EN

Service manual

Counter C2/C3/C4 & F2/F3/F4

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Revision no.: 001

Gram Scientific ApS
Aage Grams Vej 1
6500 Vojens
Denmark
CVR-No. 43 12 21 93

Content

Scope of this service manual

This service manual is made in order to aid service technicians when servicing and troubleshooting on the Gastro Counter product range, and in particular related to the electrical controller.

The service manual is **not intended to be handed over to end-users**, since unintended changes of settings potentially can cause situations where the temperature inside the cabinet cannot be kept as intended, (high foodstuff temperatures can occur if wrong adjustments are made).

Another side effect of making unintended changes of the controller settings, is potentially causing damage to the refrigeration system.

Changing service level parameter settings from the factory default, will void the warranty!

This service manual does explain how to access the different additional controller levels related to service. These levels are:

- Entering / adjusting factory default parameter settings (adjustable if necessary)
- Entering and using the I/O test area

Furthermore, this manual does explain:

- The layout of the controller and the different connections including the specifications of these.
- EC declaration of conformity
- Wiring diagrams for:
  - R – Models (Refrigerator)
  - C – Models (Extended refrigerator)
  - F – Models (Freezer)
- Piping diagram

Introduction to this manual

- This manual will advise you how to service the product.

- Changes in installation and other use of the product than described under intended use, might affect the operation and durability of the product.

- The manual is written according to our current technical knowledge. We constantly work on updating this information, and we reserve the right to make technical changes.

User manual

Intended use

The product is intended for the storage of foodstuffs in non-household environments but not for the display to or access by customers.

The product is designed for storage at a constant temperature and not be used for chilling down or freezing hot/fresh foodstuff.

The product is only to be used for the purpose for which it has been expressly designed. Any other use could cause that the foodstuff stored in the product is not kept at the correct temperature or even damage the product.

The product is not suited for storing blood plasma, laboratory samples, pharmaceuticals or similar substances.

The manufacturer will not be held liable or responsible for any damage caused by improper, incorrect or unreasonable use of the product.

Safety information

Important

Description of symbols used in this manual.

Warning Lacking observation to these instrucions might result in accidents with personal injury.

Important If these instructions are not observed, the product might be damaged or destroyed.

Be aware that Gram Scientific has taken precautions to ensure that the safety of the product is in order.

Please read carefully the following information regarding safety.

It is important, that everyone who are to use or install the product, to have access to this manual.

This appliance is not intended for use by persons with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervison or instruction concerning use of the appliance by a person responsible for their safety.

Children should be supervised to ensure that they do not play with the appliance.

The appliance might contain parts with sharp edges in the compressor compartment, and in the inside compartment.

The appliance is not to be transported on a sack truck, there is a danger of loosing the balance, causing danger to persons.

Do not pull the power cord to dicconnect the appliance, or when moving the appliance.

Location

When receiving the counter, check the packaging material for damage.

If any damage occurs at the packaging material, it should be considered if the cabinet might have been damaged too. If the damage is substantial, please contact your dealer.

The transport pallet can be removed by loosening the screws that fasten the pallet to the counter.

⚠ This task requires at least 2 persons.

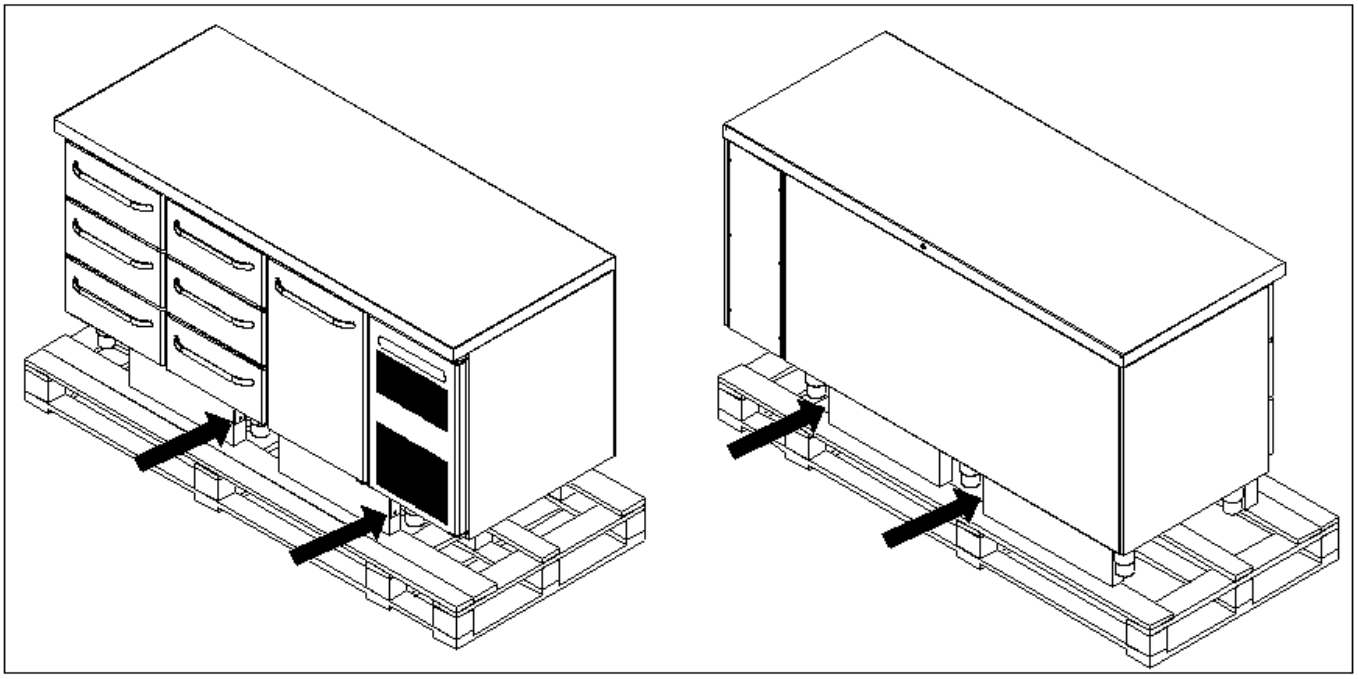


Fig. 1

If the counter has been transported in horizontal position it must stand upright at least 2 hours before it is started to allow the oil from the compressor to run back.

Because of the heavy weight of the counter, the floor might be damaged or scratched when moving the cabinet.

Correct set up gives the most effective operation.

The counter should be located in a dry and adequately ventilated room.

To ensure efficient operation, it may not be placed in direct sunlight or against heat-emitting surfaces. The counter is designed to operate in an ambient temperature between +16°C and +40°C.

Avoid placement of the counter in a chlorine/acid-containing environment (swimming bath etc.) due to risk of corrosion.

The counter and parts of the interior is equipped with a protecting film, which should be removed before use.

Clean the counter with a mild soap solution before use.

The set up place must be level and horizontal.

For versions with legs, use the adjustable legs to make sure that the counter stands level and upright.

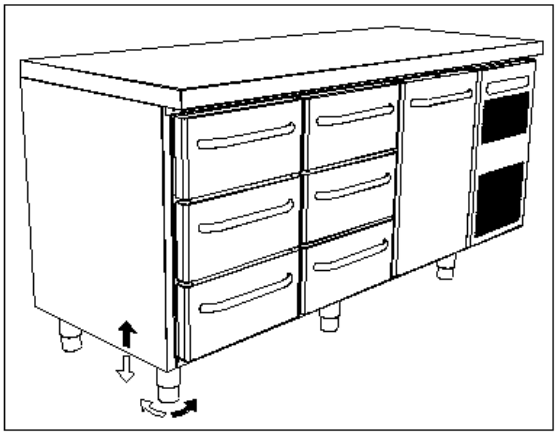


Fig.2

For versions with castors, the locking devices of the two front castors must be activated, when the cabinet is in place. The base must be level, and the counter may not be placed on frames or the like.

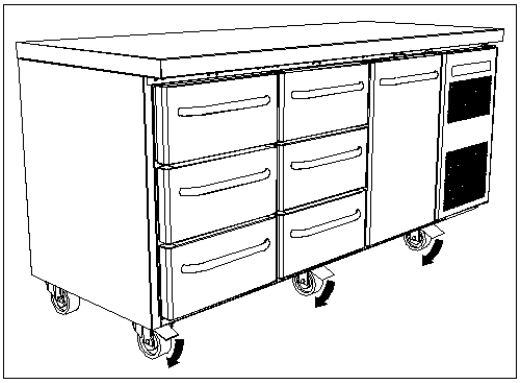


Fig. 3

Optimizing the energy consumption

- Correct set up gives the most effective operation.
- The product should be located in a dry and adequately ventilated room.
- To ensure efficient operation, it may not be placed in direct sunlight or against heat-emitting surfaces. The product is designed to operate in an ambient temperature between +16°C and +40°C.
- Do not keep the door open for too long.
- Keep the condenser filter clean – to be cleaned at least every 2 weeks.
- Do not set the temperature setpoint too low.

