGBl. I p. 762 or contact BINDER service who will organize taking back and disposal of the unit according to the German national law for electrical and electronic equipment (Elektro- und Elektronikgerätegesetz, ElektroG) from 23 March 2005, BGBl. I p. 762.

	CAUTION
	Violation against existing law. ∅ Do NOT dispose of BINDER devices at public collecting points. ➢ Have the device disposed of professionally at a recycling company, which is certified according to the German national law for electrical and electronic equipment (Elektro- und Elektronikgerätegesetz, ElektroG) from 23 March 2005, BGBl. I p. 762. *or* ➢ Notify BINDER Service to dispose of the device. The general terms of payment and delivery of BINDER GmbH apply, which were valid at the time of purchasing the unit.

Certified companies disassemble waste BINDER equipment in primary substances for recycling according to directive 2002/96/EC. The devices must be free from toxic, infectious or radioactive substances in order to eliminate any health hazards to the employees of the recycling companies.

	Prior to handing the unit over to a recycling company, it is the user’s responsibility that it is free from toxic, infectious or radioactive substances. • Prior to disposal, clean all introduced or residual toxic substances from the unit. • Prior to disposal, disinfect the unit from all sources of infection. Be aware that sources of infection may also be located outside the inner chamber. • If you cannot safely remove all toxic substances and sources of infection from the unit, dispose of it as “special” waste according to national law. • Fill out the contamination clearance certificate (chap. 18) and enclose it with the unit.

WARNING

Contamination of the device with toxic, infectious or radioactive substances.

Danger of intoxication.

Danger of infection.

∅ NEVER take a unit contaminated with toxic substances or sources of infection for recycling according to directive 2002/96/EC.

➢ Prior to disposal, remove all toxic substances and sources of infection from the unit.

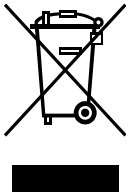
➢ Dispose of a unit from which all toxic substances or sources of infection cannot be safely removed as “special” waste according to national law.

The refrigerants used R404a and R508B are not inflammable at ambient pressure. They must not escape into the environment. In Europe, recovery of the refrigerants R404a (Global Warming Potential GWP 3750) and R508B (GWP 12300) is mandatory according to regulation No. 842/2006/EC. Ensure the compliance with the applicable legal requirements regarding qualification of staff, disposal, and documentation.

14.4 Disposal of the unit in the member states of the EC except for the Federal Republic of Germany

According to directive 2002/96/EC of the European Parliament and of the Council on waste electrical and electronic equipment (WEEE), BINDER devices are classified as “monitoring and control instruments” (category 9) only intended for professional use“. They must not be disposed of at public collecting points.

The chamber bears the symbol for the marking of electrical and electronic equipment manufactured / placed on the market in the EC after 13 August 2005. It must be disposed of in separate collection according to the directive 2002/96/EC on waste electrical and electronic equipment (WEEE). WEEE marking: crossed-out wheeled bin with solid bar under.



At the end of the device’s service life, notify the distributor who sold you the device, who will take back and dispose of the unit according to the directive 2002/96/EC of 27 January 2003 on waste electrical and electronic equipment (WEEE).

CAUTION

Violation against existing law.

∅ Do NOT dispose of BINDER devices at public collecting points.

➢ Have the device disposed of professionally at a recycling company that is certified according to conversion of the directive 2002/96/EC into national law.

or

➢ Instruct the distributor who sold you the device to dispose of it. The agreements apply that were agreed with the distributor when purchasing the unit (e.g. his general terms of payment and delivery).

➢ If your distributor is not able to take back and dispose of the unit, please contact BINDER Service.

Certified companies disassemble waste BINDER equipment in primary substances for recycling according to directive 2002/96/EC. The devices must be free from toxic, infectious or radioactive substances in order to eliminate any health hazards to the employees of the recycling companies.

Prior to handing the unit over to a recycling company, it is the user's responsibility that it is free from toxic, infectious or radioactive substances.

- Prior to disposal, clean all introduced or residual toxic substances from the unit.
- Prior to disposal, disinfect the unit from all sources of infection. Be aware that sources of infection may also be located outside the inner chamber.
- If you cannot safely remove all sources of infection and toxic substances from the unit, dispose of it as "special" waste according to national law.
- Fill out the contamination clearance certificate (chap. 18) and enclose it with the unit.

WARNING

Contamination of the device with toxic, infectious or radioactive substances.

Danger of intoxication.

Danger of infection.

∅ NEVER take a unit contaminated with toxic substances or sources of infection for recycling according to directive 2002/96/EC.

➢ Prior to disposal, remove all toxic substances and sources of infection from the unit.

➢ Dispose of a unit, from which you cannot remove all toxic substances and sources of infection safely as "special" waste according to national law.

The refrigerants used R404a and R508B are not inflammable at ambient pressure. They must not escape into the environment. In Europe, recovery of the refrigerants R404a (Global Warming Potential GWP 3750) and R508B (GWP 12300) is mandatory according to regulation No. 842/2006/EC. Ensure the compliance with the applicable legal requirements regarding qualification of staff, disposal, and documentation.

14.5 Disposal of the unit in non-member states of the EC

CAUTION

Alteration of the environment.

➢ For final decommissioning and disposal of the freezer, please contact BINDER Service.

➢ Follow the statutory regulations for appropriate, environmentally friendly disposal.

The main board of the freezer includes a lithium cell. Please dispose of it according to national regulations.

The freezer is equipped with a rechargeable battery (12 V, 7.2 Ah) which can be recycled. At the end of its useful life, please dispose of it according to national regulations.

The refrigerants used R404a and R508B are not inflammable at ambient pressure. They must not escape into the environment. In Europe, recovery of the refrigerants R404a (Global Warming Potential GWP 3750) and R508B (GWP 12300) is mandatory according to regulation No. 842/2006/EC. Ensure the compliance with the applicable legal requirements regarding qualification of staff, disposal, and documentation.

15. Troubleshooting

Fault description	Possible cause	Required measures
Refrigerating performance		
Unit without function.	No power supply.	Check connection to power supply.
	Wrong voltage.	Check power supply for voltage of 115V / 208 - 240 V / 230V.
	Unit fuse has responded.	Contact BINDER service.
	Controller defective.	Contact BINDER service.
No refrigerating performance after turning on the chamber. Safety controller responds.	Limit temperature reached. Safety controller (chap. 9) set too low.	Hit the “EXIT” button of the controller. If appropriate, select suitable limit value.
	Safety controller (chap. 9) defective.	Contact BINDER service.
Chamber refrigerating permanently, set-point not held.	Semiconductor relay defective.	Contact BINDER service.
	Controller defective.	
	Controller not adjusted, or adjustment interval exceeded.	Calibrate and adjust controller.
Chamber refrigerating permanently, set-point not held. Alarm message“992” or “998” or “999”	Refrigerating machine in continuous operation (see chap. 10.8).	Contact BINDER service.
No or too low refrigerating performance.	Pt 100 sensor defective.	Contact BINDER service.
	Refrigerating system defective.	
	Semiconductor relay defective.	
	Temperature set-point not set correctly on the controller.	Set temperature set-point correctly on the controller
	Ambient temperature too high > 32 °C (chap. 3.4).	Select cooler place of installation.
	Compressor not switched on.	Contact BINDER service.
	No or not enough refrigerant.	
	Too much external heat load.	Reduce heat load.
Alarm message A21 (cooling cycle – early warning system)	Cooling cycle not running properly.	Contact BINDER service.
Alarm message A31 (Ambient temperature alarm: Ambient temperature > 32 °C)	Place of installation too hot.	Select cooler place of installation or contact BINDER service.
	Ventilation slots are blocked.	Make sure to have free air access to the device at the front and bottom. Keep clear the ways of the exhaust air to the top and side. The warm exhaust air must not be sucked in at the front again.
	Freezer positioned too close to the wall (spacers not mounted or twisted).	Install / check the spacers (chap. 4.2).

