

## **FR-I Air Curtain Horizontal & Vertical**



## **INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS**

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# 1. INTRODUCTION

Frenger is a market leading brand, renowned worldwide for specialist heating and cooling solutions, stemming back to the early 1930's and work in association with Thermoscreens for their FRA ranges of Air Curtains.

Like all our other products, the FR-I air curtains range has been designed with energy efficiency in mind.

The models are designed to be installed horizontally over or vertically next to a door opening, inside a building.

They must not be installed on the outside of a building.

Please enter the following information for future reference:

Purchase date .....

Where purchased .....

Serial number .....

If you wish to make a warranty claim, you will need the proof of purchase.



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## 2. SAFETY INSTRUCTIONS

### 2.1 Safety in use

**WARNING:** Do not put any objects into the inlets and outlets.

**WARNING:** Do not obstruct the unit's inlets or outlets.

**WARNING:** The upper surface of the unit becomes hot during operation.

**CAUTION:** In exceptional situations, water may run out of the unit. Therefore, do not place anything under the unit that could be damaged as a result.

### 2.2 Safety issues relating to installation, maintenance and servicing

**DANGER:** The unit may only be opened by qualified technical staff.

**WARNING:** Perform the following actions before opening the unit:

1. Switch the unit off using the control panel.
2. Wait until the fans have stopped.

**DANGER:** The fans may continue rotating for a while.

3. Allow the unit to cool down.

**CAUTION:** The heat exchanger or, the case or the heating elements can get very hot.

4. Disconnect the mains supply ( set the isolation switch to OFF).

**5. For water-heated models:**

shut off the central heating feed (if possible).

**WARNING:** The fins of the heat exchanger are sharp.

## 3. RESTRICTIONS ON USE

### 3.1 Field of application

- The unit is only to be used indoors.
- The unit is suitable only for dry and non-dusty environments.
- The unit is not to be used in an environment where corrosive or chemically aggressive gases are present.
- The unit is suitable for ambient temperatures from 0°C to 40°C.

These restrictions also apply to the control unit and/or control panel.

### 3.2 Required skills

- You must be technically qualified to install, maintain or service the unit in accordance with local legislation, regulations, and standards.
- For operation in daily use, no special skills are required.
- The unit is not intended for use by children or people with an intellectual disability.

**DANGER: Do NOT attempt to install, maintain or service the unit unless you are adequately qualified to do so.**

## 4. DELIVERY CONTENTS

The delivery consists of the following components:

**NOTE:** Report any damage to the driver immediately.

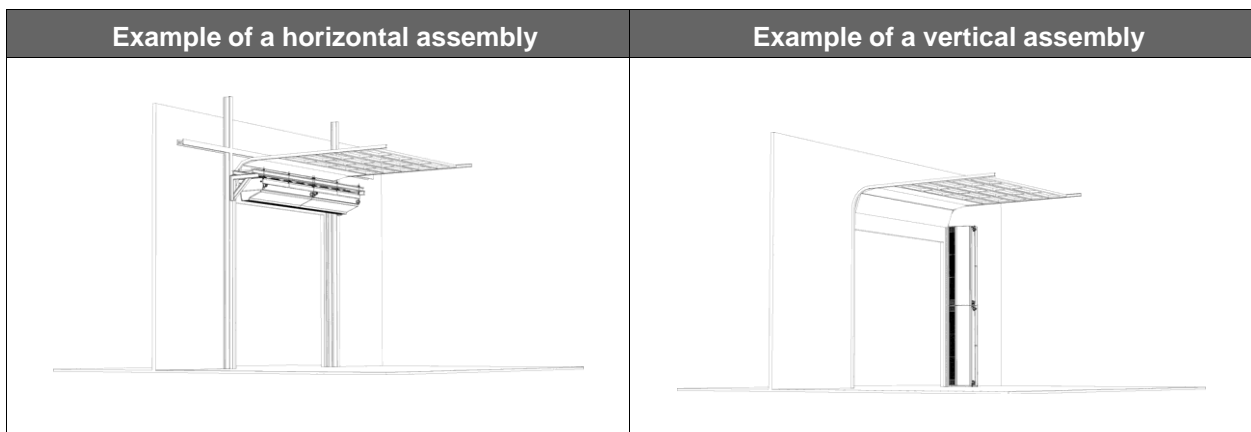
Contact your supplier if any components are missing.

