LIEBHERR

Service Manual

CBN(bs,ef) 4315, 4815 from 20A

Premium, A+++

Combined fridge-freezer with BioFresh and NoFrost

Issue 01

Date 24.03.2016

Translation of original instructions

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Document information and key to changes

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Liebherr-Hausgeräte Ochsenhausen GmbH
Memminger Straße 77-79
88416 Ochsenhausen/Deutschland

Tel.:+49 7352 928-0
E-Mail: info.lhg@liebherr.com
Internet: home.liebherr.com

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1 User Guidance

Service instructions and product are marked with various symbols. The symbols and their functions make the safe and efficient use of the product easier.

1.1 Warning information

1.1.1 Structure of warning information

DANGER
Type and source of danger.
Consequences of danger.
- Countermeasures to avoid danger.

Warning of an immediately threatening danger that could lead to death or serious injury if not avoided.

1.1.2 Classification of warning information

DANGER
Identifies an imminent dangerous situation that will result in death or serious physical injury if not avoided.

WARNING
Identifies a dangerous situation that could result in death or serious physical injury if not avoided.

CAUTION
Identifies a dangerous situation that could result in slight or medium physical injuries if not avoided.

1.2 Notes

ATTENTION
Identifies a dangerous situation that could result in damage to property if not avoided.

NOTE
Identifies useful notes and tips.

1.3 Symbols in the service instructions

1.3.1 Action guidelines

Structure of action guidelines:

- ▸ Instructions for an action.
- ☐ Information on results if required.

1.3.2 Lists

Structure of non-numbered lists:

- ■ List point
- ■ List point
- ☐ List result

Structure of numbered lists:

1. List point
2. List point

(1) List point
(2) List point

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2 Safety notes

2.1 Electric shock

Incorrect maintenance and repair

- Disconnect appliance from the mains solely by pulling out the mains plug.
- In cases of fault, disconnect appliance from the mains.
  - by pulling out the mains plug
  - by deactivating the fuse
- Make sure that the appliance is disconnected from the power supply during maintenance or repair work.
- Only service and repair the appliance according to the information in the service documentation and repair documentation.
- Only operate this appliance with an intact and appropriate mains power cable.

2.2 Fire

Incorrectly connected appliance

- Do not use an extension cable.
- Do not use distributor blocks.
- Make sure that the appliance does not come into contact with any connectors or mains cables.

Flammable refrigerant

- Make sure that the refrigeration circuit pipes are undamaged.
- Do no use any naked flames or ignition sources in the appliance interior.
- Do not use any electrical devices in the appliance interior.
- Do not use any naked flames or ignition sources when repairing the refrigeration circuit.
- Do not store any explosive materials or spray cans with flammable propellants (e. g. butane, propane, pentane) inside the appliance.
  - See printed list of contents or flame symbol on the spray can.

Blocked ventilation openings

- Keep ventilation openings clear.
- Ensure efficient air intake and exhaust ventilation.

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2.3 Injuries

Coldness

- Avoid skin contact with cold surfaces or refrigerated/frozen food.
- Wear gloves for long-term contact with cold surfaces or refrigerated/frozen food.

Incorrect transport

- Do not transport or carry the appliance on your own.

Incorrect opening or closing

- Do not put fingers in the hinge when opening or closing the door.

2.4 Mechanical damage

Poor access to the appliance

- Remove built-in appliances correctly and carefully.
- Place built-in appliances on a suitable underlay.
- Ensure that free-standing appliances are moved only on their transport castors.

2.5 Damage to the electronics

Incorrect connection to the mains

- Do not use stand-alone inverters.
- Do not use energy-saving connectors.

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3 Target group

3.1 Maintenance/repair personnel

3.1.1 Areas of responsibility

The maintenance/repair personnel:

- maintain the machine to ensure safe and reliable function.
- have read and understood the operating instructions.
- wear protective clothing.
- carry out all the prescribed maintenance activities.
- do not make any alterations to the machine without consulting the manufacturer.
- use only original LIEBHERR spare parts.

3.1.2 Personnel requirements

The maintenance/repair personnel:

- have passed the statutory minimum age.
- are physically suited to the work (sufficient levels of vision and hearing, short reaction times).
- are familiar with the machine and its dangers.
- are familiar with all maintenance procedures and provisions.
- are qualified and trained to carry out the maintenance/repair work, and also in the use of special equipment.
- do not suffer from any physical or mental limitations that would impinge on any of the above requirements.
- are not under the influence of alcohol or drugs.

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4 Description of appliance

4.1 Appliance as a whole

The **CBN** is a freestanding refrigerator/BioFresh appliance with NoFrost freezer compartment.

The appliance cools using a compressor and two evaporators. Both evaporators are connected in series. The refrigeration control of the refrigerator BioFresh evaporator and the freezer evaporator is effected via a bi-stable 3/2-way solenoid valve (3 connections, 2 feed paths). The refrigerator compartment can only be operated in combination with the freezer compartment. The freezer compartment can be operated on its own

.

NOTE
It is not possible to operate the refrigerator compartment on its own.

4.1.1 Refrigerator/ BioFresh compartment

The refrigerator and BioFresh compartment are cooled by a common evaporator. The foamed-in evaporator is situated behind the rear wall of the inner liner and is thermally partitioned by an insulated, vertical separating plate.

The control of the refrigerator BioFresh compartment is carried out via a fan and 3 sensors, the refrigerator compartment evaporator sensor, the refrigerator compartment air sensor and the BioFresh air sensor. The fan is integrated into the vertical separating plate. If the refrigerator requires cooling (detection via the refrigerator compartment air sensor), the fan is switched ON. The fan takes in warm air from the front and blows it past the evaporator in a downward direction. The air, which is now cold, is fed past the BioFresh safes upwards into the refrigerator compartment.

The fan is switched OFF once it is sufficiently cold in the refrigerator compartment. The compressor continues to run and the BioFresh safes are statically cooled by the falling coolness. The demand on the compressor continues and the solenoid valve is in position A (refrigeration + freezing) until the air in the BioFresh compartment is cold enough (detection by BioFresh air sensor). The refrigerator compartment evaporator sensor causes cooling to switch on again.

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4.1.2 Freezer compartment

The freezer compartment is cooled by a NoFrost evaporator system. The NoFrost evaporator system is a lamellar evaporator with inserted defrost heater and fan. The lamellar evaporator is situated between the freezer compartment liner and an air duct panel.

Control of the freezer compartment is carried out via 2 sensors, the freezer compartment air sensor and the evaporator sensor. If the freezer compartment requires cooling (detection via the freezer compartment air sensor), the compressor is switched on. If the freezer compartment is sufficiently cold (detection via freezer compartment air sensor), the demand for cooling is switched off. The temperature display and the cooling activation/deactivation are effected by the air sensor. The evaporator sensor is responsible for controlling the freezer compartment fan and the defrosting of the lamellar evaporator. Defrosting is automatic.

4.2 Operating and control elements

4.2.1 Home screen

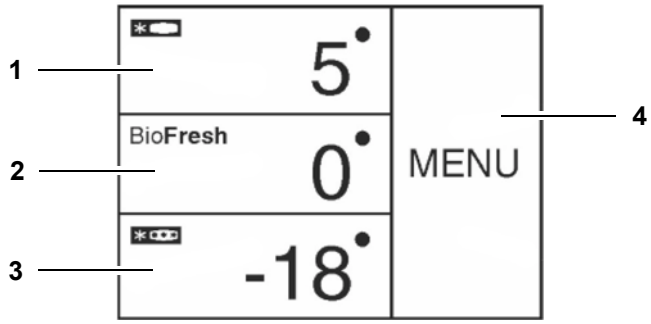

Abb. 1 Home screen overview

(1) Refrigerator compartment field
(2) BioFresh field
(3) Freezer compartment field
(4) Menu field

4.2.2 Navigation

Symbol	Function	Description
	**Standby**	Switch on appliance or temperature zone.
MENU	**Menu**	Call up options.
	**Minus / Plus**	Change settings (e.g. adjust temperature, time setting for SuperCool).
	**Navigation arrow left / right**	Select options and navigate within the menu. You can scroll through the individual options with the navigation arrow. After the last option, the first option is displayed once more.
	**Back**	Cancel selection. The display changes to show the next level up or to the home screen.
OK	**OK**	Confirm selection. After confirmation, the display changes to the home screen.
ON OFF START STOP	**ON / OFF, START / STOP**	Activate / deactivate options. After activating or deactivating an option, the display will change to the home screen.
RESET	**RESET**	Reset the timer.
	**Customer Service access**	

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4.2.3 Display symbols

Symbol	Function	Description
	**Ascending arrows**	Temperature is increased.
	**Descending arrows**	Temperature is reduced.
	**Standby**	Appliance or temperature zone is switched OFF.
	**Messages**	There are active error messages and reminders.

4.2.4 Appliance options

Symbol/button	Explanation
	**SuperCool**
	**SuperFrost**
	**Sabbath mode**
	**Child lock function**
	**Temperature unit**
	**BioFresh**