General description

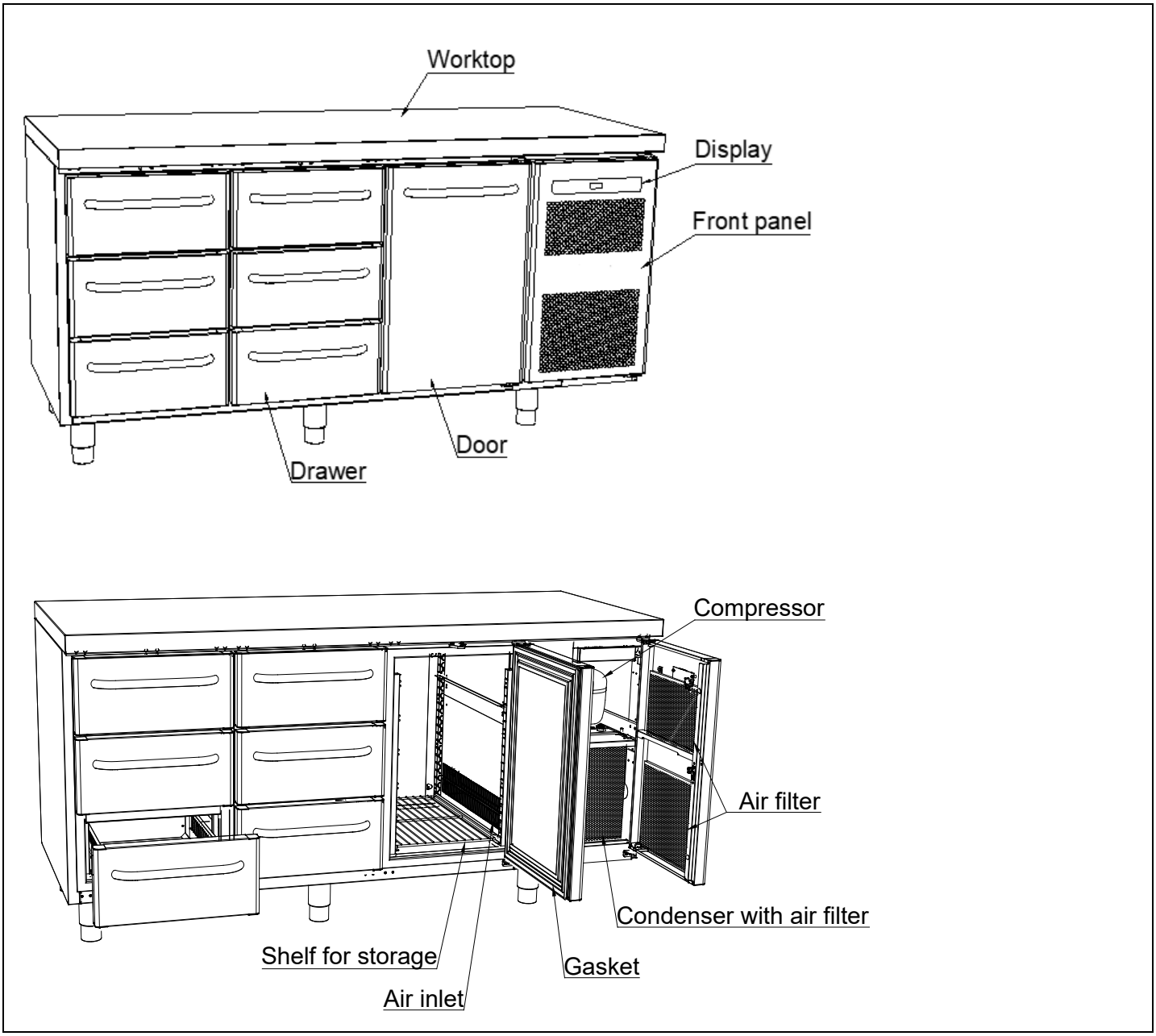


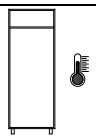
Fig. 4

Refrigerant / GWP value

Refrigerator counter	Refrigerant	Charge kg	GWP	CO_2 equivalent t
R/C 2	R290	0,097	3	0,00029
R/C 3	R290	0,097	3	0,00029
R/C 4	R290	0,097	3	0,00029
Freezer counter				
F 2	R290	0,050	3	0,000150
F 3	R290	0,059	3	0,000177
F 4	R290	0,060	3	0,000180

Climate / temperature class

Products are tested according to the following climate and temperature classes. Information about the product's climate and temperature class can be found at the name plate (see fig.9)

Climate class	
3	25°C / 60 % RH
4	30°C / 55 % RH
5	40°C / 40 % RH

Temperature class	
L1	-18°C
M1	+5°C

Electrical connection

Read the text below thoroughly before electrical connection.

The cabinet is intended for connection to alternating current. The connection voltage (V) and frequency (Hz) are shown on the name plate in the cabinet (see Fig. 9). Only the supplied cord is to be used.

Never use an extension cord for this appliance!
If a wall socket is placed in a longer distance than the length of the supplied power cord, contact an electrician to establish a wall socket within the range of the supplied power cord.

If the product is defective, it must be examined by an authorized technician with proper knowledge of the product during the guarantee period, if it is a product with built-in compressor.
If it is a product connected to an external compressor unit, it must be examined by the company who has connected the product to the unit.
Outside the guarantee period, it is advisable to use the service advised by your dealer. If this is not the case, assistance is required from an authorized technician with proper knowledge of the product.

Always disconnect the power if interruptions in power supply occur, and when electrical parts are removed/put on, and before cleaning and maintenance of the appliance.

Repairing of electrical/technical parts may only be performed by authorized technicians with proper knowledge of the product.

Do not use the appliance before all coverings are installed, so that live or rotating machine parts can not be touched.

The counter is not to be used outdoor.

All earthing requirements stipulated by the local electricity authorities must be observed. The cabinet plug and wall socket should then give correct earthing. If necessary, contact an electrician.

Make sure the appliance is switched off at the socket before service is performed on electrical parts. It is not sufficient to switch off the cabinet by the START/STOP key as there will still be voltage to some electrical parts of the counter.

General use

Do not block vent holes in the front panel.

Do not damage the refrigeration system parts.

During normal operation, some parts of the refrigeration system in the compressor compartment might reach high temperatures, and could therefore cause burns if touching these components.

Do not use electrical devices inside the cabinet.

To ensure correct and efficient air flow in the cabinet, the shaded areas must be kept free of products. (see Fig. 5)

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

If any controller parameters are changed from default, this could cause that the appliance is not functioning normally, and harmful temperatures could damage products that are kept inside the appliance.

If the appliance is turned off, wait minimum 3 minutes before turning the appliance on again. This is to protect the compressor from damage

Maximum loading of wire shelf: 40 kg

Do not store explosive substances such as aerosol cans with flammable propellant in this appliance.

Be aware, if bottles are stored near the air outlet, they may freeze up and break, causing a risk of injury.

Do not pack the cabinet with foods. Allow some space between them to ensure a good airflow.

Moist or fresh foods and those with a strong smell should be wrapped up in a plastic film or packed in a container. Otherwise the food may dry up or give their smell to other foods.

Foods containing acetic acid or yeast should be wrapped up in plastic film. Otherwise they may accelerate corrosion of the evaporator and metal parts, resulting in failure.

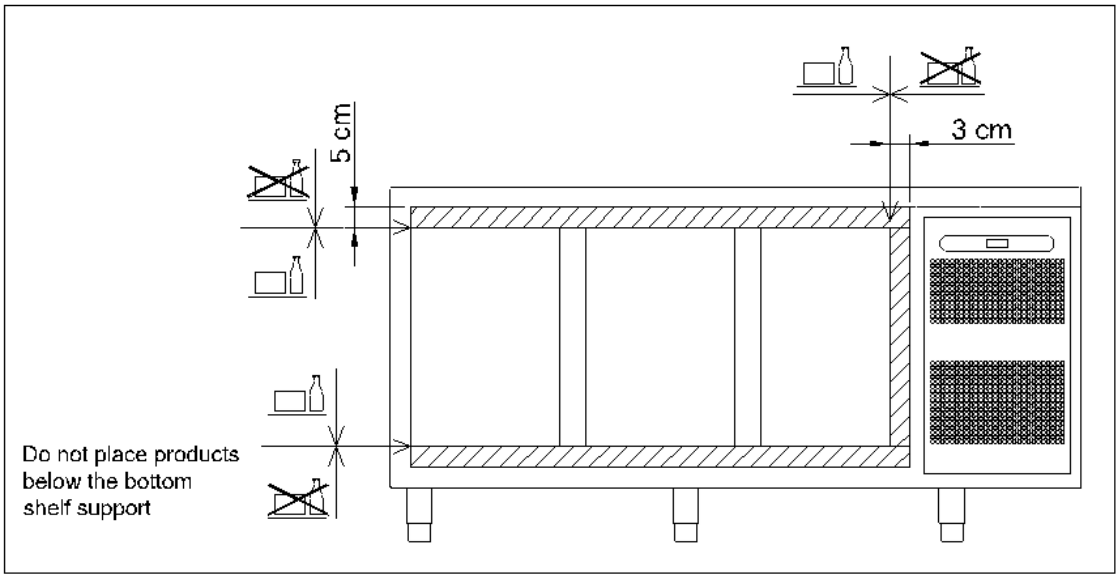
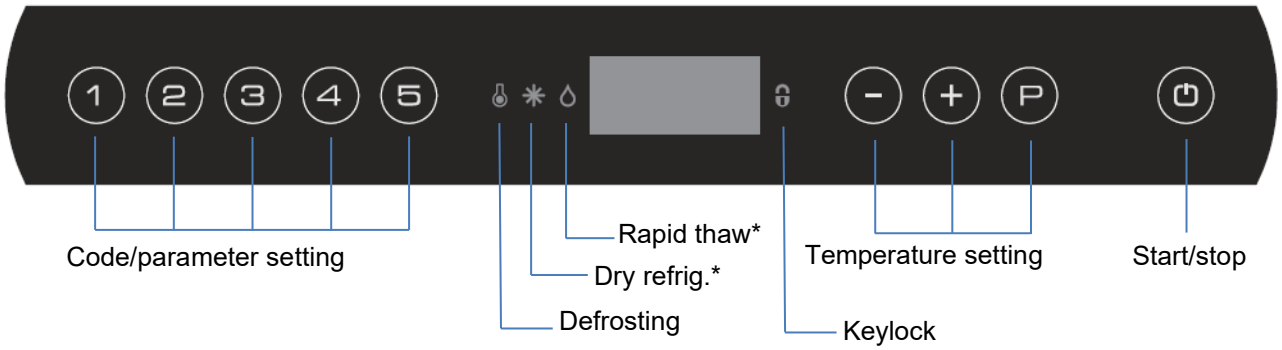


Fig.5

Starting up

Display overview:



* = no function in this product.

Plug in the cabinet.

To start, press the START/STOP key.

During start up, the software version is displayed, followed by the software variant. The cabinet temperature is displayed, when the cabinet starts normal operation.

The cabinet starts with a defrost, which is stopped shortly after, when the system has performed a system check.

To cancel the defrost program, press keys P and ⏻ for more than 3 seconds. 🌡 is turned off.

To turn off the cabinet, push ⏻ for more than 3 seconds.

Shortcuts:

Key combination	Time	Function
P + ⏻	> 3 seconds	Start or stop manual defrosting
⏻ + 1	> 5 seconds	Activation/deactivation of keylock
P	-	Displays temperature setpoint
P + 1	> 3 seconds	Access to user menu and alarm settings

Temperature setting

Temperature control:

Press (P) to see the cabinet temperature setting; the display will show the set temperature.

Temperature regulation:

Keep (P) pressed. At the same time, press (+) or (-).

Each time (+) or (-) is pressed the temperature will change one degree. When the display shows the desired temperature, let go of the two keys and the setting has been made.

Error codes on the display

Display code	Description
A2	Local upper alarm LHL is or has been avtivated
A4	External upper alarm EHL is or has been activated
F1	Room sensor error. In the meantime the counter itself will maintain the set temperature by the memory of the controller. Temperature stability will be affected. Service assistance is required.
F2	Evaporator sensor error. Service assistance is required. The counter will keep running until the error has been mended.
F3*	Condenser sensor error. The counter will keep running, until the error has been mended. Service assistance is required.
F7*	Indicates that the condenser temperature is too high. The cause might be a clogged condenser, or too high ambient temperature. If the condenser or air filter needs cleaning, the counter must be disconnected at the mains power. Cleaning of the condenser is done with a brush or a vacuum cleaner. The air filter can be removed and cleaned in a dishwasher at max. 50°C. If the ambient temperature is too high, the placement of the counter might be wrong, and an alternative place should be found. Ventilation might help. If this does not help, request service assistance.

* Applies only to counters with built-in compressor.

Acknowledgement of an alarm:

Acknowledge an alarm: push (P).

Troubleshooting

Noise:

- If abnormal noise occurs, request service assistance.
- Operating sounds from compressor, condenser fan and interior fan are normal.
- If sheet metal parts, front panels or panels in front of the compressor compartment are making noise, these might be open. Close the panels.

