Refrigeration unit and freezer unit with electronic control
TectoRefrigo WMC2
TectoRefrigo WMF2 R452A

VIESMANN

Before starting work on the refrigeration unit, please observe the following instructions:

Installation, maintenance, cleaning and repair may only be carried out by a specialist refrigeration company.

Technical changes and manipulations are prohibited.

Our guarantee obligations are void in the event of non-compliance.

Work on the refrigeration unit is only permitted when the mains plug is disconnected. The refrigeration unit must be secured against unauthorised recommissioning by suitable measures (e.g. warnings). The regulations VDE 0105 part 1 – for work on electrical equipment must be observed.

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1. Description

The devices are designed for the specified temperature ranges. If they are operated for several days outside the intended temperature range, a serious defect of the refrigeration unit cannot be ruled out.

1.1 Frozen unit
TectoRefrigo WMF2 R452A 0900, 1400, 1800, 2400

The devices are designed for cooling rooms in which goods are stored at -25°C to -1°C.

1.2 Refrigeration unit
TectoRefrigo WMC2 0500, 0900, 1300, 2000, 2800

The devices ts are designed for cooling rooms in which goods are stored at -5°C to +19°C.

2. General information

2.1 Extract from our warranty terms

The warranty period is 1 year. The warranty claim starts on the day of the delivery, which is to be verified by the delivery note or invoice. Malfunctions that can be attributed to poor workmanship or material defects, will be rectified free of charge within the warranty period.

Further claims, in particular for consequential damages are excluded.

We shall assume no warranty for damages resulting from improper or inappropriate use, faulty installation or commissioning by the purchaser or third party, natural wear and tear, faulty or negligent handling, chemical or electrochemical and electrical impacts, provided that they cannot be attributed to our fault, failure to observe the installation, operating, and maintenance instructions, improper modifications or repair work by the purchaser or third party, and effects of parts of external origin.

The warranty shall also expire if the refrigerant circuit has been opened by unauthorized persons, interventions in the system structure have been made, or the serial number on the device has been changed or made unrecognisable.

2.2 Standards and regulations

The wall-hanging refrigeration unit was built and tested in accordance with the standards and regulations in force at the time of manufacture.

It corresponds to the
EMC directive 2004/108/EG
Machinery Directive 2006/42/EC.
The device has been tested at the factory for leaks in the refrigeration circuit and for function.

2.3 Requirements for the installation space/ intended use

The refrigeration unit must not be installed outdoors.

The refrigeration unit is designed for free intake and discharge out of air. If air ducts are unavoidable, they must be designed by a specialist refrigeration company.

Sufficient free space must be available in front of the inlet and discharge openings of the refrigeration unit to ensure good air conduction:

- at least 250 mm in front of all inlet and discharge openings

If this distance cannot be maintained, suitable measures (air baffle plate, air ducts, additional fans) must be taken to ensure air flow.

Do not use the refrigeration unit in areas where strong magnetic interference pulses are to be expected and in the vicinity of transmitting antennas.

Do not install the refrigeration unit in an explosive environment!

Do not install the refrigeration unit in fire-hazardous areas!

These are in accordance with DIN VDE 0100-482 (VDE 0100 part 482): 1997-08
Rooms or places or places in rooms or outdoors where there is a risk that, according to local and operational conditions, hazardous quantities of highly flammable substances may approach the electrical equipment in such a way that higher temperatures at these equipment or arcs may cause a fire hazard. This may include: Working, drying, storage rooms or parts of rooms as well as such outdoor sites, e.g. paper, textile or wood processing plants, hay, straw, jute, flat storage facilities.

- According to BGR, Chapter 2.35 or local regulations for operation and maintenance (qualified personnel).

2.4 Transport

Due to the oil in the compressor, the refrigeration unit may only be transported in the operating position. Only the original packaging may be used for any further transport.

2.5 Delivery condition of wall-hanging refrigeration units

The wall-hanging refrigeration unit is delivered ready for operation and wired ready to plug in, packed in a cardboard box.

2.6 Unpacking and handling

- Before and when unpacking the refrigeration unit, a visual inspection must be carried out to detect any damage that may have been caused during transport.

- Please pay attention to loose parts, dents, scratches, visible oil loss, etc.

- Before the packaging material is disposed of, it must be checked whether it still contains loose parts.

- For processing warranty claims, please provide us with precise details of the fault (with photo where applicable), as well as the type designation and serial number of the device.

- To protect the device from damage, it must only be transported and stored in the operating position. It must be ensured that the evaporator and condenser are not damaged. Failure to do so will void the warranty.

2.7 Energy savings

Direct sunlight increases power consumption.
Avoid opening the door too long and unnecessarily.

Monitor storage temperature.
Clean the refrigeration unit regularly. A clean device saves energy and has a longer service life.

Observe cleaning intervals (see "Cleaning and maintenance of refrigeration units"). Regular maintenance increases the service life.

3. Cleaning and maintenance of the refrigeration unit

⚠️ **Caution!**

When conducting cleaning and maintenance work, always unplug the mains plug from the socket and secure it against being plugged in again.

The refrigeration unit should be periodically checked and, if necessary, cleaned after commissioning. The time until the next inspection or cleaning process must be determined depending on the level of dirt. The cleaning interval depends on the ambient conditions. However, maintenance must be conducted at least once a year.

The evaporator can be cleaned with a soft cleaning brush, compressed air or, in the case of very greasy residues, an industrial cleaning agent. Do not use pointed or sharp-edged objects. The thin fins must also not be crushed or damaged during cleaning work.

Do not spray-clean the appliance with water or steam!

3.1 Disposing of refrigerant

If the refrigeration unit has to be replaced with a new appliance, ensure that its pipes are not damaged so that no refrigerant can escape.

Faulty refrigeration units or refrigerant that has been suctioned out must be disposed of in an environment-friendly manner under consideration of the applicable provisions.

4. Installation of the wall-hanging refrigeration unit in a Viessmann cold room

Sufficient free space must be available in front of the inlet and discharge openings of the refrigeration unit to ensure good air conduction:

We can supply a wall element with the corresponding openings and holes for installation in the cold room.

Otherwise, the necessary holes and openings must be drilled by the refrigeration system manufacturer on site with the aid of the fitting template or the dimensioned drawing. Figures in brackets for big size units.

The cut edges and holes must be protected against corrosion with zinc paint.

⚠️ **Caution!**

Do not install electrical power supply until commissioning after completion of installation work – danger to life!

Loosen the locking bracket from the refrigeration unit.
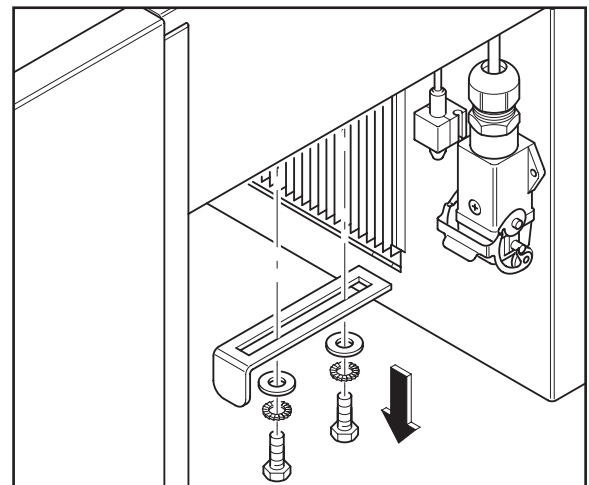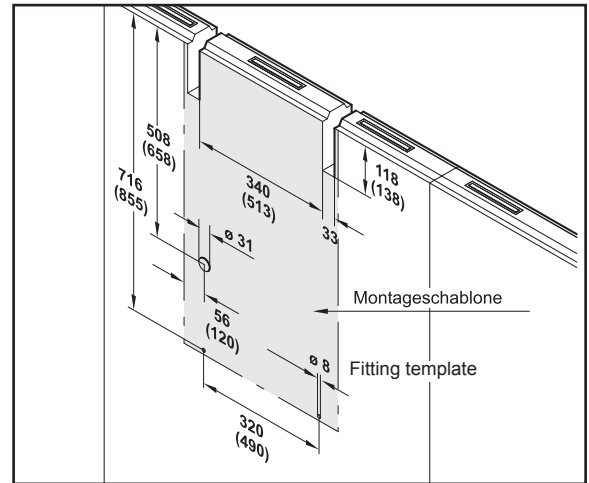
Mount the refrigeration unit into the room wall and press it against it from the outside.
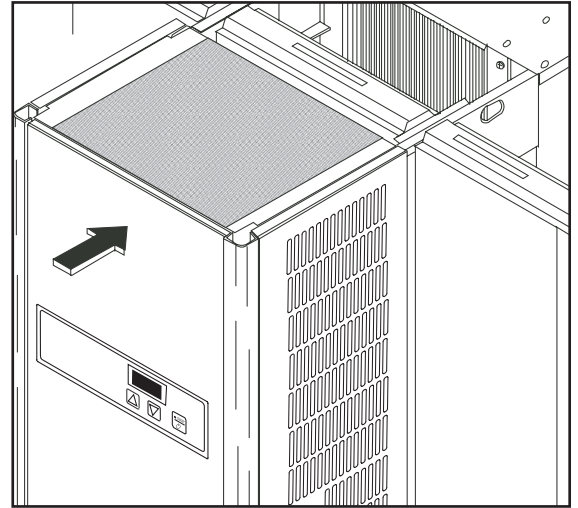
Slide the locking brackets against the inside of the room wall and tighten them with one or two screws.
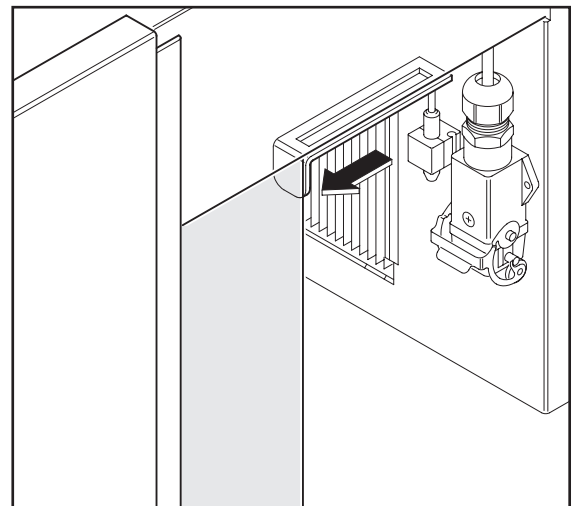
Insert the enclosed blind rivet nut (P) into the holes (d = 8 mm).