4.3 Sensor positions, schematic diagrams

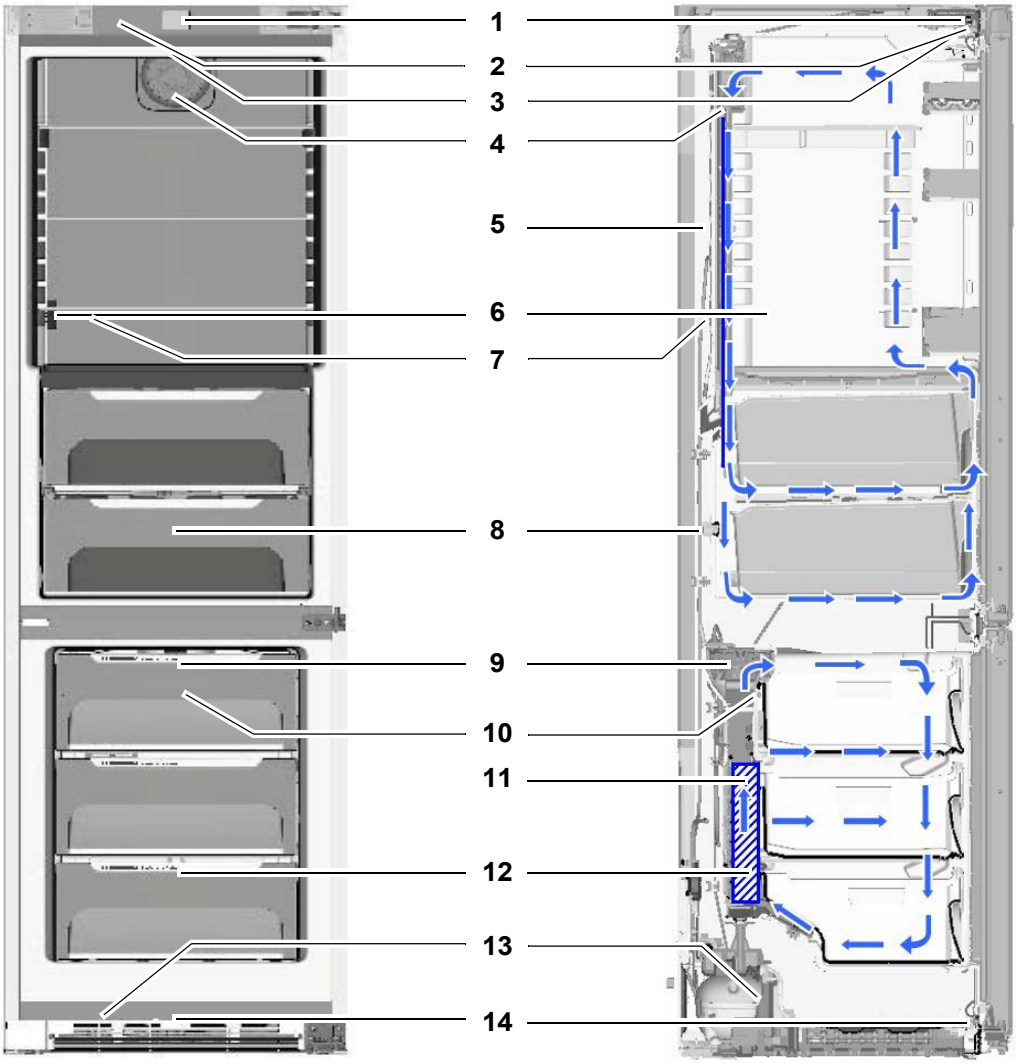

Abb. 2 Schematic diagram

(1) Electronic unit

(2) Refrigerator compartment door switch

(3) Refrigerator compartment ceiling light

(4) Refrigerator BioFresh compartment fan

(5) Refrigerator compartment evaporator

(8) BioFresh air sensor

(9) Freezer compartment fan

(10) Freezer compartment air sensor

(11) Freezer compartment evaporator

(12) Freezer compartment evaporator sensor

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(6) Refrigerator compartment air sensor

(7) Refrigerator compartment evaporator sensor

(13) Base fan

(14) Freezer compartment door switch

5 Functional description

5.1 Overview

Control	
Electronics	Front panel with control panel + power unit
Temperature display	
Refrigerator compartment	Actual value
BioFresh compartment	Fixed value, 0 °C
Freezer compartment	Actual value
Temperature range	
Refrigerator compartment	+3 °C to +9 °C
BioFresh compartment	1 to 9 (1=coldest setting, approx. 0 °C to +2 °C)
Freezer compartment	-16 °C to -26 °C
Temperature alarm	
Refrigerator compartment:	Not featured
BioFresh compartment	Not featured
Freezer compartment:	Visual and audible
Door alarm	
Refrigerator BioFresh compartment	Visual and audible
Freezer compartment:	Visual and audible
Fan	
Refrigerator BioFresh compartment	Featured
Freezer compartment:	Featured
Defrosting	
Refrigerator BioFresh compartment	Automatic
Freezer compartment	Automatic
Interior light	
Refrigerator compartment	Featured
BioFresh compartment	Not featured
Freezer compartment	Not featured
Service menu	Featured
Compressor	VCC, standard

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5.2 Function principle

The function principle shows the refrigeration system design of the appliance in exemplary fashion.

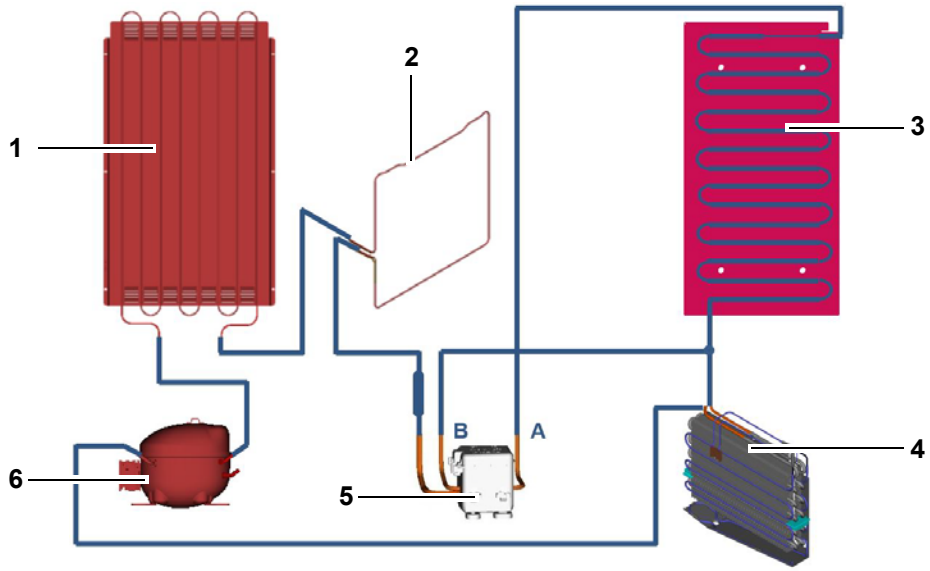

Abb. 3 Function principle of the appliance

(1) Condenser
(2) Freezer compartment frame heater
(3) Refrigerator BioFresh compartment evaporator
(4) Freezer compartment evaporator
(5) Solenoid valve
(6) Compressor

5.3 Main components

5.3.1 Electro-technical components

5.3.1.1 General

Electronics	
Type	Electronic control system
Components	Front panel with control panel and power unit This is an assembly unit; individual parts are not available

Compressor		
Type	VCC, standard	
Function	**ON**	Refrigerator compartment evaporator sensor switch-on value or freezer compartment air sensor switch-on value **Note:** Switch-on delay time is 8 minutes
	OFF	BioFresh air sensor switch-off value and freezer compartment air sensor switch-off value

VCC compressor, standard

- Compressor with various speed settings
- The compressor is triggered via an inverter, the inverter electronics are mounted directly on the compressor
- The speed and the switching off of the compressor are controlled by an appropriate data signal

NOTE
If the data signal is interrupted, the compressor continues to run at a pre-specified speed!

Solenoid valve refrigeration circuit		
Type	Bi-stable	
Function	**Switchover between**	A = refrigerator/BioFresh compartment + freezer compartment B = Freezer compartment

NOTE
Freezer compartment priority of 2 hours on start-up!

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5.3.1.2 Refrigerator BioFresh compartment

Electronics		
Setting range	**Refrigerator compartment**	+3°C to +9°C
	BioFresh compartment	■ 1 to 9 ■ 1 = coldest setting ■ 0 °C to +2 °C
Display range	-50 °C to +50 °C (actual value display) Ascending or descending arrows indicate the direction of the newly adjusted target temperature value	

Functions		
SuperCool	**ON**	■ Can be set to 12, 9, 6 or 3 hours ■ The refrigerator compartment adjusts itself to the coldest target value ■ BioFresh temperature remains unchanged
	OFF	■ Automatically after the set SuperCool time has expired ■ The refrigerator compartment adjusts itself to the set target value **End SuperCool function early:** ■ Select SuperCool via the menu ■ Press “Remaining time” ■ Press STOP The refrigerator compartment once more adjusts itself to the set target value
Defrosting	■ Automatic, if solenoid valve is set to position B, freezer compartment only ■ Automatic during compressor standstill phase	
Door alarm	**When**	If door is open after 60 seconds
	Visual	Door alarm symbol in display 
	Audible	Beep
		4 x alarm signal with 60 seconds break, then 4 x alarm signal with 30 seconds break, then alarm signal with 5 seconds break

Sensors		
Air sensor	**Position**	See 4.3 Sensor positions, schematic diagrams
	Function	■ Switches the fan ON/OFF ■ Generates the display value
Evaporator sensor	**Position**	See 4.3 Sensor positions, schematic diagrams
	Function	■ Refrigerator compartment evaporator sensor or freezer compartment air sensor switch the compressor ON ■ Switches the solenoid valve to position A (refrigeration + freezing) ■ Enables fan ON (from +10 °C) ■ Ends defrost phase
BioFresh air sensor	**Position**	See 4.3 Sensor positions, schematic diagrams
	Function	■ BioFresh air sensor and freezer compartment air sensor switch the compressor OFF ■ Switches solenoid valve to position B (freezer)
Ambient air sensor	**Position**	On the electronic power unit
	Function	■ Affects the switch-off value of the BioFresh air sensor ■ Minimises temperature fluctuations in the BioFresh compartment ■ Display of ambient air sensor errors in service menu only ■ In cases of fault, the switch-off value of the BioFresh air sensor is not affected
		In the event of a defect, exchange power PCB

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Switches			
Door switch	**Position**	In front panel	
	Type	Magnetic field sensor	
	Contact type	Closing mechanism	
	Function	**Activation**	■ Magnet (foamed-in within the door) ■ Magnet is not replaceable
		Switching signal door closed	■ Fan ON ■ Interior light OFF
		Switching signal door open:	■ Fan OFF ■ Interior light ON ■ Door alarm ON after 60 seconds

Consumers/Loads			
Ceiling light	**Position**	See 4.3 Sensor positions, schematic diagrams	
	Function	■ Illuminated after door is opened ■ Switches off after the door has been open for 15 minutes	
Fan	**Position**	See 4.3 Sensor positions, schematic diagrams	
	Function	**Fan ON**	■ Refrigerator compartment air sensor Switch-on value (refrigerator compartment warm)
		Fan OFF	■ Refrigerator compartment air sensor Switch-off value ■ Refrigerator compartment door – OPEN
		Low speed	6 V/DC
		High speed	12 V/DC
			On start-up, the fan switches ON from +10 °C on the evaporator sensor

5.3.1.3 Freezer compartment

Electronics	
Setting range	-16 °C to -26 °C
Display range	+50 °C to -26°C (actual value display) Ascending or descending arrows indicate the direction of the newly adjusted target temperature value

Functions		
Defrosting	**ON**	■ During start-up after 10 hours' cumulative compressor running time. ■ After a cumulative compressor running time of 10 to a maximum of 70 hours (depending on number and duration of door openings).
		■ When the defrost phase starts: ■ Compressor and fan are switched OFF ■ Defrost heater is switched ON
	Duration	■ Switch-on time of defrost heater: ■ Freezer compartment evaporator sensor has reached +9 °C ■ or ■ 40 minutes (maximum defrosting time)
		■ After the end of the defrosting phase, the compressor is switched ON with a 2 minute delay. ■ No interruption of the defrost phase after SuperFrost has been switched on
SuperFrost (time-controlled)	**ON**	■ Freezer compartment adjusts itself to -40 °C ■ Duration: 65 hours
	OFF	■ Ends automatically after 65 hours ■ Freezer compartment adjusts to the set target value
		Once the defrost phase has ended, it is possible to switch on SuperFrost.

