

WRA

Wall-mounted unit for cold rooms

User's manual



Medium temperature	Low Temperature
WRA-M5-1	WRA-L8-1
WRA-M8-1	WRA-L11-1
WRA-M12-1	WRA-L15-1
WRA-M18-1	WRA-L18-1
WRA-M24-1	WRA-L29-1
WRA-M32-1	WRA-L47-1
WRA-M42-1	WRA-L54-1
WRA-M46-1	
WRA-M55-1	

For instructions on how to use the controller, see
Usermanual_Monoblock_WRA Controller



DANGER! Anyone who uses this machine is required to read these instructions for their own safety.

Contents

Conformity	3		
1. Introduction	4	6. Starting and stopping	27
1.1 Identification data	4	6.1 Procedures	27
1.2 Information about the instruction manual ..	4	7. Maintenance	28
2. Safety	5	7.1 Maintenance warnings	28
2.1 Generic safety warnings	5	7.2 Maintenance and cleaning performed by the operators	29
2.2 Personnel skills	6	7.3 Periodic maintenance	30
2.3 Residual risks	8	7.4 Corrective maintenance	30
2.4 Safety labels	9	7.5 Remove the front panel	31
2.5 Fixed guards	10	7.6 Checking or replacing condensing unit components	31
2.6 Noise	10	7.7 Checking or replacing evaporating part components	34
3. Learning about the unit for cold rooms ..	11	7.8 Check or replace components of the electrical box	36
3.1 Limits of use	11	8. Diagnostics	37
3.2 Overview	11	8.1 Installation and operation troubleshooting ..	37
3.3 Description of the unit	12	9. Appendix	40
3.4 Unit operation	14	9.1 Decommissioning	40
4. Transport and handling	15	9.2 Technical features	40
4.1 Handling warnings	15	9.3 Attachments	40
4.2 Transport and handling	15		
5. Installation	17		
5.1 Installation warnings	17		
5.2 Setting the unit in place	17		
5.3 Installation requirements	18		
5.4 Install the WRA (wall saddle)	19		
5.5 Install the WRA (with plug-in insulating panel)	21		
5.6 Install the WRA (with the pre-fitted plug-in insulating panel)	23		
5.7 Secure the door micro switch	25		
5.8 Connect the unit to the electrical mains ..	26		
5.9 Work area and operational tasks	26		

Conformity

Declaration of conformity

Conformity  

Directives List of Directives for which the product is declared to be conforming:

- 2014/68/EU (Pressure Equipment Directive)
- 2014/35/EU (Low Voltage Directive)
- EMC 2014/30/EU (Electromagnetic Compatibility Directive)
- 2006/42/EC (Machinery Directive)
- RED 2014/53/EU (Radio Equipment Directive)

Note: the original declaration of conformity accompanies the machine.

1. Introduction

1.1 Identification data

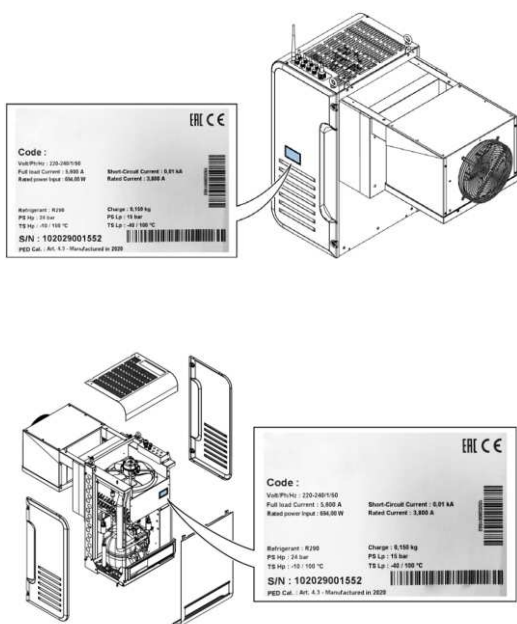
1.1.1 Distributor's contacts

TEFCOLD

e-mail: info@Tefcold.com

1.1.2 Identification

The information on the identification plates is important for requesting assistance, maintenance or spare parts.



1.2 Information about the instruction manual

1.2.1 Objectives of the instruction manual

These instructions guide the personnel in charge of installing, using and servicing the unit safely.

1.2.2 Obligations with respect to this instruction manual

NOTICE: This instruction manual is an integral part of the unit and must be kept for its entire life cycle.

It must be stored in a clean place and kept in good condition to be accessible to the operators. If the manual is lost or damaged, contact TEFCOLD A/S.

If the unit is transferred, always attach the instruction manual.

1.2.3 Safety messages

Below are the warnings related to user safety and damage to the machine provided in this document:



DANGER!

Indicates a hazardous situation which, if not avoided, will result in death or serious injury.



WARNING

Indicates a hazardous situation which, if not avoided, can result in death or serious injury.



CAUTION

Indicates a hazardous situation which, if not avoided, can result in minor injury.

NOTICE

Indicates obligations which, if not complied with, can damage the device.

1.2.4 Other messages

Note: *neutral and positive information that emphasizes or adds information to the main text. It provides information that can only be applied in special cases.*

1.2.5 Figures and illustrations

The figures and illustrations in this instruction manual are only used for reference and may differ in detail and proportions from the actual product.

2. Safety

This section includes the following topics:

2.1	Generic safety warnings	5
2.2	Personnel skills	6
2.3	Residual risks	7
2.4	Safety labels	8
2.5	Fixed guards	9
2.6	Noise	9

2.1 Generic safety warnings**2.1.1 Foreword**

The unit is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities or lacking experience and knowledge, unless they are supervised or instructed in the use of the unit by a person responsible for their safety.

Keep children away from the unit.

2.1.2 Obligations for the employer

The employer must select, train and appoint authorised personnel to carry out their duties.

It is the employer's responsibility to instruct the personnel in charge and to enforce the safety regulations for every specific task. The employer must also define the operating procedures and ensure that they comply with the instruction manual provided by the manufacturer. See "Personnel skills" on the next page for more information.

2.1.3 Obligations for the recipients of the instruction manual

NOTICE: *anyone who uses this unit is obliged to read this instruction manual for their own safety.*

2.1.4 Recipients of this instruction manual

This instruction manual is intended for personnel authorised by the employer to install, use and service the unit.

2.1.5 Clothing



Do not wear loose clothing, ties, chains and watches that can get caught in the moving parts.

2.1.6 Personal protective equipment



During lifting and transport



During installation and commissioning



During use



During maintenance or dismantling



2.2 Personnel skills

2.2.1 Foreword

Every section of this instruction manual is preceded by the skills that the personnel in question must have. Not having these skills can:

- endanger the safety of personnel
- invalidate the warranty

Note: the operator's tasks are defined by the complexity of the operations and their level of experience and skill. Operators must collaborate with the technicians to receive operating instructions or to request adjustment operations.

2.2.2 List of skills

Symbol	Operations allowed	Skills
 COMPANY Manufacturer's personnel	All operations	Technical personnel employed or authorized by the manufacturer.
 Mechanical maintenance engineer	• Installation and decommissioning • Maintenance excluding works on the electrical system • Solving problems that cause blockages	Has extensive technical knowledge in the mechanical and pneumatic fields. Understands the technical drawings and the refrigerating diagram.
 Electrical maintenance engineer	• Electrical connections during installation and decommissioning • Solving problems that cause faults in the electrical system	Has extensive technical knowledge in the electrical field. Understands the wiring diagrams and works inside live electrical boxes, junction boxes and control equipment. Understands the refrigerating diagram.
 Operator	• Operate using the controls • Clean the packaged unit • Adjust the equipment after receiving the relevant instructions • Change certain parameters but only after receiving the relevant instructions	Has generic technical knowledge and experience in managing the unit.
 Driver	• Lifting and handling	Authorised to use means to lift and handle materials and equipment according to local regulation.

2.3 Residual risks

2.3.1 Definition

A danger zone is any area inside or outside the unit where a person is exposed to the risk of serious or minor injuries.

Every procedure described in this instruction manual indicates the possible risks. Always follow the instructions in the instruction manual to avoid damage or injury.

- Follow the warnings given in this instruction manual concerning installation.
- Follow the instructions for adjustment, cleaning and maintenance given in this instruction manual

2.3.2 Foreword

The unit has been designed and built to function, be adjusted and subjected to maintenance without these operations exposing the personnel in charge to risks if carried out according to the instructions given in this manual. The adopted measures minimize the risk of accidents throughout the life cycle of the unit, both in the context of the intended use and of reasonably foreseeable misuse.

2.3.3 Mechanical residual risks

Risk	When it occurs	How to avoid it
Bruising and superficial abrasion	During installation, cleaning, maintenance and dismantling.	Wear the personal protective equipment.
Crushing	During transportation, lifting, installation and dismantling.	• Always use lifting equipment and accessories of adequate capacity for the load to be lifted. • Prevent unauthorised people from accessing the area near the packaged unit. • Follow the warnings given in this instruction manual concerning lifting. • Check that the wall where the packaged unit is installed is suitable for supporting the packaged unit.
Falling from above	During installation, maintenance at a height and dismantling.	Always use adequate means and accessories.
Impact	During installation, cleaning and maintenance.	Wear the personal protective equipment.
High pressure fluid ejection	During maintenance and	Maintenance on pressurised circuits must only be performed by the mechanical main

2.3.4 Electrical residual risks

Risk	When it occurs	How to avoid it
Electrocution	During installation, connection, maintenance and dismantling.	- The electrical connection and disconnection must only be carried out by the electrical maintenance engineer. - Wear the personal protective equipment.

2.3.5 Thermal residual risks

Risk	When it occurs	How to avoid it
Low temperatures	During maintenance in the cold room.	- Wear the personal protective equipment. - Follow the instructions for adjustment, cleaning and maintenance given in this instruction manual. - Take work breaks to prevent long exposure to excessively low temperatures.
Burns	During and immediately after use.	Wear the personal protective equipment.

2.3.6 Chemical residual risks

Risk	When it occurs	How to avoid it
Explosion and fire	During transport and handling, installation, cleaning and maintenance.	Follow the regulations in force and the warnings on adjustments and maintenance given in this instruction manual.

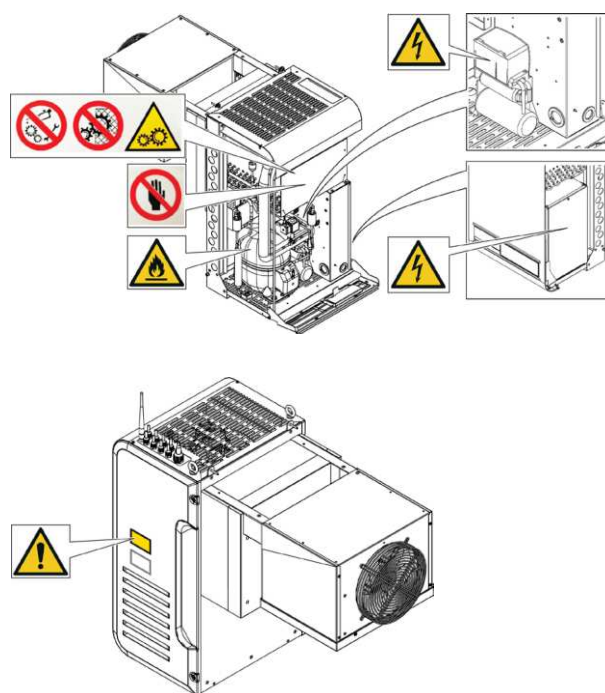
Burns	During transport and handling, installation, cleaning and maintenance.	Follow the regulations in force and the warnings on adjustments and maintenance given in this instruction manual.
-------	--	---

2.4 Safety labels

DO NOT apply other labels or notes that can hide the indications affixed by the manufacturer or make them partially illegible.

2.4.2 Position of the safety stickers

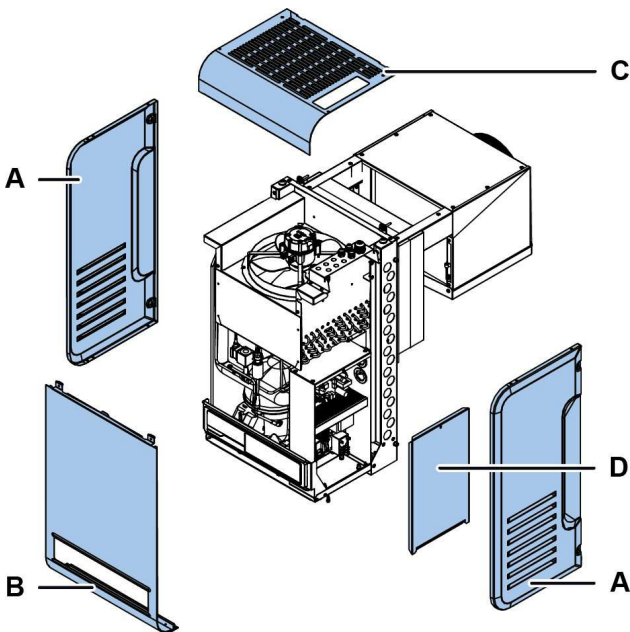
The position of the stickers is as follows:



Symbol	Description
	Do not repair moving parts
	Do not remove safety devices
	Do not clean the condenser by hand
	Moving parts
	Flammable gas
	Electrocution
	Disconnect the power supply before performing maintenance

2.5 Fixed guards

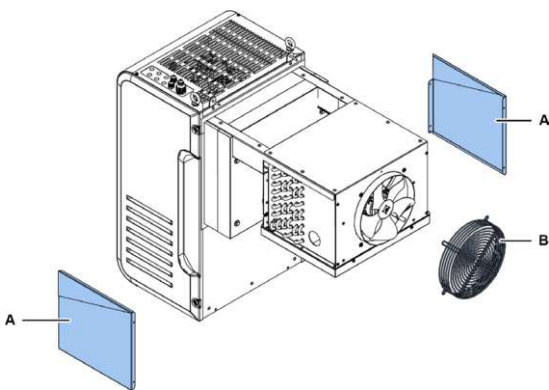
2.5.1 Condensing unit



Part	Description
A	Side panel
B	Front panel
C	Top panel
D	Electrical box panel

2.5.2 Evaporating part

The fixed guards of the evaporating part consist of the side panels **[A]** and the grid **[B]**.



Part	Description
A	Side panel
B	Grid

2.6 Noise

2.6.1 Sound pressure level

The sound pressure measured while the unit is running is less than 70 dB(A) LEX and/or 135 dB(C) Lpeak.

3. Learning about the unit for cold rooms

3.1 Limits of use

3.1.1 Intended use

WRA R290 is an indoor wall-mounted unit for cold room refrigeration.

3.1.2 Unintended use

This unit has been designed for all the uses declared in "Intended use" above.

With this unit it is NOT possible to:

- Install the unit on a sloping or horizontal wall
- Install the unit on a wall with different structural characteristics than those intended
- Install the unit on a ceiling or floor
- Install the unit in a cold room with different characteristics from those intended
- Use a different refrigerant gas than that intended
- Use the unit without protection
- Apply labels or notes that can hide the indications provided with the unit or make them partially illegible
- Tamper with the electrical equipment and/or safety devices
- Set the unit with different values than those indicated by the manufacturer
- Climb on or cling to the unit

3.1.3 Work environment

The unit CANNOT be used in the following conditions:

- Environments with a potentially explosive atmosphere (ATEX)
- Environments with vapours deriving from chemical processes
- Environments with the presence of radiation (ionizing and non)
- Environments with temperatures other than the range from +41 °F a +110 °F
- Environments subject to potential fire hazards (see the local standards and regulations applied at national level)
- Environments with poor ventilation
- Outdoors (installation), exposed to the atmospheric agents

3.2 Overview

3.2.1 Unit configurations

The unit is available in different configurations. The variants are:

- refrigeration temperature range:
 - NT (normal temperature): $-5\text{ °C} \leq T_{\text{cold room}} \leq +15\text{ °C}$
 - LT (low temperature): $-25\text{ °C} \leq T_{\text{cold room}} \leq -5\text{ °C}$

3.2.2 Circuits of the unit

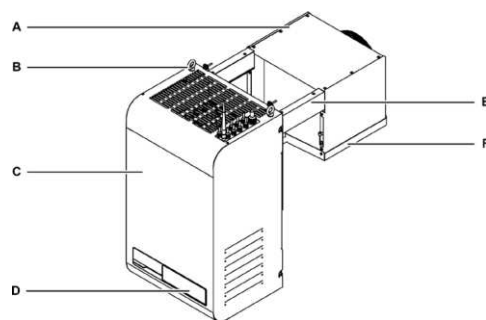
Depending on the model, the unit can be single-circuit or dual-circuit. The circuits are totally independent of each other. Every circuit is a compact and hermetically sealed system in accordance with the definitions set forth in UNI EN 378-1. The amount of refrigerant for every circuit is $\leq 150\text{ g}$ to allow installation to take place anywhere without restrictions, as required by the reference standard.

