

User manual - BioBlood

Models: 425, 500, 600/660, 1270/1400



Original User manual

GRAM

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Before You proceed

This user manual is intended for the following product series:

- BioBlood

We recommend that you read this user manual thoroughly through before using the cabinet.

Your feedback is appreciated, if you have any that you would like to share, feel free to email us at: info@gram-bioline.com



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Installation

Setting up

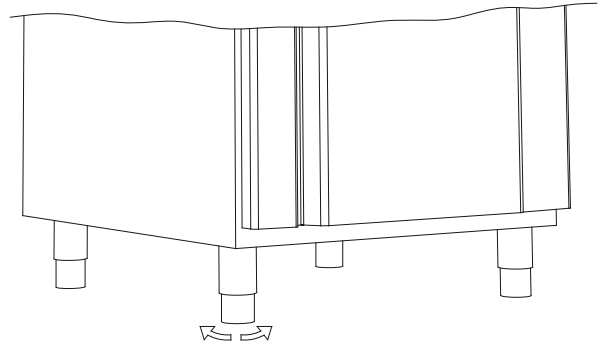
This part of the manual describes how to set up the cabinet.

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.

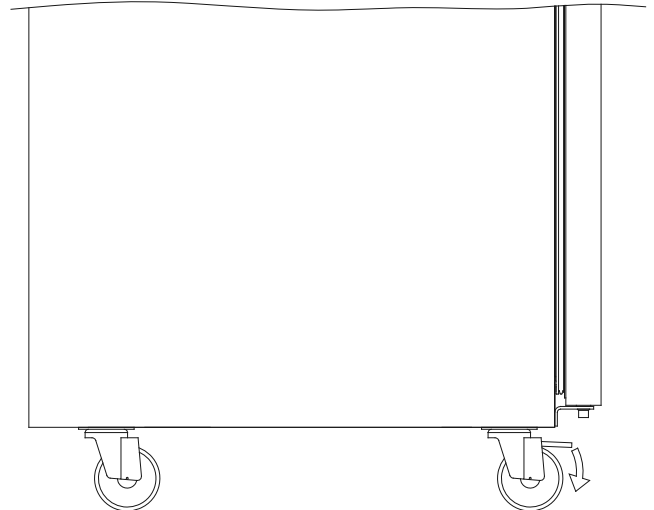
| Cabinet | Minimum ambient operating temperature | Maximum ambient operating temperature |
|-----------------------------------|---------------------------------------|---------------------------------------|
| BR with solid door: +10/+43 °C | +10 °C | +43 °C |
| BR with glass door: +10/+38 °C | +10 °C | +38 °C |
| BF: +10/+43 °C | +10 °C | +43 °C |
| PF: +10/+30 °C | +10 °C | +30 °C |

This part of the manual describes how to adjust legs / casters on the cabinet.

Cabinets equipped with legs should be levelled as shown in the illustration below.



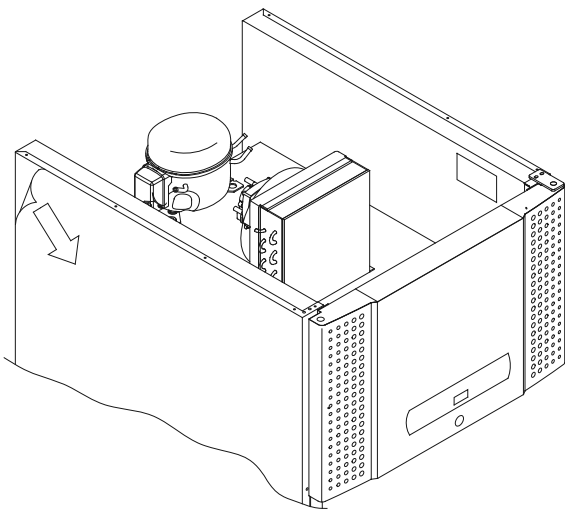
For cabinets equipped with casters, the floor must be level to ensure stable positioning and safe use. When the cabinet is positioned, the 2 front casters should be locked.



Avoid placement of the cabinet in an chlorine/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.



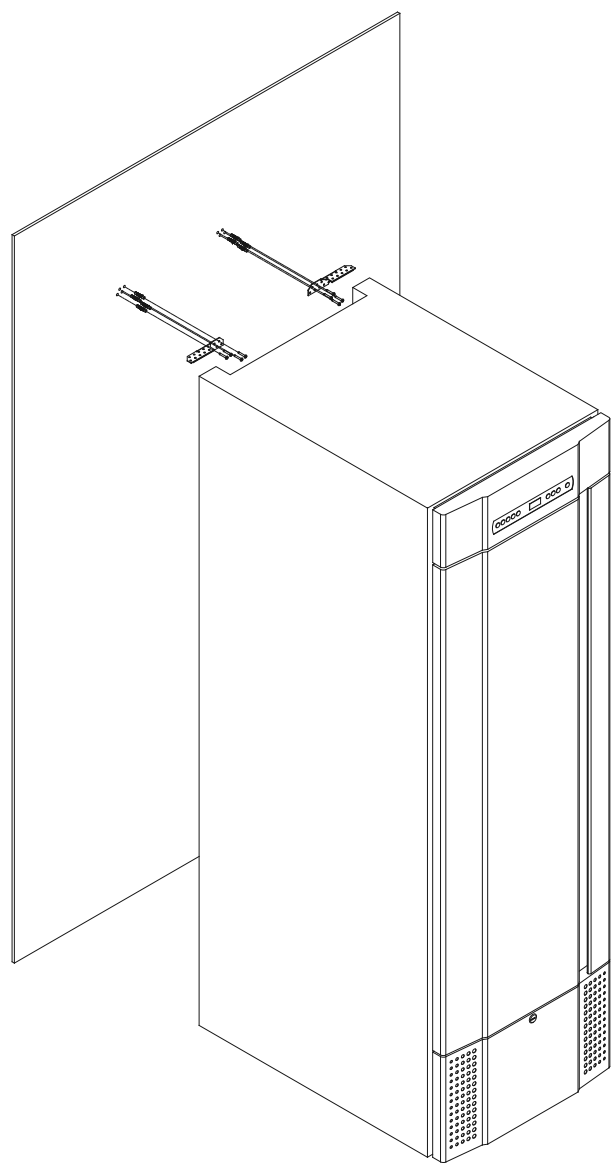
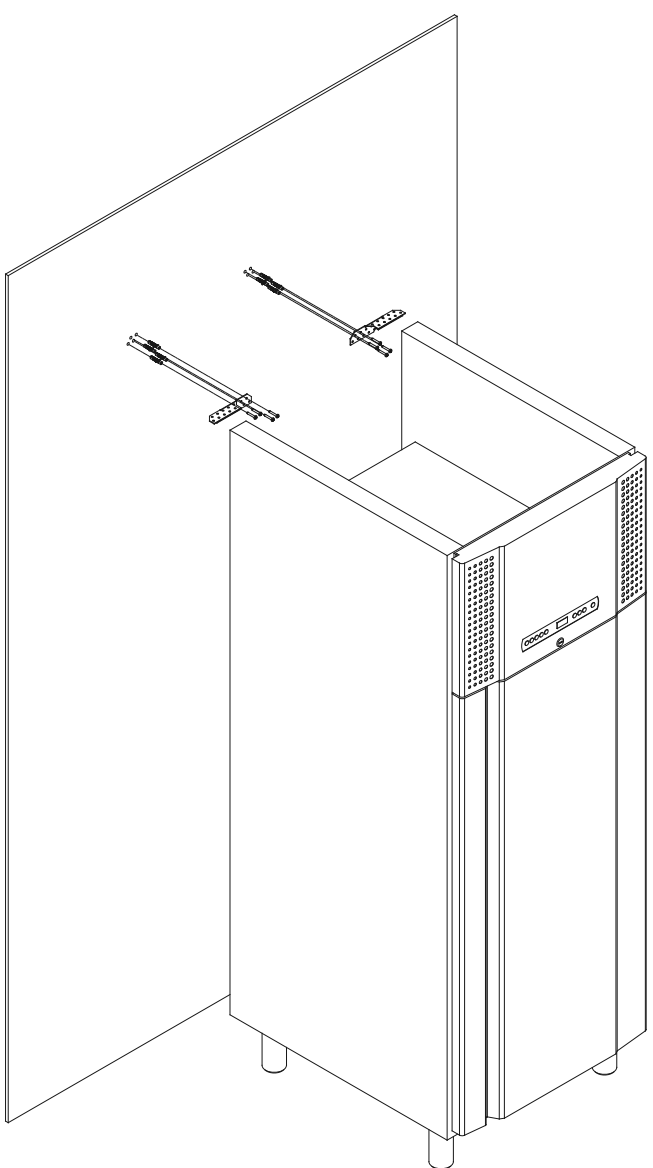
If the cabinet has been laying down (ex. during transport.) Then the cabinet must stand up-right for 24 hours prior to use, This enables oil in the compressor to run back into place.