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Functions		
Temperature alarm	**Maximum alarm value**	-10 °C
	Minimum alarm value	-12 °C
	Delay	60 minutes
	Visual	Temperature alarm symbol in display 
	Audible	Beep
		■ If the temperature is at -12 °C for 60 minutes, the temperature alarm will be triggered ■ After the start of the defrost phase, the temperature alarm will be suppressed for 1.5 hours
Door alarm	**When**	If door is open after 60 seconds
	Visual	Door alarm symbol in display 
	Audible	Beep
Power failure alarm	**When**	■ Due to a mains power failure or a power supply interruption, the temperature in the freezer compartment reaches -10 °C or higher ■ Once the power supply interruption has ended, the appliance continues to operate at the last temperature setting
	Visual	Power failure alarm in display 
	Audible	Beep
Beep sounds for: Temperature alarm, door alarm, power failure alarm		4 x alarm signal with 60 seconds break, then 4 x alarm signal with 30 seconds break, then alarm signal with 5 seconds break

Sensors		
Air sensor	**Position**	See 4.3 Sensor positions, schematic diagrams
	Function	■ Compressor ON/OFF ■ Fan ON/OFF ■ Generates the display value
Evaporator sensor	**Position**	See 4.3 Sensor positions, schematic diagrams
	Function	■ Enable for fan ON (-21 °C) ■ Defrost heater OFF

Switches			
Door switch	**Position**	See 4.3 Sensor positions, schematic diagrams	
	Type	Reed contact	
	Contact type	Closing mechanism	
	Function	**Activation**	■ Magnet in door ■ Magnet is replaceable
		Switching signal door closed	--
		Switching signal door open:	Door alarm ON after 60 seconds

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Consumers/Loads			
Fan	**Position**	See 4.3 Sensor positions, schematic diagrams	
	Function	**Fan ON**	The following conditions must be met: ■ Compressor ON ■ Freezer compartment door CLOSED ■ Evaporator sensor switch-on value
			Evaporator sensor switch-on value: ■ During start-up or after defrost phase: -21 °C ■ In control mode: 2 K colder than freezer compartment air sensor
		Fan OFF	■ Compressor OFF
			*Exception:* The refrigerator compartment air sensor is too warm and the freezer compartment air sensor is at least 2 K colder than the switch-off value. Consequently, there is more power available for the refrigerator compartment!
Defrost heater	**Position**	Clipped into the lamellar evaporator	
	Function	Keeps the lamellar evaporator ice-free Activation of defrost heater see: **Functions/Defrosting**	

5.3.2 Refrigeration components

5.3.2.1 General

Compressor	
Compressor	VCC, standard

Solenoid valve	
Solenoid valve	Bi-stable
Function	Switchover between: A = refrigerator/BioFresh compartment + freezer compartment B = freezer compartment On start-up, freezer compartment has a priority of 2 hours.

5.3.2.2 Refrigerator compartment

Evaporator	
Type of appliance	Rear wall evaporator
Type of installation	Foamed-in
Injection point	Top centre
Flow sequence	See section: "Function principle"

5.3.2.3 Freezer compartment

Evaporator	
Type of appliance	Lamellar evaporator
Type of installation	Freestanding between air duct panel and inner liner
Injection point	Front, top, centre
Flow sequence	See section: "Function principle"

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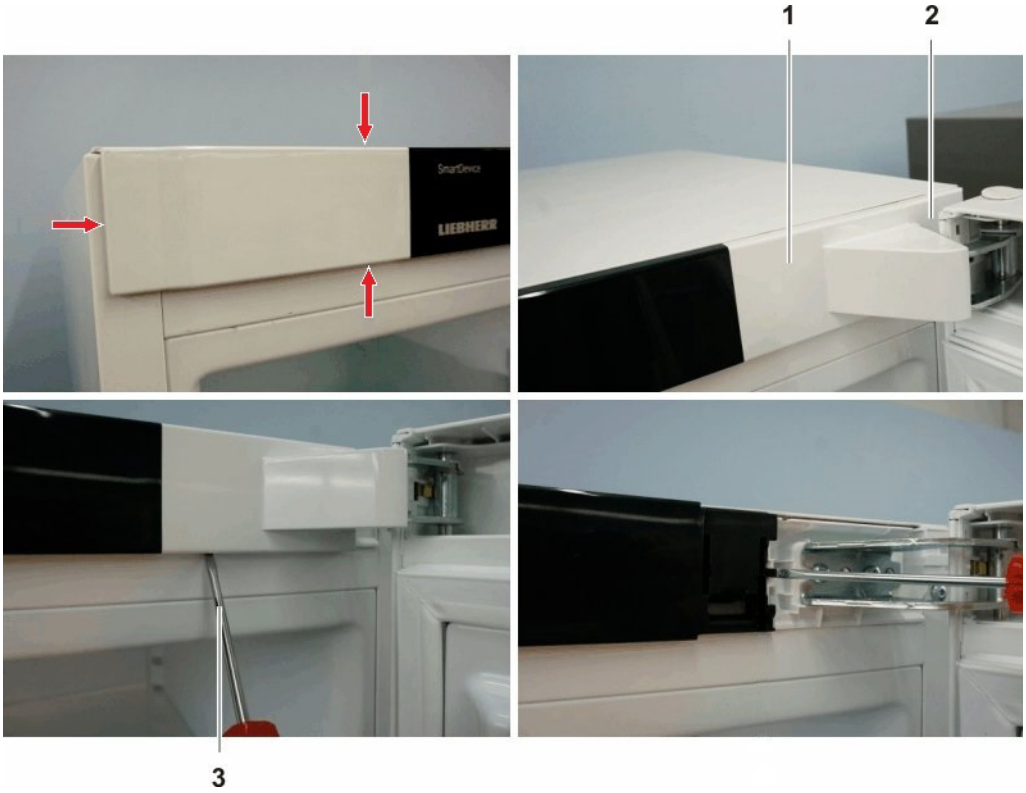
6 Service and repair

6.1 Assembly

6.1.1 Appliance

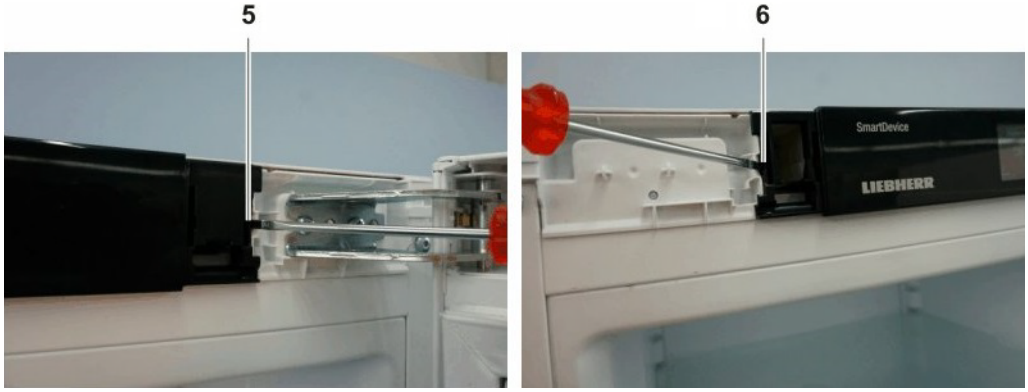
6.1.1.1 Electronics

Covers



- Undo cover on the left at the marked point and remove.
- Push outer partial cover **2** to the right and remove.
- Undo turn hinge cover **1** with screwdriver **3** and remove.

Front panel



- Unlock locating lug **5** on the right of the front housing.
- Unlock locating lug **6** on the left of the front housing.

PCB carrier

- Draw the front panel forwards for removal.
- Detach cable.
- Disengage the connector.
- Pull out the connector.

