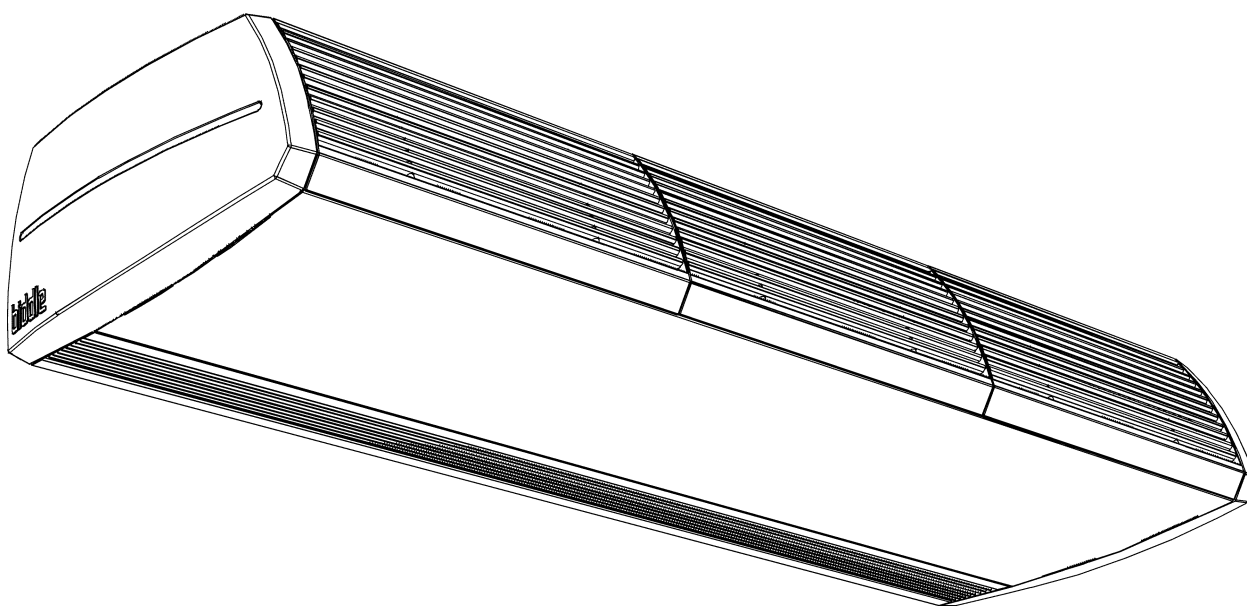
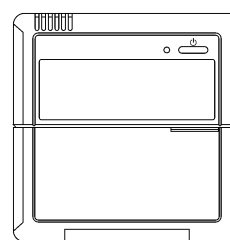
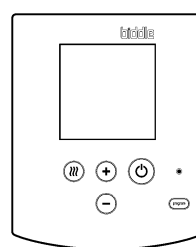


# Manual

# Comfort Air Curtain

# for Direct Expansion

Model CA V



Version: 5.1



**DAIKIN**



**biddle**

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# 1 . . Introduction

## 1.1 About this manual

This manual relates to the comfort air curtain, models CA V, which are intended specifically for application within Daikin direct expansion systems.

This manual contains information and instructions for installation, operation and maintenance, which are specific to these particular unit models.

## 1.2 How to use this manual

### 1.2.1 General

This manual is a leading. It should be read in the written order.

From this manual, references are made to:

- the manual of the Biddle CA model Comfort Air Curtain
- the manuals of the Daikin system components (outdoor unit, indoor unit, operation panel, etc.)

Before carrying out any work on this appliance, read this manual, and all referred sections in other manuals, completely through in the presented order.

### 1.2.2 Marginal symbols

In this manual the following marginal symbols are used:



**Note:**

Draws your attention to an important part of the text.  
Read this part of the text carefully.



**Caution:**

If you do not perform this procedure or action correctly you can damage the device.  
So follow the instructions carefully.

**Warning:**

If you do not perform this procedure or action correctly you can cause bodily injury and/or damage. So follow the instructions carefully.



**Danger:**

This indicates actions which are not permitted. Ignoring this warning can lead to serious damage or accidents which may involve bodily injury. The action concerned may only be performed by qualified technical staff when carrying out maintenance or repair.

### 1.2.3 Pictograms on the device and in the guide

The pictograms in table I-1 refer to possible risks and/or dangers. You will find these pictograms in the text when risky actions are being discussed. The same pictograms will also be found on the device.