Fault description	Possible cause	Required measures
Refrigerating performance (continued)		
Alarm message A41 (cooling cycle operating permanently > 72 hs.)	Door not shut tightly.	Check if doors are closed.
	Frost on door gasket.	Defrost the door gasket with the ice scraper.
	Door gasket defective.	Contact BINDER service.
	Door opened very frequently.	Open doors less frequently
	Place of installation too warm.	Select cooler place of installation or contact BINDER service.
	Introduction of too warm or too large amount of material.	Cool down material before introducing and / or load in smaller portions.
	Too low temperature set-point set on the controller.	Set temperature set-point correctly on the controller
	Controller not adjusted, or adjustment interval exceeded.	Calibrate and adjust controller
	Semiconductor relay defective.	Contact BINDER service.
	Controller defective.	
Alarm message A51	Cooling system error	Contact BINDER service.
Alarm message A52	Condenser air filter soiled.	Clean the condenser air filter (chap. 13.3.1).
	Condenser soiled.	Clean the condenser (chap. 13.3.2).
	Ventilation slots are blocked.	Make sure to have free air access to the device at the front and bottom.
Alarm message A53	Condenser fan defective.	Turn off the freezer and contact BINDER service.
Safety controller responds.	Limit temperature reached.	Check setting of temperature set-point and of safety controller. If appropriate, select suitable limit value.
	Too much external heat load.	Reduce heat load
	Controller defective.	Contact BINDER service.
	Safety controller defective.	
	Semi-conductor relay defective.	
Humidity		
Icing at the walls of the inner chamber	Long time of continuous operation.	Defrost the unit (chap. 13.3.3)
Controller		
No unit function (dark display).	Power failure. Display mode “Standby” active.	Press any key on the controller display.
	Main power switch (key switch) is off.	Turn on the key switch (6).
No entries to controller keypad possible.	Keyboard locking activated.	Unlock keyboard locking (chap. 8.4).
No access to menu “USER”.	User code incorrect.	Contact BINDER service.
EXIT button does not cancel the notifying or alarm indication.	Cause of disturbance not removed correctly The EXIT button permits resetting notifying or alarm messages for temperature only with in a tolerance sector of +/- 2 °C.	Remove cause of disturbance. If the EXIT button still does not cancel the indication, contact BINDER service.

Fault description	Possible cause	Required measures
Controller (continued)		
Alarm test key cannot actuate the alarm.	Main power switch (key switch) is off.	Turn on the key switch (6).
Alarm test key actuates an incomplete alarm (just message or just buzzer).	When only the buzzer or only the alarm is actuated by the alarm test key, the part, which has not been actuated is out of order and must be replaced.	Contact BINDER service.

	Only qualified service personnel authorized by BINDER must perform repair. Repaired units must comply with the BINDER quality standards.

16. Overview of all controller indications

16.1 Indications of setting menus

	Setting the temperature set point	chap. 6
	Operating mode HAND	chap. 8.2
	Operating mode USER	chap. 8.3
	Locking and unlocking the operating functions' settings, Operating mode LOCK	chap. 8.4.1
	Password request	chap. 8.3
	Password for locking/unlocking	chap. 8.4
	Password setting for access to operating mode USER	chap. 8.3
	Setting the Safety controller set point (limit value)	chap. 9.1.1
	Setting the address	chap. 8.3
	Setting the ambient temperature alarm	chap. 8.3
	Switch on or off ambient temperature alarm (On OFF)	chap. 8.3
	Indication of supply voltage (only with option Advanced voltage booster)	chap. 8.2 chap. 8.3
	Release of CO_2 emergency cooling (with CO_2 emergency cooling "On")	chap. 8.3

	Set-point setting of CO_2 emergency cooling (with CO_2 emergency cooling “On”)	chap. 8.3
	Switch on or off test of CO_2 emergency cooling (On OFF) (with CO_2 emergency cooling “On”)	chap. 8.3
	Firmware revision of main controller (for service)	chap. 8.3
	Firmware revision of safety controller (for service)	chap. 8.3
	Data record (year) (for service)	chap. 8.3
	Data record (month) (for service)	chap. 8.3
	Data record (day) (for service)	chap. 8.3
	Data set version (for service)	chap. 8.3
	Counter of operating weeks	chap. 8.3
	Counter of operating hours, up to one week	chap. 8.3
	Indication of battery voltage	chap. 8.3
	Temperature value of cooling system (for service)	chap. 8.3
	Temperature value of cooling system (for service)	chap. 8.3
	Temperature value of cooling system (for service)	chap. 8.3
	Temperature value of cooling system (for service)	chap. 8.3

16.2 Information and alarm messages

	Safety controller temperature alarm	chap. 10.3
	Temperature tolerance range alarm	chap. 10.4
	Door open alarm	chap. 10.5
	Battery alarm (no battery recognized)	chap. 10.6
	Battery alarm (very low battery voltage)	chap. 10.6
	Battery charging mode (information message, no alarm) (low battery voltage, battery is charging) This message can be displayed up to 45 hours with a new freezer or after a power failure. With a freezer equipped with a CO_2 emergency cooling (option) this message can be displayed up to 8 days.	chap. 10.6

	Power failure alarm	chap. 10.7
992 994	Failure of Pt100 temperature sensors for the refrigerating machine	chap. 10.8
997	Failure of temperature sensor for ambient temperature	chap. 10.8
998	Failure of temperature sensor for safety controller	chap. 10.8
999	Failure of temperature sensor for interior measurement	chap. 10.8
Er.	Internal controller dysfunction	chap. 10.9
Er.5	Internal controller dysfunction	chap. 10.9
3.	Internal controller dysfunction	chap. 10.9
A.	Internal controller dysfunction	chap. 10.9
inJ	CO_2 emergency cooling system (option) activated	chap. 11
P.Lo	Alarm CO_2 supply of emergency cooling system (option)	chap. 11
bt.E	Alarm low battery voltage during emergency cooling with battery operation	chap. 11
A2 1	Early warning system cooling cycle	chap. 15
A3 1	Ambient temperature alarm	chap. 15
A4 1	Continuous operation of cooling cycle	chap. 15
A5 1	Cooling system error	chap. 15
A52	Condenser air filter and perhaps condenser soiled, or all ventilation slots (at the front and bottom) are blocked.	chap. 13.3.1
A53	Condenser fan defective	chap. 15

17. Technical description

17.1 Factory calibration and adjustment

The chambers were calibrated and adjusted in factory. Calibration and adjustment were performed using standardized test instructions, according to the QM DIN EN ISO 9001 system applied by BINDER (certified since December 1996 by TÜV CERT). All test equipment used is subject to the administration of measurement and test equipment that is also a constituent part of the BINDER QM DIN EN ISO 9001 systems. They are controlled and calibrated to a DKD-Standard at regular intervals.

17.2 Over current protection

The devices are equipped with an internal fuse not accessible from outside. If this fuse is blown, please inform an electronic engineer or BINDER service.

17.3 Battery replacement

Replace the battery only with a substitute of the same ratings (see chap. 17.6, art. no. 5007-0001). Respect the correct polarity when replacing the battery!

