

Technical Manual
IK 458.1-4T / IK 458.2-4T
IK 458-2-4T / IK 458-4-4T

Service Manual: H8-420-03-01Ä

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1. Safety



Danger!

Repairs may only be carried out by a qualified electrician! Inexpert repairs may lead to risks and damages for the user!

To prevent electric shocks, please observe the following tips:

- In the event of faults, housing and frame may be live!
- Touching live components inside the appliance may cause dangerous currents to flow through your body!
- Prior to repairs, disconnect the appliance from the mains!
- When inspecting live parts, a residual current operated device must be used at all times!
- The ground wire resistance must not exceed that specified in the standard! It is of vital importance for ensuring the safety of people and the functioning of the appliance.
- On completion of repairs, an inspection must be carried out in accordance with VDE 0701 [Association of German Electrical Engineers] or the corresponding regulations for your country!



Caution!

Make sure you observe the following instructions:

- The appliances must be disconnected from the mains prior to all repairs. If inspections must be carried out on live appliances, make sure you use a residual current operated device.



Sharp edges: Use protective gloves.



Components may be electrostatic!
Observe handling precautions!

2. General

2.1 NO FROST appliances

The need to supply consumer appliances which fulfil the requirements of the most modern criteria in food storage and which make optimum use of the available space has led to the development of the NO FROST refrigeration and freezing technology.

2.2 The design of the NO FROST appliances

In principle there are no restrictions as regards the appliance design.

All the usual designs in the field of refrigeration and freezing technology can also be produced using NO FROST technology. The appliances are manufactured with up to a maximum of four doors. The doors can be arranged adjacently or one above the other. With most appliances it is possible to adjust the direction in which the door opens.

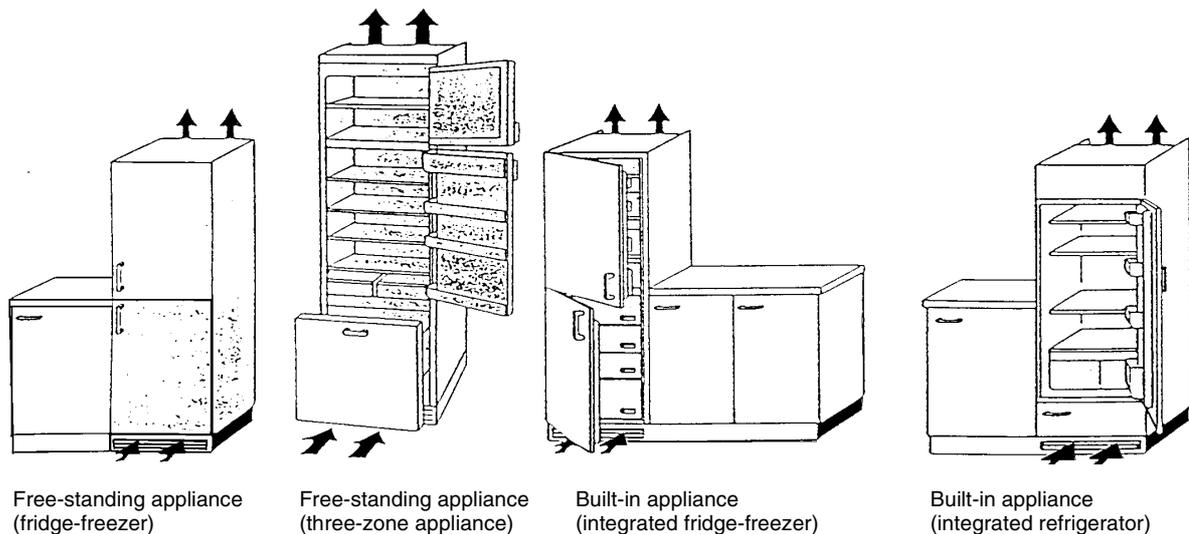
Three types of appliance are available: free-standing, built-under and built-in appliances.

Built-under appliances can be equipped with a decorative top panel.

Built-in appliances are completely integrated and adapted to match the front of the kitchen furniture.

The furniture door is fastened directly to the door of the appliance or to the furniture itself using sliding hinges, all depending on the type of furniture.

Appliance design



Free-standing appliance
(fridge-freezer)

Free-standing appliance
(three-zone appliance)

Built-in appliance
(integrated fridge-freezer)

Built-in appliance
(integrated refrigerator)

2.3 Methods of refrigeration

At Küppersbusch we distinguish between 3 types of refrigeration:

a. *Static refrigeration*

Refrigeration by means of an evaporator, where the air flow factor is not increased by the auxiliary device. With static refrigeration we depend on the normal circulation of air inside the appliance.

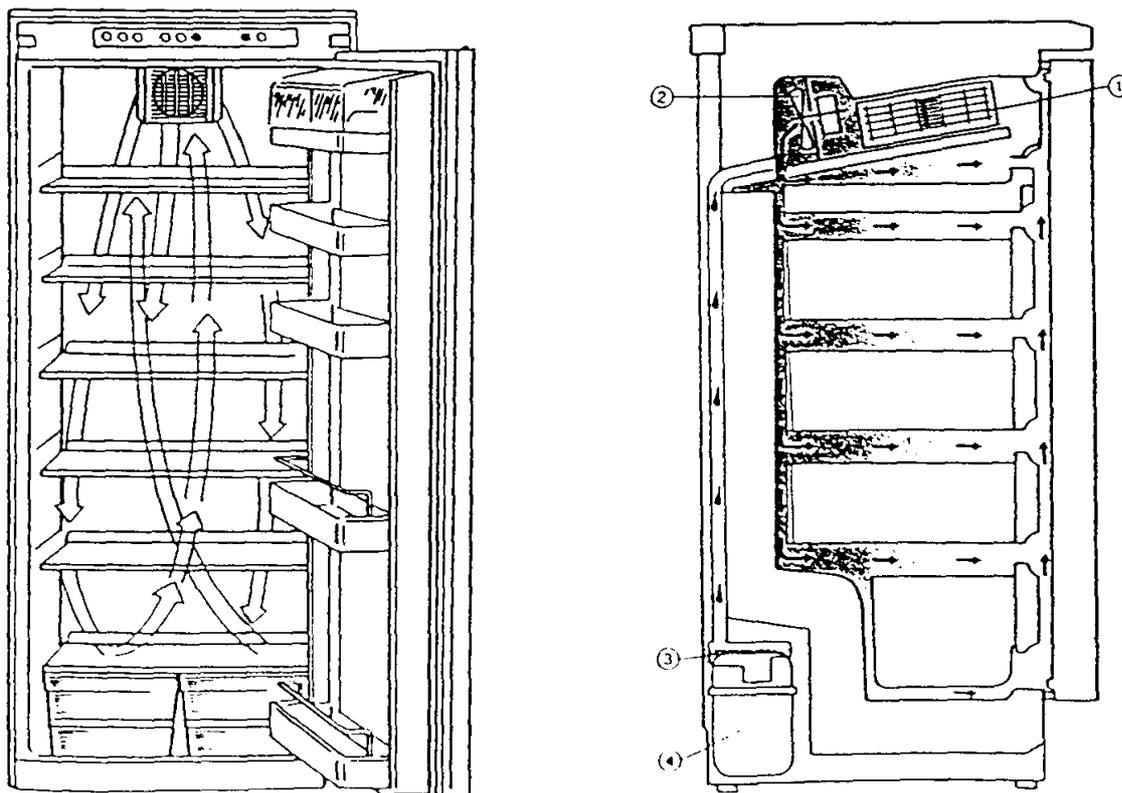
b. *Dynamic refrigeration*

The air is moved around the refrigeration cavity by means of a ventilator. This makes it possible to achieve an even distribution of cold air inside the refrigeration cavity. Air is not lead through the evaporator; instead it is circulated in the refrigeration cavity.

c. *Refrigeration with circulating air*

The air is distributed throughout the refrigeration cavity by means of a ventilator. The air is distributed in such a way that it is conducted through the evaporator. In this way moisture condenses on the evaporator so that the air inside the appliance remains dry.

Methods of refrigeration



1. Evaporator
2. Ventilator
3. Evaporation unit for condensed water
4. Compressor

2.4 NO FROST fridge-freezers

With NO FROST appliances we distinguish between models with only one compressor and models with separate cooling circuits which have two compressors.

- a. All NO FROST appliances with a refrigeration unit belonging to the Küppersbusch family of domestic appliances are characterised by the same thermo-dynamic design. They differ only in terms of capacity, dimensions and aesthetics.

The upper part of the appliance operates using the cyclic (static) refrigeration method; the lower part of the appliance works by using the NO FROST method.

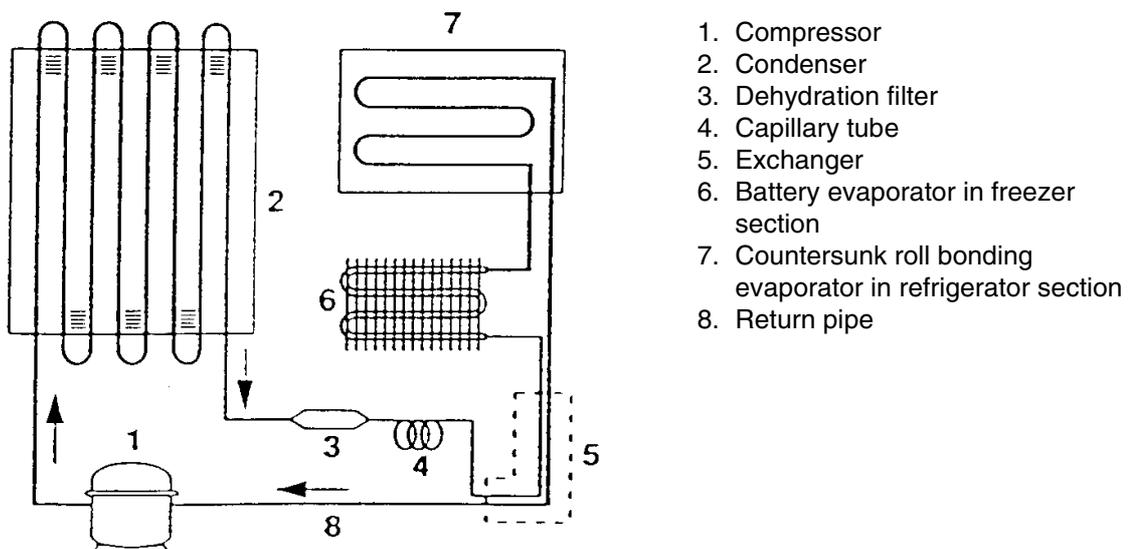
The temperature in both parts of the appliance is regulated by means of a thermostat fitted in the refrigerator section.

The cooling circuit consists of the evaporator, which is fitted in the refrigerator section (also completely integrated, depending on the model), and a battery evaporator which is fitted in the freezer section.

The circuit is completed by a compressor, the condenser and two thermostats with capillaries of varying lengths.

Due to the different capillaries, the appliances have different evaporator zones. The first and absolute evaporator zone is located in the refrigerator section and the second in the freezer section (battery evaporator).

NO FROST cooling circuit in the single-compressor version



1. Compressor
2. Condenser
3. Dehydration filter
4. Capillary tube
5. Exchanger
6. Battery evaporator in freezer section
7. Countersunk roll bonding evaporator in refrigerator section
8. Return pipe

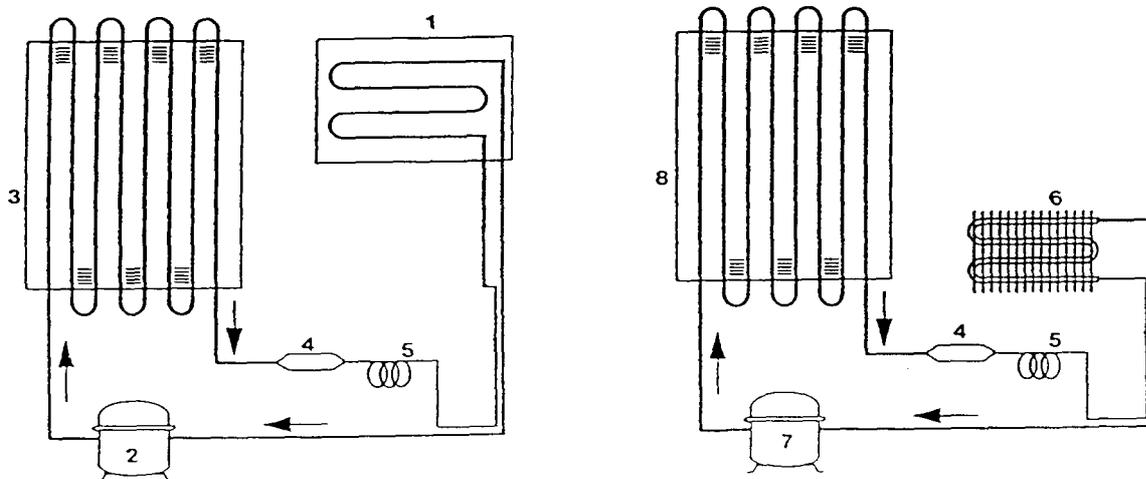
- b. In addition to the NO FROST fridge-freezer appliances with one cooling unit, KÜPPERSBUSCH also manufactures models with two compressors. These are appliances with a capacity of 300 l and with 3 or 5 doors.

These models have two different cooling circuits.

The refrigerator section operates by means of cyclical cooling with one cooling unit and separate temperature adjustment. A second cooling unit controls the NO FROST operation of the freezer section and the 0° zone.

The temperature of each cooling circuit is controlled directly and separately by means of a thermostat.

NO FROST dual-compressor version



1. Evaporator of the refrigerator section
2. Compressor of the refrigerator section
3. Condenser of the refrigerator section
4. Dryer

5. Capillary tube
6. Evaporator of the freezer section
7. Compressor of the freezer section
8. Condenser of the freezer section (compressor area)

2.5 Installation and connection

Dry, well ventilated rooms present the best conditions for installing the fridge-freezers.

