

UNIT AIR COOLERS

INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS

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This document defines the outline for installation, commissioning and maintenance of **UNIT AIR COOLERS** produced by FRITERM A.Ş.

Products mentioned, include the series given below:

PRODUCT	TYPE	SERIES
Unit Air Coolers	Standard Unit Coolers	FEA, FEC, FEH, FEM, FED, FEL
	Walk in room Coolers	FWRA, FWRH, FWRC
	Dual Discharge Coolers	FDDA, FDDH, FDDM
	Very Low Speed Dual Discharge Coolers	FDCA, FDCH
	Water-Glycol Standard Unit Coolers	GCA, GCH
	Water-Glycol Dual Discharge Coolers	GDDA, GDDH, GDDM

1. GENERAL

The instructions below should be observed for health and safety reasons, during installation, use and maintenance of the product.

When product received, it should be inspected visually and supplier should be informed within 7 days incase of any damage or **deficiency**.

2. HANDLING AND STORAGE

Check if there is any damage on product or package.

Store the product in its original **package** in a dry area protected from **the improper weather conditions** or protect it from dirt and **enviromental effects** until final installation is done.

Do not keep the product in extreme hot and cold places.

Avoid extreme long storage time (maximum one year is recommended for storage)

If the product is stationary for long periods in humid atmosphere, it should be runned for minimum of two hours per month to remove any damp that may have condensed within the motor.

A forklift or crane should be used to carry heavy products. **Work gloves** should be used if light products are handled without any lifting vehicle.

3. INSTALLATION

System **installer** is responsible for the accordance of adequate installation and safety informations with valid standards and instructions. (DIN EN 292/294)

Builder or operator should observe EMC 89/336 EEC instructions.

Before installation, it should be ensured that product's technical specifications are in accordance with desired working conditions.

3.1 Location

Product is designed to work only for fixed location. It should be installed on stable base.

Ventilation of working place should be sufficient and there should not be any hazardous substances and explosives.

Air motion should not be adversely affected by obstructions and the inlet air should not be undesirably heated or cooled by other devices.

3.2. Installation

Installation and electrical connections must only be carried out by qualified personnel.

Care should be taken while unpacking and installing of the products in order not to cause any damage to the tubes and piping connections.

During installation, product should not be connected to power supply.

The installing position of product should be in accordance with its design.

Connections used in installation should be adequate to support the total operational forces.

Installation should not carry external vibrations to the product. If necessary, a vibration eliminator should be added to the system.

