Safety

Instruction manual
Read this instruction manual first!

Since this option is a supplementary part of the variable speed drive (VSD), the user must be acquainted with the original instruction manual of the variable speed drive. All safety instructions, warnings, etc. as mentioned in this instruction manual are to be known to the user.

Safety instructions
Read the safety instructions in the instruction manual for the variable speed drive.

Installation
Installation, commissioning, dismounting, making measurements, etc. on the variable speed drive may only be carried out by personnel who are technically qualified for the task. Installation must also be carried out in accordance with the local standards. Ensure that all necessary safety measures are taken.

WARNING: Take all necessary safety precautions during installation and commissioning to prevent personal injuries, e.g. by an uncontrolled load.

Opening the variable speed drive

WARNING: Always switch off the mains supply before opening the variable speed drive and wait at least 7 minutes to allow the buffer capacitors to discharge.

Always take adequate precautions before opening the variable speed drive, even though the connections for the control signals and jumpers are isolated from the mains voltage.
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1. General Information

1.1 Introduction
The Emotron FDU2.0 and VFX2.0 series frequency inverters in IP20 frame sizes G and up for 400 V, and H69 and up for 690 V can be integrated in a standard cabinet to increase the protection class up to the class IP54.

When integrating these types of units in a cabinet, care should be taken to ensure retention of the nominal operating conditions, as described in the Cabinet Mounting Instructions. It is important to ensure that adequate air-cooling is available, so that the drives can operate as specified as well as comply with the protection class requirements.

Emotron has therefore designed different “roof-unit” solutions, which ensure that all the operating conditions are complied with.

This air-cooling solution provides IP54 protection, and depending on the type of inverter there will be a roof unit for a 2-stack or 3-stack air duct solution on the top of the cabinet.

1.2 Package contents
The following come supplied with the air duct:
- Air duct with fixed mounting clips, fixed gasket (to seal roof and cabinet) and installed filters (for specification see paragraph 2.1, page 7)
- Four hooks and fixing materials
- Drill template to position the air duct on rooftop
- Datasheet and instruction manual
- Plug connector for electrical connection

1.3 Overview of air duct
Table 1 contains an overview of the VSD types and their equivalent recommended roof unit for a 2-stack or 3-stack air duct.

<table>
<thead>
<tr>
<th>VSD</th>
<th>Qty.</th>
<th>Type of air duct</th>
</tr>
</thead>
<tbody>
<tr>
<td>G</td>
<td>1</td>
<td>01-4110-00 Roof unit for 2-stack</td>
</tr>
<tr>
<td>H (69)</td>
<td>1</td>
<td>01-4110-00 Roof unit for 2-stack</td>
</tr>
<tr>
<td>I (69)</td>
<td>1</td>
<td>01-4110-10 Roof unit for 3-stack</td>
</tr>
<tr>
<td>J (69)</td>
<td>2</td>
<td>01-4110-00 Roof unit for each 2-stack</td>
</tr>
<tr>
<td>K (69)</td>
<td>2</td>
<td>01-4110-10 Roof unit for each 3-stack</td>
</tr>
</tbody>
</table>

Fig. 1 and Fig. 2 show the air duct positioned on top of the cabinet.

Table 1 Type of air duct

On two sides of the air duct there are two clips. The air duct comes supplied complete with hooks that are to be fitted to the rooftop. The drill template shows where the hooks are to be placed and is separately delivered with the airduct.

In Fig. 2 you can see that for installation of a roof unit for 3-stack air duct the air ducts are rotated 90 degrees. In Fig. 3 you can see how the hooks and clips are attached to the rooftop.

Fig. 1 Example of roof unit for 2-stack

Fig. 2 Example of roof unit for 3-stack

Fig. 3 Close-up of clips
1.4 Dimensions

Fig. 4 shows the external dimensions of an air duct. Depending on frame size, one or more of these air ducts are used; see Table 1.

Fig. 4 Dimensions of 2-stack air duct
2. Technical Information

2.1 General information
The fan unit is supplied with an Wiltec W290 filter that is installed in the air duct. Table 2 shows the specifications for the air duct and the filter.

To ensure a stable working, it is recommended that the same filter be used.