In order to keep electricity consumption low, the appliances should not be installed next to a cooker or a radiator. Avoid direct sunlight.

When installed in a kitchen, fridge-freezers are arranged to fit in with normal work routines. It must be ensured that the direction in which the door opens is the right one for the type of work carried out in the kitchen.

Freezers - particularly freezer chests - can also be installed in a basement or cellar, in a basement corridor or in a larder. If these rooms are damp, it is advisable to use an appliance with a condenser on the outside wall.

Fridge-freezers are available in a number of different temperature groups which determine under what ambient temperatures the appliances function to optimum satisfaction:

- Normal "N": Ambient temperature of between +16 °C and +32 °C
- Extended normal "SN": Ambient temperature of between +10 °C and +32 °C
- Subtropical "ST": Ambient temperature of between +18 °C and +38 °C
- Tropical "T": Ambient temperature of between +18 °C and +43 °C

(Source: DIN 8950)

The sign indicating these limits appears on the rating label. The fridge-freezers used in Germany almost all belong to class "N", i.e. avoid installing them in a room where a temperature of less than +16 °C or more than +32 °C can be reached as the temperature regulation device of the appliances will then fail to function correctly. This has particularly adverse effects in refrigerators with an evaporator compartment and in fridge-freezers with only one cooling circuit.

Freezers only function correctly in an ambient temperature of approx. 0 °C.

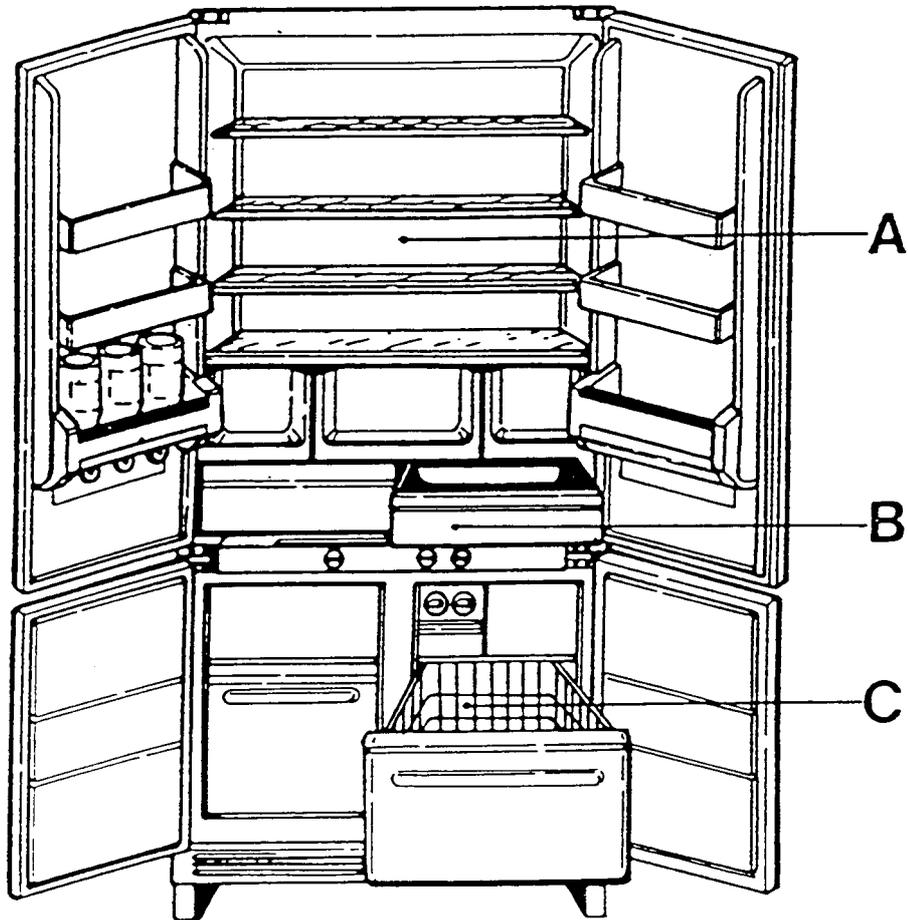
On no account should the appliance be installed in a place where the temperatures exceed +32 °C.

Fridge-freezers are supplied ready to plug in and are connected to a protected socket. For refrigerators the wattage is roughly between 100 W and 240 W and between 145 W to 265 W for fridge-freezers.

Freezers have a wattage of between 100 W and 300 W. For reasons of safety the freezer should have a separate electricity circuit. This ensures that it will continue to operate when the circuit becomes overloaded due to other appliances being connected or when the electricity circuit is interrupted due to another appliance becoming defective.

3. The fully integrated 3-zone fridge-freezer

3.1 The various zones



A - Refrigerator

B - 0 °C zone

C - Freezer

Multi-zone appliances enable the customer to make use of 3 refrigeration zones for optimum storage of all types of food.

The refrigeration sections in detail:

Refrigeration section A:

Here an ideal environment is created for the storage of fresh food. This section employs an evaporator made of an integrated aluminium sheet and the temperature is controlled by means of an adjustable thermostat on the operation panel.

Refrigerator section B:

This refrigeration section has even temperatures of between 0 °C and 3 °C. Refrigeration is by means of the enforced convection of air from the lower freezer section. The temperature control in this section is regulated by means of a special flap thermostat (mechanically). Even temperatures are guaranteed, even during defrosting.

Freezer section C:

The cold air is generated by a battery evaporator and the enforced convection of the air is effected by means of a ventilator.

This means that moist air in the form of frost only condenses on the evaporator and not on the walls of the freezer section or on packages of food. A timer activates a defrost resistor at regular intervals (depending on the model every 12 – 14 hours). It is not possible for the compressor to start up. As soon as the temperature of the evaporator reaches +10 °C, the power supply of the heating resistor is interrupted by a thermal switch during defrosting.

A further safety thermal switch interrupts the power supply to the thermal resistor when the temperature of the battery evaporator rises to abnormal levels (+30 °C /+40 °C) due to a malfunction.

The temperature in the freezer is clearly indicated by means of various LEDs on an electronic thermometer located on the operation panel.

The temperature is regulated by means of an adjustable thermostat on the operation panel.

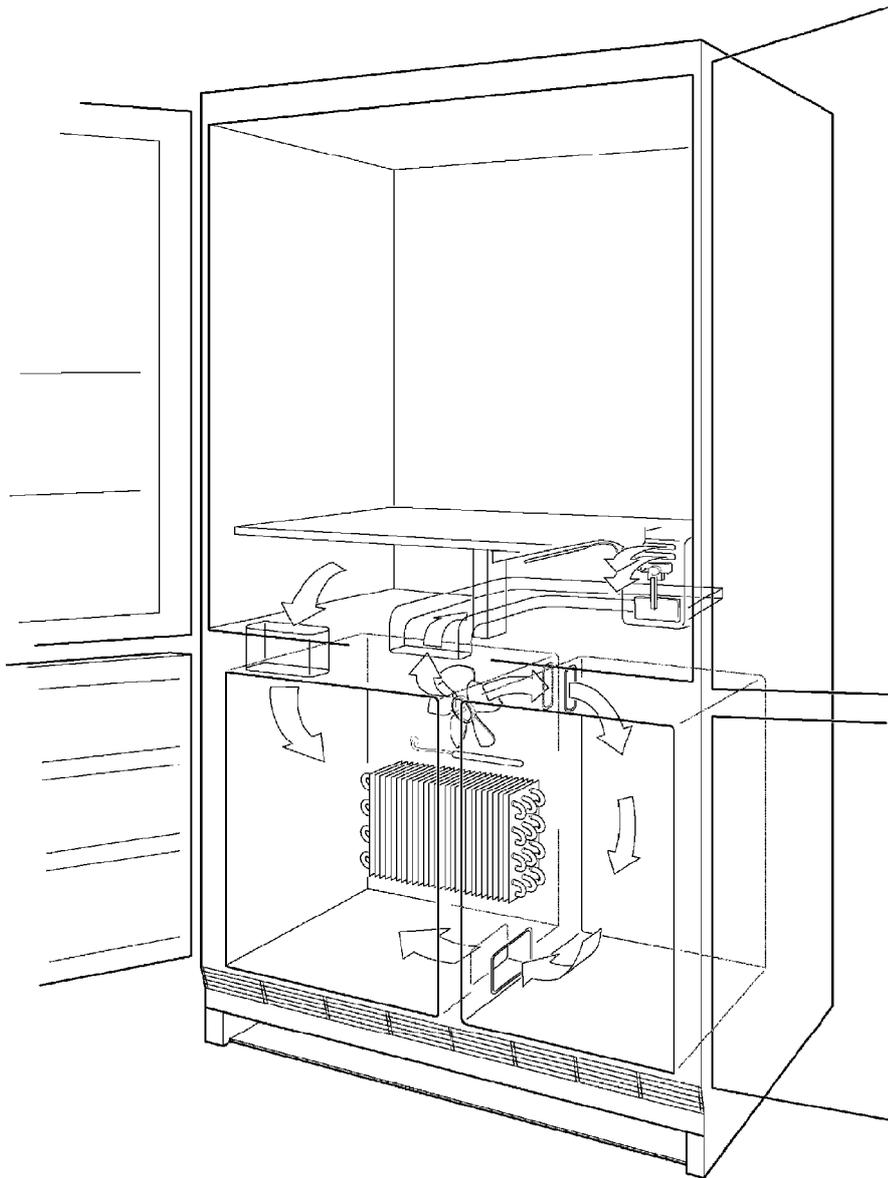
The 3-zone appliance has two cooling circuits.

3.2 Technical data:

	IK 458.1-4T	IK 458.2-4T
General features		
Dimensions HxWxD	190x86x55 cm	190x86x55 cm
Gross capacity:		
Refrig./ freezer/ 0° zone	274 / 128 / 45 l	274 / 128 / 45 l
Cooling:		
Refrig./ freezer/ 0° zone	cyclical / **** / 0-3°C	cyclical / **** / 0-3°C
Amount of cooling agent:	R12	R134a
Refrig./ freezer	90 / 160 g	75 / 130 g
Class	N	N
Refrigerator:		
Thermostat:		
Minimum setting:		
Switching on / switching off	+4.5 / -12°C	+4.5 / -12°C
Maximum setting:		
Switching on / switching off	+4.5 / -22°C	+5 / -24°C
Motor compressor		
Operating voltage	220-230 V / 50 Hz	220-240 V / 50 Hz
Power of motor	1/8 HP	1/8 HP
Power consumption	93 W	89 W
Nominal / starting current	0.6 / 3.5 A	0.5 / 2.7 A
Resistance of main and auxiliary winding	20 / 21 ohms	25 / 26 ohms
Cooling output	83 Kcal/h	92 Kcal/h
Freezer		
Thermostat:		
Minimum setting:		
Switching on / switching off	-11 / -20°C	-11 / -20 °C
Maximum setting:		
Switching on / switching off	-26 / -34 °C	-26 / -34 °C
Motor compressor / KS		
Operating voltage	220-240 / 50 / V/Hz	220-240 / 50 / V/Hz
Power of motor	1/5 HP	1/5 HP
Power consumption	150 W	149 W
Nominal / starting current	0.7 / 4.7 A	0.8 / 4.8 A
Resistance of main and auxiliary winding	12 / 14 ohms	12 / 14 ohms
Cooling output	169 Kcal/h	204 Kcal/h
Operating condensor	5 µF	5 µF

	IK 458-2-2T	IK 458-4-4T
General features		
Dimensions HxWxD	190x86x55 cm	190x86x55 cm
Gross capacity		
Refrig./ freezer/ 0° zone	266 / 96 / 28 l	266 / 96 / 28 l
Cooling:		
Refrig./ freezer/ 0° zone	cyclical / **** / 0-3°C	cyclical / **** / 0-3°C
Amount of cooling agent:		
Refrig./ freezer	R134a 75 / 130 g	R600a 38 / 60g
Class	N	SN
Refrigerator:		
Thermostat:		
Minimum setting:		
Switching on / switching off	+4.5 / -12°C	+5 / -3.5°C
Maximum setting:		
Switching on / switching off	+4.5 / -22°C	+5 / -24°C
Motor compressor		
Operating voltage	220-240 V / 50 Hz	220-240 V / 50 Hz
Power of motor	1/8 HP	1/12 HP
Power consumption	89 W	60 W
Nominal / starting current	0.5 / 2.7 A	0.29 A
Resistance of main and auxiliary winding	25 / 26 ohms	38.5 / 26 ohms
Cooling output	92 Kcal/h	60 Kcal/h
Freezer		
Thermostat:		
Minimum setting:		
Switching on / switching off	-11 / -20°C	-12 / -20.5°C
Maximum setting:		
Switching on / switching off	-26 / -34°C	-23 / -34°C
Operating voltage	220-240 V / 50 Hz	220-240 V / 50 Hz
Power of motor	1/5 HP	1/6 HP
Power consumption	149 W	131 W
Nominal / starting current	0.8 / 4.8 A	0.9 / 4.9 A
Resistance of main and auxiliary winding	12 / 14 ohms	
Cooling output	169 Kcal/h	204 Kcal/h
Operating condensor	5 µF	5 µF

3.3 Air circulation



Freezer section: the air produced by the battery-driven evaporator is put into circulation by the fan, which is located above the battery. The air flows into the right-hand compartment of the freezer and flows out again through two slits.