P

General notice (liability): the information in this technical document is provided for description purposes. Guarantees regarding existence of certain properties or purposes mentioned always require prior written consent.
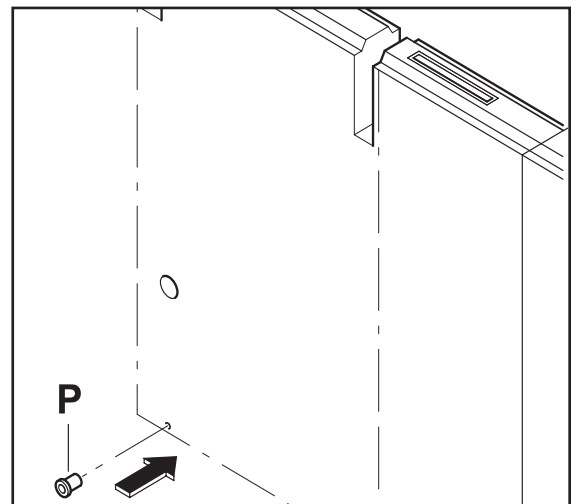
Screw the enclosed fastening bracket (M) to the housing of the refrigeration unit and the room wall (screws M4 x 15 (H) for using the blind rivet nuts (P) in the room wall and hexagon nuts (L) with washers (K) for the housing).
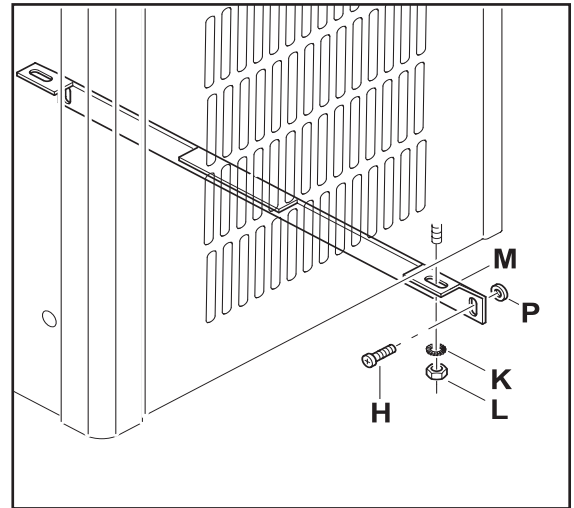
Loosen the closing screws of the front cover (4 pieces). Make sure that the serrated lock washers are not lost.

Slide the front cover slightly upwards and pull it off to the front.
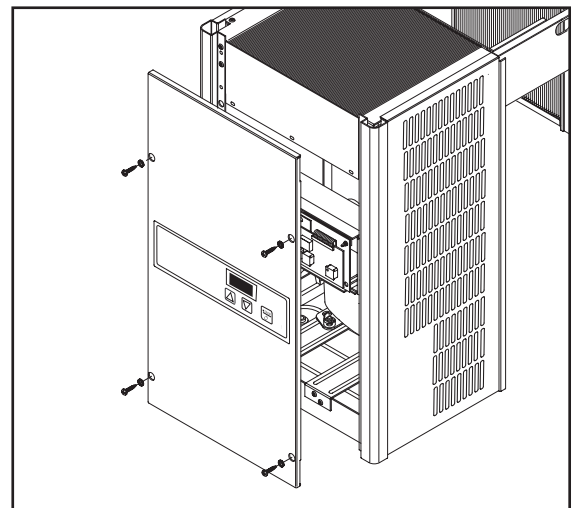
Slide the enclosed plastic washer (D) over the defrost water drain hose (B).

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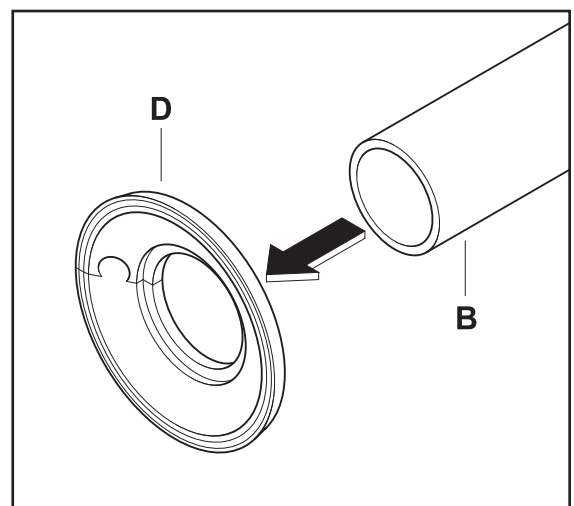
For units with electrical defrost, insert the defrost water drain heater (A) into the defrost water drain hose (B), while pulling the defrost water drain hose (B) largely straight for easier insertion.
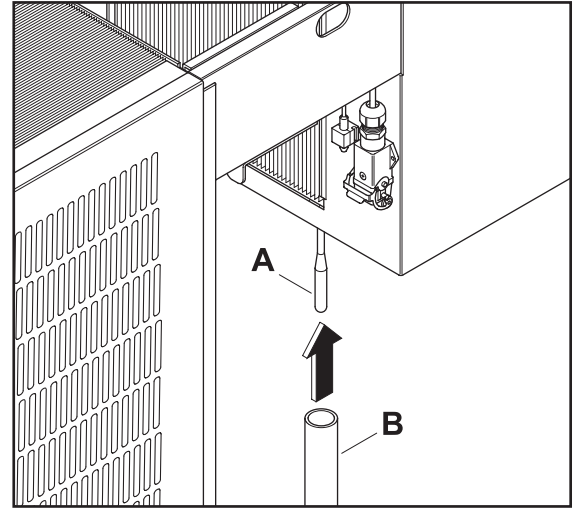
Siphon (C) only for freezer units.

Guide the defrost water drain hose (B) from the inside through the bore (G, d = 31 mm) in the room wall (F). If necessary, a lubricant can be used.

Attach the defrost water drain hose (B) to the outlet socket (E) of the evaporator tray.

For refrigeration and freezer units, lead defrost water drain into the defrost water tray.

