

# User manual - BioUltra

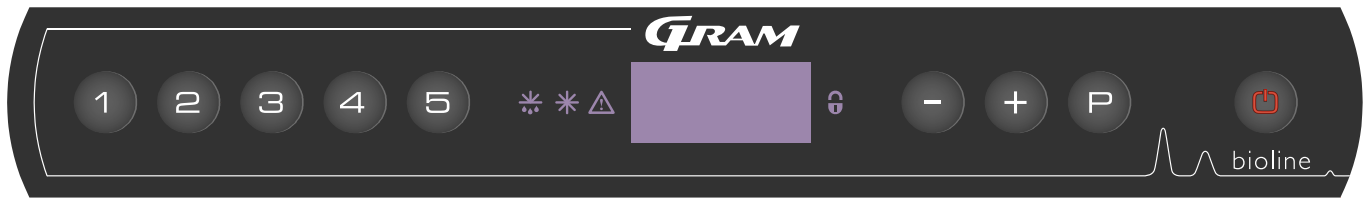
Models: 570



Original User manual

Item nr. 765041576  
Revision nr. 21\_11\_2018  
English

# Quick Guide - BioUltra



## On/Off

Press the  $\text{⏻}$  button to turn the cabinet on. Press the  $\text{⏻}$  button for 6 seconds to turn the cabinet off. The software version of the cabinet will be shown when turning the cabinet on, followed by the variant. The cabinet is ready when the temperature is displayed.

## Setting the temperature

Temperature adjustments are done by holding the  $\text{P}$  button and pressing either  $\text{+}$  or  $\text{-}$ . Confirm the settings by letting go of the buttons.

## User menu

Menu Access $\text{P} + \text{1} \rightarrow \downarrow \rightarrow$				
Local alarm settings	LAL	LHL	[° C]	Upper alarm limit. Code for activated alarm [A2]
		LLL	[° C]	Lower alarm limit. Code for activated alarm [A3]
		LHd	[Min.]	Delay of upper alarm limit
		LLd	[Min.]	Delay of lower alarm limit
		bU	On/off	Acoustic signal for alarm codes [ A2] and [ A3]. [1=on / 0=off]
External alarm settings	EAL	EHL	[° C]	Upper alarm limit. Code for activated alarm [A4]
		ELL	[° C]	Lower alarm limit. Code for activated alarm [A5]
		EHd	[Min.]	Delay of upper alarm limit
		ELd	[Min.]	Delay of lower alarm limit
		bU	On/off	Acoustic signal for external alarm codes [ A4], [ A5]. [1=on / 0=off]
Offset of sensors	CAL	CA	[K]	Offset of A-sensor. Reference sensor for the refrigeration system
		CE	[K]	Offset of E-sensor. Reference sensor for the display and alarms
	ALL			Activation of escorted alarm limits. [FAS]= locked limits / [ESC] = follows setpoint
	dPS			Reference sensor for the display (A or E) (E is factory setting)

## Example: Setting the upper limits for the alarms; LHL

- ↳ Press and hold  $\text{P} + \text{1}$  for more than 3 seconds until the display shows LAL
- ↳ Press  $\text{P}$  to select LAL, LHL is now shown in the display
- ↳ Press  $\text{P}$  to select LHL, 25 is shown in the display
- ↳ Press  $\text{-}$  or  $\text{+}$  to set the desired value for the upper temperature limit
- ↳ Press  $\text{P}$  to confirm the set value
- ↳ Press  $\text{⏻}$  two times to return to LAL
- ↳ Press  $\text{+}$  to reach the next level, EAL, CAL, ALL and dPS are located on the same level
- ↳ Press  $\text{⏻}$  to leave the user menu

## Alarms

Alarm codes	A2	The upper alarm limits, (LHL) alarm is or has been activated
	A3	The lower alarm limits, (LLL) alarm is or has been activated

### Canceling an acoustic alarm

Canceling a temperature alarm: [A2 and/or A3] Flashes in the display. Press (P) to cancel.

The display will continue to flash if the temperature is outside the alarm limits, and will continue until the temperature has recovered.

### Reading Max/Min temperature

Read the highest recorded temperature inside the cabinet by holding down (+).

Read the lowest recorded temperature inside the cabinet by holding down (-).

### Reading the alarm history - Example [A2]

[A2] flashes in the display - This means that the temperature has exceeded the set value for the upper temperature limit, LHL. Press (P) to cancel the [A2]. The display continues to flash, indicating that there is information in the alarm history.

Press (+), Htt (High temperature time) is shown, press (P) to see for how long the temperature was above the set alarm limit.

Press (⊖) to return to Htt. Press (+) to reach Ht (Highest temperature). Press (P) to read the highest recorded temperature during Htt. Press (⊖) to return to Ht and press (⊖) again to leave the alarm history function.

The procedure for reading an [A3] alarm is identical, apart from entering the alarm history with the (-) button

When reading out temperatures below set limits, the parameters are Ltt and Lt.

A flashing display with no alarm codes indicates that the alarm codes have been canceled, but the alarm system contains information.

### Resetting Max/Min and alarm history

Resetting of the Max/Min and alarm history is done by holding (-) and (+) or more than 3 seconds, an acoustic signal will be given when reset is complete.

### Sensor read-out and error codes

Menu Access (P) + (5) → ↓	(P) → [° C]	Display code and its message
Sensor for refrigeration system	P-A Value on sensor for refrigeration system	F1 Error on sensor for refrigeration system
Sensor for evaporator	P-b Value for evaporator sensor	F2 Error on evaporator sensor
Sensor for condensor	P-C Value for condensor sensor	F3 Error on condensor sensor
Sensor for display and alarms	P-E Value for display and alarm sensor	F5 Error on sensor for display and alarm
		F7 Overheated condensor
		F8 Over pressure safety switch has triggered by excessive pressure in the LT cooling system

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Manufactured by Gram Commercial A/S  
Aage Grams Vej 1  
DK-6500 Vojens  
Denmark  
+45 7320 1300  
www.gram-bioline.com

## Before you proceed

Make sure to read the user manual through thoroughly before using the cabinet for the first time.

Your feedback is much appreciated, feel free to email us at: [info@gram-bioline.com](mailto:info@gram-bioline.com)

## Before You proceed

This user manual is intended for the following product series: **BioUltra**

We recommend that you read this user manual through thoroughly before using the cabinet for the first time. Gram Commercial A/S does not guarantee safe operation if the cabinet is used for anything other than its intended use. Contents of the manual can be subject to change without notice. No part of this manual may be reproduced in any form without expressed written consent of Gram Commercial A/S. Gram Commercial A/S guarantees the cabinet under certain warranty conditions. Gram Commercial A/S is in no way responsible for any loss or damage of content.

This manual should be considered an integral part of the cabinet, and should be stored close to the cabinet and be easy to access. If the manual is lost, please refer to your local distributor or Gram Commercial A/S for a replacement. For current versions of the manual, please go [www.gram-bioline.com](http://www.gram-bioline.com).

# Intended Use

**Gram BioLine BioUltra** freezers are designed and manufactured to provide safe and precise conditions at ultra-low temperatures for the items stored. Designed for an operating range between  $-60^{\circ}\text{C}$  and  $-86^{\circ}\text{C}$ , with a maximum ambient temperature of  $+30^{\circ}\text{C}$  and a maximum relative humidity of 70% .

## Symbols used throughout the manual



Hazard



Risk of electric shock



Risk of material damage



Risk of personal injury



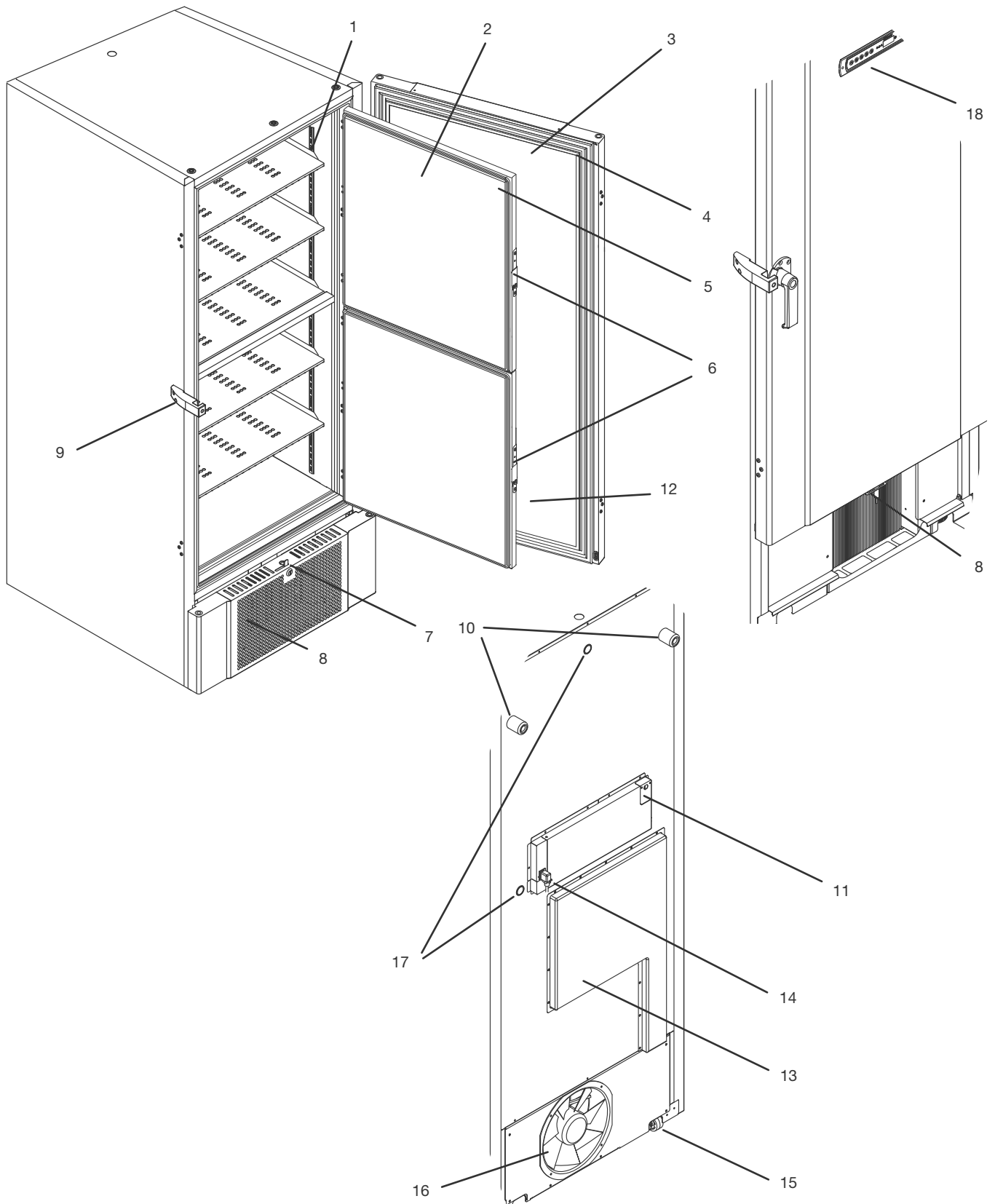
Risk of burning / freezing



Info

# Cabinet components

*This part describes the main components pertinent to the user.*



## Cabinet component list

*This part describes the main components pertinent to the user.*

- 1. Shelves and wall rails** - Ensure that the shelves are fixated as this manual instructs, before exerting load on them. All shelves must be supported by at least 6 shelf support clips each.
- 2. Inner doors** - Ensure that the doors are closed completely after use. To minimise ice build up and fluctuations in temperature, make the door openings as brief as possible. The inner doors are removable for easy cleaning.
- 3. Door** - Ensure that the door is closed completely after use. To minimise ice build up and fluctuations in temperature, make the door openings as brief as possible.
- 4. Gasket for door** - Ensure that the gasket is pliable and in good working order. Keep clean, find instructions in this manual.
- 5. Gaskets for inner doors** - Ensure that the gaskets are pliable and in good working order. Keep clean, find instructions in this manual.
- 6. Latch for inner doors** - Ensure that inner doors are closed completely after use. Find instructions for operation in this manual.
- 7. Door lock** - Lock to secure the door.
- 8. Front panel, air intake and condenser** - Do not cover the holes in the front panel. Remove the front panel to access the condenser.
- 9. Door handle and backstop** - The door handle has to be in the closed position when the door is closed. Follow instructions in this manual to use the handle correctly.
- 10. Rubber spacers** - Are intended to ensure appropriate space between the cabinet and the wall. Do not remove.
- 11. Access plate for potential free contact** - Use to connect to an external alarm system. Instructions for connection is found in this manual. Remember to set external alarms (EAL).
- 12. Pressure equalisation valve** - Do not use as access port. Keep it as free of ice as possible.
- 13. Service hatch** - Use to access the dry filter and heat exchanger. **Must be done by a service professional.**
- 14. Mains connection** - Ensure that the hanger is mounted on the connection plug prior to start up.
- 15. Leveling castors** - The castors allow for easy positioning, with the added stationary stability of legs once deployed. Find instructions and precautions in this manual.
- 16. Fan exhaust** - Do not obstruct the fan exhaust, failing to do so will lead to reduced performance or breakdown.
- 17. Access ports** - Use to lead sensors and similar into the cabinet. Ensure that the access port is sealed properly prior to start up.
- 18. Digital display for controller** - Use the display to show the cabinet temperature and, to set the parameters described in this manual.

