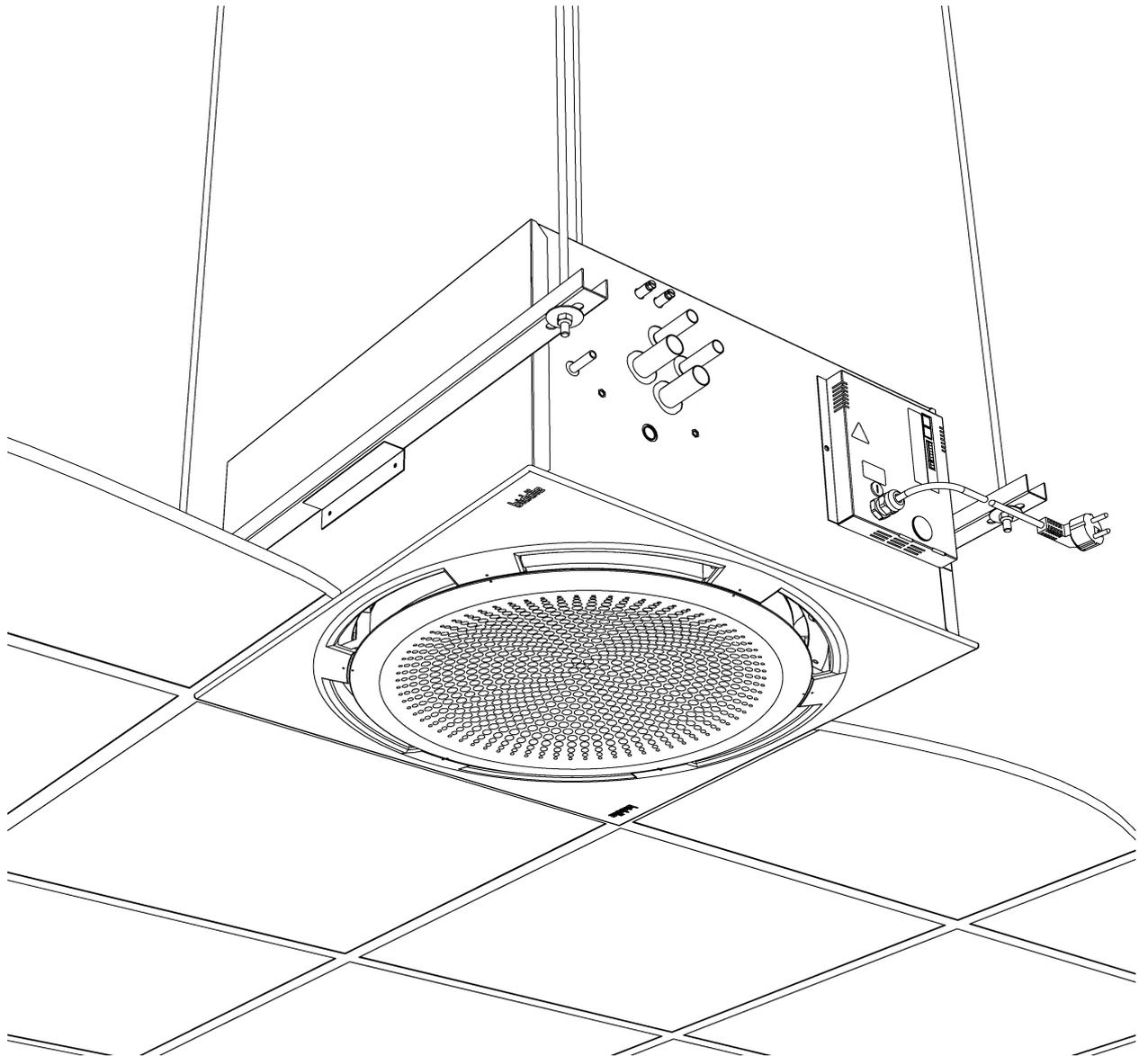


Manual

Cassette unit

Model Comfort Circle



Version of Guide: 2.0



biddle

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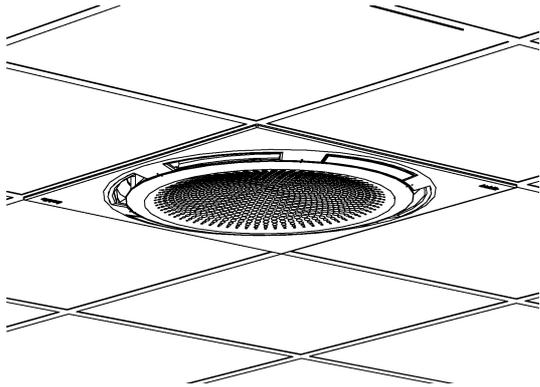
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1 . . Introduction

1.1 About this manual



1.1.1 General

This manual describes the installation, operation and maintenance of the Cassette Air Heater/Cooler, type Comfort Circle. The manual also provides instructions and information on service works.

The manual provides important directions for the correct and safe operation of the Comfort Circle as well as for the prevention of accidents and damages.

So, read this manual carefully before starting to handle the unit in any way.

This manual describes the installation and use of the standard devices. Customer-specific alterations or deviating models are not covered by this manual.

1.2 How to use this manual

If you are unfamiliar with the Comfort Circle, read this manual section by section.

If you are familiar with the device, you may use this manual as a reference. Refer to the table of contents for looking up information.

1.2.1 References in the manual

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 thoroughly.



Caution:

If you do not carry out this procedure or action correctly, you may damage the unit. Follow the instructions strictly.



Warning:
 If you do not carry out this procedure or action correctly, you may cause material damage and/or physical injury.
 Follow the instructions strictly.



Danger:
 This indicates actions which are not permitted. Ignoring this warning may lead to serious damage or accidents that may involve physical injury. The action may be carried out only by technical staff qualified to perform maintenance or repair works.

1.2.2 Icons used on the unit and in the manual

The icons in Table I-1 warn against potential risks or dangers. The icons can be found opposite text discussing risk-entailing operations. The same icons can also be found on the unit.

Table I-1 Icons

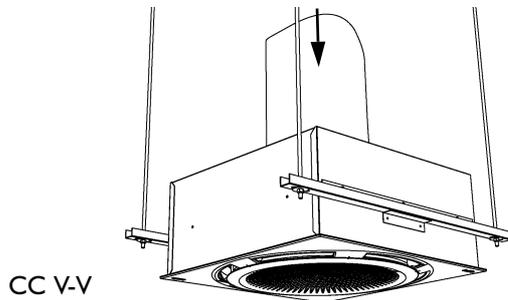
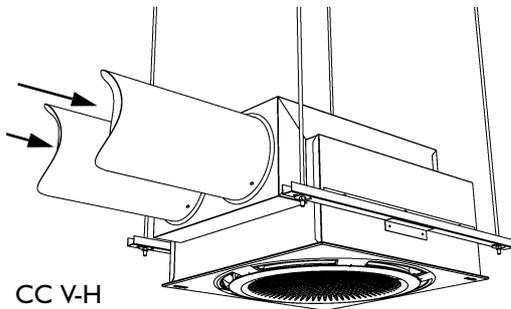
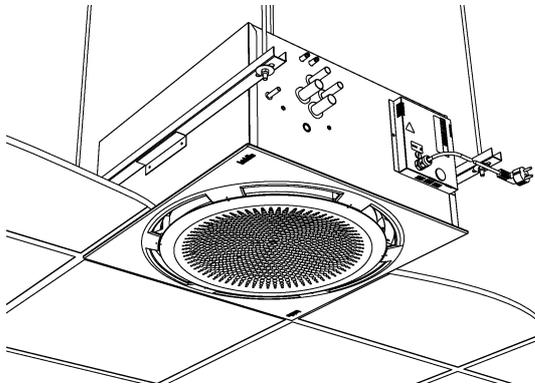
ICON	DESCRIPTION
	<p>Warning: You are entering an area which contains live components. Accessible to qualified maintenance staff only. Exert caution.</p>
	<p>Warning: This surface or part can be hot. There is a risk of burns on contact.</p>

1.2.3 Related documentation

Besides this manual, the following document comes with the unit:

- wiring diagram for installation and service purposes.