Proceeding to exchange the battery:

- Turn off the freezer at its key switch (6) and disconnect it from the power supply.
- Remove the bottom cover on the rear of the unit
- Remove the holding clamp of the battery
- Disconnect the battery connections

	When connecting the battery, respect the correct polarity.

- When connecting the new battery, be sure to respect the correct polarity (red = positive, black = negative)
- Secure the battery with its holding clamp
- Reinstall the bottom cover on the rear of the unit
- Connect the freezer to the power supply and turn it on with the key switch (6)

17.4 UF V (E2.1) technical data

Unit size			500	700
Exterior dimensions				
Width, including hinges, housing of automatic door mechanism and controller		mm / *inch*	900 / *35.4*	1200 / *47.2*
Height (incl. castors)		mm / *inch*	1985 / *78.2*	1985 / *78.2*
Depth, including power connection, without controller housing (equals depth when door open)		mm / *inch*	890 / *35.0*	890 / *35.0*
Depth, including power connection, housing of the automatic door mechanism and controller		mm / *inch*	935 / *36.81*	935 / *36.81*
Wall clearance rear		mm / *inch*	100 / *3.9*	100 / *3.9*
Wall clearance side (side without hinges)		mm / *inch*	100 / *3.9*	100 / *3.9*
Wall clearance side (side with hinges)		mm / *inch*	245 / *9.6*	245 / *9.6*
Number of unit doors			1	1
Number of compartment doors			4	4
Interior dimensions				
Number of compartments			4	4
Number of shelves			3	3
Width of interior		mm / *inch*	619 / *24.4*	911 / *35.9*
Width of shelf		mm / *inch*	588 / *23.1*	880 / *34.6*
Height of interior		mm / *inch*	1300 / *51.2*	1300 / *51.2*
Height of individual compartment (with shelves)		mm / *inch*	312-319 *12.3-12.6*	312-319 *12.3-12.6*
Depth of interior		mm / *inch*	603 / *23.7*	603 / *23.7*
Depth of shelf		mm / *inch*	600 / *23.6*	600 / *23.6*
Interior volume, total		l / *cu.ft.*	460 / *16.2*	685 / *24.2*
Permitted load of individual shelf (regular)		kg / *lbs*	50 / *110*	65 / *143*
Permitted total load of all shelves (regular)		kg / *lbs*	200 / *441*	260 / *573*
Permitted load of individual optional shelf (for operation at -40 °C / *-40 °F*)		kg / *lbs*	30 / *66*	30 / *66*
Permitted total load of all optional shelves (for operation at -40 °C / *-40 °F*)		kg / *lbs*	120 / *265*	120 / *265*
Stainless steel racks per level			4	6
Cryo boxes 50 mm / *2 inch* (max. quantity)			352	528
Cryo boxes 75 mm / *3 inch* (max. quantity)			224	336
Temperature data				
Control range		°C / *°F*	-40 / *-40* up to -86 / *-122.8*	
Setting range		°C / *°F*	-40 / *-40* up to -90 / *-130*	
Average temperature uniformity (variation) at -80 °C / *-112 °F*		± K	2.5	2.5
Pull-down time from +25 °C / *77°F* to -80 °C / *-112 °F*		hours	6	6
Pull-up time in case of power failure from -80 °C / *-112 °F* to -60 °C / *-76 °F*		hours	2.5	2.5
Miscellaneous				
Weight of the unit (empty)		kg / *lbs*	320 / 705	360 / *794*
UF V (230 V)	Filling weight of refrigerant R 404a (1st stage cooling, GWP 3750)	kg	0.365	0.365
	Filling weight of refrigerant R 508B (2nd stage cooling, GWP 12300)	kg	0.360	0.380

Unit size			500	700
Miscellaneous (continued)				
UF V (230 V) with water cooling	Filling weight of refrigerant R 404a (1st stage cooling, GWP 3750)	kg	0,250	0.250
	Filling weight of refrigerant R 508B (2nd stage cooling, GWP 12300)	kg	0,300	0.320
UF V-UL (115 V)	Filling weight of refrigerant R 404a (1st stage cooling, GWP 3750)	kg	0.365	0.365
	Filling weight of refrigerant R 508B (2nd stage cooling, GWP 12300)	kg	0.450	0.450
UF V-UL (208-240 V)	Filling weight of refrigerant R 404a (1st stage cooling, GWP 3750)	kg	0.375	0.360
	Filling weight of refrigerant R 508B (2nd stage cooling, GWP 12300)	kg	0.370	0.380
Noise level (mean value)		dB (A)	49	49
Electrical Data UF V (230 V)				
IP system of protection acc. to EN 60529		IP	20	20
Nominal voltage (±10%) at 50 Hz power frequency		V	230	230
Current type			1N~	1N~
Nominal power		kW	1.1	1.1
Nominal current		A	4.8	4.8
Energy consumption at -80 °C/ *-112 °F*, with an ambient temperature of +25 °C / *77°F;* ± 10%		kWh/day	13.9	13.9
Average heat dissipation at set-point -80 °C / *-112 °F* with an ambient temperature of +25 °C / *77°F*		W	535	680
IEC connector plug and cable		mm / *inch*	2000 / *78.7*	2000 / *78.7*
Power plug			Shock-proof plug	
Installation category acc. to IEC 61010-1			II	II
Pollution degree acc. to IEC 61010-1			2	2
Over-current release category C, 2 poles		A	10	10
Electrical Data UF V-UL (115 V)				
IP system of protection acc. to EN 60529		IP	20	20
Nominal voltage (±10%) at 60 Hz power frequency		V	115	115
Current type			1N~	1N~
Nominal power		kW	1.1	1.1
Nominal current		A	9.6	9.6
Energy consumption at -80 °C/ *-112 °F*, with an ambient temperature of +25 °C / *77°F;* ± 10%		kWh/day	12.5	12.5
Power cable (fix)		mm / *inch*	1800 / *70.9*	1800 / *70.9*
Power plug		NEMA	5-20 P	5-20 P
Installation category acc. to IEC 61010-1			II	II
Pollution degree acc. to IEC 61010-1			2	2
Over-current release category C, 2 poles		A	16	16
Electrical Data UF V UL (208 - 240 V)				
IP system of protection acc. to EN 60529		IP	20	20
Nominal voltage (±10%) at 60 Hz power frequency		V	208 - 240	208 - 240
Current type			2~	2~
Nominal power		kW	1.5	1.5

Unit size		500	700
Electrical Data UF V UL (208 - 240 V) (continued)			
Nominal current	A	6.5	6.5
Energy consumption at -80 °C/ *-112 °F*, with an ambient temperature of +25 °C / *77°F;* ± 10%	kWh/day	14.9	14.9
IEC connector plug and cable	mm / *inch*	2000 / *78.7*	2000 / *78.7*
Power plug	NEMA	6-20P	6-20P
Installation category acc. to IEC 61010-1		II	II
Pollution degree acc. to IEC 61010-1		2	2
Over-current release category C, 2 poles	A	10	10

All technical data is specified for units with unloaded standard equipment at an ambient temperature of +22 °C +/- 3°C / *71.6 °F ± 5.4 °F* and a power supply voltage fluctuation of ±10. Technical data is determined in accordance to BINDER Factory Standard Part 1:2015 following DIN 12880:2007.

All indications are average values, typical for units produced in series. We reserve the right to change technical specifications at any time.

17.5 Equipment

To operate the freezer, use only original BINDER accessories or accessories / components from third-party suppliers authorized by BINDER. The user is responsible for any risk arising from using unauthorized accessories.