**Table I-1** Pictograms

PICTOGRAM	DESCRIPTION
	<b>Warning:</b> You are entering an area which contains 'live' components. Accessible to qualified maintenance staff only. Caution is urged.
	<b>Warning:</b> This surface or part can be hot. There is a risk of burns on contact.

### 1.2.4 Related documentation

Besides this manual, the following documents are supplied with this unit:

- Biddle CA model Comfort Air Curtain Manual;
- wiring diagram for installation and service.

## 1.3 About the unit

### 1.3.1 System operation

The air curtain is connected within a Daikin direct expansion system. Air discharged by the appliance is heated by the refrigerant.

The air curtain is controlled and operated partially by the Daikin system, and partially by the Biddle system.

### 1.3.2 Outside air temperature sensor (accessory)

The sensor controls the air curtain in response to outside air temperatures. At lower temperatures, the unit is set one or two settings higher.

### 1.3.3 Limitations

- The unit can only be applied within Daikin direct expansion systems.
- The unit is not suitable for cooling.
- No external controls may be connected to the unit.

### 1.3.4 Models and type references



Table I-2 provides an overview of the models, that are described in this manual, and their corresponding type references. Combined, the type references constitute the type code, for instance: CA V-M-150-DK80-F. Several combinations are available.

**Table I-2** Type code explained

TYPE CODE ELEMENT	REFERENCE	MEANING
Biddle product series	CA	air curtain, CA model
Daikin system	V	for connection within Daikin VRV system ('multi')
capacity	S, M, L or XL	small, medium, large or extra large range
discharge width	100, 150, 200 or 250	discharge width in cm
heating	DK80 ... DK250	heating within Daikin direct expansion system (The number corresponds to the Daikin capacity index.)
mounting method	F	free-hanging model
	R	recessed model
	C	cassette model

### 1.3.5 Type plate

The type plate can be found at the left side, on the inlet side (under the inlet cover).

 Biddle bv Markovlei 4 NL-9288 HA Kootsterlille  	Type	CA V-M-150-DK80-F		
	Code	1213	U	230 V 1N- 50 Hz
	N°	5426/1-1 00-01	I <sub>max</sub> L1	2.4 A
			I <sub>max</sub> L2	-
	M	60 kg	I <sub>max</sub> L3	-
	Medium	R410A	P <sub>motor</sub>	0.56 kW
	P <sub>max</sub>		P <sub>heating</sub>	-

Example of a type plate

It lists the following data:

- *Type*: full type code of the unit;
- *Code*: unit code of the Biddle electronic controller;
- *M*: weight of the unit;
- *Medium*: refrigerant
- $U, I_{max}, P_{motor}$ : maximum load on the electrical system by the unit.

### 1.3.6 Components and accessories

#### Daikin components

The following components are required with an installation:

- outdoor unit
- *optional*: one or several indoor units
- Daikin operation panel
- materials necessary for connection, e.g. refrigerant pipes, cables, etc.: see the outdoor unit's Installation Manual.



#### Note:

The outdoor unit's control system and capacity index must match with those of the air curtain unit. These are referred to by the type code: see section 1.3.4.

#### Biddle components

The following components are delivered separately but always required:

- Biddle control panel (able to control a maximum of 10 units);
- Biddle control cable, available in various lengths;
- *only with free-hanging models*: set of end panels.

#### Accessories

The following accessories are available as options:

- outdoor air temperature sensor;
- wall bracket set, 'Standard' or 'Design';
- threaded rod lining;



## I.4 Safety instructions

### I.4.1 Operation



**Warning:**  
Do not put any objects in the inlets and outlets.



**Warning:**  
Do not block the inlets and outlets.



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



**Caution:**  
Water may leak from the unit in exceptional situations. Do not place anything under the unit that may suffer damage as a result of any leakage.

### I.4.2 Installation, maintenance and service



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



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



1. Switch the system Off using the Daikin operation panel.
2. Wait until the fans of the air curtain unit have stopped.
3. Allow the unit to cool down.



- The heat exchanger can get very hot. Moreover, the fans may keep on running for a while.
4. Disconnect power supply to the Daikin outdoor unit
  5. Disconnect power supply to the air curtain unit.



**Caution:**  
If the unit is working, or just has worked in defrost mode, there may be water in the inspection panel.



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

# 2. . Installation

## 2.1 General instructions



**Warning:**

Installation may only be carried out by technically qualified staff.