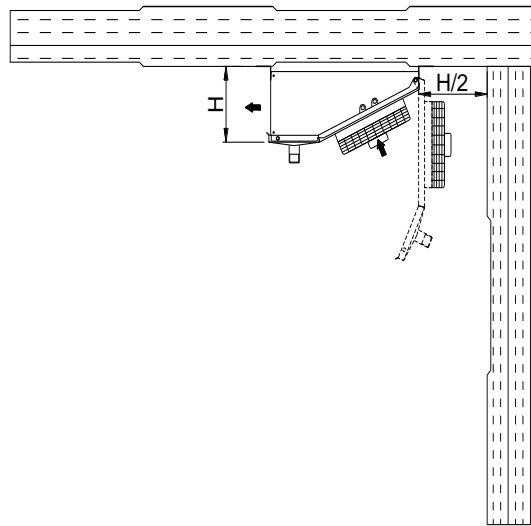


Figure 1. Walk in room coolers placing in cold room

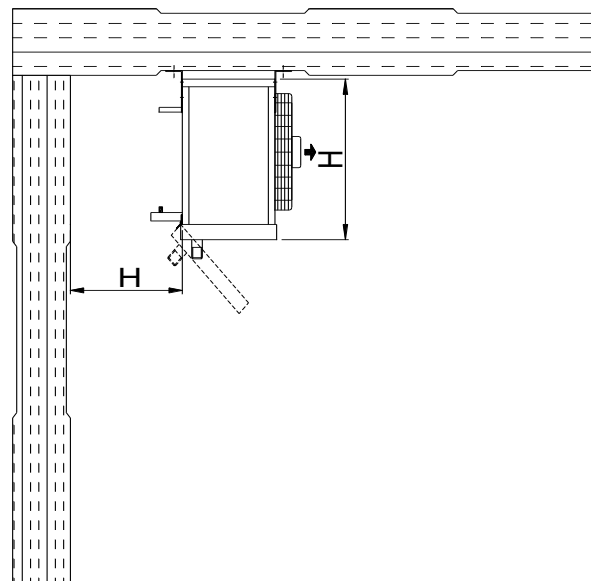


Figure 2. Standard unit coolers placing in cold room

3.2.1. Fans

SAFETY INFORMATION

- The fans are only intended for the transfer of air or air-like mixtures. They can not be used for any other purposes.
- Installation, electrical connection and commissioning must only be carried out by qualified personnel. (According to DIN EN 50 110 or IEC 364)
- **The fan can be used within the ranges specified on the label!**
- The maximum **allowable** operating data are valid **for the condition of air density 1,2 kg/m³**.
- The thermistor or PTC resistors mounted on the winding serve as motor cut-out switches and must be connected!
- Permissible testing voltage for thermistor, is max. 2.5 V.
- Motor cut-out switch should be employed for motors without thermistor.

- EMC manual should be followed in connection with control units. If fans are completed with components of other manufacturers, the operator or the manufacturer of the plant is responsible for keeping EMC 89/336/EWG manual.
- Pay attention to the notes about maintenance and service.
- The operating instructions are part of the product and should be kept carefully.

INSTALLATION

- Do not use metal compression-gland fittings together with plastic terminal boxes. If connection is incorrect, there is a danger of electric shock.
- Use a dummy plug seal for the compression-gland fitting as well.
- **When operated** under extreme conditions (damp operating environment, open air installations), **pre-installed sealing elements should be used.**
- Depending on the type of cable gland, attach a water drain sleeve or use a sealing compound.
- **Bolt** on plastic terminal box covers should be sealed with sealant.
- Starting torque for cover bolts:
Plastic version 1.3 Nm
Metal version 2.6 Nm
- Secure fan connection cable to protection grille or motor struts, with cable fasteners.
- Thermistors and PTC resistors with triggering device must be connected.
- Thermistors must be integrated in the control circuit in such a way that, **if the circuit is shut down by thermistor**, the motor can not switch on again automatically after it has cooled down. It is possible to protect several motors by connecting motor's thermistor in series with a control tool. Be aware that If thermistor cut out the circuit in one motor, **all the motors will be out of service.** Because of this, in practice, motors are assembled in groups. So if a motor goes out of order, only its group does not work and in emergency there is still a reduced performance even if a motor fails.

COMMISSIONING

Before initial operation, check the following:

- Installation and electrical connection have been properly completed.
- Safety equipment is in its place.
- All leftover installation materials and unfamiliar objects have been removed from fan cavity.
- Protective earth conductor is connected.
- Thermistor or motor cut-out switch has been installed properly and **it** is operational.
- Cable gland is sealed. (see "installation")
- The position of the installation corresponds to **condensed** drainage.
- Connection datas are in accordance with **label** specifications.
- Motor operating capacitor data (1,~ motor) is in accordance with the specifications on the **label.**
- Commissioning may only take place if all safety instructions have been checked and **danger is excluded.**
- Check the sense of rotation and air feed direction.
- **Be sure that running of motor is smooth.**
- Check if there are intensive vibrations due to uneven running (out-of-balance) or not.

This may be caused by improper handling and bad storage. In such case, fan can not be used.

MAINTENANCE AND SERVICE

- Outdoor Fans

If a fan is stationary for long periods in humid atmosphere, it should be run for minimum of two hours per month to remove any damp that may have condensed within the motor.

Maintenance is only to be performed by qualified service personnel.

Maintenance should be in accordance with service, operation and operator's safety rules. (DIN EN 50110)

- During maintenance;

Fan impeller **must** come to a standstill!

Power supply must be interrupted and secured against restoration. No maintenance work should be done at running fan.

Do not clean the running fan with high-pressure cleaner. ("steam jet")!

Do not wet-clean the fan when it is connected to the power supply; otherwise it can cause electric shock.

Danger to life. Keep the airways of the fan free because of objects dropping out.

Record unusual noises.

Replace the bearings in greasing period or if there is a breakdown. Consult to our maintenance guide or service department (special tools may be required.)

Replace the bearings only with original parts.

Electrical connection diagrams of fans are given below.