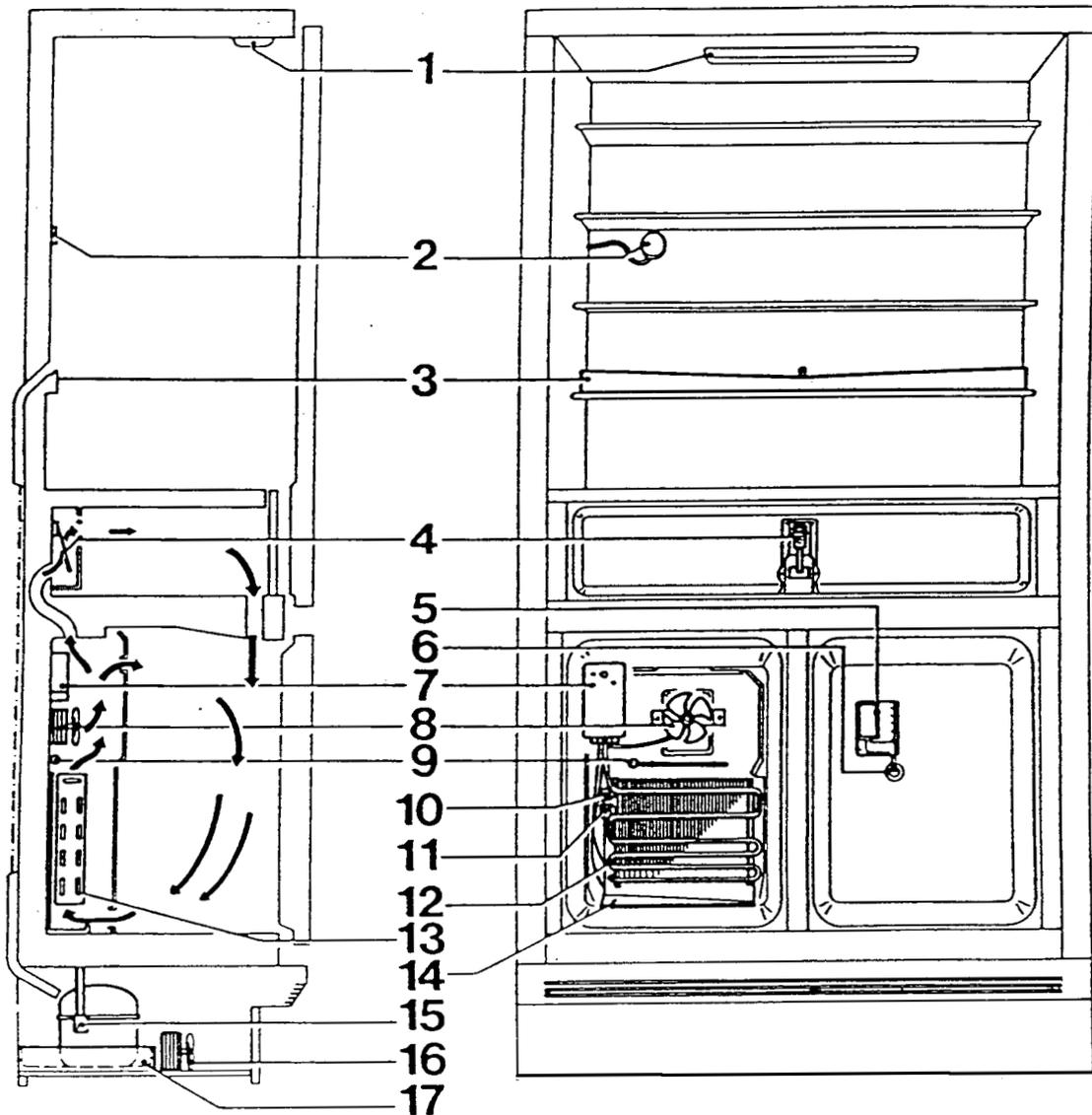
The temperature is controlled by the thermostat bulb which can be seen installed right above the battery.

Zero-degree zone: the air flows in through a foamed duct above the fan and flows out through the slits of the flap thermostat. The air can flow back into the freezer section through a slit on the bottom left of the zero-degree zone. The temperature is regulated by the flap thermostat.

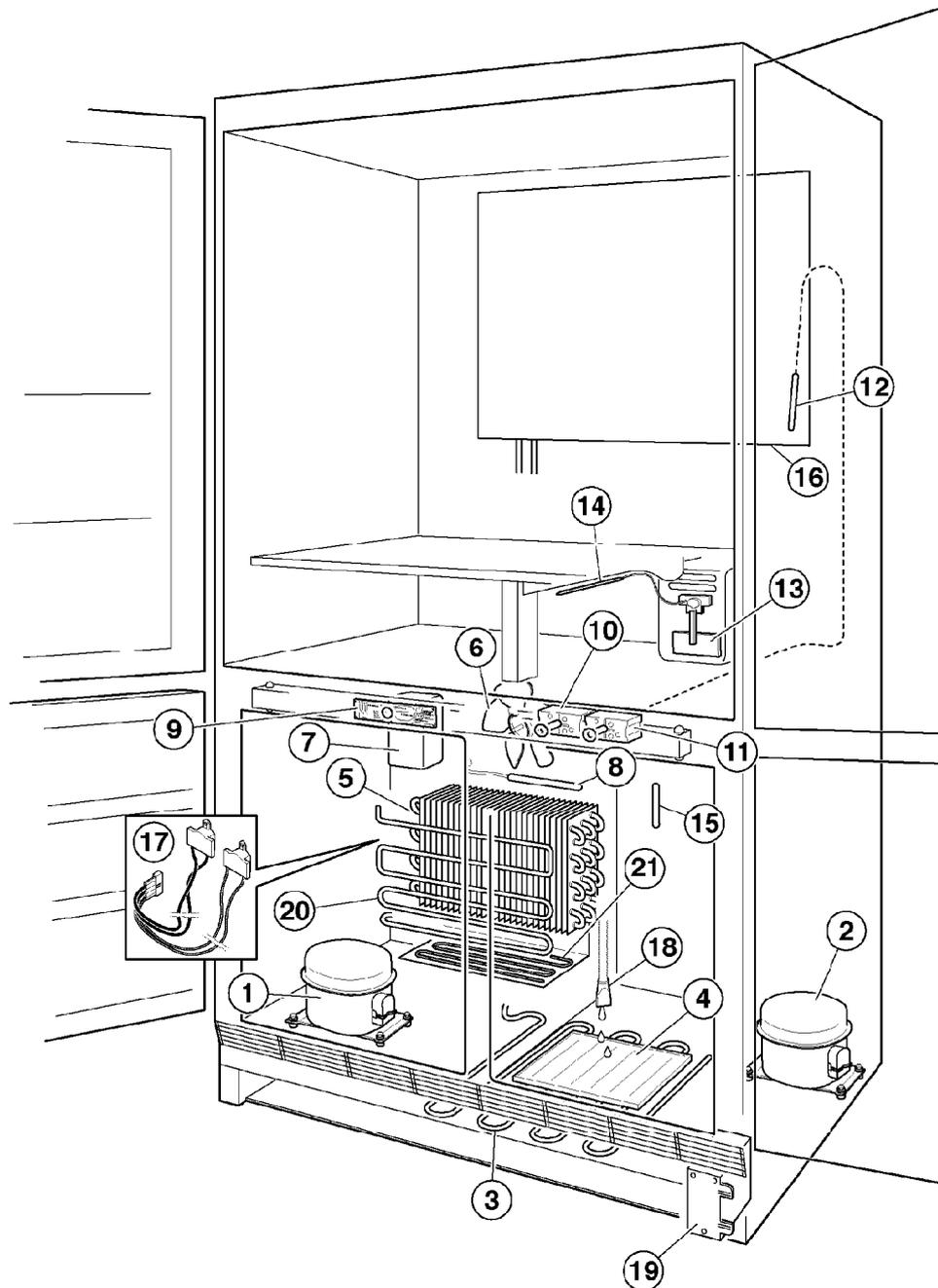
Refrigerator section: the air is circulated by means of natural air convection. The flow is regulated by the built-in thermostat bulb.

3.4 System components

IK 458.1-4T, IK 458.2-4T, IK 458-2-4T



- | | |
|---|--|
| 1. Lighting | 10. Defroster - thermal switch |
| 2. Thermostat sensor | 11. Safety thermostat |
| 3. Water drainage | 12. Heating resistor of the evaporator |
| 4. Flap thermostat | 13. Battery evaporator |
| 5. Cold storage unit | 14. Drainage system incl. heating resistor |
| 6. Thermometer probe | 15. Drain valve |
| 7. Timer | 16. Fan compressor |
| 8. Ventilator of freezer section | 17. Drainage bowl |
| 9. Thermostat sensor of freezer section | |

IK 458-4-4T

- | | |
|---|--|
| 1. Compressor of the refrigerator section | 12. Thermometer bulb of the refrigerator section |
| 2. Compressor of the freezer section | 13. Flap thermostat |
| 3. Condenser of the refrigerator section | 14. Flap thermostat bulb |
| 4. Drain pan | 15. NTC probe of the electronic thermometer |
| 5. Battery-operated evaporator | 16. Sunk-in refrigerator evaporator |
| 6. Ventilator of evaporator | 17. Thermal protection device |
| 7. Terminal board casing, | 18. Rubber valve |
| 8. Thermometer bulb of the freezer section | 19. Timer |
| 9. Electronic thermometer with LEDs | 20. Defrost resistor |
| 10. Thermometer of the freezer section | 21. Condensation water channel resistor |
| 11. Thermometer of the refrigerator section | |

3.4.1 Components of the refrigerator section (for IK 458.1-4T, IK 458.2-4T and IK 458-2-4T only)

Thermostat

The temperature in this section is regulated by means of a thermostat which is located behind the operation panel.

The probe of this thermostat projects through a small tube embedded in foam into the inner area of the appliance at the point where the evaporator is fastened.

Thermal protection (lamps)

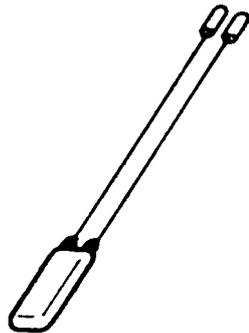
The new lighting system in the refrigerator section comprises two lamps. These lamps are located at the top of the refrigerator section.

In order to avoid the housing of the lamp overheating when the door is opened, there is a thermal cut-out in the row to the two lamps.

As soon as the temperatures around this sensor exceed 70 °C, the power supply of the lamps is cut off.

The lamps will switch on again at a temperature of approx. 45 °C when the door is opened.

Thermal cut-out



3.4.2 Components of the 0 °C zone (all models)

At the rear of the inner housing of this compartment there is a flap thermostat enclosed in a transparent protector.

The sensor is fastened under the top of the inner housing.

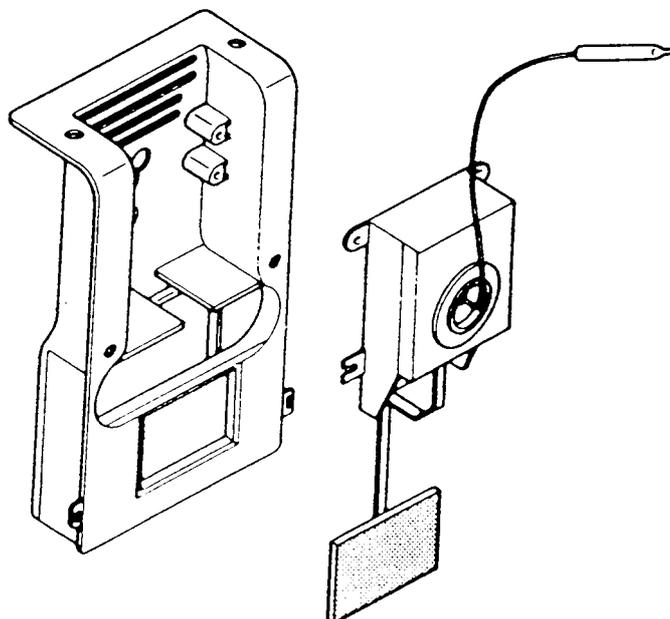
The thermostat opens up or blocks the entry of cold air from the freezer located below.

The ventilator of the freezer section is one of the factors responsible for maintaining an even temperature in the 0 °C zone.

This ventilator ceases to operate during defrosting.

The flap thermostat can be regulated by means of a screw, but please refrain from making use of this option!

Flap thermostat



3.4.3 Components of the left freezer section (IK 458.1-4T, IK 458.2-4T, IK 458-2-4T)

The various components of the system are located in the inner cavity.

The following elements are fastened at the rear of the inner housing behind a protector:

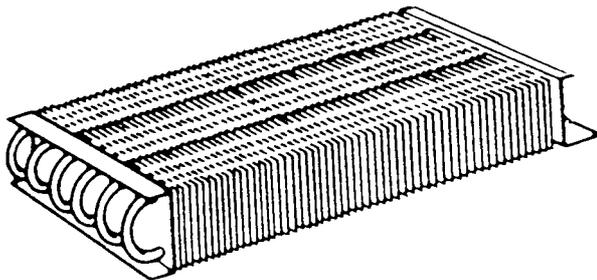
- Battery evaporator
- Fan
- Defrosting timer
- Thermostat sensor
- Thermal switch
- Heating resistor and drainage system

The battery evaporator has a high refrigeration power, although it occupies only little space.

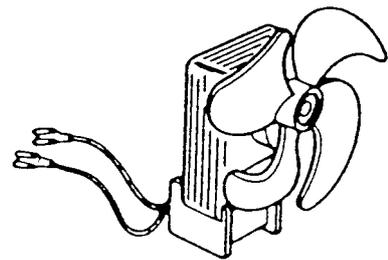
Due to the enforced convection of the air, moisture condenses on the evaporator, which is the coldest part of the inner cavity.

This enforced convection is generated by a fan located above the evaporator.

Battery evaporator



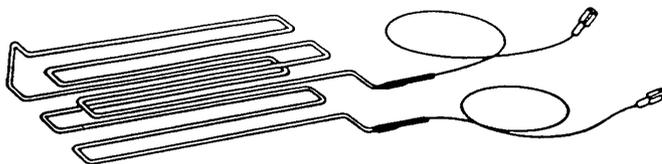
Fan



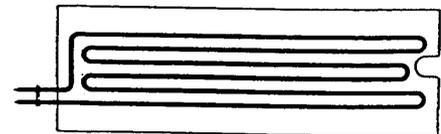
The ice on the evaporator must be defrosted at regular intervals. For this purpose every 14 hours the timer switches on a heating resistor which is in contact with the battery evaporator.