# Installation

## Setting up

*This part of the manual describes how to set up the cabinet.*



Due to safety and operating reasons, the cabinet must not be used outdoors. The cabinet should be installed in a dry and sufficiently ventilated area. To ensure efficient operation, the cabinet should not be installed in direct sunlight or close to heat sources.

Minimum ambient operating temperature: +10°C  
Maximum ambient operating temperature: +30°C

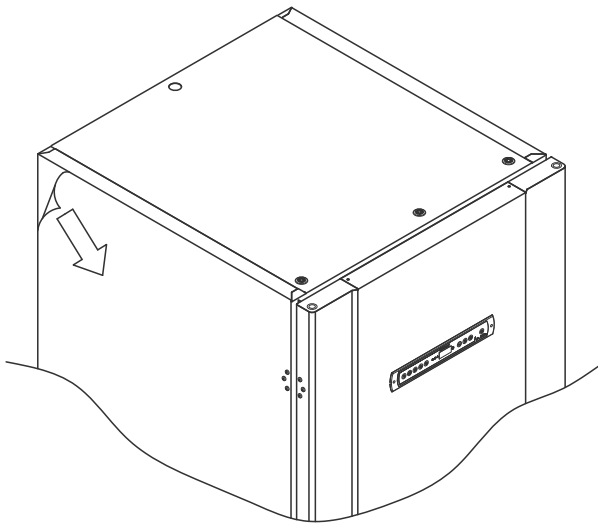
Setpoint temperature: -60°C to -86°C



Avoid placement of the cabinet in a chloric/acidic environment due to risk of corrosion.



The cabinet is shipped with a protective film that should be removed prior to use.



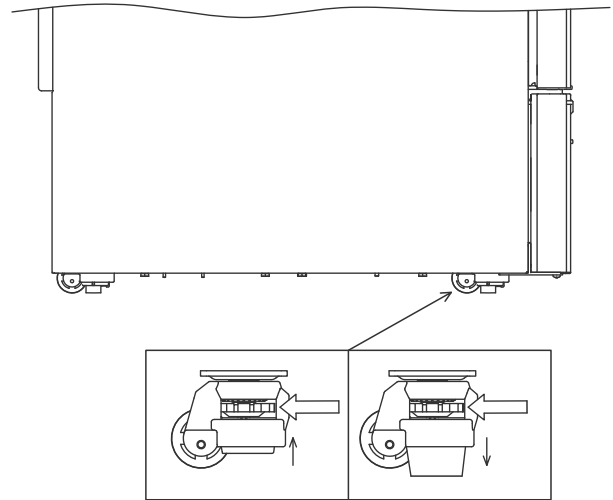
Clean the cabinet with a mild soap solution prior to use.



The cabinet is only allowed to lay down for very short durations (for instance handling through a doorway). If the cabinet has been laying down, the cabinet must stand up-right for at least 24 hours prior to use. This enables oil in the compressors to run back into place.

*This part of the manual describes how to adjust the levelling castors on the cabinet.*

All BioUltra cabinets are equipped with multifunctional levelling castors. These allow for easy positioning, with the added stationary stability of legs once deployed.



Turn the dial to either raise or lower the legs.  
Raising all four legs, makes it possible to move the cabinet unhindered.



When the cabinet is positioned, ensure that at least two of the legs of the cabinet are deployed.



All lifting of the cabinet must be done by mechanical lifting equipment. Lifting by hand can result in injury.



A visual inspection of the cabinet must be conducted prior to putting the cabinet into service. Check the cabinets structural integrity, that door frames and doors don't have deformities, that gaskets seal properly and that the doors sit flush up against the door frame.





The cabinet must always be placed min. 50mm from the wall while in use. Allowing warm exhaust from the compressor room to dissipate. And at least a 30mm gap between cabinet sides and or/walls.



Do not cover the holes in the front panel of the cabinet.



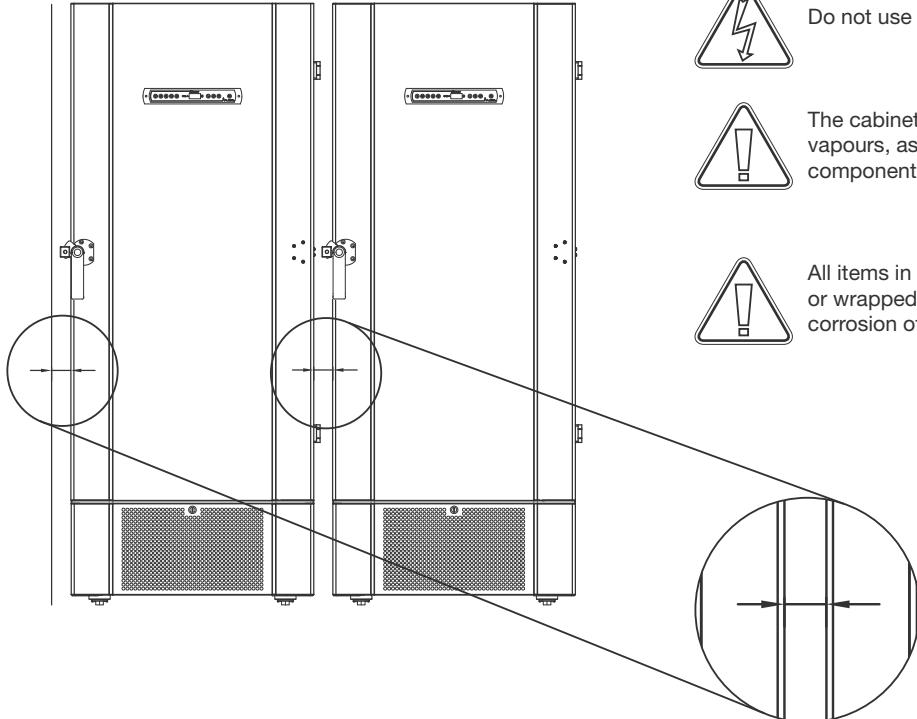
Do not use electrical appliances inside the cabinet.



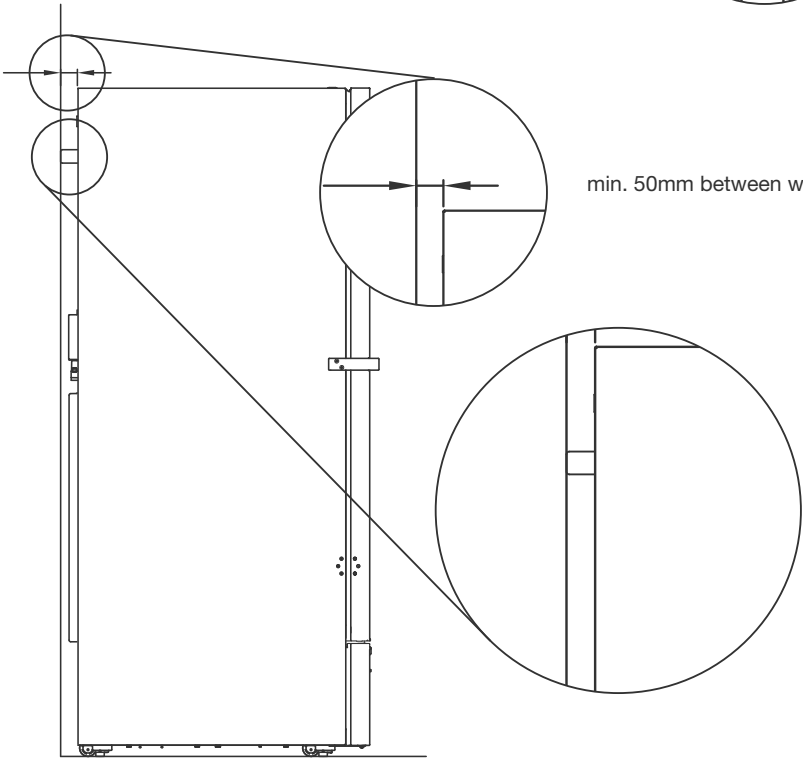
The cabinet is not suited for storing items that emit vapours, as they might corrode the cabinet and its components.



All items in the cabinet that are not encapsulated, or wrapped, should be covered to reduce the risk of corrosion of the cabinet and its components.



min. 30mm between cabinets and/or walls



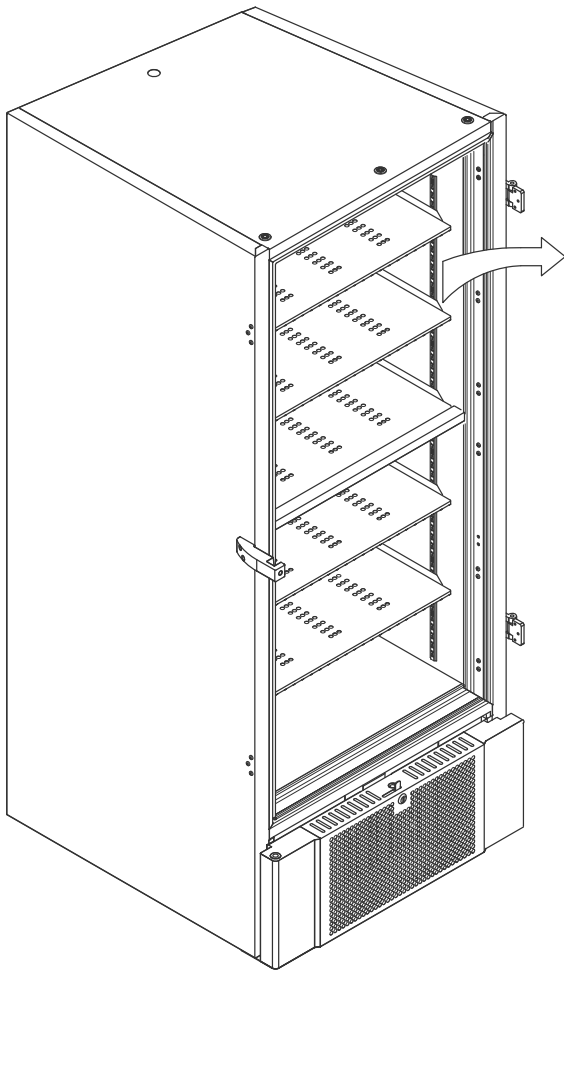
min. 50mm between wall and the cabinet



Do not remove the rubber spacers on the back of the cabinet, as they ensure the minimum required distance from the fan exhaust to the wall.

## Mounting shelves

This part of the manual covers mounting and rearranging of the shelving in the cabinet.



Mount the shelf support clips to the wall rails, using the numbering on the wall rails to determine the right shelf height. Finally placing the shelf on the supports. Please note that the pronounced lip on the shelf must face outwards, as shown in the illustration.

Mount the clip by firstly slotting the protrusion on the horizontal part of the clip into the wall rail.

While the protrusion is cradled in position, turn the clip down and inwards.

When turning the clip downwards, compress the diagonal strut of the clip, thereby allowing the protrusion on the diagonal strut to rest in the appropriate hole on the wall rail.

After mounting the shelf support clips, lay the shelf on top of the clips.

Ensure that the shelf is safely mounted before exerting load on them.



All shelves must be supported by at least 6 shelf support clips each.



Touching any part of a cold cabinet with wet hands can cause frost burns.





Changing the interior configuration must only be conducted when the cabinet is turned off, and when the cabinet is at room temperature


# Correct use of outer handle


*This part covers the correct use of the outer door handle. Read the following part thoroughly before using the cabinet.*

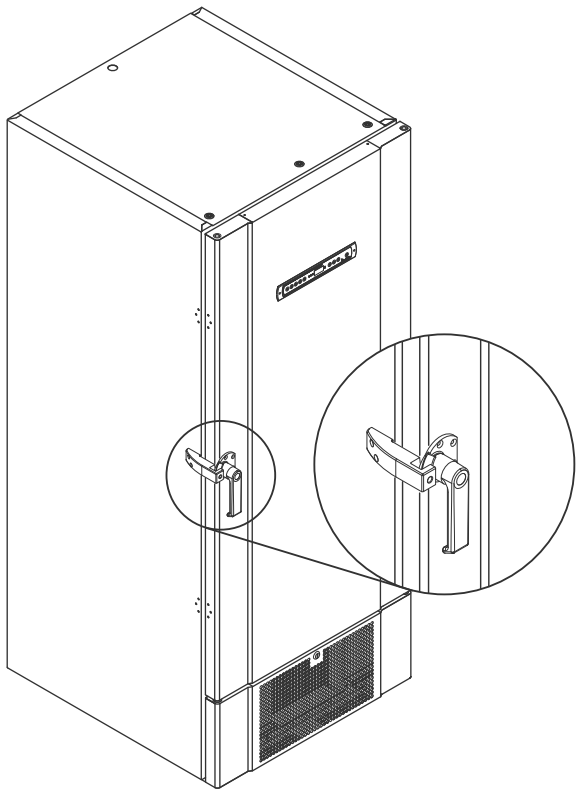
**i** It is important for safe operation and performance that the door is closed entirely when items in the cabinet are not being accessed.