1.3 About the unit



1.3.1 Applications

The Comfort Circle is designed for heating, cooling and/or ventilating rooms.

The model is designed for integration into suspended ceilings but can be used in other ceilings as well. The unit is designed to be mounted at a height of 2.0 to 3.5 m (from floor to discharge grille).

The recirculation unit draws air from the room, heats or cools it, and blows it back into the room.

The ventilation unit draws air from elsewhere, heats it, and blows it into the room. This may be either unconditioned outside air or preconditioned air supplied by an A/C system. The ventilation unit is available in two models: air intake from a side, and air intake from above.

1.3.2 Working

The Comfort Circle blows out a flow of heated or cooled air, creating a comfortable climate in the room.

The units that can both heat and cool have automatic discharge angle control, which determines the discharge angle based on the mode (cooling or heating). The other units have a fixed discharge angle setting.

The units that can cool come standard with an integrated condensate draining pump.

The unit can be delivered with two types of control: a modulating control and a standard control. The modulating control controls both the fan speed and the discharge temperature to reach the desired room temperature. The standard control controls only the fan speed to achieve this goal. The ventilation units come with modulating control only.

1.3.3 Models and type references

Table I-2 provides an overview of available models of the Comfort Circle and corresponding type references. Combined, the type references constitute the type code, for instance, CC 90-H2-M1.

If some part of the manual applies to certain models only, these will be indicated using the corresponding type reference, for instance:

- CC M: units with modulating control;
- CC S: units with standard control;
- CC V: ventilation units;
- CC V-H: ventilation unit with horizontal connection.

Not all combinations are possible.

Table I-2 Type code explained

TYPE CODE ELEMENT	REFERENCE	MEANING
product series	Comfort Circle	general reference for the Comfort Circle
physical size	60 or 90	dimensions of the unit in the ceiling, 600x600mm and 900x900mm
ventilation	V	no reference: recirculation unit, V = ventilation unit
heat exchanger	H2, H3	water-heated, 2 or 3 rows
	C2, C3	water-cooled, 2 or 3 rows
	R2, R3	direct expansion (DX) cooling, 2 or 3 rows
	H1/C2	water-heated and -cooled, 1 and 2 rows, resp.
	H1/R2	water heating with DX cooling, 1 and 2 rows, resp.
control	M	modulating control
	S	standard control
discharge angle adjustment	0 or I	without or with automatic angle adjustment
ventilation connection	H or V	horizontal (CC V-H) or vertical (CC V-V) ventilation connection

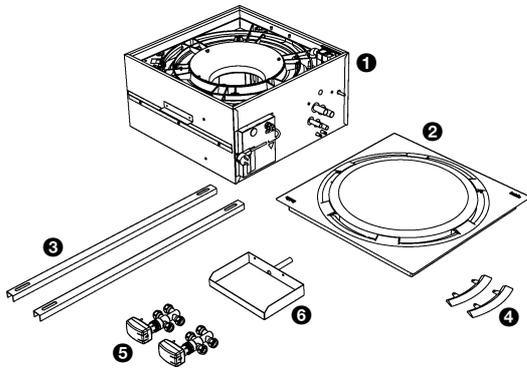
 Biddle bv Markowei 4 NL-9288 HA Kooiesterille 	Type	CC 60-H2-M1		
	Code	xxx	U	230 V 1N~ 50 Hz
	N°	123456/1-1 05-53	I _{max} L1	xxx A
			I _{max} L2	-
			I _{max} L3	-
	M	30 kg	P _{motor}	xxx kW
	Medium	LPHW	P _{heating}	-
	p _{max} 1400 kPa			

I.3.4 Type plate

The type plate can be found on the front side of the unit.

This manual refers to the following data on the type plate:

- *Type*: full type code of the unit;
- *M*: weight of the unit;
- *p_{max}*: maximum permissible operating pressure in the hot water circuit (at 90 °C);
- *U*, *I_{max}*, *P_{motor}* and *P_{heating}*: the unit's maximum load on the electrical system.



I.3.5 What's in the box

The unit comes in a box, which contains the following components:

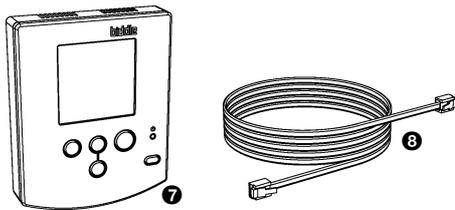
- unit **1**;
- cover **2**;
- 2 suspension profiles **3**;
- 2 blind plates **4** with fixing screws to adjust the discharge pattern;
- 1 or 2 valves **5** with servomotors (only for units with modulating control CC M);
- external drip tray **6** with fixing screws (only for cooling units CC C and CC R).

I.3.6 Components and accessories

Components

The following components are delivered separately but are always required:

- controller **7**;
- control cable **8**, available in various lengths.



Accessories

The following accessories are available as options:

- suspension kit consisting of Flamco rails and threaded rods;
- low-limit sensor for change-over detection;
- saddle piece for additional discharge connection;
- ventilation module for coupling to exhaust fan;
- edge sections for edge finishing in suspended ceilings.

Accessories for ventilation units

Biddle provides the following components for the proper installation of the ventilation units:

- ventilation section, including damper with servo motor and filter;
- wall or roof grates.

I.3.7 Third-party deliverables

In addition to the components mentioned earlier, the following components are required for the proper installation of the ventilation units:

- insulated ducts.

These parts are not supplied by Biddle and should be procured from other vendors.

I.4 Safety instructions

I.4.1 Operation



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



Warning:
Do not block the in- and outlets.



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



Warning:
The maximum environmental temperatures during operation are:
- in cooling mode: 35°C
- in heating mode: 30°C

I.4.2 Installation, maintenance and service



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



Warning:
Before opening the unit, do the following:



1. Switch the unit off using the controller.
2. Wait until the fans have stopped.
3. Allow the unit to cool down.

The heat exchanger can get very hot.



4. Disconnect the power supply (pull plug from socket or move isolation switch, if any, to Off).
5. Close CH supply (if possible).



Warning:
The fins of the heat exchanger are sharp.

2. . Installation

2.1 Safety instructions



Danger:

Installation works on the unit may be performed by qualified technical staff only.



Warning:

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

2.2 Delivery check

1. Check the unit and its packaging for correct delivery. Immediately report any transit damage to the driver and the supplier.
2. Make sure that all components have been delivered (see section 1.3.5). Immediately report any defects to the supplier.

2.3 General working method

Order of working

Biddle recommends the following working method for installing the Comfort Circle:

1. Suspend the unit (section 2.4).
2. Connect the unit to the CH system (section 2.5).
3. Connect the condensate discharge (CC C only, section 2.8).
4. Connect the unit to the air ducts (CC V only, section 2.9).
5. Connect the unit to the power supply (section 2.12).
6. Install the controller and (any optional) connections to external controls (section 2.15).
7. Turn on the power supply and check the working of the unit (section 2.18).

General instructions

Some parts of this section are applicable only to certain models. Where this is the case, it will be indicated. If no specific model is referred to, the description applies to all models.



Note:

Make sure you perform all installation operations that are required for your unit.

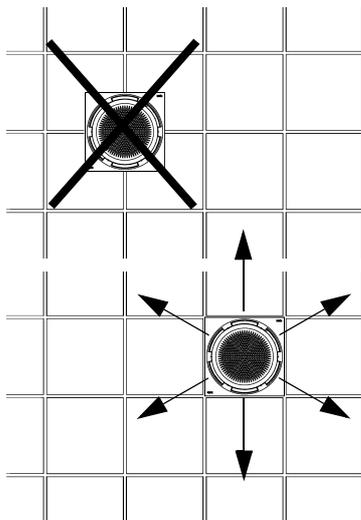
Check the type plate. Refer to section 1.3.4 if you are not sure about the model or type of your unit.