Setting up



Cabinets with drawers and / or glass door must be secured to a stable vertical surface, ensuring that the cabinet can not tip over when the drawers are drawn to the outermost position, or the door is open. Brackets for securing is included.

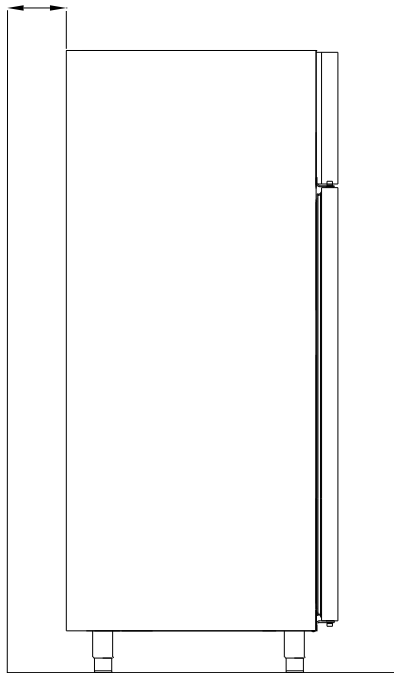
Find the instructions for the tilt bracket below.





 The anti-tilt brackets must be fitted when installing the cabinet, ensuring that the users, surroundings and stored items are not damaged by a tilting cabinet.


The cabinet must always be placed max. 75 mm from the wall while in use. It is optimal to install the cabinet as close to the wall as possible.


Max. 75mm





 Do not cover the upper part of the cabinet if it has a top mounted compressor (applies to BioBlood 500, 600/660 and 1270/1400).

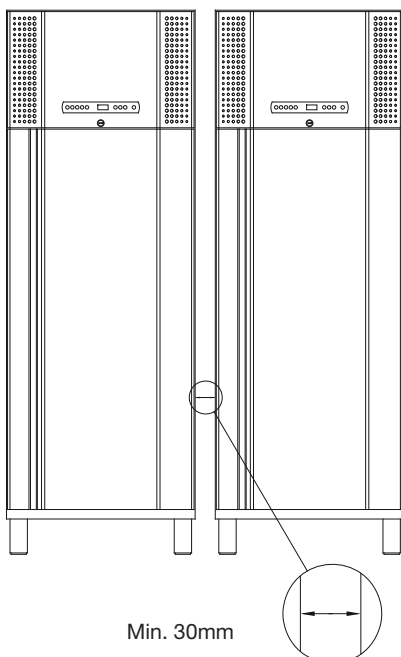
 Do not cover the holes in the front panel of the cabinet.

 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.

 There must be at least a 30mm gap between cabinets.



Voltage-free contact

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

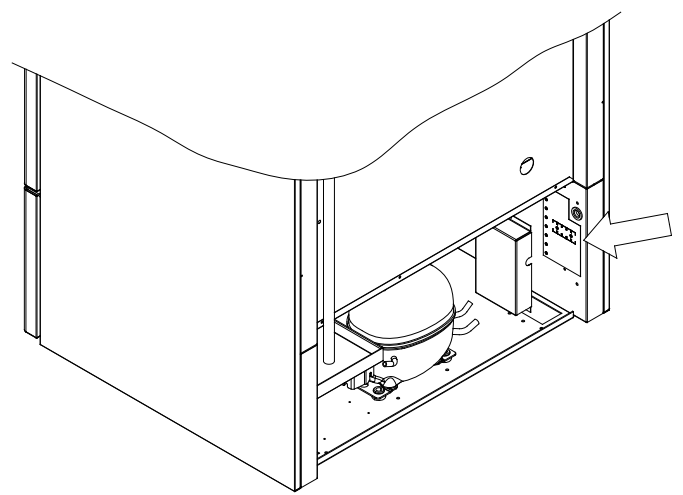
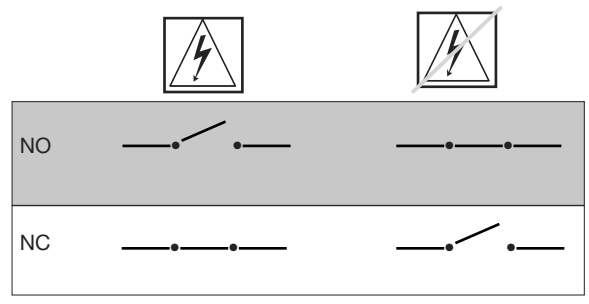
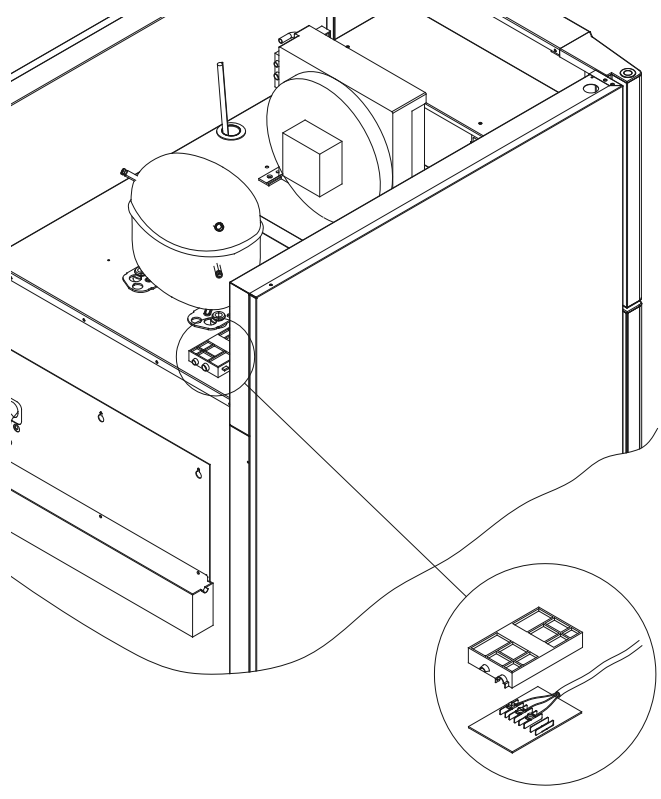


The illustration below shows the three connectors for the relay (used ex. in connecting to CTS or other external monitoring systems). The three connections, are respectively. Common, NO and NC.