Frosting inside compartment:

- Ambient humidity too high.
- The door is opened too often.
- The door is left open for too long.
- Damaged door gasket.

Poor cooling performance:

- Ambient temperature too high.
- The door is opened too often and/or open for too long.
- The door is left open.
- Damaged door gasket.
- Room temperature setting too high.
- Counter too packed with foods - air inlet/outlet blocked.
- Condenser mesh filter is clogged.
- Warm or hot foods inside.
- Defrost in progress. The room temperature may rise temporarily during the defrost cycle, but it will not affect the foods inside.

Some of the foods are frozen:

- Counter too packed with foods - air inlet/outlet blocked.
- Room temperature setting too low.

Condensation around the door:

- Ambient humidity too high.
- The door is not closed tightly.
- Damaged door gasket.

Too high energy consumption:

- Ambient temperature too high.
- The door is opened too often and/or open for too long.
- The door is left open.
- Damaged door gasket.
- Room temperature setting too low.
- Counter too packed with foods - air inlet/outlet blocked.
- Condenser mesh filter is clogged.
- Warm or hot foods are brought into the cabinet too often.
- Counter placed in direct sunlight or close to heat-emitting surfaces.
- The default settings have been changed.

User menu

This chapter includes setting of alarm values.

The alarm system is divided into 2 systems. The one system only triggers local alarms, which means that the error codes are only shown at the display.
The other alarm system triggers both alarms at the display, but it also activates the remote alarm outlet. Each alarm system operates independently of each other.

If a change of the setting is required, get access to the menu by pushing P + 1 for more than 3 seconds. The values are changed by pushing the + or - keys. The new setting is saved by pushing P. To exit the menu, push ⏻.

Menu access P + 1 ⇥	↴	⇥		
Local alarm setting	LAL	LhL	°C	Setting the upper alarm limit. At alarm, the display shows: **A2**
		Lhd	min.	Time delay for the upper alarm limit.
		BU	On/off	Activation of buzzer. The buzzer sounds at alarms A1, A2. (1=on / 0=off)
External alarm setting	EAL	EHL	°C	Setting the upper alarm limit. At alarm, the display shows: **A3**
		ELL	°C	Setting the lower alarm limit. At alarm, the display shows: **A4**
		EHd	min.	Time delay for the upper alarm limit.
		ELd	min.	Time delay for lower alarm.
Temperature offset (sensor calibration)	CAL	CA	K	-5…+5 K
Escorting alarm limits	ALL	FAS/ESC		Activation of escorting alarm limits. **FAS**= fixed limits / **ESC** = limits following the setpoint
No. of defrosts	dEF	4		Number of defrosts in 24 hours.

Keylock

The keypad can be locked by simultaneously pushing ⏻ + 1 for more than 5 seconds.
🔒 lights to indicate that the keys are locked, and a short beep sounds. Now it is not possible to use the keys for temperature setting etc.
The same code is to be used for unlocking the keypad again.

Defrosting

Defrosting is automatically performed 4 times every 24 hours. If the counter is operating under severe load (frequent door opening and frequent replenishment), manual defrosting can become necessary.

Starting manual defrosting: push P + ⏻ simultaneously for more than 3 seconds.

The next defrost will occur 6 hours later. 🌡 lights up to indicate a defrosting cycle.

It is possible to change the number of defrosts. See the chapter “User menu” for setting.

⚠ Do not use sharp or pointed objects to accelerate the defrosting process.

Defrost water

Counters with compressor
Defrost water is led through a pipe, from the evaporator and into a tray behind the condenser. Here, the water is evaporated by heat from the condenser.

Counters connected to a common compressor
The defrost water is led through a pipe to a tray behind the front panel, from where it is evaporated by a heating element.

☝ It is recommended to clean the tray at least once a year. Remember to disconnect the counter before cleaning.

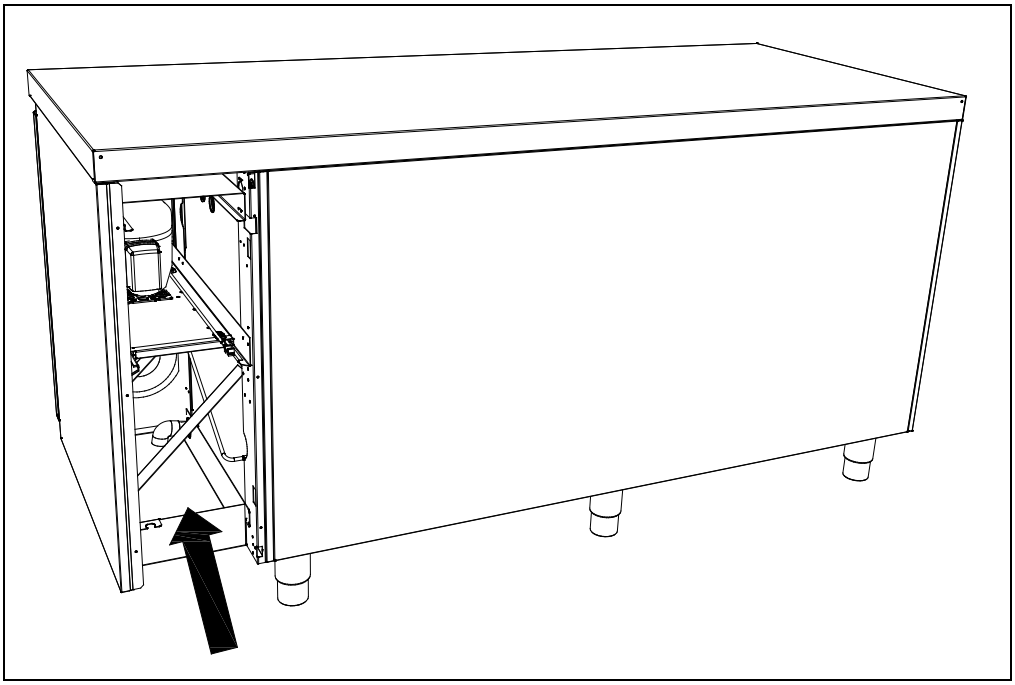


Fig. 6

Power failure

In the event of a power failure, the control remembers the temperature setting and restarts the counter when power is restored. If the power failure persists for some time, the control might revert to the factory setting.

Cleaning

Insufficient cleaning will cause that the counter will not work at optimum perfomance, or eventually it will be defective.


Before cleaning, the counter should always be disconnected.


Do not flush the counter with water, do not use water jet or steam hose as this may cause short-circuits in the electrical system.


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


The compressor compartment and in particular the condenser must be kept free from dust and dirt. This is best done with a vacuum cleaner and a brush.
The air filters on the condenser and the front panel can be removed and cleaned in a dishwasher at max. 50°C.


For the external maintenance – use stainless steel polish.


The counter should be cleaned internally with a mild soap solution at suitable intervals and checked thoroughly before it is put into operation again.

<u>Cleaning of counters with drawers:</u>

If the counter is equipped with drawers and the bottom, sides or back wall require cleaning, the drawers can be removed as follows (see Fig. 7a,7b,7c):

Pull out the drawer. Lift it up, after which the drawer can be pulled of the extension rails.

After cleaning, the drawer can be replaced. Place the drawer on the outer wheels on the telescopic rails. Lower the drawer into a horizontal position after which it can be pushed into a closed position. The drawer is now securely positioned.

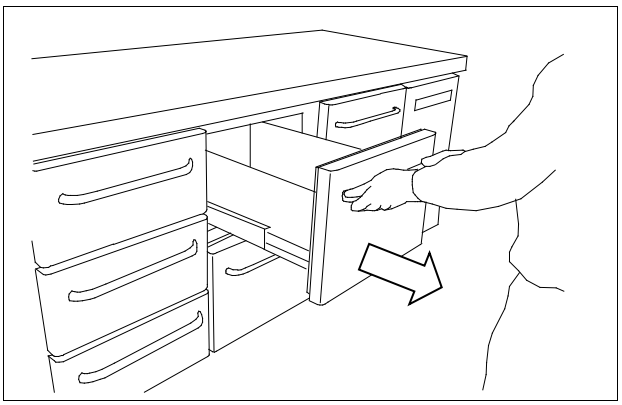


Fig.7a

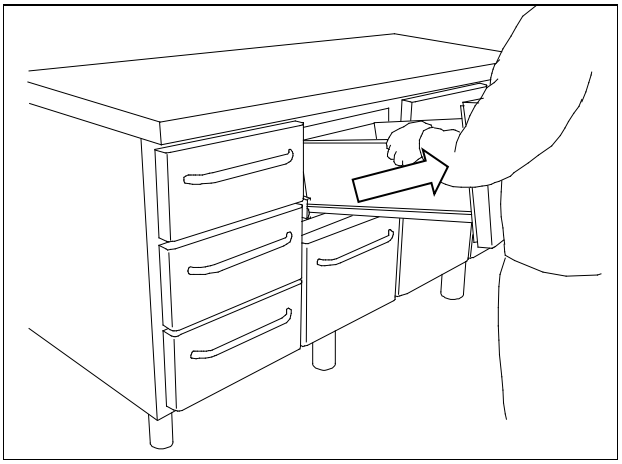


Fig.7b

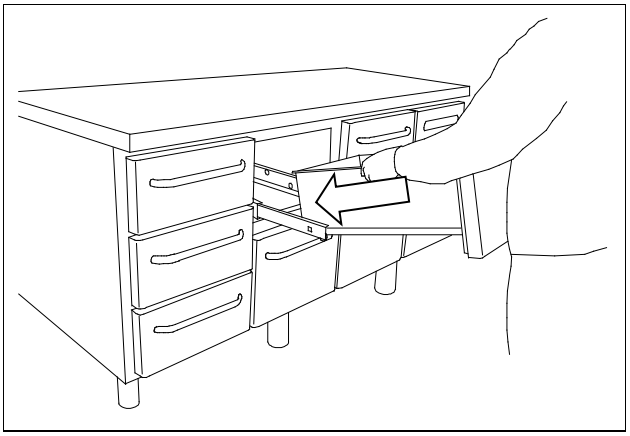


Fig.7c

Changing door hinge side

The door can be changed from righthand-hinged to lefthand-hinged or vice-versa.