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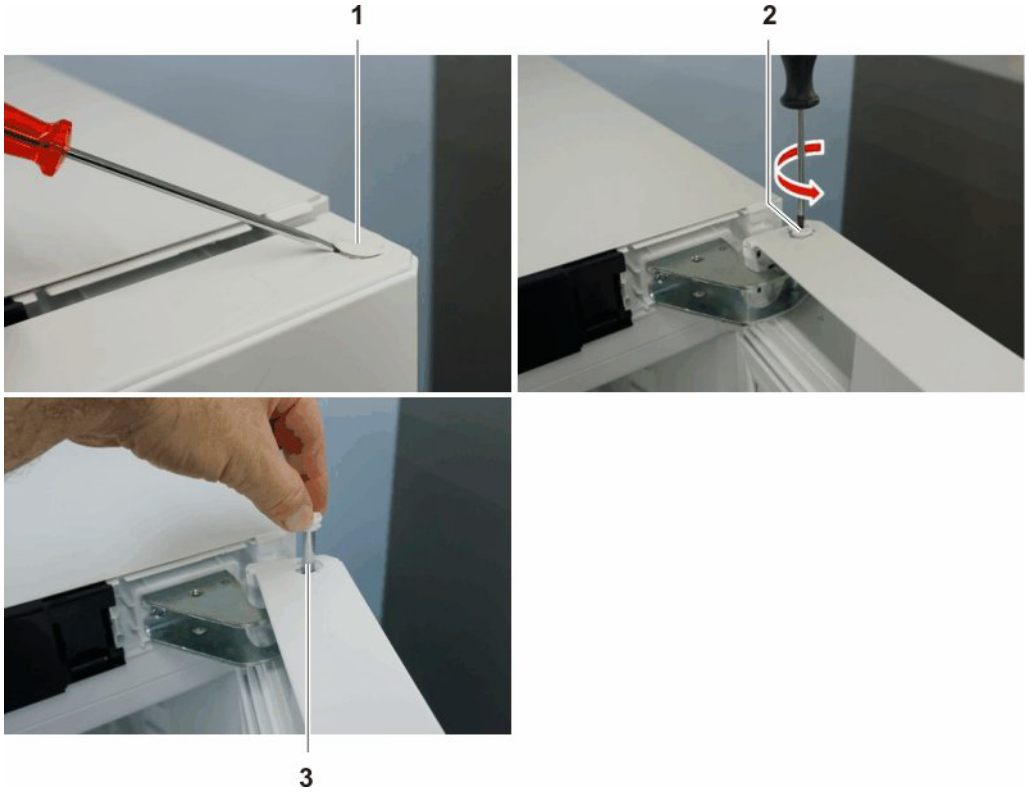
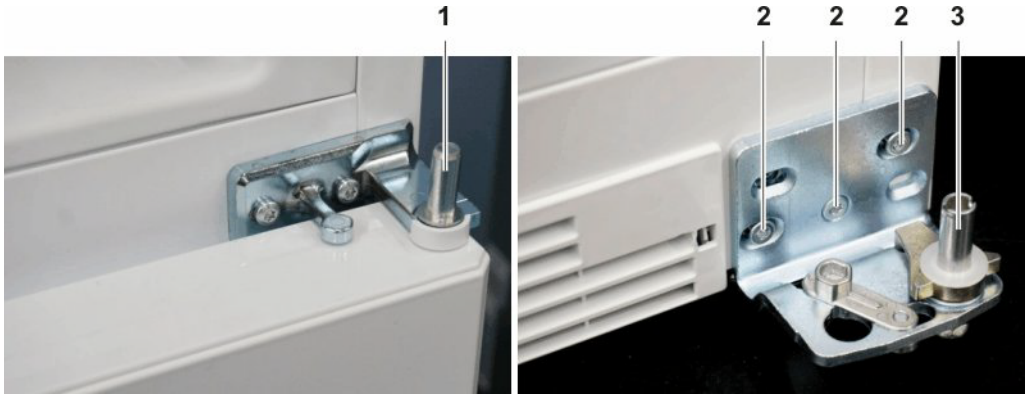
6.1.1.2 Doors

Remove top door



- Remove covers to the right and left of the front panel (see electronics).
- Remove safety cover **1**.
- Undo bearing pin **2**.
- Hold door.
- Lift out the bearing pin **3**.
- Lift the door slightly and remove.

Remove bottom door

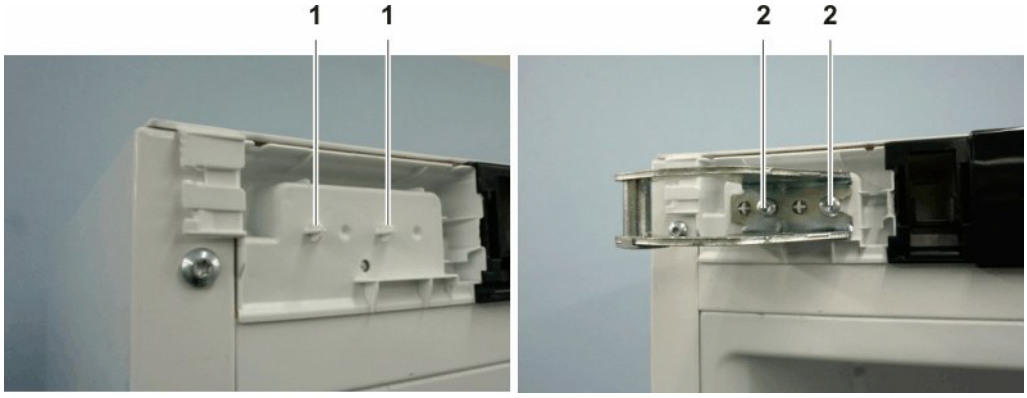


- Remove top door.

- Lift out the bearing pin **1**.
- Tilt bottom door and remove.
- Unscrew and remove fastening screws **2**.
- Remove bottom turn hinge.
- Lift out the bearing pin **3**.

6.1.1.3 Changing the door hinges

Top turn hinge



- Remove cover on the opposite side.
- Rotate turn hinge by 180°.
- Push turn hinge onto rests **1**.
- Attach fastening screws **2**.
- Change over hinge bushing.

Middle turn hinge

- Remove cover **1**.
- Push in cover **1** on the opposite side.
- Rotate turn hinge by 180°.
- Attach turn hinge with fastening screws **2**.

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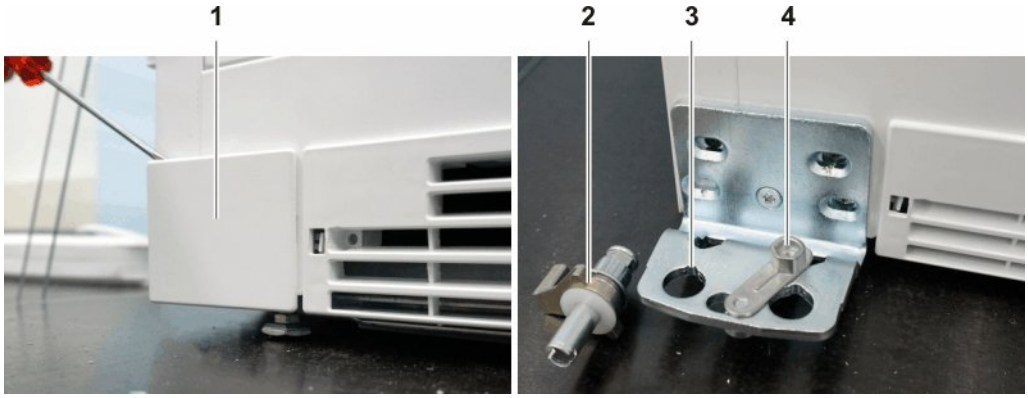
- Change over bearing part (plastic).

Bottom turn hinge

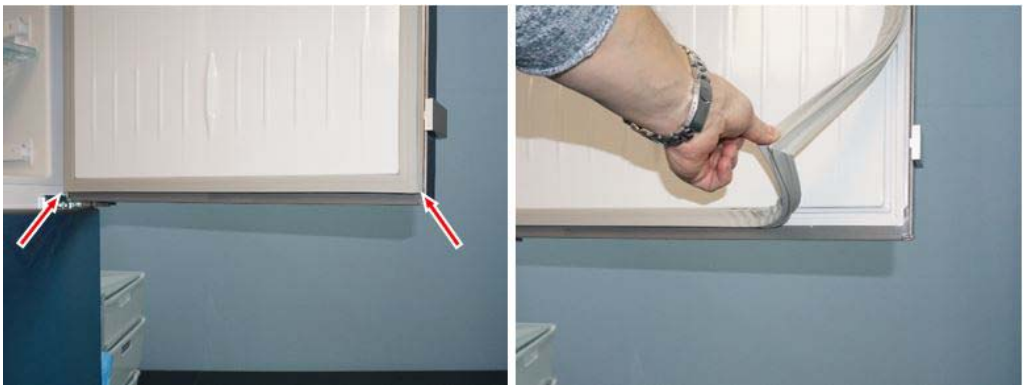


- Remove cover **1**.
- Push in cover **1** on the opposite side.
- Undo fastening screw on the door closing aid **4**.
- Lift door closing aid **4** slightly and rotate by 90°.
- Insert door closing aid **4** in drill hole.
- Tighten fastening screw for door closing aid **4**.
- Attach turn hinge with fastening screws.
- Insert bearing pin **2**.
- Observe notch **3**.

6.1.1.4 Door seal

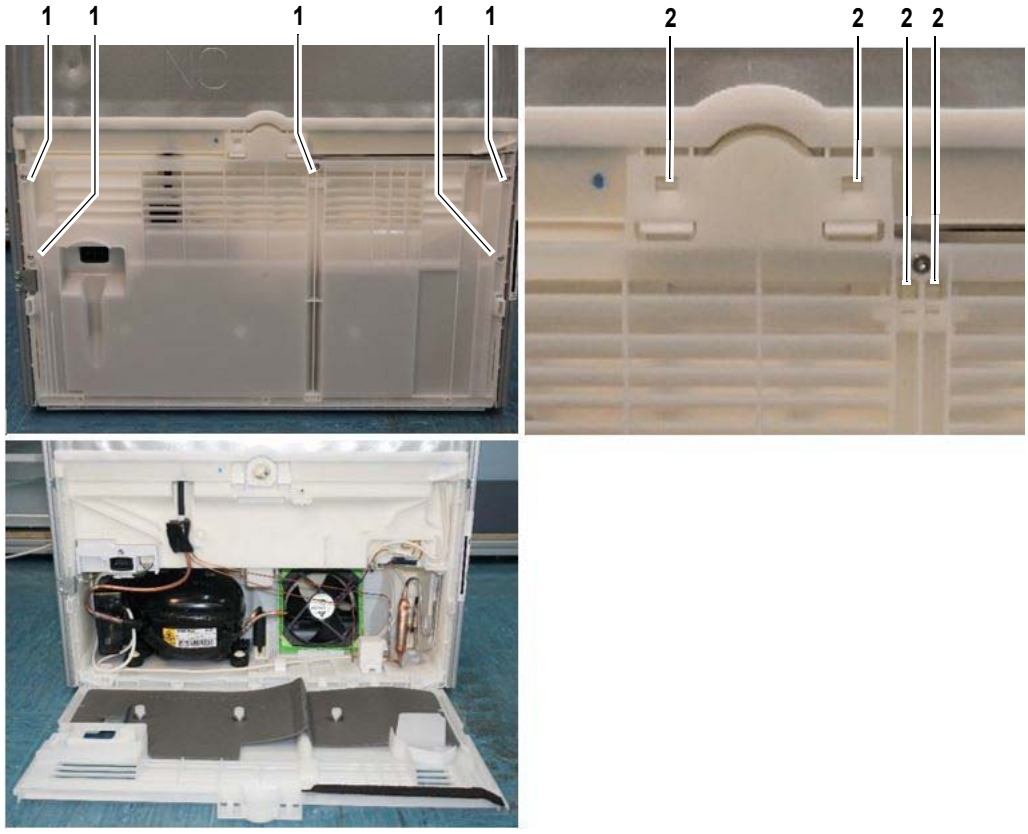
The door seal is pushed into a groove.