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, door alarms and power failures. Temperature alarms and door 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 in the connection block for the voltage-free contact, are secured in place by the press-fit plate that is pressed onto the block, thereby also preventing access to the electrical circuit.

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



Mechanical low temperature protection

This part covers mechanical low temperature protection

The illustrations below depicts the locations of the low temperature protection on the different kinds of cabinets in the BioBlood range.

- Only applicable to models with mechanical low temperature protection -

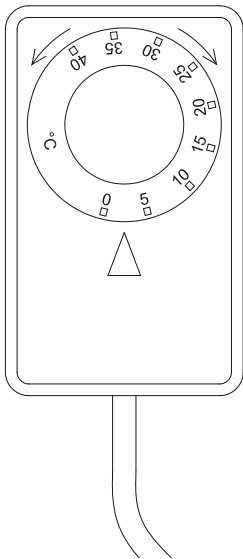
Mechanical low temperature protection is an independent module that is connected to the compressor.

It measures the cabinets temperature and turns off the compressor (cut-off) if the temperature in the cabinet drops below the set value, ensuring that the cabinet does not become colder.

Please note that low temperature protection is set to between +2 and +2.5°C as factory settings.

Ensure that the scale is set at the correct temperature prior to installation.

The scale of the low temperature protection is turned counterclockwise to adjust the "cut-off" down, and clockwise to adjust the "cut-off" up.

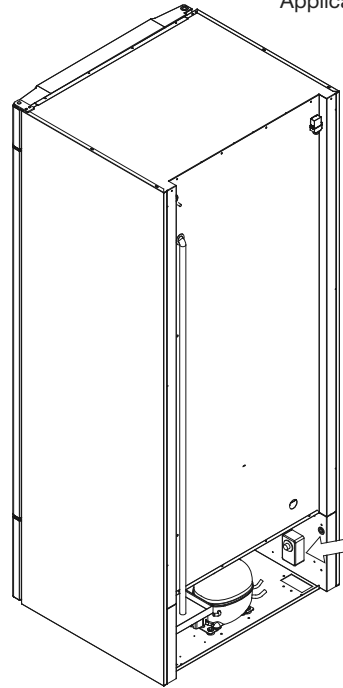


Example:

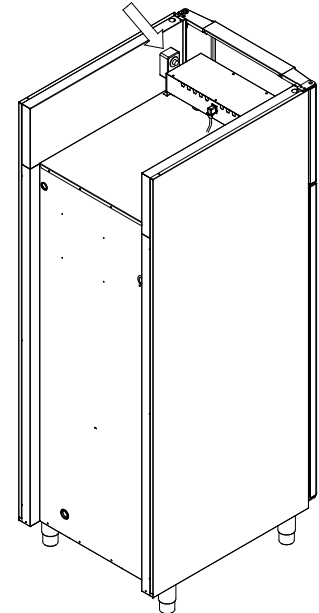
The compressor is turned off by the low temperature protection at 2.5 °C, the desired "cut-off" temperature is 1.5 °C.

Turn the scale on the low temperature protection counterclockwise until the desired value is set.

Applicable to BioBlood 425



Applicable to BioBlood 500, 600/660 and 1270/1400



Connection to electricity

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

Note that there are special regulations for products that are in accordance with EN 60079-15 zone 2.



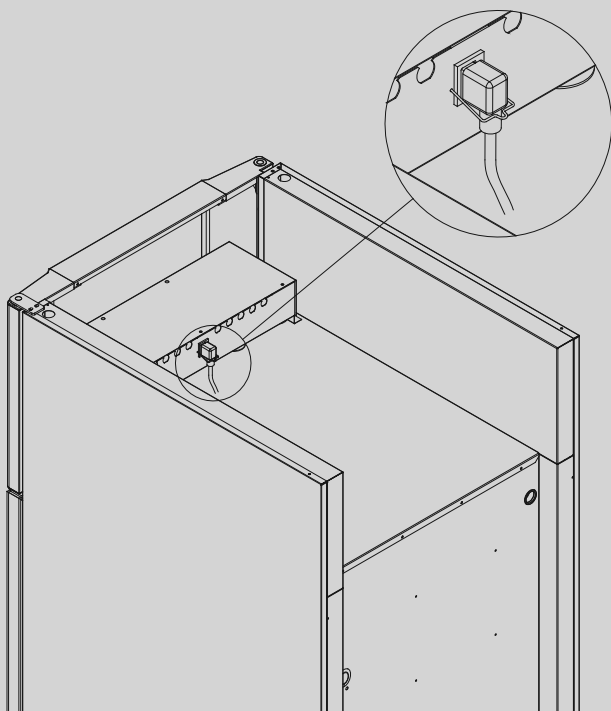
The appliance has been manufactured in accordance with EN 60079-15: Electrical apparatus for explosive gas atmospheres - Part 15: Type of protection "n". Zone 2 is the applicable zone. If the appliance is to be installed in a zone 2 environment, specialist personnel should perform the installation, or be consulted beforehand, in order to ensure that the appliance is installed in compliance with the guidelines currently contained in the standard.



The cabinet is intended for connection to alternating current. The connection values for voltage (V) and frequency (Hz) are given on the nameplate in the engine room.



The power cord from the mains is plugged in the terminal box, in the engine room. The plug is then fixated 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 appliance 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



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

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

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

The halogen lighting must never be dismantled while the appliance is connected to a power source.

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

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

When setting up in an ordinary scenario that is not subject to regulations for Zone 2:

The appliance may be connected in accordance with applicable local heavy current regulations.

In both cases:

Use a three-wire plug, if the power outlet is intended for a three-wire plug, a the lead in green / yellow insulation should be connected to the ground terminal.

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

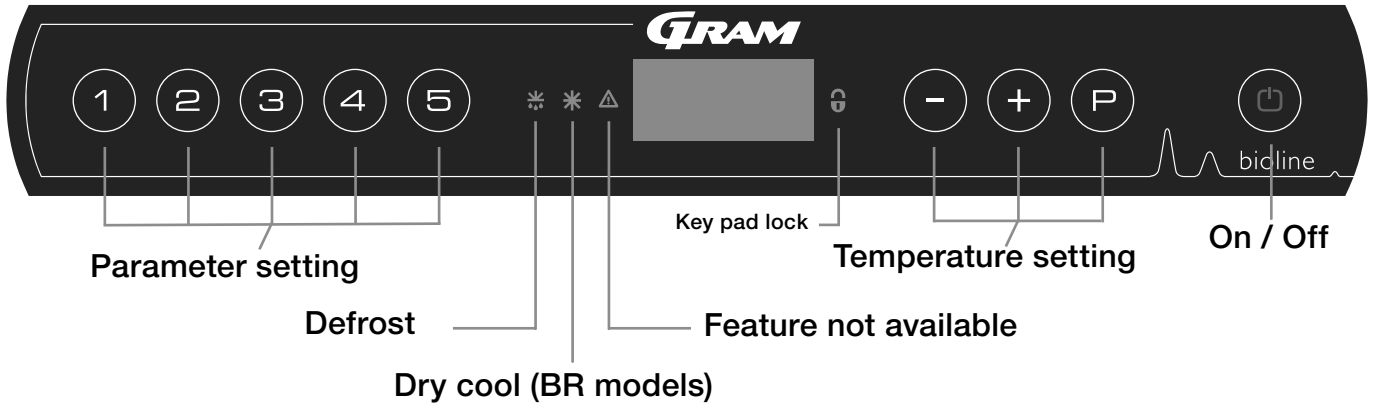
All earthing requirements stipulated by the local electricity authorities must be observed. The cabinet plug and wall socket should then give correct earthing. If in doubt, contact your local supplier or authorized electrician.