At the same time, power is supplied to a heating resistor which is adhesively secured to the drainage system.

Defroster heating resistor 303 ■

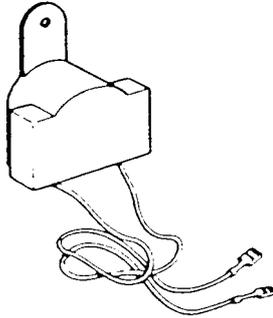


Heating resistor drainage system 2679 ■



A safety thermal switch is connected to the evaporator. This switches both heating resistors off as soon as the evaporator reaches a temperature of more than +30 °C due to a malfunction. The +10 °C thermostat switch first switches off the heating element on the battery evaporator.

Thermal switch

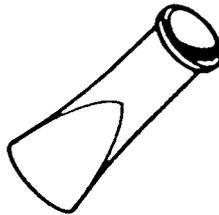


> +10 °C - grey cable
> +40 °C - black cable

The water from defrosting is conducted outside the appliance by means of a special silicon rubber valve attached to the drainage system.

The structure of this rubber valve enables the water from defrosting to drain away smoothly. During the cooling phase the pressure of the vacuum causes the valve to close. This prevents air from being sucked in from outside the appliance.

Rubber valve



3.4.4 Components of the right freezer section (IK 458.1-4T, IK 458.2-4T, IK 458-2-4T)

The following elements are located on the side wall:

- The temperature probe, PTC, for the electric thermometer
- The cold storage unit

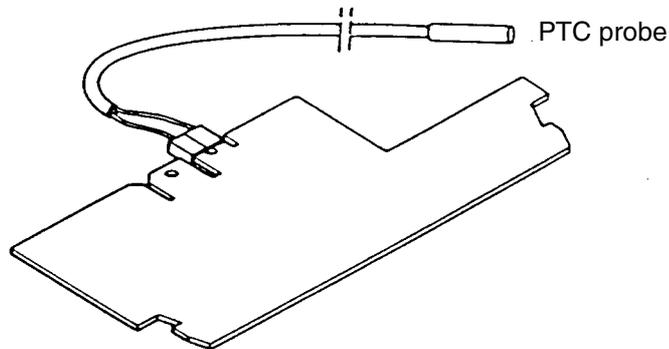
The electronic thermometer

An electronic board in the operation panel indicates the temperature in the freezer by means of 6 LEDs which light up in sequence. The same board controls an ON/OFF LED, a super LED and an ALARM LED.

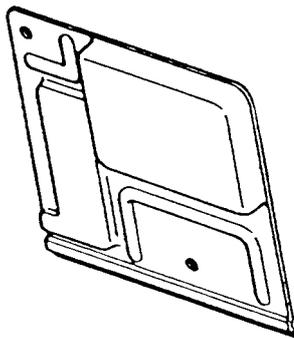
The board is controlled by a PTC probe. The electronics control the optical displays on the operation panel.

The PTC probe is located at the side of the inner cavity and connected to a cold storage unit (buffer effect), which ensures constant display on the part of the LED diodes and avoids any abnormal display due to brief fluctuations in temperature.

Electronics



Cold storage unit

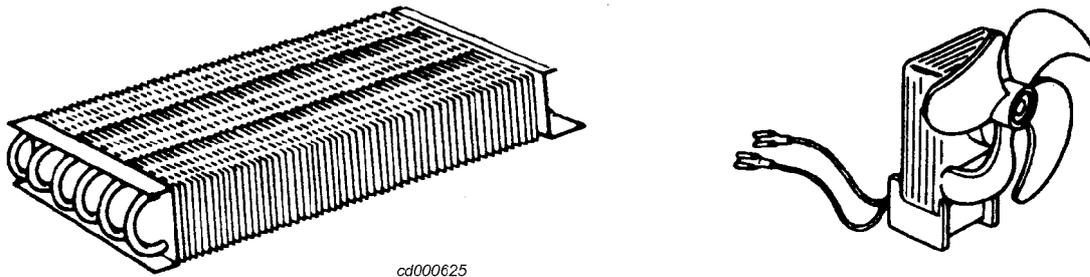


3.4.5 Components of the freezer section (IK 458-4-4T)

Battery-operated evaporator and fan

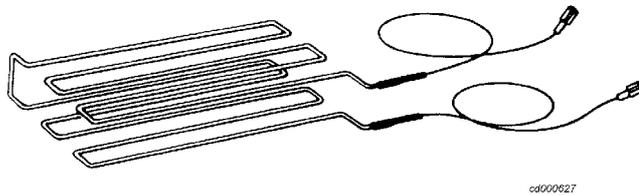
The battery-operated evaporator cools extremely well in spite of the fact that it takes up little space. This is made possible because the surface of the evaporator has been enlarged with numerous aluminium ribs installed in a zinc serpentine tube.

An active circulation of air (power output: 3.1 watts, velocity: 2400 rpm), generated by a fan installed above the evaporator ensures that all of the humidity present is deposited on the evaporator, which is the coldest part of the interior of the appliance.



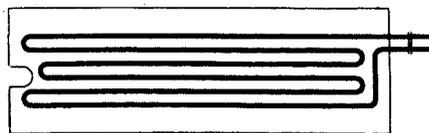
Defrost resistor

The ice which builds up on the evaporator needs to be defrosted at regular intervals. For this reason a timer located in the bottom right-hand corner of the appliance (under the bottom hinge of the right-hand door of the freezer) uses direct battery contact to activate a resistor which operates at 190 watts (resistance: 303 ohms, voltage: 240 V) approx. every 12 hours.



Condensation water channel resistor

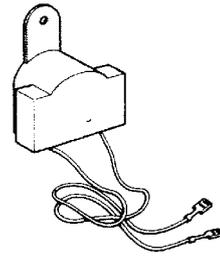
In order to prevent condensation water from turning into ice, a 21.5-watt resistor (resistance: 2679 ohms, voltage: 240 V) has been connected under the condensation water channel. This resistor is connected in parallel to the defrost resistor.



Temperature switch

Two temperature switches with direct contact to the battery cut off the power supply to the defrost resistor in the case of:

- +10 °C, end defrost switch (cable color: grey);
- +40 °C, safety switch (cable color: black).



Rubber valve

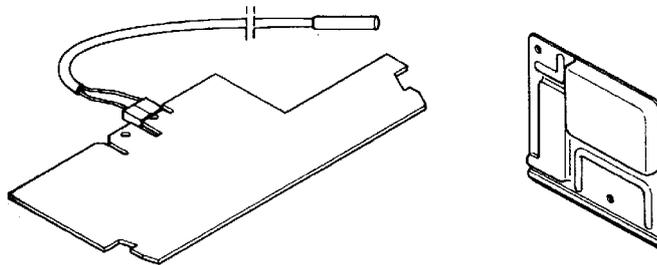
The condensation water is let off through a silicone plastic valve located in the condensation water drainage hole.

The quality of the condensation water enables it to flow out freely; on the other hand, during the cooling phase, the valve closes due to the suction which is produced in the inside of the appliance, hence preventing moist air from the outside from being sucked in.



Electronic thermometer

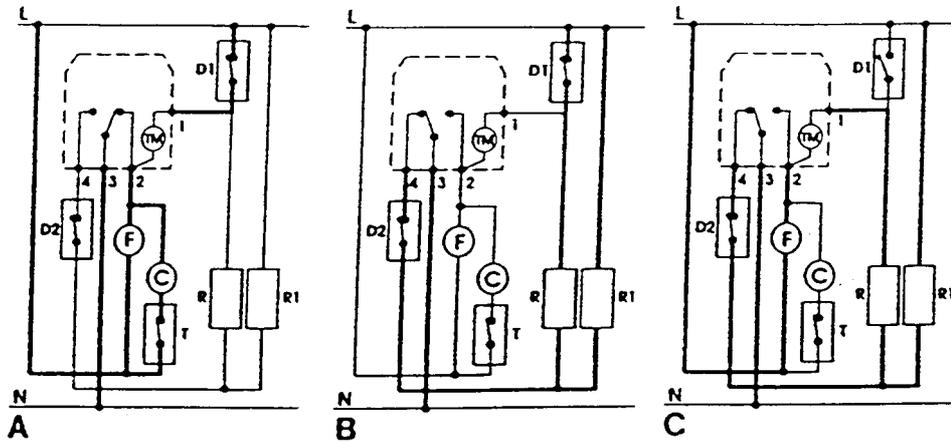
An electronic plate in the control panel indicates the temperature in the freezer cavity by means of 6 LEDs which light up in succession. This plate controls an ON-OFF LED, a super LED and an alarm LED which lights up when the temperature exceeds -11°C.



The plate is controlled by an NTC probe which adjusts its resistance according to changes in temperature. The probe is on the bottom of the cell and is contacted to a eutectic mass, hence ensuring that the LEDs light up consistently and avoiding a faulty message in the case of momentary changes in temperature.

3.5 The function of the defroster heating element (all models)

The heat generated by the defroster heating element has no influence on the temperature in the freezer or on that of the packages of food after the total thermal power has been consumed when the ice on the evaporator has been defrosted.



TM	Timer	R1	Water channel heat resistor 2.679 \square
F	Fan	D1	Defrost thermal switch
T	Thermostat for the freezer section	D2	Safety thermal switch
C	Compressor for the freezer section		
R	Defrost heat resistor = 303 \square		

Figure A illustrates the normal operating conditions when contacts 2 - 3 of the timer are closed.

After 14 hours (approx. 12 hours for IK 458-4-4T) the cam of the timer interrupts contacts 2 - 3 and switches on contacts 3 - 4, resulting in the condition shown in figure B:

The power supply to the motor of the timer, to the compressor and the ventilator is interrupted and, at the same time, the heating resistor of the battery evaporator and that of the water drainage system are activated.

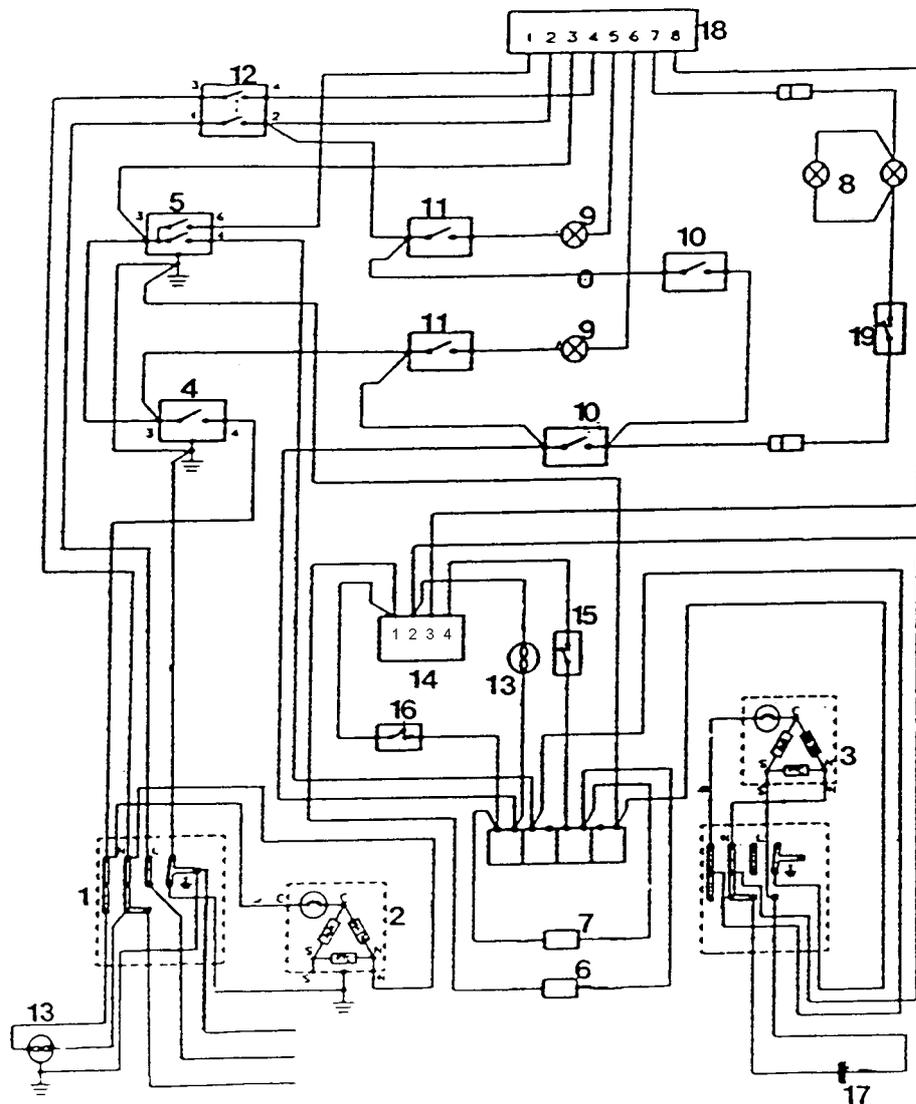
The thermal switch is activated as soon as the evaporator has reached a temperature of +10 °C.

It interrupts the power supply to the heating resistor of the evaporator and the timer is under voltage again.

After the appliance has been in operation for approx. 10 mins. it returns to the conditions shown in figure A. During this time, the heating resistor of the water drainage system remains switched on to ensure that the water from defrosting is drained away correctly.