To do so, proceed as follows:

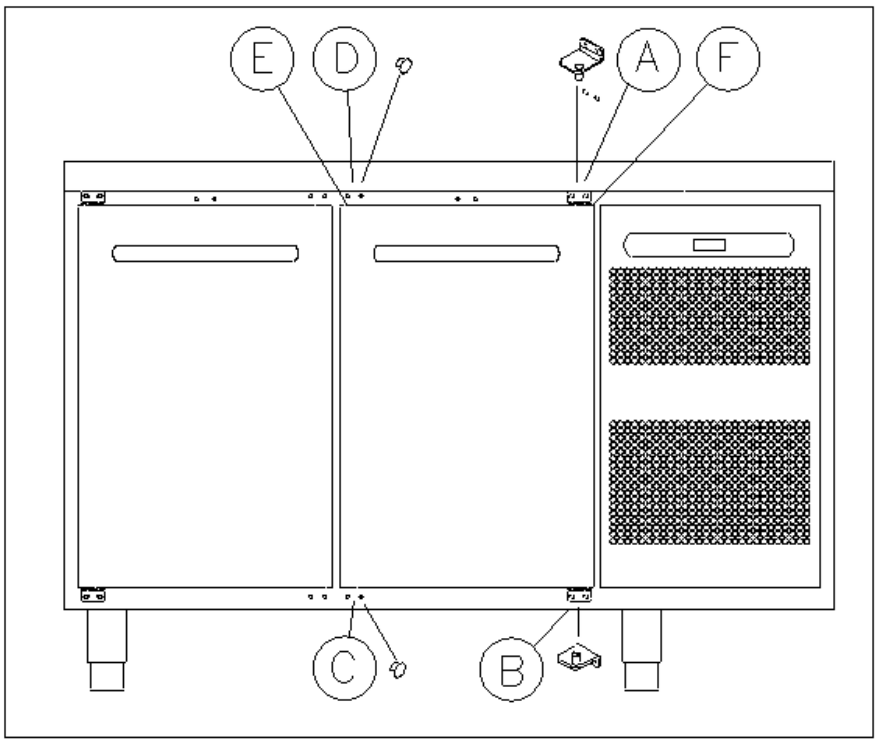


Fig. 8

1. Remove the hinge at pos. A.
2. Lift off the door.
3. Remove the hinge at pos. B.
4. Move cover plugs in the cabinet from pos. D to pos. A and from pos. C to pos. B.
5. Move the cover plug in the door from pos. D to pos. A, too.
6. The hinge previously mounted at pos. A is now mounted at pos. C.
7. The door is now placed at the hinge at pos. C.
8. The hinge previously mounted at pos. B is now mounted at pos. D and adjusted, so that the door is closing properly. Then tighten the screws.

Door/drawer gaskets

This chapter deals with the importance of a well-functioning gasket.

Gaskets are an important part of a refrigerator/freezer. Gaskets with reduced functionality, reduces the tightness of the counter. Reduced tightness might cause increased humidity, internal icing, an iced up evaporator (leading to reduced refrigeration capacity), and in worst case reduced lifecycle of the counter.

Therefore it is important to be aware of the condition of the gasket. Regular inspection is recommended.

The gasket should be cleaned regularly with a mild soap solution.

If a gasket needs replacement, contact your supplier.

Long term storage

If the counter is taken out of operation, and need to be prepared for long-term storage, clean the inside compartment, the door and door gasket thorougly with a hot soapy damp cloth. Eventual remnants of food could create mould.

Service

The refrigerating system and the hermetically sealed compressor require no maintenance - they merely must be kept clean.

If refrigeration fails, first investigate whether the unit has been unintentionally disconnected or switched off at the socket, or whether a fuse has blown.

If it is not possible to find the cause of the refrigeration failure, please contact your dealer.

When reporting a malfunction please state the type and serial number (S/N) of the cabinet. This information is found on the name plate, see Fig. 9.

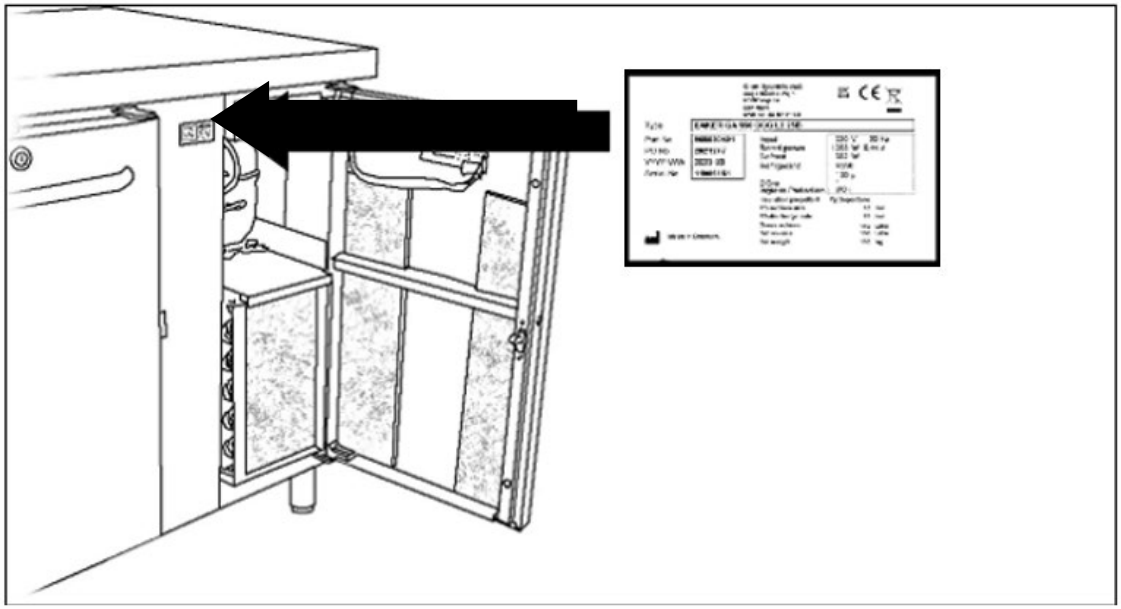


Fig.9

Disposal

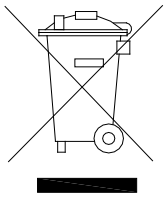
Electrical and electronic equipment (EEE) contains materials, components and substances that can be dangerous and harmful to human health and the environment if the waste (WEEE) is not disposed of properly.
Products that are labelled with a “crossed-out wheelie bin” is considered electric and electronic equipment. The crossed-out wheelie bin symbolizes that waste of this type cannot be disposed of with unsorted municipal waste but must be collected separately.
Contact your local dealer when the product needs to be disposed of.
Please be aware of not damaging the refrigeration system and piping when a product is taken out of use. This will prevent the uncontrolled escape of the refrigerant from the refrigeration system.

The below only concerns the United Kingdom.

Disposal of an old cabinet is only available when we are delivering a new one at the same time. Cabinets must be fully defrosted and emptied prior to collection.

Gram Scientific recognises that our products for the catering market are considered as WEEE when they become obsolete. To ensure that Gram Scientific’s responsibilities are handled correctly and environmentally friendly, we are signed up the largest Business to Business compliance scheme in the UK – B2B Compliance
http://www.b2bcompliance.org.uk

B2B Compliance will on our behalf deal with all areas of our responsibilities when collecting and disposing of equipment which fall under the UK WEEE regulations.
B2B Compliance can be contacted on telephone number 01691 676124.



EC-Declaration of conformity

Producer	Name:	Gram Scientific ApS. (CVR No. 43122193)
	Adress:	Aage Grams Vej 1, 6500 Vojens
	Tel.:	0045 73 20 13 00
Product	Model:	R2, C2, F2 – R3, C3, F3 - R4, C4, F4
	Refrigerant:	R290
	Year:	2023

Directives

The product is in compliance with all the essential health- and safety requirements and provisons in:

Directive for Machinery 2006/42/EF

The product is where relevant in compliance with the following other directives:

Electromagnetic Compatibility Directive – 2014/30/EU

Design of energy related products 2009/125/EF

Regulation 2015/1095

Energy labelling directive 2010/30/EU

FCM regulation 10/2011

Regulation 1935/2004

RoHS 2 - 2011/65/EU

ROHS 3 - (EU) 2015/863

Standards

The following standards are used to the extent necessary to comply with the relevant directives:

DS/EN 12100:2011 - Safety of machinery -- General principles for design -- Risk assessment and risk reduction

DS/EN 60335-1:2012 – Household and similar electrical appliances. Safety. General requirements

DS/EN 60335-2-89:2010 – Household and similar electrical appliances. Safety. Particular requirements for commercial refrigerating appliances with an incorporated or remote refrigerant condensing unit or compressor

Person responsible for technical dossier

Company: Gram Scientific ApS. (CVR No. 43122193)

Adress: Aage Grams Vej 1

Name: John Lund

Signature

Vojens 05/10-2023 R&D Manager

UKCA-Declaration of conformity

Producer	Name:	Gram Scientific ApS. (CVR No. 43122193)
	Address:	Aage Grams Vej 1, 6500 Vojens
	Tel.:	0045 73 20 12 00
Product	Model:	R2, C2, F2 – R3, C3, F3 - R4, C4, F4
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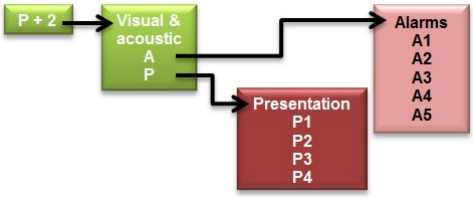
Responsible Technical File	Company:	Gram Scientific ApS. (CVR No. 43122193)
	Name:	R&D Manager John Lund
Signature	Vojens	19/12-2023

Service manual

The introduction.

Since the introduction of our own standard controller I year 2001, the controller has gone through several software updates. More program variants is developed, new functions is added to existing variants and others is been improved.



There was a directly access to the menus on the front of our cabinet, which was a great help for the service men and also for the workers in the factory here in Vojens.

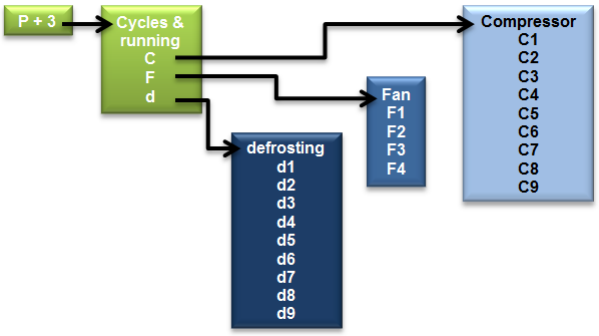
All different settings are categorize and placed in submenus.
The access comes through main menus.

MPC 46 and the menus.

The menus are divided up in two main menus.

A menu for presentations of values in the display and settings for alarms parameters, and another menu for technical, practical or physical settings to a normal refrigerator or freezer.

In each main menu there exist smaller submenus.
These submenus are divided up in specific menu for kind of cycles as defrosting or the settings for running the evaporator fan.



Make sure the appliance is switched off at the socket before service is performed on electrical parts. It is not sufficient to switch off the cabinet by the START/STOP key as there will still be voltage to some electrical parts of the cabinet..

Software version and program variant in start-up sequence

When the cabinet switches ON, the controller shows the software version and program variant.

The version number glows in 2 sec. followed by name on the program variant until the controller is finished with the start-up sequence. The program variant is like the example here below.

In the example above software ver. 2.1 and program variant M2+ is presented.

Cabinets with compressor (HAV) is given by the symbol " ⊣ ". The symbol should look like a "+" which means including compressor.

Cabinets without compressor (FAV) is given by the symbol " – ". The "-" symbol means "Compressor not included".

Because program variants like R and C is difficult to present in a 7-segment display, the symbols below is used instead:
- H (Refrigerator).
- n (Extended temperature range).
- P (Process cabinets).