Note: TEFCOLD A/S cannot be held liable for any restrictions due to national or regional regulations or laws.

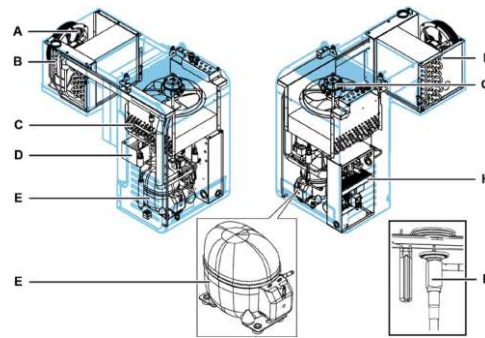
3.3 Description of the unit

3.3.1 WRA components for saddle installation

Part	Description
A	Evaporating part
B	Eyebolts
C	Condensing unit part
D	Control panel
E	Brackets
F	Evaporator tray

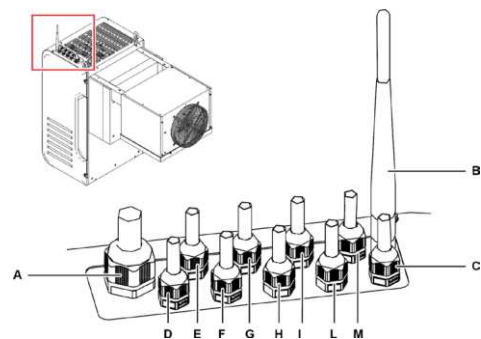


3.3.2 Internal Components



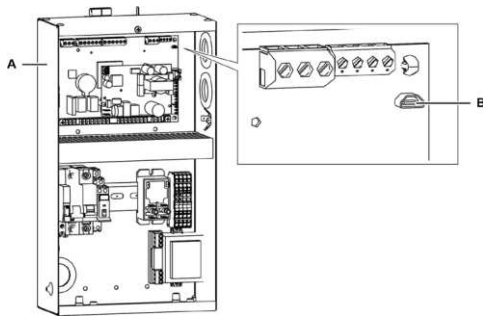
Part	Description
A	Ventilation unit of the evaporating part
B	Thermostatic valve
C	Condenser
D	Condensate drain tray
E	Compressor
F	Evaporator
G	Condensing unit ventilation unit
H	Electrical box

3.3.3 Connections



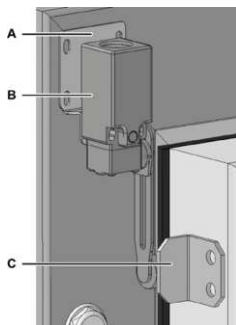
Part	Description
A	Power supply
B	IoT Wi-Fi gateway antenna
C	BMS (Building Management System)
D	Cold room light
E	Alarm
F	Door heater (only for low temperature)
G	Free position
H	IoT 2G gateway antenna
I	Master & slave
L	Remote control panel
M	Door micro switch

3.3.4 USB port connection (if present)



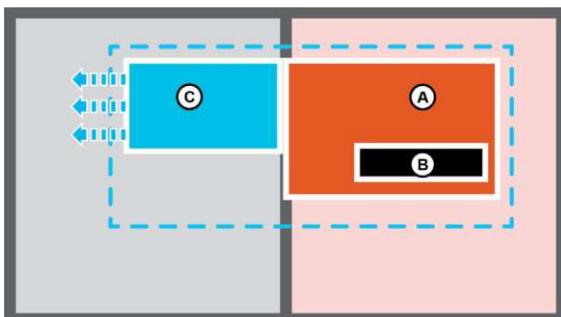
Part	Description
A	Electrical box
B	USB micro port

3.3.5 Door micro switch components



Part	Description
A	Fixing plate
B	Door micro switch
C	Retainer

3.4.1 General operation



The unit is a refrigeration unit consisting of a condensing unit part **[A]** and a controller **[B]** outside the cold room and an evaporating part **[C]** placed inside. The controller manages the refrigeration and defrosting cycles.

3.4 Unit operation

The refrigeration cycle is the compression type, and the refrigerant gas is condensed and evaporated cyclically.

Defrosting is of the hot gas type and takes place automatically with a cyclic frequency that can be modified by the user or fully automatically via the Smart Defrost function already active in the standard configuration.

3.4.2 MY I.D. app operation (only units with Bluetooth)

Within the App you can access the following sections:

- **News:** to know the news and events of the Tefcold world.
- **Select:** to know all the Tefcold products.
- **Documents:** to download the sales and technical documentation relating to Tefcold products.
- **My Vision:** to have access to the cloud through which it is possible to monitor and control the operation of every unit. The IOT service must be purchased to have access to this area
- **Smart Control:** to control and command the unit using the mobile device connected via Bluetooth, instead of the interface on the machine.
- **Contacts:** to know and find the closest Tefcold sales contact person.

Note: For further information, please refer to the controller manual.

4. Transport and handling

This section includes the following topics:

- 4.1 Handling warnings _____ 13
- 4.2 Transport and handling _____ 13

4.1 Handling warnings

4.1.1 Required skills



4.1.2 Safety



DANGER!

Explosion/Burns. Presence of flammable gas. During transport and handling, adopt all the precautions required by the legislation in



WARNING

Crushing. Always use lifting equipment and accessories of adequate capacity for the load to be lifted. Use the personal protective equipment. Follow the warnings given in this instruction manual

NOTICE

There is oil in the machine. Always handle in an upright position.

4.1.3 Choosing lifting equipment and accessories

The following generic indications apply to load lifting operations and also concern the use of lifting accessories not supplied with the unit.

Choose lifting equipment and accessories according to the dimensions, weight and shape of the load to be lifted.

4.1.4 Preliminary checks

- Check that the lifting accessories are intact.
- Check that there are no people or objects in the maneuvering area.
- Check the stability and correct balancing of the load by slowly lifting it slightly.

4.1.5 Generic warnings

- Due to the presence of oil in the compressor, move the unit **ONLY** in the upright position. **NEVER** turn the unit upside down.
- Choose the harnessing points so that the load is balanced correctly, considering its centre of gravity.

Note: the centre of gravity is indicated on the unit packaging.

4.2 Transport and handling

4.2.1 Transport conditions

The unit is secured and packed in such a way as to prevent movement, impact and damage during transport.

4.2.2 Packaging content

The unit is placed in a single package, complete with all electrical connections. The contents of the packaging are as follows:

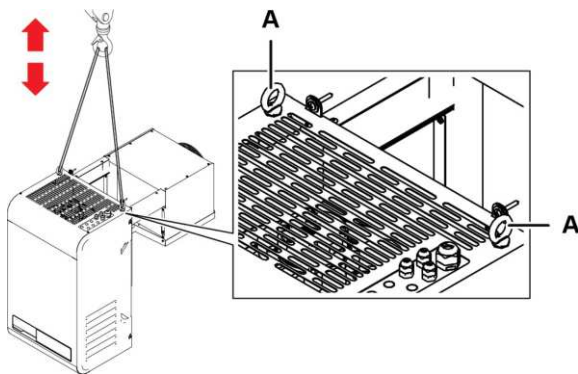
- unit
- door micro switch with retainer
- fastening kit
- cold room light

4.2.3 Storage

The wrapped unit must be stored indoors or covered to avoid exposure to atmospheric agents.

4.2.4 Lifting the unit

The centre of gravity is indicated on the unit packaging. Use the lifting eyebolts [A] on the frame.



5. Installation

5.1 Installation warnings

5.1.1 Foreword

Always refer to the instructions given in this instruction manual. In case of need, please contact the Tefcold technical support.

For operations from control panel, a complete list of electronic control commands and functions, please refer to the controller manual.

5.1.2 Required skills



COMPANY

5.1.3 Safety



DANGER!

Explosion/Burns. Presence of flammable gas. The place of installation must have good air circulation and must be far from heat sources, such as naked flames or hot surfaces and from electrical components or flammable materials. During installation, adopt all the precautions required by legislation in force.

Crushing. Always use lifting equipment and accessories of adequate capacity for the load to be lifted and follow the lifting warnings given in this instruction manual.

Falling from above. Always use adequate means and accessories. Provide safe access to the installation area. Follow the warnings given in this instruction manual.

5.2 Setting the unit in place

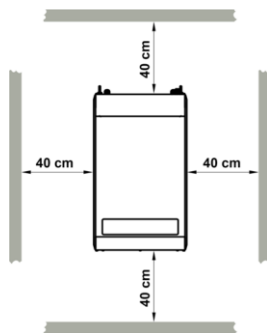
5.2.1 Characteristics of the placement area

The placement area must have the following characteristics:

- The place of installation must have good air circulation and must be far from heat sources (e.g. naked flames or hot surfaces) and from electrical components or flammable materials.
- the wall must be vertical with an adequate surface to support the weight of the unit, even, well levelled and free from vibrations.
- The walls of the coldrooms must not be thicker than 200 mm.
- The place of installation must have a temperature indicated in "Technical features" on page 39.

5.2.2 Minimum distances of the placement area

The unit must be positioned in a placement area with minimum distances to allow proper air circulation and facilitate maintenance.



5.2.3 Removing the packaging

Remove all packaging and fastening elements used during transport.

5.2.4 Inspections and checks on the unit

Visually inspect the unit to look for any damage caused during transport that could compromise normal operation. Transport damage must be attributed to the carrier and immediately reported to TEFCOLD A/S.

5.3 Installation requirements

5.3.1 Stability requirements

Check that the wall where the unit is to be installed is suitable for supporting it.

5.3.2 Requirements for the connection to the electrical mains

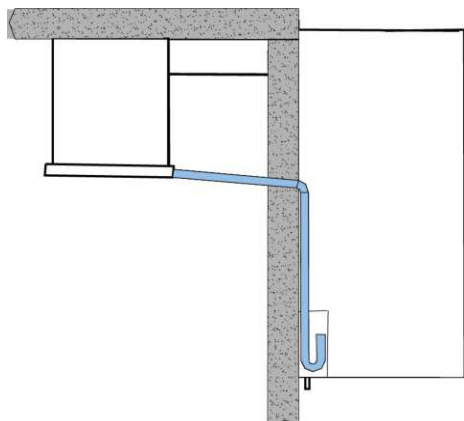
The unit is supplied with a power lead and plug.

Comply with the following requirements:

- The voltage and frequency supplied must correspond to those indicated on the identification plate
- Insert a differential circuit breaker (RCD) between the power line and the unit, adequately sized for the application and the laws in force in the country of installation. The switch must be near the unit.

5.4 Install the Wall saddle

5.4.1 Result of the installation

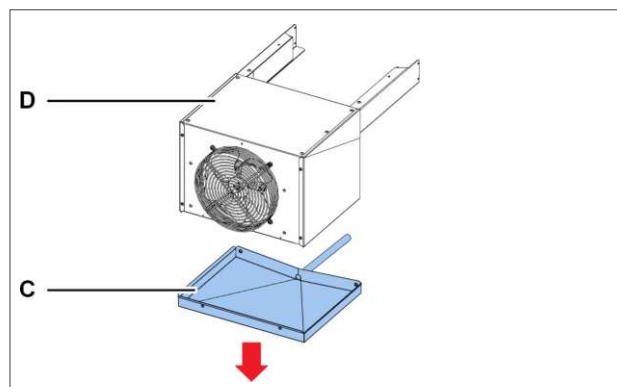
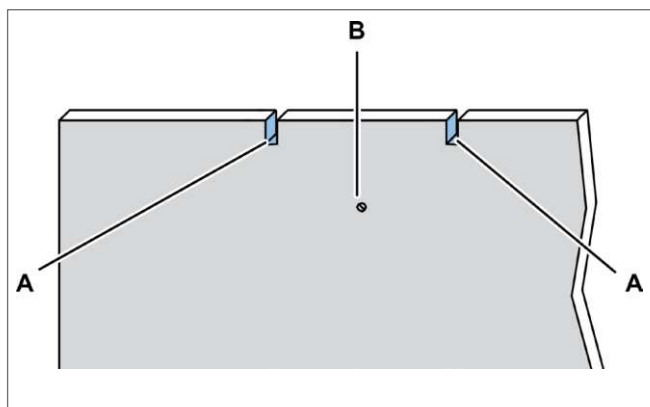


5.4.2 Dimensions of the grooves to be made in the wall

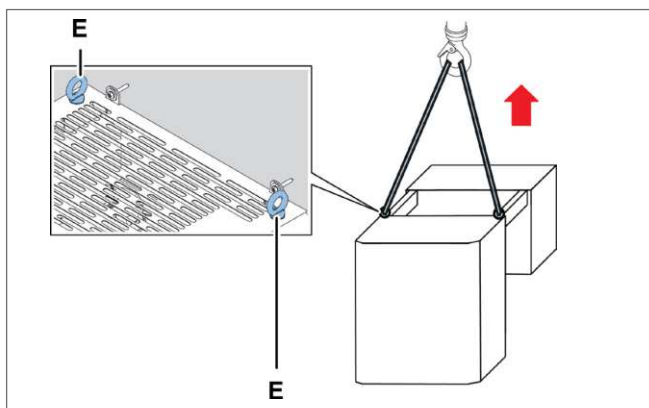
Depending on the dimensions of the unit, make two grooves on the upper end of the cold room wall. Use the packing template to proceed more quickly (measurements in mm).

M5/M8/M12/L8/L11	M18/M24/M32/L15/L18/L29	M42/M46/M55/L47/L54

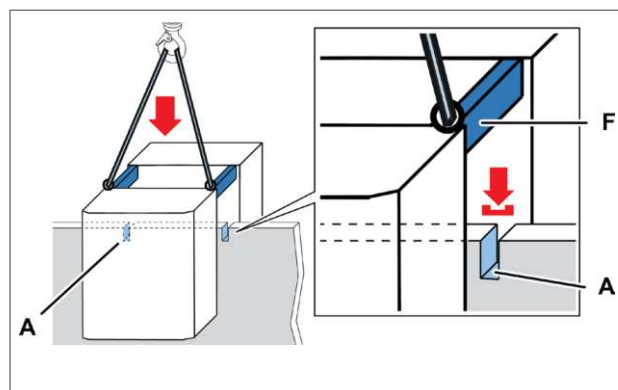
5.4.3 Procedure



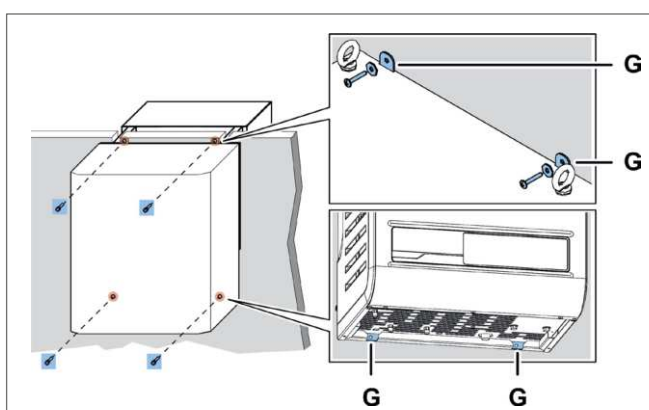
1. Make the grooves **[A]** and a hole **[B]** in the wall to drain water, using the packaging template.
2. Undo the screws of the tray **[C]** and remove it from the evaporating part **[D]**.



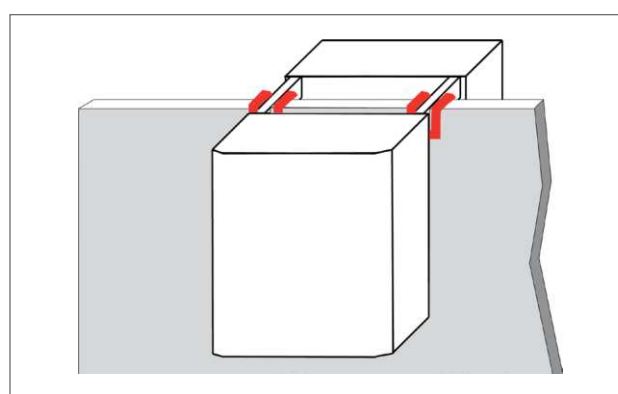
3. Lift the unit using the eyebolts **[E]**.