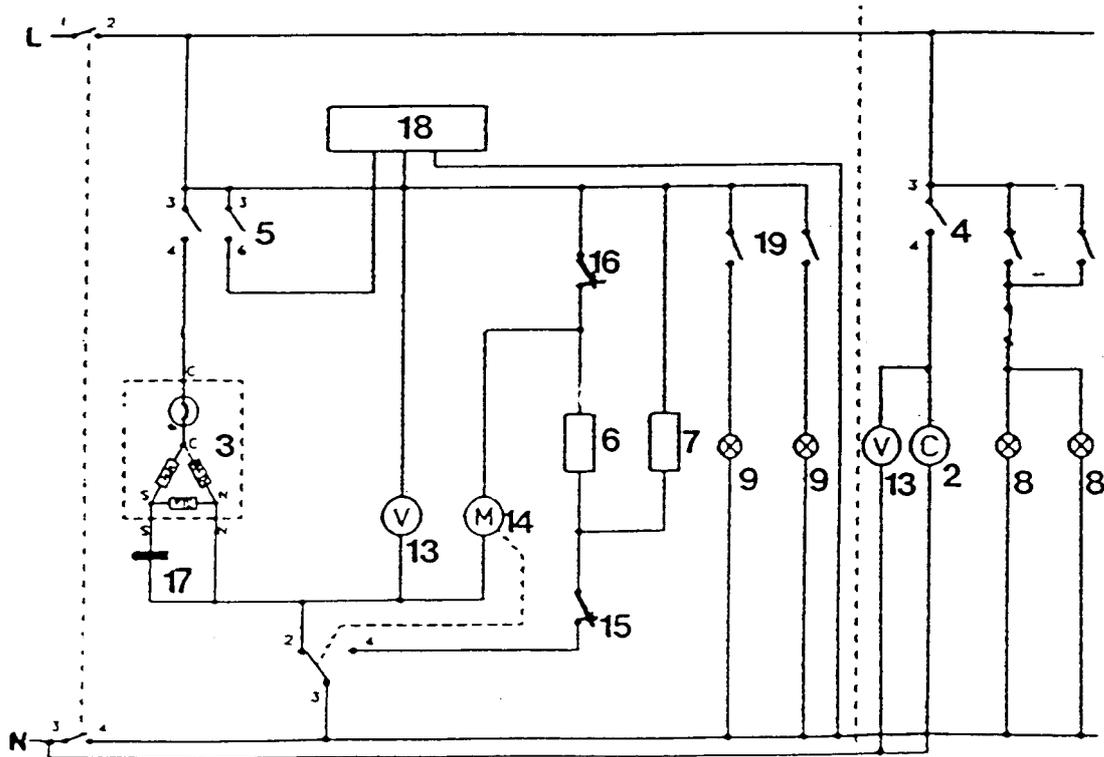
3.6 The electronic circuit

3.6.1 Wiring diagram IK 458.1-4T, IK 458.2-4T, IK 458-2-4T



- | | |
|---|---------------------------------|
| 1. Terminal board | 10. Door switch of refrigerator |
| 2. Compressor refrigerator section | 11. Door switch of freezer |
| 3. Compressor freezer section | 12. ON/OFF switch |
| 4. Thermostat refrigerator section | 13. Ventilator of evaporator |
| 5. Thermostat freezer section | 14. Timer |
| 6. Defrost heating resistor | 15. Safety thermostat |
| 7. Heating resistor water drainage system | 16. Defroster thermal switch |
| 8. Lamp of refrigerator | 17. Condenser |
| 9. Lamp of freezer | 18. Electronic thermometer |
| | 19. Thermal switch of lamps |

3.6.2 Circuit diagram IK 458.1-4T, IK 458.2-4T, IK 458-2-4T

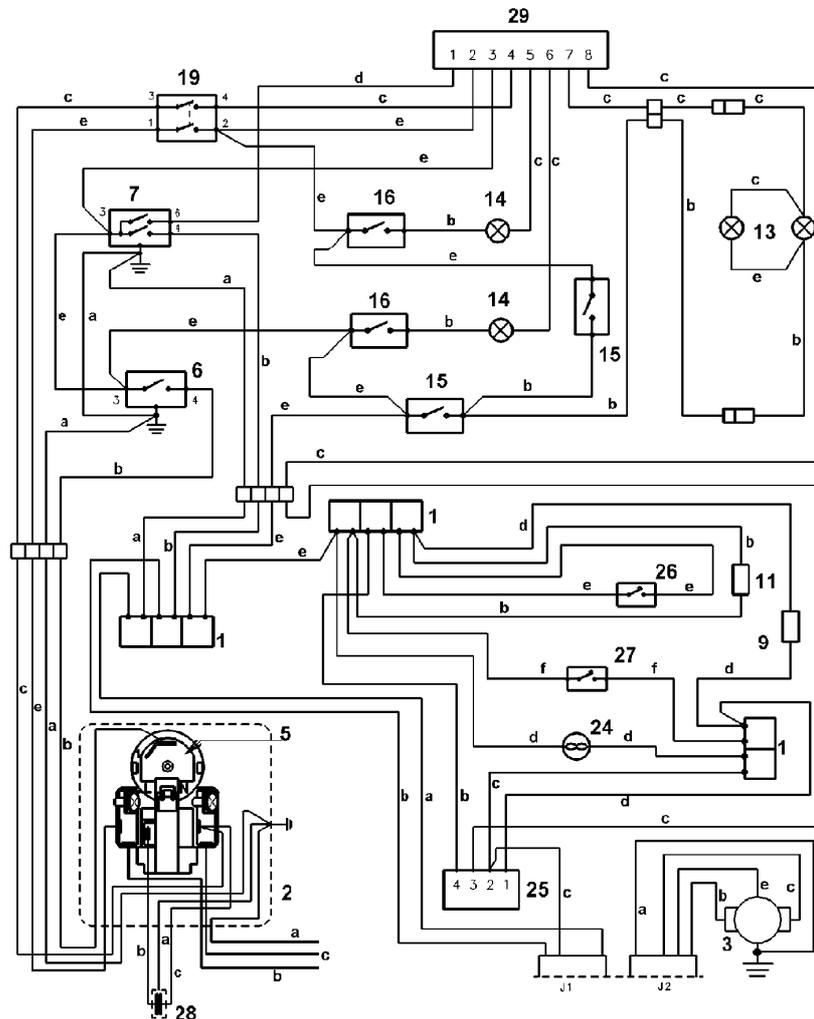


- | | |
|---|---------------------------------|
| 1. Terminal board | 10. Door switch of refrigerator |
| 2. Compressor refrigerator section | 11. Door switch of freezer |
| 3. Compressor freezer section | 12. ON/OFF switch |
| 4. Thermostat refrigerator section | 13. Ventilator of evaporator |
| 5. Thermostat freezer section | 14. Timer |
| 6. Defrost heating resistor | 15. Safety thermostat switch |
| 7. Heating resistor water drainage system | 16. Defroster thermal switch |
| 8. Lamp of refrigerator | 17. Condenser |
| 9. Lamp of freezer | 18. Electronic thermometer |
| | 19. Thermal switch of lamps |

3.6.3 Wiring diagram IK 458-4-4T

PNC code 925780652 00
925780652 01
925780652 02

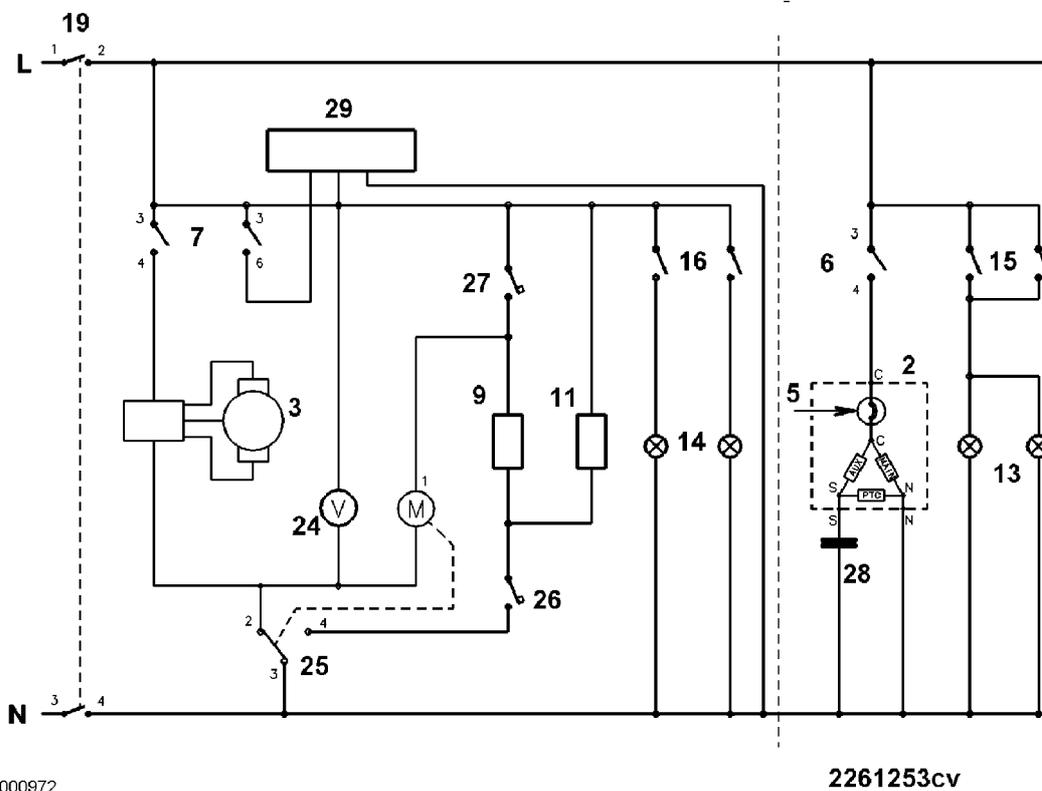
925780652 03
925780652 04



- | | |
|---|--|
| 1. Terminal board | 16. Door switch of freezer |
| 2. Compressor of the refrigerator section | 19. ON/OFF switch |
| 3. Compressor of the freezer section | 24. Fan |
| 5. Protective motor switch | 25. Timer |
| 6. Thermostat refrigerator section | 26. Safety temperature switch, |
| 7. Thermostat freezer section | 27. Defrost temperature switch (+10°C) |
| 9. Defrost resistor | 28. Operating condenser |
| 11. Condensation water channel resistor | 29. Electronic thermometer. |
| 13. Lamp of refrigerator | |
| 14. Lamp of freezer | |
| 15. Door switch of refrigerator | |
- a) yellow-green, b) brown, c) blue, d) white
e) black, f) grey, g) red, h) orange

3.6.4 Circuit diagram IK 458-4-4T

PNC code 925780652 00
 925780652 01
 925780652 02
 925780652 03
 925780652 04



cd000972

2261253cv

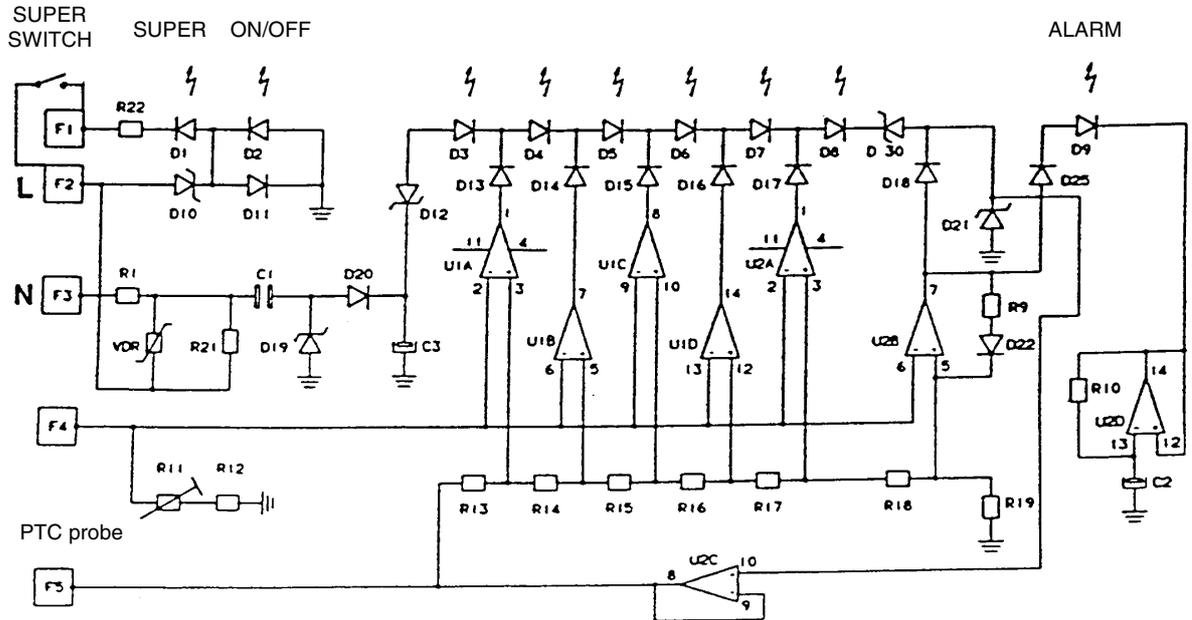
- | | |
|---|--|
| 1. Terminal board | 16. Door switch of freezer |
| 2. Compressor of the refrigerator section | 19. ON/OFF switch |
| 3. Compressor of the freezer section | 24. Fan |
| 5. Protective motor switch | 25. Timer |
| 6. Thermostat refrigerator section | 26. Safety temperature switch |
| 7. Thermostat freezer section | 27. Defrost temperature switch (+10°C) |
| 9. Defroster resistor | 28. Operating condenser |
| 11. Condensation water channel resistor | 29. Electronic thermometer. |
| 13. Lamp of refrigerator | |
| 14. Lamp of freezer | a) yellow-green, b) brown, c) blue, d) white |
| 15. Door switch of refrigerator | e) black, f) grey, g) red, h) orange |