 Do not slam the door, as this can cause material damage.

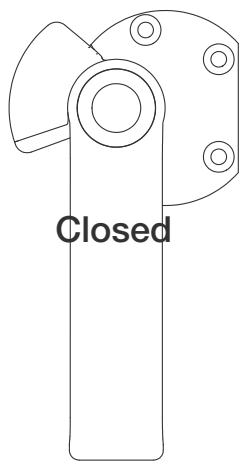
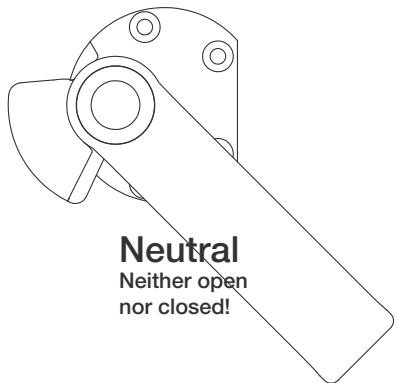
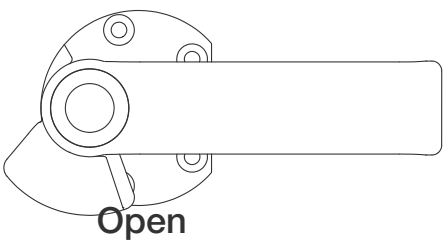
 A vacuum can be created in the storage space after closing the door, please allow the cabinet to equalise in pressure before attempting to open the door again. Attempting to open the door before adequate equalisation can result in material damage.

 Ensure that there is a proper seal between gasket and door frame when the door is closed and the handle is in the closed position.

 The outer door handle must not be closed before securing that the inner doors are closed correctly.



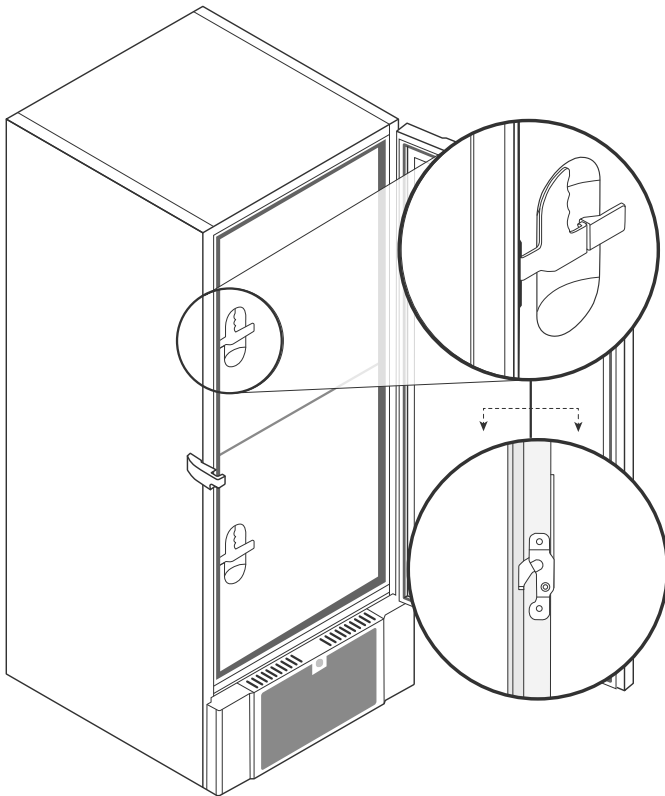
**i** Please note that the door is not fully closed until the handle is pointing down, as shown in the illustration below.



## Correct use of inner handles

This part covers the correct use of the inner door handles. Read the following part thoroughly before using the cabinet.

The inner doors are designed to operate, close and mount/unmount independently.



The inner doors are locked when the door lever clicks in place and sits flush up against the inner door.

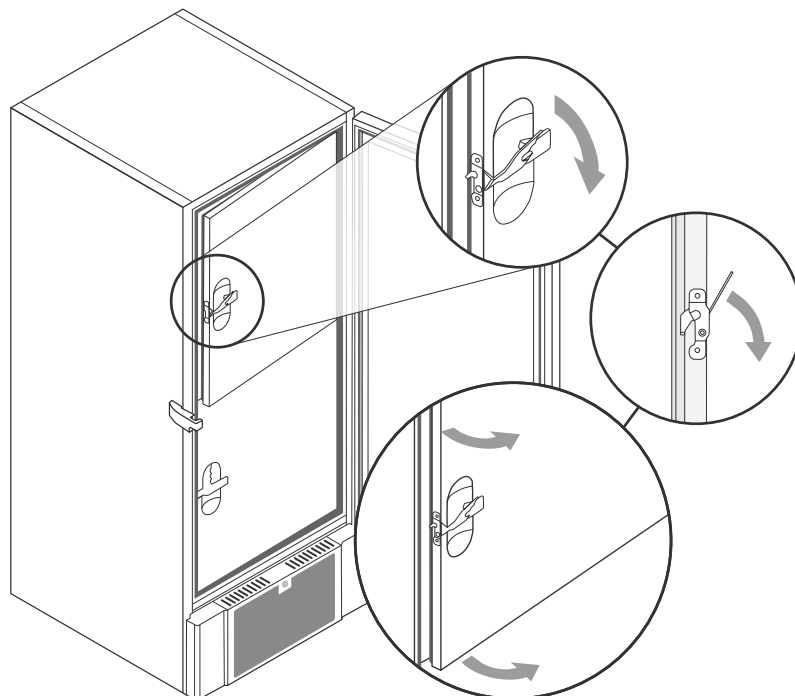
The illustration on the left shows the inner doors in the closed position.

The inner doors are opened by pulling the door lever straight downwards until the door latch disengages, then open the door normally.

The illustration below shows the process of opening an inner door.



Always ensure that the door seals are in good condition. And that the different gaskets seal properly.



## Voltage-free contact

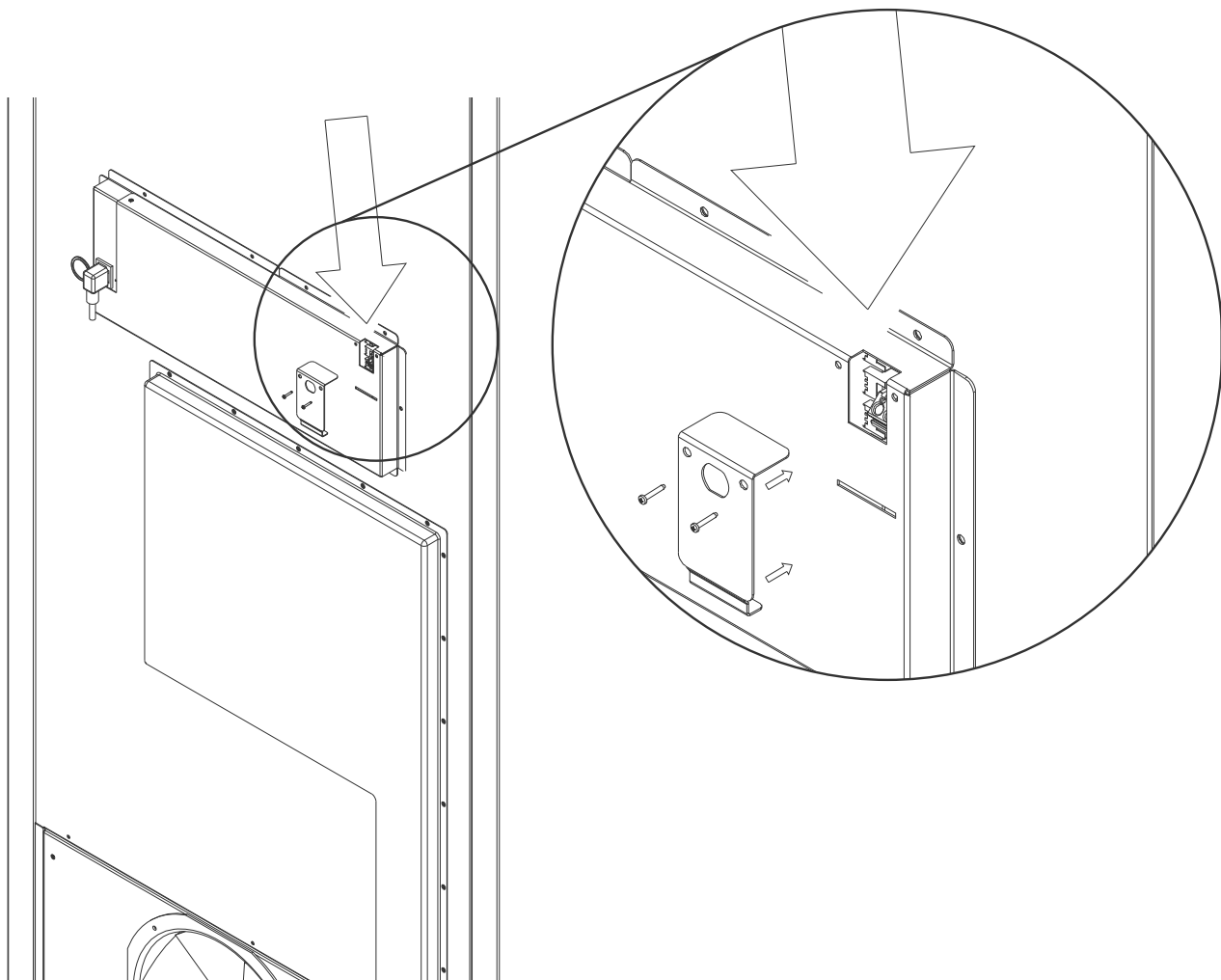
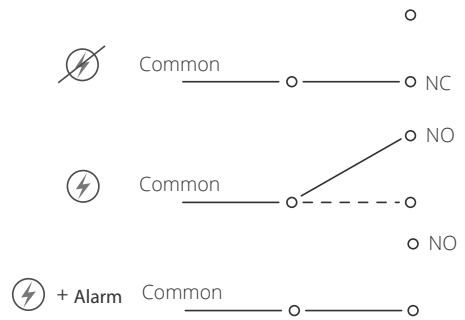
*This part of the manual covers the voltage-free contact.*

The illustration below shows the three connectors for the relay (used f.ex. in connecting to CTS or other external alarm systems). The three connections, are respectively. Common, NO and NC.

The moment when voltage is applied the controller draws the relay, this makes it possible for the controller to respond to both high and low temperature alarms and power failures. Temperature alarms must be configured in the external alarm settings (EAL) before they will activate the voltage-free contact. Find instructions on setting external alarms in the Parameter settings section.

The wires that are connected to the connection block for the voltage-free contact, are secured in place by a cable tension relief and a securing plate that is screwed in place. This secures that there is no tension on the connection block and prevents access to the electrical circuit.

Connection of the voltage-free contact should be done by a qualified installer.



## Connection to electricity

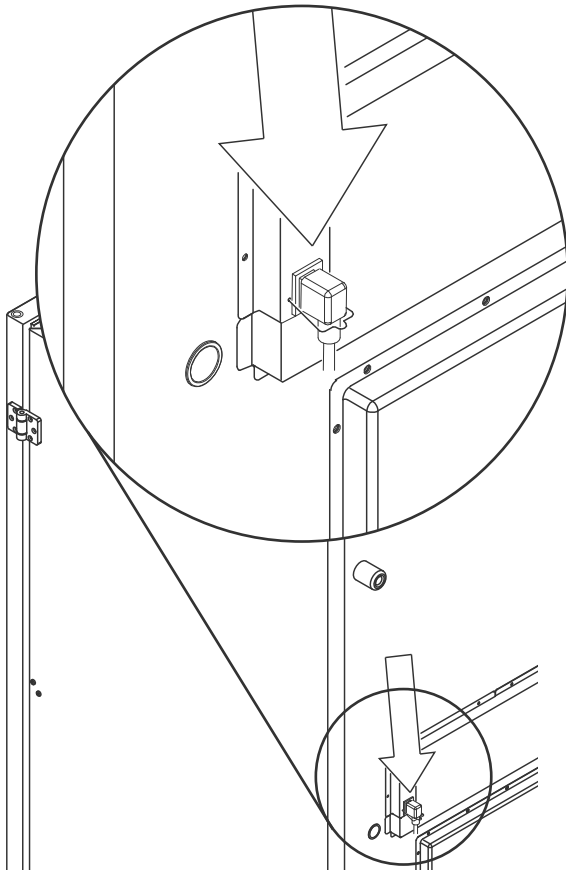
Read the following part thoroughly before connecting the cabinet. Contact a qualified electrician if in doubt.