Other program variants name:
- F (freeze).
- B (Counter).
- V (Varm/hot/swallow cabinets)*.
- E (Extreme low temperature).

* Complete new variant

Defrosting

The defrosting cycle runs 4 times each day. The lamp glows to indicate that a defrosting cycle is running.

If the cabinet is operating under severe load (frequent door opening and frequent replenishment) manual defrosting can become necessary. The manually defrosting can be carried through by pushing (P) and (⏻) key in more than 3 sec. The cabinet starts a defrosting cycle.
With the same to keys, a defrosting cycle can be stopped before end time.

The next defrost will occur 6 hours later.

Defrosting can be set from 1 to 8 times per 24 hours. See chapter "***User menu***".

Temperature control and regulation:

Press (P) to see the cabinet temperature setting; the display will show the set temperature.

Temperature up:

Keep (P) pressed. At the same time, press (+). Each time (+) is pressed the temperature will change one degree. When the display shows the desired temperature let go of the two keys and the setting has been made. By keeping (+) pressed, the digits change fast.

Temperature down:

Keep (P) pressed. At the same time, press (-). Each time (-) is pressed the temperature will change one degree. When the display shows the desired temperature let go of the two keys and the setting has been made. By keeping (-) pressed, the digits change fast.

Key lock

The keypad can be locked by entering the code: ⏻ + 1 for more than 6 seconds.
The lamp 🔒 lights up to indicate that the keys are locked, and a short beep sounds. Now it is not possible to use the keys for temperature setting etc.
The same code is to be used for unlocking the keypad again.

Error codes in the display during normal operation

- 0 -	The door is open. The alarm system is activated, if the door is not closed within a certain time. The user is reminded that the door is not properly closed.
F1	Cabinet sensor error. In the meantime the cabinet itself will maintain the set temperature by the memory of the controller. Service assistance is required.
F2	Evaporator sensor error. The cabinet will keep running until the error has been mended. Service assistance is required.
F3/F4	Condenser sensor error. The cabinet will keep running, until the error has been mended. Service assistance is required. Applies only to cabinets with built-in compressor.
F7	Indicates that the condenser temperature is too high. The cause might be a clogged condenser, or too high ambient temperature. If the condenser or air filter needs cleaning, the cabinet must be disconnected at the mains power. Cleaning of the condenser is done with a brush or a vacuum cleaner. The air filter can be removed and cleaned in a dishwasher at max. 50°C. If the ambient temperature is too high, the placement of the cabinet might be wrong, and an alternative place should be found. Ventilation might help. If this does not help, request service assistance. Applies only to cabinets with built-in compressor.

User menu

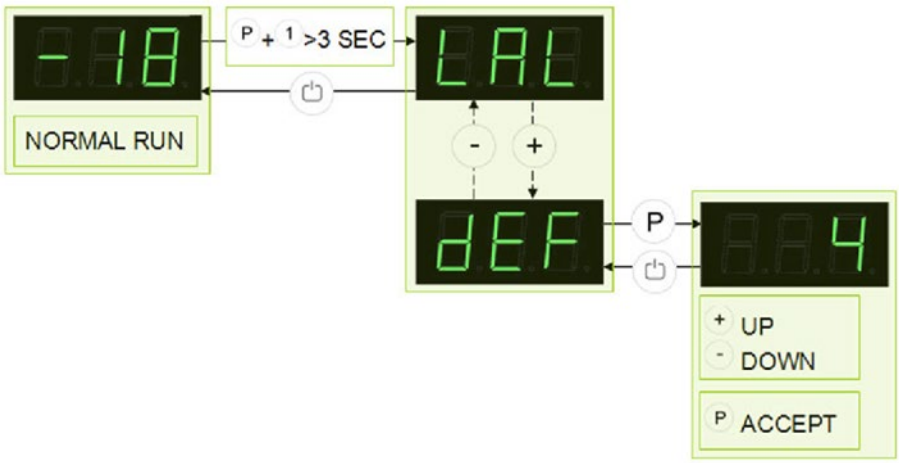
Push on (P) and (1) buttons at the same time in more than 3 sec. and the first Setup menu appears in the display.

With (+) and (-) buttons its possible to look through each menu items in the “User menu”. Push on (P) button to activate the desired item and adjust the setting with (+) and (-) buttons.

To confirm the new setting, push (P) button. Leave the menu item and user menu with the (⏻) button.

Menu access P+1 ⇥	↴	⇥		
Dry refrigeration	dC*		Activation of dry refrigeration. [HO=off / H1=on]	
Rapid thaw	UF*		Activation of rapid thaw. [on/off]	
Local alarm setting	LAL*	LhL	[° C]	Setting the upper alarm limit. At alarm, the display shows: [**A2**].
		LLL	[° C]	Setting the lower alarm limit. At alarm, the display shows: [**A3**].
		Lhd	[min.]	Time delay for the upper alarm limit.
		LLd	[min.]	Time delay for the lower alarm limit.
		dA	On/off	Activation of local door alarm. At alarm, the display shows: [**A1**]. [1=on / 0=off]
		dAd	[min.]	Time delay for the door alarm.
		BU	On/off	Activation of buzzer. The buzzer sounds at alarms [**A1**], [**A2**], [**A3**]. [1=on / 0=off]
External alarm setting	EAL*	EhL	[° C]	Setting the upper alarm limit At alarm, the display shows: [**A4**].
		ELL	[° C]	Setting the lower alarm limit . At alarm, the display shows: [**A5**].
		Ehd	[min.]	Time delay for upper alarm.
		ELd	[min.]	Time delay for lower alarm.
		dA	On/off	Activation of local door alarm. At alarm, the display shows: [**A1**]. [1=on / 0=off]
		dAd	[min.]	Time delay for the door alarm.
		BU	On/off	Activation of buzzer. The buzzer sounds at alarms [**A1**], [**A4**], [**A5**]. [1=on / 0=off]
Sensor calibration	cAL*	cA	[° K]	Offset adjustment of A-sensor. Room sensor.
		cE	[° K]	Offset adjustment of E-sensor. Extra sensor (placed in air or liquid container).
		cF	[° K]	Offset adjustment of F-sensor. Sensor for low temperature protection.
	ALL		Activation of escorting alarm limits. [FAS]= fixed limits / [ESC] = limits following the setpoint.	
	dEF		Number of defrosts in 24 hours.	
	dPS*		Selection of sensor display. Selection between: A, E or F.	

*Might not be available, be available at limited or full extent, depending on programme variant and product.



Visual and acoustic settings

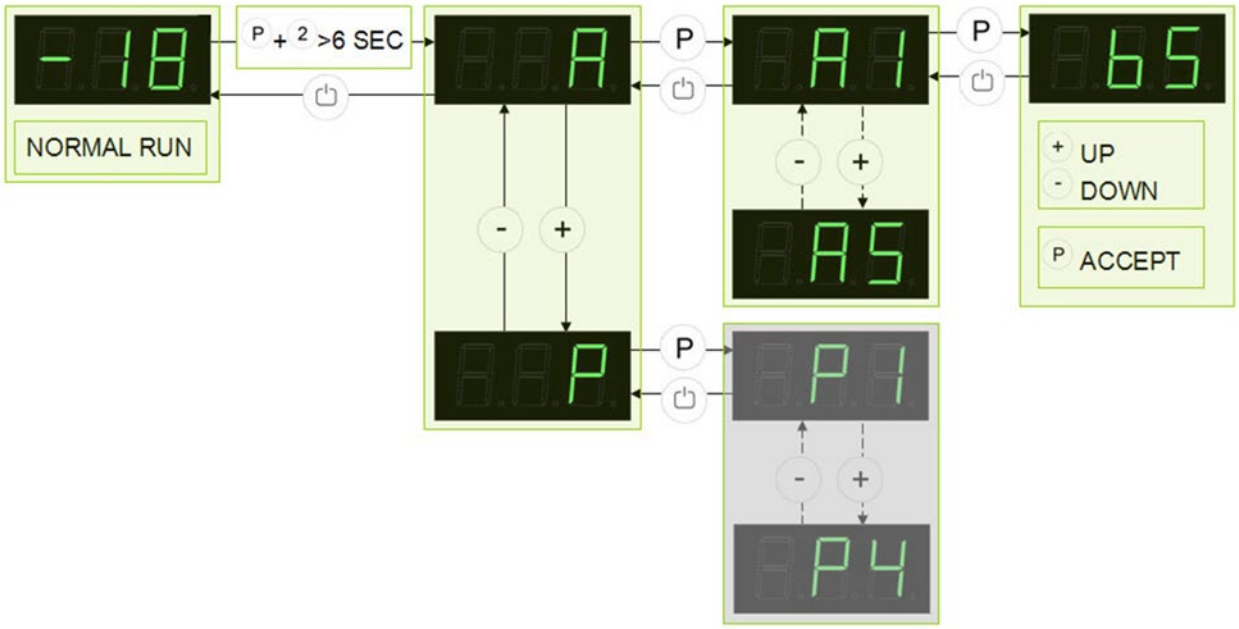
Push on (P) and (2) buttons at the same time in more than 6 sec. and the menu item [**A**] appears in the display.

With (+) and (-) buttons it's possible to look through the main menu item [**A**] and [**P**]. Push on (P) button to enter the submenu from the main menu items.
With (+) and (-) buttons it's possible to look through the submenus menu items. Push on (P) button to enter the desired menu item and adjust the setting with (+) and (-) buttons.

To confirm the new setting, push (P) button. Leave the menu item and submenu with the (⏻) button.

Menu access P+2 ⇥	↴	⇥			
Alarm setup	A	A1	[° C]	In case of condenser overheat, compressor protection cycle is started.	
		A2	[° C]	Condenser temperature, which disconnects the compressor protection cycle.	
		A3	[min].	Re-enter time for acoustic alarm (min.)	
		A4*	On/off	Activation of alarm history. History only works with alarm system: **LAL.** [1=on / 0=off]	
		A5*		Selection between A, E or F sensor for alarm systems **LAL** and **EAL**. Apllies to both!	
Display presentation	P	P1	[min.]	Temperature freeze after defrosting end.	
		P2	[° K]	Temperature freeze around setpoint. Temperature fluctuation filter.	
		P3	[sec.]	Display updating frequency.	
		P4		Selection of Celsius or Fahrenheit temperature scale.	

*Might not be available, be available at limited or full extent, depending on programme variant and product.