CONNECTION OF SINGLE FAN MOTOR	CONNECTION OF MULTI-FAN MOTORS
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Figure 3. Single Phase Fan Connection (Ø300; Ø350; Ø400; Ø450) (For a single fan and multi-fans)

CONNECTION OF SINGLE FAN MOTOR	CONNECTION OF MULTI-FAN MOTORS
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Figure 4. Single Phase Fan Connection (Ø500) (For a single fan and multi-fans)

Figure 5. Three Phase Fan Connection (Ø500) (For a single fan and multi-fans)

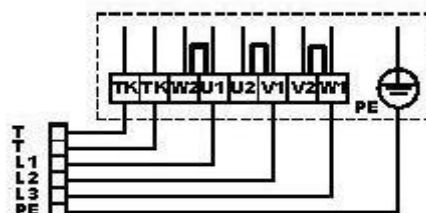


Figure 6. Three Phase Fan High Speed Connection Diagram

Unless otherwise declared, three phase double speed fans are connected to the standard evaporators as operating in high speed. For low speed or double speed connection, following diagrams should be observed.

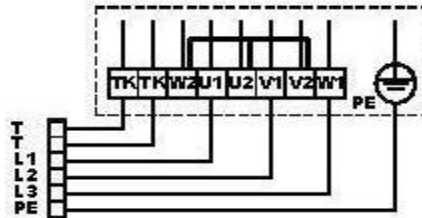


Figure 7. Three Phase Fan Low Speed Connection Diagram

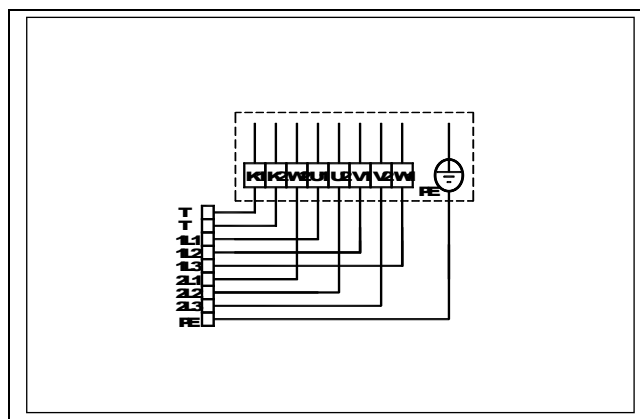


Figure 8. Three Phase Double Speed Motor Connection

To prevent incorrect connection of evaporators with three phase fan, "400V3 ~" label is sticked under label of the product.

Connection diagrams are valid for the fans that are used in standard products (EBM, Ziehl Abegg, Rosenberg fans) by FRITERM. During replacement, if another manufacturer's fan is employed, connection should be done as specified on the fan. Refer to the catalogs for fan diameter and number of fans.

3.2.2. Heaters

Ring pliers should be used for installing or uninstalling the heater fasteners.

Heater connection diagrams are shown below.

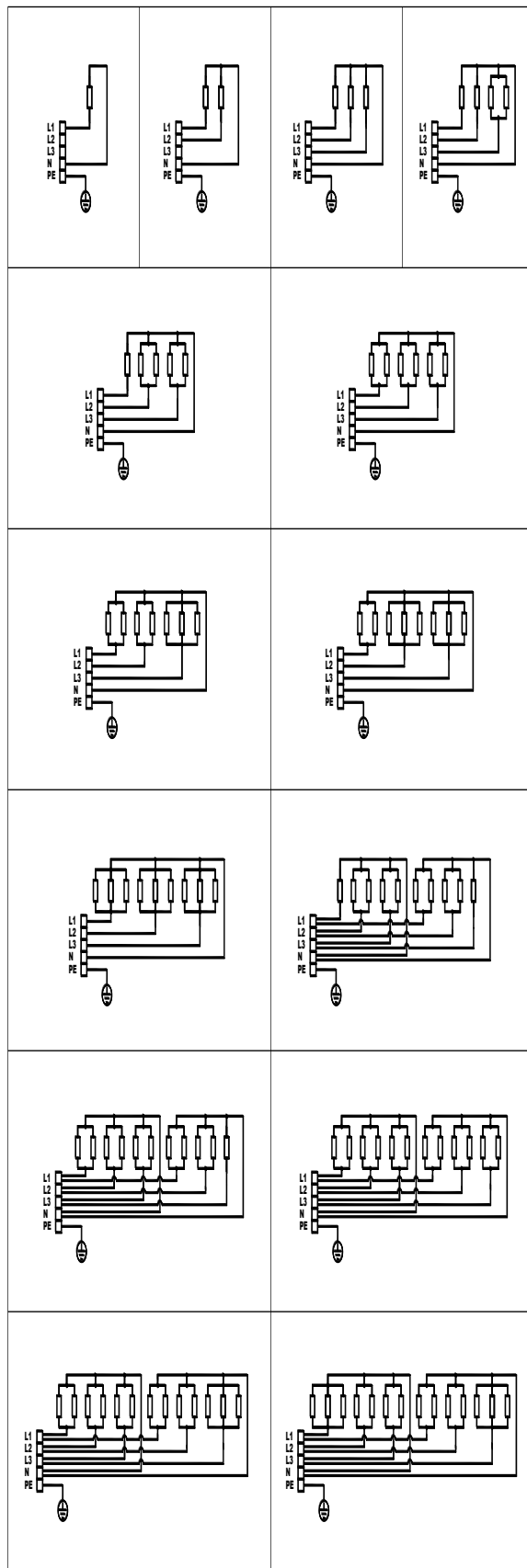


Figure 9. Drain pan heaters and electric defrost heaters of unit coolers connection diagrams