- FR-I air curtain
- Attachment hooks (6 per unit)
- Coupling plates (4 per unit)
- Base plate with 4 base coupling plates (for vertical installation)
- Door contact switch (optional)

## 5. INSTALLATION

### 5.1 Applications

The air curtain can be hung horizontally above the doorway or erected vertically next to the doorway (on left or right, or on both sides).



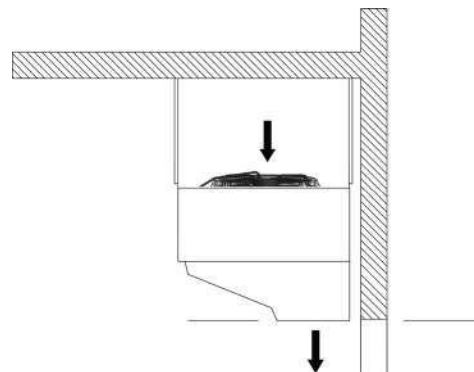
### 5.2 Hanging up the unit horizontally

#### 5.2.1 Determining the location of the unit

- Make sure that the structure from which the unit is about to be suspended can bear at least 4 times the weight of the unit.
- Note the following dimensions:
  - The unit must be at least as wide as the door opening.
  - Position the unit as near to the doorway as possible.
  - Position the unit as close to the top of the door as possible.

**WARNING: The minimum installation height is 1.8 m.**

- If the unit is mounted against the ceiling, Make sure that air can enter the unit freely above the unit.



### 5.2.2 Suspending and securing the unit

1. Lay the unit in a horizontal position.

**CAUTION:** Make sure the fins of the discharge grille are not damaged.

**NOTE:** The unit is screwed securely to the pallet using attachment hooks.



2. Fix the attachment hooks to the corners of the unit.

**NOTE: For FR-I 2200 models:** Fix attachment hooks to the centre of the unit as well.

3. Affix threaded rods (M8) to the attachment hooks.
4. Provide all threaded rods with lock nuts and tighten them.
5. Affix lock nuts to the top of each threaded rod.
6. Bring the unit into position using lifting equipment.
7. Fix the threaded rods to the ceiling or some auxiliary structure.

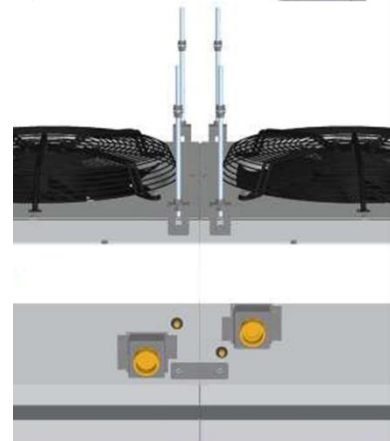
**NOTE:** Adjust the unit to hang level and horizontal in both directions.



8. Repeat steps 1 to 7 for each unit to be suspended.
9. Secure all units by tightening the locking nuts.

**NOTE:** The threaded rods must be secured, otherwise the unit may fall down.

10. Fix the units to each other using a coupling plate on each side of the unit.



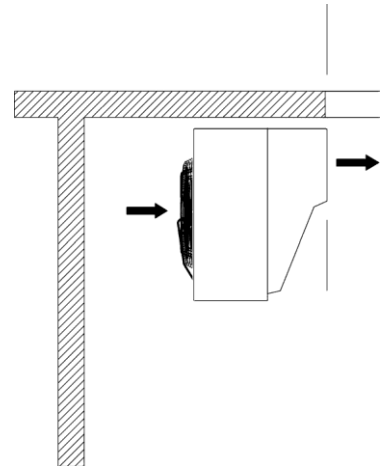


## 5.3 Installing the unit vertically

### 5.3.1 Determining the location of the unit

- Place the units on the left or right hand side of the door.
- Position the discharge side of the unit so that its breadth coincides with that of the doorway.
- Position the discharge side of the unit as close to the doorway as possible, to ensure optimum operation.
- Units of different sizes can be placed on each other in random order.
- Make sure that the intake side and the inspection side of the units remain accessible for maintenance.