3.6.5 The electronics

PRINTED CIRCUIT INPUT CONTACTS



ELECTRONIC THERMOMETER (PRINTED CIRCUIT 1.6 mm FR2 YO



- F1 Input fast freeze - yellow LED (contact no. 1 on the printed circuit board)
- F2 Phase voltage (contacts no. 2 - 3 on the printed circuit board)
- F3 Neutral voltage (contacts no. 4 - 8 on the printed circuit board)
- F4 and F5 probe (contacts no. 1 - 2 on the printed circuit board)

3.7 Properties of the NTC probe

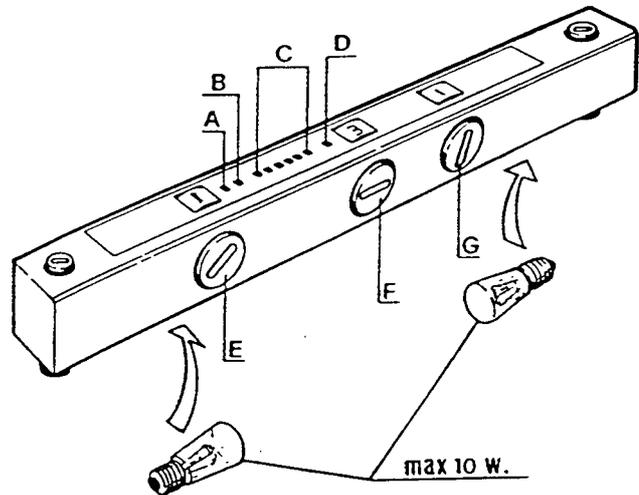
Conversion chart

° C	Δ	OHM
10	± 0.6	5348
9	± 0.6	5611
8	± 0.6	5888
7	± 0.6	6182
6	± 0.6	6491
5	± 0.4	6818
4	± 0.4	7164
3	± 0.4	7529
2	± 0.4	7916
1	± 0.4	8325
0	± 0.4	8758
-1	± 0.4	9216
-2	± 0.4	9701
-3	± 0.4	10215
-4	± 0.4	10759
-5	± 0.4	11337
-6	± 0.6	11949
-7	± 0.6	12598
-8	± 0.6	13288
-9	± 0.6	14019
-10	± 0.6	14795
-11	± 0.7	15620
-12	± 0.7	16497
-13	± 0.7	17429
-14	± 0.7	18420
-15	± 0.7	19475
-16	± 0.8	20596
-17	± 0.8	21791
-18	± 0.8	23063
-19	± 0.8	24418
-20	± 0.8	25862
-21	± 0.9	27402
-22	± 0.9	29045
-23	± 0.9	30797
-24	± 0.9	32668
-25	± 0.9	34666
-26	± 1	36800
-27	± 1	39082
-28	± 1	41521
-29	± 1	44131
-30	± 1	46921
-31	± 1	49910
-32	± 1	53111
-33	± 1	56541
-34	± 1	60218
-35	± 1	64161
-36	± 1	68393
-37	± 1	72932
-38	± 1	77808
-39	± 1	83046
-40	± 1	88577

3.8 Disassembling the individual components

3.8.1 Components in the vicinity of the operation panel (IK 458.1-4T, IK 458.2-4T and IK 458-2-4T)

- A. Operation control lamp
- B. Alarm display
- C. Electronic thermometer
- D. Fast freeze display (S)
- E. Button of main switch
- F. Button of freezer thermostat and fast freeze S (super)
- G. Button of thermostat of refrigerator section

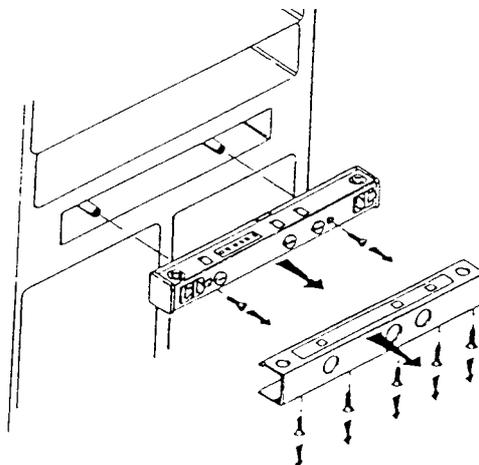


Removing the operation panel

In order to access the components located on the operation panel, please proceed as follows:

- Unscrew the 5 screws fastening the cover of the operation panel and remove the operation panel, pulling out the lower part.
- We recommend pressing in the door contact switch buttons and arresting them by rotation. This makes it easier to remove the operation panel.
- Unscrew the 2 screws fastening the operation panel to the housing. Rotate the housing downwards and remove.

When reassembling the components it must be ensured that the sealing between the operation panel and the cover is reinserted correctly.



The electronic board

If the board of the electronic timer is to be removed, first of all remove the thermostat of the freezer, which prevents the board from falling out, and then unscrew the two screws fastening the holder to the front of the operation panel.

The correct voltage can be measured at some points of the contacts of the board.

Some contacts are used as connections (terminal board function contacts 5, 6, 7, 8) for other components of the circuit.

If the appliance is switched off and the connectors are disconnected, the heating resistance of the temperature probe can be ascertained by measurement.

The resistance at room temperature (18 °C) should be some 1878 Ω . This measurement should fall on cooling.

Removing the thermostats

The sensor must be detached from the inner housing. In the refrigerator section it is sufficient to remove the board fastening the sensor.

In the freezer section the evaporator protector must be removed first; bend the end part of the capillary tube straight and withdraw. The capillary tubes of both thermostats are conducted through a tube embedded in polyurethane.

3.8.2 Components in the refrigerator section

In order for the lamps to be accessible, the screw fastening the cap of the top to the holder must be unscrewed.

In order for the thermal switch to be accessible, both screws fastening the lamp holder to the top of the inner housing must be unscrewed.

3.8.3 Components of the 0 °C zone

The flap thermostat has a transparent housing and is located on the rear wall of the inner cavity.

To remove the flap thermostat the sensor and the capillary tube which are fastened to the top of the inner cavity must be detached carefully. Remove the fastening screws of the sensor.

The new thermostat is supplied complete with protector. This protector must not be dismantled in order not to impair the functioning of the device.

3.8.4 Components of the left freezer section

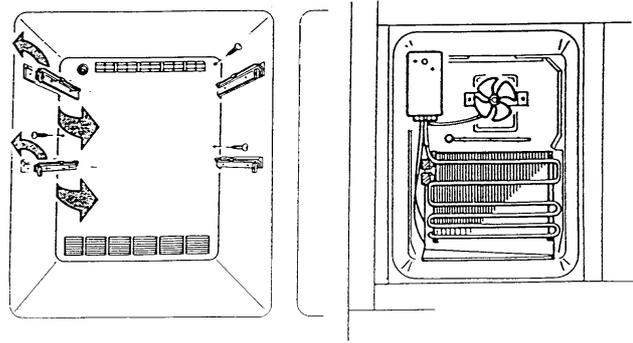
At the top right of the evaporator protector there is a hole sealed by a stopper. Behind this stopper is the axis of the defrost timer. Rotating this axis places the timer into a defrost or non-defrost position.

The components are made accessible by removing the protective device on the rear wall. Please proceed as follows:

- Remove the left-hand basket rails.
- Unscrew the screws of the protective device and pull them towards the front.

This makes the following elements accessible:

- Thermal switch
- Timer
(not for IK 458-4-4T, see page 16)
- Fan
- Thermostat sensor
- Battery evaporator
- Heating resistor of the evaporator
- Heating resistor of the water duct



The various electric components of the compartment are connected to a terminal board in the **interior** of the timer housing.

In order for the heating resistor of the drainage system to be accessible, the evaporator must be removed and the drainage system withdrawn. When being replaced, the drainage system must be inserted accurately and fastened with metal-coated adhesive tape.

Fan

The ventilator is stored in dampers and fastened to the rear wall of the inner cavity. The two dampers must be correctly positioned when being reinstalled.

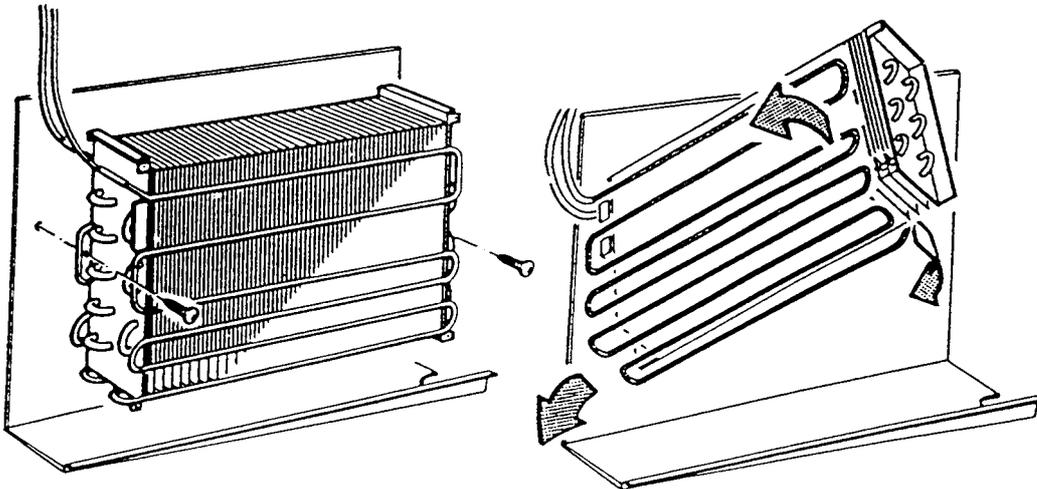
The blade must be flush with the axis. If the blade is pushed in too far, this results in a disadvantageous air flow.

Defroster resistor - Battery evaporator

Unscrew the screws fastening the evaporator to the rear wall of the freezer section.

If it should be necessary to push the battery evaporator towards the front, press on the suction pipe from the back.

The heating resistor is inserted into the hollow grooves of the battery blades.



Note: In order to exchange some components they must be removed through the opening in the rear wall. It is important that the openings are correctly sealed after the components have been replaced (cold kit).

3.8.5 Components of the compressor cavity

In order to access the compressor cavity, the front ventilation rail which is fastened to the housing by six crosshead screws must be removed.

Four screws are arranged vertically. These screws can be accessed through slits on the base of the rail. The other two screws fasten the rail at the sides.

The inner cavity contains the two compressors, the operating condenser of the freezer compressor, the bowl for receiving the water from defrosting and the cooling ventilator of the compressors of the condenser.

The IK 458-4-4T has no cooling fan.

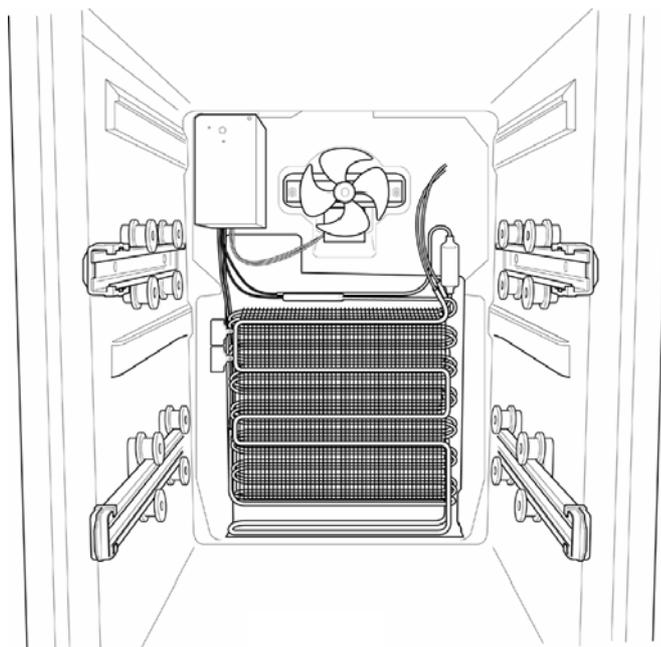
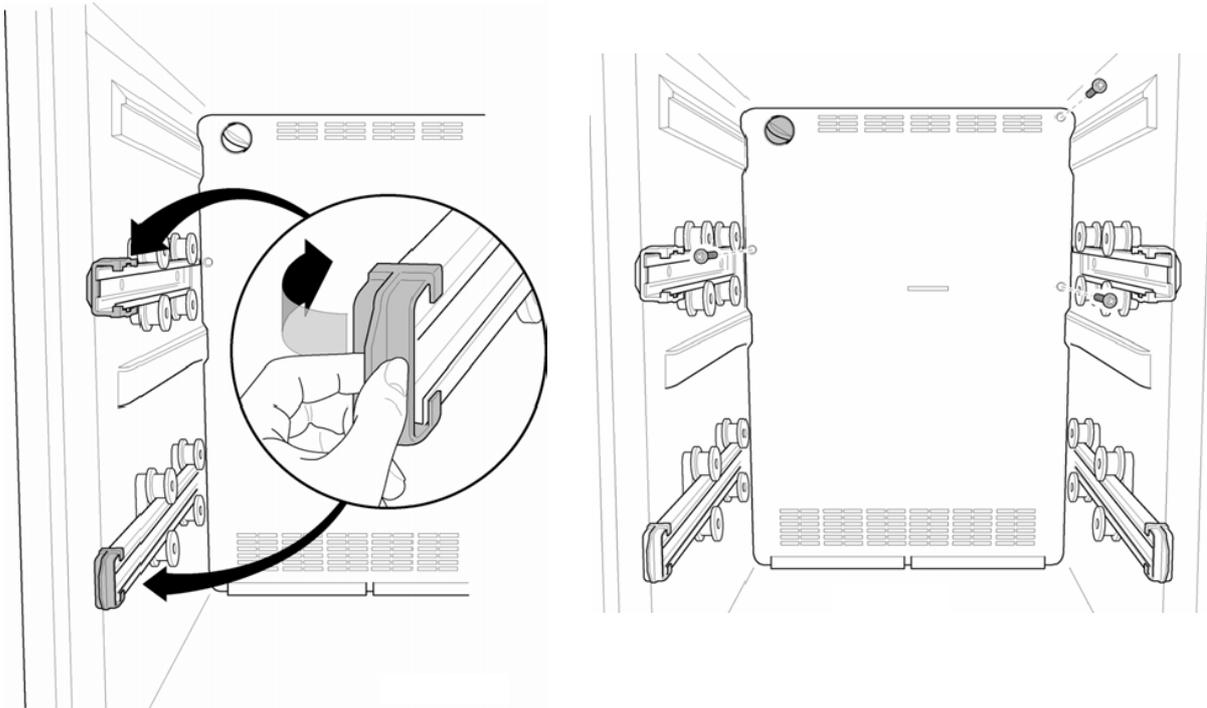
Attention: Please note that the terminal board in the compressor of the freezer is under voltage. Disconnect the power from the mains in order to ensure safety!!