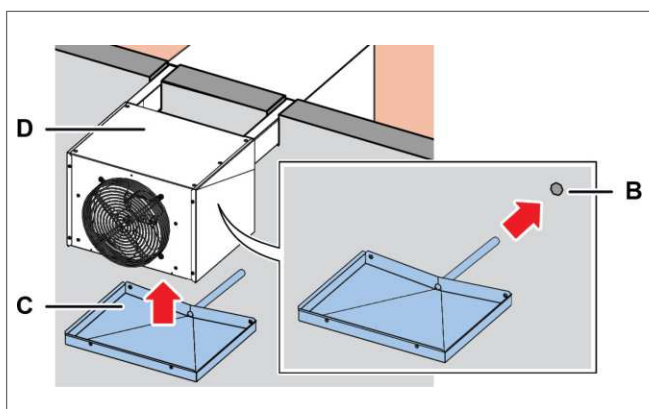
4. Set the unit in place, inserting the brackets **[F]** into the grooves **[A]** of the wall.



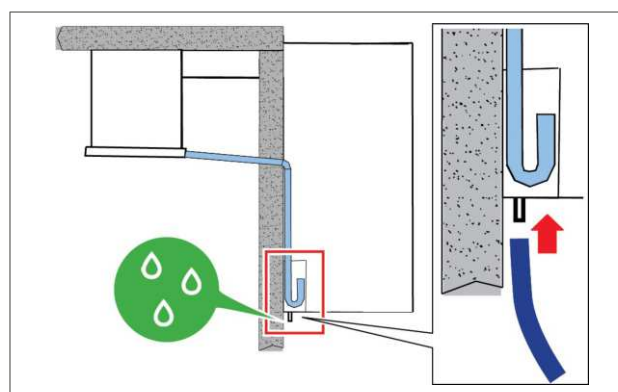
5. Secure the unit to the wall by inserting the screws in the holes **[G]**.



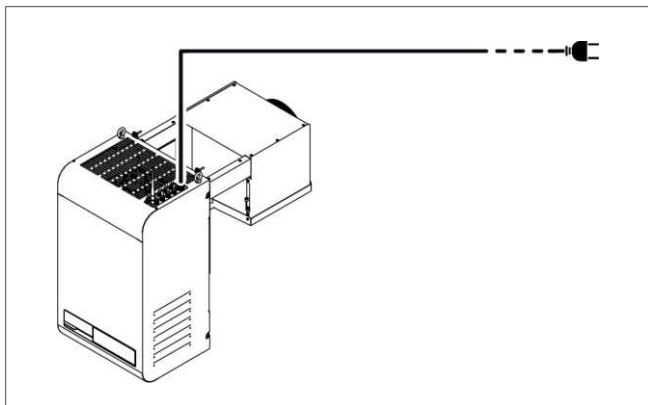
6. Seal the grooves in contact with the unit and the brackets with silicone.



7. Secure the tray **[C]** to the evaporating part **[D]** by inserting the tube in the hole **[B]** of the wall.



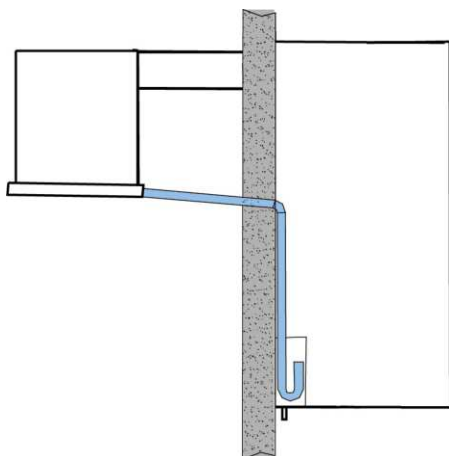
8. Connect the 5/8" (15.9 mm) diameter condensate drain overflow pipe.
9. Wire the cold room light by connecting it to the unit with the already prepared cable.
10. Install the door micro switch (see "Secure the door micro switch" on page 22).



11. Connect electricity and turn on (see "Starting and stopping" on page 25).

5.5 Install the WRA (with plug-in insulating panel)

5.5.1 Result of the installation

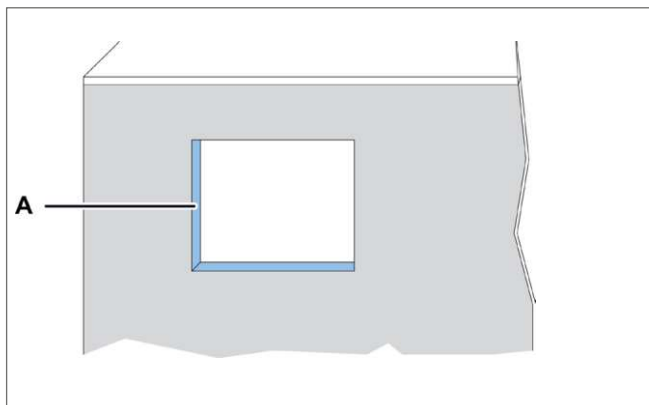


5.5.2 Dimensions of the window to be made in the wall

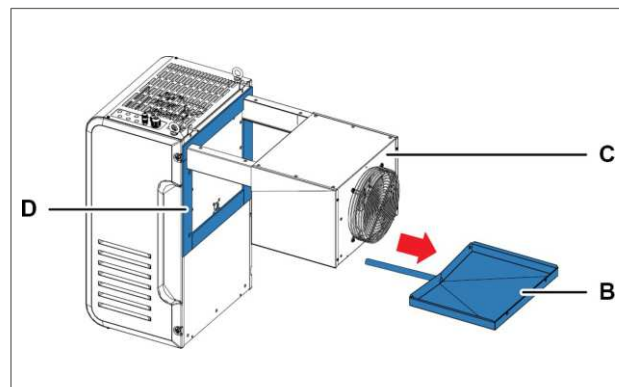
Depending on the size of the unit, cut a window in the cold room wall with the following dimensions (in mm). Use the packaging template to proceed more quickly.

25 Codes	30 Codes	35 Codes
Diagram showing the dimensions for the 25 Codes unit. The window opening is 385 mm wide and 345 mm high. The unit is shown in red, fitting into the opening.	Diagram showing the dimensions for the 30 Codes unit. The window opening is 635 mm wide and 345 mm high. The unit is shown in red, fitting into the opening.	Diagram showing the dimensions for the 35 Codes unit. The window opening is 675 mm wide and 525 mm high. The unit is shown in red, fitting into the opening.

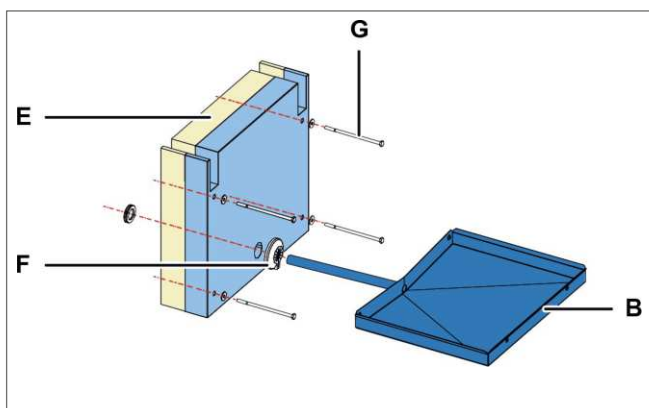
5.5.3 Procedure



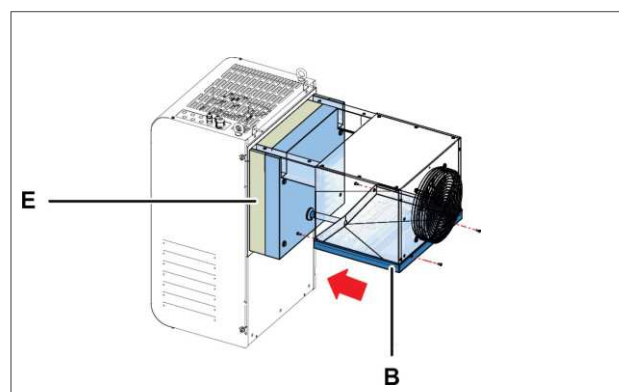
1. On the wall of the cold room, make a window **[A]** using the template in the packaging.



2. Unscrew the tray screws **[B]** and remove it from the evaporating part **[C]**, paying attention to the drain heater.
3. Apply the gaskets **[D]** supplied with the plug-in insulating panel kit.

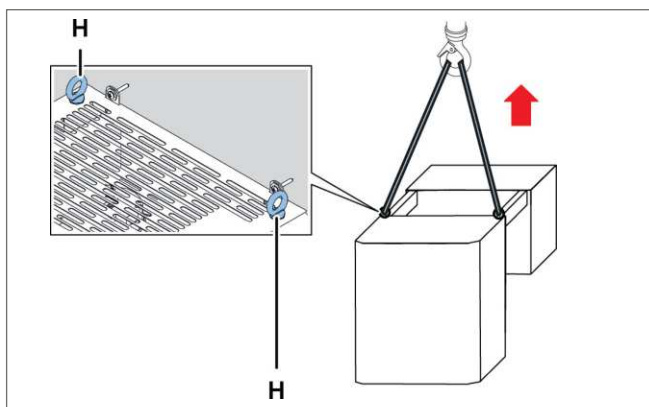


4. Place the plug-in insulating panel **[E]** between the brackets of the unit.
5. Insert the tube of the tray **[B]** with the gasket **[F]** together with the screws **[G]** into the plug-in insulating panel.

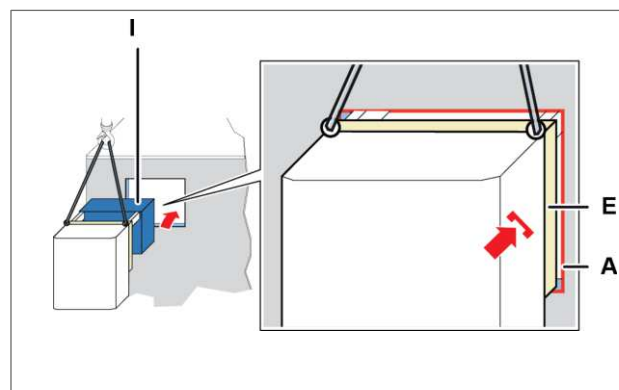


6. Secure the plug-in insulating panel **[E]** and the tray **[B]** to the unit.

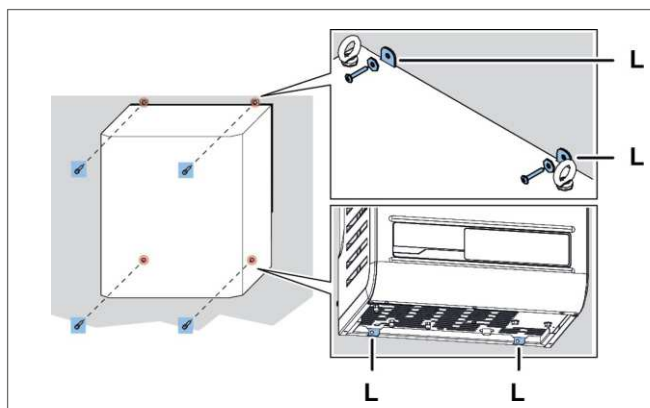
NOTICE : pay attention to the correct positioning of the drain heater.



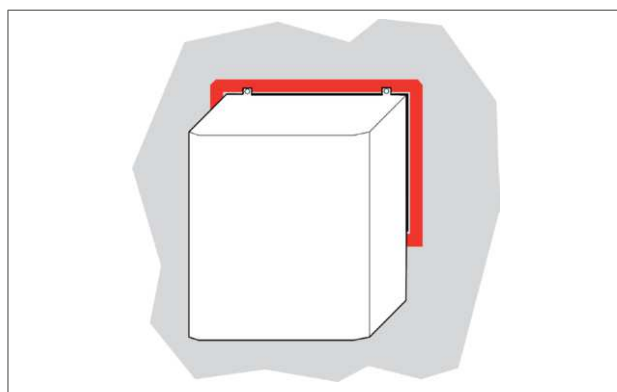
7. Lift the packaged unit using the eyebolts



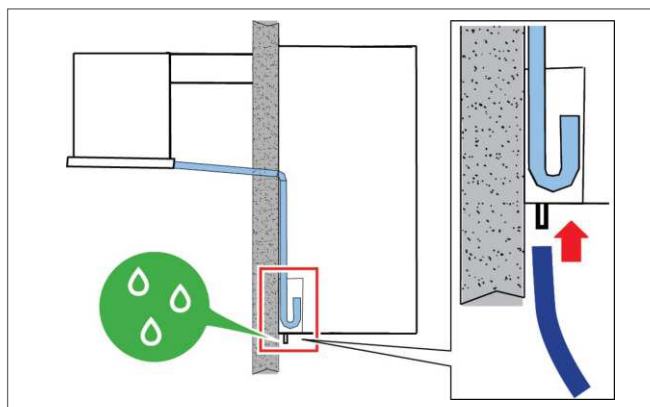
8. Insert the evaporating part **[I]** and recess the plug-in insulating panel **[E]** in the window **[A]** of the wall.



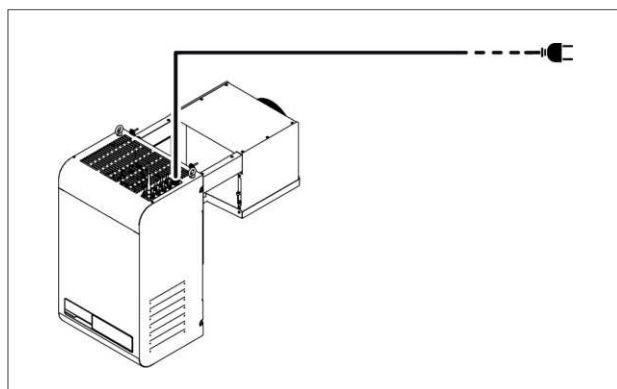
9. Secure the unit to the wall by inserting the screws in the holes [L].



10. Seal the parts of the unit in contact with the edges of the window with silicone.



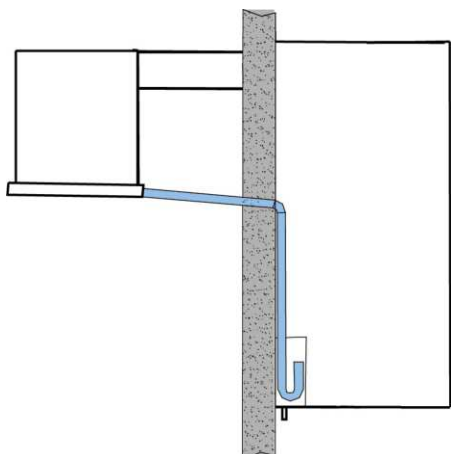
11. Connect the overflow tube to drain the condensate.
 12. Wire the cold room light by connecting it to the unit with the already prepared cable.
 13. Install the door micro switch (see "Secure the door micro switch" on page 22).