The cabinet is intended for connection to alternating current. The connection values for voltage (V) and frequency (Hz) are given on the type/number-plate.



The power cord from the mains is plugged in the terminal box on the back of the cabinet. The plug is then fixed in place by the hanger that is built into the terminal box. Please note that the hanger should be fitted tightly around the plug, as shown below.



The cabinet must be connected to the external power supply using a suitable device which mechanically prevents the plug and socket from being separated unintentionally. The connection must be labelled:

**"DO NOT SEPARATE WHEN ENERGIZED"**



**IMPORTANT**



Power must be connected via a wall socket. The wall socket should be easily accessible.

Fuses and similar must never be removed or replaced while the cabinet is connected to a power source.

The electrical terminal box must never be opened while the cabinet is connected to a power source.

The compressor starting equipment must never be dismantled while the cabinet is connected to a power source.

Whenever electrical components are dismantled or replaced, the cabinet must be moved to an area in where there is no risk of ignition caused by the electrical components or gases contained in the cabinet.

Never use the cabinet if the plug is damaged. The cabinet should be examined by a Gram Commercial A/S trained service technician in such cases.

All earthing requirements stipulated by the local electricity authorities must be observed. The cabinet plug and wall socket should then give correct earthing. If in doubt, contact your local supplier or authorized electrician.

Never ground the cabinet through a gas pipe, water main or telephone line.

In case of technical difficulties or breakdowns always contact authorized service personnel. Never dismantle the terminal box or any other electrical component.

Disconnect the power supply plug if there is something wrong with the cabinet. Continued abnormal use may result in electric shock or fire.

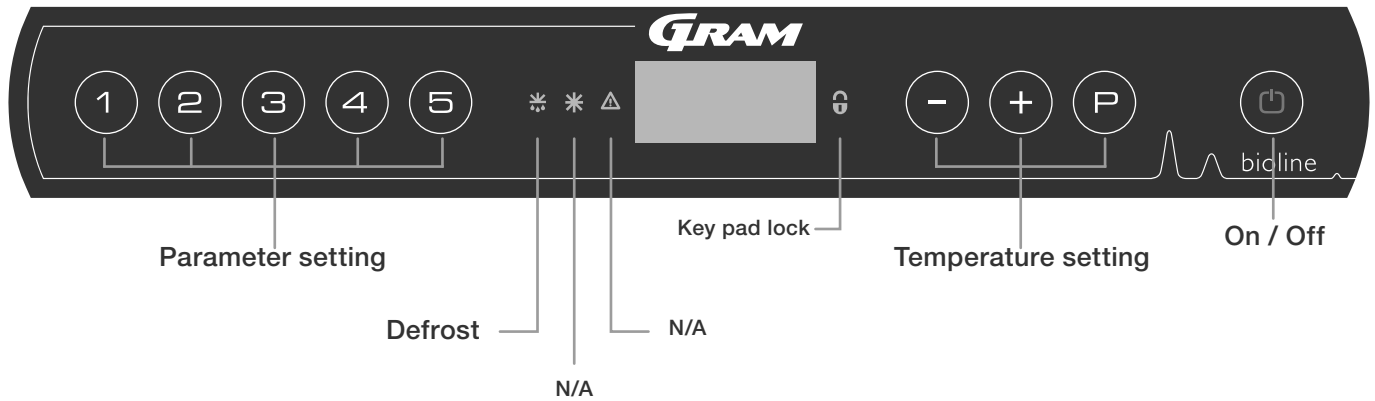
When removing the plug from the power supply, grip the plug, not the cord. Pulling the cord may result in electric shock or fire.

Disconnect the power supply plug if there is something wrong with the cabinet. Continued abnormal use or operation may result in electric shock or fire.

Disconnect the power plug when the cabinet is not used for long periods. Keeping the connection may cause electric shock, current leakage, or fire due to deterioration of insulation.

## The digital display

The digital display depicted below, shows the cabinets temperature and indicates if the cabinet is connected to a power source.



- Parameter setting - Gives access to the cabinets configurable parameters, such as alarms, test program and sensor values.
- Defrost - Defrost in progress
- Key pad lock - Keypad is locked, no access to functions or menus
- Temperature setting - Setting of temperature setpoint and navigation in the menus
- On / Off - Turn the cabinet On or Off, and navigation in the menus

### All-round introduction to navigating the menu

Beyond setting the temperature and on/off, (P), (+), (-) and (⏪) is used to navigate the menus and set the parameters for the cabinet. The buttons have following functions in the menus:

- (P) - Open a menu step / confirm a set value in the parameter settings.
- (+) - Scroll upwards in a given menu / raise a given value in parameter settings (alarm limit for instance).
- (-) - Scroll downwards in a given menu / lower a given value in parameter settings (alarm limit for instance).
- (⏪) - Go a menu step back.

### On / Off

Press (⏪) to turn the cabinet on. Press (⏪) for 6 seconds to turn the cabinet off. The software version of the cabinet will be shown when turning the cabinet on, followed by the software variant. The cabinet is ready when the temperature is displayed.

The cabinet will always commence operation when initially connected to a power supply. For instance after a power outage or when plugging the cabinet in for the first time.



Make sure the cabinet is switched off at the socket before service is performed on electrical parts.

It is not sufficient to switch off the cabinet on the (⏪) key, as current will persist in some electrical parts of the cabinet. If fuses or similar are to be replaced, the cabinet must be moved to a no-risk area.

### Temperature setting

Temperature adjustments are done by holding (P) and pressing either (+) or (-). Confirm the settings by letting go of the buttons.

## Walkthrough of menu

The menu below gives a quick overview of the parameter settings for the cabinet.

## User menu

Menu Access (P) + (1) →	↓	→		
Local alarm settings	LAL	LHL	[° C]	Upper alarm limit. Code for activated alarm [A2]
		LLL	[° C]	Lower alarm limit. Code for activated alarm [A3]
		LHd	[Min.]	Delay of upper alarm limit
		LLd	[Min.]	Delay of lower alarm limit
		bU	On/off	Acoustic signal for alarm codes [ A2] and [ A3]. [1=on / 0=off]
External alarm settings	EAL	EHL	[° C]	Upper alarm limit. Code for activated alarm [A4]
		ELL	[° C]	Lower alarm limit. Code for activated alarm [A5]
		EHd	[Min.]	Delay of upper alarm limit
		ELd	[Min.]	Delay of lower alarm limit
		bU	On/off	Acoustic signal for external alarm codes [ A4], [ A5]. [1=on / 0=off]
Offset of sensors	CAL	CA	[° K]	Offset of A-sensor. Reference sensor for the refrigeration system
		CE	[° K]	Offset of E-sensor. Reference sensor for the display and alarms
	ALL			Activation of escorted alarm limits. [FAS]= locked limits / [ESC] = follows setpoint
	dPS			Reference sensor for the display (A or E) (E is factory setting)

## Other Shortcuts

Buttons:	Duration:	Function:
(P) + (P)	> 3 seconds	Start or stop a defrost
(P) + (1)	> 6 seconds	Activating / deactivating the key pad lock
(P)	-	Shows temperature setpoint value
(+)	-	Shows the highest registered temperature spike (since the last reset alarm history)
(-)	-	Shows the lowest registered temperature spike (since the last reset alarm history)
(+) + (-)	> 3 seconds	Reset alarm history
(P) + (1) + (3)	> 6 seconds	Reset of set parameters. Restores factory settings
(P) + (1)	> 3 seconds	Access to user menu and alarm settings



## Error codes

The following table covers the different error codes that might occur.

## Examples of alarms

Display code:	Explanation:
A2	Local upper alarm LHL is or has been activated
A3	Local lower alarm LLL is or has been activated
A4	External upper alarm EHL is or has been activated
A5	External lower alarm ELL is or has been activated
F1	Error on the main cabinet sensor. The refrigeration system will use an emergency program to make the cabinet run. Temperature stability will be affected. Service is required
F2	Error on the evaporator sensor. Service is required. NOTE: F2 fault can occur at start-up. Please ignore for 10-15 minutes.
F3	Error on the 1. condenser sensor. Service is required
F5	Error on the extra sensor. Service is required
F7	F7 indicates that the temperature of the condenser is too high. Turn off the cabinet and check that the condenser is not covered by undesirable items, and insure that the condenser (and possibly filter) is clean. Service is required if the problem is not alleviated
F8	Over pressure safety switch has triggered by excessive pressure in the LT cooling system

### Mute an acoustic alarm






Cancelling a temperature alarm: [A2, A3, A4 and/or A5] Flashes in the display. Press  to cancel.


The display will continue to flash if the temperature is outside the alarm limits, and will continue until the temperature has recovered.


### Reading the alarm history - Example [A2]

[A2] flashes in the display - This means that the temperature has exceeded the set value for the upper temperature limit, LHL.

Press  to cancel the [A2]. The display continues to flash, indicating that there is information in the alarm history.

Press , Htt (High temperature time) is shown, press  to see for how long (in Minutes) the temperature was above the set alarm limit. Press  to return to Htt. Press  to reach Ht (Highest temperature). Press  to read the highest recorded temperature during Htt.

Press  to return to Ht and press  again to leave the alarm history function.

The procedure for reading an [A3] alarm is identical, apart from entering the alarm history with . When reading out temperatures below set limits, the parameters are Ltt and Lt.

A flashing display with no alarm codes indicates that the alarm codes have been cancelled, but the alarm history contains information.

# Local alarms

## Local high alarm

*The following part covers the setting of upper and lower temperature alarm limits.*

## Local low alarm

### LHL - Setting the upper alarm limit [° C]

- ↳ Press and hold (P) + (1) for more than 3 seconds. "LAL" is shown in display
- ↳ Press (P) to select "LAL". "LHL" is now shown in the display
- ↳ Press (P) to select "LHL". The upper alarm limit is now shown in the display
- ↳ Press (+) or (-) to set the desired value for the upper alarm limit
- ↳ Press (P) to confirm the set value

- The upper alarm limit is now set, proceed to other parameters by pressing (⏏), and then navigate by using (+) or (-).

- ↳ Leave the user menu by pressing (⏏) several times until the cabinet temperature is shown in the display

### LLL - Setting the lower alarm limit [° C]

- ↳ Press and hold (P) + (1) for more than 3 seconds. "LAL" is shown in display
- ↳ Press (P) to select "LAL". "LHL" is now shown in the display
- ↳ Press (+) to proceed to "LLL"
- ↳ Press (P) to select "LLL". The lower alarm limit is now shown in the display
- ↳ Press (+) or (-) to set the desired value for the lower alarm limit
- ↳ Press (P) to confirm the set value

- The lower alarm limit is now set, proceed to other parameters by pressing (⏏), and then navigate by using (+) or (-).

- ↳ Leave the user menu by pressing (⏏) several times until the cabinet temperature is shown in the display

## Local high alarm delay

The following part covers the setting of the delay for the local upper and lower temperature alarm limits.

## Local low alarm delay

### LHd - Setting the delay of the local upper alarm limit [min.]

- ↳ Press and hold (P) + (1) for more than 3 seconds. "LAL" is shown in display
  - ↳ Press (P) to select "LAL". "LHL" is now shown in the display
  - ↳ Press (+) several times until "LHd" is shown in the display
  - ↳ Press (P) to select "LHd". The delay of the upper alarm limit is now shown in the display
  - ↳ Press (+) or (-) to set the desired value for the delay of the upper alarm limit
  - ↳ Press (P) to confirm the set value
- The delay of the upper alarm limit is now set, proceed to other parameters by pressing (⏏), and then navigate by using (+) or (-).
- ↳ Leave the user menu by pressing (⏏) several times until the cabinet temperature is shown in the display

### LLd - Setting the delay of the local lower alarm limit [min.]

- ↳ Press and hold (P) + (1) for more than 3 seconds. "LAL" is shown in display
  - ↳ Press (P) to select "LAL". "LHL" is now shown in the display
  - ↳ Press (+) several times until "LLd" is shown in the display
  - ↳ Press (P) to select "LLd". The delay of the lower alarm limit is now shown in the display
  - ↳ Press (+) or (-) to set the desired value for the delay of the lower alarm limit
  - ↳ Press (P) to confirm the set value
- The delay of the lower alarm limit is now set, proceed to other parameters by pressing (⏏), and then navigate by using (+) or (-).
- ↳ Leave the user menu by pressing (⏏) several times until the cabinet temperature is shown in the display

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## Local acoustic settings

The following part covers the setting of the acoustic local alarms.

### bU - Activation / deactivation of the acoustic local alarms

- ↳ Press and hold (P) + (1) for more than 3 seconds. "LAL" is shown in display
  - ↳ Press (P) to select "LAL". "LHL" is now shown in the display
  - ↳ Press (+) several times until "bU" is shown in the display
  - ↳ Press (P) to select "bU".
  - ↳ Press (+) or (-) to activate / deactivate the local acoustic alarms [1 = activated / 0 = deactivated]
  - ↳ Press (P) to confirm the set value
- The local acoustic alarms is configured, proceed to other parameters by pressing (⏪), and then navigate by using (+) or (-).
- ↳ Leave the user menu by pressing (⏪) several times until the cabinet temperature is shown in the display



## IMPORTANT!

In order to assure the safety of the stored items, the local temperature alarms should be supported by independent external temperature alarms.