Cover the opening (G) for the defrost water drain hose (B) with the plastic washer (D).
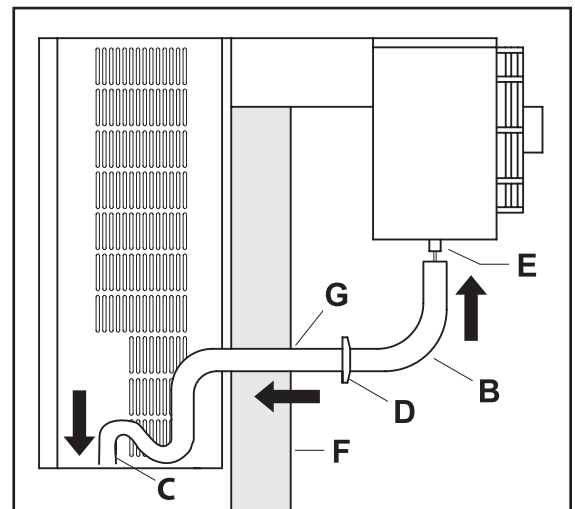
Fill the area above the suspension rail of the refrigeration unit with the enclosed Armaflex hoses (N) as sealing material.

Hang in the front cover and affix it to the refrigeration unit using the existing self-tapping screws ST 3.9 x 19 and serrated lock washers A 4.3.

⚠ **Caution!**

If cable ducts or similar are installed next to the refrigeration unit, there must be a gap of 30 mm between the cable duct and the refrigeration unit so that the side wall of the refrigeration unit can be removed for maintenance work.

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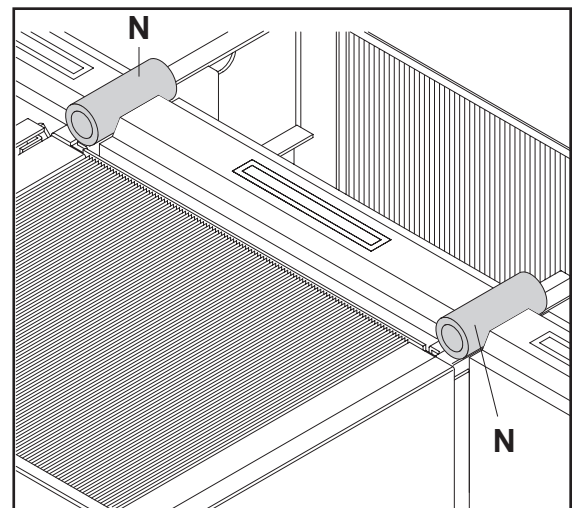
4.1 Connecting a remote control (SD control)

If the refrigeration unit was ordered with remote control, mount the remote control at the intended location and connect the adapter via the 10-pin ribbon cable at the rear of the control. Fasten the adapter to the rear panel of the control housing using the cable tie supplied. (For bus operation, see bus operation manual)
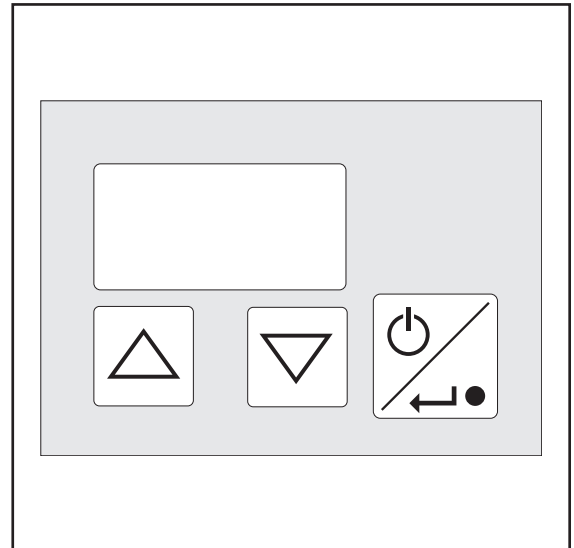
5. Discharge of condensation

For optimum drainage of the condensation, we recommend the use of the optional accessory pack for defrost water drainage.

The accessory pack can be used for all Viessmann refrigeration units in this series.

6. Electric power supply cold room

On the refrigeration unit, there is a 4-pole socket on the inlet side of the evaporator for the electrical power supply of consumers installed in the refrigeration room with a total output of max. 250 watts (lighting, door frame heating). A door contact switch can also be connected via this socket.

6.1 Connection of the door contact switch

The evaporator fan should be switched off when the cold room door is open. We therefore recommend the installation of a potential-free door contact switch (switching capacity 230VAC, min. 0.5 A).

The connection is made via the 4-pole socket on the inlet side of the evaporator.

The refrigeration unit is ready for operation without an external door contact switch when delivered.
The door contact switch is not included with the refrigeration unit.

6.1.1 Refrigeration unit with electronic control

If a door contact switch is connected to the refrigeration unit, the control parameter P29 must be changed to "1" (see 8.5.1 Parameter list).

4-pin plug connection

on the unit   from cold room

2 3 1 PE   2 3 1 PE   L1 230VAC
                              N   max. 250 VA
                              PE

Door contact switch
drawn with door open
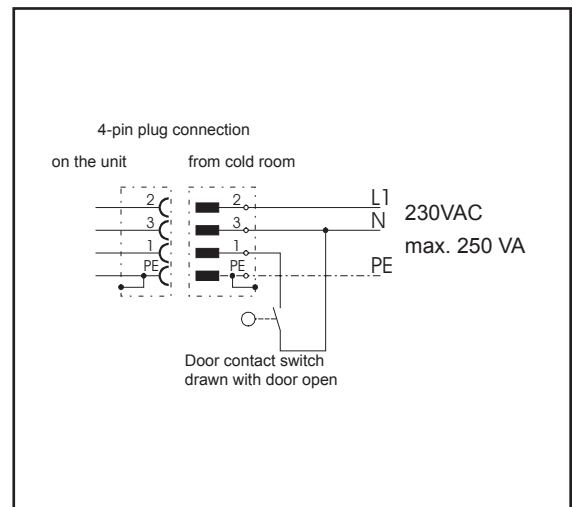
6.2 Connection of the fault message contact

The electronic control SD has a potential-free fault alarm contact for connecting an on-site fault message device (max. 10A, 230VAC).

In the event of a fault, contacts C and NC are closed.

The connection is on the circuit board (connector A3 orange).

6.3 Mains connection and commissioning

⚠ **Caution !**

Do not carry out electrical power supply until commissioning – Danger to life!

Work on the mains connection and protective measures must be carried out by a specialist company in accordance with IEC 364, the local regulations and the connection conditions of the respective power supply company!

Plug the mains plug into a properly grounded socket (230 VAC or 400 VAC, 50 Hz, 16 A delay fuse).

Electronic control SD
The device starts up after the control self-test and after a delay time of approx. 3 minutes (adjustable via parameter P34). This time delay can be bypassed the first time the device is switched on by pressing the Start/Stop button and then switching it on again. To switch off the system, press the "Stop-Start-Enter" button for approx. 3 seconds.

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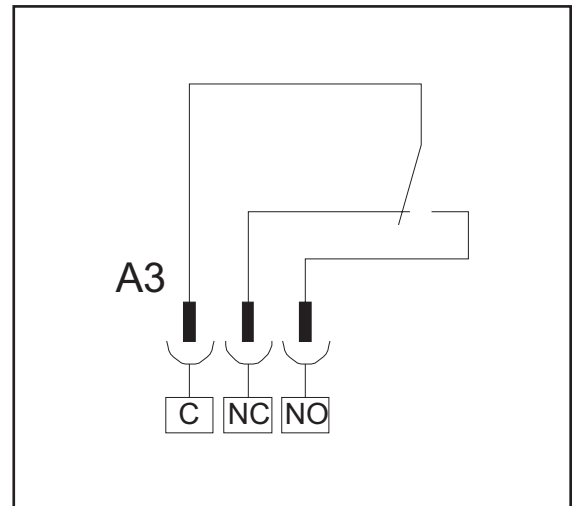
6.3.1 CEE power plug
(Only refrigeration units TectoRefrigo WMF2 R452A 1800, 2400)

Loosen the closing screws of the front cover (4 pieces). Make sure that the serrated lock washers are not lost.

Slide the front cover slightly upwards and pull it off to the front.
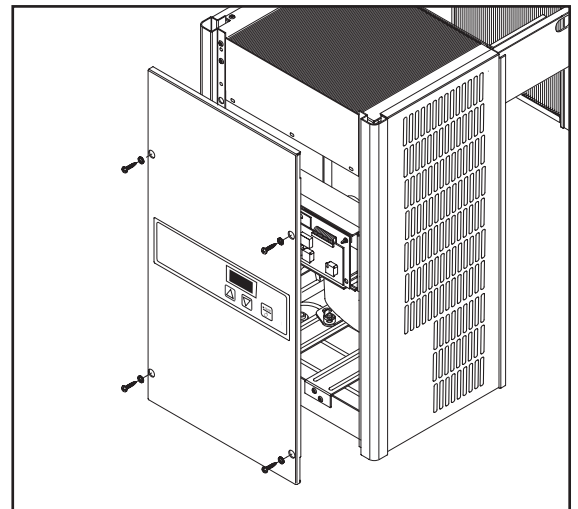
Loosen the fastening screw on the inside of the right side part, push the side part (Y) upwards and remove it. Connect the mains cable with CEE plug (Q) to the outside. Reattach the side part (Y), slide it downwards and secure it with the fastening screw.