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

Start-up

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 configureable parameters.
- Defrost - Defrost in progress
- Dry cool - Dry cool in progress (BioBlood BR-models)
- 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 menu and set the parameters of the cabinet.

The buttons have following functions in the menu:

- (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 setpoint for instance).
- (-) - Scroll downwards in a given menu / lower a given value in parameter settings.
- (⏪) - Go a menu step back

On / Off

Press the (⏪) button to turn the cabinet on. Press the (⏪) 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 software variant and a displaytest.

The cabinet is ready when the temperature is displayed. The cabinet will automatically start a defrost-cycle when turned on, and terminate it again after a system check..

⚠ Servicing:

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

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

Temperature setting

Temperature adjustments are done by holding the (P) button 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.

Please note: electric low temperature protection is not applicable to BioBlood cabinets

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 |
| | | dA | On/off | Door alarm. Code for activated alarm [A1]. [1=on / 0=off] |
| | | dAd | [Min.] | Delay of door alarm. |
| | | bU | On/off | Acoustic signal for alarm codes [A1], [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 |
| | | dA | On/off | Door alarm. Code for activated alarm [A1]. [1=on / 0=off] |
| | | dAd | [Min.] | Delay of external door alarm |
| | | bU | On/off | Acoustic signal for external alarm codes [A1], [A4], [A5]. [1=on / 0=off] |
| Calibration of sensors | CAL | CA | [° K] | Calibration of A-sensor. Reference sensor for the refrigeration system |
| | | CE | [° K] | Calibration of E-sensor. Reference sensor for the display and alarms |
| | | CF | [° K] | Calibration of F-sensor. Reference sensor for the low temperature protection |
| Electric low temperature protection | FP | ACt | On/off | Activation/deactivation of low-temperature protection |
| | | tES | On | Test of low-temperature protection |
| | | SEt | [° C] | Setting of the cut-off temperature for the low-temperature protection |
| | | PrE | [...] | Read out of the real-time temperature of the F-sensor |
| | ALL | | | Activation of escorted alarm limits. [FAS]= locked limits / [ESC] = follows setpoint |
| | dEF | | | Number of defrosts per 24 hours (4 is factory setting) |
| | dPS | | | Reference sensor for the display (A, E or F) (E is factory setting) |

Other Shortcuts


| Buttons: | Duration: | Function: |
|-----------------|-------------|--|
| (P) + (⊕) | > 3 seconds | Start or stop a defrost. |
| (⊕) + (1) | > 6 seconds | Activating / deactivating the key pad lock. |
| (P) | - | Shows temperature setpoint value. |
| (+) | - | Shows the highest registered temperature spike (since the last clear and reset alarm history). |
| (-) | - | Shows the lowest registered temperature spike (since the last clear and reset alarm history). |
| (+) + (-) | > 3 seconds | Clear and 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.

| Display code | Explanation |
|--------------|--|
| - 0 - | Door is open. |
| A1 | Door alarm "dAd" from LAL and/or EAL has been activated. |
| 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 LLL 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. |
| F3 | Error on the 1. condenser sensor. Service is required. |
| F4 | Error on the 2. 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. |

Cancelling an acoustic alarm



Cancelling a door alarm: [A1] flashes in the display. Press  to cancel.

Cancelling a temperature alarm: [A2 and/or A3] 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 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 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 cancelled, but the alarm history contains information.



Parameter settings

Dry cool

The following part covers activation / deactivation of the dry cool feature (only applicable to BR models).

dC - Setting the dry cool feature

- ↳ Press and hold P + 1 for more than 3 seconds
- ↳ Press P to choose "dC"
- ↳ Press - or + to choose between
[H1= on] [H0=off]
- ↳ Press P to confirm
- ↳ Leave the user menu by pressing P , press several times until the cabinet temperature is shown in the display.

Please note that the dry cool feature reduces that relative humidity in the cabinet, but does not control it.

Furthermore, please note that activation of the dry cool feature can cause greater fluctuations in the cabinet temperature during defrost.

Local alarm settings

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

LHL - Setting the upper alarm limit [° C]

- ↳ Press and hold P + 1 for more than 3 seconds
- ↳ Press + to proceed to "LAL" (Note: only applicable to BR models)
- ↳ 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
- ↳ Press + to proceed to "LAL" (Note: only applicable to BR models)
- ↳ 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 alarm settings

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

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

- ↳ Press and hold $\text{P} + \text{1}$ for more than 3 seconds
- ↳ Press + to proceed to "LAL" (Note: only applicable to BR models)
- ↳ 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 $\text{P} + \text{1}$ for more than 3 seconds
- ↳ Press + to proceed to "LAL" (Note: only applicable to BR models)
- ↳ 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

On / Off local door alarm

The following part covers the setting of the door alarm and the delay of the door alarm.

Delay for local door alarm

dA - Activate / deactivate of local door alarm

- ↳ Press and hold $\text{P} + \text{1}$ for more than 3 seconds
 - ↳ Press + to proceed to "LAL" (Note: only applicable to BR models)
 - ↳ Press P to select "LAL". "LHL" is now shown in the display
 - ↳ Press + several times until "dA" is shown in the display
 - ↳ Press P to select "dA".
 - ↳ Press - or + to activate / deactivate the local door alarm [1 = activated / 0 = deactivated]
 - ↳ Press P to confirm the set value
- The local door alarm is now 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

dAd - Setting the delay of the local door alarm [min.]

- ↳ Press and hold $\text{P} + \text{1}$ for more than 3 seconds
 - ↳ Press + to proceed to "LAL" (Note: only applicable to BR models)
 - ↳ Press P to select "LAL". "LHL" is now shown in the display
 - ↳ Press + several times until "dAd" is shown in the display
 - ↳ Press P to select "dAd". The delay of the local door alarm is now shown in the display
 - ↳ Press - or + to set the desired value for the delay of the local door alarm
 - ↳ Press P to confirm the set value
- The delay of the local door alarm is now 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

Local alarm 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
 - ↳ Press + to proceed to "LAL" (Note: only applicable to BR models)
 - ↳ 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 alarms should be supported by external alarms. This can be done by utilizing the possibility of external alarms via the voltage-free contact.

Please find instructions for connecting the "voltage-free contact" in "Installation"

External alarm settings

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

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

- ↳ Press and hold $\text{P} + \text{1}$ for more than 3 seconds
- ↳ 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 $\text{P} + \text{1}$ for more than 3 seconds
- ↳ 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 alarm settings

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

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

- ↳ Press and hold $\text{P} + \text{1}$ for more than 3 seconds
- ↳ 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 $\text{P} + \text{1}$ for more than 3 seconds
- ↳ 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

On / Off external door alarm

The following parts covers the setting and delay, of the external door alarm.

Delay for external door alarm

dA - Activation / deactivation of external door alarm

- ↳ Press and hold $\text{P} + \text{1}$ for more than 3 seconds
 - ↳ Press + to proceed to "EAL"
 - ↳ Press P to select "EAL". "EHL" is now shown in the display
 - ↳ Press + several times until "dA" is shown in the display
 - ↳ Press P to select "dA"
 - ↳ Press - or + to activate / deactivate the external door alarm [1 = activated / 0 = deactivated]
 - ↳ Press P to confirm the set value
- The external door alarm is now 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

dAd - Setting the delay of the external door alarm [min.]