CAUTION
Risk of damage!
If the door seal is damaged, it is possible that the door might not close correctly, leading to insufficient cooling or an iced-up appliance.
- Make sure that the door seal is not damaged.



- Loosen the door seal at the top and bottom corners and remove from the groove.
- Pull out the door seal all the way around.
- Press in the new door seal at the top and bottom corners.
- Press in the seal all the way around.

6.1.1.5 Rear base compartment cover



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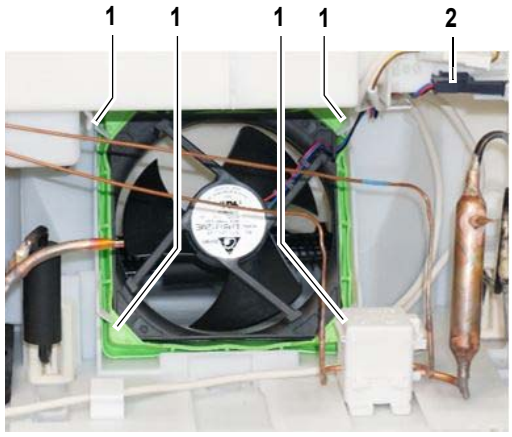
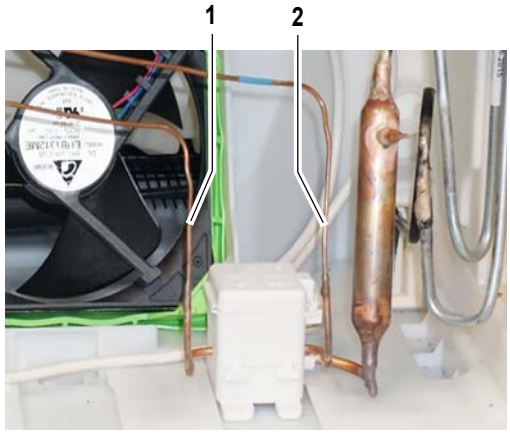
- Pull out the mains plug from the appliance.
- Undo screws **1**.
- Disengage retaining clips **2**.
- Remove cover.

6.1.1.6 Base compartment fan



- Release locking devices **1**.
- Disengage fan connector **2**.

6.1.1.7 Solenoid valve



- After disconnecting the capillary tubes, ensure that these are later properly re-connected.

Marking on solenoid valve cover:

- KS: Refrigerator compartment capillary tube **1**
- GS: Freezer compartment capillary tube **2 (marking: blue adhesive tape)**

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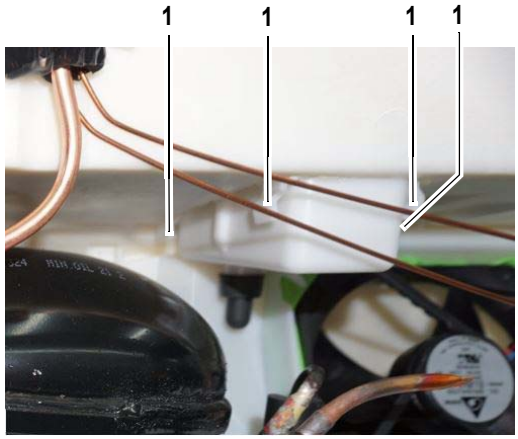
6.1.1.8 Compressor

- Lift out plastic rivets **1**.
- Lift the compressor out of the base compartment by bending the tubes.

6.1.1.9 Siphon



- Press the retaining clips **1** simultaneously.
- Pull the siphon out downwards.

6.1.1.10 Evaporation tray

DANGER
Heavy weight!
Risk of crushing.
- Ensure that no limbs are jammed under the tray.

CAUTION
Risk of damage!
If the appliance is tipped, marks may appear on the floor.
- Make sure that the floor is not damaged.

- Empty the appliance.
- Lay the appliance on its back.
- Undo screw **1**.
- Undo marked retaining clips.
- Remove evaporation tray.

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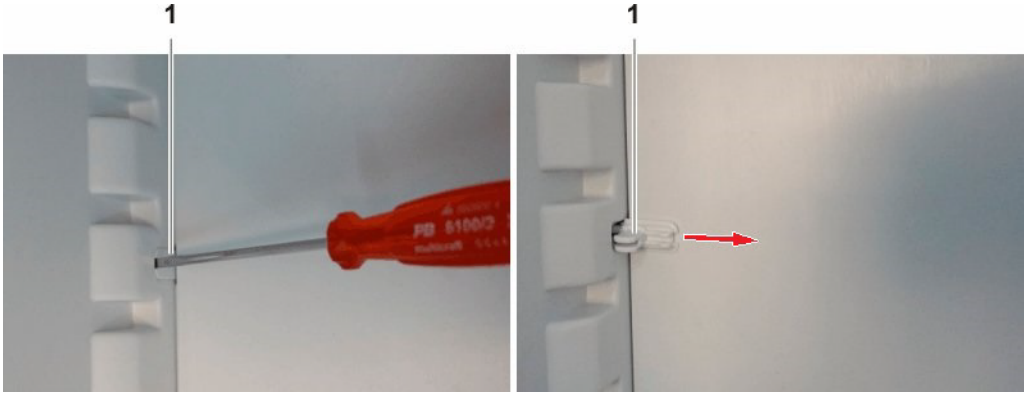
6.1.2 Refrigerator BioFresh compartment

6.1.2.1 Horizontal separating plate

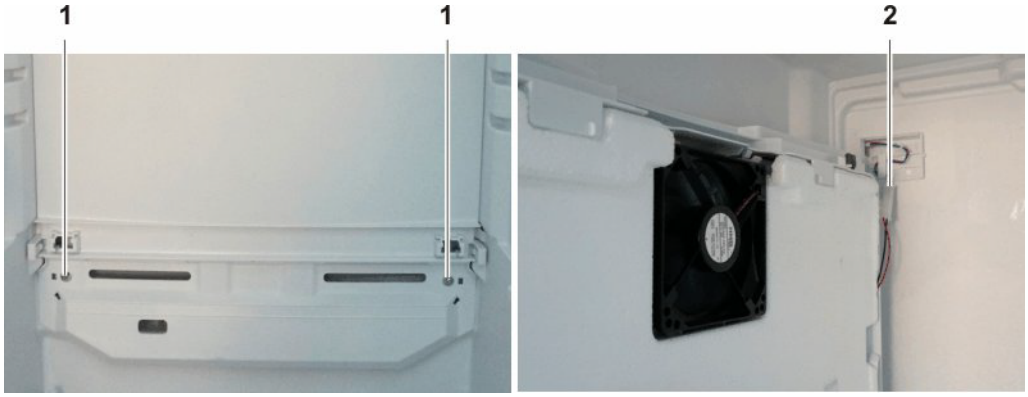
- Remove upper BioFresh drawer
- Draw out the horizontal separating plate in a forward direction (no locking mechanism)

6.1.2.2 Vertical separating plate

Removal



- Remove horizontal separating plate.
- Remove glass shelves.
- Remove retaining clips **1** (right and left) using screwdriver.
- Press retaining clip **1** towards the separating plate and remove.



- Undo the separating plate fastening screws **1**.
- Unplug fan connection cable **2**.
- Remove vertical separating plate.

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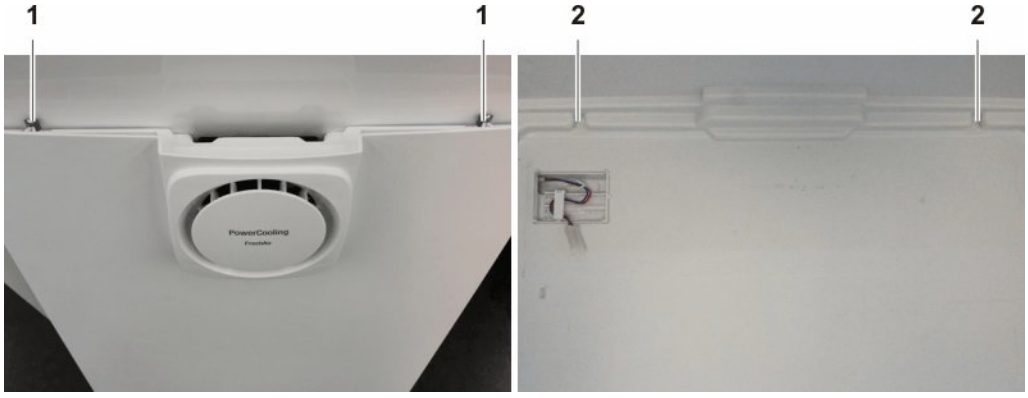
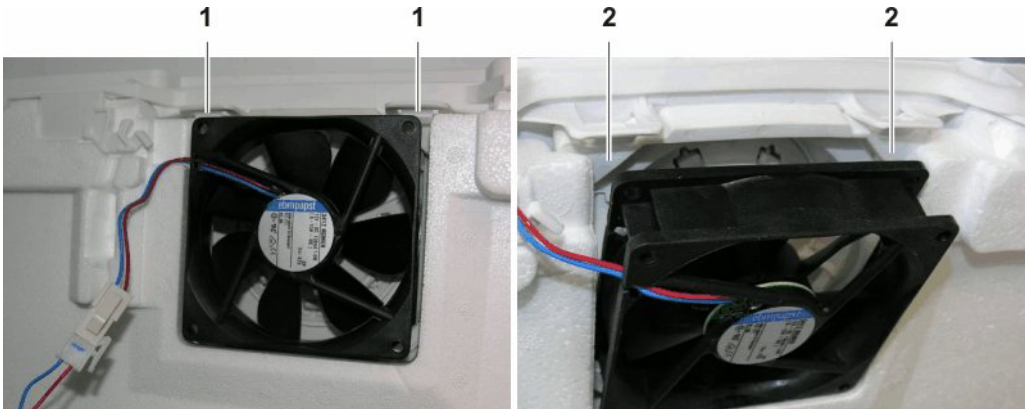
Installation



- Ensure that the retaining lugs **1** of the vertical separating plate are slipped into the grooves **2** of the inner liner.