Regular equipment	UF V	UF V UL
Microprocessor controller for temperature	x	x
Electronic error auto-diagnosis system with zero-voltage relay alarm output	x	x
Safety controller	x	x
Opening and closing door mechanism, easy to use without use of the hands	x	x
V technology (V = vacuum-isolation-panels)	x	x
Powerful, energy-efficient refrigeration system	x	x
Four-compartment system	x	x
Counter of operating hours / weeks	x	x
3 shelves	x	x
10 mm access port prepared to be finalized by the user	x	x
RS422 interface	x	x
Analog output 4-20 mAmp for temperature 4-20mA with 6 pole DIN socket, DIN plug included	x	x
Independent digital Datalogger with USB port	(option)	x
Advanced voltage booster (buck/boost controller)	(option)	x
GUARD.CONTROL personal RFID access control	x	(option)
Connection kit for cooling water (UF V with water cooling)	x	--
Door hinged left or right	x	x
Voltage 230 V	x	--
Voltage 115 V or 208 - 240 V	--	x

17.6 Optional equipment, accessories and spare parts

	BINDER GmbH is responsible for the safety features of the unit only provided skilled electricians or qualified personnel authorized by BINDER perform all maintenance and repair, and if components relating to chamber safety are replaced in the event of failure with original spare parts. The user is responsible for any risks arising from using unauthorized accessories / components.

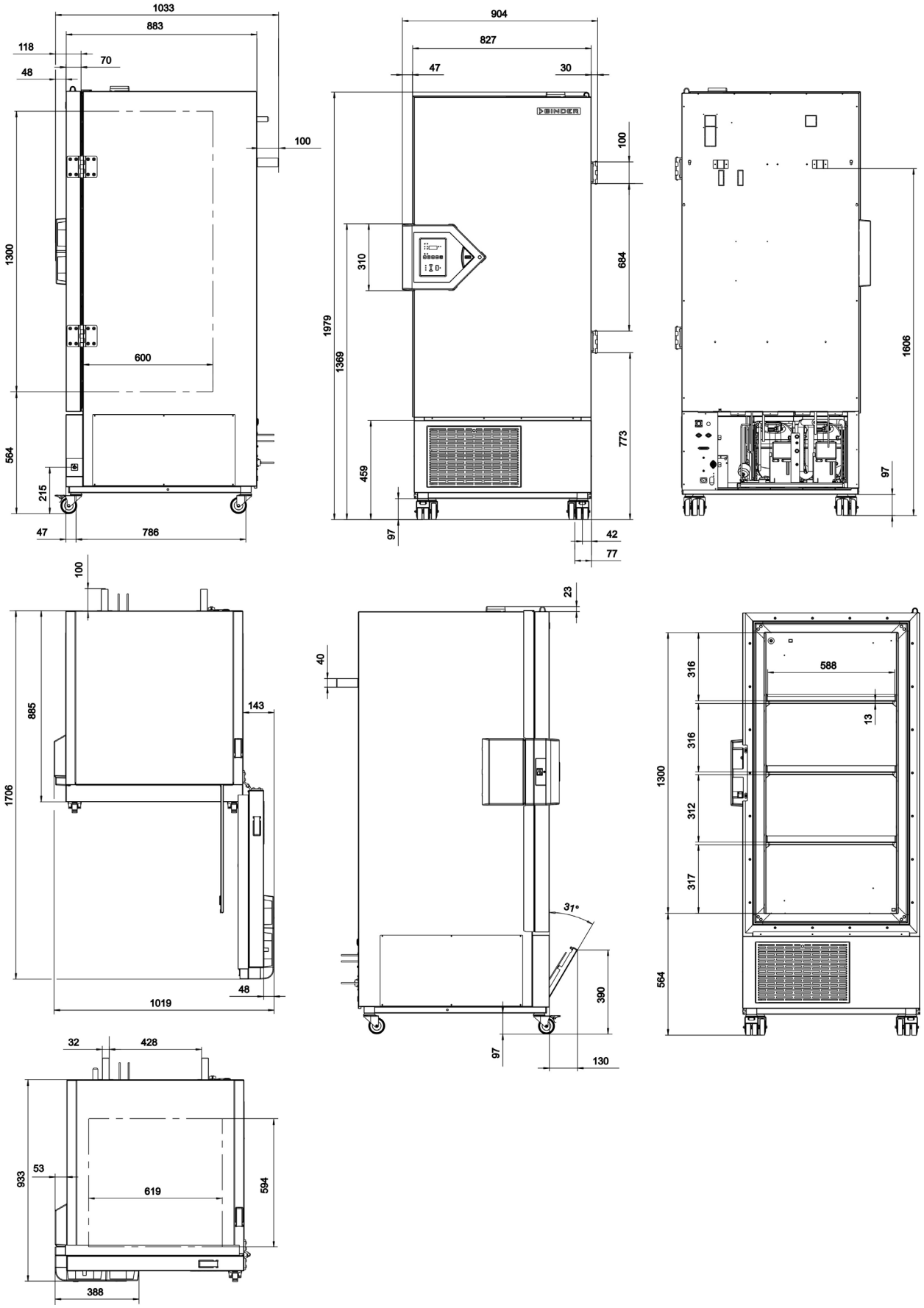
Unit Size	**500**	**700**
Description	**Art. no.**	
Outer unit door gasket, PVC, magnetic	6005-0218	6005-0215
Inner unit door gasket, silicon	6005-0239	6005-0240
Compartment door	8003-0198	8003-0192
Standard shelf for compartment	8009-0698	8009-0701
Fixing plate for adjustable shelf	4020-0863	4020-0863
Stainless steel shelf with 4 fixing plates (complete set)	8012-0800	8012-0799
Optional stainless steel shelf for operation at -40 °C / *-40 °F*	6004-0128	6004-0134
Optional stainless steel shelf for operation at -40 °C / *-40 °F* with 4 fixing plates (complete set)	8012-0803	8012-0707
Independent digital Data logger with USB port	8012-0590	8012-0590
Data logger (spare part)	5016-0055	5016-0055
Built-in circular chart recorder with cover	8012-0754	8012-0712
Circular chart recorder kit: paper (104 pc.), pens (6 pc.)	8012-0811	8012-0811
Paper (52 pc.)	6017-0030	6017-0030
Pen (6 pc.)	6017-0031	6017-0031
Battery for circular chart recorder	6017-0032	6017-0032
Circular chart recorder (spare part)	5016-0056	5016-0056
Rechargeable battery 12V, 7.2 Ah	5007-0001	5007-0001
Replacement condenser air filter	6014-0015	6014-0014
Deicing kit (complete set), consisting of	8012-0748	8012-0747
drain well for condensate, with gasket	8009-0650	8009-0503
Wiper (rubber to wipe off water)	1007-0142	1007-0142
Adhesive tape scratch	6007-0037	6007-0037
Ice scraper	6002-0433	6002-0433
Drain well for condensate, with gasket	8009-0650	8009-0503

Description	**Art. no.**
Fuse 4A / 250V - F - 6,3x32mm	5006-0074
Over-current release category C 10 A (for UF V and UF V UL 208-240V)	5006-0084
Over-current release category C 16 A (for UF V UL 115V)	5006-0085
Controller board RP1	5014-0090
IEC connector plug EU with 2 m cable, with internal locking system	5023-0199
IEC connector plug Switzerland with 2 m cable, with internal locking system	5023-0200
IEC connector plug UK with 2 m cable, with internal locking system	5023-0201
Emergency release cover	6002-0470
Spacer for rear wall distance	4020-0604
Front castor with lock	6006-0029
Rear castor	6006-0028
Wiper (rubber to wipe off water)	1007-0142