- ↳ Press and hold $\text{P} + \text{1}$ for more than 3 seconds
 - ↳ Press + to proceed to "EAL"
 - ↳ Press P to select "EAL". "EHL" is now shown in the display
 - ↳ Press + several times until "dAd" is shown in the display
 - ↳ Press P to select "dAd". The delay of the external door alarm is now shown in the display
 - ↳ Press - or + to set the desired value for the delay of the external door alarm
 - ↳ Press P to confirm the set value
- The delay of the external door alarm is now 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

External alarm settings

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

bU - Activation / deactivation of the acoustic external alarms

- ↳ Press and hold P + 1 for more than 3 seconds
 - ↳ Press + to proceed to "EAL"
 - ↳ Press P to select "EAL". "EHL" 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 external acoustic alarms [1 = activated / 0 = deactivated]
 - ↳ Press P to confirm the set value
- The external 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

Sensor calibration

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

The temperature sensors connected to MPC controller can be calibrated independently of each other under the parameter cAL.

Calibration is used in cases where there are deviations in the cabinets actual operation compared to 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, not in storage space. The location of the A sensor must not be altered.

The E-sensor is placed in the cabinet storage space and can be moved around in the cabinet to get the desired reference point for temperature. The E-sensor is the default display sensor and reference for the alarms. The E-sensor has no effect on control of the refrigeration system.

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

The E-sensor is calibrated 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. Calibration of E-sensor is named "cE"

Practical example of calibration:

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

With a setpoint of +4 °C, the actual temperature inside the cabinet is between +2 and +4 °C. The desired temperature range is between +3 and +5 °C. This means that "cA", in this case, should be -1,0K, so that the refrigeration system stops 1,0K before and starts 1,0K later than the setpoint normally otherwise would dictate.

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

With a setpoint of +4 °C, the actual temperature inside the cabinet is between +4 and +6 °C. The desired temperature range is between +3 and +5 °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.

Calibration 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 calibrate the A-sensor
- ↳ Press (P) to confirm the set value

-The A-sensor is now calibrated, 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

Calibration 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 calibrate the E-sensor
- ↳ Press (P) to confirm the set value

- The E-sensor is now calibrated, 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 (P) + (1) for more than 3 seconds
- ↳ Press (+) several times until "ALL" is shown in the display
- ↳ Press (P) to select "ALL"
- ↳ Press (-) or (+) to select set or escorted alarm limits
- ↳ Press (P) to confirm the set value
- ↳ Leave the user menu by pressing (⏏) several times until the cabinet temperature is shown in the display

Defrosts / 24 hours

The following part covers the setting of the amount of defrosts per 24 hours.

dEF- Number of defrosts

- ↳ Press and hold (P) + (1) for more than 3 seconds
- ↳ Press (+) several times until "dEF" is shown in the display
- ↳ Press (P) to select "dEF"
- ↳ Press (-) or (+) to set the desired amount of defrosts per 24 hours (factory setting is 4)
- ↳ Press (P) to confirm the set value
- ↳ Leave the user menu by pressing (⏏) several times until the cabinet temperature is shown in the display



Please note: It is very important that defrosts should not be set to 0 for a prolonged period of time, as this will reduce the cooling capacity of the cabinet.

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

"Escorted alarm" is fixed limits locked to the setpoint. The temperature 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 $\text{P} + \text{1}$ 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 ⏏ 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.

Electric low temperature protection

Electric low temperature protection is not available for BioBlood.

FP - Activation / deactivation of low temperature protection

- ↳ Press and hold (P) + (1) for more than 3 seconds
- ↳ Press (+) several times until "FP" is shown in the display
- ↳ Press (P) to select "FP". "Act" is now shown in the display
- ↳ Press (P) to select "Act"
- ↳ Press (-) or (+) to activate / deactivate [1 = activated / 0 = deactivated]
- ↳ Press (P) to confirm the set value
- ↳ Leave the user menu by pressing (⏏) several times until the cabinet temperature is shown in the display

FP - Test of low temperature protection

- ↳ Press and hold (P) + (1) for more than 3 seconds
- ↳ Press (+) several times until "FP" is shown in the display
- ↳ Press (P) to select "FP". "Act" is now shown in the display
- ↳ Press (+) to progress to "tES"
- ↳ Press (P) to select "tES" - test will then be performed
- ↳ Leave the user menu by pressing (⏏) several times until the cabinet temperature is shown in the display

Electric low temperature protection is not available for BioBlood.



FP - Setpoint of low temperature protection

- ↳ Press and hold (P) + (1) for more than 3 seconds
- ↳ Press (+) several times until "FP" is shown in the display
- ↳ Press (P) to select "FP". "Act" is now shown in the display
- ↳ Press (+) several times until "SET" is shown in the display
- ↳ Press (P) to select "SET"
- ↳ Press (-) or (+) to select the setpoint temperature for the low temperature protection
- ↳ Press (P) to confirm the set value
- ↳ Leave the user menu by pressing (E) several times until the cabinet temperature is shown in the display

FP - Temperature of low temperature protection sensor

- ↳ Press and hold (P) + (1) for more than 3 seconds
- ↳ Press (+) several times until "FP" is shown in the display
- ↳ Press (P) to select "FP". "Act" is now shown in the display
- ↳ Press (P) to select "Pre"
- ↳ Press (P) to show the low temperature protection sensor temperature
- ↳ Leave the user menu by pressing (E) several times until the cabinet temperature is shown in the display

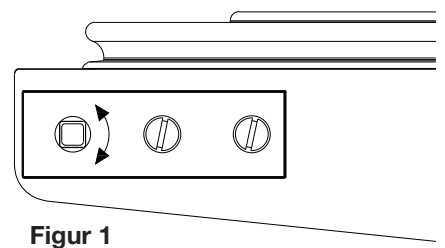
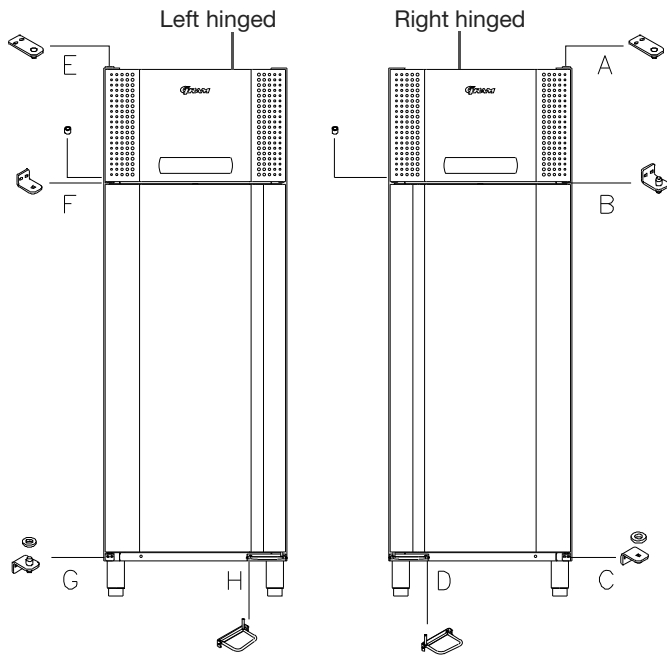
Reversing of door

The following part covers the process of reversing a door on a cabinet with a top mounted compressor


1. Disconnect the cabinet at the wall socket. Remove the hinge in position "A". You are now able to remove the front panel (remember to disconnect cables to the display and lighting).
2. Now remove the hinge in position B, lift the door out of the bottom hinge in position "C". Remove the foot pedal in position "D", and mount the new foot pedal in position "H".
3. Move the hinge from position "B" to position "G", the nylon washer is attached.
4. Rotate the door 180 ° relative to the original installation. Put the self closing in the neutral position (see Fig. 1). Check that the spring is in correct working order before further assembly.
5. Move the hinge from position "C" to "F". Set the door in the hinge at position "G". Adjust the door and finally fasten the hinge in position "F".
6. Drop the front panel into the hinge in position "F". Attach the hinge from position "A" to position "E".
7. Re-connect the cables for the front panel and close the panel. Reconnect the power at the wall socket.