Note:

Protect the unit from damage and ingress of dust, cement, etc. throughout the installation. You can, for instance, use the packaging for protection.

2.4 Mounting the unit



2.4.1 Positioning the unit

- Make sure that the structure from which the unit is about to be suspended can hold the weight of the unit. The weight is specified on the type plate (see section 1.3.4).
- Ensure the following:
 - Position the unit between the ceiling profiles.
 - Give heed to the unit's orientation in the room (it is possible to adapt the discharge pattern to the room – see section 2.14).
 - The maximum mounting height for the unit is 3.5 m. (measured from floor to ceiling).



Note:

After hanging the unit, it is no longer possible to change the orientation of the cover.



Caution:

Provide for an inspection hatch in the ceiling if the Comfort Circle is not fitted in a suspended ceiling.



Note:

The ceiling tiles should not rest on the cover. Instead, use the T-beams of the suspended ceiling or use the optional edge sections (see Section 2.11).



Warning:
The *minimum* mounting height is 2.0 m.



Note:
Mounting the unit above the maximum height may affect the proper working of the unit.

2.4.2 Suspending and securing the unit

1. Mount Flamco rails ① and fit threaded rods M8 ② according to the dimensions in Table 2-1. Make sure the threaded rods are perpendicular.
2. Mount the suspension profiles ③ to the threaded rods.
3. Hook the unit into the suspension profiles.
4. You can still change the position of the unit somewhat by moving it in the suspension profiles and Flamco rails.

5. Secure the suspension on both sides using the securing brackets ④.
6. Bring the underside of the unit in line with the T-beams of the ceiling.



Caution:
Ensure that the unit is level.



Warning:
The unit may come down if you do not secure the suspension.

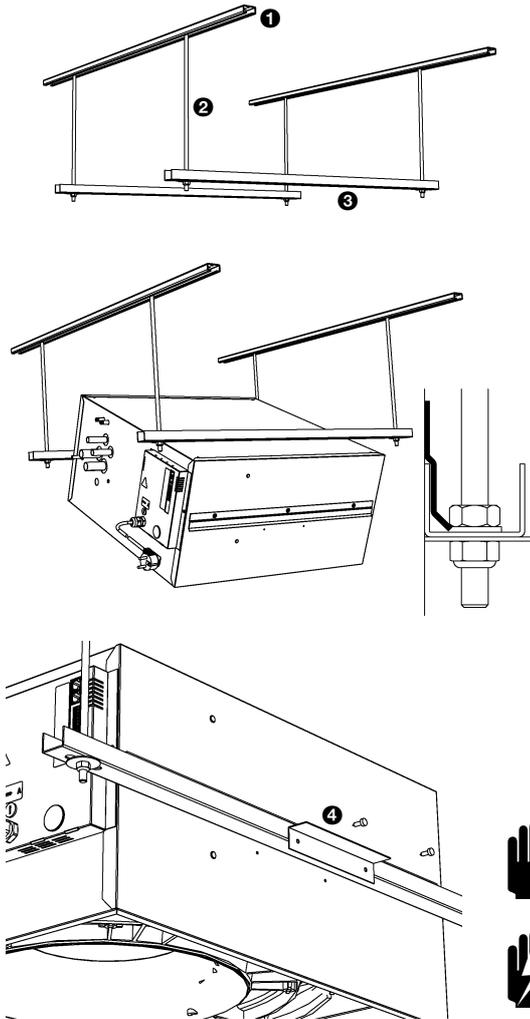
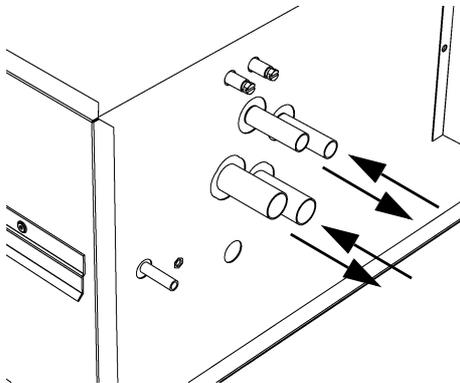


Table 2-1 Dimensions for suspending the unit

	REFERENCE	TYPE	DIMENSION
	a	all models	as needed
	b	all models	670 - 750
	c	CC 60 CC 90	600 900

2.5 Connecting the unit to the CH and CW systems



2.5.1 Particulars



Caution:

The supply and return pipes of the CH and CW systems must be connected to the appropriate corresponding connections. The directions are indicated on the unit by means of arrows.



Warning:

Maximum water temperature ranges for the CC S:

- CC H2-S: 80/60°C
- CC H3-S: 70/50°C



Warning:

The maximum discharge air temperature should not exceed 65°C.

Where necessary, install a throttle valve in the pipes to limit the flow.

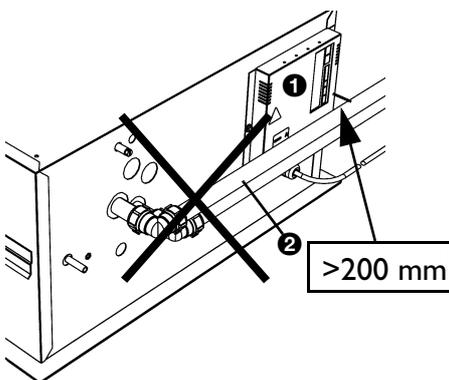


Warning:

Use only compression fittings for connecting the unit to the system. Table 2-2 lists the diameters of the compression fittings per unit type.

Table 2-2 Diameters of compression fittings.

TYPE	COMPRESSION FITTING
CC 60-H2, C2, H3, C3	ø22mm
CC 60-H1/C2	H: ø15mm - C: ø22mm
CC 90-H2, C2, H3, C3	ø22mm
CC 90-H1/C2	H: ø15mm - C: ø22mm



Warning:

Prevent the pipes from twisting.



Caution:

The electronics module ❶ must remain accessible. The distance between the pipes ❷ and the electronics module ❶ must be at least 200 mm.



Caution:

Biddle recommends to include, close to the unit, a shut-off valve and a relief valve in both pipes.

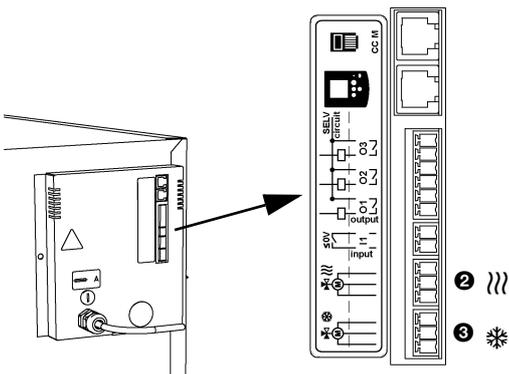
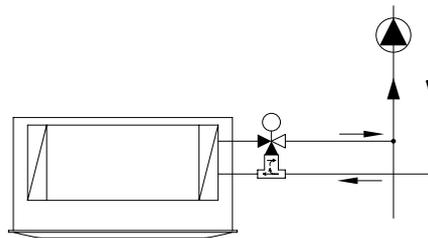
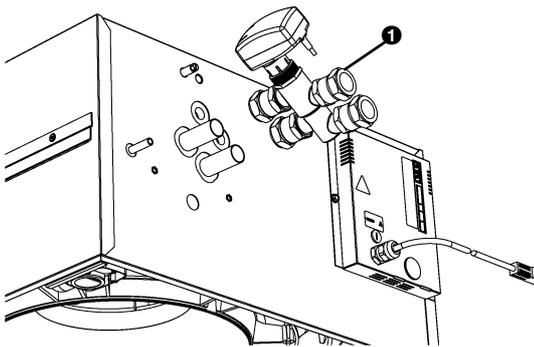
The maximum permissible operating pressure of the hot water circuit is specified on the type plate (see section 1.3.4). This pressure applies at a water temperature of 90 °C.