**CAUTION:** Make sure that all units can freely take in and discharge air across their entire height.



### 5.3.2 Fitting and securing the units

1. Position the base plate and fix it to the floor.

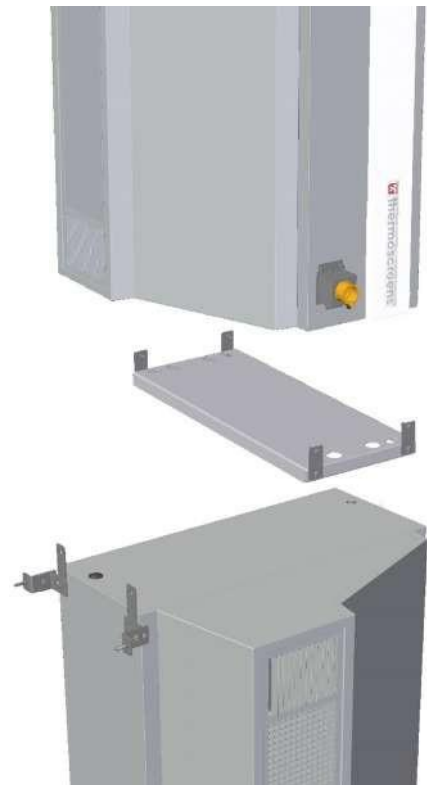
**CAUTION:** Ensure that the base plate is level.

2. Fix the unit to the base plate using the 4 base coupling plates.
3. Fix the top corners of the unit to the wall using the attachment hooks.

**NOTE:** Attach coupling plates directly to the attachment hooks if a further unit is to be attached to this unit.

**CAUTION: For FR-I 2200 models:** Fix the centre of the unit to the wall as well using attachment hooks.

4. Fix the next unit to the underlying unit with the 4 coupling plates.
5. Repeat steps 3 and 4 for each unit to be installed.



## 6. CONNECTING TO CENTRAL HEATING SYSTEM

Only for water-heated models (type W)

### 6.1 Special points

**CAUTION:** The central heating system's supply and return pipes must be attached to the correct corresponding connectors. On the unit, the directions are indicated with arrows.

- Keep the connectors in place by using pliers when connecting the pipes.
- Insert a valve on both pipes close to the unit.
- The unit is fitted with valves for venting.

#### Application limits

Heating medium		water with max. 20% glycol
Maximum water flow-path	type W1	125/105 °C
	type W2	90/70 °C
	type W3	80/60 °C
Maximum discharge temperature		60°C
Maximum operating pressure		see type plate

### 6.2 Frost protection

Take the following precautions if you install the unit in a room where frost may occur:

- Ensure constant circulation of the water at the right temperature;
- Add up to glycol to the water when the unit is not in operation during the wintertime;
- Or bleed the system and the unit.

### 6.3 Connecting the unit

1. Connect the unit to the central heating system.
2. Vent the heat exchangers.
3. Check the connections for leakage.

## 7. CONNECTING THE UNIT TO THE MAINS SUPPLY

### 7.1 Special points regarding the mains supply

**WARNING:** The unit must be earthed.

**WARNING:** The unit must be connected in accordance with the applicable local requirements.

**NOTE:** An isolation switch (not supplied) must be fitted between the system and the mains supply.  
This switch must:

- be all-pole,
- have a contact separation of at least 3 mm,
- be positioned near the unit.

#### 7.1.1 Fuse ratings

**WARNING:** Each unit must be fused in accordance with the table below.

##### Fuse ratings

	Maximum fuse value A
≤ 10 A	16 A

**NOTE:** A single fuse may only be used for multiple units if they draw a total current of less than 10 A.

### 7.2 Mounting and connecting the control box

**WARNING:** Make sure that the mains supply on which you are working has been turned off.

**WARNING:** Only connect the unit if you are qualified to work on three-phase power systems.

**Make sure that the mains supply on which you are working has been turned off.**

**NOTE:** Use the control box manual for fixing and connecting.

1. Fasten the control box near to the unit.
2. Fit an isolation switch between the mains supply and the control box and connect it to the mains supply.