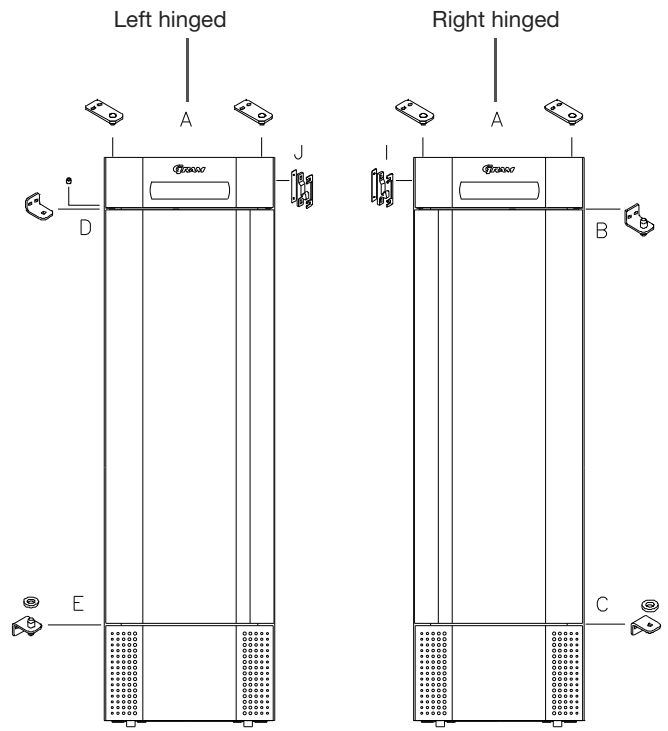
The following part covers the process of reversing a door on a cabinet with a bottom mounted compressor

1. Disconnect the cabinet at the wall socket. Remove the hinge in position "A". Remove the top front panel (remember to disconnect cables to the display and lighting). Remove the bottom front panel by pulling it outwards.
2. Now remove the hinge in position "B", lift the door out of the bottom hinge in position "C". Mount the hinge from position "B" in position "E", the nylon washer attached.
3. Rotate the door 180 ° relative to the original installation. Put the self closing in the neutral position (see Fig. 1). Check that the spring is in correct working order before further assembly.
4. Move the hinge from position "C" to position "D".
5. Set the door in the hinge at position "E". Adjust the door and finally fasten the hinge in position "D". Move closing mechanism for the top front panel from position "I" to position "J".
6. Drop the top front panel into the hinge in position "D". Re-connect the cables in the front panel and the upper hinge of position "A". Install the bottom front panel. Reconnect the power at the wall socket.



Figur 1

 Door pedal and springs are not reversible, contact your local Gram BioLine distributor for further information regarding spare parts.



Ordinary use

The following part shows how items should be placed and stored in the cabinet.

Keep the marked areas in the cabinet (shown on this page) clear of all items, thereby ensuring adequate air circulation, and therein cooling.

Do not place items beneath the lowest shelf bracket.

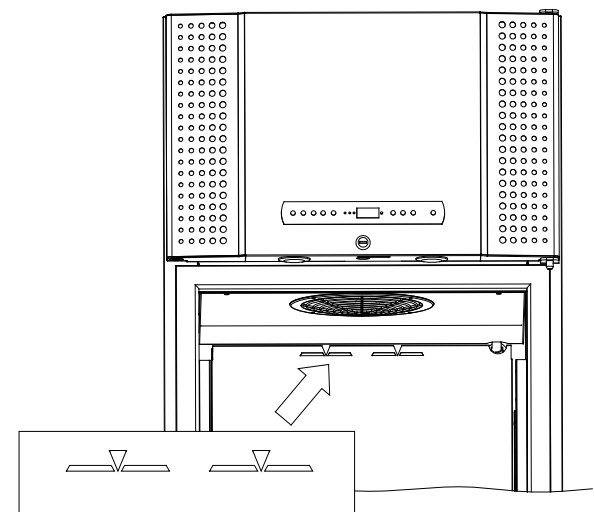
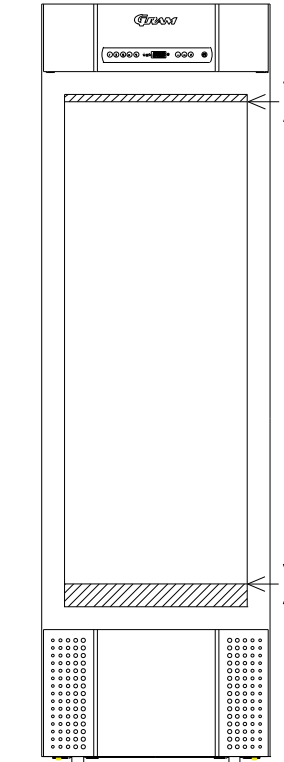
All products to be stored, that are not wrapped or packed, must be covered in order to avoid unnecessary corrosion of the inner parts of the cabinet.



Items placed on the bottom of the cabinet will cause the air circulation to be impeded, which reduces the cabinets performance.

The items should be evenly distributed in the cabinet, with minimum layer-thickness / maximum surface. And at the same time, the air should be able to circulate freely between the items.

The illustration on the right shows the maximum load height of the cabinet.



Cleaning

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

Always disconnect the cabinet before 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.

For the external maintenance – use stainless steel polish.

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.

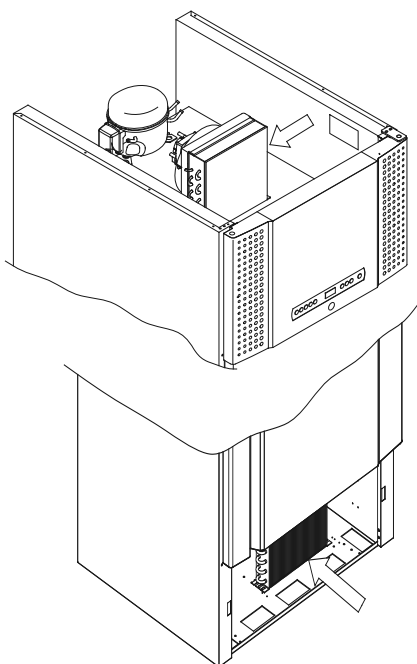
The air filters on the condenser and the front panel should be removed and cleaned with warm water (max. 50°C).

The re-evaporation tray should be emptied and cleaned at least once a year.

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

Cleansing agents containing chlorine or compounds of chlorine as well as other corrosive agents, may not be used, as they might cause corrosion to the stainless panels of the cabinet and the evaporator system.

The location of the condensers for both bottom- and top-mounted cabinets is illustrated below.