**Warning:**

Follow the safety instructions in Section 1.4.



**Caution:**

The unit should be connected in compliance with all local statutory regulations, instructions and standards.



**Caution:**

Taking in building dust, grit, cement powder etc. may damage the unit. While such substances are present in the room:

- do **not** start to use the device,
- cover air intake and discharge openings.

You may cover the unit with the packaging material.

## 2.2 Delivery check

- Check the unit and its packaging for correct delivery. Immediately report to the supplier any damage caused in transit.
- Check whether all parts are included.

## 2.3 Installation procedure

Install the system in the following predefined order:

- I. Install Daikin components as described in the relevant manuals:
  - outdoor unit
  - **if applicable to your system:** indoor unit(s)
  - operation panel

2. Install the air curtain unit as described in the 'Installation' chapter in the CA model Air Curtain Manual:
  1. Mount the unit.
  2. Install the control panel.
  3. Finish the unit.
4. Connect the air curtain unit to the power supply (see Section 2.4)
5. Connect the air curtain unit to the Daikin system (see Section 2.5).
6. Install the outside air temperature sensor (optional, see Section 2.6)
7. Turn the system on and check that it functions properly (see Section 2.7)

## 2.4 Connecting the unit to the power supply

1. Ensure that an (earthed/grounded) power point is available at a maximum of 1.5 m from the left side of the unit.



**Warning:**

The unit must be earthed (grounded).



**Warning:**

The wall socket must remain accessible after the installation of the unit to be able to disconnect the unit from the mains when maintenance work is to be performed.

## 2.5 Connecting the unit to the Daikin system

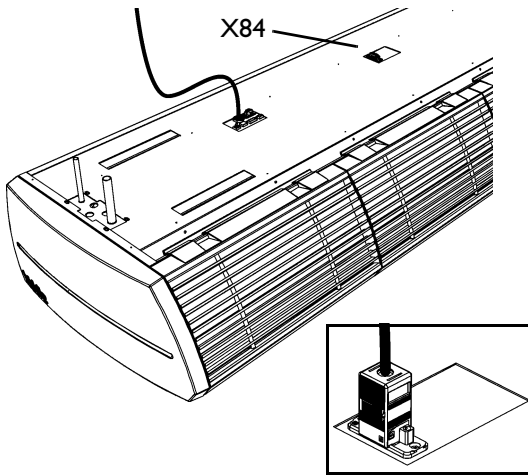
### 2.5.1 Connecting the control system

#### All models



**Caution:**

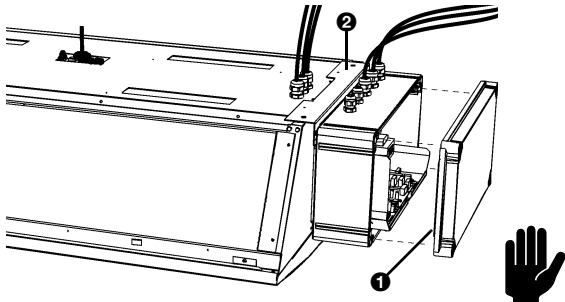
Use a cable with a minimum cross-sectional area of 0.75 mm<sup>2</sup>.



**Models with discharge widths 150, 200, or 250**

1. Connect the system controller to the X84 connector located on the top of the air curtain:
  - Connect the controller cable from the outdoor unit to F1/F2.
  - **If applied to your unit:** Connect the Daikin operation panel to P1/P2.
2. Attach the cable housing (supplied) to the connector.

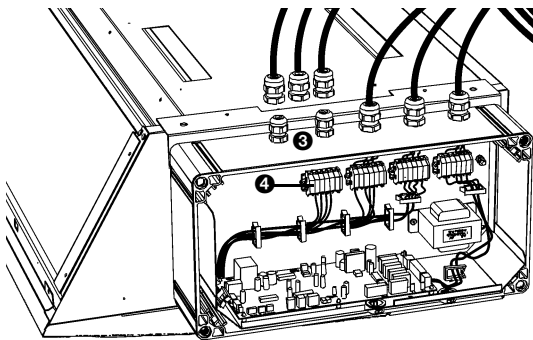
**Models with discharge width 100**



1. Remove the cover ❶ from the box on the side of the unit.
2. **Optional:** Detach the box from the unit:
  - Remove the bracket ❷ from the unit and from the box.
  - Mount the box to the wall at a place of your choice.