6.1.2.3 Fan



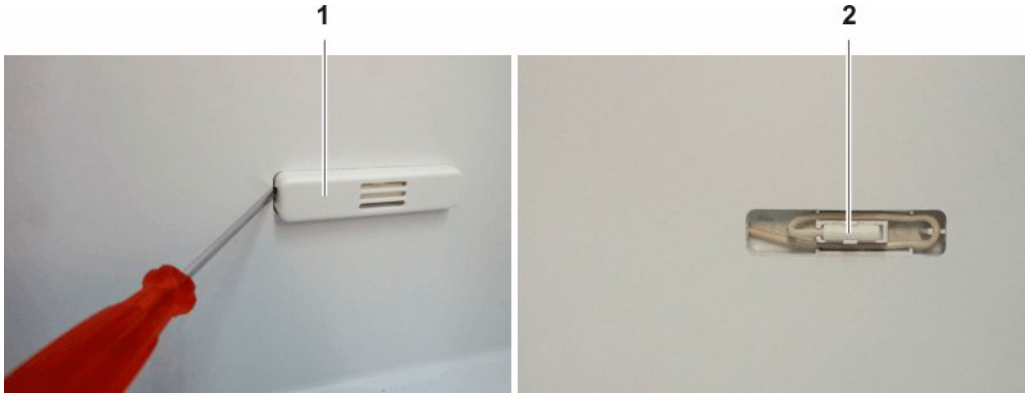
Removal

- Remove horizontal separating plate.
- Remove vertical separating plate.
- Disconnect the connector.
- Undo retaining clips **1**.
- Remove fan from rubber mount **2** (using screwdriver).

Installation

- Take note of the correct direction for installing the fan (air flow direction).
- Ensure that the arrow points in the direction of the inner liner (rear wall of the appliance).

6.1.2.4 BioFresh air sensor



- Remove BioFresh drawers.
- Remove holder **1** of the BioFresh air sensor **2**.
- Repair the sensor according to the repair instructions accompanying the repair kit.

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6.1.2.5 Refrigerator compartment air sensor

- Remove horizontal separating plate.
- Remove cover **1** of refrigerator compartment air sensor **2**.
- Repair the sensor according to the repair instructions accompanying the repair kit.

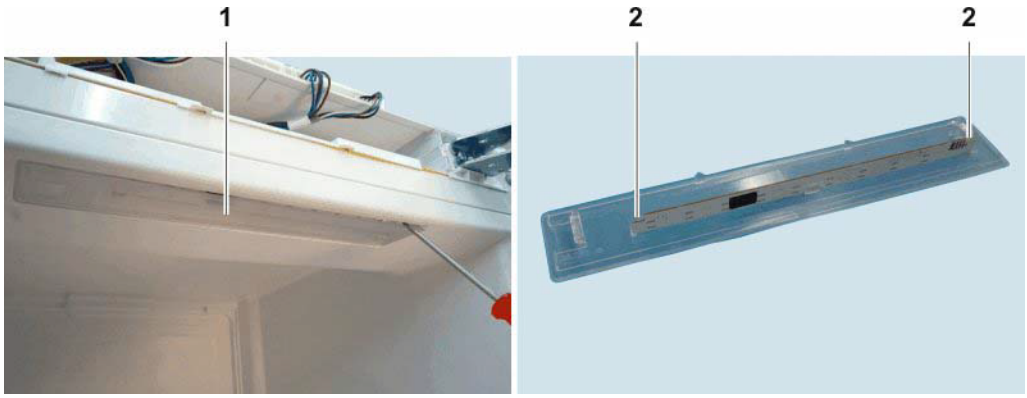
6.1.2.6 Refrigerator compartment evaporator sensor

- Remove horizontal separating plate.
- Remove vertical separating plate.
- Remove cover **1** of refrigerator compartment air sensor **2**.
- Cut off the refrigerator compartment evaporator sensor at the black line **3**.
- Repair the sensor according to the repair instructions accompanying the repair kit.

6.1.2.7 Lighting

DANGER
Dangerous voltage!
Danger to life.
- Ensure that the appliance is de-energised.

LED light cover



- Move a screwdriver backwards and forwards to undo the catch mechanism.
- Draw LED lighting unit **1** downwards (has a double catch).
- Remove LED lighting unit, drawing it down and to the right.

LED PCB

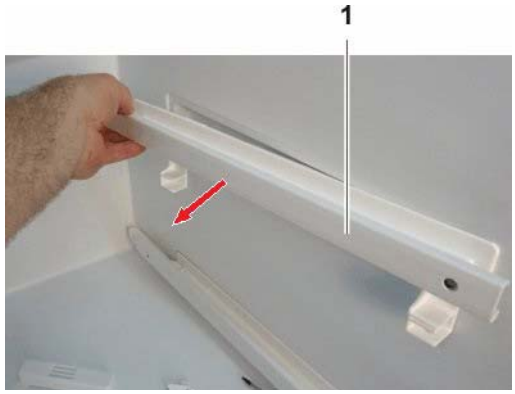
- Unlock LED PCB at the locking points **2**.
- Lift out LED PCB.

6.1.2.8 BioFresh pull-out rails

Drawers

- Remove BioFresh drawers.
- Lift slightly at the rear.
- Draw out towards the front.

Pull-out rails



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- Take a firm grip on the back of pull-out rail **1**.
- Draw out pull-out rail **1**.

6.1.2.9 Door magnet

- The door magnet is foamed-in above the door seal in the upper part of the door.
- The door magnet is not replaceable.

6.1.2.10 Door switch

- The door switch is located on the electronic control system.
- In the event of a defect, the electronic control system must be replaced.

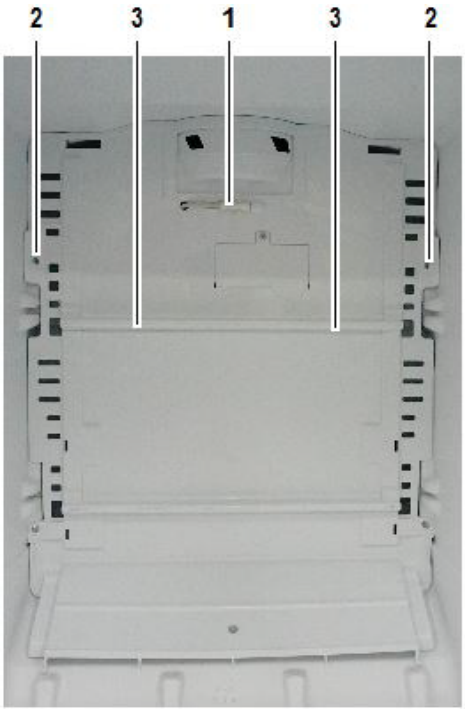
6.1.3 Freezer compartment

6.1.3.1 Air sensor, air duct panel upper section and fan

Air sensor

NOTE
The air sensor is engaged in the sensor holder on the air duct panel.

- Remove drawers.
- Remove glass shelves.



Air duct panel upper section

- Disengage the air sensor **1**.
- Undo marked screws **2**.
- Disengage locating lugs **3** from below.
- Carefully loosen the fan housing with the air duct panel upper section and draw forwards to remove.

NOTE
Watch out for the fan cable!

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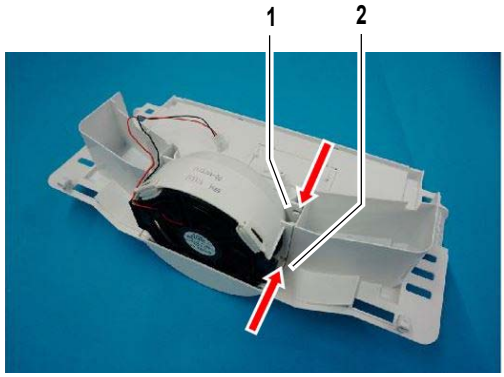
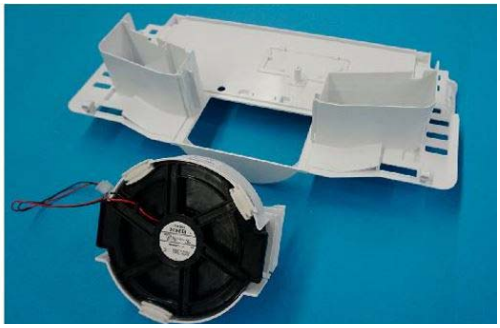
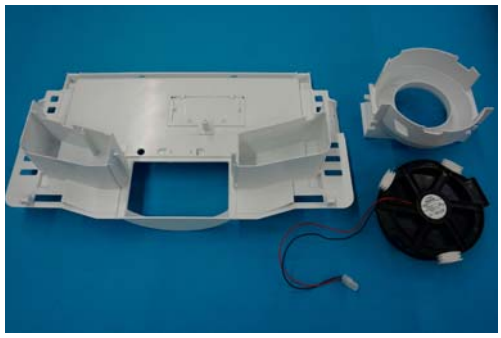
Fan

- Release fan connector **4** and disconnect.





- Disengage locating lug **1**.
- Disengage locating lug **2**.
- Draw fan housing upwards.
- Repeat on the other side and remove the fan plus housing.



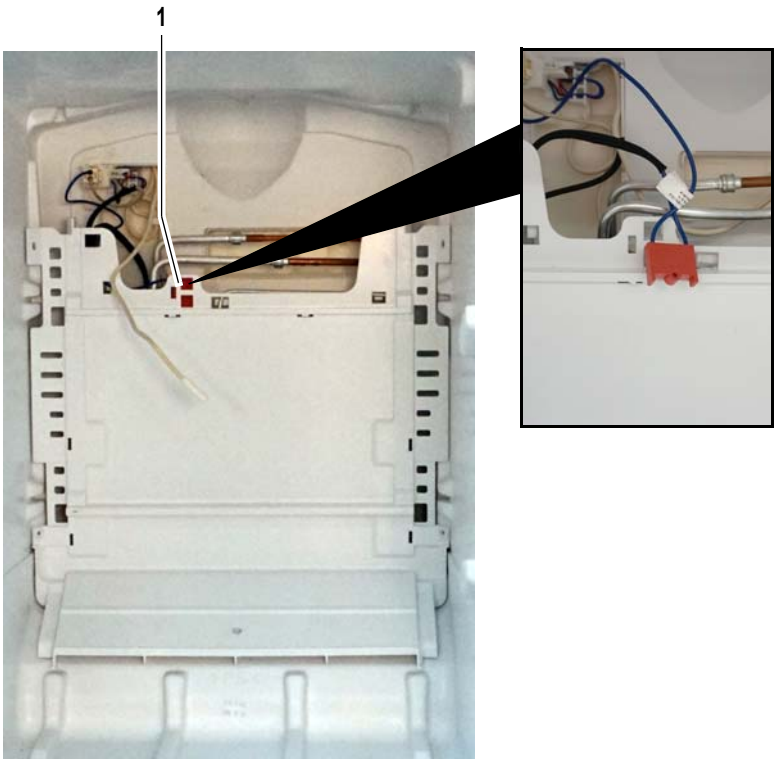
- Pull the fan out of the housing.