2.5.2 Units without water side control (CC S)

1. Connect the unit to the CH system.
2. Fill and bleed the system.
3. Check the connections for leaks.

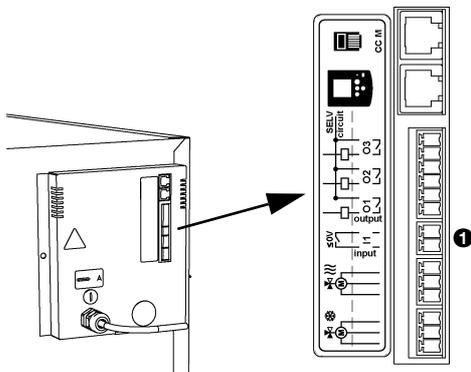
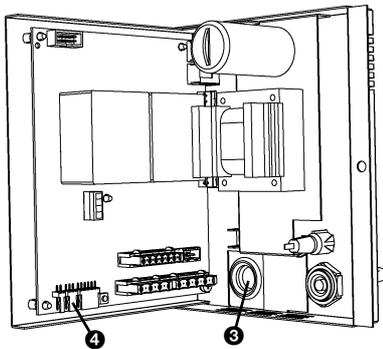
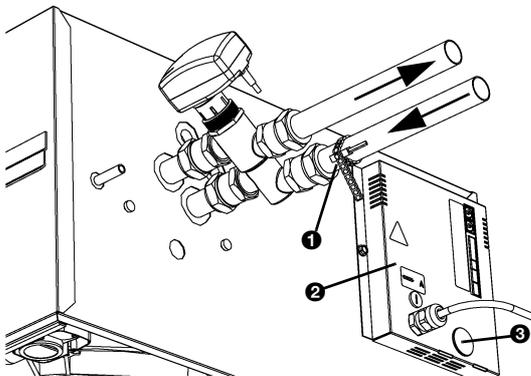
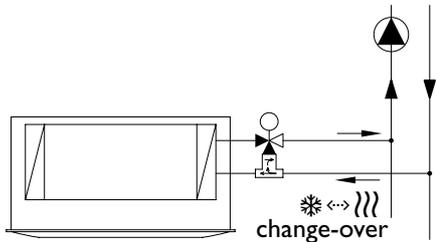
2.5.3 Units with water side control (CC M)

1. Connect the unit and the valve ❶ to the CH system according to the opposite diagram.



1. Connect the heating valve to connector ❷ (|||) according to the wiring diagram.
2. Connect the cooling valve to connector ❸ (*) according to the wiring diagram.
3. Fill and bleed the system.
4. Check the connections for leaks.

2.6 Connecting change-over



2.6.1 Introduction

If a unit is integrated into a change-over system, the controller must know whether the system is supplying hot or cold water. There are three options to achieve this:

1. Low-limit-temperature sensor (option) (see section 2.6.2).
2. Signal to the unit's input (see section 2.6.3).
3. Signal to the unit's output (see section 2.6.4).

2.6.2 Connecting the low-limit-temperature sensor

1. Mount the low-limit-temperature sensor ❶ onto the system's supply pipe.
2. Open the electronics module ❷ (see section 8.7).
3. Make crosswise cuts in grommet ❸.
4. Lead the sensor cable through the grommet.
5. Connect the sensor to terminal X360 ❹ on the PCB.
6. Close the electronics module.
7. Set function 79 to value 1 (see section 3.2.2).
The unit now follows the mode of the system.

2.6.3 Signal to the unit's input

If contact is made to the unit's input, the unit will switch from heating mode to cooling mode (see table 3-1, function 90).

1. Connect the signal cable to the unit's input ❶ (see section 2.17.7).
2. Set function 90 to value 1 (see section 3.2.2).
If a signal is sent to the input, the unit will switch from heating mode to cooling mode.

2.6.4 Signal to the unit's output

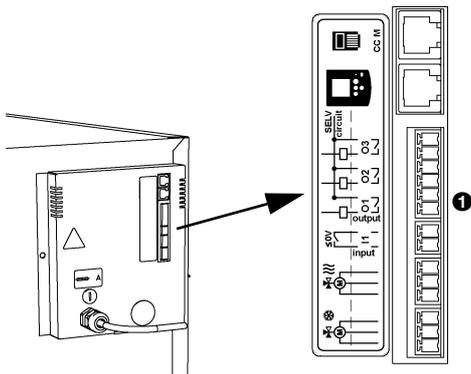
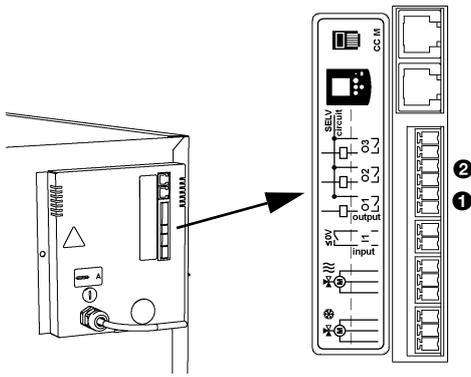
Both a CH and a CW machine can be controlled via the unit's outputs. You can connect the CH and CW machines to an output either separately or linked. The unit thus determines whether the change-over system will cool or heat.

Connecting CH and CW separately

1. Connect the CH signal cable to output O1 ❶.
2. Connect the cold water machine signal cable to output O2 ❷.
3. Set function 91 (output O1 function) to value 55 (heating demand) (see section 3.2.2).
4. Set function 91.5 to value 0 (make contact).
5. Set function 92 (output O2 function) to value 56 (cooling demand).
6. Set function 92.5 to value 0 (make contact).

Connecting CH and CW together

1. Connect the signal cable of the change-over system to output O1 ❶.
 2. Set function 91 (output O1 function) to value 57 (see section 3.2.2).
 3. Set function 91.5 to value 0 (make contact).
- If the unit switches from heating mode to cooling mode, a signal is sent to the output.

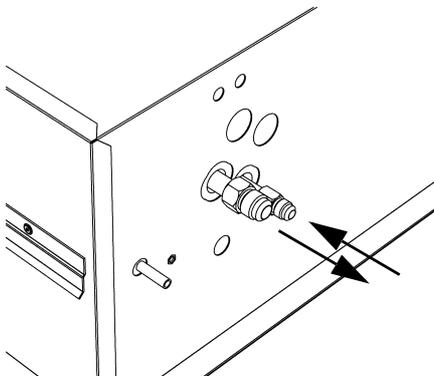


2.7 Connecting CC-R

2.7.1 Particulars

Direct expansion units (CC R) have a relay for the control of an outdoor unit.

The units come standard with a frost protection device, which will switch off the outdoor unit when the discharge air temperature falls below the preset minimum value. The default value is set at 5°C but can be changed (see Table 3-1, function 58).





Note:

The supply and return pipes must be connected to the correct corresponding connections. The directions are indicated on the unit by means of arrows.



Warning:

Use only flare fittings for connecting the unit to the system. Table 2-3 lists the diameters.

Table 2-3 Flare fitting diameters.

TYPE	FITTING
CC 60-R2, R3,	flare 3/8" - 5/8"
CC 60-H1/R2	H: compression ø15 mm; R: flare 3/8" - 5/8"
CC 90-R2, R3	flare 3/8" - 3/4"
CC 90-H1/R2	H: compression ø15 mm; R: flare 3/8" - 3/4"
CC 60-R2, R3,	flare 3/8" - 5/8"



Warning:

Prevent the pipes from twisting.



Danger:

Do not apply solder to any of the unit's fittings. Soldering may cause the unit's insulation to inflame.

2.7.2 Connecting the unit

1. Connect the pipes.
2. Fill and test the CH system in accordance with the applicable regulations.

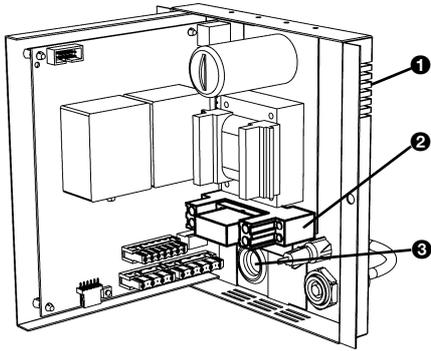
2.7.3 Connecting the outdoor unit

The CC R comes standard with a relay for the control of an outdoor unit.