**Caution:**

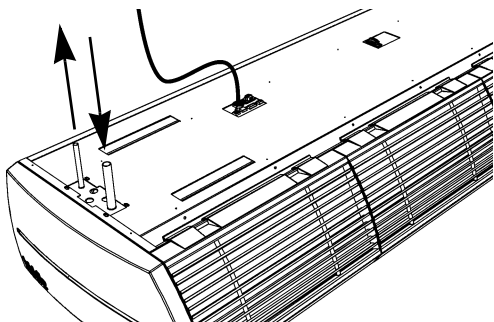
Do **not** detach the cables between the unit and the box.



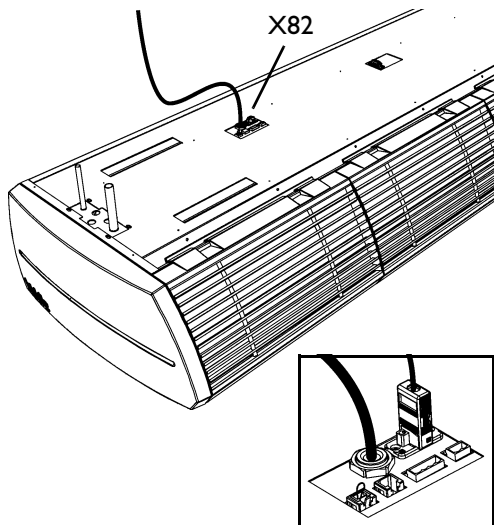
3. Lead the control cable(s) into the box through the free cable gland(s) ❸.
4. Connect the system controller to the terminal block ❹:
  - Connect the controller cable from the outdoor unit to F1/F2.
  - **If applied to your unit:** Connect the Daikin operation panel to P1/P2.
5. Screw down the cable gland(s).
6. Put the cover ❶ back onto the box.

**2.5.2 Connecting the refrigerant**

- Attach the pipes as described in the Daikin outdoor unit Installation Manual.
- Attach the pipelines to the protruding pipe ends on the top surface of the unit by means of a soldered joint.



## 2.6 Installing the outside air temperature sensor (accessory)



1. Attach the outside air temperature sensor to the outside of the building.

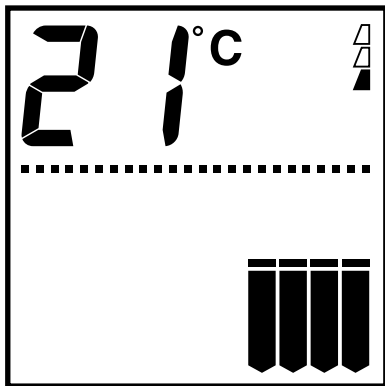


**Note:**

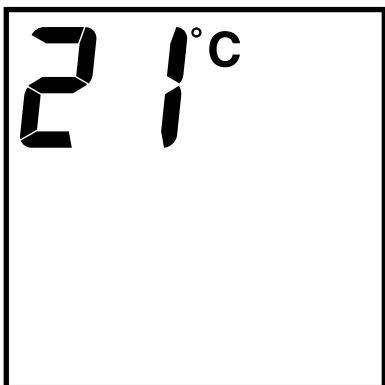
Do not place the sensor in direct sunlight.

2. Connect the sensor to the X82 connector on top of the air curtain.
3. Attach the cable housing (supplied) to the connector.

## 2.7 Switching on and testing operation



display for operational air curtain



display for non-operational air curtain

### 2.7.1 Switching the system on

1. Check all air curtain connectors:
  - power supply
  - control cable(s) connecting Biddle control panel and unit(s)
  - control cable(s) connecting Daikin outdoor unit and unit(s)
  - control cable(s) connecting Daikin operation panel and unit(s)
2. Turn on the power supply and/or put the air curtain plug in the socket.

If the unit is working correctly, then the Biddle control panel will display symbols.

**If multiple air curtain units have been attached:**

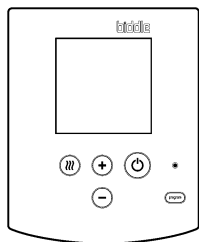
1. Turn on the power supply to all air curtain units.
2. Reset the Biddle control panel: Please refer to the CA model Air Curtain Manual.
3. **If applicable to your system:** Turn on the Daikin indoor unit(s) as described in their Installation Manual.
4. Turn on the Daikin outdoor unit as described in its Installation Manual.