Plug the CEE plug into the CEE socket (3+N+PE, AC 400V, 16A, 50 Hz) provided by the customer.
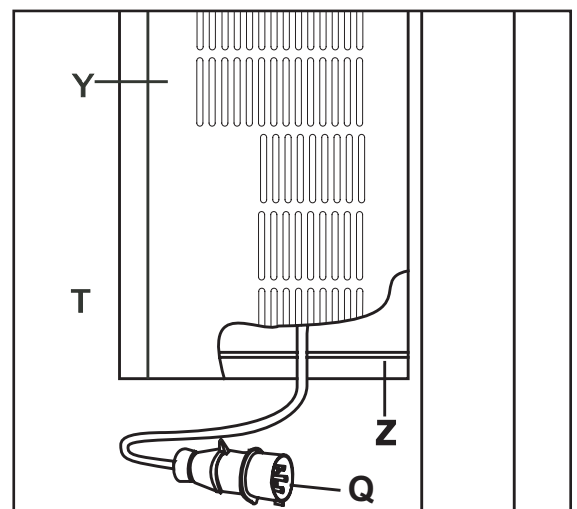
Hang in the front cover and affix it to the refrigeration unit using the existing self-tapping screws ST 3.9 x 19 and serrated lock washers A 4.3.

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7. Operation of the SD control unit

VIESSMANN

7.1 Normal operation

The display shows the current cold room temperature.
If one of the keys [▲] or [▼] is pressed, the current target temperature appears. The right decimal point lights up in the display.
If no new key is pressed within 10 seconds, the room temperature is displayed again.

The system can be switched off and on again by pressing the "Stop-Start-Enter" button. When deactivated, "OFF" appears in the display.

If both [▲] and [▼] keys are held down and then the "Stop-Start-Enter" key is pressed, the system is started with a forced defrost. If the keys [▲] and [▼] are not pressed when switching on, the system is started in cooling mode. Any defrosting initiated beforehand is switched off.

Never use pointed objects (e.g. ballpoint pen, screwdriver, etc.) to operate the keys.
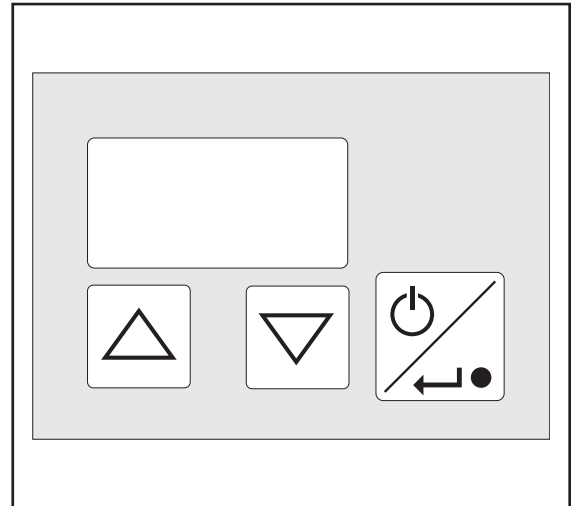
Display during operation:

Function	German	English	French
StandBy	OFF		
Defrost	Dept.	dEF.	dEg.
Display when the key is pressed and the keypad is locked	Bo.L		
Fault (x=error no.)	F.x	E.x	d.x
Version display	"Sd" -> "5.13"		

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7.2 Parameter entry

If both [▲] and [▼] keys are pressed simultaneously during operation, the parameter function is accessed.

In this function, the set temperature and defrost times can be entered or changed. The operating mode of the evaporator fan can also be set for high or low humidity in the cold room.

The display shows the name of the selected parameter; at the same time, the yellow LED lights up in the "Stop-Start-Enter" key; in this case, the "Stop-Start" function is switched off.

By pressing the "Stop-Start-Enter" key, the display can be switched between the parameter designation and the value of the parameter.

The parameter address or the value of the parameter can be changed within the specified limits using the keys [▲] or [▼].

The parameters can be password protected against unauthorized changes (P07 <> x2).
In order to access the parameters released for the system operator, the following procedure is necessary in this case:

During operation, press both [▲] and [▼] keys simultaneously,

P01 appears in the display and the yellow LED in the "Stop-Start-Enter" key lights up at the same time.

Press the "Stop-Start-Enter" key – the display shows 1.

Select the value 5 with the keys [▲] or [▼].

Press the "Stop-Start-Enter" key.
- P01 reappears in the display.

The desired parameter P02 - P09 or P02 - P23 (see 8.2.6) can now be selected using the keys [▲] or [▼].

Parameter entry is terminated automatically after 10 seconds if no key is pressed. It is also terminated if the value 0 is entered in parameter P01.

7.2.1 Entry of the target temperature

After entering the password, select parameter P02 (displayed in SL.t.), press the Enter key, the current target temperature in °C is displayed. It can be changed via the [▲] or [▼] keys in the range which is enabled for the respective refrigeration unit type (normal cooler -5°C ... 20°C; freezer -25°C ... -5°C).

7.2.2 Entry of defrost times

Defrosting according to specified cycle times - Entry of defrost pause:

After entering the password, select parameter P03 (Display shows down.h.), press Enter key, the current defrost pause in hours is displayed. It can be changed via the [▲] or [▼] keys in the range from 1 hour to 24 hours.

The defrost pause should be shortened if the humidity in the cold room is so high that the evaporator completely freezes.

Defrosting at fixed times

If a DCF radio receiver is connected to the control unit, P12.. P23 12 switching points can be entered, at which defrosting is started. Parameter P30 must be set accordingly (only by a specialist refrigeration company).

After entering the password, select parameters P12 to P23 (shown in display t.01. t.12), press the Enter key, the current switching point to start defrosting is shown in hh.m(x10) format. They can be changed using the [▲] or [▼] keys in the range from 00.0 to 23.5 or "OFF". The numbers before the decimal point indicate the hours, the number after the decimal point indicates the tens of minutes.

Entry of the defrost time:

After entering the password, select parameter P04 (shown in the display down.d.), press the Enter key, the current defrost time in minutes is displayed. It can be changed in the range from 5 min. to 60 min. using the [▲] or [▼] keys.

Defrost is stopped before the "Defrost time" has elapsed if the evaporator has exceeded 10°C.

The defrost time should be extended if the evaporator is not completely defrosted at the end of the defrost time.

7.2.3 Selection of humidity in the cold room

After entering the password, select parameter P05 (shown in display rF.), press Enter key, the current operating mode of the evaporator fan is shown. Press the [▲] key to switch the evaporator fan to continuous operation (high relative humidity), display HI; press the [▼] key to switch the fan to compressor operation (low relative humidity), display LO.

7.2.4 Selecting the language for display

After entering the password, select parameter P06, press the Enter key, the set language is displayed (d=German, gb=English, f=French). It can be changed using the [▲] or [▼] keys.

7.2.5 Password and keypad lock

If the value 0 is entered in parameter P07, the keys [▲] and [▼] and the start/stop key are disabled. This function can be used if there is a risk that the controls could be tampered with by unauthorised persons.

The keypad lock is active when "Bo.L" appears in the display when a key is pressed.

Activation or deactivation of the keypad lock: Press [▲]- and [▼] keys simultaneously
P01 appears
Press the Enter key
Select value 5
Press the Enter key
Select P07
Press the Enter key

Select one of the following functions with the keys [▲] or [▼]:

P07 = 0 : Keypad lock is switched on

P07 = 1 : Keypad is enabled

P07 = 2 : The parameters P02 .. P09 can be edited without a password. After pressing the two keys [▲] and [▼], the parameter address of the target temperature appears immediately.

Deactivating the display of the SD control:

The keypad lock is also active if a value >= 10 is entered in parameter P07. In this case, the temperature display is also switched off during SD control. The decimal point moves back and forth to indicate that the refrigeration unit is in operation.
Error messages and defrost status are displayed.
The temperature is still displayed on a connected remote control.

This function is useful if a remote control is connected to the control unit and the refrigeration unit is accessible to unauthorised persons.

7.2.6 Access level for the system operator

The parameter levels P02..P23 are accessed if the password 5 or the password for the operating mode parameters has been selected in parameter P01. If parameter P07 has the value 2, this parameter level is accessible without a password.