Settings for running cycle

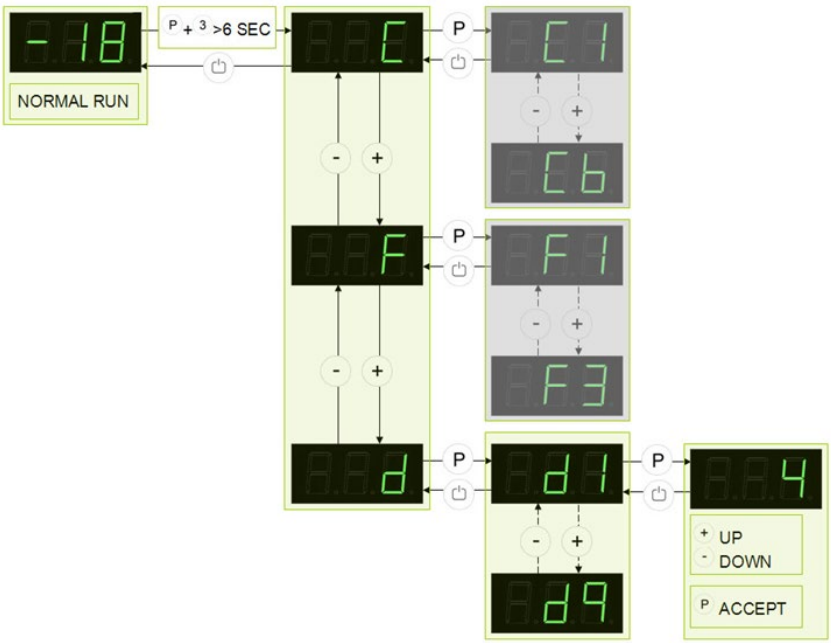
Push on (P) and (3) buttons at the same time in more than 6 sec. and the menu item [C] appears in the display.

With (+) and (-) buttons it's possible to look through the main menu item [C], [F] and [d]. Push on (P) button to enter the submenu from the main menu items.
With (+) and (-) buttons it's possible to look through the submenus menu items. Push on (P) button to enter the desired menu item and adjust the setting with (+) and (-) buttons.

To confirm the new setting, push (P) button. Leave the submenu and main menu item with the (⏻) button.

Menu access P+3 ↦	↧	↦			
Compressor setup	C	C1	[° K]	Differential for compressor cut-in and cut-out.	
		C2	[° C]	Highest allowed temperature limit for the cabinet.	
		C3	[° C]	Lowest allowed temperature limit for the cabinet.	
		C4	[min]	Forced pause time for compressor between cut-out and cut-in.	
		C5*		Number of condenser sensors connected.	
		C6*	[min]	Compressor stop by open door.	
		C7*	[° K]	Soft differential for cool/heat cut-out (kelvin)	
		C8*	[° C]	Setpoint for condenser fan	
		C9*	[° K]	Cut-out differential for condenser fan (kelvin)	
Evaporator fan	F	F1*	[° C]	Temperature allowing the evaporator fan to start after defrosting.	
		F2	[min.]	Pause time of evaporator fan, while the compressor is stopped.	
		F3	[sek.]	Running time of evaporator fan, while the compressor is stopped.	
		F4*	[° K]	Stop temp. of LT compressor i cascade evaporator (celcius)	
Display presentation	d	d1		Number of defrosts / 24h	
		d2	[° C]	Defrost stop temperature measured at the evaporator.	
		d3	On/off	Activation of defrost by start-up sequence [1=on / 0=off].	
		d4*	[min.]	Maximum defrosting time.	
		d5*		Selection between automatic- [1], air- [2] or electric defrosting [3].	
		d6*	[min.]	Dripping time after defrosting	
		d7*	[° C]	Temperature limit deciding the defrosting method, when d5 = [1]	
		d8*	[° C]	Evaporator temperature starting an extra defrosting cycle.	
		d9*		Defrosting after chilling (process)	

*Might not be available, be available at limited or full extent, depending on programme variant and product.



Test program for relays and electrical components

Push on (P) and (4) buttons at the same time for more than 6 sec. and the menu item [**tC**] appears in the display.

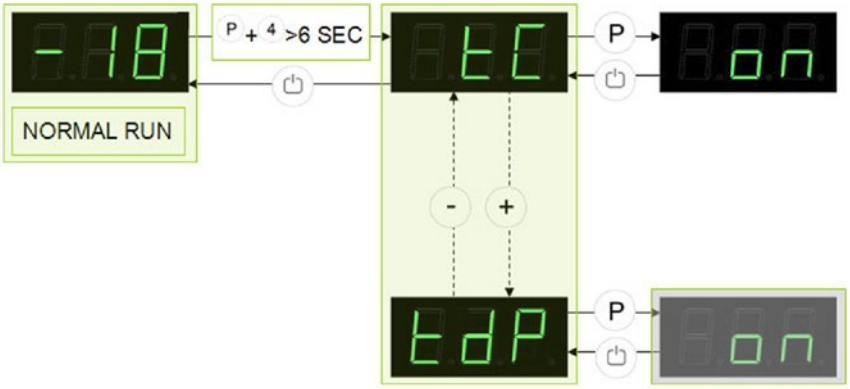
Note: When this test program is started, all outputs are de-activated, which means the cabinet is turned off.
It might be experienced that the compressor does not start again after leaving the program, because the compressor protection “forced pause” takes effect.

With (+) and (-) buttons its possible to look through each menu items in the “Service program”. Push on (P) button to activate the desired relay and the display glows with [**on**]. The desired relay conducts now power to the electrical component.

Push the (⏻) button to switch off the power from the electrical component. Leave the service program with the (⏻) button.

Menu access P+4 ⇥	↴	P-key ⇥ [on]
Compressor	tC	Comressor is running, and if a condenser fan is present, it runs too.
Evaporator fan	tF	Evaporator fan is running
Defrost heater	td	Defrost heater is turned on. Warning: the heater might be very hot. Danger of burn!
Light	tL	Light is switched on.
Alarm output	tA	Activation of voltage free contact. Alarm output.
Display test	tdP	All LED’s light up for 1 sec. and the buzzer sounds. Then the software revision number is displayed.

*Might not be available, be available at limited or full extent, depending on programme variant and product.

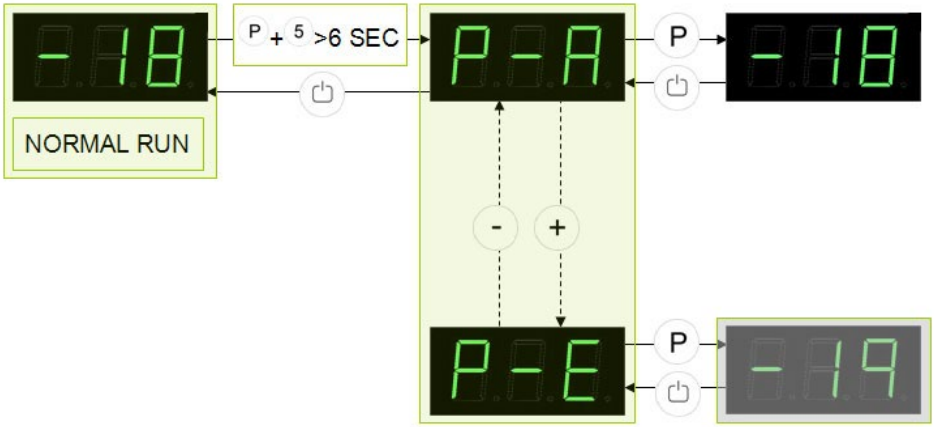


Display of current sensor inputs

Push on (P) and (5) buttons at the same time in more than 6 sec. and the menu item [**P-A**] appears in the display.

With (+) and (-) buttons its possible to look through each menu items to check each sensor in the cabinet. Push on (P) button to activate the actual sensor and the display shows the actual temperature.
Leave the program with the (⏻) button.

Menu access P+5 ⇥	↴	P-key ⇥ [° C]	Display message and cause	
Room sensor	P-A	Room sensor measurement is displayed	F1	Room sensor error
Evaporator sensor	P-b	Evaporator sensor measurement is displayed	F2	Evap.sensor error
Condenser sensor 1	P-C	Condenser sensor 1 measurement is displayed	F3	Condenser sensor 1 error
Condenser sensor 2	P-d*	Condenser sensor 1 measurement is displayed	F4	Condenser sensor 2 error
*				
An overheated condenser could be caused by a clogged air filter. Can be triggered by both C and d sensor.			F7	Overheated condenser 1 and 2
By open door this symbol is displayed. In event of a too long door opening, an alarm is triggered [**A1**].			-0-	Open door symbol



Reset the controller to factory setting

To reset the controller to factory settings:

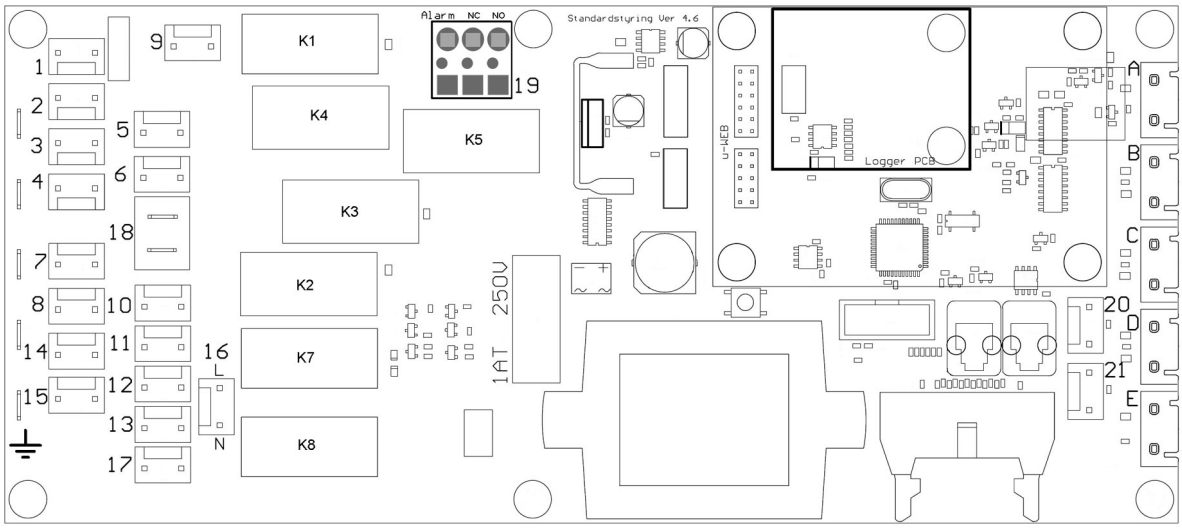
Push (P) + (1) + (3) for more than 6 seconds. The display shows "**rES**".
Push (P), and a beep sounds for confirmation.