### 2.7.2 Testing operation

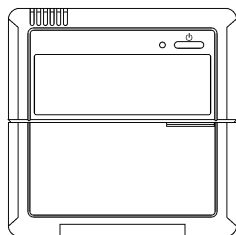
5. Test the system according to the outdoor unit's Installation Manual.
6. Operate the unit with the Daikin operation panel (see Chapter 3) and verify its operation:
  1. Switch the system On. The unit should start to discharge air.
  2. Set the operation mode to *Heating*, and set the temperature setpoint to maximum. After some time, the unit should discharge heated air.
  3. Set the operation mode to Fan only. After some time, the unit should discharge unheated air.
  4. Switch the system Off. After some time, the unit should turn itself off.
5. **If you have installed the outdoor air temperature sensor:** Verify the operation of the sensor with function no. 87 in the Installer's Level (see Section 4.2.2).

# 3 . . Operation

## 3.1 General



Biddle control panel



Daikin operation panel


The air curtain is operated partially from the Daikin operation panel, partially from the Biddle control panel.

Most features on the Daikin operation panel work as described its Operation Manual. However, several features do not work or operate differently.


The features on the Biddle control panel work as described below.

## 3.2 Switching On and Off


### 3.2.1 Switching the system On and Off

- To switch the system On or Off, press the  button on the Daikin operation panel.

When the LED next to this button is lit, the system is On. If the LED is flashing, there is a fault.

The  button on the Biddle control panel has no function. When the LED on this panel is lit, the system has turned off the air curtain.

### 3.2.2 Selecting the operation mode

- Select the operation mode with the  button on the Daikin operation panel:



- *Fan only*: the air curtain always discharges unheated air.




- *Heating*: the air curtain's heating is automatically controlled.

Other modes are not available.

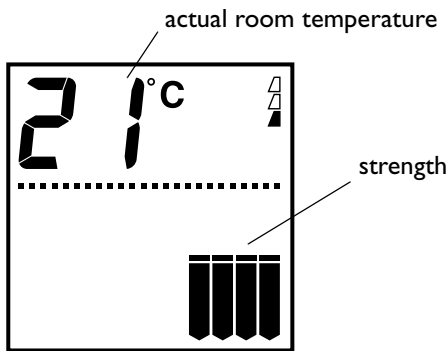
### 3.2.3 Defrosting



When the Daikin operation panel displays the  symbol, the system is working in defrost mode. Then, the air curtain will either discharge unheated air, or be turned off (depending on the settings, see Section 4.1.2).

Defrosting is activated automatically by the system when necessary. When the defrosting is done, the unit will operate normally again.




## 3.3 Air curtain settings



Display on Biddle control panel (example)

### 3.3.1 Adjusting settings

- Adjust the strength of the air curtain using the  $\oplus$  and  $\ominus$  buttons on the Biddle control panel.


The   and  buttons on the Daikin operation panel have no function.



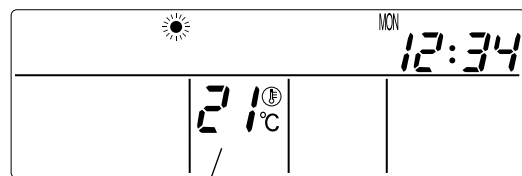
**Note:**

To achieve maximum climate separation with minimum energy consumption, Biddle recommends to select the lowest strength at which no draught occurs.

### 3.3.2 Adjusting heating

Adjust the temperature setpoint with the  buttons on the Daikin operation panel. The display on this panel shows the setpoint.

The system controls the air curtain's heating automatically. The heating is stopped when the setpoint is reached. Then, the air curtain will either discharge unheated air, or be turned off (depending on the settings, see Section 4.1.2).




temperature setpoint

Display on Daikin operation panel (example)



**Note:**

To prevent draught problems, Biddle recommends to adjust the temperature setpoint to maximum.

The  button on the Biddle control panel has no function. The display on this panel always shows the actual room temperature.



## 3.4 Messages on the Biddle control panel

### 3.4.1 Dirty-filter indicator



The number of 'full' triangles indicates the filter's service life: the more triangles, the longer the service life.

When the message **FILTER** appears, the filter's maximum life has lapsed: you should then clean or replace it.

For details on the filter indication, see the CA model Air Curtain Manual.

### 3.4.2 Outside air temperature sensor indication



If the  $\rightleftarrows$  symbol is displayed on the Biddle control panel, then the air curtain setting is turned up by the outside air temperature sensor.