Description	Art. no.
Ice scraper	6002-0433
Glove, deep temperature, medium size	1007-0141
Calibration of temperature including certificate	DL028021
Spatial temperature measurement including certificate (6-9 measuring points)	DL028023
Qualification folder	8012-0880
Cleaning agent BINDER Freezy Clean	1002-0038
Disinfecting agent BINDER Freezy Decon	1002-0032
Cleaning kit (BINDER Freezy Clean cleaning agent, BINDER Freezy Decon disinfecting agent, disposable wipes, gloves and goggles)	8012-0837
Document pocket with magnetic strip, DIN A4	1007-0098
Ethernet interface	8012-0711
Door locking with key	8012-0744
Access port 30 mm rear, incompatible with optional CO_2 emergency cooling system	8012-0756
Sealing material kit for access port 10 mm	8009-0815
Connection kit for cooling water (UF V with water cooling)	8009-0820
Additional Pt 100 sensor, output to Lemo socket on unit rear	8012-0757
CO_2 emergency cooling UF V (E2.1), mounted. Adjustable between -40 °C / *-40 °F* and -70 °C / *-94 °F*, retrofit possible. Incompatible with optional access port 30 mm, rear (8012-0756)	8012-0830
CO_2 emergency cooling UF (E2.1) retrofit kit, installation by BINDER Service. Adjustable between -40 °C / *-40 °F* and -70 °C / *-94 °F*, retrofit possible. Incompatible with optional access port 30 mm, rear (8012-0756)	8012-0831
Advanced voltage booster (option only for UF V)	8012-0762
GUARD.CONTROL RFID personal access control (option only for UF V UL)	8012-0776
Starter set RFID cards (master card, switch-off card, 3 user cards)	8009-0669
Master card RFID	2008-0011
User card RFID	2008-0012
Switch-off card RFID	2008-0017
GUARD.CONTROL Reader Kit	8012-0789
GUARD.CONTROL reader (reading unit)	9017-0037
BINDER GSM box for remote alarms	8012-0775
Side access rack, stainless steel, empty No. of sections (D x H) 20 (4x5) for boxes (height) 50 mm / *2 inch*	6017-0043
Side access rack, stainless steel, empty No. of sections (D x H) 24 (4x6) for boxes (height) 50 mm / *2 inch*	6017-0049
Side access rack, aluminum, empty No. of sections (D x H) 20 (4x5) for boxes (height) 50 mm / *2 inch*	6017-0041
Side access rack, aluminum, empty No. of sections (D x H) 24 (4x6) for boxes (height) 50 mm / *2 inch*	6017-0047
Sliding drawer rack stainless steel, empty No. of sections (D x H) 20 (4x5) for boxes (height) 50 mm / *2 inch*	6017-0045
Sliding drawer rack stainless steel, empty No. of sections (D x H) 24 (4x6) for boxes (height) 50 mm / *2 inch*	6017-0051
Side access rack, stainless steel, with cryo boxes No. of sections (D x H) 20 (4x5) for boxes (height) 50 mm / *2 inch*	6017-0044
Side access rack, stainless steel, with cryo boxes No. of sections (D x H) 24 (4x6) for boxes (height) 50 mm / *2 inch*	6017-0050

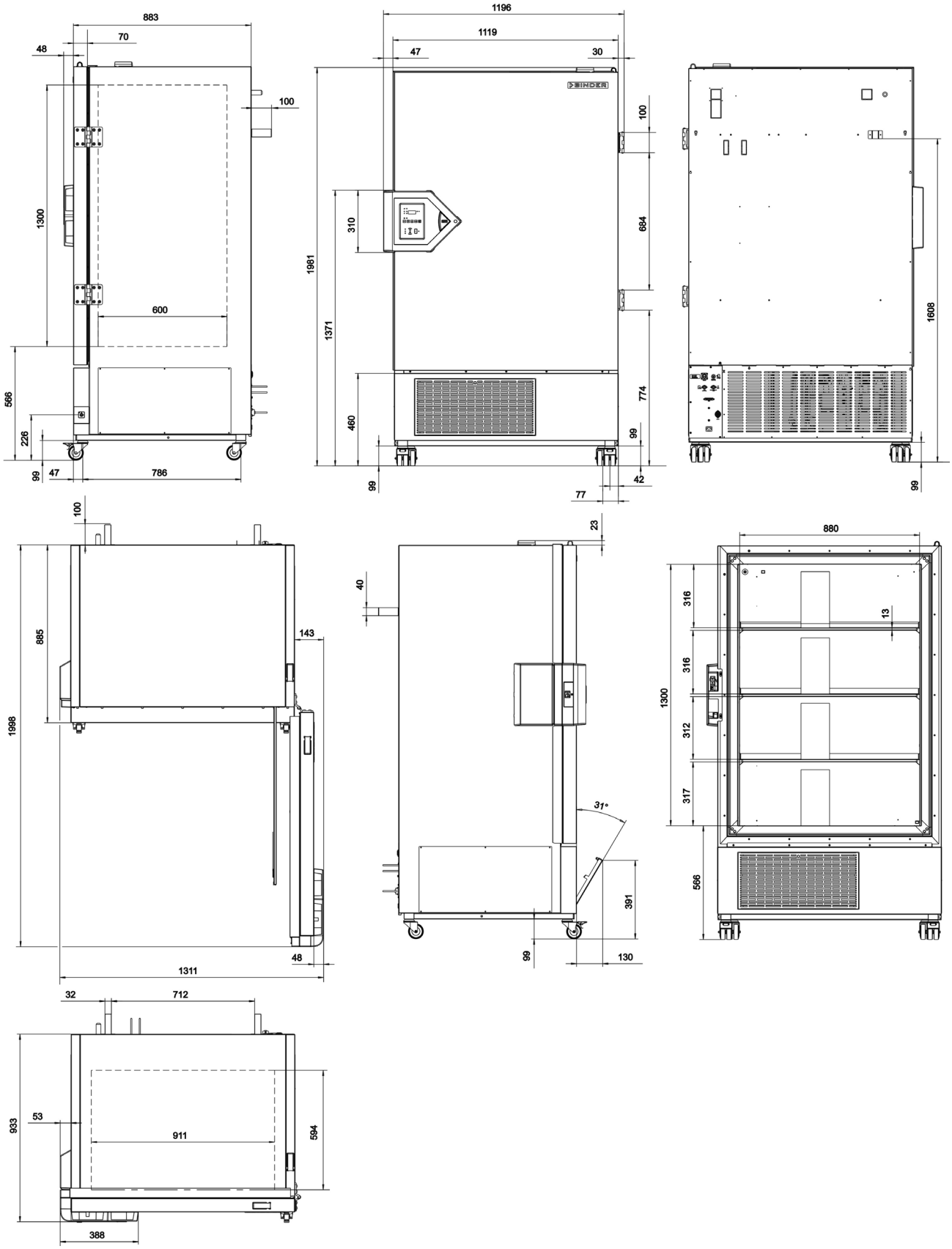
Description	Art. no.
Side access rack, aluminum, with cryo boxes No. of sections (D x H) 20 (4x5) for boxes (height) 75 mm / *3 inch*	6017-0042
Side access rack, aluminum, with cryo boxes No. of sections (D x H) 24 (4x6) for boxes (height) 50 mm / *2 inch*	6017-0048
Sliding drawer rack, stainless steel, with cryo boxes No. of sections (D x H) 20 (4x5) for boxes (height) 50 mm / *2 inch*	6017-0046
Sliding drawer rack, stainless steel, with cryo boxes No. of sections (D x H) 24 (4x6) for boxes (height) 50 mm / *2 inch*	6017-0052
Set of 36 cryo boxes, cardboard, with dividers 9x9, white height 50 mm / *2 inch*	6017-0053