14. Connect electricity and turn on (see "Starting and stopping" on page 25).

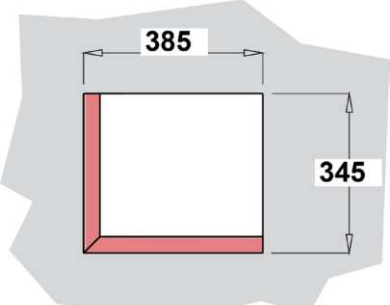
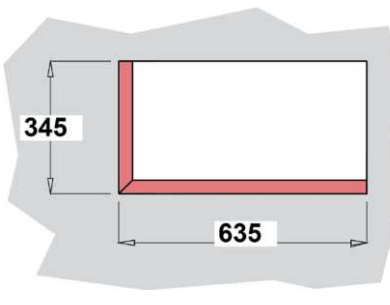
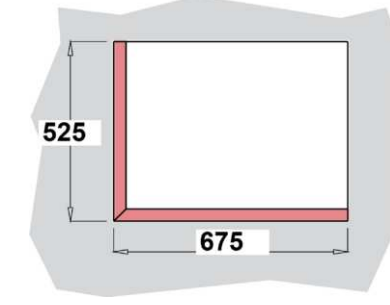
5.6 Install the WRA (with the pre-fitted plug-in insulating panel)

5.6.1 Result

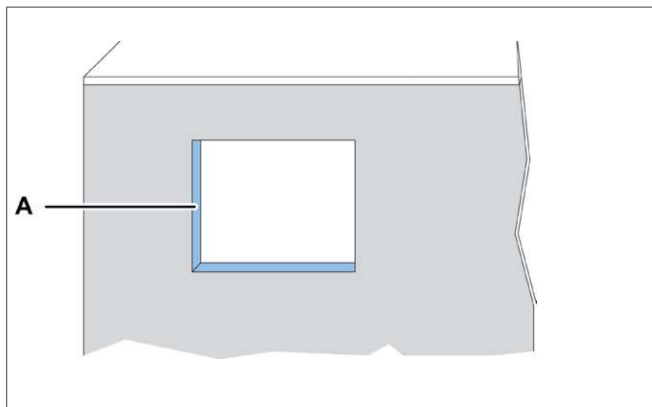


5.6.2 Dimensions of the window to be made in the wall

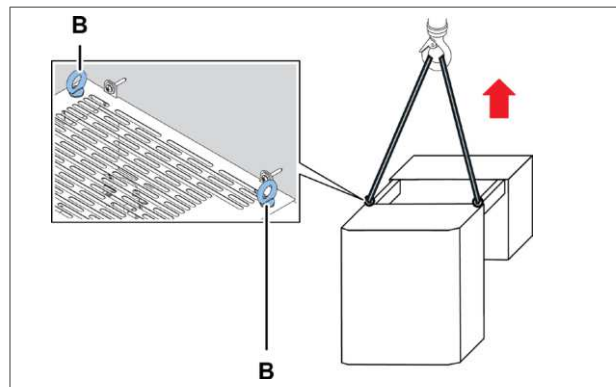
For this type of installation, depending on the dimensions of the unit, a window with the following dimensions in millimeters (mm) must be made in the cold room wall chosen for installation:

25 Codes	30 Codes	35 Codes
		

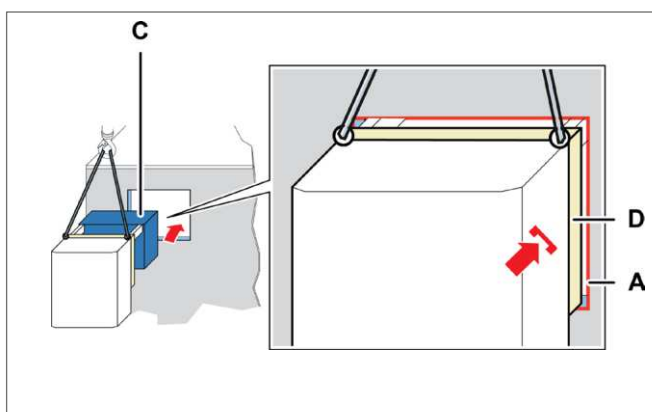
5.6.3 Procedure



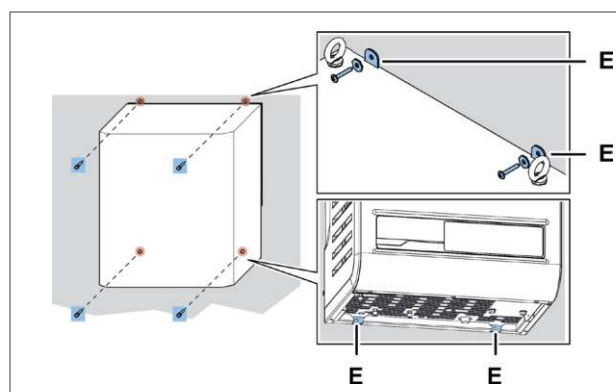
1. On the wall of the cold room, make a window **[A]** using the template in the packaging.



2. Lift the unit using the eyebolts **[B]**.



3. Insert the evaporating part **[C]** and recess the plug-in insulating panel **[D]** in the window **[A]** of the wall.



4. Secure the unit with the screws **[E]**.

5.7 Secure the door micro switch

5.7.1 Safety

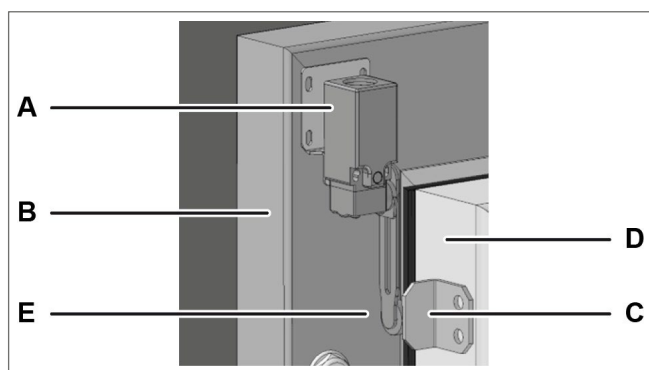
CAUTION

The installation of electrical components inside the cold room is the sole responsibility of the end user. Only use suitable materials for the types of risks, in compliance with the laws in force.

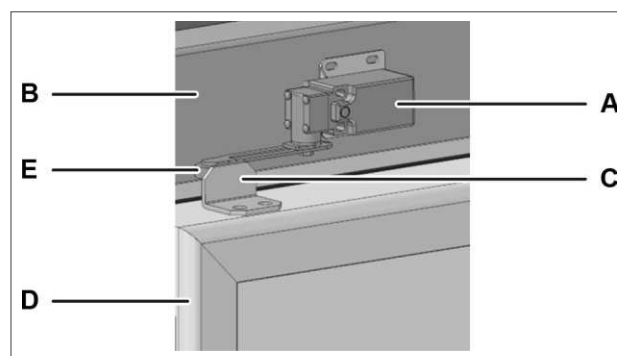
NOTICE

To avoid signal interference, the door micro switch cable must be routed away from power cables.

5.7.2 Procedure with hinged door



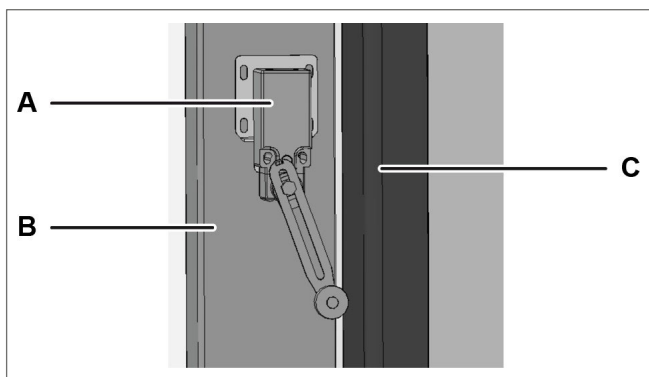
Vertical installation



Horizontal installation

1. Secure the door micro switch **[A]** on the cold room **[B]** in a horizontal or vertical position, as required.
2. Fasten the latch **[C]** on the door **[D]** at the wheel **[E]**.
3. To check that the door micro switch trips, close the cold room door: the door micro switch should trip when the door is fully closed.

5.7.3 Procedure with sliding door



Vertical installation

1. Fasten the door micro switch **[A]** on the cold room **[B]**.
2. To check that door micro switch trips, close the door **[C]** of the cold room: the door micro switch should trip when the door is fully closed.

5.8 Connect the unit to the electrical mains

5.8.1 Safety



DANGER!

Electrocution. Always use adequate equipment and accessories and follow the connection warnings given in this instruction manual.

5.8.2 Connect the unit

1. See "Requirements for the connection to the electrical mains" on page 15.
2. Once connected, the display lights up.
3. Switch on the unit (see "Starting and stopping" on page 25).

NOTICE: Only start the machine when the ambient temperature is below 32°C. For water-cooled versions, the temperature must be below 37°C.

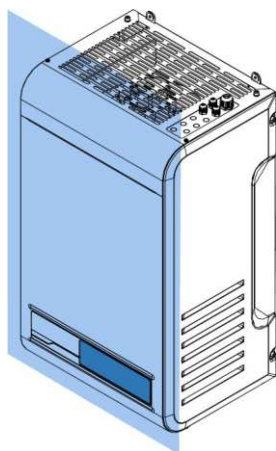
5.9 Work area and operational tasks

5.9.1 Required skills



5.9.2 Work area

The work area for the operator is in front of the control panel.



5.9.3 Operating tasks

The operator sets the unit and checks that it functions correctly. The operator periodically cleans the unit.

6. Starting and stopping

6.1 Procedures

6.1.1 Turn the unit on

To start the unit, press and hold the button  for 3 seconds: the display shows the value of the control probe (cold room temperature).

NOTICE : *The ambient temperature must be below 32°C to be able to carry out the first start-up.*

6.1.2 Switch off the unit

To stop the unit, press and hold the  button for 3 seconds: OFF appears on the display.

6.1.3 What to do next

For a complete list of electronic control commands and functions, please refer to the controller manual.

7. Maintenance

7.1 Maintenance warnings

7.1.1 Required skills



7.1.2 Safety



DANGER!

Explosion/Burns. Presence of flammable gas. During maintenance, adopt all the precautions required by legislation in force and the warnings for adjustments and maintenance indicated in this instruction manual.



CAUTION!

Low temperatures. During maintenance and cleaning in the cold room, take breaks to avoid long exposure to low temperatures.

- Only perform the maintenance described in this instruction manual and observe the indicated maintenance frequency.
- Before carrying out any type of operation, it is necessary to check for propane leaks (R290) with a special gas detector.
- The machines have a factory-sealed refrigerant circuit. At the end of any type of operation that involves the removal/replacement of the gas, it is necessary to seal the circuit hermetically, restoring the factory conditions.
- Failure to reposition the guards at the end of maintenance can cause serious damage. Always refit the guards at the end of maintenance.
- At the end of maintenance, check that there are no tools or components left inside the unit.
- Do not release the products used during maintenance into the environment. Follow the regulations in force regarding the disposal of dangerous and/or polluting fluids.

7.1.3 Isolation from energy sources

Before performing maintenance, disconnect the power plug.

7.1.4 Maintenance on equipment components

Perform maintenance by following the instructions, frequencies and all indications in the manuals and in the attached documentation. If necessary, contact TEFCOLD A/S assistance.

7.2 Maintenance and cleaning performed by the operators

7.2.1 Required skills



7.2.2 Safety



DANGER! Explosion/Burns. Presence of flammable gas. During maintenance, adopt all the precautions required by legislation in force and the warnings for adjustments and maintenance indicated in this instruction manual.

CAUTION! Low temperatures. During maintenance and cleaning in the cold room, take breaks to avoid long exposure to low temperatures.

Only perform the maintenance and cleaning described in this instruction manual and observe the indicated maintenance frequency.

7.2.3 Daily operations

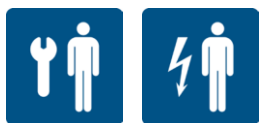
Task	Component	Procedure	Time indicative [min]
Check	Unit	Check that the unit is in good condition.	5
Cleaning	Evaporating part and condensing unit	Clean as needed.	30

7.2.4 Weekly operations

Task	Component	Procedure	Time indicative [min]
Defrosting	Evaporator	If there is ice on the evaporating part: 1. Perform manual defrosting (see controller manual). 2. Repeat the procedure until completely defrosted. 3. Check again after 12 hours	-

7.3 Periodic maintenance

7.3.1 Required skills



7.3.2 Monthly operations

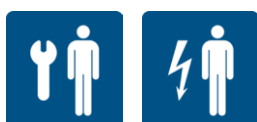
Task	Component	Procedure	Time indicative [min]
Check	Metalwork	- Check that all metal surfaces are in good condition. - Check that the screws are tightened correctly.	10
	Electrical cables	Check that the electrical cables are intact. If any cuts or cracks are found, immediately replace the power cable with a new one.	15
	Refrigeration circuit	Check that the refrigeration circuit is in good condition and that there are NO refrigerant gas leaks. Usually, the presence of lubricating oil indicates leaking refrigerant from the circuit. If in doubt, before carrying out any operation, contact TEFCOLD A/S.	30
Cleaning	Evaporator	Clean in the following cases:	15
	Condenser (air-cooled version only)	- as needed - if dust or grease is noted	

7.3.3 Operations every four months

Task	Component	Procedure
Checks, replacements	Electrical box	Check the contactors and replace them if they show signs of deterioration.
	Compressor	Check the noise (see "Check the compressor noise" on page 30)
Checks	Hydraulic circuit (water-cooled version only)	- Check that there are no leaks in the circuit. - Check the integrity of the insulation.
Cleaning	Electrical box	Clean the fixed and mobile contacts of all the contactors.

7.4 Corrective maintenance

7.4.1 Required skills

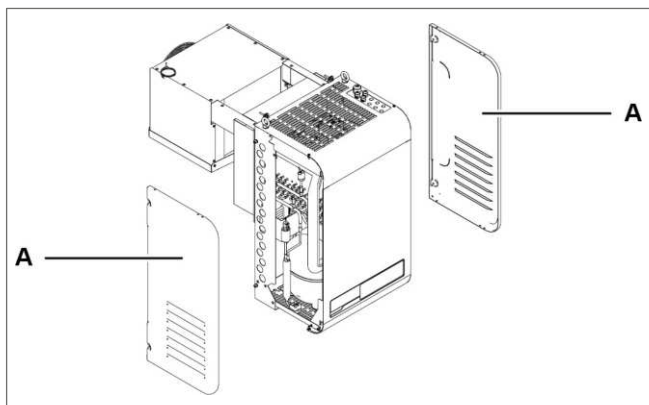


7.4.2 What to do

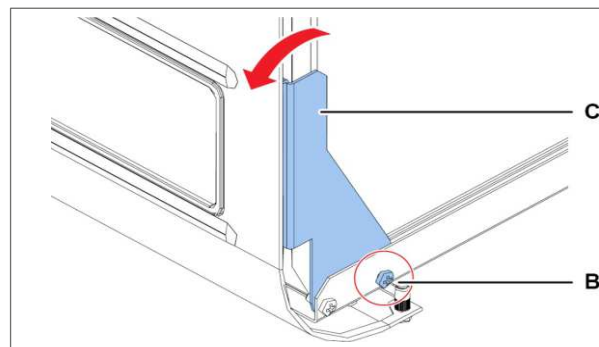
In case of damage or a malfunction, consult the "Installation and operation troubleshooting" on page 35 or contact Tefcold A/S.

7.5 Remove the front panel

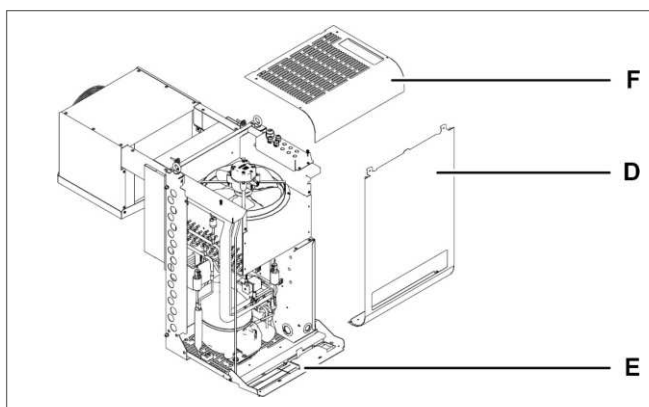
Procedure



1. Remove the side panels **[A]**.



- rotate the bracket **[C]**.
2. On both sides, undo the screws **[B]** and slightly



3. Remove the front panel **[D]**.
4. If necessary, lower the controller panel **[E]**.
5. If necessary, remove the top panel **[F]**.

7.6 Checking or replacing condensing unit components

7.6.1 Required skills



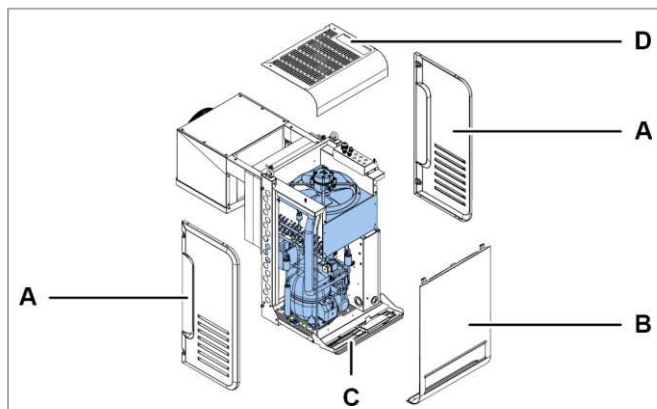
7.6.2 When to check or replace

Perform this procedure when problems are found on the condensing unit components (see "Installation and operation troubleshooting" on page 35).