**NOTE:** Set the isolation switch to 0.

3. Connect the control box to the isolation switch.



**Please note, this control box is an optional extra and will only be supplied if they are ordered with the Air Curtain units.**

## 7.3 Connecting the unit

**WARNING:** This manual describes connection via a control box. If no control box is used, the installer must make his own provisions to ensure the thermal switches turn off the unit in the event of overheating.

**NOTE:** The illustrations show horizontally hung units. The principle for connecting vertically hung units is the same.

1. Lay a mains power cable between the control box and the unit.
2. Remove the first cover of the cable tray, depending on the side through which you lead the cable into the unit.

**NOTE:** You may feed the cable inward through either end (of the row of units), as you choose.

3. Feed the mains power cable through the cable gland.
4. Connect the cable to the terminal in the unit according to the wiring diagram.
5. Connect the mains power cable to the isolation switch.

**CAUTION:** Do not switch on the mains supply yet.



### 7.3.1 Connecting multiple units

**WARNING:** Up to 11 fans can be daisy chained.

**The fans are visible on the top of the units.**

1. Remove the covers of the cable trays that adjoin each other.
2. Lay a mains power cable between the terminals.
3. Connect the cable to the terminals according to the wiring diagram.

**CAUTION:** Do not switch on the mains supply yet.



## 8. SWITCHING ON AND CHECKING OPERATION

### For all models:

1. Check the following connections:
  - power supply;
  - cable(s) between control box and unit(s);
  - **If applicable:**  
external control components.
2. Put the cover plates of the cable trays back in place.
3. Establish the correct rotation direction of the fans. This is indicated by an arrow on one of the fan blades.
4. Switch the mains supply on.
5. Start up the air curtain using on the control box.
6. Check that the fans are turning in the right direction.
7. Check that air is being blown out of all units across their full width.

### For water-heated models:

1. Check whether the heat exchanger is connected correctly.
2. Make sure that the central heating system has been turned on.
3. Feel whether the air stream is getting hotter for all connected units. This may take some time.
4. Vent the heat exchanger if necessary.

### 8.1 Hand-over

Hand the system over to the customer/end user, or a representative.

**Explain** that everyone who is going to operate the unit must receive instruction on safe use.

**Advise** them that the door should be closed whenever possible to save energy.

**Explain** that the inlet grilles must be cleaned regularly, and that the unit must be regularly maintained.

**NOTE:** Leave this manual with the customer/end user or their representative.

## 9. SIGNING OFF

Complete the form below after the commissioning has been completed.

<b>Installer's signature</b>		<b>Customer's signature</b>	
<b>Name of installer</b>		<b>Name of customer</b>	
<b>Installer's company</b>		<b>Customer's company</b>	
<b>Date</b>		<b>Date</b>	

## 10. USING THE CONTROL BOX

The components of the control box have the following functions:

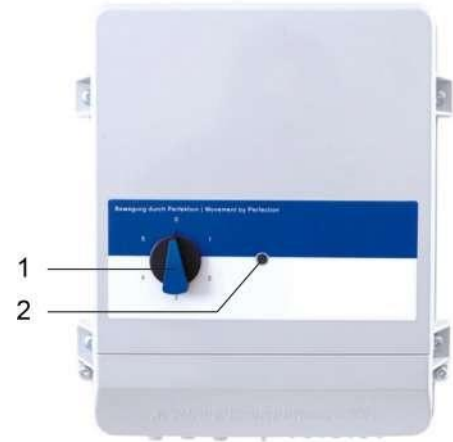
### 1 Mode button

Toggles between the various modes.

**OPMERKING:** At mode 0, the unit is switched off.

### 2 Indicator light

Is illuminated when the unit is on.



## 11. SERVICE & MAINTENANCE

### 11.1 Safety instructions

**WARNING:** Servicing activities may only be carried out by personnel who are technically qualified to do so.

**WARNING:** Before you begin: read the safety instructions.

### 11.2 Cleaning the unit

You can clean the exterior of the unit with a damp cloth and a domestic cleaning agent. Do not use any solvents.

**CAUTION:** Make sure that no water runs into the unit.

### 11.3 Scheduled maintenance

#### 11.3.1 Monthly maintenance

**With all units:**

- Check the heating elements and the fans for dust and other dirt; if necessary, clean.
- Check that all fans work.
- Check the discharge section for pollution/dirt and/or blockage; if necessary, clean.