Warning:

To prevent it from freezing, the outdoor unit must be controlled by the Comfort Circle.



Note:
Biddle recommends to connect one outdoor unit per Comfort Circle.

1. Open the electronics module ❶ (see Section 8.7.3).
2. Connect the outdoor-unit wiring to the relay ❷ according to the wiring diagram.
3. Lead the wiring through grommet ❸.
4. Put back the electronics module.

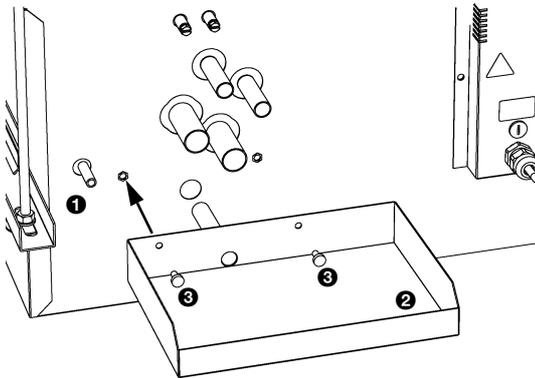
2.8 Connecting the condensate discharge (CC C and CC R)



The units with cooling come standard with a condensate draining pump. The condensate is drained from the unit through a flexible hose.

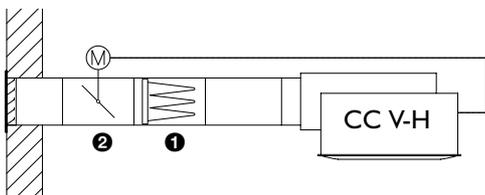


Note:
The maximum discharge head is 1 metre.



1. Install a sewer connection incl. stink trap for the discharge of condensate.
2. Connect the discharge hose ❶ to the drain pipe. In doing so, pay attention to this:
 - For proper condensate discharge, the drain pipe must be sloping (>2%).
 - Avoid kinks in the discharge hose.
 - Above the ceiling, the discharge hose must be insulated.
3. Mount the external drip tray ❷ using the supplied screws ❸.

2.9 Connecting a ventilation unit



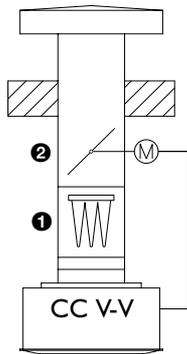
2.9.1 Connecting air intake ducts (CC V)

The ventilation units are fit for drawing air from elsewhere to discharge it into the room. This air can be either filtered outside air or preconditioned air.

It is possible to open and close air valves with the unit.



Warning:
Filtered air ❶ must be supplied to the ventilation unit.



Note:

To prevent draught when the unit is switched off, Biddle recommends to include air valves ② in the air intake ducts.

If a CC ventilation section is used, the filter and damper are integrated.

1. Connect insulated ducts with a diameter according to table 2-4 to the unit.
2. Connect the air valve servomotors to the unit according to the wiring diagram.

Table 2-4 Diameters of ducts

TYPE	DUCT DIAMETER	NUMBER
CC 60-V-H	ø200mm	2
CC 60-V-V	ø280mm	1
CC 90-V-H	ø200mm	4
CC 90-V-V	ø400mm	1

2.9.2 Air valve control

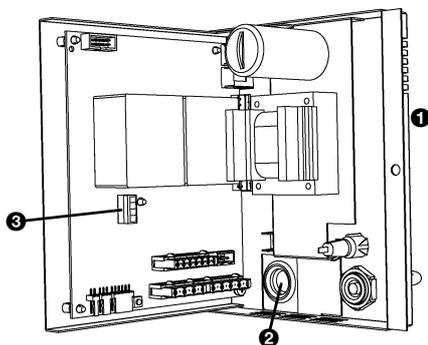
There are two options for controlling air valves:

- via the 0-10VDC output on the PCB for the control of 0-10VDC servomotors.
- via a signal to output O3 (24V~1A).

0-10VDC output

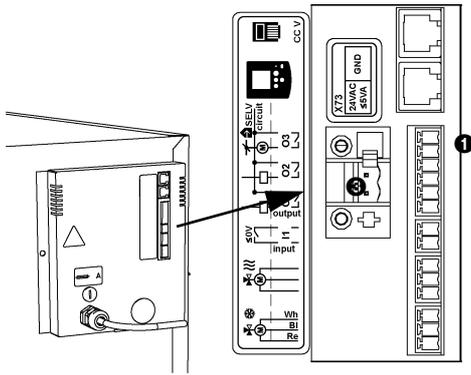
1. Open the electronics module ①.
2. Make crosswise cuts in grommet ②.
3. Lead the wiring through the grommet.
4. Connect the wiring to terminal X340 ③.
5. Set function 85 to value 1 (enabled) (see section 3.2.2).
6. Set functions 86, 87 and 88 to value 99.

This makes that the air valves are always opened fully when the unit is in operation.



Caution:

Values other than 99 make that the air valves are not opened fully, which will affect the operation of the unit.



Signal to output O3

For ventilation units, the function of output O3 is set to the default value 70, with contact being made to the output when the fans are rotating. If the discharge temperature falls below 6°C, the contact will be broken and the ventilation units will be switched off.

This signal can be used either to directly control suitable servomotors or to control a 24V relay controlling the servomotors.

1. Connect the wiring to output O3 ❶.

2.9.3 Servomotor power supply

Power supply to the servomotors of the air valves can be obtained via connection X73 ❸ on the electronics module.

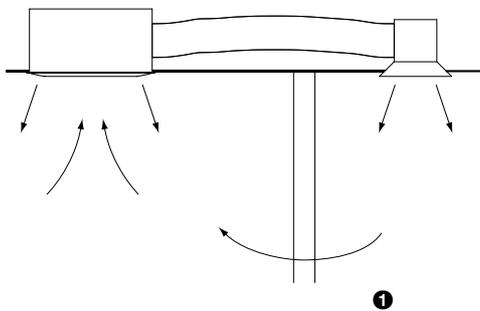


Caution:

The maximum load is 24V~, max. 5VA.

2.10 Additional discharge connection

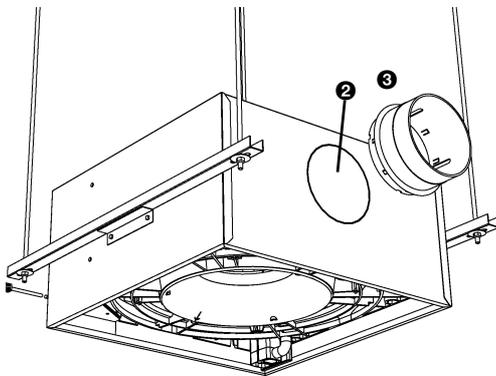
The CC has a prepunched hole in the casing. A ø160 mm air duct can be mounted to this hole, so that discharge air can be led to an additional air grille.



Caution:

If the additional discharge is located in a room other than where the unit is, an air return path ❶, such as a wall or door grate or a shortened door, must be provided for.

1. Cut the connections of the prepunched hole ❷.
2. Cut the insulation material.



Caution:

In doing so, do not damage the heat exchanger.

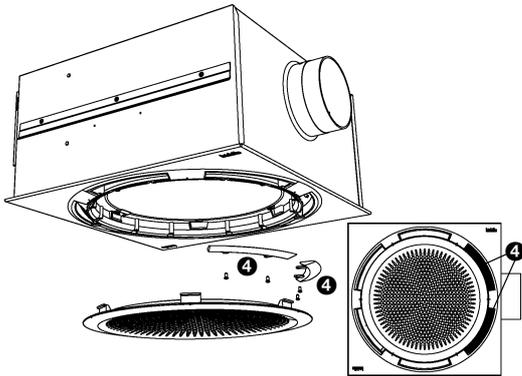
3. Press the saddle piece ❸ onto the hole.
4. Mount the ductwork and the discharge grille.



Caution:

When using ducts, take the following into account:

- Use ducts that are designed for a continuous operational temperature of 80°C.
- For cooling units, use insulated ducts.