7.6.3 Warning

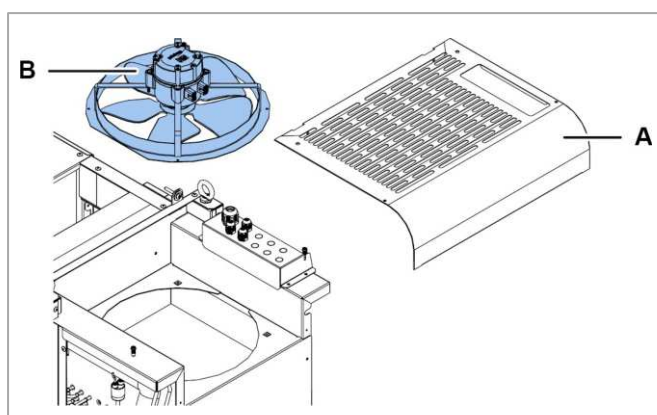
Check or replace the components following the instructions, frequency and all indications in this manual and in the attached documentation. If necessary, contact TEFCOLD A/S assistance.

7.6.4 Checking or replacing internal components of the condensing unit



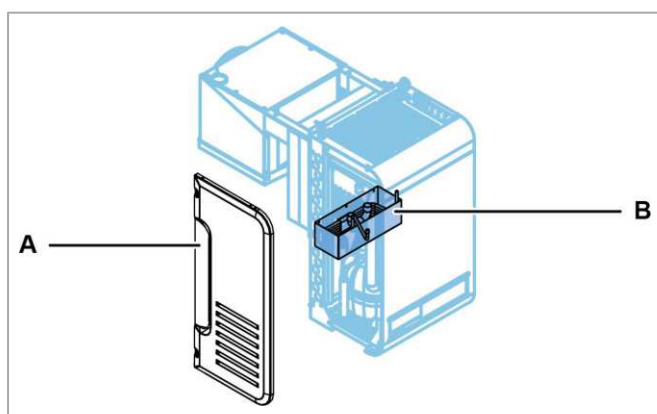
1. Remove the side panels **[A]**.
2. Remove the front panel **[B]** and lower the controller panel **[C]** and if necessary, remove the top panel **[D]** (see "Remove the front panel" on page 28).
3. Check or replace the internal components of the condensing unit.
4. Set all the panels back in place.

7.6.5 Checking or replacing the condensing fan unit



1. Remove the top panel **[A]**.
2. Check the fan unit of the evaporating part **[B]**.
3. If necessary, replace the damaged component with an original spare part and follow the enclosed instructions.
4. Set the panel back in place.

7.6.6 Check the condensate drain tray

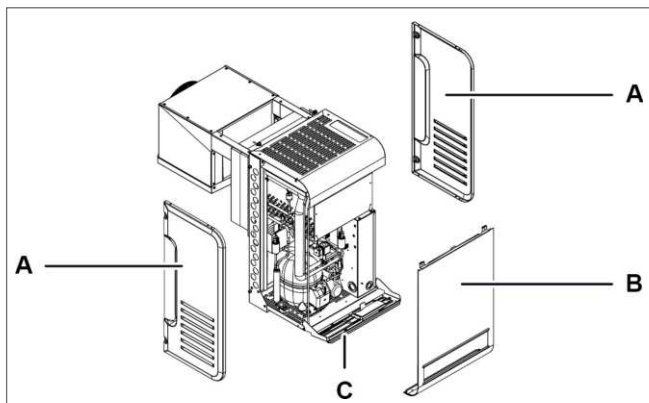


1. Remove the left side panel **[A]**
2. Check the condensate drain tray **[B]**.
3. Set the panel back in place.

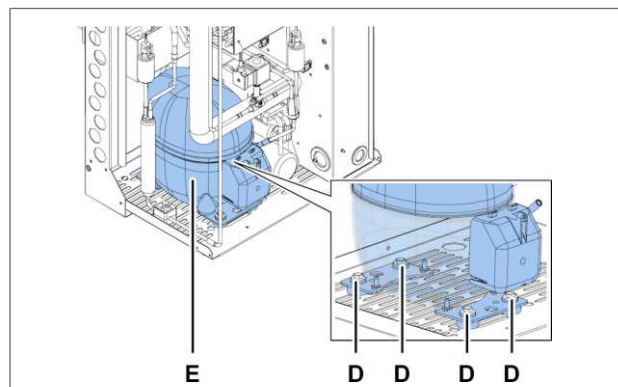
7.6.7 Check the compressor noise

1. Turn the unit on.
2. Verify that the compressor does NOT generate vibrations or clicking sounds, that is, sounds generated by short, close, sharp and frequent blows.
3. If the compressor emits or generates vibrations or clicking sounds, it could be broken and must be replaced (see "Replace the compressor" on the facing page), or there is mechanical clearance between the parts that must be fixed.

7.6.8 Replace the compressor

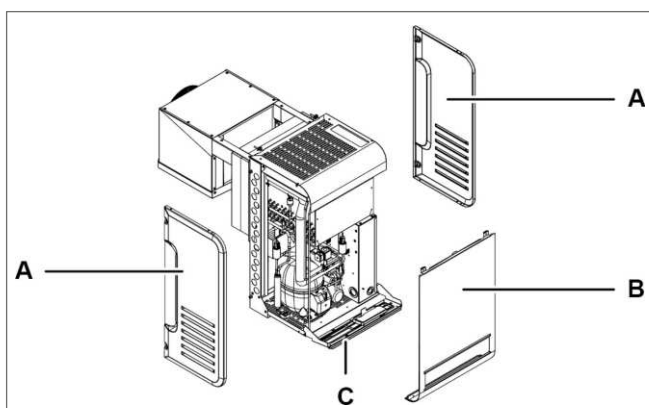


1. Remove the side panels **[A]**.
2. Remove the front panel **[B]** (see "Remove the front panel" on page 28).
3. Lower or if necessary, remove the controller panel **[C]**.

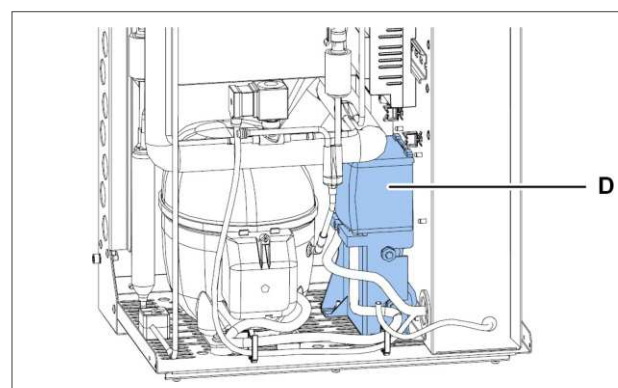


4. Undo the screws **[D]** and remove the compressor **[E]**, removing all the components that prevent its removal.
5. Insert the new compressor, securing it with the screws and put all the other components back in place.
6. Set all the panels back in place.

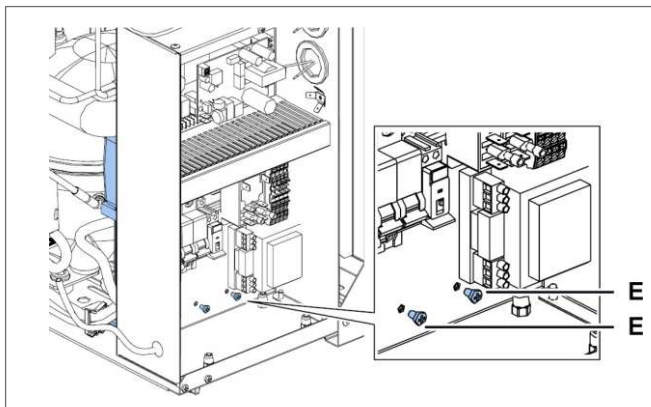
7.6.9 Replace compressor housing



1. Remove the side panels **[A]**.
2. Remove the front panel **[B]** (see "Remove the front panel" on page 28).
3. Lower or if necessary, remove the controller panel **[C]**.



4. Remove the compressor box **[D]**, removing all the components that prevent its removal.



5. For unit size 1 x 250, remove the electrical box cover (see "Check or replace components of the electrical box" on the facing page) and remove the screws **[E]**.

7.7 Checking or replacing evaporating part components

7.7.1 Required skills



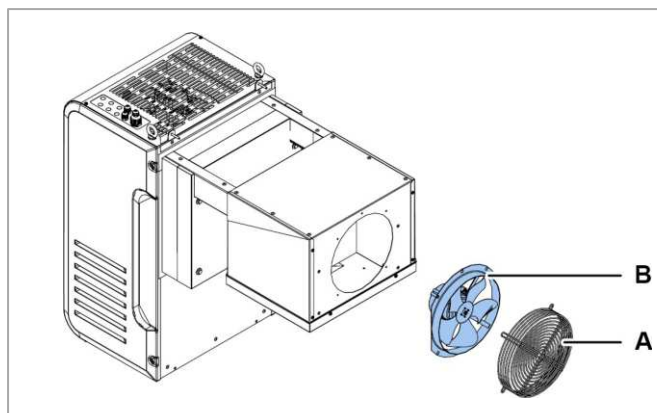
7.7.2 When to check or replace

Perform this procedure when problems are found on the evaporating part components (see "Installation and operation troubleshooting" on page 35).

7.7.3 Warning

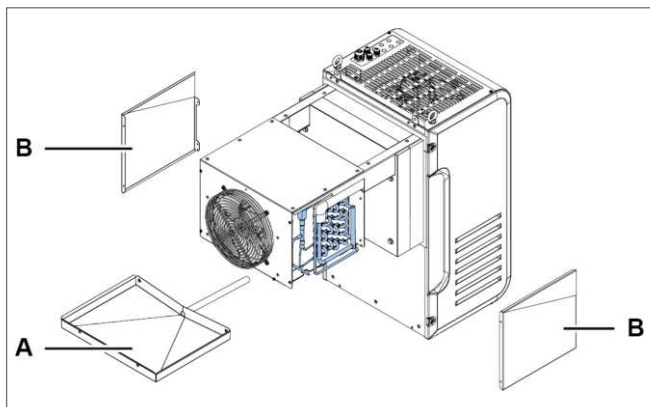
Check or replace the components following the instructions, frequency and all indications in this manual and in the attached documentation. If necessary, contact TEFCOLD A/S assistance.

7.7.4 Checking or replacing the fan unit

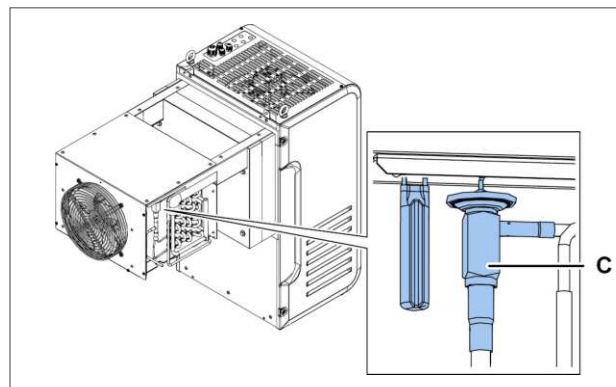


1. Remove the la grid **[A]**.
2. Check or replace the fan unit of the evaporating part **[B]**.
3. Replace the damaged component with an original spare part and follow the enclosed instructions.
4. Put the condenser-fan motor and grid back in place.

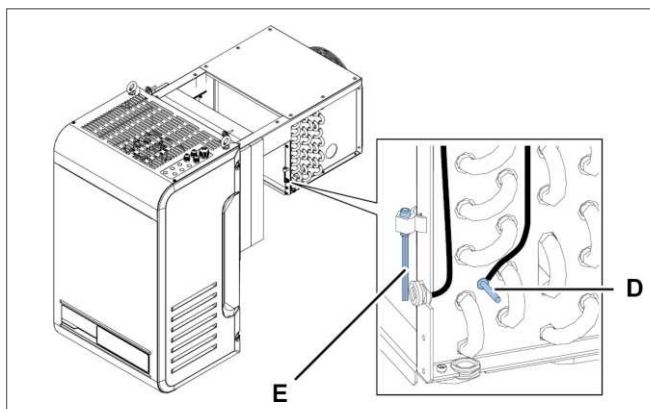
7.7.5 Checking or replacing components



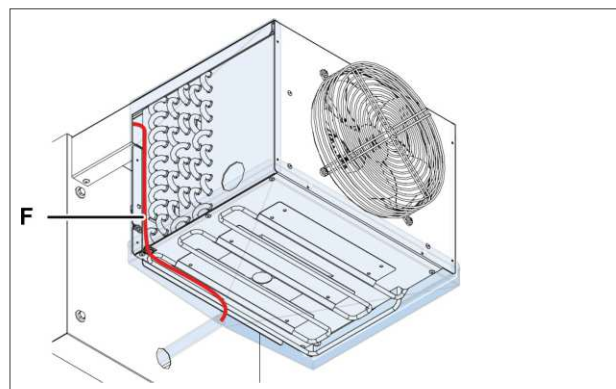
1. If the evaporator tray **[A]** must be replaced, remove it with the side panels **[B]**.



2. Check or replace the thermostatic valve **[C]**.



3. Check or replace the fin coil temperature probe **[D]** and the cold room temperature probe **[E]**.
4. Check or replace the drain heater **[F]**.



7.8 Check or replace components of the electrical box

7.8.1 Required skills



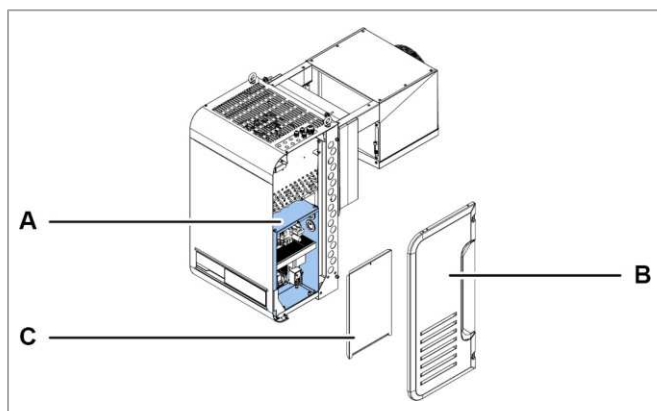
7.8.2 When to check or replace

Perform this procedure when problems are found on the electrical box components (see "Installation and operation troubleshooting" on page 35).

7.8.3 Warning

Check or replace the components following the instructions, frequency and all indications in this manual and in the attached documentation. If necessary, contact TEFCOLD A/S assistance.

7.8.4 Access the electrical box



1. Access the electrical box components **[A]** by removing the right side panel **[B]** and the electrical box panel **[C]**.
2. Check or replace the component.

8. Diagnostics

This section includes the following topics:

8.1 Installation and operation troubleshooting _____ 35

8.1 Installation and operation troubleshooting

8.1.1 Skills



COMPANY

8.1.2 Safety warnings

If maintenance is required, follow the instructions and all indications in this manual and in the attachments. If necessary, contact TEFCOLD A/S assistance.



In case of maintenance, wear helmets, footwear and protective gloves.

8.1.3 Causes and solutions

The unit does not start-up

Cause	Solution	Personnel
Power failure.	- Check the connection to the mains. - Check that there is voltage on the electrical mains and that it conforms with the rated data. - Check the state of the circuit breakers on the machine.	
The compressor's thermal protection has tripped.	Check the integrity and activation state of the compressor circuit breaker on the machine and, if present, the thermal protection on the compressor	
The start condenser is faulty.	Replace the start condenser.	
No controller consent to the compressor.	- Check the Setpoint (Set) and the differential (diF). - Load the default setting of the unit.	
There is controller consent but the compressor is off (OFF).	- Check the wiring of the compressor relay on the circuit board and its activation state. If the relay is NOT active, replace the circuit board. - Check the wiring of the compressor power relay on the electrical box and its activation state. If the relay is NOT active, replace it.	
The electric motor has an interrupted or short-circuited winding.	Replace the compressor.	

The compressor is running without consent

Cause	Solution	Personnel
The compressor relay is stuck to the circuit board.	Replace the circuit board.	
The compressor power relay is stuck to the electrical box.	Replace the compressor power relay.	

The unit runs continuously or for long periods

Cause	Solution	Personnel
The unit does NOT reach the Setpoint temperature and the evaporator fans DO NOT work.	• If there is NO controller consent, check the evaporator fan parameters and, if necessary, load the default setting. • If there is controller consent, then, check the wiring of the fans and the relay on the circuit board and its activation state. • If the relay is NOT active, replace the circuit board.	 
The unit does NOT reach the Setpoint temperature.	• If the evaporator is blocked with ice, then manually activate the defrosting several times (see the controller manual) until it is completely cleaned. • If the condenser is dirty, clean it. • Check that the unit is sized correctly for the required thermal load.	   COMPANY

Condensate water CANNOT evaporate (air-cooled version)

Cause	Solution	Personnel
The condensing temperature is too low.	If possible, activate the minimum condensing temperature limitation.	