**For units with water heating:**

- Check for water leakage; if this should be the case, then switch off the unit so that it is electrically dead and repair the leakage.
- Check whether the water piping system contains air; if necessary, vent the air out of the system.

#### 11.3.2 Annual maintenance

- Carry out all monthly checks.
- Check the cabling between the terminal boxes in the units and the control unit.
- Inspect the casing, the suspension or mounting structure, and the securing of each unit.
- Check whether the fans are firmly attached and are not running out of true; if necessary, fasten them again.



## 12. ERRORS

### 12.1 Thermal cut-out of the fans

The control box incorporates a thermal cut-out for the fans.

If the thermal cut-out has switched the unit off:

1. Turn the unit off:
  - Set the button on the control box to '0'.
2. Cut off the mains supply
3. Allow the unit to cool down.
4. Identify and remove the cause of the error.
5. Switch on the mains supply.
6. Turn the unit on:
  - Set the button on the control box to the desired mode.
7. Check the operation of the unit.

**NOTE:** Contact the installer if this error occurs repeatedly.



### 12.2 Fuses

The unit is fused externally. In the event of an electrical malfunction, the fuses may blow.

**NOTE:** First identify and remove the cause of the error before replacing the fuses.

## **13. WARRANTY**

All units are supplied with a 3-year warranty.

If you encounter any problems, please contact your installer/supplier.

If this is not possible, you can contact Frenger.

Great care has been taken in the composition of these instructions to guarantee they are correct. Frenger renounces any liability for damage or loss due to inaccuracies and/or omissions in this documentation.

Frenger reserves the right to alter the specifications as mentioned in this manual.

## 14. DECLARATION OF CONTRACT

### EC DECLARATION OF CONFORMITY

Herewith we declare that the air movement equipment designated below, on the basis of its design and construction in the form brought onto the market by us in accordance with the relevant safety, health and performance requirements of the Machinery.

If alterations are made to the machinery without prior consultations with us, this declaration becomes invalid.

**Designation of Equipment:**

AIR CURTAINS

**Series Type:**

FR-I 1100A, FR-I 1650A, FR-I 2200A, FR-I 1100W1, FR-I 1650W1, FR-I 2200W1, FR-I 1100W2, FR-I 1650W2, FR-I 2200W2, FR-I 1100W3, FR-I 1650W3, FR-I 2200W3

**In accordance with the following Directives:**

the Machinery Directive (2006/42/EC)

the Low Voltage Directive (2014/35/EU)

the Electromagnetic Compatibility Directive (2014/30/EU)