### 3.4.3 Faults

The message **SERVICE** indicates that there is a fault. Next to it, the fault code is displayed.



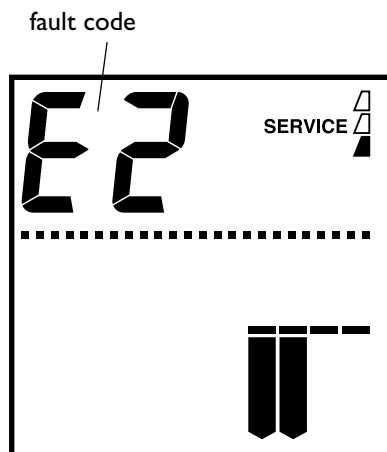
**Note:**

The fault code will disappear when you press any key.

The message **SERVICE** will however remain visible as long as the fault is not corrected.

If an fault code is displayed without the message **SERVICE**, the fault occurred in your absence, and has been resolved in the meantime.

For details on the fault messages, see the CA model Air Curtain Manual.



# 4. . Settings

## 4.1 Setting on the Daikin operation panel

### 4.1.1 General

On the Daikin operation panel, field settings can be performed as detailed in its Installation Manual.

The unit models described in this manual have some additional settings.

### 4.1.2 Additional field settings

MODE NO.	FIRST CODE NO.	DESCRIPTION OF SETTING	SECOND CODE NO.			
			01	02	03	04
(22)	3	Air curtain's operation when not heating	unheated (default)	unheated	halted (when 23-8 is set to 01)	--
(23)	8	Air curtain's operation in defrost mode	halted	unheated (default)	unheated	--

## 4.2 Settings on the Biddle control panel

### 4.2.1 General

On the Biddle control panel, settings can be performed at the *Manager's level* and at the *Installer's level* as detailed in the CA model Air Curtain Manual.

The unit models described in this manual have some additional settings. Conversely, certain functions do not work with these models.

#### 4.2.2 Additional functions at the Installer's level

No.	FUNCTION	OPTIONS	YOUR SETTING
85	Outside air temperature setpoint 1 If the outside air temperature falls below this point, then the air volume setting is increased by one level.	Pre-settable between -9.5 and +31 °C (default value = 0 °C) -- (below -9.5 °C): outdoor air temperature sensor regulation deactivated	
86	Outside air temperature setpoint 2 If the outside air temperature falls below this point, then the air volume setting is increased by two levels.	Pre-settable between -9.5 and +31 °C (default value = -9.5 °C) -- (below -9.5 °C): outdoor air temperature sensor regulation deactivated	
87	Current outside air temperature and sensor function test	The outside air temperature is displayed. flashing -9.5 °C: sensor not connected	

#### 4.2.3 Non-operational functions

- The outside air temperature reading (function no. 69) cannot be disabled.
- All functions relating to external controls (functions nos. 60, 61 & 76) cannot be set.
- All functions relating to discharge air temperature (functions nos. 1, 5, 51, 72 & 74) can be set, but have no effect.

# 5. Maintenance

## 5.1 Replacing or cleaning the filter

See the 'Maintenance' Section in the CA model Air Curtain Manual.

## 5.2 Cleaning the unit

You may clean the exterior of the unit with a damp cloth and a domestic cleaner. Do not use any solvents.



**Warning:**  
Ensure that no water runs into the unit.



**Warning:**  
Ensure that the connectors on the top surface are kept dry.

## 5.3 Scheduled maintenance

- Maintain the air curtain unit according to the 'Maintenance' Section in the CA model Air Curtain Manual.
- Maintain the Daikin components according to their Service Manuals from Daikin.

# 6 . . Faults

## 6.1 Safety instructions



**Danger:**

**Work on the unit's interior shall be performed by qualified technical staff only.**



**Warning:**

**Before opening the unit, follow the safety instructions in section 1.4.**

## 6.2 Testing for faults












**Note:**

No specialist skills are required to perform the tests described below.

If you suspect a fault, then perform the following steps to determine whether there is indeed a fault:

1. Determine whether the symptoms are part of normal operations as described in Section 6.3.
2. Determine whether the symptoms are caused by a fault as described in Section 6.4.
3. Set the system to heating mode using the Daikin operation panel and set the temperature setpoint to maximum.
  - If the appliance discharges no air at all, or no hot air, after 15 minutes, then there is a fault.
4. Set the temperature setpoint to minimum.
  - If the appliance still discharges hot air, after 15 minutes, then there is a fault.
5. If you have detected a fault, and Section 6.4 does not provide a solution, then contact the supplier.