The suction pipe and the compressor are frosted

Cause	Solution	Personnel
There is a liquid return and the evaporator fans are NOT working.	- If there is NO controller consent, check the evaporator fan parameters and, if necessary, load the default setting. - If there is controller consent, then, check the wiring of the fans and the relay on the circuit board together with its activation state. - If the relay is NOT active, replace the circuit board.	 
There is a liquid return.	Check the overheating value in the evaporator inside the cold room. If the value is less than 2K, then the thermostatic valve does NOT work and is blocked in the open position and, therefore, must be replaced.	 

The unit is unable to complete defrosting

Cause	Solution	Personnel
The by-pass valve on the hot gas circuit is blocked.	Check the supply and consequent correct opening of the valve on the hot gas by-pass during the defrost phase.	 
The hydraulic circuit valve is blocked (water-cooled version only).	Check the supply and consequent correct closing of the valve on the hydraulic circuit during the defrost phase.	 

Water leaking from the evaporator compartment / ice formation on the condenser compartment

Cause	Solution	Personnel
The drain pipe of the evaporator drain tray is blocked up with ice.	Check the positioning of the exhaust heater (the heating part must run along the entire drain pipe).	
	Check operation of the exhaust heater.	
The machine is not placed in a level position.	Check that the machine is correctly installed to allow the drain pipes to drain condensing water.	 

4.1 Decommissioning



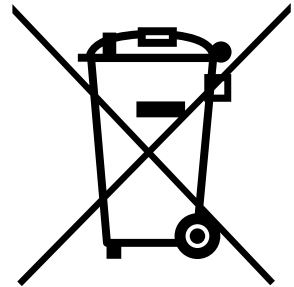
The use of the symbol indicates that this product may not be treated as household waste.

By ensuring this product is disposed of correctly, you will help prevent potential negative consequences for the environment and human health, which could otherwise be caused by inappropriate waste handling of this product.

Please recycle this product in accordance with applicable local regulations.

WEEE-Directive 2012/19/EU

Neither asbestos nor any CFC is used in this product.



DANGER!

Explosion/Burns. Presence of flammable gas. During installation, adopt all the precautions required by legislation in force.

Crushing. Always use lifting equipment and accessories of adequate capacity for the load to be lifted and follow the lifting warnings given in this instruction manual.

Falling from above. Always use adequate means and accessories. Provide safe access to the installation area. Follow the warnings given in this instruction manual.

Electrocution. Always use adequate means and accessories. Follow the warnings given in this instruction manual.

4.2 Attachments

4.2.1 Documents attached to the manual

- Controller manual

WRA

Packaged units controller



For Models:

WRA-M5-1	WRA-L8-1
WRA-M8-1	WRA-L11-1
WRA-M12-1	WRA-L15-1
WRA-M18-1	WRA-L18-1
WRA-M24-1	WRA-L29-1
WRA-M32-1	WRA-L47-1
WRA-M42-1	WRA-L54-1
WRA-M46-1	
WRA-M55-1	

Contents

Conformity	iii
1. Introduction	4
1.1 Warnings	4
1.2 General description	4
2. Control panel	5
2.1 About the control panel	5
2.2 Control panel operations	6
2.3 Quick menu	7
3. Parameters	8
3.1 Structure and editing parameters	8
3.2 Regulation parameters	9
3.3 Defrost parameters	13
3.4 Evaporator fan parameters	17
3.5 Alarm parameters	18
3.6 Output configuration parameters	20
3.7 Digital input parameters	26
3.8 Energy saving parameters	33
3.9 LAN management parameters	34
3.10 Probe configuration parameters	36
3.11 Communication parameters	36
3.12 User interface parameters	37
3.13 Other parameters (read only)	40
3.14 HOT KEY flash drive	40
4. Diagnostics and communication	40
4.1 Errors indicated by the controller	40
5. Appendix	41
5.1 Disposal	41

Conformity

Directives

List of Directives for which the product is declared to be conforming:

- 2014/35/EU (Low Voltage Directive)
- EMC 2014/30/EU (Electromagnetic Compatibility Directive)
- RED 2014/53/EU (Radio Equipment Directive)

Standards and regulations

- IEC/EN 60730-1
- IEC/EN 60079-0
- IEC/EN 60079-15
- EN 55016-2
- EN 55016-3
- EN 61000-3
- EN 61000-4



Note: the original

declaration of conformity accompanies the machine.

Certifications

1. Introduction

1.1 Warnings

NOTICE: *the controller must never be opened.*



NOTICE: *this manual is an integral part of the product and must be kept with the appliance for quick and easy reference.*

1.2 General description

1.2.1 What is WRA SERIES?

The WRA SERIES controller integrates software dedicated to the complete management of cooling systems for high-, medium- and low-temperature cold rooms, and enables the simultaneous control of both the condensing and evaporating parts of the system.

2. Control panel

This section includes the following topics:

2.1 About the control panel	5
2.2 Control panel operations	6
2.3 Quick menu	7

2.1 About the control panel

2.1.1 Control elements supplied with the packaged unit

The packaged unit can be controlled via the control panel.

2.1.2 Description of the buttons on the control panel



Button	Function
	Switches the packaged unit on and off.
	It switches the light on and off.
	Manually controls the defrosting cycle.
SET	Displays the setpoint value. In programming mode, it confirms a parameter category or a displayed parameter or value. Press SET and simultaneously: to access the programming menu. Press SET and simultaneously: to exit the displayed menu.
	To scroll through the menu items or increase the displayed value. Press SET and simultaneously: to exit the displayed menu.
	To scroll through the menu items or decrease the displayed value. Press SET and simultaneously: to access the programming menu.

2.1.3 Description of the display



Pilot light	Steady on	Flashing on
	Display of: - parameters - set values - measured values	-
	Defrosting active	Dripping stage active; defrosting request pending
ECO	Energy Saving active	-
	Light on	-
	Evaporator-fan active	Evaporator-fan waiting after defrosting
	One or more compressors active	Compressor not enabled at start-up due to: - Safety device times - Open door - Start-up delay
	Active alarm	-
°C/°F	Active unit of measurement	Active programming mode
	Global operating mode	Remote display mode active

2.2 Control panel operations

2.2.1 Turn the packaged unit on and off

- Turn on: press and hold the  button for 3 seconds. The display shows **ON** and the value of the set variable in parameter **Lod**.
- Turn off: press and hold the  button for 3 seconds. **OFF** appears on the display.

Note: the ambient temperature must be below 32°C to be able to carry out the first start-up.

2.2.2 Lock the control panel

- Press **SET** and  simultaneously one or more times to exit all menus and display the cold room temperature.
- Hold down buttons  and  simultaneously for 3 seconds: **LOC** appears on the display, and the keyboard is unlocked.

2.2.3 Unlock the control panel

Hold down buttons  and  simultaneously for 3 seconds: **UnL** appears on the display and the keyboard is unlocked.

2.2.4 Switch the Cold room light on and off

- Switch on: press button : the cold room pilot light comes on in the display.
- Switch off: press the  button: the cold room pilot light goes out in the display.

2.2.5 Set the temperature setpoint value

1. Press the **SET** button briefly: the setpoint value appears on the display (parameter **SEt**).
2. Press the  and  buttons to select the desired setpoint value.
3. Briefly press the **SET** button or wait 30 seconds to store the new setpoint value.

2.2.6 Controlling the manual defrosting cycle

Press and hold the  button for 3 seconds: the defrosting and compressor indicator lights up on the display.

2.2.7 Display the active alarms

If an alarm is active, the pilot light  comes on, a buzzer sounds and the display shows the code of the active alarm. If several alarms are active, the codes appear in sequence.

To deactivate the buzzer, press any button on the control panel.

The reset of each alarm is automatic upon re-entry of the indicated condition. See "Errors indicated by the controller" on page 42.

2.2.8 Exiting from a menu

Press buttons **SET** and  simultaneously one or more times to return to the desired position.

2.3 Quick menu

2.3.1 Functions

The Quick Menu provides access to the key information on parameters and probes.

Function code	Description
MAP	Current parameters map
dP1	Value read by probe 1
dP2	Value read by probe 2
dP3	Value read by probe 3 (if present) - if not present, the text noP will be displayed
dP4	Value read by probe 4 (if present) - if not present, the text noP will be displayed
Adr	Serial address
LSn	Number of devices connected in LAN
LAN	List of addresses connected in LAN

2.3.2 Access the Quick menu

1. Press **SET** and  simultaneously one or more times to exit all menus and display the cold room temperature.
2. Press  to display the first Quick menu item.

3. Parameters

This section includes the following topics:

3.1	Structure and editing parameters	8
3.2	Regulation parameters	9
3.3	Defrost parameters	13
3.4	Evaporator fan parameters	17
3.5	Alarm parameters	18
3.6	Output configuration parameters	20
3.7	Digital input parameters	26
3.8	Energy saving parameters	35
3.9	LAN management parameters	36
3.10	Probe configuration parameters	38
3.11	Communication parameters	38
3.12	User interface parameters	39
3.13	Other parameters (read only)	40
3.14	HOT KEY flash drive	40

3.1 Structure and editing parameters

3.1.1 Parameter menu structure

Menu	Description	Level
rEG	Regulation	1
dEF	Defrosting	1
FAn	Evaporator fans	1
ALr	Alarms	1
oUt	Digital output configuration	2
inP	Digital input configuration	1
ES	Energy saving	1
LAN	LAN	1
Prb	Probe configuration	2
CoM	RS485 configuration	1
Ui	Display	2
Oth	Other variables (read-only)	1
PAS	Password for 2nd level parameters	only 1

3.1.2 Modify a 1st level parameter

1. Press **SET** and  simultaneously one or more times to exit all menus and display the cold room temperature.
2. Press the buttons **SET** and  simultaneously for 3 seconds to access programming mode.
3. Press buttons  and  to scroll through the parameter categories.
4. Press the **SET** button to select the desired category.
5. Press buttons  and  to scroll through the parameters of the selected category.
6. Press the **SET** button to select the desired parameter.

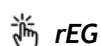
7. Press buttons ∇ and Δ to change the parameter value.
8. Press the **SET** button to confirm the value and return to the previous level.
9. Press buttons **SET** and Δ simultaneously or wait 15 seconds to exit programming mode.

3.1.3 Modify a 2nd level parameter

1. Press **SET** and Δ simultaneously one or more times to exit all menus and display the cold room temperature.
2. Press the buttons **SET** and ∇ simultaneously for 3 seconds to access programming mode.
3. Press buttons ∇ and Δ to scroll to category **PAS** and press **SET**.
4. Enter the 2nd level password **022** and press button **SET**: if the password is correct, the flashing text **Ps2** appears and you have access to the 2nd level parameters; if the password is incorrect, the flashing text **Err** appears.

3.2 Regulation parameters

3.2.1 List of parameters



rEG

Parameter	Description	Options	Unit of measurement	Range	Default
SEI	LAN mode selection	Loc = Local	-	-	Loc
		ALL = Global			
SEt	Temperature set point	-	°C	LS...US	TN/BT= 0/-20
HP	Differential	-	K	0.1...25.5	2
LS	Minimum set point limit	-	°C	-100...Set	TN/BT= -5/-25
US	Maximum set point limit	-	°C	SEt...150	TN/BT= 15/-5
OdS	Output activation delay at power on	-	minutes	0...255	3
CCO	Dual compressor adjustment	Std = Standard mode	-	-	Std
		PrE = Preventive control			
AC	Anti-swaying delay	-	minutes	0...60	3
AC1	2nd compressor activation delay	-	seconds	0...255	5
CCt	Continuous cycle duration	-	Hours: 10 minutes	00:00...24:00	00:00

Parameter	Description	Options	Unit of measurement	Range	Default
<i>CCS</i>	Continuous cycle set point	-	°C	-100...150	TN/BT=-2/-24
<i>CON</i>	Compressor ON time with faulty probe	-	minutes	0...255	10
<i>COF</i>	Compressor OFF time with faulty probe	-	minutes	0...255	10
<i>RES</i>	Resolution	in = 1 °C	-	-	dE
		dE = 0.1 °C			
<i>LOD</i>	Instrument display: default display	P1 = Probe 1	-	-	P1
		P2 = Probe 2			
		P3 = Probe 3			
		P4 = Probe 4			
		P5 = Probe 5			
		P6 = Probe 6			
		tEr = Virtual probe for thermostatting			
		dEF = Virtual probe for defrost			
		St1 = do not use			
		St2 = do not use			
<i>RED</i>	Remote display: default display	P1 = Probe 1	-	-	P1
		P2 = Probe 2			
		P3 = Probe 3			
		P4 = Probe 4			
		P5 = Probe 5			
		P6 = Probe 6			
		tEr = Virtual probe for thermostatting			
		dEF = Virtual probe for defrost			
		St1 = do not use			
		St2 = do not use			
<i>DLH</i>	Temperature display delay	-	Minutes: 10 seconds	00:00...24:00	00:00

Parameter	Description	Options	Unit of measurement	Range	Default
<i>rPA</i>	Adjustment probe A	nP = No Probe	-	-	P1
		P1 = Probe 1			
		P2 = Probe 2			
		P3 = Probe 3			
		P4 = Probe 4			
		P6 = Probe 6			
<i>rPB</i>	Adjustment probe B	nP = No Probe	-	-	nP
		P1 = Probe 1			
		P2 = Probe 2			
		P3 = Probe 3			
		P4 = Probe 4			
		P6 = Probe 6			
<i>rPd</i>	Selecting the control probe	rPA = probe selected via parameter rPA	-	-	rPA
		rAb = virtual probe: obtained via rPA and rPb temperatures according to parameter rPE			
		Aur = average of all valid probes defined as Adjustment Probe			
		LoE = minimum value of all valid probes defined as Adjustment Probe			
		HiE = maximum value of all valid probes defined as Adjustment Probe			
<i>rPE</i>	Virtual control probe percentage	-	%	0...100	0
<i>nAP</i>	Parameter map used during standard operation	C-1	-	-	TN/BT= C-1/C-2
		C-2			
		C-3			
		C-4			
		C-5			
		C-6			
<i>nPI</i>	Alternative parameters map enabled via digital input or Modbus command	C-1	-	-	TN/BT= C-1/C-2
		C-2			
		C-3			
		C-4			
		C-5			
		C-6			

Parameter	Description	Options	Unit of measurement	Range	Default
LdM	Reloads the map selected in the MAP parameter	n = no	-	-	n
		Y = yes			
UdM	Updates the map selected in the MAP parameter	n = no	-	-	n
		Y = yes			

3.2.2 Parameter rPE

Defines the percentage of rPA with respect to rPb.

The value used to adjust the ambient temperature is obtained:

$$rAb = [rPA \times rPE + rPb \times (100 - rPE)] / 100$$

3.2.3 MAP parameter

To change the parameters map, proceed as follows:

1. Press the buttons **SET** and ∇ simultaneously for 3 seconds to access programming mode.
2. Press buttons ∇ and Δ to scroll to parameter **MAP** and press **SET**.
3. Press buttons ∇ and Δ to select the desired parameter map (C-1 to C-6) and press **SET**: the controller loads the selected parameter map.

3.2.4 Parameter LdM

To reload the selected parameter map (default reset), proceed as follows:

1. Press the buttons **SET** and ∇ simultaneously for 3 seconds to access programming mode.
2. Press buttons ∇ and Δ to scroll to parameter **LdM** and press **SET**.
3. Press buttons ∇ and Δ to select Y and press **SET**: the controller reloads all the map parameters set via parameter **MAP**.

3.2.5 Parameter UdM

To change a parameter map with the current configuration, proceed as follows:

1. Press the buttons **SET** and ∇ simultaneously for 3 seconds to access programming mode.
2. Press buttons ∇ and Δ to scroll to parameter **UdM** and press **SET**.
3. Press buttons ∇ and Δ to select Y and press **SET**: the controller copies the current parameter configuration within the parameter map set via parameter **MAP**.