## External high alarm

The following part covers the setting of upper and lower external temperature alarm limits.

## External low alarm

### EHL - Setting the external upper alarm limit [° C]

- ↳ Press and hold **(P)** + **(1)** for more than 3 seconds. "LAL" is shown in display
  - ↳ Press **(+)** several times until "EAL" is shown in the display
  - ↳ Press **(P)** to select "EAL". "EHL" is now shown in the display
  - ↳ Press **(P)** to select "EHL". The external upper alarm limit is now shown in the display
  - ↳ Press **(+)** or **(-)** to set the desired value for the external upper alarm limit
  - ↳ Press **(P)** to confirm the set value
- The external upper alarm limit is now set, proceed to other parameters by pressing **(⏏)**, and then navigate by using **(+)** or **(-)**.
- ↳ Leave the user menu by pressing **(⏏)** several times until the cabinet temperature is shown in the display

### ELL - Setting the external lower alarm limit [° C]

- ↳ Press and hold **(P)** + **(1)** for more than 3 seconds. "LAL" is shown in display
  - ↳ Press **(+)** several times until "EAL" is shown in the display
  - ↳ Press **(P)** to select "EAL". "EHL" is now shown in the display
  - ↳ Press **(+)** to proceed to "ELL"
  - ↳ Press **(P)** to select "ELL". The external lower alarm limit is now shown in the display
  - ↳ Press **(+)** or **(-)** to set the desired value for the external lower alarm limit
  - ↳ Press **(P)** to confirm the set value
- The external lower alarm limit is now set, proceed to other parameters by pressing **(⏏)**, and then navigate by using **(+)** or **(-)**.
- ↳ Leave the user menu by pressing **(⏏)** several times until the cabinet temperature is shown in the display

## External high alarm delay

The following parts covers the setting of the delay of the external upper and lower alarms.

## External low alarm delay

### EHD - Setting the delay of the external upper alarm limit [min.]

- ↳ Press and hold (P) + (1) for more than 3 seconds. "LAL" is shown in display
  - ↳ Press (+) to proceed to "EAL"
  - ↳ Press (P) to select "EAL". "EHL" is now shown in the display
  - ↳ Press (+) several times until "EHD" is shown in the display
  - ↳ Press (P) to select "EHD". The external delay of the upper alarm limit is now shown in the display
  - ↳ Press (+) or (-) to set the desired value for the external delay of the upper alarm limit
  - ↳ Press (P) to confirm the set value
- The delay of the external upper alarm limit is now set, proceed to other parameters by pressing (⏏), and then navigate by using (+) or (-)
- ↳ Leave the user menu by pressing (⏏) several times until the cabinet temperature is shown in the display

### ELd - Setting the delay of the external lower alarm limit [min.]

- ↳ Press and hold (P) + (1) for more than 3 seconds. "LAL" is shown in display
  - ↳ Press (+) to proceed to "EAL"
  - ↳ Press (P) to select "EAL". "EHL" is now shown in the display
  - ↳ Press (+) several times until "ELd" is shown in the display
  - ↳ Press (P) to select "ELd". The delay of the external lower alarm limit is now shown in the display
  - ↳ Press (+) or (-) to set the desired value for the delay of the lower alarm limit
  - ↳ Press (P) to confirm the set value
- The delay of the external lower alarm limit is now set, proceed to other parameters by pressing (⏏), and then navigate by using (+) or (-)
- ↳ Leave the user menu by pressing (⏏) several times until the cabinet temperature is shown in the display

## External acoustic settings

The following part covers the setting of the acoustic external alarms.

### bU - Activation / deactivation of the acoustic external alarms

- ↳ Press and hold  $\text{P} + \text{1}$  for more than 3 seconds. "LAL" is shown in display
  - ↳ Press  $\text{+}$  to proceed to "EAL"
  - ↳ Press  $\text{P}$  to select "EAL". "EHL" is now shown in the display
  - ↳ Press  $\text{+}$  several times until "bU" is shown in the display
  - ↳ Press  $\text{P}$  to select "bU"
  - ↳ Press  $\text{+}$  or  $\text{-}$  to activate / deactivate the external acoustic alarms [1 = activated / 0 = deactivated]
  - ↳ Press  $\text{P}$  to confirm the set value
- The external acoustic alarms is configured, proceed to other parameters by pressing  $\text{P}$ , and then navigate by using  $\text{+}$  or  $\text{-}$ .
- ↳ Leave the user menu by pressing  $\text{P}$  several times until the cabinet temperature is shown in the display

# Parameter settings

## Sensor offset

The following part covers the offset of the A- and E-sensor.

The temperature sensors connected to MPC controller can be off-set independently of each other in the parameter cAL.

Offset is used in cases where there are deviations in the cabinets actual temperature compared to the temperature shown in the display and / or control measurements by independent temperature monitoring.

The cabinet is equipped with a sensor (A-sensor) and an extra sensor (E-sensor).

The A-sensor is used to manage the cabinets refrigeration system and is fixated in a given position in the cabinet. The location of the A sensor must not be altered.

The E-sensor is placed in the cabinet storage space. The E-sensor is the default display sensor and reference for the alarms. The E-sensor has no effect on operation of the refrigeration system.

The A-sensor is offset if the actual temperature in the cabinet does not match the setpoint, despite taking the hysteresis into consideration. Offset of A sensor is named "cA".

The E-sensor is offset if the actual temperature in the cabinets display, provided that the display sensor for reference is the E-sensor, does not match the independent temperature monitoring used for control. Offset of E-sensor is named "cE"



### Practical example of offset:

Example 1 - The temperature in the cabinet is operating warmer than the actual setpoint.

With a setpoint of -80°C, the actual temperature inside the cabinet is between -78°C and -80°C. The desired temperature range is between -79°C and -81°C. This means that "cA", in this case, should be +1,0K, so that the refrigeration system stops 1,0K later and starts 1,0K earlier than the setpoint normally otherwise would dictate.

Example 2 - The temperature in the cabinet is operating colder than the actual setpoint.

With a setpoint of -80°C, the actual temperature inside the cabinet is between -80°C and -82°C. The desired temperature range is between -79°C and -81°C. This means that "cA", in this case, should be -1,0K, so that the refrigeration system stops 1,0K earlier and starts 1,0K later than the setpoint normally otherwise would dictate.

## Offset of the A-sensor

- ↳ Press and hold (P) + (1) for more than 3 seconds
- ↳ Press (+) several times until "cAL" is shown in the display
- ↳ Press (P) to select "cAL". "cA" is shown in the display
- ↳ Press (P) to select "cA"
- ↳ Press (+) or (-) to offset the A-sensor
- ↳ Press (P) to confirm the set value

-The A-sensor is now offset, proceed to other parameters by pressing (⏪), and then navigate by using (+) or (-)

- ↳ Leave the user menu by pressing (⏩) several times until the cabinet temperature is shown in the display

## Offset of the E-sensor

- ↳ Press and hold (P) + (1) for more than 3 seconds
- ↳ Press (+) several times until "cAL" is shown in the display
- ↳ Press (P) to select "cAL". "cA" is shown in the display
- ↳ Press (+) until "cE" is shown in the display
- ↳ Press (P) to select "cE"
- ↳ Press (+) or (-) to offset the E-sensor
- ↳ Press (P) to confirm the set value

- The E-sensor is now offset, proceed to other parameters by pressing (⏪), and then navigate by using (+) or (-)

- ↳ Leave the user menu by pressing (⏩) several times until the cabinet temperature is shown in the display



## Escorted / set alarm limits

The following part covers the setting of escorted or set alarm limits.

### ALL - Setting of escorted / set alarm limits

- ↳ Press and hold  $\text{P} + \text{1}$  for more than 3 seconds
- ↳ Press  $\text{+}$  several times until "ALL" is shown in the display
- ↳ Press  $\text{P}$  to select "ALL"
- ↳ Press  $\text{+}$  or  $\text{-}$  to select set (FAS) or escorted (ESC) alarm limits
- ↳ Press  $\text{P}$  to confirm the set value
- ↳ Leave the user menu by pressing  $\text{⏏}$  several times until the cabinet temperature is shown in the display



"Set alarm" is fixed limits working independently from the setpoint. The alarm limits will remain the selected values regardless of the setpoint being altered.

"Escorted alarm" is fixed limits locked to the setpoint. The alarm limits will change according to the altered setpoint.

## Display sensor

The following part covers the setting of which sensor to be shown in the display.

### dPS - Selection of reference sensor for the display

- ↳ Press and hold **(P)** + **(1)** for more than 3 seconds
- ↳ Press **(+)** several times until "dPS" is shown in the display
- ↳ Press **(P)** to select "dPS"
- ↳ Press **(+)** or **(-)** to select either the A- or E-sensor
- ↳ Press **(P)** to confirm the set value
- ↳ Leave the user menu by pressing **(P)** several times until the cabinet temperature is shown in the display



Please note that dPS only changes the reference sensor for the display, and not the reference sensor for the alarms.

Furthermore, please note that the reference sensor for the refrigeration system is the A-sensor, this can not be altered.

## Cleaning

*Inadequate cleaning can lead to the cabinet not functioning properly or at all.*

Always disconnect the cabinet before cleaning.

The cabinet must be completely thawed prior to cleaning.

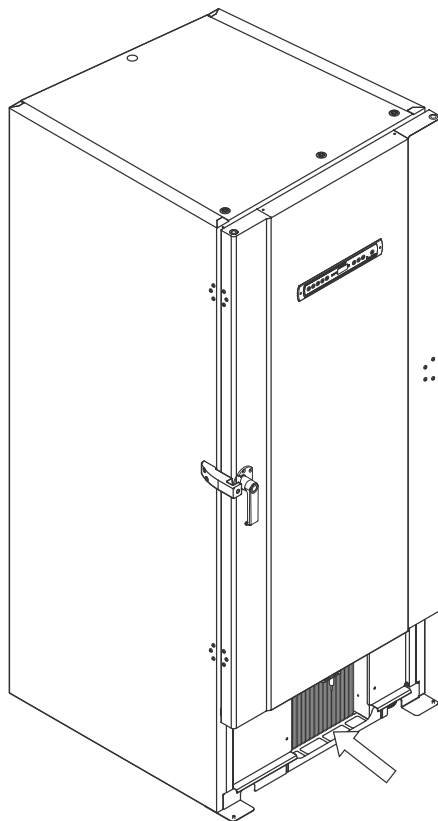
The cabinet should be cleaned internally with a mild soap solution (max. 85°C) at suitable intervals and checked thoroughly before it is put into operation again.

The compressor compartment and in particular the condenser must be kept free from dust and dirt. This is best done with a vacuum cleaner and a brush.

Do not flush compressor compartment with water as this may cause short-circuits in the electrical system.

Cleaning agents containing chlorine (or chlorine compounds), abrasive or solvent compounds as well as other corrosive agents, may not be used, as they might damage the cabinet and its components.

The location of the condenser is illustrated below.



## Door gasket

*The following part covers the importance of a properly functioning door gasket.*

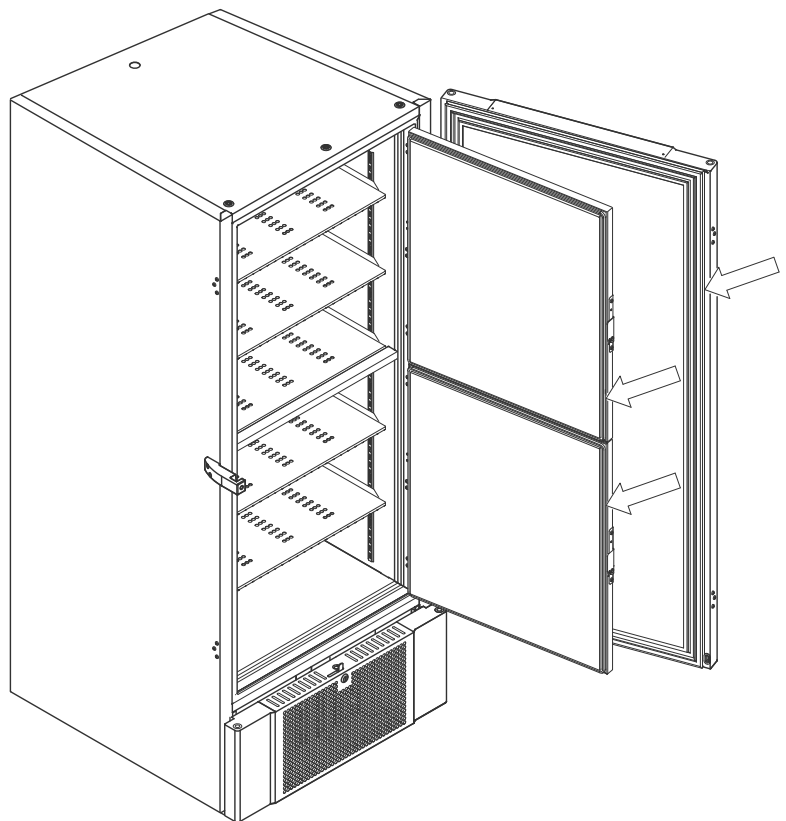
Door gaskets are an important part of a cabinet, door gaskets with impaired functionality reduces a cabinets seal with the door. Impaired seals can lead to ice build-up (and thus reduced cooling capacity), and in some cases, decreased lifetime expectancy of the cabinet.