Parameters shown in italics cannot be changed.

Display of the selected parameter during parameter entry						
Function	Parameters:	German	English	French	Unit	Area
Password	P01	P01	P01	P01		0-99
Target temperature	P02	SL.t.	n.t.	t.n.	°C	P31...P32
Defrosting cycle [h]	P03	Ab.h	dE.C	c.dE	Hours	1...24
Defrost time [min]	P04	Ab.d	dE.t	d.dE	Minutes	5...60
Moisture (Evaporator fan mode) LO=runtime w. compressor (low relative humidity) HI=continuous operation (high relative humidity)	P05	r.F.	HU.	HU.		
Language d = German e = English f = French	P06	P06	P06	P06		
keyboard release P07 = 0 : Keypad lock is switched on P07 = 1 : Keypad is enabled P07 = 2 : Parameters P02...P09 can be edited without a password P07 = 3 : The target temperature can be edited without a password.	P07	tA.F	bo.E	bo.E		0...3; 10....13
Display of evaporator temperature	*P08*	*P08*	*P08*	*P08*	*°C*	*-50...50/OFF*
Display of condenser temperature	*P09*	*P09*	*P09*	*P09*	*°C*	*0...99/OFF*
The following parameters are only displayed if x2 is set in P30 and a DCF radio clock receiver is connected.						
current time [h]	*P10*	*P10*	*P10*	*P10*	*Hours*	*0...23*
current time [min]	*P11*	*P11*	*P11*	*P11*	*Minutes*	*0...59*
Defrost time 1	P12	t.01	t.01	t.01	hh.m (x10)	00.0...23.5
Defrost time 2	P13	t.02	t.02	t.02	hh.m (x10)	00.0...23.5
Defrost time 3	P14	t.03	t.03	t.03	hh.m (x10)	00.0...23.5
Defrost time 4	P15	t.04	t.04	t.04	hh.m (x10)	00.0...23.5
Defrost time 5	P16	t.05	t.05	t.05	hh.m (x10)	00.0...23.5
Defrost time 6	P17	t.06	t.06	t.06	hh.m (x10)	00.0...23.5
Defrost time 7	P18	t.07	t.07	t.07	hh.m (x10)	00.0...23.5
Defrost time 8	P19	t.08	t.08	t.08	hh.m (x10)	00.0...23.5
Defrost time 9	P20	t.09	t.09	t.09	hh.m (x10)	00.0...23.5
Defrost time 10	P21	t.10	t.10	t.10	hh.m (x10)	00.0...23.5
Defrost time 11	P22	t.11	t.11	t.11	hh.m (x10)	00.0...23.5
Defrost time 12	P23	t.12	t.12	t.12	hh.m (x10)	00.0...23.5
Access level for refrigeration company: The level from P29 (access level for refrigeration specialist company) can only be accessed if the password for the operating mode parameters has been selected in parameter P01 (see separate parameter list).						

If no new key is pressed within 10 seconds, parameter entry is terminated and the cold room temperature is displayed again.
The yellow LED in the "Stop-Start-Enter" button goes out and this button returns to the "Stop-Start" function.
Some parameters can be used to constantly monitor the functions of the control system. In this case, the yellow LED in the "Stop-Start-Enter" button flashes. By pressing the "Stop-Start-Enter" button, the LED goes into continuous operation for 10 seconds, then the display returns to normal operation.

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7.3 Error message

Indication in the display	Meaning
F01	Sensor short circuit room sensor
F02	Sensor break room sensor
F03	Pressostatic interference
F04	Cold room temperature too high
F05	Cold room door open
F06	Cold room temperature too low
F08	Evaporator sensor defective
F09	Condenser sensor defective
F10	Emergency stop switch ON
F11	Fault EEPROM

7.4 Decommissioning of the refrigeration unit

In case of prolonged standstill or maintenance and cleaning work, the refrigeration unit must be taken out of operation by disconnecting the mains plug. The refrigeration unit can be briefly shut down by pressing the Start/Stop button for approx. 3 seconds (stand-by mode).

The cooling unit and the connected consumers are not de-energised in stand-by mode.

☞ Note:

After a power failure, all set parameters are retained.

⚠ **Caution!**

If the refrigeration unit is taken out of operation and stored in a frost-endangered area, it must be ensured that the water of the heat exchanger is completely drained, otherwise it can be destroyed. This is possible by loosening the lower screw connection of the condenser.

7.5.1 Parameter list

⚠️ **Caution !**

The following parameters have a decisive influence on the operation of the refrigeration unit. They may only be changed by qualified personnel. It is therefore recommended to make the password for the operating mode parameters unrecognisable.
If parameters are changed, they should be entered in the"Changed values" column.

Operating mode parameters (enabled if password P01 **= 22**)

The following parameters are preset as operating mode parameters for normal and freezer units. They can be adjusted.
If necessary, they can be reset to factory settings via P50 and P51.

Parameters:	Description	Unit	Area	Changed values	Specification	
					WMC	WMF
P28	*Signal display of DCF antenna*	*Sec.*	*0-59*			
P29	Door contact switch (0=without DF 1=with DF		0-1		0	0
P30	Defrosting operating mode		00-03; 10-13		0	0
	x0 = according to specified cycle times					
	x1 = according to specified cycle times, but runtime depends on compressor					
	x2= dep. on preset switching points (only with DCF antenna)					
	x3=Demand defrosting					
	0y="Defrost start" switched off via door contact					
	1y="Defrost start" switched on via door contact					
P31	Max. permissible room temperature	°C	-50...+50		20	-5
P32	Min. permissible room temperature	°C	-50...+50		-5	-25
P33	Room temperature difference	K	-8...-1 +1...+8		+2	-2
P34	Minimum compressor downtime	Min	3-10		3	3
P35	Evaporator fan start-up delay	Min	0-10		3	3
P36	After-running time of evaporator fan	Min	0-20		0	0
P37	Switching point for air circulation defrosting	°C	3-40		20	20
P38	Temperature difference to activate Demand defrosting	K	10-40		25	25
P39	Defrost limit temperature	°C	+5...+50		20	20
P40	Evaporator dripping time	Min	0-10		3	3
P41	Start temperature of evaporator fan	°C	-20...+10		-5	-15
P42	Temperature alarm delay time	Min	0-99		60	60
P43	Upper alarm temperature (target value + P43)	K	0-20		10	10
P44	Lower alarm temperature (target value - P44)	K	0-20		5	5
P45	Delay time door contact alarm	Min	0-99		4	4
P46	Condenser target temperature for speed controller	°C	20-60		20	20
P47	*Condenser fan speed in %*		*OFF/10...100*			
P48	Minimum fan speed in % condenser fan		10...100		40	40
P49	Slope speed controller condenser fan		1-100		10	10

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Parameters:	Description	Unit	Area	Changed values
P50	Type of refrigeration unit Normal refrigeration = 1 Freezer = 2		1, 2	
P51	Reset to factory setting (P = 78)			
P52	Compressor runtime last cycle [hours]	Hr.		
P53	Compressor runtime second to last cycle [minutes]	Min.		
P54	Compressor runtime second to last cycle [hours]	Hr.		
P55	Compressor runtime second to last cycle [minutes]	Min.		
P56	Compressor runtime third to last cycle [hours]	Hr.		
P57	Compressor runtime third to last cycle [minutes]	Min.		
P58	Compressor runtime fourth to last cycle [hours]	Hr.		
P59	Compressor runtime fourth to last cycle [minutes]	Min.		
P60	Compressor waiting time last cycle [hours]	Hr.		
P61	Compressor waiting time last cycle [minutes]	Min.		
P62	Compressor waiting time second to last cycle [hours]	Hr.		
P63	Compressor waiting time second to last cycle [minutes]	Min.		
P64	Compressor waiting time third to last cycle [hours]	Hr.		
P65	Compressor waiting time third to last cycle [minutes]	Min.		
P66	Compressor waiting time fourth to last cycle [hours]	Hr.		
P67	Compressor waiting time fourth last cycle [minutes]	Min.		
P68	Average runtime 4 cycles compressor [hours]	Hr.		
P69	Average runtime 4 cycles compressor [minutes]	Min.		
P70	Average waiting time 4 cycles compressor [hours]	Hr.		
P71	Average waiting time 4 cycles compressor [minutes]	Min.		
P72	Number of compressor starts (xxyy00-xxyy99)			
P73	Number of compressor starts (xx00zz-xx99zz)			
P74	Number of compressor starts (00yyzz-99yyzz)			
P75	Number of starts after restart (xxyy00-xxyy99)			
P76	Number of starts after restart (xx00zz-xx99zz)			
P77	Number of starts after restart (00yyzz-99yyzz)			
P78	Number of pressostat faults (xxyy00-xxyy99)			
P79	Number of pressostat faults (xx00zz-xx99zz)			
P80	Number of pressostat faults (00yyzz-99yyzz)			
P81	Compressor runtime at the end of the defrosting process	Hr.		
P82	Compressor runtime at the end of the defrosting process	Min.		
P83	Current bus address			
P84	Continuous time defrost pause or time [h]	Hr.		
P85	Continuous time defrost pause or time [min]	Min.		