3.3 Defrost parameters

3.3.1 List of parameters

 dEf

Parameter	Description	Options	Unit of measurement	Range	Default
d P a	Defrosting probe A	nP = no Probe	-	-	P2
		P1 = Probe 1			
		P2 = Probe 2			
		P3 = Probe 3			
		P4 = Probe 4			
		P6 = Probe 6			
d P b	Defrosting probe B	nP = no Probe	-	-	nP
		P1 = Probe 1			
		P2 = Probe 2			
		P3 = Probe 3			
		P4 = Probe 4			
		P6 = Probe 6			
t d F	Defrosting type	Air = air defrosting (the defrosting relay will not be activated)	-	-	in
		EL = electric heater defrosting			
		in = hot gas defrosting			
		rt = defrosting with pulse electric heaters			
E d F	Defrosting mode	rtc = defrosting activation via RTC (only if RTC is present)	-	-	in
		in = defrosting activation via IdF			
		Aut = On Demand defrosting			
		Sd = intelligent defrosting			
S d F	Setpoint for SMARTFROST	-	°C	-100...150	TN/BT= 0/-20

Parameter	Description	Options	Unit of measurement	Range	Default
<i>SRT</i>	Set heaters during defrosting	-	°C	-100...150	150
<i>HP r</i>	Differential for the heaters	-	K	0.1...25.5	2
<i>d2P</i>	Defrosting with two probes	n = only the dPA probe is used for defrost management Y = defrosting is managed with probe dPA and probe dPb	-	-	n
<i>d t E</i>	Defrosting end temperature (Probe A)	-	°C	-55...50	5
<i>d t S</i>	Defrosting end temperature (Probe B)	-	°C	-55...50	5
<i>i d F</i>	Interval between defrosting cycles	-	hours	0...255	6
<i>n d t</i>	Minimum defrosting duration	-	minutes	0...MdF	0
<i>n d F</i>	Maximum defrosting duration	-	minutes	ndt...255	15
<i>d S d</i>	Defrosting start delay	-	minutes	0...255	0
<i>d F d</i>	Display during the defrosting cycle	rt = actual temperature it = temperature read at start of defrosting Set = setpoint dEF = 'dEF' label dEG = 'dEG' label dEd = 'dEd' label	-	-	dEF
<i>d R d</i>	Temperature display delay after defrosting	-	minutes	0...255	TN/BT=4/5

Parameter	Description	Options	Unit of measurement	Range	Default
<i>F d t</i>	Dripping time	-	minutes	0...255	3
<i>H o n</i>	Drain pan heater ON after dripping	-	minutes	0...255	0
<i>d P o</i>	Defrosting at power-on	n = after time IdF Y = immediately	-	-	n
<i>d R F</i>	Defrosting delay after the continuous cycle	-	hours: 10 minutes	00:00...24:00	00:00
<i>E t d</i>	Defrosting on demand: defrosting start differential	-	K	0.1...25.5	2
<i>n b d</i>	Defrosting on demand: minimum compressor running time before a defrosting cycle	-	hours: 10 minutes	00:00...24:00	04:00
<i>n d b</i>	Defrosting on demand: maximum compressor running time before a defrosting cycle	-	hours: 10 minutes	00:00...24:00	24:00
<i>n c t</i>	Defrosting on demand: minimum evaporator temperature to activate a defrosting cycle	-	°C	-100...150	TN/BT=-20/-40

3.3.2 Parameter tdF

Defines the type of defrosting set.

Natural defrosting (tdF = Air)

Defrosting takes place by stopping the compressor. The operation of the fan during defrosting depends on parameter **Fnc**. The defrosting relay is switched off. The valve is closed.

Defrosting with electric heater (tdF = EL)

Defrosting takes place by stopping the compressor. The operation of the fan during defrosting depends on parameter **Fnc**. The defrosting relay is ON. The valve is closed.

It depends on the parameters:

- **Srt** (heater setpoint during defrosting)
- **Hyr** (differential for the heater)

During defrosting, the defrosting relay performs an ON/OFF adjustment with **Srt** as setpoint. If the heater temperature exceeds the **Srt** value for a **tod** time (heater timeout), defrosting ends, even if the temperature detected by the defrosting probe is below the **dtE** or **dtS** values.

Hot gas defrosting (tdF = in)

Defrosting takes place by closing the compressor/electro-valve relay. The operation of the fan during defrosting depends on parameter **Fnc**. The defrosting relay is ON. The percentage of valve opening during defrosting is set by parameter **oPd**.

3.3.3 Parameter EdF

Defines the defrosting activation mode. The device always checks the temperature detected by the defrosting probe before starting the procedure.

Defrosting via real time clock (EdF = rtc)

Can only be set if RTC is present. The defrosting interval is controlled by the defrost parameter and is executed in real time according to the times set in parameters **Ld1** to **Ld6** for working days and **Sd1** to **Sd6** for public holidays.

Defrosting by interval (EdF = in)

Defrosting is performed every time interval defined by parameter **IdF**.

Intelligent defrosting (EdF = Sd)

Recommended for medium temperature applications only, it is related to the following parameters:

- **IdF**: minimum time between two defrosting cycles. Timer **IdF** is only updated if the compressor is on and the evaporator temperature is below parameter **SdF** (temperature threshold below which the interval is counted).
- **MdF**: maximum defrosting duration
- **dtE**: defrosting end temperature

On Demand defrosting (EdF = Aut)

See "On Demand defrosting" below.

Manual defrosting

It can be activated locally via the keyboard, by supervisor command or via a digital input (if the function is configured).

3.3.4 Synchronised defrosting via LAN

Whenever a LAN controller starts a defrosting cycle, it sends the command over the network and activates the cycle of all other controllers. This allows perfect synchronisation of the defrosting of all units connected in LAN, according to parameter **LMd**.

The command can come from the LAN defrosting Master unit. The controller performs the defrosting cycle according to the programmed parameters but, at the end of the drainage time, waits until all other controllers in the LAN have completed their defrosting cycle before resuming normal temperature adjustment according to parameter **dEM**.

3.3.5 On Demand defrosting

Principle of operation

The controller monitors the evaporator temperature and starts a defrosting cycle if certain conditions are met.

NOTICE: To ensure efficient defrosting, it is important to position the end-of-defrosting probe (usually P2) at the coldest point of the evaporator.

Note: due to the different evaporator models and the resulting behaviour, it is strongly recommended to test and validate this algorithm in a climate chamber before applying it in the field.

Parameters and settings

After setting the On Demand defrosting cycle, set the following parameters:

- **ctd**: evaporator temperature differential to activate the defrosting cycle
- **nbd**: minimum compressor running time (or minimum solenoid valve activation time) before an automatic defrosting cycle. It must be set correctly to avoid premature defrosting.
- **Mbd**: maximum compressor running time (or maximum solenoid valve activation time) before an automatic defrosting cycle.
- **nct**: minimum evaporator temperature to activate an automatic defrosting cycle.

Exceptions

Defrosting on demand cannot be activated in the following cases:

- If the compressor has not run for the minimum time required by parameter **nbd** since the last defrosting cycle or initial switch-on.
- If the compressor has been running for longer than the maximum time defined by parameter **Mbd** since the last defrosting cycle or initial switch-on. In this case, a defrosting cycle is initiated regardless of the coil temperature.
- If the coil temperature reaches a very low temperature defined by parameter **nct**. In this case, a defrosting cycle is initiated regardless of the **ctd** value.

3.4 Evaporator fan parameters

3.4.1 List of parameters



Fan

Parameter	Description	Options	Unit of measurement	Range	Default
<i>F A P</i>	Evaporator A fan probe	nP = no Probe	-	-	P2
		P1 = Probe 1			
		P2 = Probe 2			
		P3 = Probe 3			
		P4 = Probe 4			
		P6 = Probe 6			
<i>F n C</i>	Evaporator fan operating mode	C_n = switched on in parallel with the solenoid valve, OFF during defrosting	-	-	C_n
		O_n = continuous mode, OFF during defrosting			
		C_y = switched on in parallel with the solenoid valve, ON during defrosting			
		O_y = continuous mode, ON during defrosting			
<i>F n d</i>	Fan start delay after a defrosting cycle	-	minutes	0...255	TN=4 / BT=5
<i>F S t</i>	Evaporator fan stop temperature	-	°C	-50...50	TN=25 / BT=5
<i>F H P</i>	Evaporator fan restart differential	-	K	0.1...25.5	2
<i>F o n</i>	ON time during anti-stratification cycle	-	minutes	0...255	0
<i>F o F</i>	OFF time during anti-stratification cycle	-	minutes	0...255	0

3.4.2 Anti-Stratification Function

The function is only activated with **Fnc** = C_n or C_y (fan activated in parallel with the compressor)

- **Fon**: evaporator fan on time when the compressor is off.
- **Fof**: evaporator fan off time when the compressor is off.

With **Fon** = 0, the fans are always switched off.

Example:

Fnc= C_n

Fon=5

Fof=5

When the setpoint is reached, the machine stops and the fans start cycles in which they are off for 5 minutes (**Fof**) and on for 5 minutes (**Fon**). When the machine is restarted, normal operation resumes.

3.5 Alarm parameters

3.5.1 List of parameters



Alr

Parameter	Description	Options	Unit of measurement	Range	Default
<i>ALC</i>	Temperature alarm configuration	rE = Set Point high and low alarms	-	-	rE
		Ab = High and low absolute temperature alarms			
<i>ALU</i>	High temperature alarm threshold	-	K	ALC=rE --> 0...50	10
			°C	ALC=Ab --> ALL...150	
<i>ALL</i>	Low temperature alarm threshold	-	K	ALC=rE --> 0...50	5
			°C	ALC=Ab --> -100...ALU	
<i>AHP</i>	Differential for temperature alarms	-	K	0.1...25.5	2
<i>ALd</i>	Temperature alarms delay	-	minutes	0...255	15
<i>rAZ</i>	Probe for second temperature alarm	nP = no Probe	-	-	nP
		P1 = Probe 1			
		P2 = Probe 2			
		P3 = Probe 3			
		P4 = Probe 4			
		P6 = Probe 6			
		tEr = virtual probe for thermostatting			

Parameter	Description	Options	Unit of measurement	Range	Default
<i>A2U</i>	Second high temperature alarm threshold	-	°C	A2L...150	150
<i>A2L</i>	Low-temperature second alarm threshold	-	°C	-100...A2U	-50
<i>A2H</i>	Differential for second temperature alarms	-	K	0.1...25.5	2
<i>A2d</i>	Temperature alarm seconds delay	-	minutes	0...255	0
<i>dAo</i>	Temperature alarm delay at start-up	-	hours: 10 minutes	00:00...24:00	12:00
<i>EdA</i>	Temperature alarm delay at end of defrosting cycle	-	minutes	0...255	60
<i>doe</i>	Temperature alarm override after door opening	-	minutes	0...255	5
<i>tbA</i>	Deactivating the alarm relay by pressing a button	n = no	-	-	Y
		Y = yes			

3.6 Output configuration parameters

3.6.1 List of parameters

 *oUt*

Parameter	Description	Options	Unit of measurement	Range	Default
 <i>R 1</i>	Relay configuration on terminals 15-16	nP = not used	-	-	LiG
		CPr = compressor function			
		CP2 = second compressor function			
		dEF = defrosting function			
		Fan = evaporator fan function			
		ALr = alarm function			
		LiG = cold room light function			
		AUS = auxiliary relay, can also be switched on/off via button			
		OnF = the relay functions as ON/OFF output			
		AC = anti-fog heaters function			
		db = dead band adjustment (not compatible with CrE=y)			
		ES = the relay is activated when the energy-saving function is active			
		HEt = counter heater function			
		Cnd = condenser fan function			

Parameter	Description	Options	Unit of measurement	Range	Default
P2	Relay configuration on terminals 13-14	nP = not used	-	-	Fan
		CPr = compressor function			
		CP2 = second compressor function			
		dEF = defrosting function			
		Fan = evaporator fan function			
		ALr = alarm function			
		LiG = cold room light function			
		AUS = auxiliary relay, can also be switched on/off via button			
		OnF = the relay functions as ON/OFF output			
		AC = anti-fog heaters function			
		db = dead band adjustment (not compatible with CrE=y)			
		ES = the relay is activated when the energy-saving function is active			
		HEt = counter heater function			
		Cnd = condenser fan function			

Parameter	Description	Options	Unit of measurement	Range	Default
P3	Relay configuration on terminals 17-18	nP = not used	-	-	CPr
		CPr = compressor function			
		CP2 = second compressor function			
		dEF = defrosting function			
		Fan = evaporator fan function			
		ALr = alarm function			
		LiG = cold room light function			
		AUS = auxiliary relay, can also be switched on/off via button			
		OnF = the relay functions as ON/OFF output			
		AC = anti-fog heaters function			
		db = dead band adjustment (not compatible with CrE=y)			
		ES = the relay is activated when the energy-saving function is active			
		HEt = counter heater function			
		Cnd = condenser fan function			

Parameter	Description	Options	Unit of measurement	Range	Default
P4	Relay configuration on terminals 1-2-3	nP = not used	-	-	dEF
		CPr = compressor function			
		CP2 = second compressor function			
		dEF = defrosting function			
		Fan = evaporator fan function			
		ALr = alarm function			
		LiG = cold room light function			
		AUS = auxiliary relay, can also be switched on/off via button			
		OnF = the relay functions as ON/OFF output			
		AC = anti-fog heaters function			
		db = dead band adjustment (not compatible with CrE=y)			
		ES = the relay is activated when the energy-saving function is active			
		HEt = counter heater function			
		Cnd = condenser fan function			

Parameter	Description	Options	Unit of measurement	Range	Default
□ R 5	Relay configuration on terminals 11-12	nP = not used	-	-	OnF
		CPr = compressor function			
		CP2 = second compressor function			
		dEF = defrosting function			
		Fan = evaporator fan function			
		ALr = alarm function			
		LiG = cold room light function			
		AUS = auxiliary relay, can also be switched on/off via button			
		OnF = the relay functions as ON/OFF output			
		AC = anti-fog heaters function			
		db = dead band adjustment (not compatible with CrE=y)			
		ES = the relay is activated when the energy-saving function is active			
		HEt = counter heater function			
		Cnd = condenser fan function			

Parameter	Description	Options	Unit of measurement	Range	Default
□ 10	Relay configuration on terminals 47-48	nP = not used	-	-	CP2
		CPr = compressor function			
		CP2 = second compressor function			
		dEF = defrosting function			
		Fan = evaporator fan function			
		ALr = alarm function			
		LiG = cold room light function			
		AUS = auxiliary relay, can also be switched on/off via button			
		OnF = the relay functions as ON/OFF output			
		AC = anti-fog heaters function			
		db = dead band adjustment (not compatible with CrE=y)			
		ES = the relay is activated when the energy-saving function is active			
		HEt = counter heater function			
		Cnd = condenser fan function			

Parameter	Description	Options	Unit of measurement	Range	Default
	Relay configuration on terminals 45-46	nP = not used	-	-	Cnd
		CPr = compressor function			
		CP2 = 2nd compressor function			
		dEF = defrosting function			
		Fan = evaporator fan function			
		ALr = alarm function			
		LiG = cold room light function			
		AUS = auxiliary relay, can also be switched on/off via button			
		OnF = the relay functions as ON/OFF output			
		AC = anti-fog heaters function			
		db = dead band adjustment (not			
		ES = the relay is activated when the energy-saving function is active			
		HEt = counter heater function			
		Cnd = condenser fan function			
	Alarm relay polarity	cL = normally closed	-	-	cL
		oP = normally open			
	The auxiliary output is not related to the ON/OFF status of the device	n = if the instrument is switched off, the auxiliary output is also switched off	-	-	n
		y = the status of the auxiliary output is independent of the ON/OFF status of the device			

3.7 Digital input parameters

3.7.1 List of parameters



inP

Parameter	Description	Options	Unit of measurement	Range	Default
	Digital input 1 polarity (terminals 31-32)	cL = the digital input is activated by closing the contact	-	-	OP
		oP = the digital input is activated by opening the contact			

Parameter	Description	Options	Unit of measurement	Range	Default
, 1 F	Digital input 1 function (terminals 31-32)	nu = not used	-	-	dor
		EAL = external alarm			
		bAL = external serious alarm			
		PAL = pressure switch activation			
		dor = door switch			
		dEF = defrosting activation command			
		AUS = auxiliary output activation			
		LiG = cold room light activation			
		OnF = instrument ON/OFF			
		FHU = not used			
		ES = energy saving function activation			
		nt = enable second parameter map			
		cLn = enable cleaning function			
		dEn = defrosting end command			
		CP1 = compressor 1 safety devices			
		CP2 = compressor 2 safety devices			
		StC = cooling stop			
d 1 d	Time/delay interval for digital input 1 signalling	-	minutes	0...255	10
, 2 P	Digital input 2 polarity (terminals 30-31)	cL = the digital input is activated by closing the contact	-	-	OP