Refer to the product catalogs for number of heaters and power.

If current exceeds 25 A in any line, connections are arranged as below.

Figure 10. Electric defrost heater connection diagram applied to prevent current exceeds 25

A in any line

Heaters are fixed to pipes from two sides with rings. To uninstall heaters, firstly rings need to be uninstalled with pliers. When a new heater is installed, heaters should be fixed by rings **again**.

Electrical connections should be in accordance with regarding specifications and earth connection should be accurate.

4. START UP

Before running the product for the first time, all fan guards, motor connections and junction box covers should be controlled for safety. Mechanical, electrical connections should be accurate. Electric cables should be remote from fans **so that** fans can rotate freely.

5. OPERATING

If a fan is stationary for long periods in humid atmosphere, it should be runned for minimum of two hours per month to remove any damp that may have condensed within the motor.

It is recommended for fans to start up to 6 times, in extreme cases maximum 10 times per hour.

When fans are running, objects that **may** pass through the fan guards such as a piece of cloth or long hair, should be kept away from fan.

Stay away from the airways of the fans **while** fans are running.

The operation should be stopped and the supplier should be consulted in case of any unusual working condition, like an unusual operating noise, is realized.

Do not maintain and service the product during operation.

6. MAINTENANCE AND SERVICE

Maintenance and service must only be carried out by qualified personnel.

Please observe safety regulations and employee's protection rules during maintenance and service.

(DIN EN 50110)

Fluid circulation should be stopped and **it must be ensured that there is no power supply connection during maintenance and service.**

If pipes in product or connection pipes, need to be repaired, the fluid in system must be discharged.

Under usual operating conditions, fans do not require 'bearing maintenance' in 30.000-40.000 hours.

Lubrication is unnecessary unless this time is expired or bearings are damaged.

Bearings should be replaced with original parts. During the maintenance and service of fans, instructions prepared by fan supplier should be followed. If necessary, apply to the manufacturer.

Be sure that there is not any left tool or unfamiliar object in or near the product during maintenance and service.

After maintenance and service, before running the system, control the Initial Starting instructions.

6.1. Periodic Controls (once a year)

Fin and pipes should be controlled whether there is a corrosion or not. There can be leakage if pipes are worn out.

Pipeline should be controlled for damage or leakage.

Mechanical and electrical connections of fans should be controlled. Fans should rotate freely. Fan guard should be stable.

All connections, especially installations of fan motor and product must be ensured to be secure.

6.2. If necessary

Surface of the heat exchangers should be inspected for dirt and dust and if necessary it should be cleaned with soft brush, pressurized air or pressurized hot water or similar method.

Take care that fins and fans are not damaged. The chemicals that can be in reaction with the product's material, should not be used. But, if necessary, adequate chemicals can be used on condition that they do not react with the product's material. Electrical connections and fan motors should not be wetted during cleaning.

7. SOUND PRESSURE LEVELS

FAN DIAMETER	RPM	Sound Power Level	Number of Fans	1	2	3	4
Ø 200	1400	49	SOUND PRESSURE LEVEL dB(A) (At distance 3 m)	31	34	36	37
Ø 250	1300	54		43	48	50	51
Ø 250	1400	54		43	48	50	51
Ø 300	1300	60		46	49	51	52
Ø 300	1400	60		46	49	51	52
Ø 350	1400	64		50	53	55	-
Ø 400	1430	69		60	63	65	66
Ø 450	1400	73		64	67	69	70
Ø 500	1210	73		51	54	56	57

Sound pressure levels as dBA at a distance of 3 m for different number of standard fans used in FRITERM products (REF: EN13487). Test datas are taken from fan manufacturer's documents. The values given above are only for comparison. Actual values may depend on the environmental factors and installation characteristics.

8. INVALIDITY OF WARRANTY

The warranty declared in sales contract, is valid unless installation; operation; maintenance instructions, given in this document and its attachment, are violated.



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