**Has been designed and manufactured to the following specifications:**

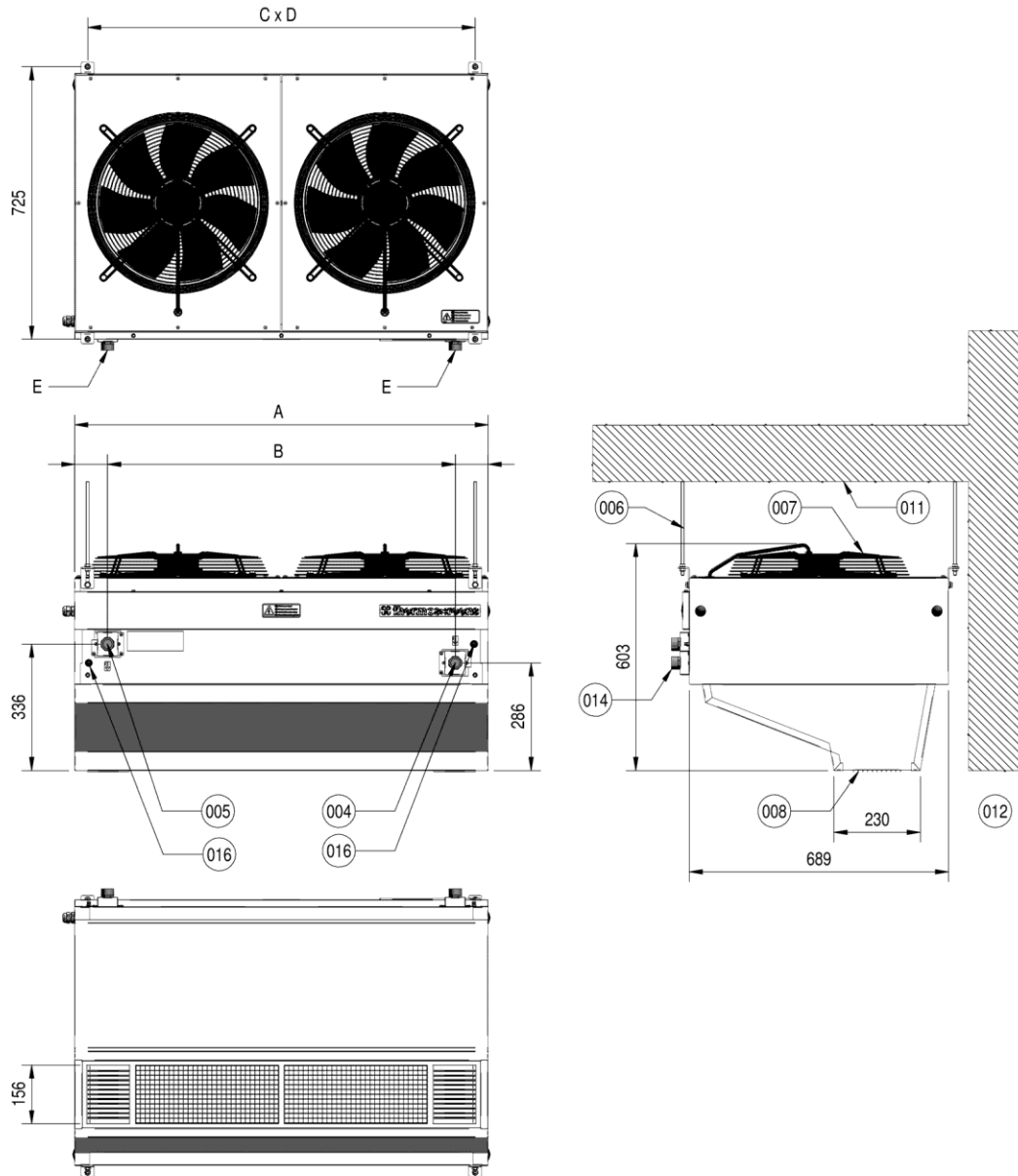
EN61000-6-2 Electromagnetic Compatibility (EMC) Part 6-2: Generic standards – Immunity for industrial environments

EN61000-6-3 Electromagnetic Compatibility (EMC) Part 6-3: Generic standards – Emission standard for residential, commercial, and light-industrial environments

EN60335-1 (Including A14) Safety of household and similar electrical appliances Part 1: General requirements

EN60335-2-30 Safety of household and similar electrical appliance's part 2-30 Particular requirements for room heaters