3.9 Accessibility of the component parts (IK 458-4-4T)

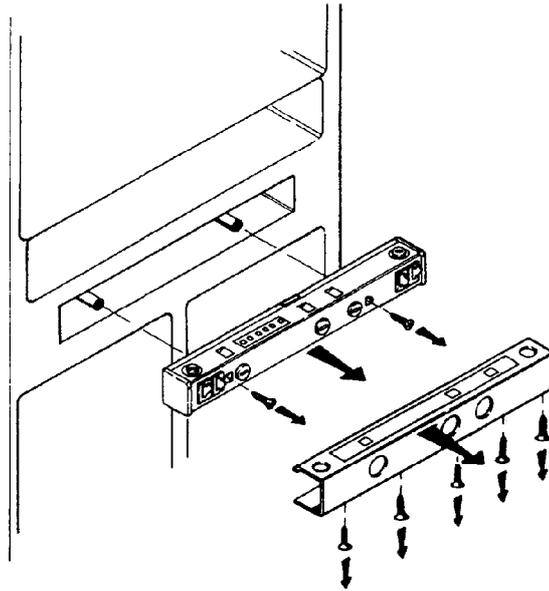
3.9.1 Freezer section

Proceed as follows in order to access the freezer section component parts:

- Turn the fastening devices as shown in the illustration and remove the baskets from the holders.
- Remove the three screws of the back panel and remove it sideways.



3.9.2 Removing the control panel



Proceed as follows in order to access the control panel component parts:

- Secure the switches of the interior lighting lamps in the lower and upper parts of the control panel. To do so, press the switches and turn them 45°.
- Remove the 5 screws with which the control panel cover is fastened.
- Remove the control panel cover, starting from the bottom.
- Unscrew the 2 screws fastening the control panel to the appliance. Turn the control panel downwards and remove.

When re-assembling, it is important that the seal between the control panel and the control panel cover is reinserted properly.

3.9.3 Replacing the thermostats

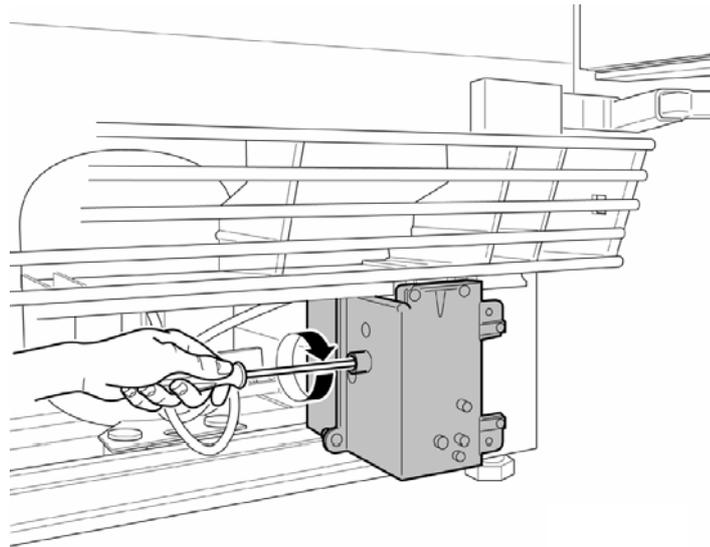
Since the thermostat of the refrigerator is a built-in thermostat, it merely needs to be pulled out of the pipe through which the capillary tubes run.

In order to remove the freezer thermostat on the other hand, the battery needs to be exposed and the thermostat bulb needs to be straightened. This is the only manner in which the capillary tubes can be removed.

3.9.4 Replacing the flap thermostat

Unhook the thermostat bulb and then screw out the two screws with which the thermostat is attached to the cell.

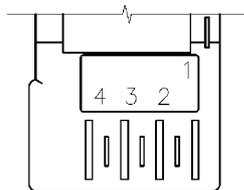
3.9.5 Timer



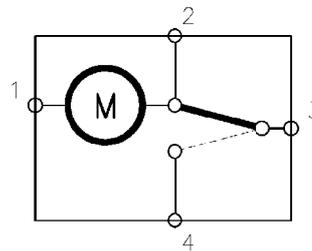
The timer is located in the casing on the right bottom corner of the appliance (under the lower hinge of the right-hand door of the freezer).

Use a screw driver to turn the camshaft (clockwise only) in order to switch over the switch for contacts 3-4 and 3-2.

VIEW OF THE TIMER CONTACTS

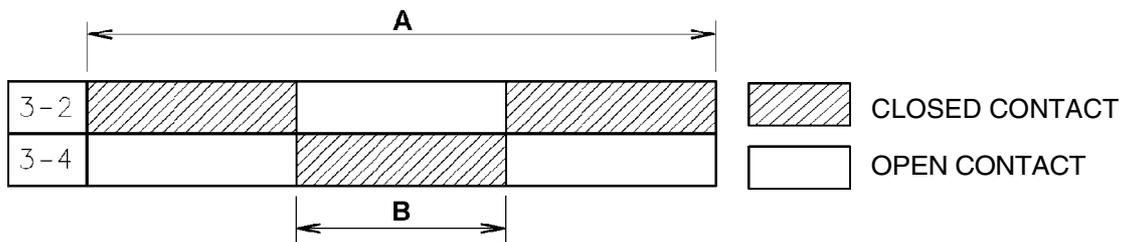


ELECTRIC CIRCUIT OF THE TIMER



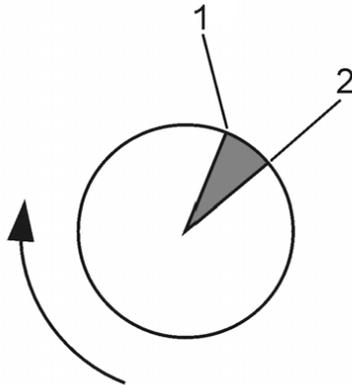
Contact 2: compressor
Contact 4: resistors

TIMER CYCLE



TIME A (full cycle)	TIME B (defrost)
12h 2'	11'

If the timer shaft is turned clockwise with a screwdriver, two engaging sounds will be heard. These indicate that the contacts have been closed. As seen in the illustration (the position indicated in which the engaging sounds can be heard is not an exact position), there is a minimal distance between the first engaging sound and the second sound, while the distance between the second and the first engaging is longer:



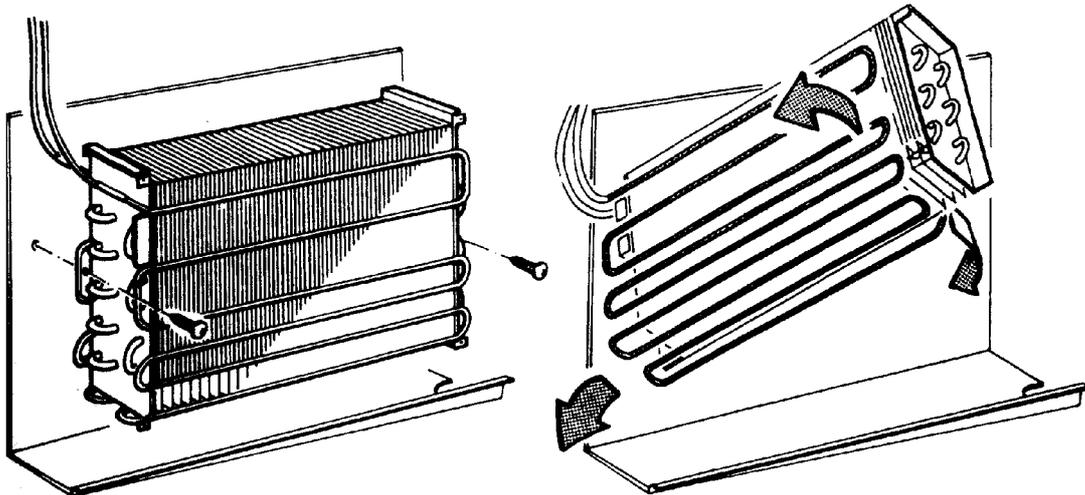
Please note:

- In order to test the appliance while it operates in the “standard” mode, the catch of the timer must be turned up to the second engaging position so that the 3-2 contact is made;
- in order to test the appliance in the “defrost” mode, the catch of the timer must be turned up to the first engaging position so that the 3-4 contact is made;

3.9.6 Defrost resistor

Remove the screws with which the battery-operated evaporator is fastened to the bottom of the cell. Carefully tilt the battery, making sure that the leads are not damaged.

The resistor is engaged in the slots in the ribs of the battery.



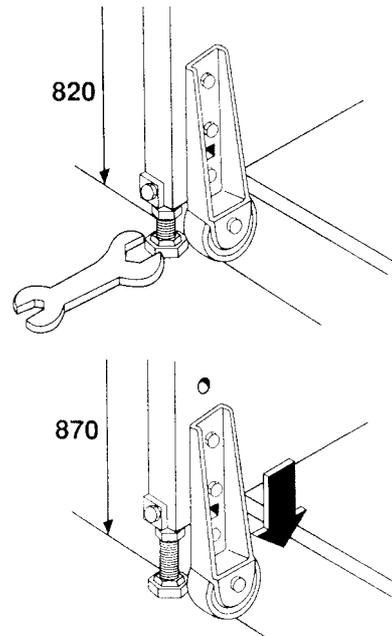
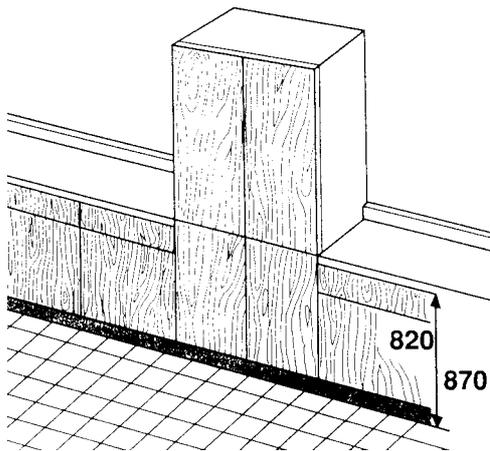
3.10 Installation

3.10.1 Adjusting the height

The appliance can be adapted to the height of the other kitchen units since the height can be set at 820 mm or at 870 mm.

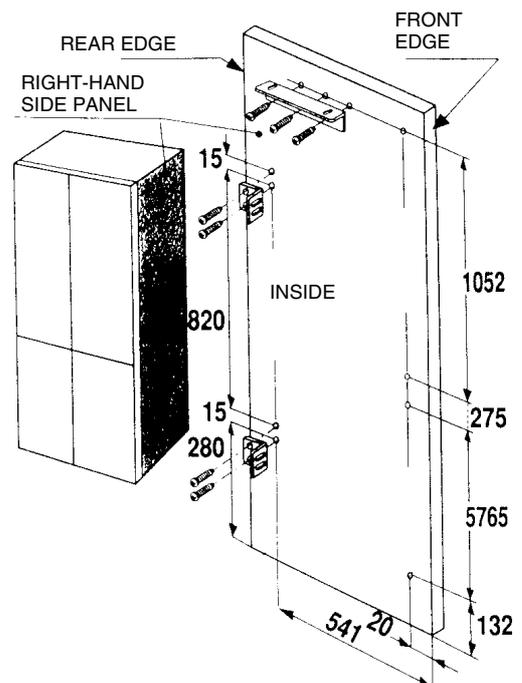
Prior to installing the appliance, set the height of the rear wheels and feet.

The initial height is set at 820 mm. In order to alter the height to 870 mm, the four feet need to be unscrewed with a suitable spanner. The wheels must then be removed and fastened again in a deeper position.

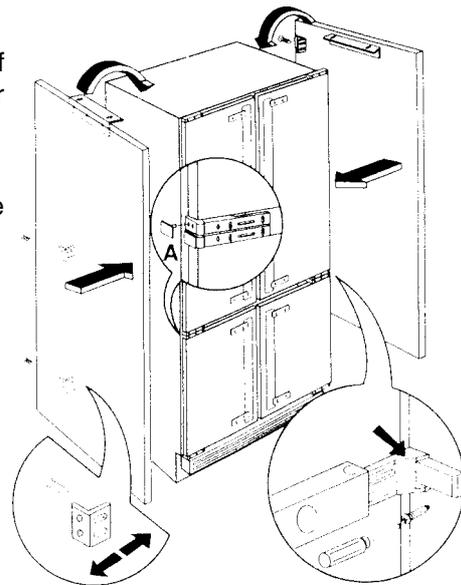


3.10.2 Mounting the side panels

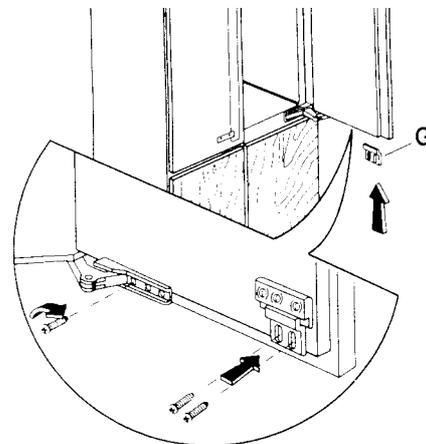
- Fix the angle on the panels in the position indicated in the illustration. The dimension of 132 is intended for a base of 100 mm in height which is located under the plate. Should the dimension of the base vary, the dimension of 132 is to be increased or decreased accordingly.