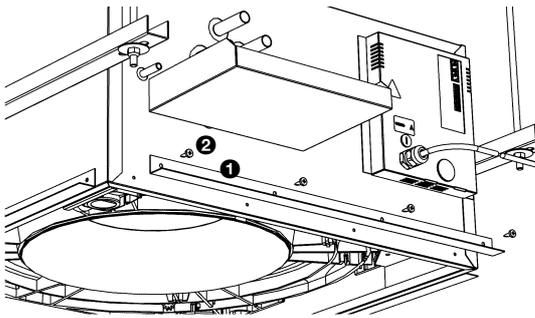
5. Mount the two supplied blind plates ④ into the discharge grille, on the side of the air connection (see section 2.14)



Caution:

The blind plates must be mounted for proper operation of the unit.

2.11 Mounting edge sections (accessory)



If the unit is integrated into a suspended ceiling, the ceiling tiles should not rest on the cover. For correct installation, you may want to use the optional edge sections.

1. Mount the edge sections ① to the unit using the enclosed screws ②.
2. Position the ceiling tiles upon the edge sections.

2.12 Connecting the unit to the power supply

1. Ensure that an earthed power point is available at a maximum of 1.5 m from the right-hand side of the unit.



Caution:

Do NOT yet switch the mains supply on.



Warning:

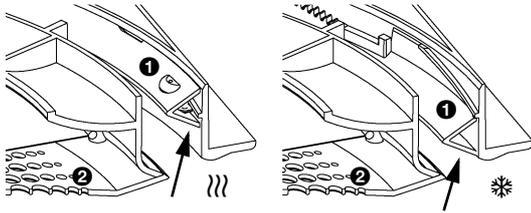
The unit must be earthed.



Warning:

Connect the unit in accordance with the applicable local requirements.

2.13 Mounting the cover



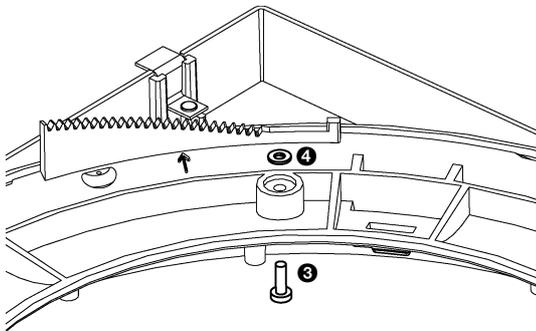
The cover consists of the discharge grille, the discharge openings, the angle adjustment ring, and the filter. In units that can both cool and heat, the angle adjustment ring is driven by a servomotor. In the other units, the position of this ring is fixed:

- In heating and ventilating units, the ring 1 is in a high position (|||);
- In cooling units, the ring 1 is in a low position (*).

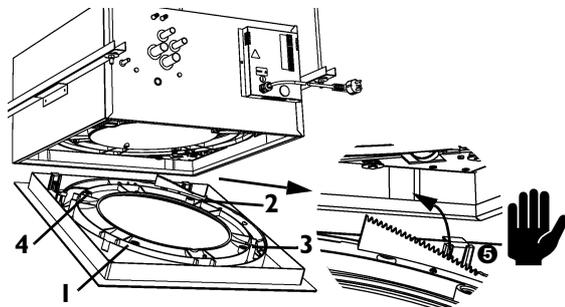


Caution:

Do not change the preset fixed angle.



1. *only units with automatic discharge angle control:* turn the ring 1 to the middle position.
2. Remove the air inlet grille 2 by turning it anticlockwise (bayonet catch).
3. Fit the supplied screws 3 and anti-loss rings 4 into the cover.

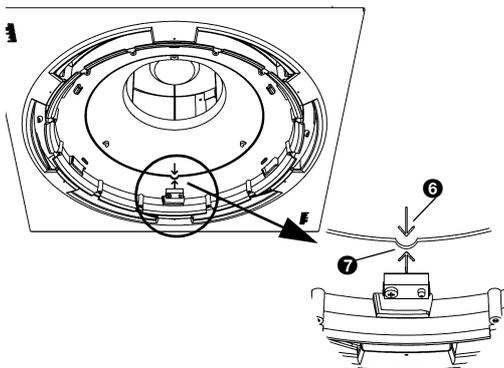


4. Mount the cover into the unit:
 - Hook the cover into the unit using the metal lips;
 - Tighten the screws in the indicated order.



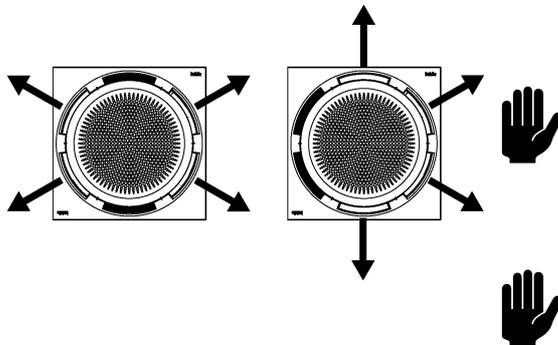
Caution:

Ensure that the projection 6 of the unit falls into the recess 7 of the cover.



5. Put back the air inlet grille.

2.14 Adjusting the discharge pattern



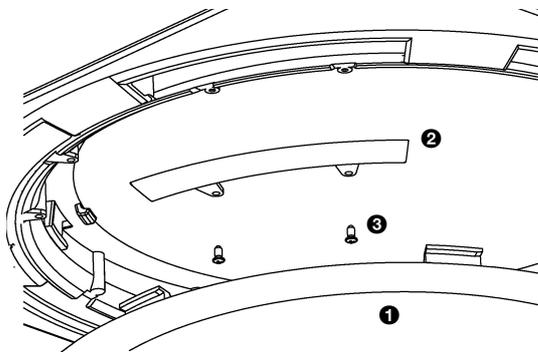
The discharge pattern can be adjusted to the room using the supplied blind plates.

Caution:

If use is made of the air connection for an adjoining room (see paragraph 2.10), the two blind plates must be mounted in the two holes on the side of this connection.

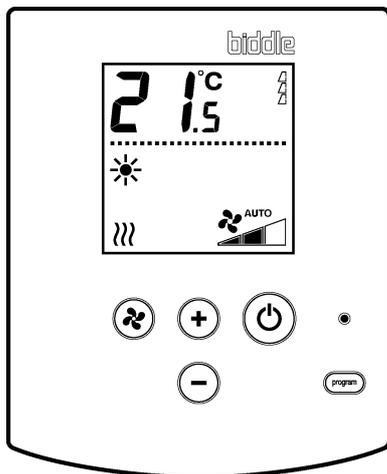
Caution:

Do not mount more than two blind plates per unit.



1. Remove the air inlet grille ❶.
2. Place the blind plate into the desired hole, and fix it with the supplied screws ❷.
3. Replace the air inlet grille.

2.15 Installing the controller



2.15.1 Controller details

Positioning

- Fix the controller to the wall or to a standard socket.
- Mount the controller at a height of 1.5 m above the floor.

Cabling



Note:

Take the following into account, otherwise faults may occur:

- The control cable between the controller and the (first) connected unit is not to exceed 50m.
- Keep control cables away from electromagnetic fields and interference sources such as high-voltage cables and fluorescent-light starters.
- Stretch control cables out or wind them bifilarly.
- Do not remove the dummy plug, unless stated so.



Note:
Use only control cables from Biddle Biddle. Standard modular telephone cable is *not* suitable.