### 6.3 Non-fault-related symptoms

SYMPTOM	EXPLANATION	ACTION
The displays of one or both control panels display is blank.	The unit connected to the control panel has no power supply.	Check the plug and the power supply.
The  ,  en  buttons on the Biddle control panel do not work.	These buttons have no function.	Switch the air curtain on with the Daikin operation panel. (See Section 3.2.)
The   and  buttons on the Daikin operation panel do not work.	These buttons have no function.	Control the strength of the air curtain with the Biddle control panel. (See Section 3.3.)
The air curtain does not work, and the LED on the Biddle control panel is lit.	Either the system is switched off, or it turned off the air curtain automatically.	Verify the settings on the Daikin operation panel. (See Sections 3.2, 3.3 en 4.1.)
The air curtain is discharging unheated air.	The system turned off the heating automatically.	Verify the settings on the Daikin operation panel. (See Sections 3.2, 3.3 en 4.1.)
The air curtain is discharging unheated or cold air, or does not work, and the Daikin operation panel displays    .	The system is working in defrost mode. This will take 5 to 10 minutes.	Wait until defrosting is done.

## 6.4 Faults with specific symptoms

SYMPTOM	EXPLANATION	ACTION
The Biddle control panel display is blank.	<ul style="list-style-type: none"> <li>• Connected unit has no power supply,</li> <li>• Faulty connection to control panel.</li> <li>• Fault in Biddle electronics in the unit.</li> </ul>	<ul style="list-style-type: none"> <li>• Check power supply.</li> <li>• Consult the 'Faults' section in CA model Air Curtain Manual.</li> </ul>
The Daikin operation panel display is blank.	<ul style="list-style-type: none"> <li>• Connected unit has no power supply,</li> <li>• Faulty connection to control panel.</li> <li>• Fault in Daikin electronics in the unit.</li> </ul>	<ul style="list-style-type: none"> <li>• Check power supply.</li> <li>• Consult Installation Manual of control panel.</li> <li>• Contact the supplier.</li> </ul>
Biddle control panel displays a fault message ( <b>SERVICE</b> and/or E or F plus a digit).	<ul style="list-style-type: none"> <li>• Biddle electronics signals a fault.</li> </ul>	<ul style="list-style-type: none"> <li>• Consult the 'Faults' section in CA model Air Curtain Manual.</li> </ul>
Daikin operation panel displays an fault message (flashing LED and/or fault code)	<ul style="list-style-type: none"> <li>• Daikin electronics in unit or outdoor unit signals a fault.</li> </ul>	<ul style="list-style-type: none"> <li>• Consult the Service Manual of the outdoor unit.</li> <li>• Contact the supplier.</li> </ul>
Air curtain does not work while Biddle control panel indicates that it is working (LED unlit, symbols on display, no <b>SERVICE</b> symbol).	<ul style="list-style-type: none"> <li>• Fault in Biddle electronics, transformer, fuse, or fans in unit.</li> </ul>	<ul style="list-style-type: none"> <li>• Consult the 'Faults' section in CA model Air Curtain Manual.</li> </ul>
Appliance discharges cooled air for a prolonged time and/or condensate is forming in the unit.	<ul style="list-style-type: none"> <li>• Fault in unit.</li> </ul> <p><b>Warning: This situation can be hazardous and/or cause damage.</b></p>	<ul style="list-style-type: none"> <li>• Turn the whole system off immediately.</li> <li>• Contact the supplier.</li> </ul>

# 7. . Service

## 7.1 Safety instructions



**Danger:**  
Service on the unit may be performed by qualified technical staff only.



**Warning:**  
Before opening the unit, follow the safety instructions in section 1.4.

## 7.2 Access to the interior of the unit

### 7.2.1 Opening the unit

See the 'Service' Chapter in the CA model Air Curtain Manual.