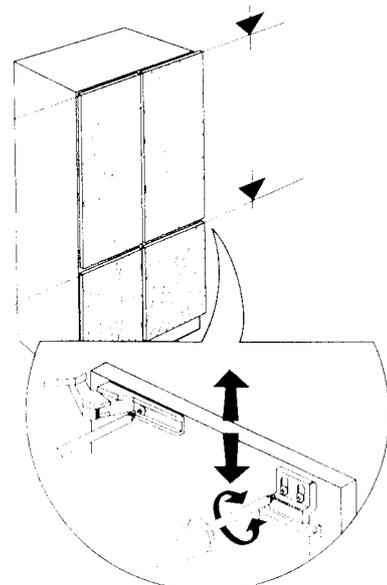
- Lean the panels onto the appliance.
- Fasten the rear angle, taking into consideration a depth of **900 mm** for the depth of the panels and the outer dimensions of the kitchen unit.
- Fasten the panels at the front.
If the thickness of the panels is less than 20 mm, the compensation discs **A** supplied are to be inserted.



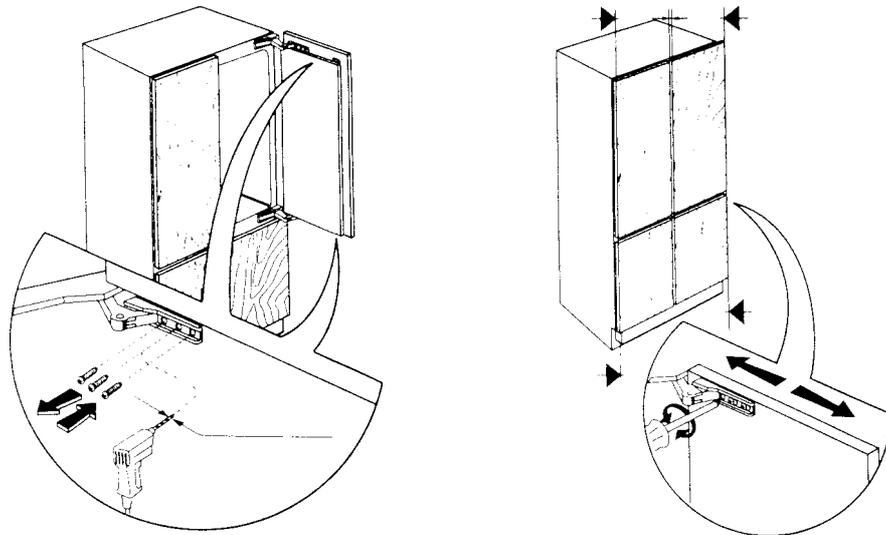
- Attach the front panel with a screw in the vertical long hole on the top hinge.
- Position the fixture **G** with two screws and attach the hinge with the screw in the vertical long hole.



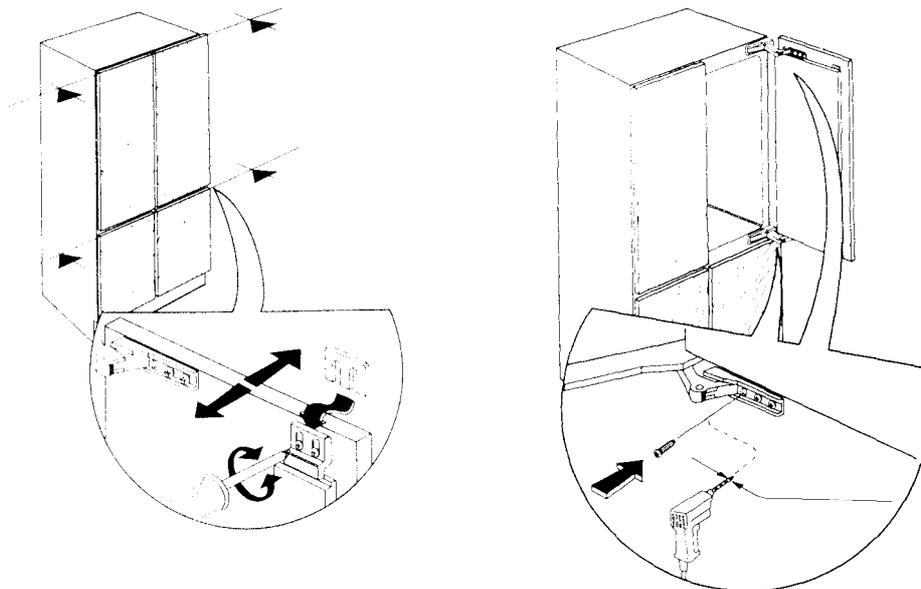
- Repeat these steps with the other top door. Check to ensure that the front panels are horizontally aligned and adjust if necessary.
- Open the doors again and use a **2.5 mm** pointed tool to pre-drill the middle of the horizontal long holes of the hinge.



- Tighten the screws and remove those in the vertical long hole.
- Check the vertical positioning of the front panels and adjust if necessary.



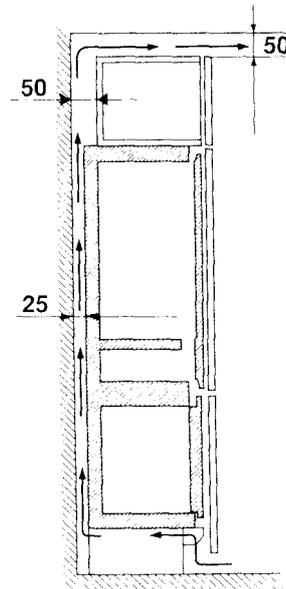
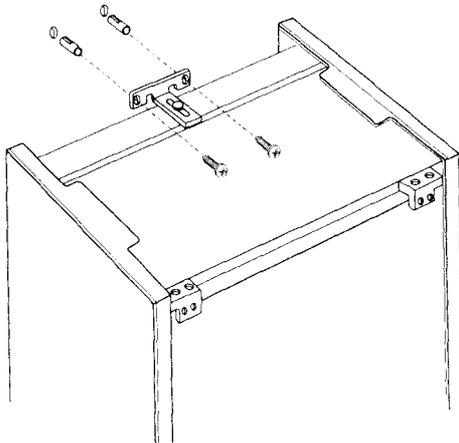
- Ensure that the front panels are level by loosening the screws of the inserts and using the compensation devices provided for this purpose.
- Once you have carried out the adjustments, open the doors and pre-drill the front panels in the opening of the hinge with a 2.5 mm pointed tool. Tighten the screws.



3.10.3 Installing the appliance

- Position the appliance as intended.
- Fasten it to the wall with an angle provided especially for this purpose.

Do not cover the top of the appliance in order to enable the air to circulate better. Should a kitchen unit be installed above the appliance, it is to be fastened 50 mm from the wall and the distance to the ceiling must be at least 50 mm.



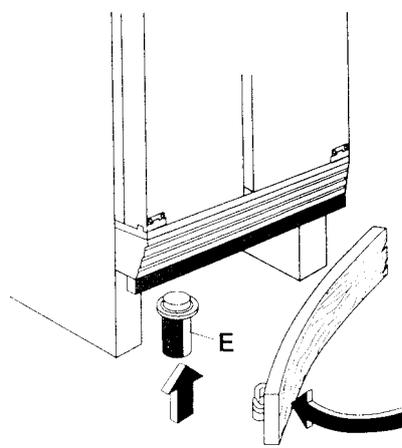
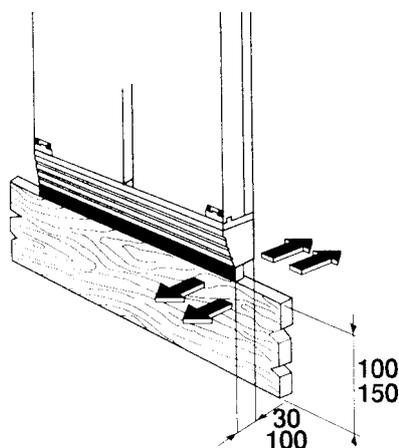
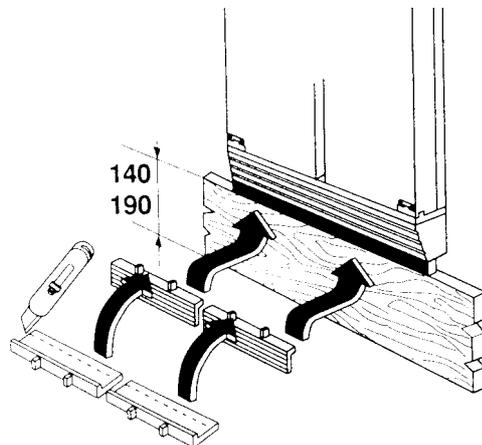
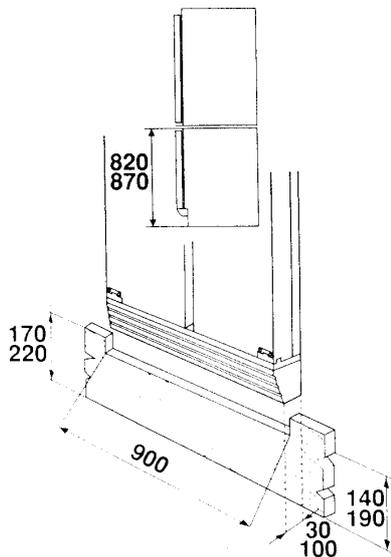
3.10.4 Attaching the base

Height adjustment $H = 820$

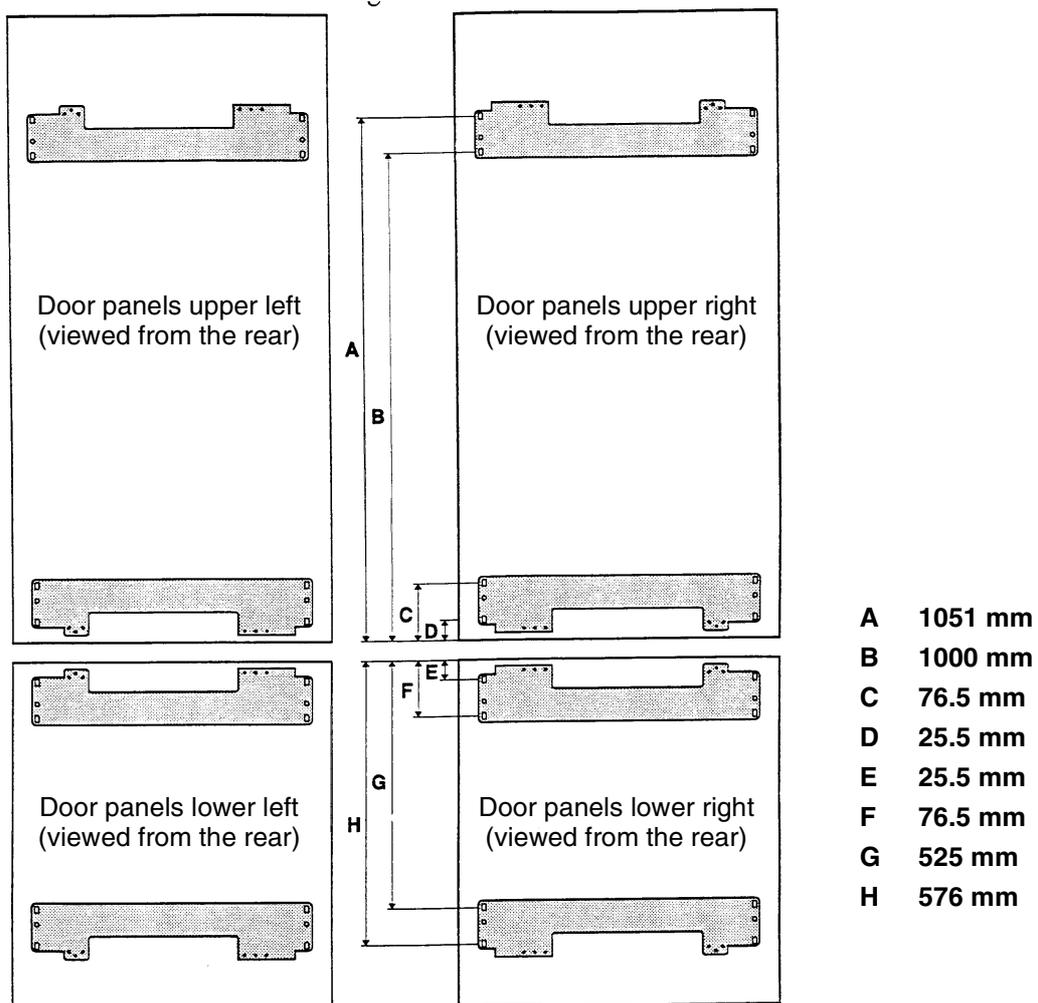
- For a base of 140 to 170 mm, make an opening as shown.
- If the base is higher than 100 mm and lower than 140 mm, cut the compensation cover piece accordingly and mount it between the base and the ventilation grid with the snap fastening underneath the grid.
- If the base is 100 mm the adjustable compensation cover piece is to be mounted over the full depth.

Height adjustment $H = 870$

- For a base of 190 mm to 220 mm, make a recess as shown.
- If the base is higher than 150 mm and lower than 190 mm, cut the compensation cover piece accordingly and mount it between the base and the ventilation grid.
- If the base is 150 mm high, the adjustable compensation cover piece is to be mounted over the full depth.
- If the built-in appliance is to be blended into a built-in kitchen, insert foot **E** to fasten the base.



3.11 IK 458.2 - 4T - Distancers for the door panels with filling



When installing door panels with filling the distancers on the right must be inserted between the door and the door panel.