6.1.3.2 Temperature fuse

ATTENTION
Incorrect repair!
Damage to the defrost heater.
- Always attach the press fittings to the blue cable of the temperature fuse.
- Make sure that the white cable of the defrost heater is not cut through.
- Only change the temperature fuse with the conversion kit.

The conversion kit comprises:

- 1 Temperature fuse.
- 2 Press fittings.
- 2 Shrink tubes.



Temperature fuse

- Unclip temperature fuse **1**.
- Replace temperature fuse using conversion kit.

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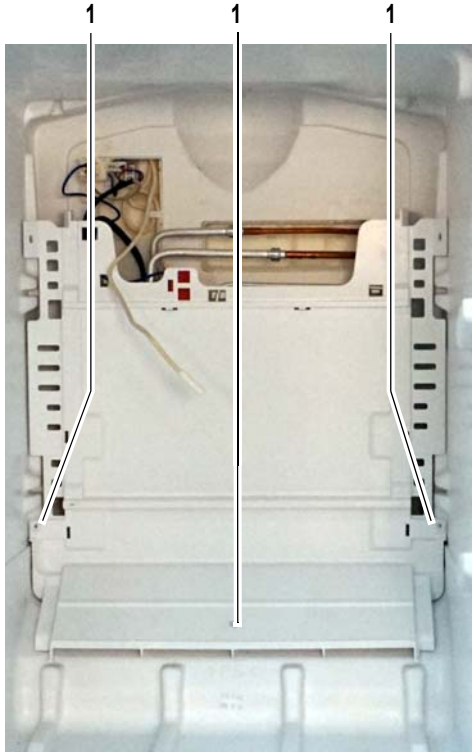
6.1.3.3 Evaporator sensor

CAUTION
Risk of cutting!
Lamellar evaporator with sharp edges.
- Wear safety gloves while fitting.



- Undo marked screws **1**.
- Swing out the evaporator module with its cover in a forward direction by raising it.

- Draw the evaporator sensor **1** out from the lamellar evaporator.
- Pull the cable out of the holders **2**.

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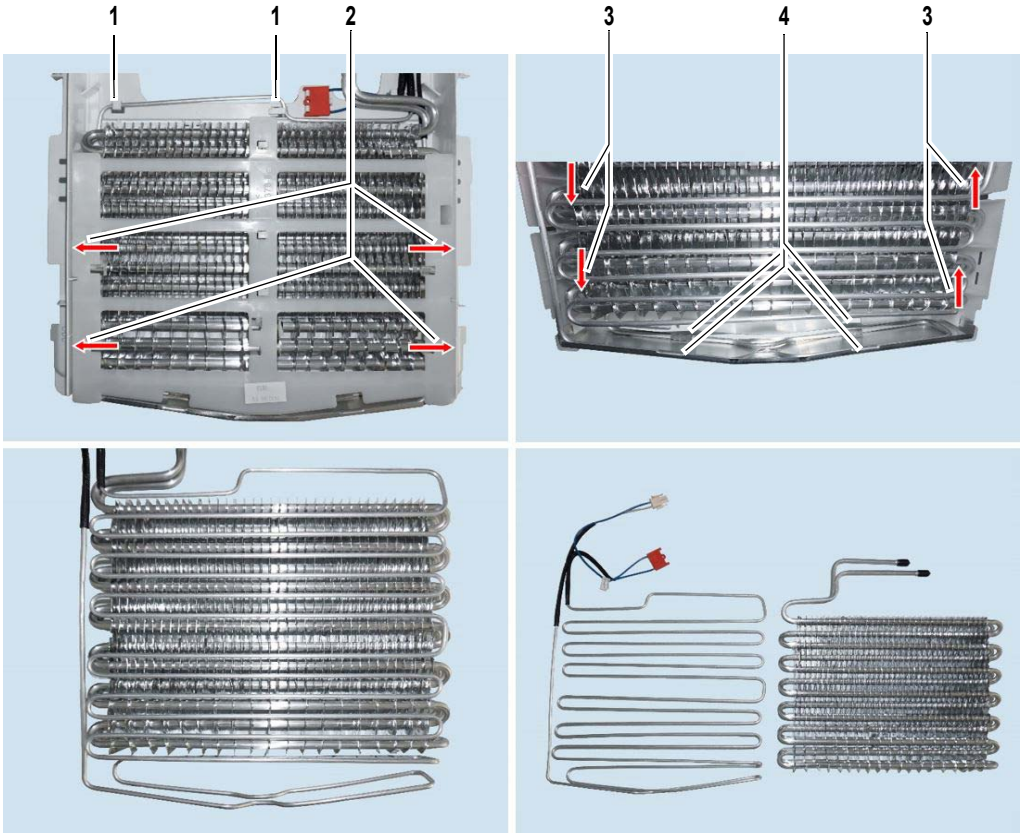
6.1.3.4 Defrost heater

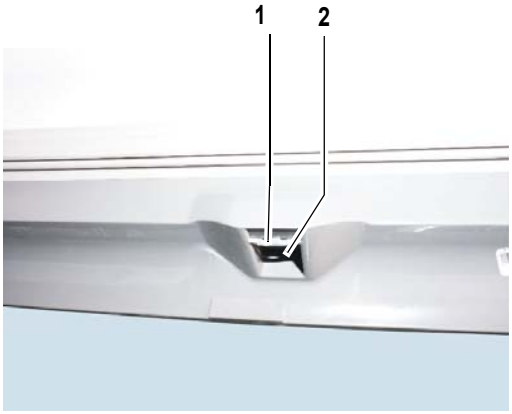
CAUTION
Risk of cutting!
Lamellar evaporator with sharp edges.
- Wear safety gloves while fitting.



- Carry out dismantling steps from **6.1.3.1** to **6.1.3.3**.
- Unfasten heater pipe from the retaining lugs **1** of the air duct panel.
- Disengage the lamellar evaporator with its holder from the air duct panel **2**.
- Disengage the holder of the lamellar evaporator **3**.
- Remove holder.
- Bend the retaining lugs **4** for the heater pipe in the drain tray upwards.
- Remove heater pipe from the lamellar evaporator.

6.1.3.5 Door magnet

Door magnet, door underside



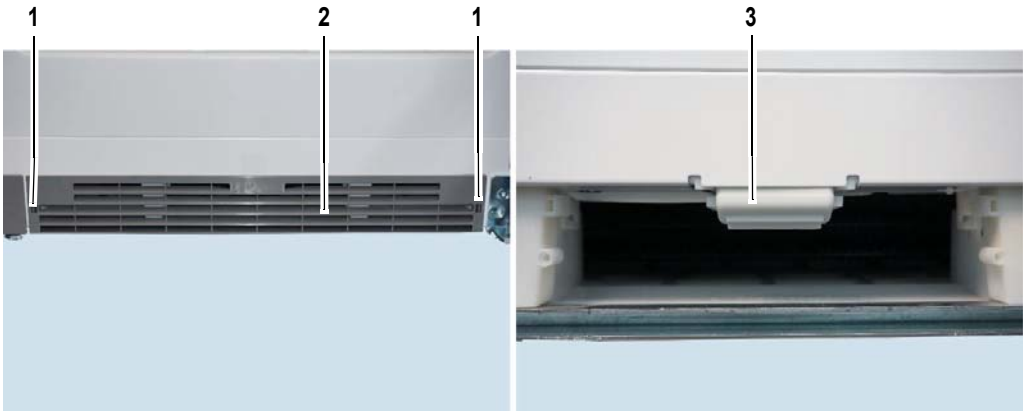
- Press in holding bar **1**.
- Remove door magnet **2** downwards.

6.1.3.6 Door switch

Base panel

- Release base panel by pressing in the retaining lugs **1**
- Pull out base panel forwards and remove.

Door switch



- Press door switch **3** downwards with a screwdriver at the side loops.

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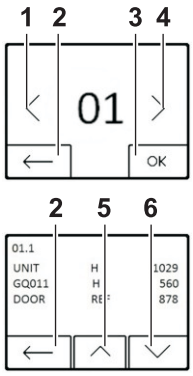
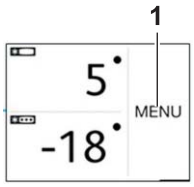
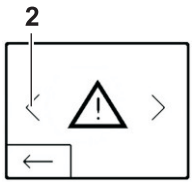
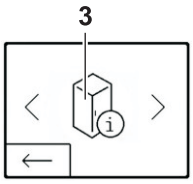
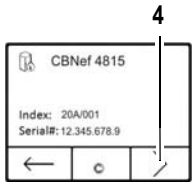
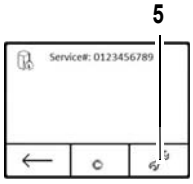
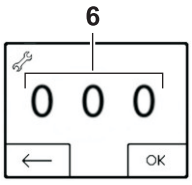
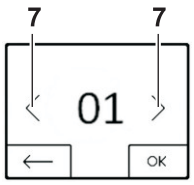
6.2 Service menu

The service menu may only be used by service engineers. The service menu only displays data on consumers, sensors and functions contained in the appliance in question.
This service menu describes more functions than are featured in the appliance in question.

Display	Operation
	▸ Accept the selected function with OK **3**. ▸ Select values with arrow buttons **1**/**4**/**5**/**6**. ▸ Use arrow **2** to go back one level.

6.2.1 Call up service menu

Display	Operation
	▸ Press button MENU **1**.
	▸ Press arrow **2**.