Door gasket

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

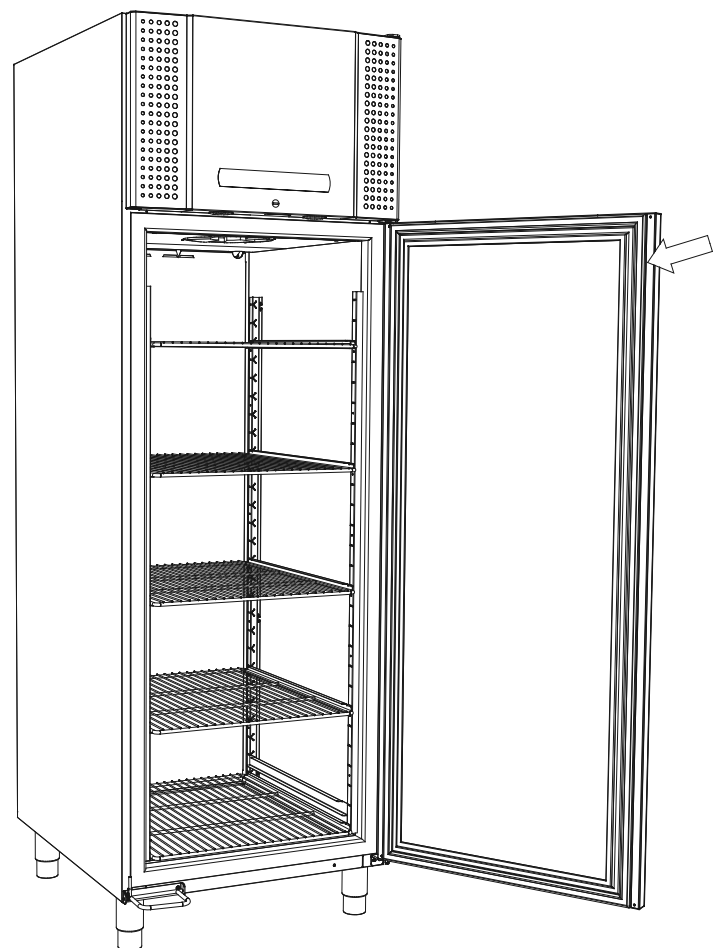
Door gaskets are an important part of a cabinet, door gaskets with impaired functionality reduces a cabinets seal with the door. Impaired seals can lead to increased humidity, iced evaporator (and thus reduced cooling capacity), and in some cases, decreased lifetime expectancy of the cabinet.

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.

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

The illustration below shows the location of the seal on a BioBlood 660



General info

Responsibility

Read the following carefully, for information on technical safety and responsibility on Gram Commercial 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. Gram Commercial can only guarantee functional and safety requirements on the cabinets, if above mentioned is adhered to.



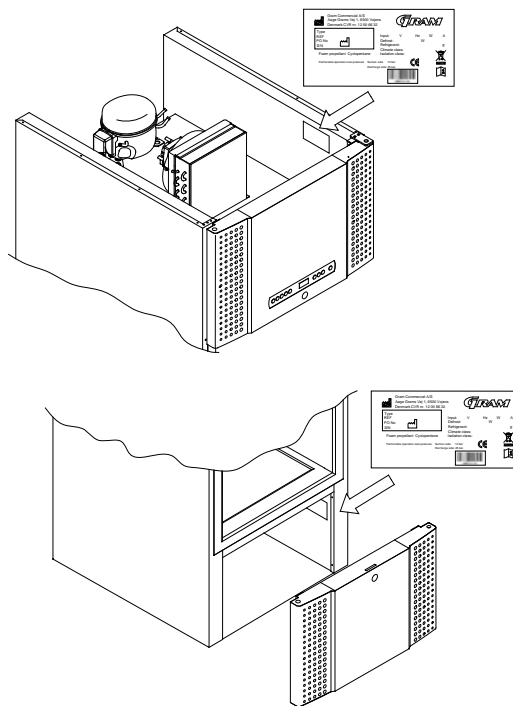
The cabinets refrigeration components should at least once a year, be checked by Gram Commercial technician or a similar professional.

Service

The refrigerating system and the hermetically sealed compressor require no maintenance. However, the condenser and air filter 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, PART NO and SE. NO of the cabinet. This information can be found on the nameplate.



The cabinet has to be disconnected at the mains if service is to be done on electrical components of the cabinet.

It is not sufficient to switch the cabinet off on the front panel, due to the fact that there is still a possibility that there is current in some of the components of the cabinet.



Contact Gram customer service or qualified personnel if the bulb(s) in the two spots above the door needs replacing

Defrost water

The cabinet creates defrost water, that is directed out into a re-evaporation tray at the back of the cabinet.

BioBlood (500, 600/660, 1270/1400):

Defrost water is led through a tube in insulation to a re-evaporation tray at the back of the cabinet.

BioBlood 425:

Defrost water is led through a tube in the insulation to a re-evaporation tray in the compressor room in the cabinet.

Door closing mechanism

Please note that BioBlood cabinets are equipped with doors that have a self-closing mechanism.

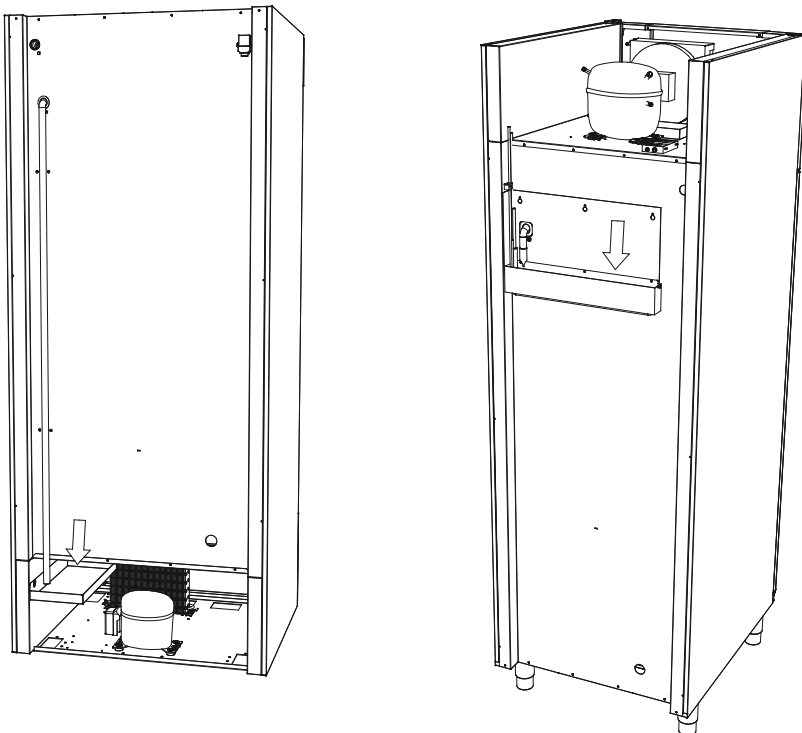
The door is equipped with an automatic closing mechanism. Open the door up to 90 °, and it will shut by itself. Open the door more than 90 ° and door will remain open.



It is recommended that the re-evaporation tray is cleaned at least once a year. This shall only be done while the cabinet is turned off.

Be careful not to damage the defrost water tube and heating element (located in the tray) when cleaning.