Parameters:	Description	Unit	Area	Changed values
P86	Room sensor calibration	K	-20...+20	
P87	Evaporator sensor calibration	K	-20...+20	
P88	Condenser sensor calibration	K	-20...+20	
P90	Room sensor -50° adjustment			
P91	Room sensor slope			
P92	Evaporator probe -50° adjustment			
P93	Evaporator sensor slope			
P94	Condenser sensor -50° adjustment			
P95	Condenser sensor slope			
P96	Switch-on delay after door contact switch closed	Min.	[0...20]	
P97	Mains frequency	Hz	50, 60	
P98	Evaluation of door contact signal from bus 0 = As soon as a door contact of a refrigeration unit on the bus system is open, the refrigeration unit switches off. 1 = Only the own door contact signal is evaluated (Description see bus operation manual)		0, 1	
P101	*Target temperature + 50*			
P102	*Status byte 1*			
P103	*Status byte 2*			
P104	*Status byte 3*			
P105	*Flag byte 7*			
P106	*Selected refrigeration unit number (only with remote control)*			
P107	*Number of devices on the bus*			

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Defrosting:

During defrosting, the display shows Abt. or dEF. or dEg.

Defrosting takes place via the electric heating. When defrosting is complete, the compressor switches on after the dripping time entered in P40. The evaporator fan starts when the evaporator temperature falls below the value entered in P41 or when the time set in P35 has elapsed after the compressor is switched on.

The evaporator temperature can be displayed in P08. If no temperature sensor is connected to the evaporator, "OFF" is displayed in P08.

Defrosting modes:

The defrosting mode can be selected via parameter P30:

Defrosting is initiated in a fixed cycle:

P30 = x0

Defrost is initiated when the time entered in P03 has elapsed from the last time the defrost was started.

Defrost stops when the evaporator temperature exceeds the value entered in P39 or when the defrost time exceeds the value entered in P04.

Defrosting is initiated depending on the running time of the compressor:

P30 = x1

At the end of a defrost, the compressor runtime is set to 0. When the compressor runtime reaches the value entered in P03, defrosting is initiated.

Defrosting stops when the evaporator temperature exceeds the value entered in P39 or when the defrost time exceeds the value entered in P04.

Defrosting is initiated at fixed times:

P30 = x2

Defrosting is initiated when the internal clock has reached one of the switching times entered under parameters P12 - P23. If parameter P12 - P23 contains the value OFF, this switching point is disabled.

Defrosting stops when the evaporator temperature exceeds the value entered in P39 or when the defrost time exceeds the value entered in P04.

This parameter is only enabled if a DCF radio clock receiver is connected to the controller.

Defrosting is initiated depending on the freezing of the evaporator:
(only with evaporator sensor connected)

P30 = x3

Defrosting is initiated when the evaporator temperature is lower than the room temperature minus the value entered in P38.

Example:
Room temperature = 5°C, P38 = 25
Defrosting is initiated when the evaporator temperature is below -20°C.

As a safety precaution, defrosting is also initiated when the compressor running time has exceeded the value entered in P03. It is therefore recommended to enter the value in P03 for approx. 10 hours.

Defrosting stops when the evaporator temperature exceeds the value entered in P39 or when the defrost time exceeds the value entered in P04.

Additional defrosting is initiated if the cold room door is open for longer than 4 minutes:

P30 = 1y

Defrosting is activated in addition to the operating mode entered in value y if the error message "Cold room door open" appears.

Air circulation defrost:

If the target temperature is above the value set in P37, defrosting takes place via recirculation air. In this case, the evaporator fan switches on during the defrosting process, the defrost heater is not in operation.

Hysteresis

Hysteresis between switch-on and switch-off temperature can be changed via P33.

If the value of P33 is negative, the cooling unit switches off when the cold room temperature has reached the target temperature minus the absolute value of the hysteresis. It switches on when the cold room temperature has reached the set temperature again.
Example: Target temperature -20℃,
                    Hysteresis -2K
Refrigeration unit OFF at -22℃,
Refrigeration unit on at -20℃.

If the value of P33 is positive, the refrigeration unit switches off when the cold room temperature has reached the target temperature. It switches on when the cold room temperature has reached the value target temperature + hysteresis.
Example: Target temperature +5℃,
                    Hysteresis +2K
Refrigeration unit OFF at +5℃,
Refrigeration unit ON at +7℃.

Condenser fan (for units with air-cooled condenser and speed control):

The condenser fan is equipped with speed control on some models. In this case, the condensing temperature is measured via a temperature sensor on the outlet pipe of the condenser. If the sensor is not connected for cost reasons, the speed control is bridged via a relay and the fan runs at full speed.

The condensing temperature can be displayed in P09. If speed control is not active or no temperature sensor is connected to the condenser,"OFF" is displayed in P09.

If the speed control should fail, the high-pressure pressostat would respond when the fan is at a standstill. Since this fault is detected, the fan is switched on via the relay. Since the high pressure switch can also be activated under other circumstances, the speed control is reactivated after one hour of operation of the refrigeration unit. If the high-pressure switch responds again within an hour, the speed control is bypassed and an error message appears. The error message can be acknowledged by briefly pressing the [▲] or [▼] key. The speed control remains bypassed until the mains voltage of the refrigeration unit is switched off and on again.

Parameterisation of the speed control:

For speed control, parameters P46 .. P49 are decisive. Parameter P46 defines the condensing temperature to be maintained via the speed control.

P48 defines the minimum speed in %. P49 determines the slope of the control. The lower the value, the slower the speed control reacts to a temperature change; with a higher value it reacts faster.

Resetting the parameters to factory settings:

The refrigeration unit type is selected in P50

Normal refrigeration = 1
Freezer = 2

If value 78 is selected in P51, parameters P29 to P49 are set to the factory parameters corresponding to the refrigeration unit type.

DCF signal (radio clock):

The DCF signal can be observed via parameter P28 when the DCF antenna is connected.

The display shows the running seconds, the decimal point of the 100-digit flashes with the pending signal.

If the time is recognised correctly 2 times in succession,"dCF" appears briefly in the display and the time is accepted.

The display is not reset while the DCF signal is displayed.

The current time can be viewed in parameters P10 [h] and P11 [Min].

Adjustment of the temperature sensors:

The temperature sensors can be adjusted via parameters P86 to P88.

Example:
The cold room temperature shown on the display is -15°C, the value measured in the cold room is -18°C, i.e. the display must show 3K less. Consequently, the value of parameter P86 must be reduced by 3. If the display is smaller than the measured value, P86 must be increased by the difference.