Parameter settings in commercial program variants

			Refrigerator			*Extended refrigerator*				*Freezer*				
			K1+	B1+	K7+	M1+	M2+	M3+	B2+	F1+	F2+	P1+	F4+	B3+
Systemvars Version number			85.75	85.75	85.75	85.75	85.75	85.75	85.75	85.75	85.75	85.75	85.75	85.75
Setpoint (celsius)			5	5	5	5	4	5	5	-18	-18	-18	-18	-18
Temperature range (celcius)			+12/+2	+12/+2	+12/+2	+12/-5	+12/-5	+12/-5	+12/-5	-5/-25	-5/-25	+10/-30	+10/-25	-5/-25
Menu access: P+1	↴													
Dry refrigeration on=H0/off=HI	dC		-	-	-	-	-	HI	-	-	-	HI	HI	-
Thaw ing on/off	UF		-	-	-	-	-	oFF	-	-	-	oFF	oFF	-
Local Alarm Limits	LAL	↴												
Upper local alarm limit (celcius)		LHL	25	25	25	25	8	25	25	25	25	25	25	25
Low er local alarm limit (celcius)		LLL	-	-	-	-	-	-	-	-	-	-	-	-
Time delay for upper alarm limit (min.)		LHd	60	60	60	60	60	60	60	60	60	60	60	60
Tiem delay for low er alarm limit (min.)		LLd	-	-	-	-	-	-	-	-	-	-	-	-
Door alarm on=1/off=0		dA	1	1	1	1	1	1	1	1	1	1	1	1
Time delay for open door (min.)		dAd	5	5	5	5	1	5	5	5	5	5	5	5
Buzzer for local alarm on=1/off=0		BU	1	1	1	1	1	1	1	1	1	1	1	1
External Alarm Limits	EAL	↴												
Upper external alarm limit (celcius)		EHL	25	25	25	25	8	25	25	25	25	25	25	25
Low er external alarm limit (celcius)		ELL	-35	-35	-35	-35	0	-35	-35	-35	-35	-35	-35	-35
Time delay for upper alarm limit (min.)		EHd	60	60	60	60	10	60	60	60	60	60	60	60
Time delay for low er alarm limit (min.)		ELd	60	60	60	60	60	60	60	60	60	60	60	60
Door alarm on=1/off=0		dA	-	-	-	-	-	-	-	-	-	-	-	-
Time delay for open door (min.)		dAd	-	-	-	-	-	-	-	-	-	-	-	-
Buzzer for local alarm on=1/off=0		BU	-	-	-	-	-	-	-	-	-	-	-	-
Calibration of sensor	cAL	↴												
Offset adjustment sensor A (kelvin)		cA	0	0	0	0	0	0	0	0	0	0	0	0
Offset adjustment sensor E (kelvin)		cE	-	-	-	-	-	-	-	-	-	0	-	-
Offset adjustment sensor F (kelvin)		cF	-	-	-	-	-	-	-	-	-	-	-	-
Frost Protection	FP	↴												
Activation of frost protection On=1/Off=0		Act	-	-	-	-	-	-	-	-	-	-	-	-
Test of frost protection		tES	-	-	-	-	-	-	-	-	-	-	-	-
Setpoint of frost protection (celcius)		SEt	-	-	-	-	-	-	-	-	-	-	-	-
Display of current sensor temperaturer (celcius)		PrE	-	-	-	-	-	-	-	-	-	-	-	-
Fixed or escorting alarm limits (FAS - ESC)	ALL		FAS	FAS	FAS	FAS	FAS	FAS	FAS	FAS	FAS	FAS	FAS	FAS
Soft chilling (soft-chill)	SCL		-	-	-	-	-	-	-	-	-	-8	-	-
Hard chilling (hard-chill)	HCL		-	-	-	-	-	-	-	-	-	3.00	-	-
Time controlled chilling (timed-chill)	PCL		-	-	-	-	-	-	-	-	-	-18	-	-
Number of defrosts / 24h			4	4	4	4	4	4	4	4	4	4	4	4
Selected sensor display	dPS		-	-	-	-	-	-	-	-	-	-	-	-
Alarm & presentation	↴													
Alarm settings	A	↴												
Condenser monitoring alarm on (celcius)		A1	65	65	65	65	65	65	65	65	65	65	65	65
Condenser monitoring alarm off (celcius)		A2	40	40	40	40	40	40	40	40	40	40	40	40
Genindtrædelses tiden for akustisk alarm (min.)		A3	5	5	5	5	5	5	5	5	5	5	5	5
Alarm history on=1/off=0		A4	-	-	-	-	-	-	-	-	-	-	-	-
Selection of sensor for alarm system		A5	-	-	-	-	-	-	-	-	-	-	-	-
Mulige valg af følere til alarm system			-	-	-	-	-	-	-	-	-	-	-	-
Præsentation af temperatur	P	↴												
Temperature display hold after defrost		P1	30	30	30	30	30	30	30	30	30	30	30	30
Temperature display hold during normal operation		P2	3	3	3	3	3	3	3	3	3	3	3	3
Display updating frequency (sec)		P3	10	10	10	10	10	10	10	10	10	10	10	10
Temperature display, Celsius or Fahrenheit		P4	C	C	C	C	C	C	C	C	C	C	C	C
System setup	↴													
Compressor settings	C	↴												
Differential for compressor start and stop (kelvin)		C1	5	5	5	5	4	5	5	5	5	5	5	5
Max. allow ed setpoint (celcius)		C2	12	12	12	12	12	12	12	-5	-5	10	10	-5
Min. allow ed setpoint (celcius)		C3	2	2	2	-5	-5	-5	-5	-25	-25	-30	-25	-25
Compulsory compressor pause time (min.)		C4	5	5	5	5	5	5	5	5	5	5	5	5
No. of sensors for condenser monitoring		C5	1	1	1	1	2	1	1	1	2	1	1	1
Door open time before compressor stops (min.)		C6	1	1	1	1	1	1	1	1	1	1	1	1
Soft differential for cool/heat cut-out (kelvin)		C7	-	-	-	-	-	-	-	-	-	-	-	-
Setpoint for condenser fan		C8	-	35	-	-	-	-	35	-	-	-	-	35
Cut-out differential for condenser fan (kelvin)		C9	-	5	-	-	-	-	5	-	-	-	-	5
Evaporator fan settings	F	↴												
Evap.fan start after defrost, and during dry refrig. (celcius)		F1	-	-1	-	-1	-1	-3	-1	-1	-1	-1	-1	-1
Evap.fan pause time at compressor stop (min.)		F2	5	0	5	5	5	5	0	5	5	5	5	0
Ford. vent. køretid ved kompressor stop (sek.)		F3	60	60	60	60	60	60	60	60	60	60	60	60
Stop temp. of LT kompressor ic cascade evaporator (celcius)		F4	-	-	-	-	-	-	-	-	-	-	-	-
Defrost settings	d	↴												
Number of defrosts / 24h		d1	4	4	4	4	4	4	4	4	4	4	4	4
Stop temperature in evaporator during defrost (celcius)		d2	7	4	7	4	7	4	4	4	4	12	4	4
Defrosting on/off = (0/1) at pow er up first time		d3	0	0	0	0	0	0	0	0	0	0	0	0
Max allow ed defrosting time (min.)		d4	30	30	30	30	30	30	30	30	30	30	30	30
Defrosting mode (1=automatic, 2=air, 3=electrical)		d5	2	3	2	1	3	1	3	3	3	3	3	3
Drip time after defrost stop (min.)		d6	0	4	0	4	0	4	4	4	4	2	4	4
Limit for automatic defrosting mode (celcius)		d7	2	2	2	4	2	4	2	4	4	4	4	4
Evaporator monitoring (celcius)		d8	-35	-35	-35	-35	-35	-35	-35	-35	-35	-40	-35	-35
Defrost after chilling stop		d9	-	-	-	-	-	-	-	-	-	1	-	-

Plug connections onboard the controller

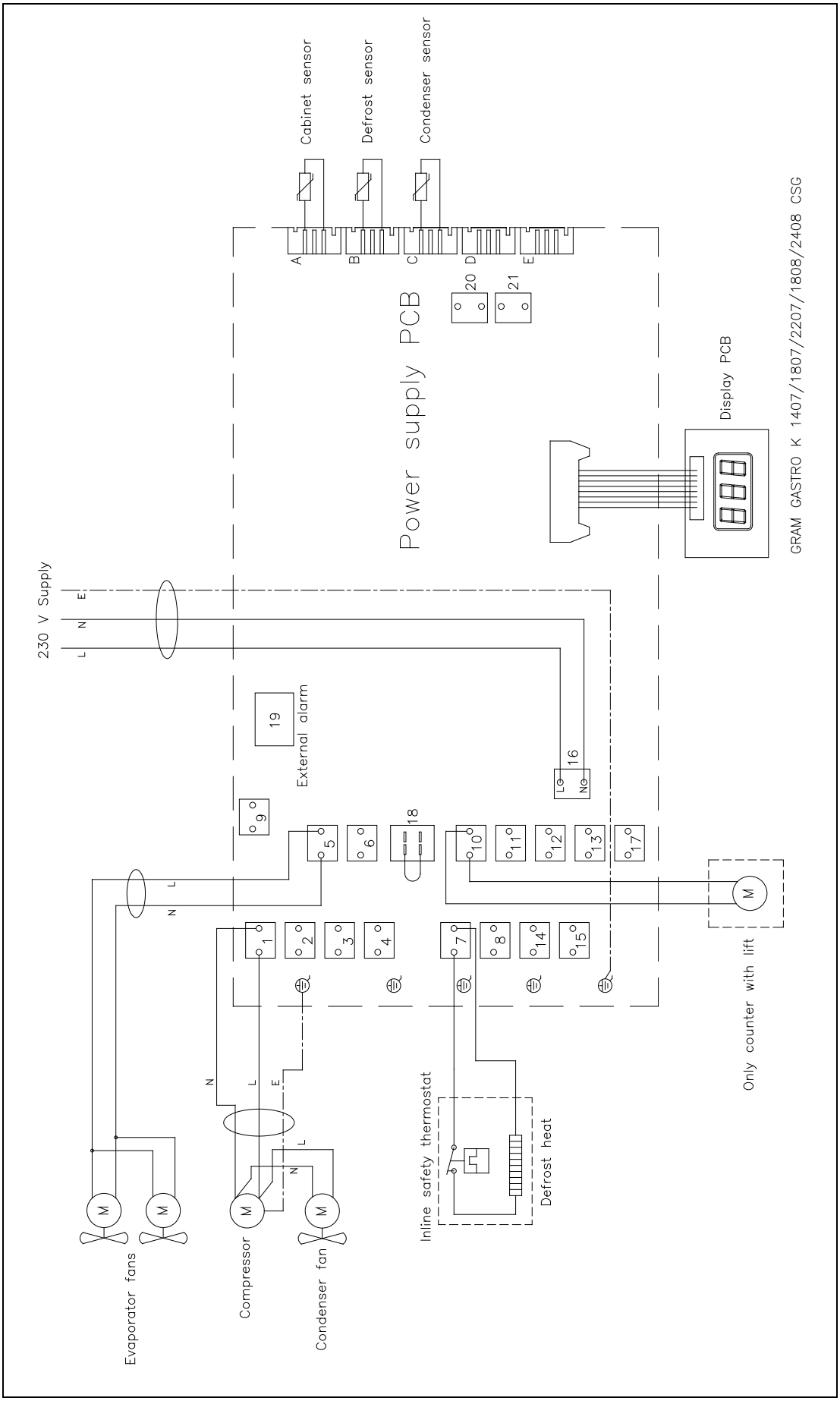
The description here below explains the plugs or terminals to each special function and relay.