17.7 Dimensions UF V 500 (E2.1)



Indications in mm

17.8 Dimensions UF V 700 (E2.1)



Indications in mm

18. Certificates

18.1 EC – declaration of conformity

CE

EG – KONFORMITÄTSERKLÄRUNG
EC - DECLARATION OF CONFORMITY
CE - DECLARATION DE CONFORMITE

Anbieter / Supplier / Fournisseur:	BINDER GmbH
Anschrift / Address / Adresse:	Im Mittleren Ösch 5, D-78532 Tuttlingen
Bezeichnung der Maschine / Denomination of the machine / Dénomination de la machine:	Ultra-Tiefkühlschränke / Freezer Ultra low temperature freezers Congélateurs à ultra-basse température
Typenbezeichnung / Type / Type:	UF V 300, UF V 500, UF V 700

Die oben beschriebenen Maschinen sind konform mit folgenden EG-Richtlinien (gemäß Veröffentlichung im Amtsblatt der europäischen Kommission):
The machines described above are in conformity with the following EC guidelines (as published in the Official Journal of the European Union):
Les machines décrites ci-dessus sont conformes aux directives CE suivantes (selon leur publication dans le Journal officiel de l'Union européenne):

Maschinenrichtlinie 2006/42/EG Machinery directive 2006/42/EC Directive Machines 2006/42/EC	Richtlinie 2006/42/EG des Europäischen Parlaments und des Rates vom 17. Mai 2006 über Maschinen und zur Änderung der Richtlinie 95/16/EG (Neufassung) Directive 2006/42/EC of the European Parliament and of the Council of 17 May 2006 on machinery, and amending Directive 95/16/EC (recast) Directive 2006/42/CE du Parlement Européen et du Conseil du 17 mai 2006 relative aux machines et modifiant la directive 95/16/CE (refonte)
EMV-Richtlinie 2004/108/EG EMC Directive 2004/108/EC Directive CEM 2004/108/CE	Richtlinie 2004/108/EG des Europäischen Parlaments und des Rates vom 15. Dezember 2004 zur Angleichung der Rechtsvorschriften der Mitgliedstaaten über die elektromagnetische Verträglichkeit und zur Aufhebung der Richtlinie 89/336/EWG. Directive 2004/108/EC of the European Parliament and of the Council of 15 December 2004 on the approximation of the laws of the Member States relating to electromagnetic compatibility and repealing Directive 98/336/EEC. Directive 2004/108/CE du Parlement Européen et du Conseil du 15 décembre 2004 relative au rapprochement des législations des États membres concernant la compatibilité électromagnétique et abrogeant le directive 98/336/CEE.

Die oben beschriebenen Maschinen entsprechen aufgrund ihrer Konzipierung und Bauart sowie in der von uns in Verkehr gebrachten Ausführung den einschlägigen grundlegenden Sicherheits- und Gesundheitsanforderungen der genannten EG-Richtlinien.

The machines described above are conform to the mentioned EC directives in regard to the relevant safety and health demands due to their conception and their style of construction as well as to the version put onto market by us.

Les machines décrites ci-dessus correspondent aux demandes de sécurité et de santé des directives citées de la Communauté Européenne due à leur conception et construction et dans la réalisation mise sur le marché par nous.

Die oben beschriebenen Maschinen tragen entsprechend die Kennzeichnung CE.
The machines described above, corresponding to this, bear the CE-mark.
Les machine décrites ci-dessus, en correspondance, portent l'indication CE.

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Die oben beschriebenen Maschinen sind konform mit folgenden harmonisierten Normen:
The machines described above are in conformity with the following harmonized standards:
Les machines décrites ci-dessus sont conformes aux normes harmonisées suivantes:

Sicherheit / safety / sécurité:	
EN 61010-1:2010	Sicherheitsbestimmungen für elektrische Mess-, Steuer-, Regel- und Laborgeräte – Teil 1: Allgemeine Anforderungen (DIN EN 61010-1:2011, VDE 411-1:2011)
	Safety requirements for electrical equipment for measurement, control, and laboratory use – Part 1: General requirements (IEC 61010-1:2010, BS EN 61010-1:2010)
	Règles de sécurité pour appareils électriques de mesurage, de régulation et de laboratoire – Partie 1: Prescriptions générales (CEI 61010-1:2010, NF EN 61010:2011)
EN ISO 12100:2010 + Corr. 1:2011	Sicherheit von Maschinen - Allgemeine Gestaltungsleitsätze - Risikobeurteilung und Risikominderung (DIN EN ISO 12100:2011 + Berichtigung 1:2013)
	Safety of machinery - General principles for design - Risk assessment and risk reduction (BS EN ISO 12100:2010)
	Sécurité des machines - Principes généraux de conception -Appréciation du risque et réduction du risque (NF EN ISO 12100:2010)
EN ISO 13732-3:2008	Ergonomie der thermischen Umgebung – Bewertungsverfahren für Reaktionen des Menschen bei Kontakt mit Oberflächen. Teil 3: Kalte Oberflächen (DIN EN ISO 13732-3:2008)
	Ergonomics of the thermal environment – Methods for the assessment of human responses to contact with surfaces. Part 3: Cold surfaces (BS EN ISO 13732-3:2008)
	Ergonomie des ambiances thermiques – Méthodes d'évaluation de la réponse humaine au contact avec des surfaces. Partie 3: Surfaces froides (NF EN ISO 13732-3:2008)
EN ISO 13849-1:2008	Sicherheit von Maschinen. Sicherheitsbezogene Teile von Steuerungen. Teil 1: Allgemeine Gestaltungsleitsätze (DIN EN ISO 13849-1:2008)
	Safety of machinery. Safety-related parts of control systems. Part 1: General principles for design (BS EN ISO 13849-1:2008)
	Sécurité des machines – Parties des systèmes de commande relatives à la sécurité – Partie 1: principes de conception généraux (NF EN ISO 13849-1:2008)
EN ISO 13849-2:2012	Sicherheit von Maschinen – Sicherheitsbezogene Teile von Steuerungen – Teil 2: Validierung (DIN EN ISO 13849-2:2013)
	Safety of machinery. Safety-related parts of control systems. Part 2: Validation (BS EN ISO 13849-2:2012)
	Sécurité des machines. Parties des systèmes de commande relatives à la sécurité. Partie 2: Validation (NF EN ISO 13849-2: 2012)
EN 60204-1:2006 + A1:2009 + Corr. :2010	Sicherheit von Maschinen. Elektrische Ausrüstung von Maschinen. Teil 1: Allgemeine Anforderungen (DIN EN 60204-1:2007 + A1:2009 + Berichtigung 1:2010)
	Safety of machinery. Electrical equipment of machines. Part 1: General requirements (BS EN 60204-1:2006 + A1:2009)
	Sécurité des machines - Équipement électrique des machines - Partie 1 : règles générales (NF EN 60204-1:2006 + A1:2009)

EMV / EMC / CEM:

EN 61326-1:2013	Elektrische Mess-, Steuer-, Regel- und Laborgeräte - EMV-Anforderungen - Teil 1: Allgemeine Anforderungen (DIN EN 61326-1:2013, VDE 0813-20-1:2013) Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 1: General requirements (IEC 61326-1:2012, BS EN 61326-1:2013) Matériel électrique de mesure, de commande et de laboratoire - Exigences relatives à la CEM - Partie 1: Exigences générales (CEI 61326-1:2012, NF EN 61326-1:2013.)