It is therefore very important to be aware of the door gaskets condition. Regular inspection is recommended.

The door gasket should be cleaned regularly with a mild soap solution and dried off with a dry cloth.

If a gasket needs to be replaced, please contact your local Gram BioLine distributor.

The illustration below shows the location of the gaskets .



## Defrost inner doors and cabinet

The following part covers the procedure for manually defrosting inner doors and cabinet.



The BioUltra has no automatic defrosting system and requires manual defrosting.

At the event of excessive frost and ice build-up, where it hinders performance, general use, and/or item safety, defrosting the chamber and inner doors is needed.

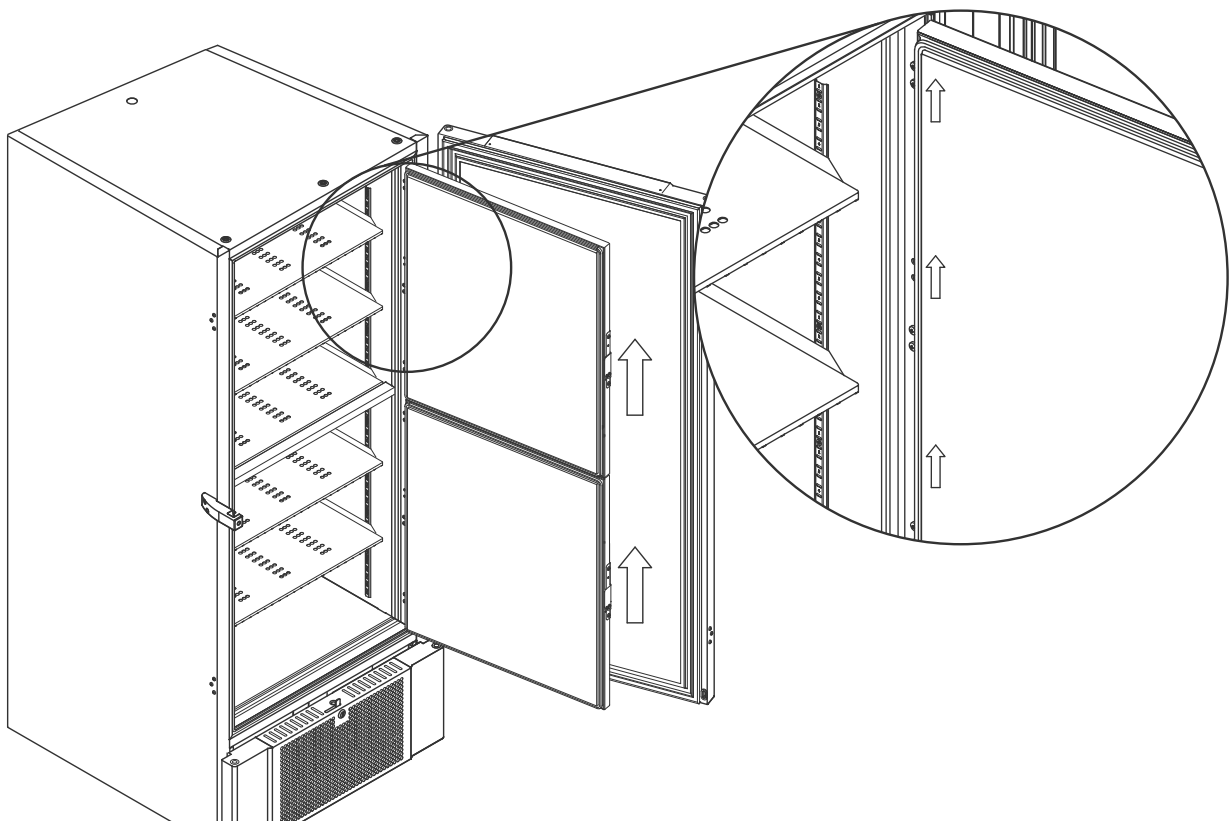
Please follow the procedure described below to clean the chamber and inner doors of frost.

- ↳ (If applicable) Turn off the back-up system
- ↳ Transfer the stored items to an appropriate environment
- ↳ Turn off the cabinet
- ↳ Open the inner doors more than 90°
- ↳ Lift off the inner doors and either let the ice thaw or manually defrost them
- ↳ Let the freezer defrost by thawing (with doors open) Thawing agents such as hot water must not be used.
- ↳ Collect the accumulated water in the bottom of the chamber
- ↳ After cleaning the inner doors and chamber, refit the inner doors to the cabinet
- ↳ Turn on the cabinet, according to the procedures in "Start-up"
- ↳ Put the items back in the chamber when the temperature has stabilized at the desired temperature
- ↳ (If applicable) Turn on the back-up system

Use the ice scraper included with the cabinet for any manual defrosting, do not hack or chip at the ice



If necessary, it is possible to defrost the inner doors periodically without taking the cabinet out of service. Unmount the inner doors according to the instructions on this page, and defrost manually or by thawing. Ensure that the outer door is closed while the inner doors are being defrosted.

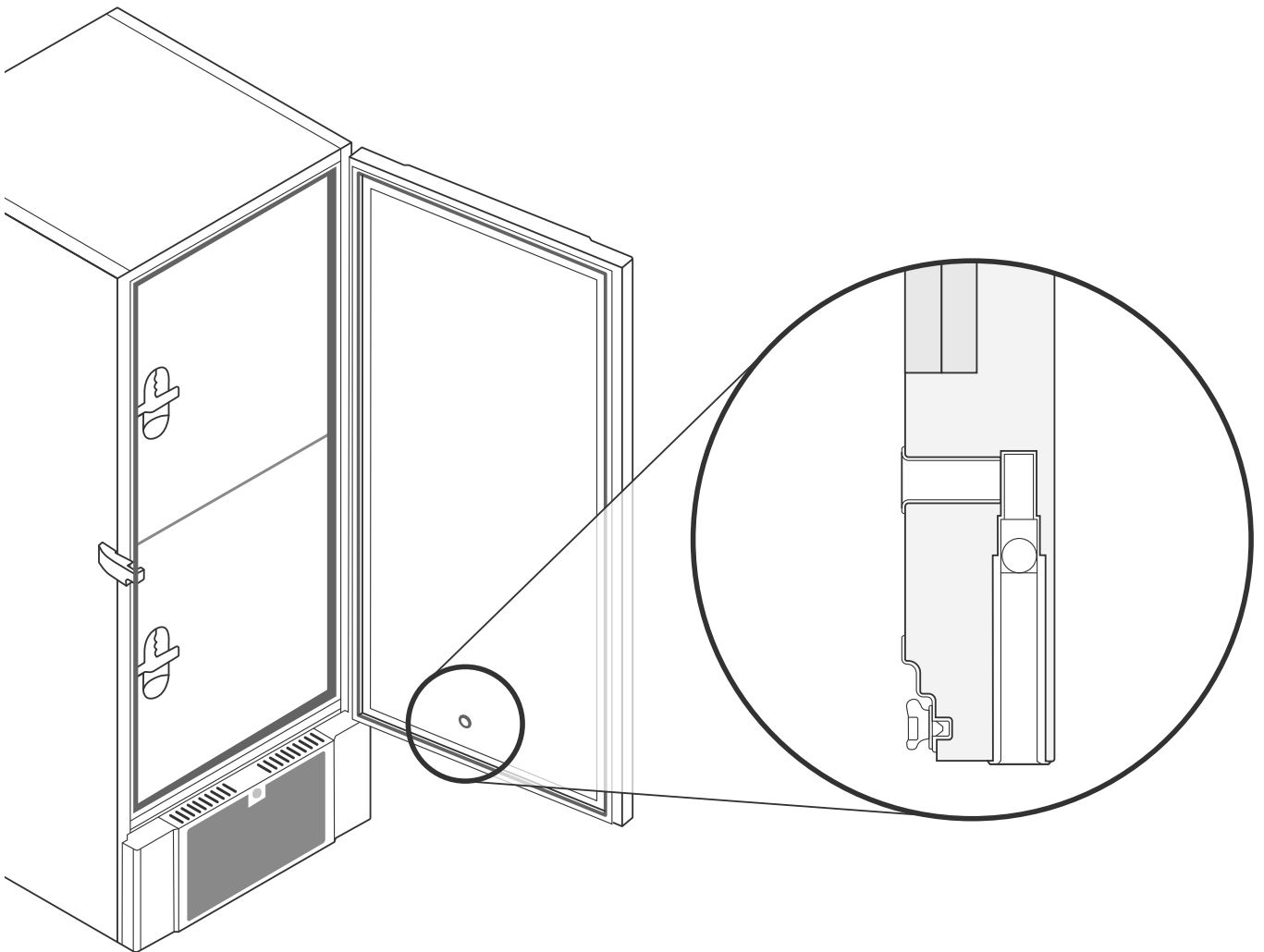


## Equalisation valve

*The equalisation valve may require cleaning depending on use and ambient conditions.*

Over the duration of some weeks, a small amount of ice can form around the inside of the pressure equalisation valve. If allowed to build up, pressure equalisation will be impeded to the point where the cabinet is not able to equalise through the valve after a door opening. This in turn forces the equalisation to occur over the door gaskets. Thereby potentially damaging gaskets, creating unwanted ice formations around the door and exceedingly long equalisations.

Make sure routinely that the equalisation valve and the port leading into the storage chamber is free of ice and is in proper working order.



The illustrations above shows the location of the equalisation valve.

# General info

## Responsibility

Read the following carefully, for information on technical safety and responsibility on Gram Commercial A/S products.



Is the cabinet being used for purposes other than its intended use, or use of the cabinet is not in accordance with guidelines specified in the user manual, the user bears full responsibility for any consequences thereof.



Defective parts must be replaced with original parts from Gram Commercial A/S. Gram Commercial A/S can only guarantee functional and safety requirements on the cabinets, if above mentioned is adhered to.



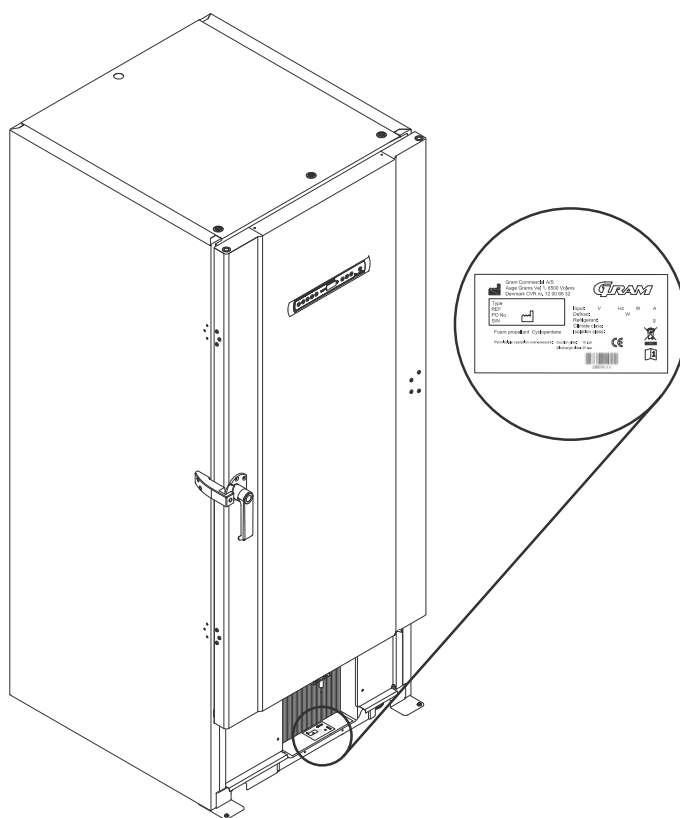
The cabinets' refrigeration components should at least be checked once a year by a Gram Commercial A/S technician or a similarly skilled person.

## Service

The refrigeration system and the hermetically sealed compressor require no maintenance. However the condenser requires regular cleaning.

If refrigeration fails, first look to see whether the cabinet has been unintentionally switched off, or whether a fuse has blown.

If the cause of failure cannot be found, contact your supplier quoting Type and S/N. This information can be found on the type/number-plate.



Make sure the cabinet is switched off at the socket before service is performed on electrical parts. It is not sufficient to switch off the cabinet on the (⏻) key, as current will persist in some electrical parts of the cabinet.

If fuses or similar are to be replaced, the cabinet must be moved to a no-risk area.