8. Drawings

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8.1 Diagram of the refrigeration circuit
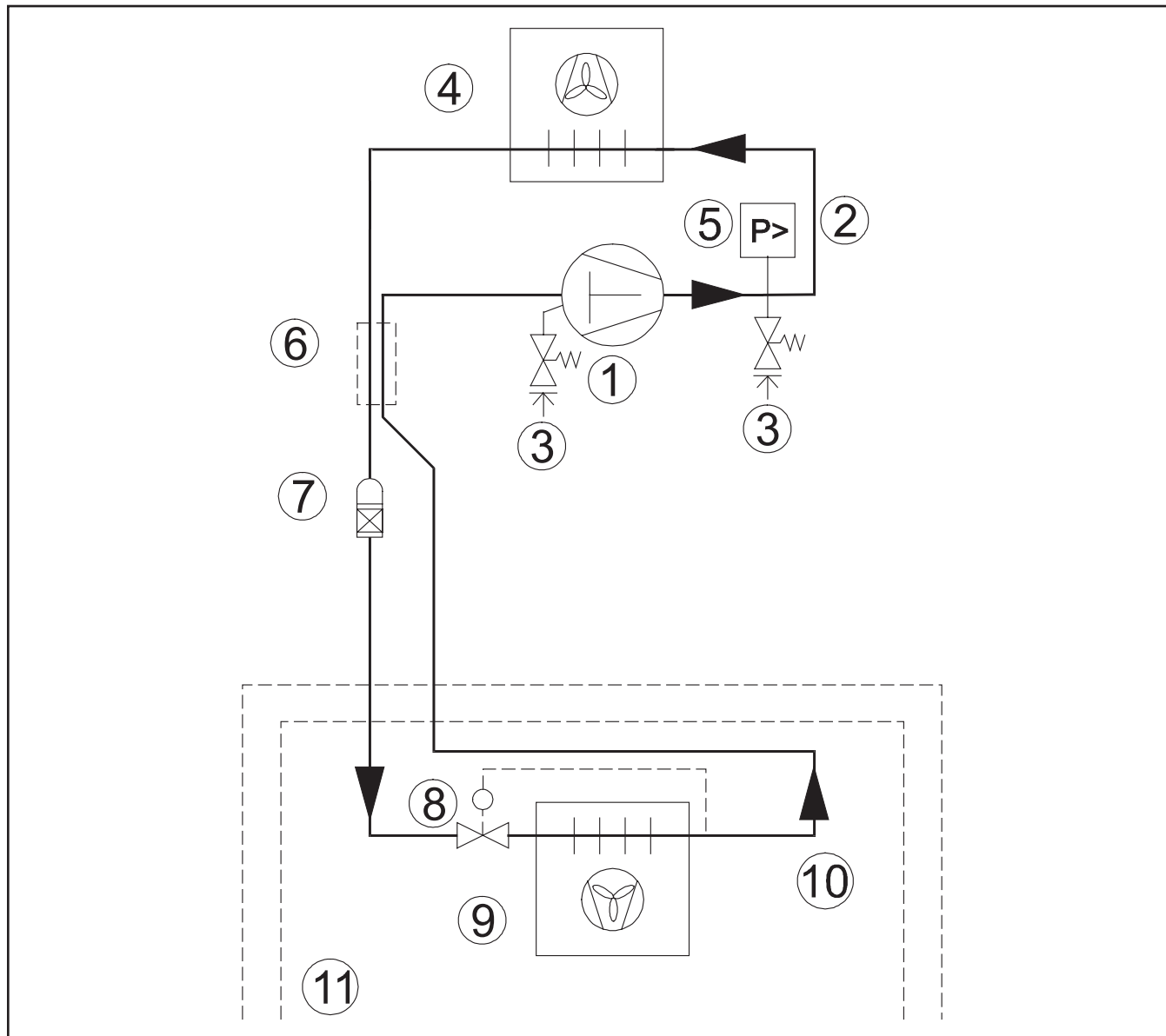
1   Compressor
2   Pressure line
3   Schrader test couplers
4   Air-cooled condenser
5   High-pressure switch
6   Heat exchanger
7   Collector-drier
8   Thermal expansion valve
9   Evaporator
10 Inlet line
11 Cold room

8.2 Electrical circuit diagram for TectoRefrigo WMC2 0500, 0900, 1300, 2000, 2800
TectoRefrigo WMF2 R452A 0900, 1400

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Connection diagram of the optional serial interface RS232 for bus operation

E-plan
FS 1800 and FS 2400/SD
with three-phase compressor
25.02.03.Wgn

Condenser sensor (optional)
Evaporator sensor (optional)
Room sensor
Temperature sensors PT 1000

ext. fault message (in the event of a fault or in the de-energised state, the relay drops out)

Defrost heater

Oil sump heater

Solenoid valve high pressure (only for split units)

Compressor relay

Pressostat

Condenser fan

Evaporator fan

4-pin connector for cold room

PE strip

Compressor

CEE device plug
3+N+PE/ 400V/ 16A

Mains filter

Circuit breaker 10A

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In case of faults, an error code appears in the display.

If the refrigeration unit is not in cooling mode and not in defrost mode, the fail-safe relay drops. The signal can be forwarded via the potential-free contact.

9.1   Error codes (SD control)

see operation of the SD control 8.3 Error messages

9.2   Emergency operation (SD control)

If the control system fails or malfunctions, the cooling unit can continue to be operated in emergency operation.

The emergency stop switch is located on the lower side of the control unit below the [▲] key.

⚠️   **Caution!**

Remove the mains plug from the socket and secure it against reactivation.

After removing the front panel, the switch can be operated.

To do this, loosen the closing screws of the front cover (4 pieces). Make sure that the serrated lock washers are not lost.

Slide the front cover slightly upwards and pull it off to the front.

On the underside of the control housing there is a recess through which the switch can be reached. To switch on emergency operation, this switch must be moved to the right, to switch off to the left.

By actuating this switch, the output relays for the compressor and the fans are controlled directly.
The device goes into continuous operation. The function of the pressostat as a safety device is maintained.
When emergency operation is switched on, the error code "F10" appears in the display.
If the controller is in standby mode, "OFF" appears in the display.

Emergency operation must be monitored, as the cold room temperature is not controlled and automatic defrosting is not in operation. The cold room temperature must be controlled manually by temporarily interrupting the power supply for the refrigeration unit.

Hook in the front cover and reattach to the refrigeration unit using the existing self-tapping screws ST 3.9 x 19 and serrated lock washers A 4.3.

Plug the mains plug back into the socket.
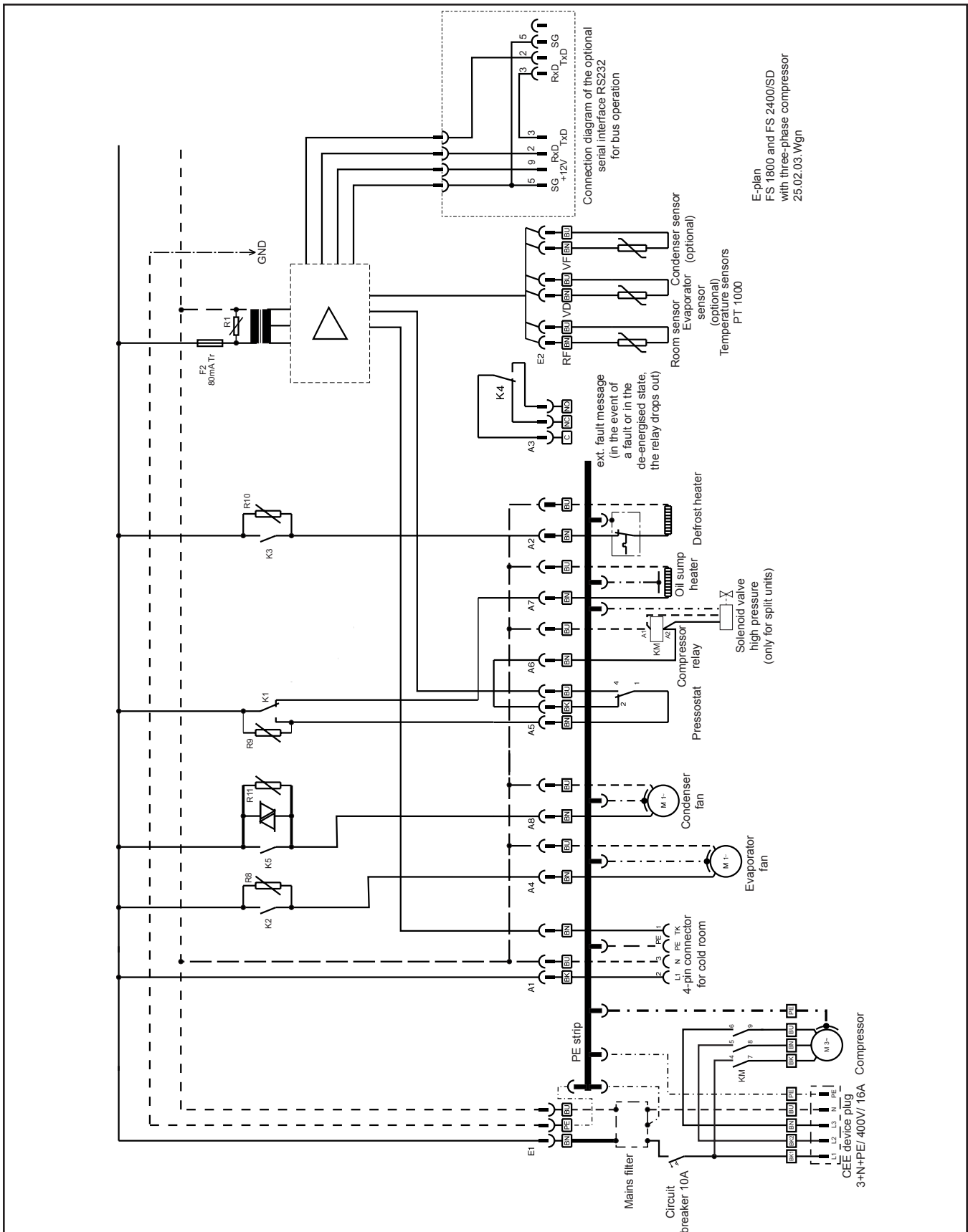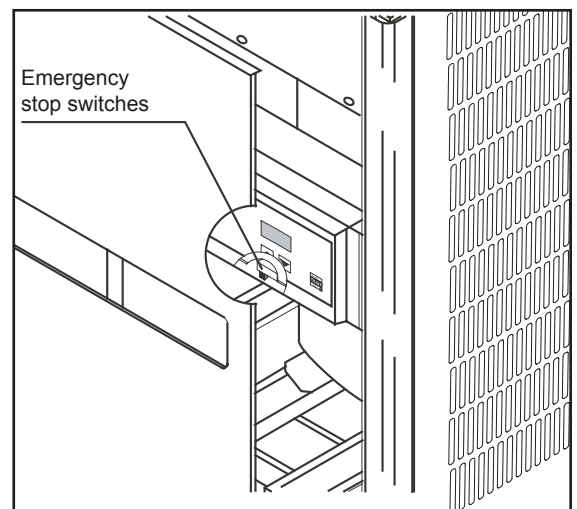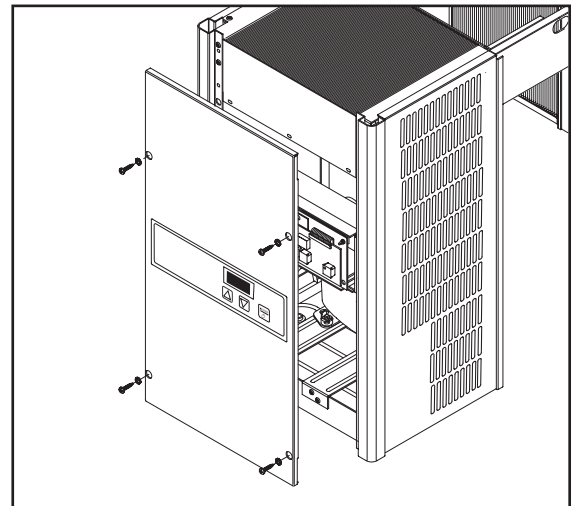