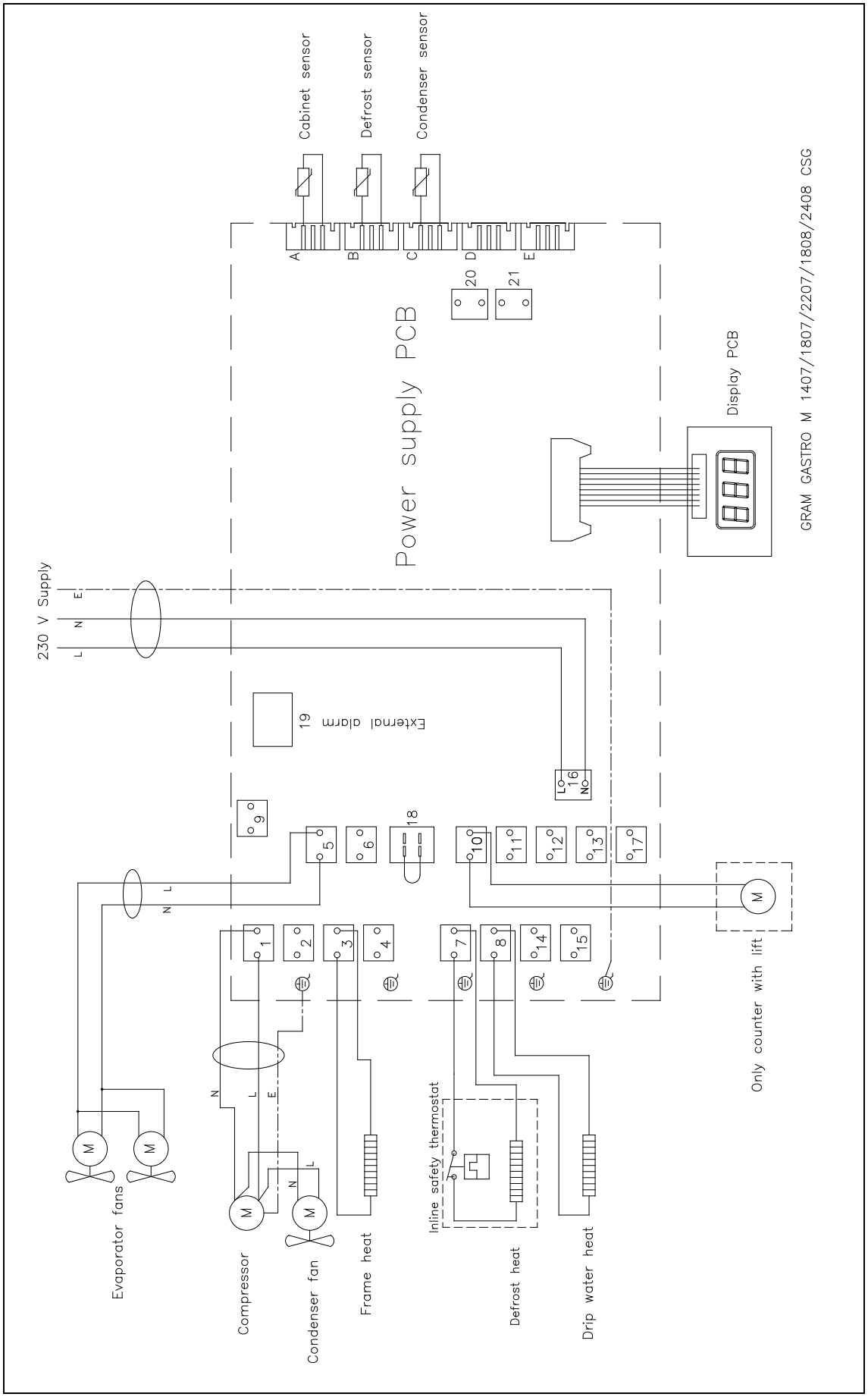
Plug	Electrical component	Description
1	230 Volt relay – K1	The relay supplies the compressor and the condenser fan with power.
2		
3		
4		
5	230 Volt relay – K3	The relay supplies the evaporator fan with power.
6		
7	230 Volt relay – K2	The relay supplies the defrosting heating element and the drip water heating element with power
8		
14		
15		
9	230 Volt relay – K4	The relay supplies the halogen light transformer with power (230V/12V).
10	230 Volt relay – K7 and K8	The relay supplies the front frame heater, re-evaporating heating element, and the condensing pump with power. When the cabinet is switched on, the power is constantly viable.
11		
12		
13		
17		
18	Plug connection for the safety thermostat	The plug is connected in series with the defrosting heating element.
19	230 Volt relay – K5	The potential free alarm relay. The relay changes position when the cabinet switches the power on. By alarms and by power failure the relay switches back to normal position.
16	230 Volt input	These terminals are the power input connection with 230 V to the controller.
20	Digital input from the door contact	When these terminals are not in use, the controller lets the evaporator fans keep running. By shortcutting the terminals, the fan stops.
21		

A	Room sensor input	NTC sensor
B	Evaporator sensor input	NTC sensor
C	Condenser sensor input 1	NTC sensor
D	Condenser sensor input 2	NTC sensor
E	Sensor input for a extra sensor	NTC sensor

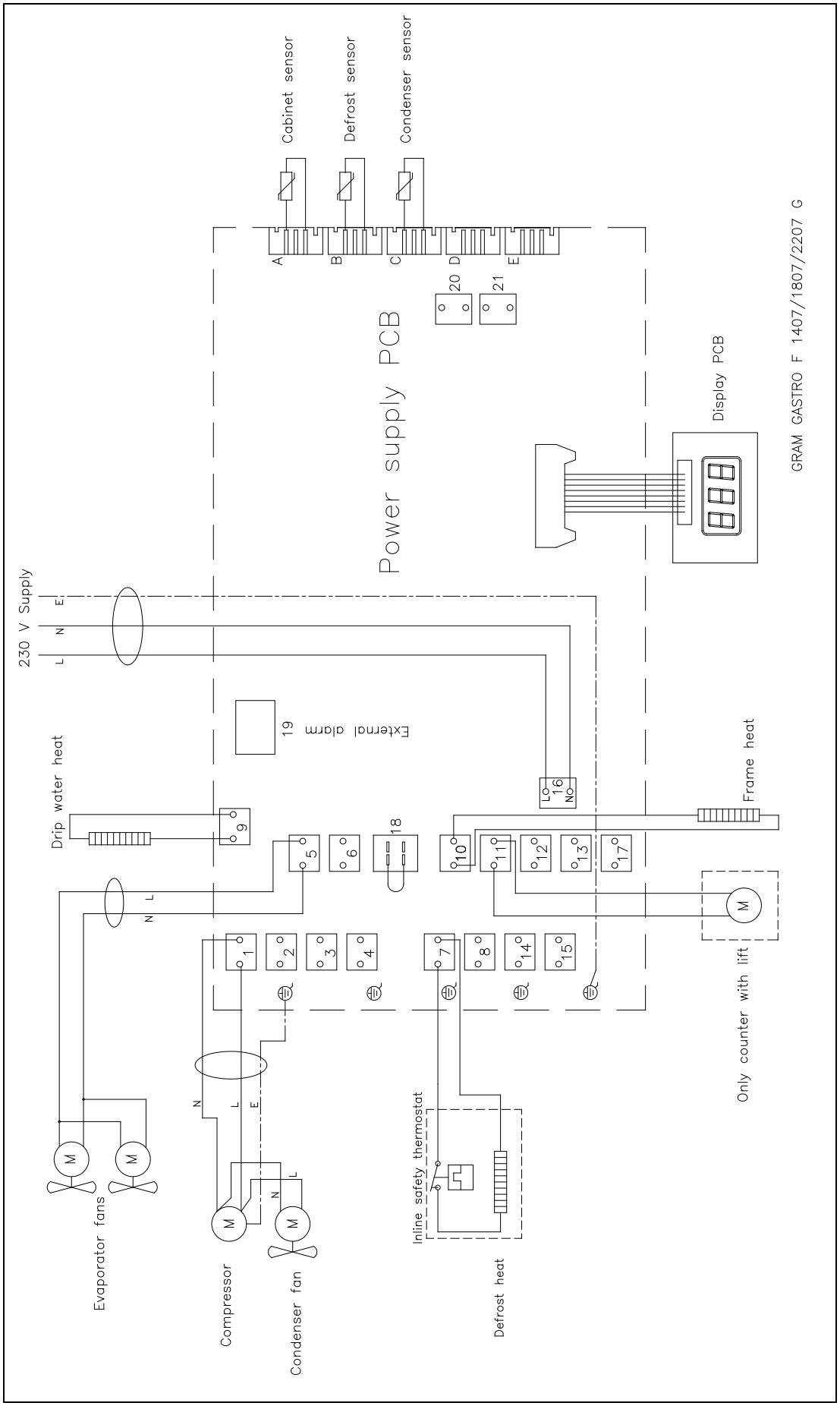
Wiring diagram – R



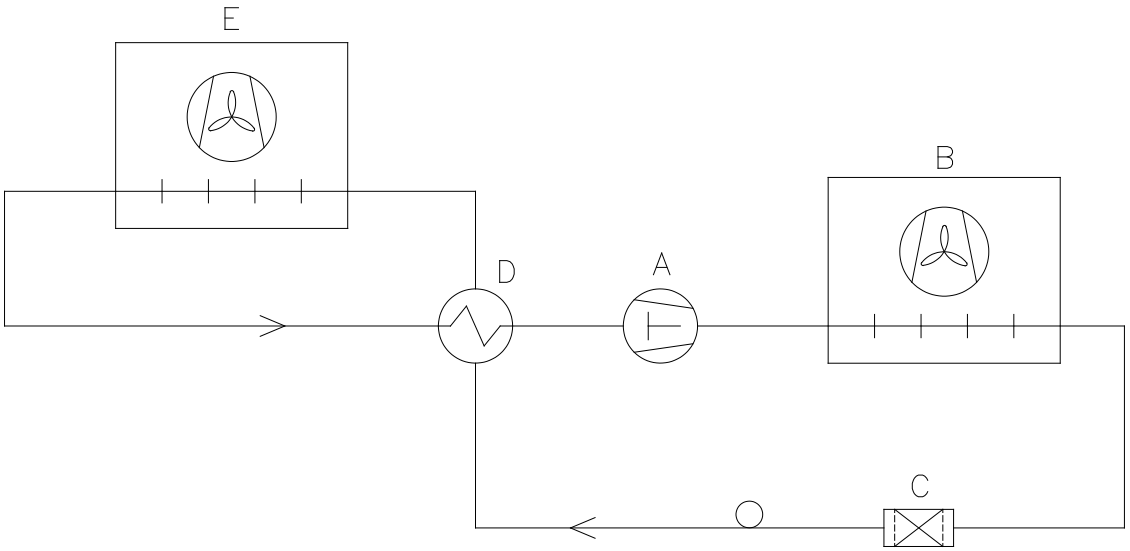
Wiring diagram – C



Wiring diagram – F



Piping diagram



	DK	GB	D
A	Kompressor	Compressor	Kompressor
B	Kondensator	Condenser	Verflüssiger
C	Tørrefilter	Filter drier	Trockenfilter
D	Varmeudveksler	Heat exchanger	Wärmeaustauscher
E	Fordamper	Evaporator	Verdampfer