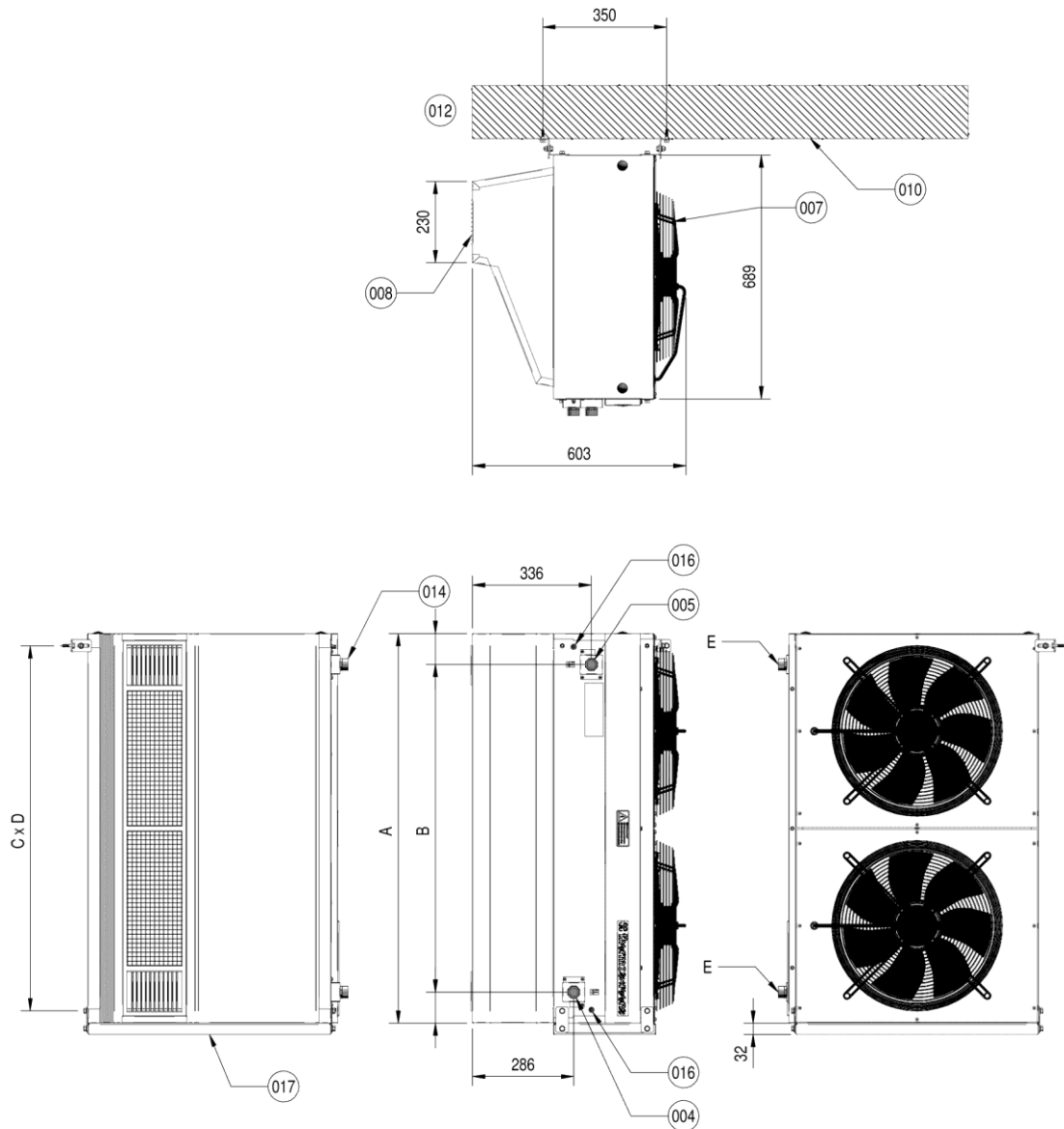
## 15. APPENDIX 1A – FR-I DIMENSIONS HORIZONTAL



	A	B	C	D	E
<b>FR-I 1100</b>	1100	925	1	1031	-
<b>FR-I 1650</b>	1650	1475	1	1582	-
<b>FR-I 2200</b>	2200	2025	2	1065.5	-
<b>W1</b>					G1"
<b>W2</b>					G 1 1/4"
<b>W3</b>					G1 1 1/4"
<b>A</b>					-

01	M8 Inserts
02	Connection control panel
03	Connection G1" Insert
04	Flow
05	Return
06	M8 Threaded rods
07	Air Inlet
08	Air Outlet
09	250 mm for pipework and air inlet are recommended (free hanging model)