Below are the re-evaporation trays for a BioBlood 425 and BioBlood 600 shown



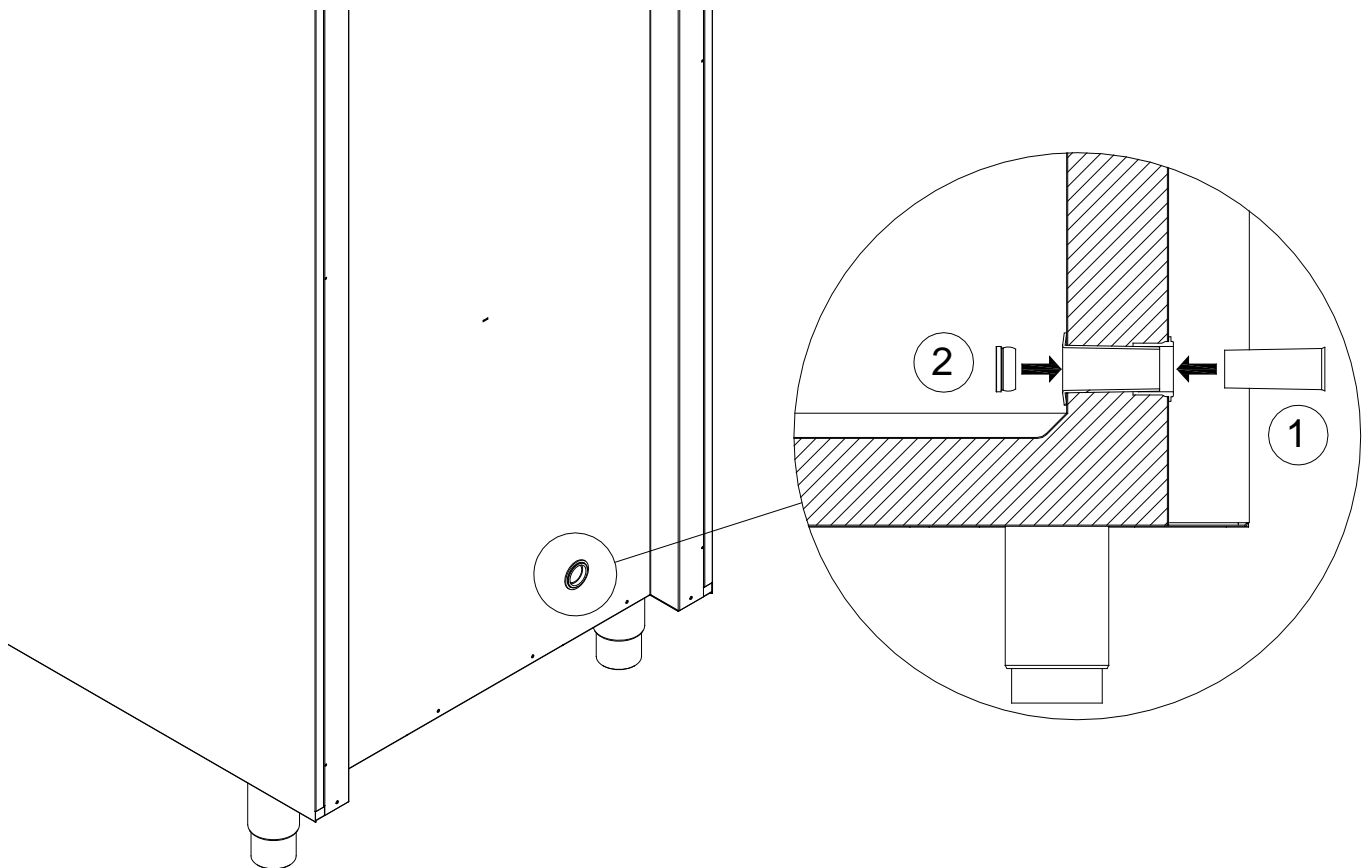
Access port

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 BioBlood 600 cabinet.

All access ports are constructed in the same fashion, with a conical polystyrene plug (fitted from the back of the cabinet) and a plastic cap (fitted from the inside of the cabinet).

Please note, it is very important to re-fit the polystyrene plug and plastic cap after mounting sensor, probe etc. Failing to do so can result in lowered performance or break-down of the cabinet.



The following part briefly covers the Gram Datalogger, which comes with all BioBlood cabinets as standard.

All BioBlood models come with Gram Data Logger as standard.

Gram Data Logger allows you to monitor the temperature through our MPC controller.

The collected logs can be downloaded on a computer and read from there.

It is also possible to set up alerts that make notifications if the cabinet exceeded temperature limits (set by the user).

For more information, as well as a manual for the Gram Data Logger, go to: www.gram-bioline.com -> Download

Guideline for Service Technicians

- How to handle blood infected equipment when servicing BioBlood cabinets -

This guideline is intended to provide guidance for employees servicing BioBlood cabinets. Thereby ensuring that contact with biohazardous specimens (e.g. blood), does not lead to contamination and thereby infection.

Foreword

Gram BioBlood cabinets are intended for storage of blood and/or specimens that could be hazardous to your health if infection occurs. With this in mind, simple but effective precautions can be taken to enable you to work safely with/around BioBlood cabinets.

1 - Ensuring maximum facility and patient safety -

There is always an inherent risk of *you*, contributing to contamination of the facility, its equipment and potentially, its patients when servicing a BioBlood cabinet. Therefore:

- Ensure that your tools are adequately clean prior to any work on a BioBlood cabinet.
- Ensure that you are not ill, when servicing a BioBlood cabinet!
This includes anything from the common cold, influenza and diarrhoea to pneumonia and anything in between. You as a host of an illness, have the risk of contaminating the facility, its equipment and potentially infecting patients if you disregard this precaution.
If you are sick, or have a suspicion of coming down something, do not hesitate to sign off the job to another colleague. We encourage full disclosure on this part, patient safety is of utmost importance.

The main focal point is that we want to ensure lowest possible risk of contamination!

2 - Always follow local hygiene regulations-

- Always follow any local hygiene regulations that may apply to the facility in which you are servicing a BioBlood cabinet.

3 - Recommended personal behaviour by our bioanalyst -

- All equipment used for biohazardous specimens (blood, plasma or other material of human origin) are to be considered infected.
- Leave coat, and other personal belongings not needed for the job, in a safe area (gowning room, wardrobe etc).
- Always use rubber gloves, the facility in which you are servicing the BioBlood cabinet can supply gloves if you do not have your own.
- Be exceedingly careful If you have wounds/scratches, as these wounds/scratches renders you without protection from biohazards if contact should occur.
- Always consider gloves as contaminated, even if it is not visually apparent. It is important that you consciously only touch what you consider contaminated areas i.e the inside of the cabinet of the BioBlood cabinet - if you need "clean hands", remove the gloves and wash your hands before touching personal belongings such as phones, car keys etc.
- Change gloves immediately if they are visually contaminated.
- Consider your toolbag, tools, notepad, pens etc. used when servicing the cabinet as contaminated, this means that these items are not to be used outside facilities using BioBlood cabinets. This applies especially to your own home or with customers that are not in the hospital sector.
- Phone, laptop, car keys and the like, should never come in direct contact with tools and equipment that have been used in contaminated areas. If you need to use the phone, laptop or similar while servicing a cabinet, wash your hands thoroughly in advance.

4 - Wash hands -

- After contact with any BioBlood cabinet you should wash your hands and wrists very carefully with soap and disinfectant (also applies when gloves have been used, as they do not restrain all kinds of biohazardous specimens).

5 - Change your clothes -

- If you have been working with a BioBlood cabinet, you should always change your clothes immediately after leaving the facility. This applies regardless of you going directly home, to the office or another service job.

Declaration of conformity

Declaration of conformity is readily available for all BioLine cabinets.

Find declaration of conformity for the cabinet at: www.gram-bioline.com

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. Danger of wedging of body parts in the drawer column between the drawers and interior of the cabinet , show due diligence when using the drawers. Negligence of these precautions can lead to injuries.
4. Be particularly vigilant in relation to closing doors with self-close mechanism as these are spring-loaded. Negligence of these precautions can lead to injuries.
5. Unlocked castors can lead to unexpected movements of the cabinet. Lock the castors after installation. Negligence of these precautions can lead to injuries.
6. The re-evaporation tray, re-evaporation tray heating element, pressure pipes and compressors develops considerable heat during operation. Assure yourself that these components are sufficiently tempered before touching. Negligence of these precautions can lead to injuries.
7. The evaporator develops considerable cold during operation. Reassure yourself that the evaporator is sufficiently tempered before touching. Negligence of this precaution may lead to injuries.
8. 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.

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

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