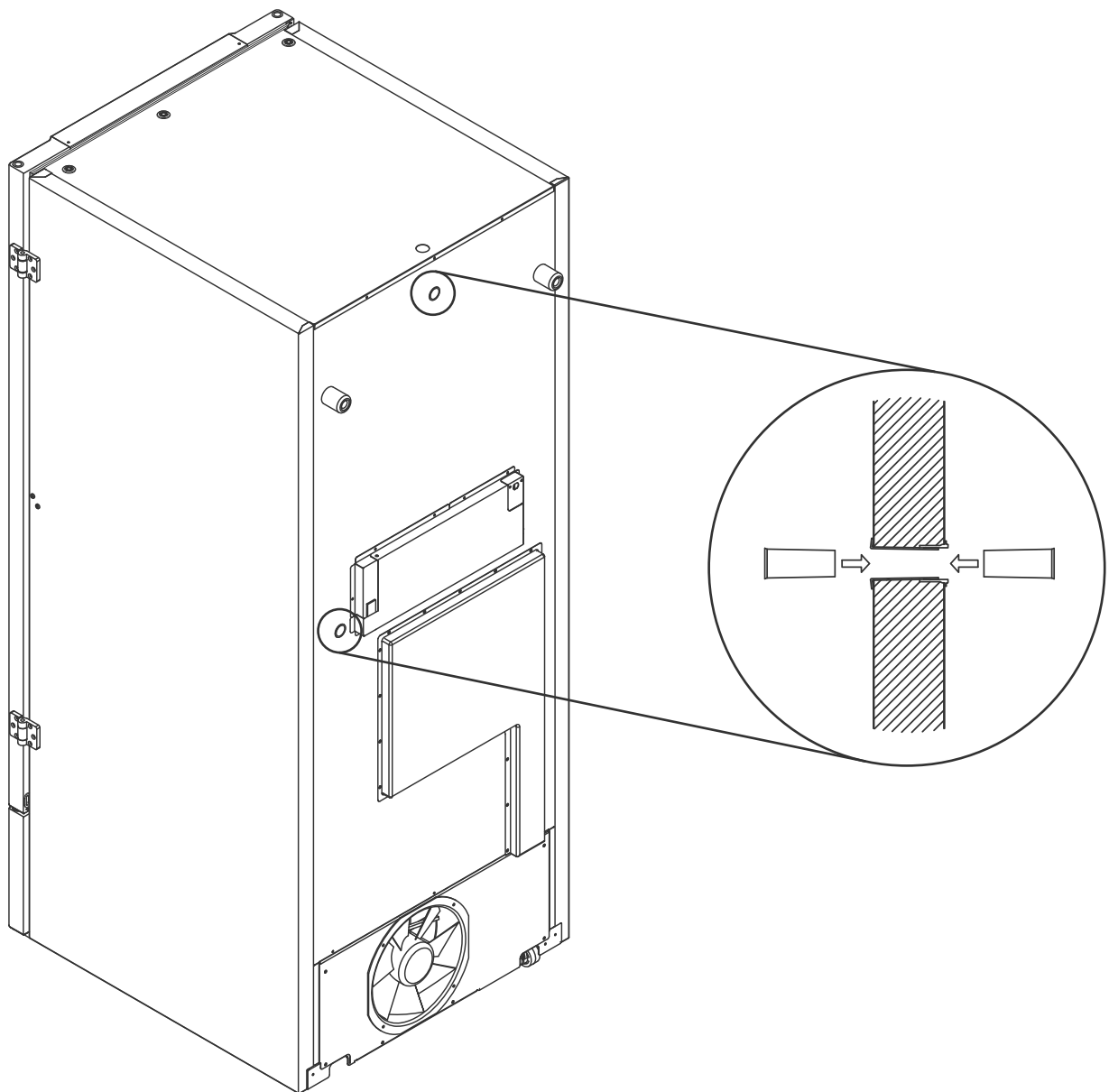
## Access port

*All BioLine cabinets are equipped with an access port on the back of the cabinets, this can be used to easily fit external sensors and the like.*

The illustration below shows an access port on a BioUltra cabinet.

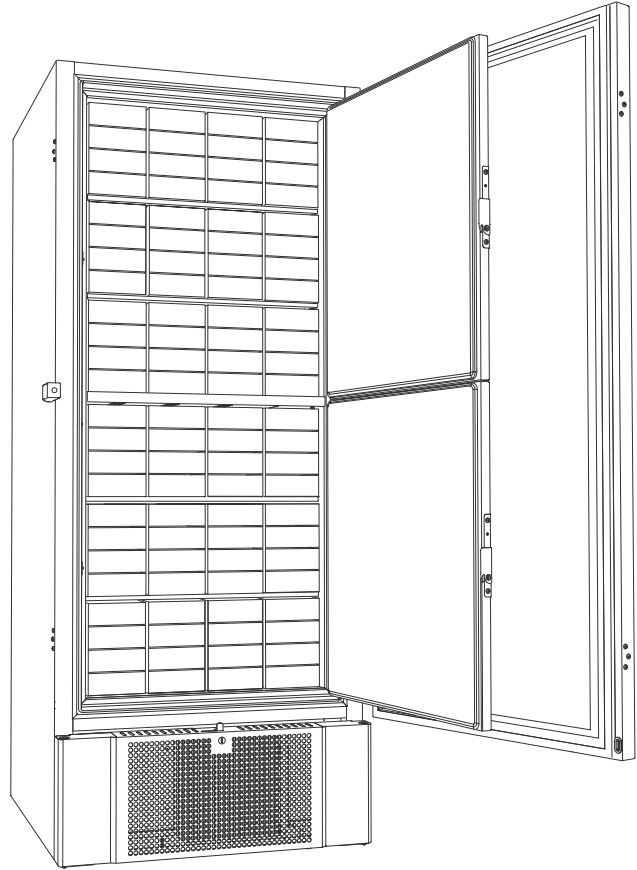
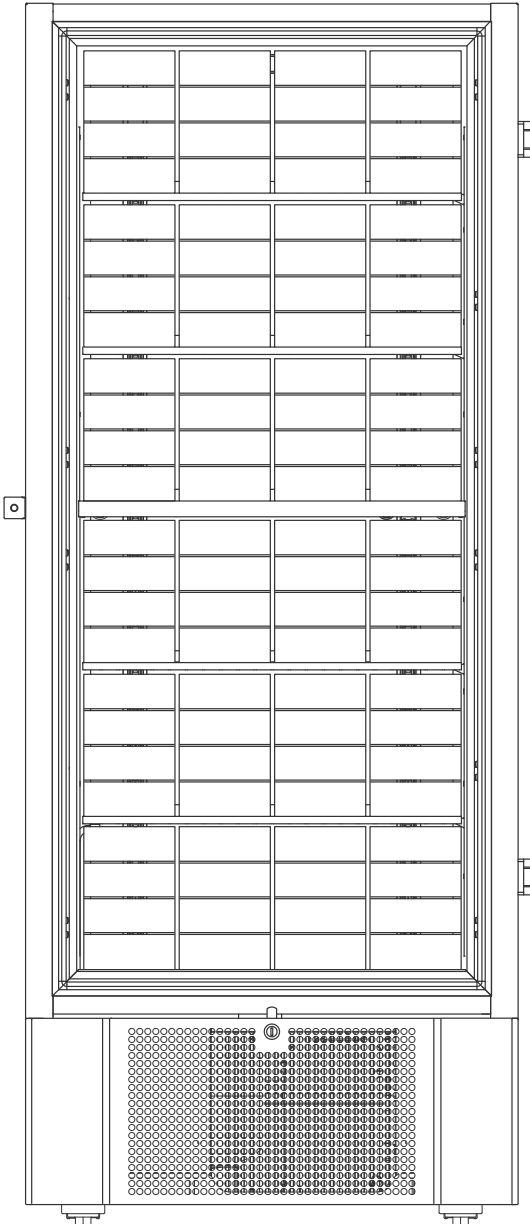
The access ports are constructed in the same fashion, with two conical polystyrene plugs ( fitted from the back of the cabinet and the inside of the cabinet ).

Please note, it is very important to ensure that the access port is sealed properly prior to start up after mounting sensor, probe etc. Failing to do so can result in lowered performance or break-down of the cabinet.



## Boxes and racks

This part covers quantity of racks stored in the cabinet.



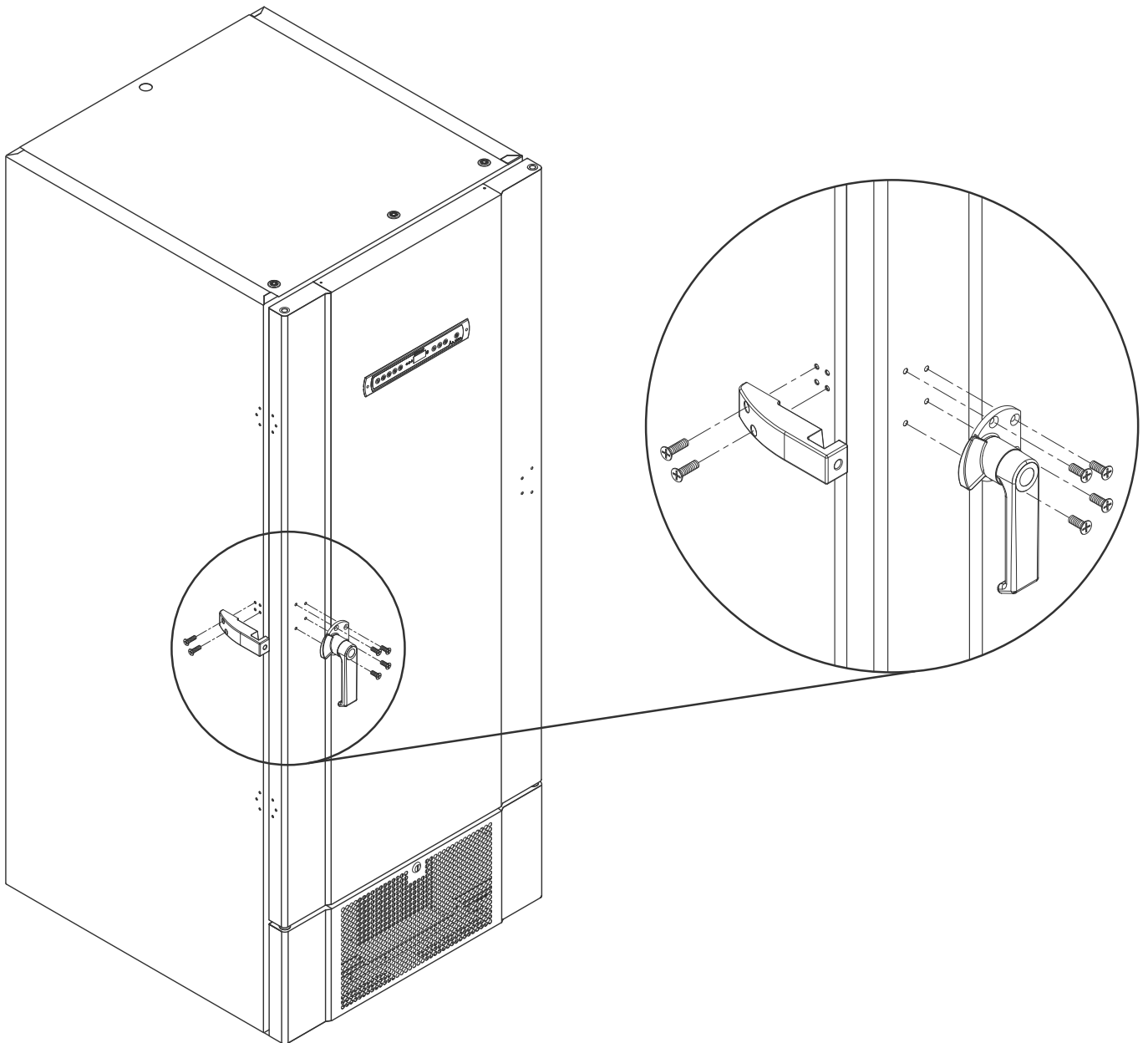
Box size	Number of Boxes	Number of Racks
2"/50mm	384	24 (4x4 racks)
3"/75mm	192	16 (3x4 racks)
4"/100mm	192	24 (2x4 racks)