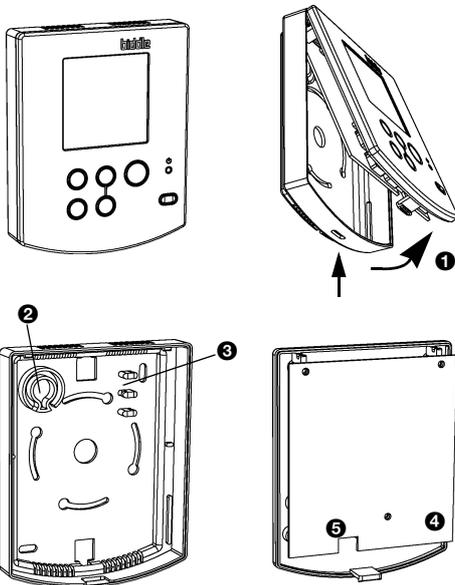
Multiple units operated from one controller

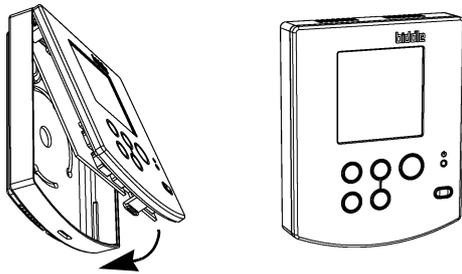
 Biddle bv Markowei 4 NL-9288 HA Kootsterlille 	Type	CC 60-H2-M1		
	Code	xxx	U	230 V 1N~ 50 Hz
	N°	123456/1-1 05-53	I _{max} L1	xxx A
			I _{max} L2	-
	M	30 kg	I _{max} L3	-
	Medium	LPHW	P _{motor}	xxx kW
	P _{max} 1400 kPa	P _{heating}	-	

- Up to 10 units can be connected to one single controller. To do so, the units must be interlinked.
- The following combinations of units are possible:
 - units with unit codes ending on 11;
 - units with unit codes ending on 21;
 - units with unit codes ending on 12, 13 or 14;
 - units with unit codes ending on 22, 23 or 24;
 - units with unit codes ending on 13 and 18;
 - unit code 3000 only in conjunction with code 2023.
- The total length of the control cables is not to exceed 100 m.
- The distance between the controller and the first unit is not to exceed 50 m.

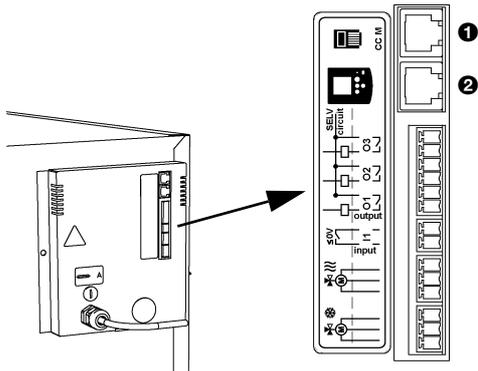
2.15.2 Mounting and connecting the controller

1. Lay the control cable.
2. If the external-control input in the controller is used (see section 2.17.2):
Lay the necessary cabling. The cable core diameter is not to exceed 0.75 mm² AWG 20.
3. Open the controller ①.
4. Lead the control cable and the external control cable (if any) through the back plate.
5. Screw the back plate onto the socket or the wall.
6. Lead the cable/s through the pull reliefs.
 - The upper left pull relief ② is designed for the control cable, and the upper right pull relief ③ for the external-control cable.
 - The cable must protrude some 9cm from the pull relief.





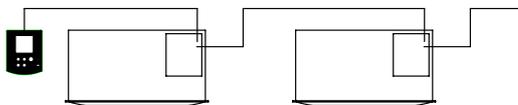
7. Couple the connector to the PCB ④.
8. Connect the external-control cable (if any) to the terminal on the PCB ⑤.
9. Put the front onto the back plate.



2.15.3 Connecting the controller to the unit

The controller sockets ① and ② are located in the connector plate on the front side of the unit. The two sockets are identical.

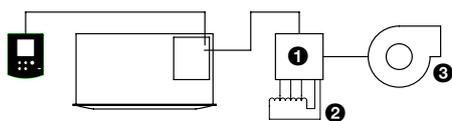
1. Remove the dummy plug at 1 of the first unit.
2. Connect the control cable to the free socket ① or ②.



Multiple units operated from one controller

1. Remove the dummy plug at 1 of the first unit.
2. Interlink the units: connect the control cables to ① and ②.

2.16 Connecting the ventilation module VM-FCC (accessory CC-V)



The ventilation module VM-FCC ① allows the Comfort Circle to control a connected tapped transformer ② and extractor fan ③. The extractor fan automatically follows the Comfort Circle’s three ventilation settings. In this way, the air volume that the extractor fan removes from the room can be geared to the volume that the Comfort Circle supplies to the room.

It is also possible to control an extraction fan with a 0-10VDC signal (see section 2.17.5).



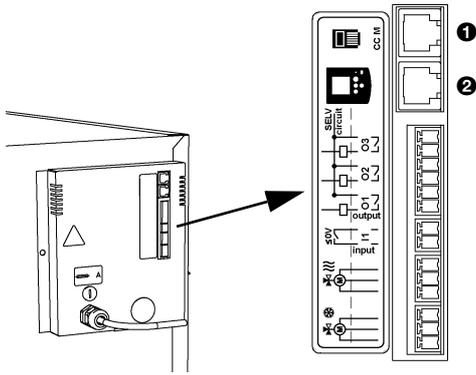
Note:

The extractor fan and the corresponding tapped transformer are *not* included in the ventilation module delivered.



Caution:

Do not connect any ventilation module other than the VM-FCC to the CC V.



1. Install the ventilation module according to the supplied manual.
2. Remove the dummy plug at ❶ of the unit to which the ventilation module is going to be connected.
3. Connect the ventilation module to the Comfort Circle: connect the control cables to ❶ or ❷.



Note:
If multiple units are connected to one single controller, it does not matter to which unit the ventilation module is connected.

2.17 Connecting external controls to unit (optional)

2.17.1 External control details

The unit has a number of in- and outputs to which external controls can be connected:

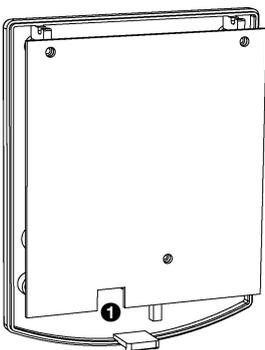
- one input in the controller;
- one input in the unit;
- three outputs in the unit;
- 0-10VDC input in the unit;
- 0-10VDC output in the unit.

2.17.2 Input in controller

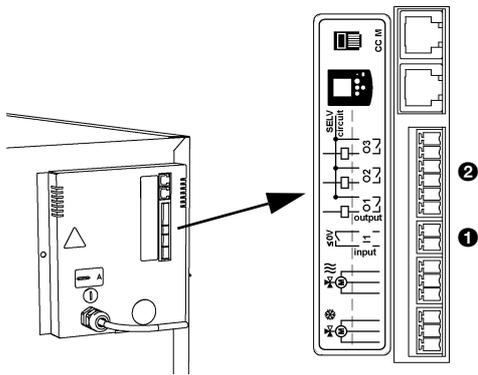
The controller has one input signal interface, to which a timer is usually connected.

The signal switches the unit on or off. Depending on the setting I in the timer menu, the unit either can or cannot be switched on or off using the ☺-key (see section 5).

The operation is global – the signal affects all units connected to the controller.



Caution:
The input is designed for controls with potential-free contacts, and is not to be loaded.



2.17.3 Input in unit

The unit has one input signal interface ❶, to which a timer, a low-limit or room thermostat or a BMS signal may be connected.

The effect of the input signal depends on the controller settings. (see section 3.3.1). A signal to one unit will have the same effect on all units linked with that unit.



Caution:

The input is designed for controls with potential-free contacts, and is not to be loaded.

2.17.4 Outputs in unit

The unit has interfaces ❷ for three output signals: these can be used for, for instance, controlling the central-heating or cooling system, or for transmitting status reports to a BMS.



Caution:

The outputs are potential-free contacts (relays). Their maximum load is 24V and 1A.



Danger:

Connect SELV circuits only – Safety Extra Low Voltage circuits.

The function of the outputs depends on the controller setting (see section 3.3.2).