D-78532 Tuttlingen, 10.03.2015

BINDER GmbH

P. M. Binder

Geschäftsführender Gesellschafter
Managing Director
Directeur général

J. Bollaender

Leiter F & E und Dokumentationsbevollmächtigter
Director R & D and documentation representative
Chef de service R&D et autorisé de documentation

18.2 Certificate for the GS mark of conformity of the “Deutsche Gesetzliche Unfallversicherung e.V.“ (German Social Accident Insurance) DGUV

Note: Chambers equipped with the optional CO_2 emergency cooling do not bear the GS mark.

DGUV Test
Prüf- und Zertifizierungsstelle
Fachausschuss Nahrungs- und Genussmittel

Bescheinigung
Nr. **NG 11036**
vom 04.03.2011

GS-Prüfbescheinigung

Name und Anschrift des Bescheinigungsinhabers: (Auftraggeber)	**Binder GmbH** Im Mittleren Ösch 5 D 78532 Tuttlingen
Name und Anschrift des Herstellers:	dto.
Produktbezeichnung:	**Tiefkühlschrank** **Ultra-Tiefkühlschrank**
Typ:	UF V 300, UF V 500, UF V 700
Bestimmungsgemäße Verwendung:	siehe zugehöriger Prüfbericht
Prüfgrundlage:	GS-NG 4 Prüfgrundsätze für Industriekühl- und -gefriergeräte 02/2011

Bemerkungen:

Das geprüfte Baumuster stimmt mit den in § 7 Absatz 1 Satz 2 des Geräte- und Produktsicherheitsgesetzes genannten Anforderungen überein. Der Bescheinigungsinhaber ist berechtigt, das umseitig abgebildete GS-Zeichen an den mit dem geprüften Baumuster übereinstimmenden Produkten anzubringen. Der Bescheinigungsinhaber hat dabei die umseitig aufgeführten Bedingungen zu beachten.

Diese Bescheinigung einschließlich der Berechtigung zur Anbringung des GS-Zeichens ist gültig bis:
03.03.2016
Weiteres über die Gültigkeit, eine Gültigkeitsverlängerung und andere Bedingungen regelt die Prüf- und Zertifizierungsordnung vom September 2010.

Unterschrift (Zertifizierer)

Postadresse: Postfach 10 04 41 • 68136 Mannheim • Hausadresse: Dynamostraße 7-11 • 68165 Mannheim
Telefon: 0621 4456-3430 • Telefax: 0621 4456-3470 • E-Mail: maschinensicherheit@bgn.de • www.pz.bgn.de
Zeichen der PZ-Stelle: 612.17 Kis/Rm • Produktschlüsselnummer: 009001702

PZB04_D
07.10

Rückseite der GS-Prüfbescheinigung

GS-Zeichen

Normalausführung

Bei einer Höhe von 20 mm oder weniger auch zulässige Ausführung

1)Bescheinigungs-Nummer

1. Der Bescheinigungsinhaber hat die Voraussetzungen einzuhalten, die bei der Herstellung des umseitig genannten Produktes zu beachten sind, um die Übereinstimmung mit dem geprüften Baumuster zu gewährleisten.

2. Die Prüf- und Zertifizierungsstelle des Fachausschusses Nahrungs- und Genussmittel führt in regelmäßigen Abständen Kontrollmaßnahmen zur Überwachung der Herstellung und rechtmäßigen Verwendung des GS-Zeichens durch.

3. Die für die Herstellung verantwortliche Person hat sich zur Einhaltung der Voraussetzungen nach Nummer 1 und Duldung der Kontrollmaßnahmen verpflichtet.

4. Die Prüf- und Zertifizierungsstelle entzieht dem Bescheinigungsinhaber die Zuerkennung des GS-Zeichens, wenn sich die Anforderungen nach § 7 Absatz 1 Satz 2 des Geräte- und Produktsicherheitsgesetzes geändert haben oder die Voraussetzungen nach Nummer 1 nicht eingehalten werden.

5. Das GS-Zeichen darf nur verwendet und mit ihm darf nur geworben werden, wenn die Voraussetzungen nach § 7 Absatz 1 Satz 1 des Geräte- und Produktsicherheitsgesetzes erfüllt sind.

19. Product registration

Online Product Registration

Register your BINDER now!

www.binder-world.com/register

The registration is free and takes just a few seconds

Advantages:

- Short response times if service is needed
- Fair prices when relocating or installing equipment
- Calibration as required at no charge in case of recalls
- Free information on news, product upgrades and accessories

Easy registered in 3 steps:

1. List serial number here: ☐☐-☐☐☐☐☐
2. Go online: www.binder-world.com/register
3. Register serial number

20. Contamination clearance certificate

20.1 For units located outside North America and Central America

Declaration regarding safety and health

Erklärung zur Sicherheit and gesundheitlichen Unbedenklichkeit

The German Ordinance on Hazardous Substances (GefStofV), and the regulations regarding safety at the workplace, require that this form be filled out for all products that are returned to us, so that the safety and the health of our employees can be guaranteed.

Die Sicherheit und Gesundheit unserer Mitarbeiter, die Gefahrstoffverordnung GefStofV und die Vorschriften zur Sicherheit am Arbeitsplatz machen es erforderlich, dass dieses Formblatt für alle Produkte, die an uns zurückgeschickt werden, ausgefüllt wird.

	Note: A repair is not possible without a completely filled out form. Ohne Vorliegen des vollständig ausgefüllten Formblattes ist eine Reparatur nicht möglich.

- A completely filled out form must be transmitted via Fax (+49 (0) 7462 2005 93555) or by letter in advance, so that this information is available before the equipment/component part arrives. A second copy of this form must accompany the equipment/component part. In addition, the carrier should be notified.

  Eine vollständig ausgefüllte Kopie dieses Formblattes soll per Fax unter Nr. +49 (0) 7462 2005 93555 oder Brief vorab an uns gesandt werden, so dass die Information vorliegt, bevor das Gerät/Bauteil eintrifft. Eine weitere Kopie soll dem Gerät/Bauteil beigefügt sein. Ggf. ist die Spedition zu informieren.

- Incomplete information or non-conformity with this procedure will inevitably lead to substantial delays in processing. Please understand the reason for this measure, which lies outside our area of influence, and help us to speed up this procedure.

  Unvollständige Angaben oder Nichteinhalten dieses Ablaufs führen zwangsläufig zu beträchtlichen Verzögerungen in der Abwicklung. Bitte haben Sie Verständnis für Maßnahmen, die außerhalb unserer Einflussmöglichkeiten liegen und helfen Sie mit, den Ablauf zu beschleunigen.

- **Please fill out this form completely**

  Bitte unbedingt vollständig ausfüllen!

1.	**Unit/ component part / type** / Gerät / Bauteil / Typ:
2.	**Serial No. /** Serien-Nr.:
3.	**Details about utilized substances / biological substances** / Einzelheiten über die eingesetzten Substanzen/biologische Materialien:
3.1	**Designations** / Bezeichnungen:
a)	_____
b)	_____
c)	_____
3.2	**Safety measures required for handling these substances** / Vorsichtsmaßnahmen beim Umgang mit diesen Stoffen:
a)	_____
b)	_____
c)	_____

3.3 **Measures to be taken in case of skin contact or release into the atmosphere** / Maßnahmen bei Personenkontakt oder Freisetzung:

a) _____

b) _____

c) _____

d) _____

3.4 **Other important information that must be taken into account** / Weitere zu beachtende und wichtige Informationen:

a) _____

b) _____

c) _____

4. **Declaration on the risk of these substances** (please checkmark the applicable items) / Erklärung zur Gefährlichkeit der Stoffe (bitte Zutreffendes ankreuzen) :

❑ **4.1** **For non toxic, non radioactive, biologically harmless materials** / für nicht giftige, nicht radioaktive, biologisch ungefährliche Stoffe:

We hereby guarantee that the above-mentioned unit / component part… / Wir versichern, dass o.g. Gerät/Bauteil...