Table 2 Assembly information

<table>
<thead>
<tr>
<th>Type</th>
<th>Specification 50 Hz</th>
<th>Specification 60 Hz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Filter</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thickness of synthetic fibres</td>
<td>17 mm</td>
<td></td>
</tr>
<tr>
<td>Filter effectiveness</td>
<td>80 - 85%</td>
<td></td>
</tr>
<tr>
<td>Colour of filter</td>
<td>White</td>
<td></td>
</tr>
<tr>
<td>Filter class</td>
<td>G3</td>
<td></td>
</tr>
<tr>
<td>Airduct</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Net weight</td>
<td>20 kg</td>
<td></td>
</tr>
<tr>
<td>Protection class</td>
<td>IP54</td>
<td></td>
</tr>
<tr>
<td>Colour</td>
<td>RAL 7035</td>
<td></td>
</tr>
<tr>
<td>Compliance with</td>
<td>CE</td>
<td></td>
</tr>
<tr>
<td>Material</td>
<td>Aluzink</td>
<td></td>
</tr>
<tr>
<td>Air flow (free flow)</td>
<td>1650 m³/h</td>
<td>1870m³/h</td>
</tr>
<tr>
<td>Surface treatment</td>
<td>Powder coated</td>
<td></td>
</tr>
<tr>
<td>Fan</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lifetime (L10)</td>
<td>30,000 hrs</td>
<td></td>
</tr>
<tr>
<td>Max. working temperature</td>
<td>60 °C</td>
<td>50 °C</td>
</tr>
</tbody>
</table>

2.2 Electrical connection
The wiring diagrams can be found in the appendix to this document.

Table 3 contains the electrical specifications.

Table 3 Electrical information

<table>
<thead>
<tr>
<th>Specification</th>
<th>50 Hz</th>
<th>60 Hz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage</td>
<td>230V</td>
<td>230V</td>
</tr>
<tr>
<td>Power consumption</td>
<td>280 W</td>
<td>430 W</td>
</tr>
<tr>
<td>Sound pressure level</td>
<td>77 dB</td>
<td>80 dB</td>
</tr>
</tbody>
</table>

Table 4 Plint on the roof unit

<table>
<thead>
<tr>
<th>Min cable thickness</th>
<th>0.75 mm² / 24 AWG/kcmil</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max cable thickness</td>
<td>4 mm² / 10 AWG/kcmil</td>
</tr>
<tr>
<td>Nominal voltage</td>
<td>400 V</td>
</tr>
<tr>
<td>Nominal current</td>
<td>20 A</td>
</tr>
<tr>
<td>Insulation material</td>
<td>PA</td>
</tr>
<tr>
<td>Flammability class</td>
<td>V0 (UL94)</td>
</tr>
</tbody>
</table>

(always in accordance with local regulations and standards)
3. Mounting Instructions

On delivery of an air duct, the rooftop of the cabinet has to be adapted.

Check that the package contents are complete (see paragraph 1.2, page 5).

Depending on the type of air duct, the mounting instruction are for a roof unit for 2-stack or a roof unit for 3-stack air duct.

Remember that with a roof unit for 3-stack air duct, the air duct is rotated 90 degrees.

3.1 2-stack air duct mounting instructions

1. Check the template model and dimensions before cutting and making holes.
2. Use adhesive tape to fix the drilling templates to the roof of the cabinet.
3. Cut and drill the big holes for the fan unit and the holes for attachment of the clips, as shown in the drawing.
4. Mount the fan unit with four-clips; the clips can be attached using 8 M6x10 screws.

NOTE: Always use air inlets in the doors in combination with the air duct.

3.2 3-stack air duct mounting instructions

1. Check the template model and dimensions before cutting and making holes.
2. Use adhesive tape to fix the drilling templates to the roof of the cabinet.
3. Cut and drill the big holes for the fan unit and the holes for attachment of the clips, as shown in the drawing.
4. Mount the fan unit with four-clips; the clips can be attached using 16 M6x10 screws.

NOTE: Always use air inlets in the doors in combination with the air duct.

3.3 Electrical installation

To make the electrical connections the air duct is connected via a Phoenix PC4/3-STF-7,62 connector.

Depending on whether the air duct is of 2-stack or 3-stack type the Phoenix connector is rotated 90 degrees. This is an option that has already been pre-configured during factory assembly.

The wiring diagrams for a roof unit for 2-stack and roof unit for 3-stack air duct are contained in Appendices A and B to this document. Further technical details are visible in Table 3.
4. Maintenance

In time the filters inside the air duct may get contaminated by particles from the surrounding air. This will decrease the airflow. When the airflow decreases, the risk that the internal temperature goes above the maximum internal cabinet temperature, increases.

The contamination of the filters is heavily dependent on the environment in which the VSD is located.

To ensure free airflow we recommend checking the filters on a regular basis. When the filters are contaminated or clogged, replace the filters.

Table 5  Number of filters and part number

<table>
<thead>
<tr>
<th>VSD</th>
<th>Number of Filters</th>
<th>Qty.</th>
<th>Part No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>G</td>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>H (69)</td>
<td></td>
<td>1</td>
<td>01-4099-00</td>
</tr>
<tr>
<td>I (69)</td>
<td></td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>J (69)</td>
<td></td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>K (69)</td>
<td></td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>
5. Appendix

5.1 Appendix A: Wiring
Diagram for 2-Stack Air Duct
5.2 Appendix B: Wiring
Diagram for 3-Stack Air Duct

Roof-Unit 1 Connection

Roof-Unit 2 Connection

CABINET COOLING FAN
1.25A/230VAC

K11

C1

PE

L/230VAC

N/230VAC

Blue
Black
Brown
Green/Yellow

L
N
PE