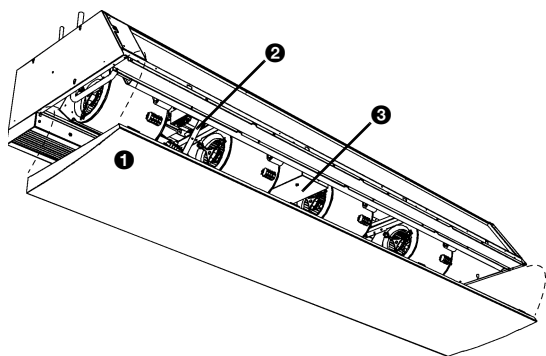
### 7.2.2 Accessing electronics in the unit



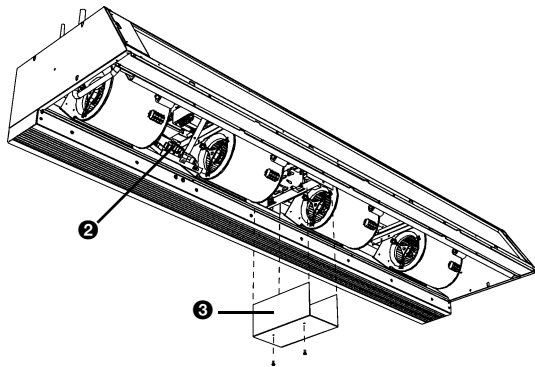
**Warning:**  
Before opening the unit:  
Follow the safety instructions in Section 1.4.

#### All models

1. Remove the inspection panel ❶ (see CA Model Air Curtain Manual).
2. Biddle electronics are located at ❷.

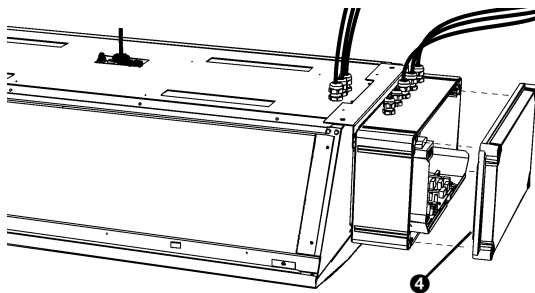






**Models with discharge widths 150, 200, or 250**

3. Remove cover ③. Daikin electronics are located behind this cover.



**Models with discharge width 100**

4. Remove the cover ④ from the box on the side of the unit. Daikin electronics are located behind this cover.

**7.3 Fuses**

There are 4 fuses in the unit. Their values are indicated near the fuse holders.

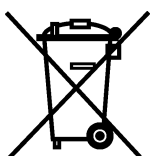
**Table 7-1** Locations of fuses

LABEL	LOCATION
F100	on PCB of Biddle electronics
F110	on PCB of Biddle electronics
transformer fuse (unlabelled)	near transformer with Biddle electronics
FIU	on PCB of Daikin electronics

**7.4 Other service works**

See the 'Service' Chapter in the CA model Air Curtain Manual.

# 8. . Dismantling



Dismantling the system, handling coolant, oil and other components should be performed by a qualified engineer in compliance with relevant local and national regulations.

Any used electrical/electronic devices must be handed in for processing in compliance with EU regulations. By ensuring that this product is disposed of in the correct manner, you prevent any damage to human health and/or the environment. For more information about this subject, please contact your supplier or local government agency.

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## Declaration of Conformity

manufacturer: Biddle BV  
address: Markowei 4  
9288 HA Kootstertille  
The Netherlands

We declare that the following product:

product description: Comfort Air Curtain  
brand: Biddle  
model: CA with integrated Daikin VRV system  
type: CA V-S-100/150/200/250  
CA V-M-100/150/200/250  
CA V-L-100/150/200/250  
CA V-XL-100/150/200/250

Remark: The installer is responsible for making the whole heating system comply with the PED directive.

In accordance with the following Directives:

2006/95/EC the Low Voltage Directive  
2004/108/EC the Electromagnetic Compatibility Directive

Has been designed and manufactured to the following specifications:

EMC: EN 61000-6-2 Electromagnetic Compatibility (EMC) -- Part 6-1: Generic standards – Immunity for industrial environments  
EN 61000-6-3 Electromagnetic Compatibility (EMC) -- Part 6-3: Generic standards – Emission standard for residential, commercial and light-industrial environments

LVD: EN 60335-1 Safety of household and similar electrical appliances  
Part 1: General requirements  
EN 60335-2-40: 2002 Safety of household and similar electrical appliances  
Part 2-40: Particular requirements for electrical heat pumps, air conditioners and dehumidifiers

I hereby declare that the equipment named above has been designed to comply with the relevant sections of the above referenced specifications. The unit complies with all essential requirements of the directives.

signed by: P. Stoelwinder, Managing Director, 31-08-2009