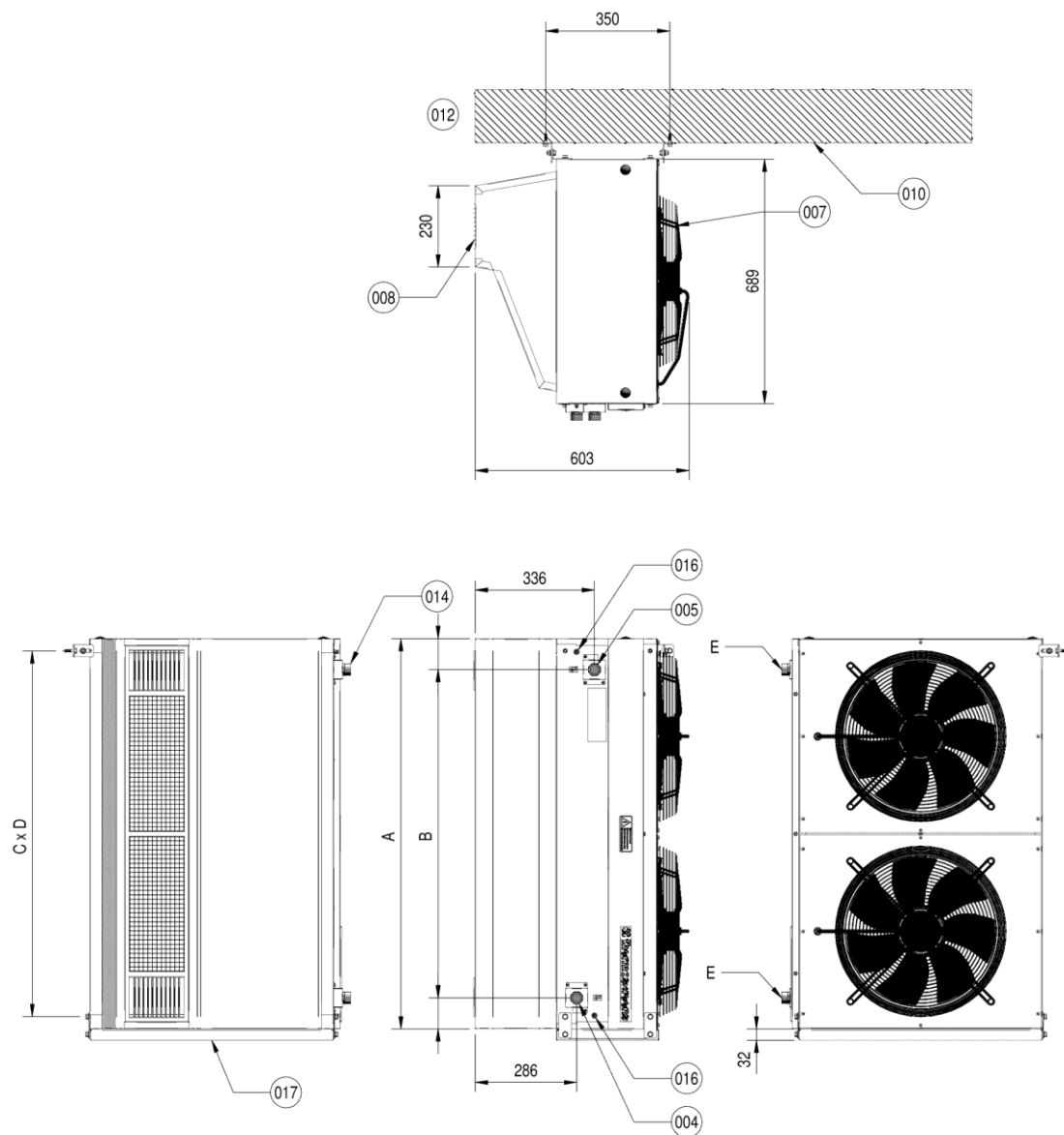
## 16. APPENDIX 1B – FR-I DIMENSIONS VERTICAL



	A	B	C	D	E
<b>FR-I 1100</b>	1100	925	1	1031	-
<b>FR-I 1650</b>	1650	1475	1	1582	-
<b>FR-I 2200</b>	2200	2025	2	1065.5	-
<b>W1</b>					G1"
<b>W2</b>					G 1 1/4"
<b>W3</b>					G1 1 1/4"
<b>A</b>					-

04	Flow
05	Return
07	Air inlet
08	Air outlet
10	Wall
12	Door
14	External thread
16	Air vent
17	Base plate

## 17. APPENDIX 1B – FR-I DIMENSIONS VERTICAL



	A	B	C	D	E
<b>FR-I 1100</b>	1100	925	1	1031	-
<b>FR-I 1650</b>	1650	1475	1	1582	-
<b>FR-I 2200</b>	2200	2025	2	1065.5	-
<b>W1</b>					G1"
<b>W2</b>					G 1 1/4"
<b>W3</b>					G1 1 1/4"
<b>A</b>					-

04	Flow
05	Return
07	Air inlet
08	Air outlet
10	Wall
12	Door
14	External thread
16	Air vent
17	Base plate