Emergency stop switches

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Fault	Cause	Troubleshooting
Refrigeration unit is not working	Mains plug not plugged in; Power supply interrupted	Check the mains plug and fuse; if no defect can be detected, contact a specialist company.
	Control defective	Actuate the emergency stop switch, see 10.2 Emergency operation. If the refrigeration unit does not run when the emergency stop switch is actuated, the fuse on the control board is defective. Replace fuse (80 mA tr. 5x20mm)
	Supply voltage too low	Supply voltage must be 230 V ± 10%, 50 Hz
Error message F01 or F02	Cold room temperature sensor defective	Replace room sensor. At a target temperature >= 4°C the device switches off. At a target temperature < 4°C the compressor runs with the last runtime and waiting times.
Error message F03	High pressure pressostat is activated	Check cooling water circuit. The message in the display remains on, it can be deleted by pressing one of the [▲] or [▼] keys.
Refrigeration unit is running constantly Error message F04		Press the [▲] or [▼] keys to display the cold room temperature again. The temperature alarm is activated when the target temperature is exceeded by the value set in P43 with a time delay. If the temperature is still too high after the time set in P42, the error message is displayed again
	Evaporator fan not running	Check whether the plug connection is connected to the evaporator fan unit
	High load on the refrigerator with stored goods. Add less stored goods or store at a higher temperature	Observe storage data and storage period of the chilled goods
	Too many or excessively warm stored goods were added	Add less stored goods at once or allow goods that are too warm to cool down before adding.
	Cooling water circuit is malfunctioning	Check cooling water circuit
Refrigeration unit is running constantly and evaporator is freezing Error message F04	Long door opening times Uncovered liquids in the cold store	Keep opening times short, cover liquids, start manual defrosting (see regulation operating manual). If necessary, reduce the defrost pause (see Control operating manual)
	Defrost switches off before the set defrost time has elapsed; the evaporator is not yet ice-free.	Increase defrost limiting temperature (P39)
	The evaporator is not yet ice-free after the set defrosting time has elapsed.	Increase defrost time (P04)
Error message F05	Door contact switch is not connected	Set parameter P29 to 0
	Cold room door is open longer - than set in P45	Close door
Error message F06	Cold room temperature too low	Press the [▲] or [▼] keys to display the cold room temperature again. The temperature alarm is activated when the target temperature is exceeded by the value set in P44 with a time delay. If the temperature is still too low after the time set in P42, the error message is displayed again
	Compressor relay defective	

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Fault	Cause	Troubleshooting
Error message F07	Cooling capacity too low	Press the [▲] or [▼] keys to display the cold room temperature again. The error message appears if, after switching on the compressor, the evaporator temperature has not reached the temperature set in P41 after the time set in P35. A new error message is suppressed for 24 hours.
Error message F08	Evaporator sensor defective	Replace evaporator sensor
		The refrigeration unit continues to run However, the evaporator temperature is no longer recorded. This may have a negative effect on defrosting.
Error message F09	Condenser sensor defective	Replace condenser sensor
		The refrigeration unit continues to run The condenser fan runs at full speed.
Error message F10	Emergency stop switch has been activated	see 10.2 Emergency operation
Error message F11	Fault EEPROM	Fault in the control system. After a power failure, parameters may have changed their entered values. Pressing one of the [▲] or [▼] keys deletes the message.
		Exchange control
Evaporator fan does not start after the set delay (P35) has elapsed.	Plug connection on the evaporator fan unit loose or not plugged in.	Plug the plug connection into the evaporator fan unit and lock it.
Water or ice drops form on the ceiling of the cold room in the discharge area of the evaporator fan.	The evaporator fan sucks in water drops adhering to the evaporator fins.	Extend the start-up delay of the evaporator fan (P35) so that remaining water drops on the evaporator freeze.
Ice sheets lie on the room floor under the inlet opening of the evaporator.	The evaporator freezes too much on the inlet side, the ice dissolves during the defrosting process and falls onto the room floor.	Reduce defrost pause (see regulation operating manual) so that ice formation is reduced.
The control cannot be operated; "Bo.L" appears in the display when a control button is pressed.	The keypad lock is switched on to protect the control unit from unauthorised operation.	Switch off keypad lock (see 8.2.5 Password and keypad lock)
The control cannot be operated; the display shows no temperature and the decimal point moves back and forth. When you press a control key, "Bo.L" appears in the display.	The keypad lock is on and the temperature display is off to protect the control from unauthorised operation.	Enable display and keypad if necessary (see 8.2.5 Password and keypad lock)

10. Favourable storage data (Non-binding reference values)

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10.1 Cold storage

Refrigerated product	Temperature in °C	Relative air humidity in %
Meat products		
Meat, fresh	-1/+1	85-90
Cooked sausage	+1/+3	80-85
Poultry, fresh	-1/+1	85-90
Game, fresh	-2/+2	70-85
Fish		
Fish, fresh off ice	0/+1	90-100
Canned fish	0/+1	75-80
Milk and dairy products		
Milk	0/+2	80-85
Butter	-1/+4	75-80
Soft cheese	0/+2	80-85
Swiss cheese	+2/+4	70
Vegetables		
Lettuce	0/+1	85-90
Cauliflower	-1/0	90
Tomatoes, ripe	0/+1	80-90
Spinach	-1	90
Cucumbers	0/+4	85
Asparagus	+1	85-90
Fruit		
Apples	-1/+3	90-95
Pears	-1/+2	85-90
Cherries	-1/+1	90
Strawberries	-1/+1	90
Bananas	+12	85

10.2 Deep-freeze storage

Refrigerated product	Temperature in °C	Relative air humidity in %
Meat products		
Frozen meat	-15/-18	85-90
Offal, frozen	-15/-18	80-85
Bacon, fresh (green)	-18/-22	85-90
Sausage	-18	90
Game	-12/-18	80-90
Poultry, no offal	-12	85-90
Fish		
Frozen, oily fish	-23/-25	90-95
Frozen, lean fish	-20	90-95
Frozen, fillets	-23/-25	80-90
Butter, long-term storage	-10/-20	80-85
Frozen vegetables	-18/-23	85
Fruit	-23/-25	80-90
Bread	-18	90
Rolls	-18/-20	80
Cut cakes	-18	85-90
Small pastries	-18	85-90
Cream gateau	-18	85-90

Values from Pohlmann,
Taschenbuch der Kältetechnik Bd. 2;
Breitenbach, Der Kälteanlagenbauer Bd. 1

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