Display	Operation
	▸ Press symbol **3**.
	▸ Press arrow **4**. Information on the appliance.
	▸ Press symbol **5**. Information on the appliance.
	▸ Set menus with codes **6**. ■ Customer menu: 151 ■ Dealer menu: 254 ■ Service menu: 341
	▸ Call up functions with arrow buttons **7**. ▸ Confirm with “OK”. The following functions are available: ■ 01: Call up saved data ■ 02: Display of the values set by the customer and the corresponding factory settings ■ 03: Display values / status information (e. g. sensor values) ■ 04: Actuate consumers (e. g. compressor) individually ■ 05: Check touch function and display ■ 06: Set water intake values ■ 07: RESET to factory settings ■ 08: Manual defrosting

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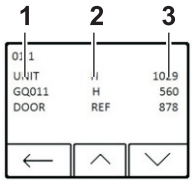
6.2.2 Call up saved data

In the **service menu 01**, enumerated operating hours, door openings, power failures, defrost cycles etc. can be called up.

Display	Operation
	▸ Call up menu **01**. Column **1** = Action Column **2** = Unit Column **3** = Values

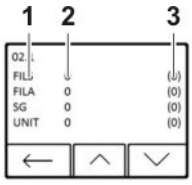
Values are only stored weekly!

Action (1)		Unit (2)		Values (3)
Abbreviation	**Designation**	**Abbreviation**	**Designation**	
DEFR	Defrost cycles	BIO	BioFresh	Numerical values
DOOR	Door openings	CNT	Number	
GQ011	Operating hours compressor 1	H	Hours	
GQ012	Operating hours compressor 2	FRZ	Freezer compartment	
IM	Operating hours IceMaker	MAX	Maximum number	
PWCUT	Power failure	REF	Refrigerator compartment	
UNIT	Operating hours Appliance	W1 (2, 3)	Wine 1 (2, 3)	
UNITX	Operating hours Appliance before conversion			

6.2.3 Call up set values

Values that can be altered by the customer can be viewed and compared with the factory settings in **service menu 02**.

Inquire about status of filters (e. g. dust, water) or particular functions.

Display	Operation
	▸ Call up menu **02**. Column **1** = Query Column **2** = Setting/Status of appliance Column **3** = Values/Factory settings

Query (1)		Setting/ Status of appliance (2)	Values (3)
Abbreviation	**Designation**		
BIO	b-value BioFresh setting	Numerical values	Numerical values
BIO+	b-value BioFreshPlus setting		
FILA	Status of activated charcoal filter		
FILS	Status of dust filter		
FILW	Status of water filter		
H	Brightness level of display		
SG	SmartGrid status		
UNIT	Display of temperature unit		
WATER	Level of water intake time		

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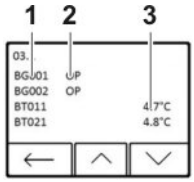
6.2.4 Call up status information

In the **service menu 03,** the current values and status information of the consumers and sensors are displayed.

Display	Operation
	▸ Call up menu **03**. Column **1** = Action Column **2** = Switching status Column **3** = Values
	The value displayed is always that of normal temperature control, not that of an activated function. (e. g. SuperFrost is activated, speed goes to Step 4=high speed. Step 1 is displayed, as according to temperature control only Step 1=low speed is required.)

Action (1)		Switching status (2)		Values (3)
Abbreviation	Designation	Abbreviation	Designation	
BG001	Refrigerator compartment door switch	OP	Open	Numerical values
BG002	Freezer compartment door switch	CLO	Closed	
BT001	BioFresh air sensor	ON	ON	
BT011	Refrigerator compartment air sensor	OFF	OFF	
BT021	Refrigerator compartment evaporator sensor	A	Direction A	
BT031	Freezer compartment air sensor	B	Direction B	
BT041	Freezer compartment evaporator sensor			
BT071	Ambient air sensor			
EA001	Refrigerator compartment lighting			
EA002	Freezer compartment lighting			
EA021	Dispenser lighting			
EA022	Left paddle lighting			
EA023	Right paddle lighting			
EB011	Freezer compartment defrost heater			
EB030	Water intake heater			
GP011	Water tank pump			
GQ011	Compressor 1			
GQ012	Compressor 2			
GQ021	Refrigerator compartment fan DC			
GQ025	Freezer compartment fan DC			
GQ033	Condenser fan DC (speed controlled)			
GQ040	Refrigerator compartment fan AC			
GQ041	Freezer compartment fan AC			
KH011	3-way refrigerant solenoid valve			
KH013	Refrigerant solenoid valve, wine 1, 2			
KH014	Refrigerant solenoid valve stop			
KH018	Stepper motor valve			
KH021	Water intake solenoid valve			
MA001	IceMaker motor			
MA020	Feed screw motor			

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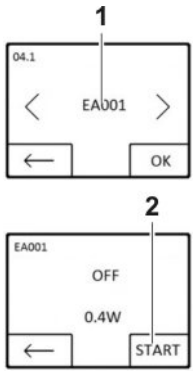
6.2.5 Actuate consumers individually

The **service menu 04** provides an option for activating the consumers individually. In part, the current power input is displayed.

Display	Operation
	▸ Call up menu **04**. Column **1** = Action Column **2** = Unit Column **3** = Values
	Maximum measurement tolerances +/- 15%

Action (1)		Unit (2)		Values (3)
Abbreviation	Designation	Abbreviation	Designation	
EA001	Refrigerator compartment lighting	H	Hours	Numerical values
EA002	Freezer compartment lighting	REF	Refrigerator compartment	
EA021	Dispenser lighting	BIO	BioFresh	
EA022	Left paddle lighting	W1	Wine 1	
EA023	Right paddle lighting	W2	Wine 2	
EB011	Freezer compartment defrost heater	W3	Wine 3	
EB030	Water intake heater	FRZ	Freezer compartment	
GP011	Water tank pump	CNT	Number	
GQ011	Compressor 1	MAX	Number	
GQ012	Compressor 2			
GQ021	Refrigerator compartment fan DC			
GQ025	Freezer compartment fan DC			
GQ033	Condenser fan DC (speed controlled)			
GQ040	Refrigerator compartment fan AC			
GQ041	Freezer compartment fan AC			
KH011	3-way refrigerant solenoid valve			
KH013	Refrigerant solenoid valve, wine 1, 2			
KH014	Refrigerant solenoid valve stop			
KH018	Stepper motor valve			
KH021	Water intake solenoid valve			
MA001	IceMaker motor			
MA020	Feed screw motor			

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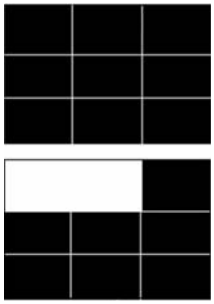
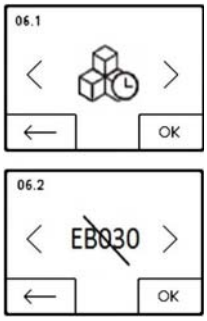
6.2.6 Check touch function, display and buzzer

In the **service menu 05,** the function of the touch buttons is tested, a visual check of the display and of pixel errors is carried out and the buzzer function is tested.

Display	Operation
	▸ Call up menu **05**. ▸ Activate 9 black touch fields one after the other. ▸ Activate the completely white field once. ▸ Beep sounds (buzzer).

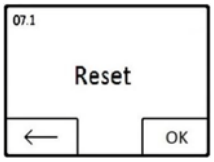
6.2.7 Set water intake options

Service menu 06 provides an option for setting the ice cube size and activating the water intake heater.

Display	Operation
	▸ Call up menu **06**. ■ Set ice cube size ■ Activate water intake heater

6.2.8 Reset to factory settings

Service menu 07 provides an option for resetting the appliance to its delivery status.

Display	Operation
	▸ Call up menu **07**. ▸ Confirm with OK (Appliance is reset to factory settings)

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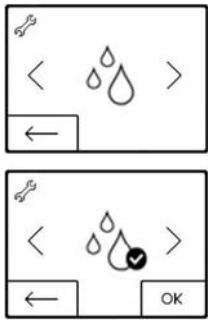
6.2.9 Manual defrosting

Service menu 08 provides an option for starting the freezer compartment defrost heater manually. Defrosting ends automatically once the switch-off values have been reached.

Display	Operation
	▸ Call up menu **08**. ▸ Animated water drop symbol appears and indicates an activated manual defrosting. ▸ Once defrosting has ended, a tick appears on the water drop symbol. ▸ Confirm with OK.

6.3 Error code

6.3.1 Table of error codes

	Error code	Defective component	Emergency mode
	BT001	BioFresh air sensor	■ Refrigeration ON – 19 minutes ■ Refrigeration OFF – 55 minutes
	BT011	Refrigerator compartment air sensor	
	BT021	Refrigerator compartment evaporator sensor	
	BT031	Freezer compartment air sensor	■ Compressor continuous operation
	BT041	Freezer compartment evaporator sensor	■ Compressor continuous operation
	BT071	Ambient air sensor	■ Ambient temperature is a default value
	GQ033	Base fan	--
	PH00X	Communication error	--
	PZ001	UI Hardware	--
	PZ002	UI Memory	--

NOTE*
Ambient sensor error is only tested and displayed in the control panel test of the service mode.

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7 Technical data

7.1 Appliance as a whole

Sensor values

Sensor in refrigerator compartment:

- Air sensor
- Evaporator sensor
- BioFresh air sensor

Sensor in freezer compartment:

- Air sensor
- Evaporator sensor

Temperature [°C]	Resistance value [kOhm]
+35	3.1
+30	3.8
+25	4.7
+20	5.9
+15	7.3
+10	9.3
+5	11.9
0	15.3
-5	19.8
-10	25.9
-15	34.1
-20	45.3
-25	60.8
-30	82.3
-35	112.8

Consumers

Solenoid valve refrigeration circuit	Voltage	230 volts/AC, (3/2, bi-stable, half-cycle impulse-controlled)
	Resistance	4.95 kOhm
Base fan	Output	1 watt
	Voltage	9 volts/DC (6V to 12V)

7.2 Refrigerator BioFresh compartment

Consumers

Lighting	Output	2.5 watts
	Voltage	13 volts/DC
Fan	Output	0.5 watts
	Voltage	9 volts/DC (6V–15V)

7.3 Freezer compartment

Consumers

Fan	Output	0.6 watts
	Voltage	9 volts/DC (6V to 12V)
Defrost heater	Output	190 watts
	Voltage	230 volts/AC
Temperature fuse	Trigger value	84 °C

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