## Mount / Unmount door handle

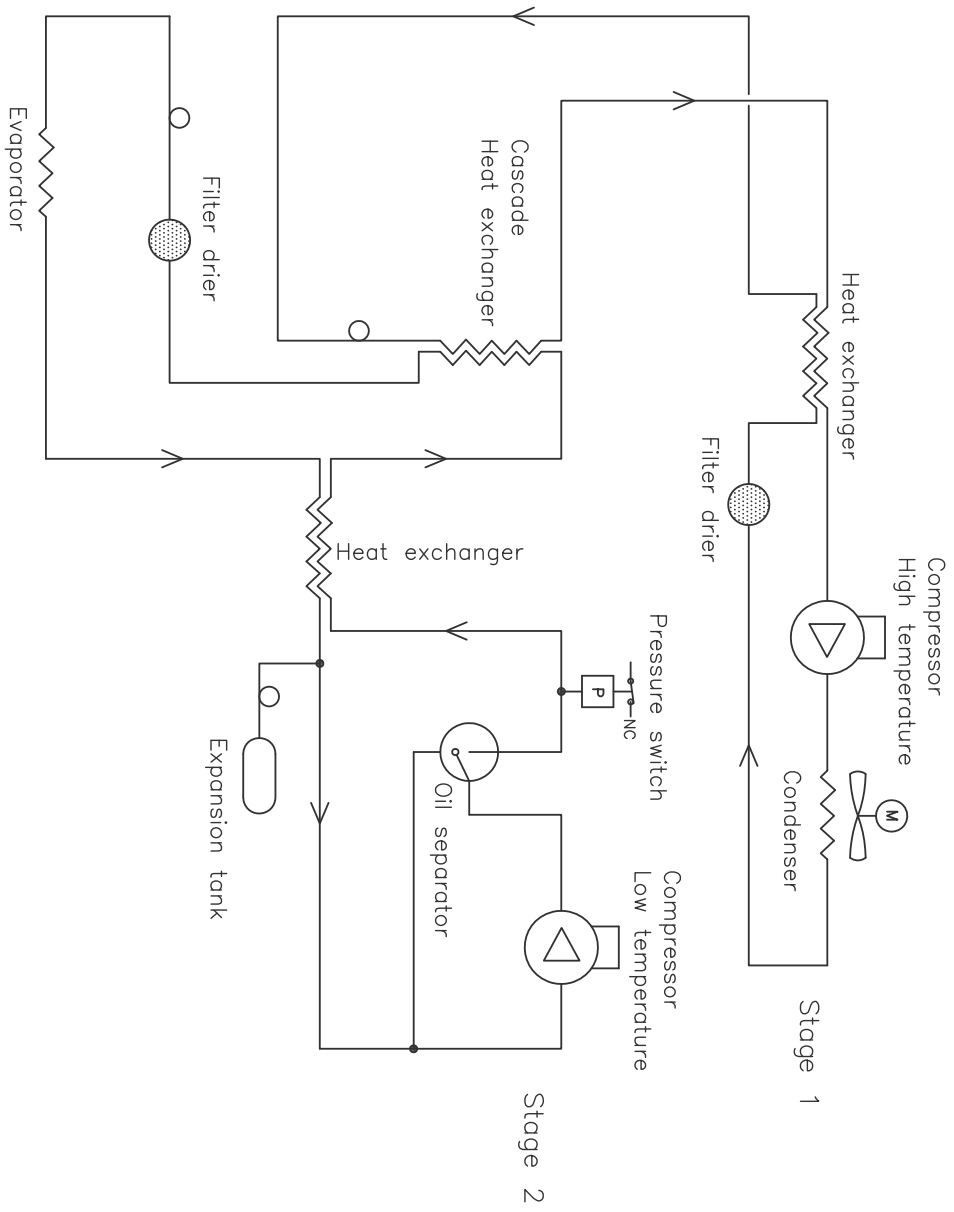
*The door handle can easily be unmounted and mounted again.*

In the case of the handle needing to be taken off, make sure that it is mounted back onto the cabinet prior to starting up again.

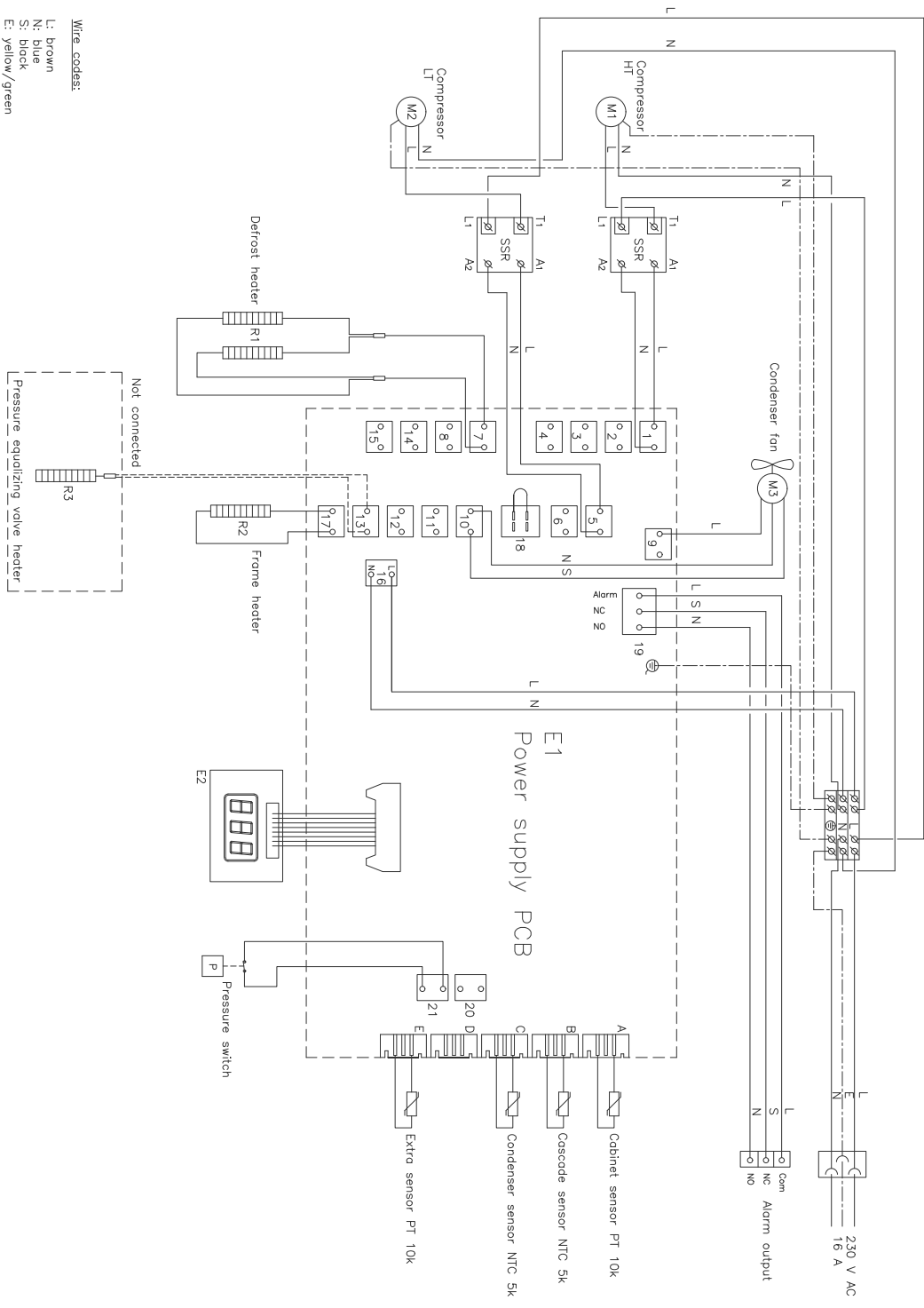


The cabinet must not operate without door handle.

# Refrigeration circuits



# Wiring diagram



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## Important



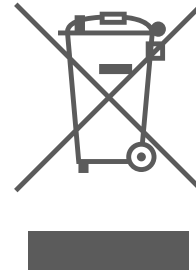
# IMPORTANT!

1. There may occur sharp edges on the cabinet housing, compressor room, and interior furnishings. Show due diligence when handling the cabinet, neglect of these precautions can lead to injuries.
2. Danger of wedging of body parts in the frame slot between the door and the cabinet, show due diligence when opening and closing the cabinet door. Negligence of these precautions can lead to injuries.
3. Castors where the legs aren't deployed can lead to unexpected movements of the cabinet. Lock the castors after installation. Negligence of these precautions can lead to injuries.
4. When the cabinet is positioned, ensure that at least two of the legs of the cabinet are deployed.
5. The fan may cause injury during operation, avoiding touching the fans while the cabinet is connected to the mains. Negligence of these precautions can lead to injuries.
6. Thawing agents such as hot water must not be used when thawing the cabinet.

## Disposal

Electrical and electronic equipment (EEE) contains materials, components and substances that can be dangerous and harmful to human health and the environment if the waste (WEEE) is not disposed of properly.

Products that are labelled with a "crossed-out wheelie bin" is electric and electronic equipment. The crossed out wheelie bin symbolizes that waste of this type can not be disposed of with unsorted municipal waste, but must be collected separately.



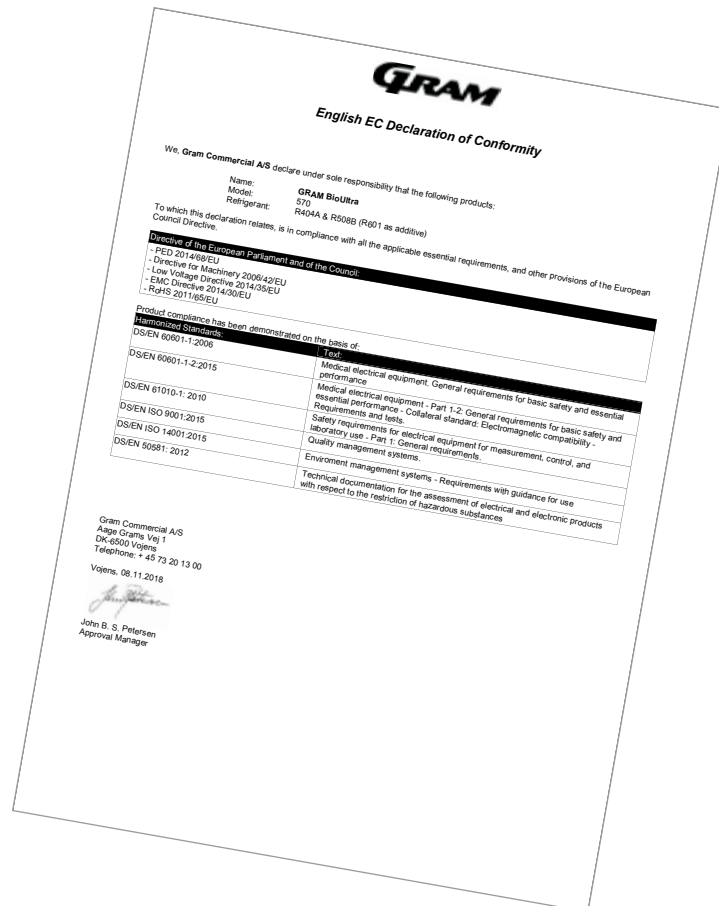
Contact you local BioLine distributor when the cabinet needs to be disposed of.

For additional information, see our website:

[www.gram-bioline.com](http://www.gram-bioline.com)

# GMP Documentation

## IQ & OQ



**IQ & OQ documentation is readily available for  
all BioUltra cabinets.**

**For Installation-, Operation- and Performance-Qualification  
documentation please go to our website.**

**[www.gram-bioline.com](http://www.gram-bioline.com)**

## Declaration of conformity



### English EC Declaration of Conformity

We, **Gram Commercial A/S** declare under sole responsibility that the following products:

Name: **GRAM BioUltra**  
Model: 570  
Refrigerant: R404A & R508B (R601 as additive)

To which this declaration relates, is in compliance with all the applicable essential requirements, and other provisions of the European Council Directive.

#### Directive of the European Parliament and of the Council:

- PED 2014/68/EU
- Directive for Machinery 2006/42/EU
- Low Voltage Directive 2014/35/EU
- EMC Directive 2014/30/EU
- RoHS 2011/65/EU

Product compliance has been demonstrated on the basis of:

Harmonized Standards:	Text:
DS/EN 60601-1:2006	Medical electrical equipment. General requirements for basic safety and essential performance
DS/EN 60601-1-2:2015	Medical electrical equipment - Part 1-2: General requirements for basic safety and essential performance - Collateral standard: Electromagnetic compatibility - Requirements and tests.
DS/EN 61010-1: 2010	Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 1: General requirements.
DS/EN ISO 9001:2015	Quality management systems.
DS/EN ISO 14001:2015	Environment management systems - Requirements with guidance for use
DS/EN 50581: 2012	Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

Gram Commercial A/S  
Aage Grams Vej 1  
DK-6500 Vojens  
Telephone: + 45 73 20 13 00

Vojens, 08.11.2018

John B. S. Petersen  
Approval Manager

Rev. 004 - 08.11.2018



Gram Commercial A/S  
Aage Grams Vej 1 · 6500 Vojens · Danmark  
Tel: +45 73 20 13 00 · Fax: +45 73 20 12 01  
e-mail: [info@gram-bioline.com](mailto:info@gram-bioline.com)  
[www.gram-bioline.com](http://www.gram-bioline.com)

The GRAM logo features the word "GRAM" in a large, bold, italicized, sans-serif font. The letter "G" is significantly larger and overlaps the "R".

Biostorage you can depend on