Parameter	Description	Options	Unit of measurement	Range	Default
12F	Digital input 2 function (terminals 30-31)	nu = not used	-	-	EAL
		EAL = external alarm			
		bAL = external serious alarm			
		PAL = pressure switch activation			
		dor = door switch			
		dEF = defrosting activation command			
		AUS = auxiliary output activation			
		LiG= cold room light activation			
		OnF = instrument ON/OFF			
		FHU = not used			
		ES = energy saving function activation			
		nt = enable second parameter map			
		cLn = enable cleaning function			
		dEn = defrosting end command			
		CP1 = compressor 1 safety devices			
		CP2 = compressor 2 safety devices			
		StC = cooling stop			

Parameter	Description	Options	Unit of measurement	Range	Default
020	Time/delay interval for digital input 2 signaling	-	minutes	0...255	0
03P	Digital input 3 polarity (terminals 25-26)	cL = the digital input is activated by closing the contact	-	-	OP
		oP = the digital input is activated by opening the contact			

Parameter	Description	Options	Unit of measurement	Range	Default
13F	Digital input 3 functions (terminals 25-26)	nu = not used	-	-	PAL
		EAL = external alarm			
		bAL = external serious alarm			
		PAL = pressure switch activation			
		dor = door switch			
		dEF = defrosting activation command			
		AUS = auxiliary output activation			
		LiG= cold room light activation			
		OnF = instrument ON/OFF			
		FHU = not used			
		ES = energy saving function activation			
		nt = enable second parameter map			
		cLn = enable cleaning function			
		dEn = defrosting end command			
		CP1 = compressor 1 safety devices			
		CP2 = compressor 2 safety devices			
		StC = cooling stop			

Parameter	Description	Options	Unit of measurement	Range	Default
<i>d 3 d</i>	Time/delay interval for digital input 3 signaling	-	minutes	0...255	90
<i>, 4 P</i>	Digital input 4 polarity (terminals 24-25)	cL = the digital input is activated by closing the contact oP = the digital input is activated by opening the contact	-	-	CL

Parameter	Description	Options	Unit of measurement	Range	Default
I 4 F	Digital input 4 function (terminals 24-25)	nu = not used	-	-	nU
		EAL = external alarm			
		bAL = external serious alarm			
		PAL = pressure switch activation			
		dor = door switch			
		dEF = defrosting activation command			
		AUS = auxiliary output activation			
		LiG= cold room light activation			
		OnF = instrument ON / OFF			
		FHU = not used			
		ES = energy saving function activation			
		nt = enable second parameter map			
		cLn = enable cleaning function			
		dEn = defrosting end command			
		CP1 = compressor 1 safety devices			
		CP2 = compressor 2 safety devices			
		StC = cooling stop			

Parameter	Description	Options	Unit of measurement	Range	Default
<i>d 4 d</i>	Time/delay interval for digital input 4 signalling	-	minutes	0...255	0
<i>n P 5</i>	Number of pressure switch activations	-	-	0...15	3
<i>0 d C</i>	Status of compressor and evaporator fans with door open	no = normal Fans = evaporator fans off CPr = compressor off F-C = compressor and evaporator fans off	-	-	F-C
<i>r r d</i>	Open door alarm effect on the outputs	n = outputs not affected by open door alarm Y = the outputs restart with the open door alarm	-	-	Y
<i>o F C</i>	Compressor stop delay when the door is opened	-	seconds	0...255	30

3.8 Energy saving parameters

3.8.1 List of parameters



ES

Parameter	Description	Options	Unit of measurement	Range	Default
<i>H E 5</i>	Temperature increase during the energy-saving cycle	-	K	-30...30	3
<i>P E L</i>	Activating energy saving when the light is switched off	n = disabled function Y = energy saving is activated when the light is switched off and vice versa	-	-	n

3.9 LAN management parameters

3.9.1 List of parameters



LAN

Parameter	Description	Options	Unit of measurement	Range	Default
LND	Defrosting synchronisation	n = the section does not send a global defrosting command	-	-	Y
		y = the section sends a defrosting start command to the other controllers			
DEN	Type of defrosting end	n = the end of the defrosting cycle is independent for the controller connected to the LAN	-	-	Y
		y = the end of the defrosting cycle is synchronised for the controllers connected to the LAN			
LSP	Set-point synchronisation L.A.N.	n = the set-point value is only changed in the local controller	-	-	n
		y = when the set-point is changed, it is updated with the same value for all other controllers connected to the LAN			
LDS	Synchronisation of the L.A.N. display	n = the displayed value is not shared across the LAN	-	-	Y
		y = the value displayed by the section is sent to all other controllers			
LOF	L.A.N. On/Off synchronisation	n = On / Off command only acts on the local section	-	-	n
		y = the On/Off command is sent to all other sections			
LLI	L.A.N. light synchronisation	n = the light command only acts on the local section	-	-	Y
		y = the lights command is sent to all other sections			
LAU	L.A.N. AUX output synchronisation	n = the AUX command only acts on the local section	-	-	n
		y = the AUX command is sent to all other sections			

Parameter	Description	Options	Unit of measurement	Range	Default
L E S	L.A.N. energy-saving synchronisation	n = the energy-saving command only acts on the local section	-	-	Y
		y = the energy-saving command is sent to all other sections			
L S d	Remote probe display	n = the displayed value is that of the local probe	-	-	n
		y = the displayed value is from another section (which has parameter LdS = y)			
S t n	Shared cooling request via LAN	n = not used	-	-	n
		y = a generic cooling request from the LAN activates the electro-valve, the fan and the SH control			
R C E	Shared cooling request via LAN even if the compressor is blocked	n = no	-	-	n
		Y = yes			

Note: maximum number of devices permitted **8**.

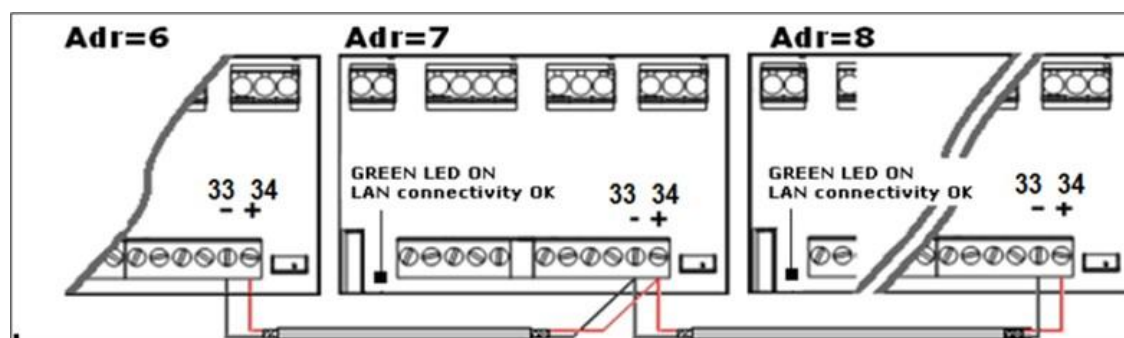
Identify each device with a different address via parameter **Adr**.

Use a shielded cable for the connection. Max distance: **30m**.

The address **Adr** is the same as that used for the ModBus network.

If the network is correctly connected, the green LED lights up.

If the connection has been made incorrectly, the green LED flashes.



NOTICE: DO NOT connect the shielding to the GND terminal or the device's earth.

3.10 Probe configuration parameters

3.10.1 List of parameters



PrB

Parameter	Description	Options	Unit of measurement	Range	Default
<i>P 1 C</i>	Probe 1 con-figuration	nP = not present	-	-	ntc
		ntc = NTC			
		PtM = Pt1000			
<i>OF 1</i>	Probe 1 calibration	-	K	-12...12	0
<i>P 2 C</i>	Probe 2 con-figuration	nP = not present	-	-	ntc
		ntc = NTC			
		PtM = Pt1000			
<i>OF 2</i>	Probe 2 calibration	-	K	-12...12	0
<i>P 3 C</i>	Probe 3 con-figuration	nP = not present	-	-	nP
		ntc = NTC			
		PtM = Pt1000			
		di = digital input (the function is selected via parameter i3F)			
<i>OF 3</i>	Probe 3 calibration	-	K	-12...12	0
<i>P 4 C</i>	Probe 4 con-figuration	nP = not present	-	-	nP
		ntc = NTC			
		PtM = Pt1000			
		di = digital input (the function is selected via parameter i4F)			
<i>OF 4</i>	Probe 4 calibration	-	K	-12...12	0

3.11 Communication parameters

3.11.1 List of parameters



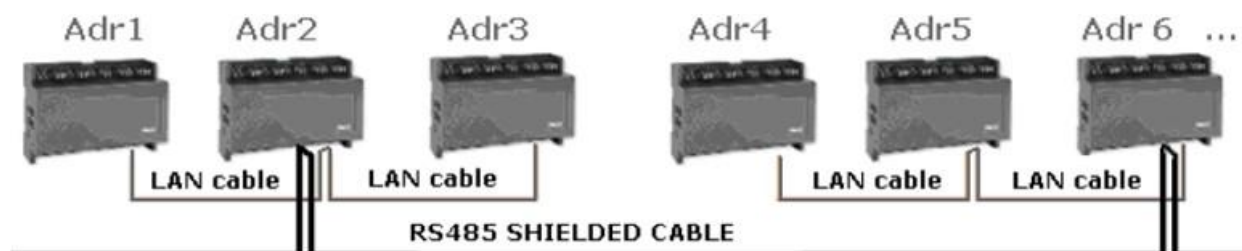
COM

Parameter	Description	Options	Unit of measurement	Range	Default
<i>Ad r</i>	RS485 serial address	-	-	1...247	1

Parameter	Description	Options	Unit of measurement	Range	Default
<i>b A u</i>	Set the speed in communication between:	9.6...9600	-	-	9.6
		19.2...19200			
		38.4...38400			
		57.6...57600			
		115...115000			
<i>P A r</i>	Parity check	no = no parity check	-	-	no
		odd = odd parity check			
		EvE = even parity check			
<i>F n</i>	Read-only parameters	Std = standard: the parameters can be changed	-	-	Std
		ro = read-only mode: the parameters can be read but not changed by the supervision system			

Note: identify each device with a different address via parameter *Adr*.
Use a shielded cable for the connection. Max distance: **1km**.
The address *Adr* is the same as that used for the LAN.

NOTICE: only connect one device per LAN to the RS485 connection.



NOTICE: DO NOT connect the shielding to the GND terminal or the device's earth.

3.12 User interface parameters

3.12.1 List of parameters

Ui

Parameter	Description	Options	Unit of measurement	Range	Default
<i>P S U</i>	Password setting for second-level parameters	-	-	0...999	22

3.13 Other parameters (read only)

3.13.1 List of parameters

 *oth*

Parameter	Description	Options	Unit of measurement	Range	Default
<i>r E L</i>	Software version	-	-	-	-
<i>S r L</i>	Software subversion	-	-	-	-
<i>F d Y</i>	Firmware release date: day	-	-	-	-
<i>F M n</i>	Firmware release date: month	-	-	-	-
<i>F Y r</i>	Firmware release date: year	-	-	-	-
<i>P t b</i>	Table of parameters	-	-	-	-

3.14 HOT KEY flash drive

3.14.1 Download the parameters to the flash drive

1. Set the controller programmed with the desired values.
2. Insert the flash drive with the controller ON, then press Δ : the download of the parameters to the flash drive starts and the display shows **uPL** flashing.
3. At the end of the operation, the display shows the following for 10 sec:
 - **End** if programming was successful.
 - **Err** if programming failed.

Note: pressing the Δ button restarts programming.

3.14.2 Load the parameters from the flash drive

To program the controller with a previously programmed flash drive, proceed as follows:

1. Switch off the instrument or put it in stand-by via the keyboard.
2. Insert the programmed flash drive.
3. Switch on the instrument: data is automatically downloaded from the flash drive to the controller, and

the display shows **d o L** flashing.

4. At the end of the operation, the display shows the following for 10 sec:
 - **End** if programming was successful and adjustment starts again.
 - **Err** if programming failed.

Note: repeat the operation or remove the flash drive to start with normal adjustment.



4. Diagnostics and communication

4.1 Errors indicated by the controller

4.1.1 Skills



COMPANY

4.1.2 Errors

The reset of each alarm described below is automatic upon re-entry of the mentioned condition.

ID	Reference	Condition / Meaning	How the machine behaves	Reset
<i>n o d</i>	No display	The keyboard is trying to communicate with another board in LAN but is not responding or there is a problem with the connection. Press the 'up arrow' for 3 sec, enter the 'SEC' menu and select 'LOC'.	The machine works normally.	AUT
<i>r S t</i>	-	Alarm reset	The alarm relay is reset.	AUT
<i>n o P</i>	Probe input	Probe not configured	The compressor enters a cycle of 15 min on (Con) and 15 min off (Cof).	AUT
<i>n o L</i>	-	The keyboard does not communicate with the WRA Series board.	Check the wiring and call Service.	AUT
<i>P 1</i>	Probe input	Cold room probe error, check connection	The compressor enters a cycle of 15 min on (Con) and 15 min off (Cof).	AUT
<i>P 2</i>	Probe input	Defrosting probe error, check connection	Defrosting lasts according to parameter (MdF).	AUT
<i>P 3</i>	Probe input	Probe P3 error (default - probe not configured)	The machine works normally.	AUT
<i>P 4</i>	Probe input	Probe P4 error (default - probe not configured)	The machine works normally.	AUT
<i>H R</i>	Temperature threshold	High-temperature alarm; triggered when the setpoint value + "ALU"+ "AHy" diff. param. is exceeded. Delays 'dAO' (start-up), 'ALd' (threshold), 'EdA' (defrost), 'dot' (door opening) is considered.	The machine works normally.	AUT

ID	Reference	Condition / Meaning	How the machine behaves	Reset
L R	Temperature threshold	High-temperature alarm; triggered when the setpoint value + "ALL" param. + "AHy" diff. is exceeded. Delays 'dAO' (start-up), 'ALd' (threshold), 'EdA' (defrost), 'dot' (door opening) are considered.	The machine works normally.	AUT
H R 2	Second temperature threshold	If rA2 ≠ nP, then: High-temperature alarm; triggered when the setpoint value + "A2U" param. + "A2H" diff. is exceeded. Delays 'dAO' (start-up), 'A2d' (threshold), 'EdA' (defrost), 'dot' (door opening) are considered.	The machine works normally.	AUT
L R 2	Second temperature threshold	If rA2 ≠ nP, then: High-temperature alarm; triggered when the setpoint value + "A2L" param. + "A2H" diff. is exceeded. Delays 'dAO' (start-up), 'A2d' (threshold), 'EdA' (defrost), 'dot' (door opening) are considered.	The machine works normally.	AUT
P R	Digital input	Blocking due to the pressure switch tripping; the alarm will only be displayed after the pressure switch trips 'nP5' times within the 'd3d' time span.	All OFF outputs; power must be disconnected to reset alarm.	SEMI-AUT
d R	Digital input	Warning due to door opening. 'd#d' delays are considered (default: 'd1d').	Compressor, fans OFF (depending on "odc" parameter) and cold room light on. After the alarm, adjustment resumes following the 'rrd' parameter.	AUT
E R	Digital input	Compressor 1-2 digital input activated (compressor circuit breaker activation)	The alarm relay is activated. The compressor in alarm stops electro-mechanically. The compressor not in alarm remains active.	AUT*
C R	Digital input	Not configured	All outputs OFF	AUT
C P 1	Compressor 1 alarm	Not configured	All outputs active except that of comp.1, alarm relay activated	AUT*
C P 2	Compressor 2 alarm	Not configured	All outputs active except that of comp.2, alarm relay activated	AUT*
E E	-	Faulty EEPROM memory	All outputs OFF - Board to be replaced	AUT

Note (*): AUT alarm reset, intervention on compressor(s) circuit breaker required

5.1 Disposal

5.1.1 Warnings

Polluting materials. Environmental contamination.



Disposal of polluting materials according to DIRECTIVE 2012/19/EU (WEEE) and It. Legislative Decree 49/2014 on waste electrical and electronic equipment:

- Do not throw away the packaging of your equipment but sort the materials according to local waste disposal regulations.
- This equipment must not be disposed of in municipal waste but must be disposed of as separate collection. Contact the Waste Electrical and Electronic Equipment (WEEE) collection centres in your area or return it to the vendor when purchasing equivalent new equipment.
- The symbol on the side indicates that the equipment cannot be disposed of as municipal waste.
- Unauthorised or incorrect disposal of the equipment will result in administrative and/or criminal penalties as provided for by the laws in force.