- ❑ Has not been exposed to or contains any toxic or otherwise hazardous substances / weder giftige noch sonstige gefährliche Stoffe enthält oder solche anhaften.
- ❑ That eventually generated reaction products are non-toxic and also do not represent a hazard / auch evtl. entstandene Reaktionsprodukte weder giftig sind noch sonst eine Gefährdung darstellen.
- ❑ Eventual residues of hazardous substances have been removed / evtl. Rückstände von Gefahrstoffen entfernt wurden.

❑ **4.2** **For toxic, radioactive, biologically harmful or hazardous substances, or any other hazardous materials** / für giftige, radioaktive, biologisch bedenkliche bzw. gefährliche Stoffe oder anderweitig gefährliche Stoffe.

We hereby guarantee that … / Wir versichern, dass …

- ❑ The hazardous substances, which have come into contact with the above-mentioned equipment / component part, have been completely listed under item 3.1 and that all information in this regard is complete / die gefährlichen Stoffe, die mit dem o.g. Gerät/Bauteil in Kontakt kamen, in 3.1 aufgelistet sind und alle Angaben vollständig sind.
- ❑ That the unit /component part has not been in contact with radioactivity / das Gerät/Bauteil nicht mit Radioaktivität in Berührung kam

5. **Kind of transport / transporter** / Transportweg/Spediteur:

Transport by (means and name of transport company, etc.) Versendung durch (Name Spediteur o.ä.)

_____

Date of dispatch to BINDER GmbH / Tag der Absendung an BINDER GmbH:

_____

We hereby declare that the following measures have been taken / Wir erklären, dass folgende Maßnahmen getroffen wurden:

- ❑ Hazardous substances were removed from the unit including component parts, so that no hazard exists for any person in the handling or repair of these items / das Gerät/Bauteil wurde von Gefahrstoffen befreit, so dass bei Handhabung/Reparaturen für die betreffenden Person keinerlei Gefährdung besteht
- ❑ The unit was securely packaged and properly identified / das Gerät wurde sicher verpackt und vollständig gekennzeichnet.
- ❑ Information about the hazardousness of the shipment (if required) has been provided to the transporter / der Spediteur wurde (falls vorgeschrieben) über die Gefährlichkeit der Sendung informiert.

We hereby commit ourselves and guarantee that we will indemnify BINDER GmbH for all damages that are a consequence of incomplete or incorrect information provided by us, and that we will exempt BINDER GmbH from eventual damage claims by third parties./ Wir versichern, dass wir gegenüber BINDER für jeden Schaden, der durch unvollständige und unrichtige Angaben entsteht, haften und BINDER gegen eventuell entstehende Schadenansprüche Dritter freistellen.

We are aware that, in accordance with Article 823 of the German Civil Code (BGB), we are directly liable with regard to third parties, in this instance especially the employees of BINDER GmbH, who have been entrusted with the handling / repair of the unit / component. / Es ist uns bekannt, dass wir gegenüber Dritten – hier insbesondere mit der Handhabung/Reparatur des Geräts/des Bauteils betraute Mitarbeiter der Firma BINDER - gemäß §823 BGB direkt haften

Name: _____

Title/Position: _____

Date / Datum: _____

Signature / Unterschrift: _____

Company stamp / Firmenstempel:

Equipment that is returned to the factory for repair must be accompanied by a completely filled out contamination clearance certificate. For service and maintenance on site, such a contamination clearance certificate must be submitted to the service technician before the start of any work. No repair or maintenance of the equipment is possible, without a properly filled out contamination clearance certificate.

20.2 For units in North America and Central America

Product Return Authorization Request

Please complete this form and the Customer Decontamination Declaration (next 2 pages) and attach the required pictures. E-mail to: IDL_SalesOrderProcessing_USA@binder-world.com

After we have received and reviewed the complete information we will decide on the issue of a RMA number. Please be aware that size specifications, voltage specifications as well as performance specifications are available on the internet at www.binder-world.us at any time.

Take notice of shipping laws and regulations.

	Please fill:	
Reason for return request	○ Duplicate order	
	○ Duplicate shipment	
	○ Demo	*Page one completed by sales*
	○ Power Plug / Voltage	115V / 230 V / 208 V / 240V
	○ Size does not fit space	
	○ Transport Damage	Shock watch tripped? *(pictures)*
	○ Other (specify below)	
	_____	
Is there a replacement PO?	○ Yes ○ No	
If yes -> PO #		
If yes -> Date PO placed		
Purchase order number		
BINDER model number		
BINDER serial number		
Date unit was received		
Was the unit unboxed?	○ Yes ○ No	
Was the unit plugged in?	○ Yes ○ No	
Was the unit in operation?	○ Yes ○ No	
Pictures of unit attached? *Pictures of Packaging attached?*	○ Yes ○ No ○ Yes ○ No	Pictures have to be attached!

	Customer Contact Information	Distributor Contact Information
Name		
Company		
Address		
Phone		
E-mail		

Customer (End User) Decontamination Declaration

Health and Hazard Safety declaration

To protect the health of our employees and the safety at the workplace, we require that this form is completed by the user for all products and parts that are returned to us. (Distributors or Service Organizations cannot sign this form)

	NO RMA number will be issued without a completed form. Products or parts returned to our NY warehouse without a RMA number will be refused at the dock.

A second copy of the completed form must be attached to the outside of the shipping box.

1.	**Unit/ component part / type**:
2.	**Serial No.**
3.	**List any exposure to hazardous liquids, gasses or substances and radioactive material**
3.1	**List with MSDS sheets attached where available or needed (if there is not enough space available below, please attach a page):** a) _____ b) _____ c) _____
3.2	**Safety measures required for handling the list under 3.1** a) _____ b) _____ c) _____
3.3	**Measures to be taken in case of skin contact or release into the atmosphere**: a) _____ b) _____ c) _____ d) _____
3.4	**Other important information that must be considered**: a) _____ b) _____ c) _____

4. Declaration of Decontamination

For toxic, radioactive, biologically and chemically harmful or hazardous substances, or any other hazardous materials.

We hereby guarantee that

4.1 Any hazardous substances, which have come into contact with the above-mentioned equipment / component part, have been completely listed under item 3.1 and that all information in this regard is complete.

4.2 That the unit /component part has not been in contact with radioactivity

4.3 Any Hazardous substances were removed from the unit / component part, so that no hazard exists for a persons in the shipping, handling or repair of these returned unit

4.4 The unit was securely packaged in the original undamaged packaging and properly identified on the outside of the packaging material with the unit designation, the RMA number and a copy of this declaration.

4.5 Shipping laws and regulations have not been violated.

I hereby commit and guarantee that we will indemnify BINDER Inc for all damages that are a consequence of incomplete or incorrect information provided by us, and that we will indemnify and hold harmless BINDER Inc. from eventual damage claims by third parties..

Name: _____

Position: _____

Company: _____

Address: _____

Phone #: _____

Email: _____

Date: _____

Signature: _____

Equipment returned to the NY warehouse for repair must be accompanied by a completed customer decontamination declaration. For service and maintenance works on site, such a customer decontamination declaration must be submitted to the service technician before the start of work. No repair or maintenance of the equipment is possible without a completed form.