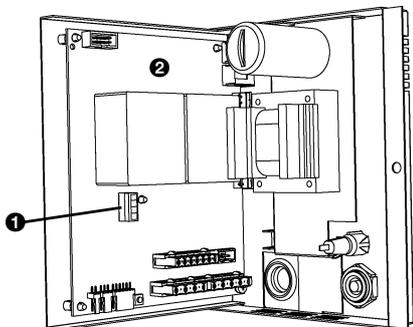
The operation is global, being identical for all units connected to the controller. If a signal activates one unit, all linked units will also be activated.

2.17.5 0-10VDC in- and output (CC M)

The 0-10VDC in- and output ❶ are located on the PCB ❷ in the unit. To access these, the electronics module must be removed from the unit (see section 8.7.3).

The 0-10VDC input can, for instance, be used to let a CO₂ sensor determine the ventilation setting.

The 0-10VDC output can, for instance, be used for controlling an extraction fan.



2.17.6 Options and operation

Options and operation depend on the in- or output as well as on the controller settings. These are further described in section 4.5.

2.17.7 Connecting in- and outputs

The connections are located on the unit’s connector plate. The corresponding connectors are located in the terminals.

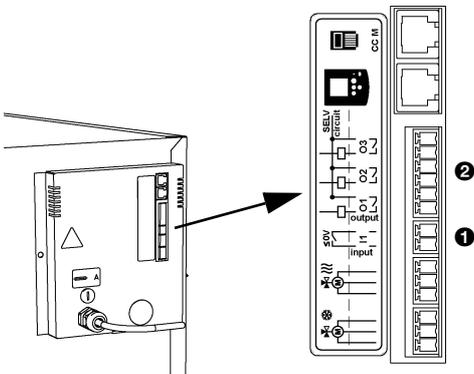


Caution:

For all connections, allow for approx. 30 cm extra cable length – it will be needed to easily take the electronics out when servicing the unit.

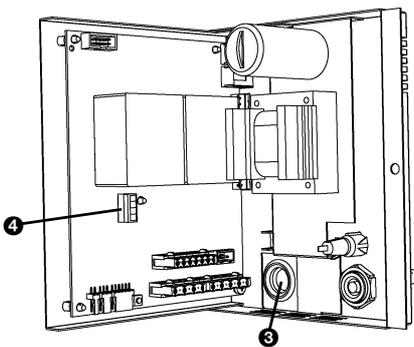
Connecting in- and outputs

- Connect the output signal cable to terminal ❶.
- Connect the input signal cable to terminal ❷.



Connecting 0-10VDC in- and outputs

1. Disconnect power supply (remove plug from socket or move main switch to Off).
2. Remove the electronics module from the unit (see section 8.7).
3. Lead the 0-10VDC in- and output cables through grommet ❸.
4. Connect the cables to terminal ❹. Refer to the wiring diagram if necessary.
5. Replace the electronics module into the unit.



2.18 Switching on and checking operation

- I. Check the following connections:
 - power supply;
 - control cable’s between controller and unit’s;
 - external control components (if any).

2. Check if the heat exchanger is connected correctly.
3. Make sure the CH and CW systems are switched on.
4. Switch the mains power on and/or plug in all connected units.

If you switch on the mains power for the first time, the display will briefly show the number of connected units. You can also check this number via the service menu (see section 8.2, function 28).

5. *Only units that can cool:*
 - Test the operation of the condensate discharge pump: Pour water into the external drip tray. The condensate pump should start working shortly.
6. Switch on the Comfort Circle using the controller (see section 4.1).
7. *Only units that can heat:*
 - Set the desired room temperature to a high value (see section 4.3).
 - Feel if the discharged air gets warm. This may take some time. You may want to read the actual discharge temperature from the service menu (section 8.2) – only for CC M, parameters 36 and 37.
8. *Only units that can cool:*
 - Set the desired room temperature to a low value (see section 4.3).
 - Feel if the discharged air gets cold. This may take some time. You may want to read the actual discharge temperature from the service menu (section 8.2) – only for CC M, parameters 36 and 37.
9. *Only units that can both heat and cool:*
 - Check if the position of the angle adjustment ring changes when switching from heating to cooling.
10. *Only ventilation units:*
 - Check the operation of the air valve servomotors.

3. . Settings

3.1 General

3.1.1 Operation levels

The controller has four menu levels:

1. The *user menu* is the level at which the controller normally operates: it contains the functions that you will need for the day-to-day use of the Comfort Circle (see section 4).
2. In the *timer menu* , you can set the timer (see section 5).
3. In the *installation menu*, you can enter settings to adjust the operation of the unit to the room and the system. Usually, this menu is used only for installation, maintenance or service purposes.
4. In the *service menu*, you can read information on the operation of the unit (see section 8).

This section deals with the installation menu. The access to the installation menu and the timer menu can be limited by turning a switch in the controller (see section 3.2.3).

Multiple units operated from one controller

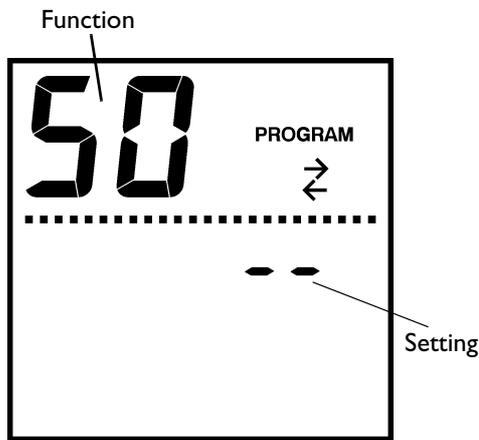
If multiple units are connected to the control panel, the settings are global, that is, they apply to all units connected to the controller.

3.2 Settings

3.2.1 Required settings

The settings in the installation menu are optional. In most situations, the default settings will do.

If the unit's in- and outputs are used, the functions nos. 90, 91, 92 and 93 must always be set during installation (see section 3.3).



3.2.2 Changing settings in the installation menu

Moving from user menu to installation menu

- Press the key and the -key simultaneously for five seconds.

The text **PROGRAM** appears in the display. You are now in the installation menu.

Table 3-1 lists the functions in the installation menu. The larger digits in the display indicate the function number, and the smaller ones the setting.



Note:

Depending on the unit type, some functions are either displayed or not.

Operation in the installation menu

- To go to the next function, press the key.
- To go to the previous function, press the key.
- To change the value of the function, press or .
- To default the value, press and simultaneously.
- To return to the user menu and save the changes, press the key for 3 seconds.
- To return to the user menu *without* saving any changes, press the key.

If you do not press any key for two minutes, the controller will automatically return to the user menu *without* saving any changes.

3.2.3 Blocking access to menus

The access to the installation menu and timer menu can be limited by turning a switch in the controller (see section 3.2.3).

1. Open the controller.
2. Move switch to the Lock position.
3. Replace the controller.

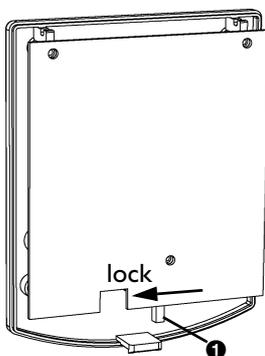


Table 3-1 Functions in the installation menu

No.	FUNCTION	OPTIONS
50	Reset settings This allows you to reset all settings in the installation menu and timer menu to their default values.	dF = all functions have default values -- = there are functions with deviating values To reset: • press ⊕ and ⊖ simultaneously.
51	Maximum filter life	Presettable between 1 and 51 weeks(26)
52	Ignore fault code FI	0 = show fault code (default) 1 = ignore fault code
55	Adjusting controller's temperature reading Use this function if the displayed room temperature differs from the actual temperature.	Can be set between -3 and +3°C (0°C)
56	Night temperature	Can be set between 5 and 30°C (15°C)
57	Minimum discharge temperature, heating	Can be set between 12 and 55°C (22°C)
58	Minimum discharge temperature, cooling	Can be set between 0 and 30°C (CC C: 12°C; CC R: 5°C)
59	Dead band for switching between heating and cooling (CC S and M) This is also used for switching off the fan in the AUTO mode (CC M)	Can be set between 1 and 5°C (1.5°C)
61	Dead band around temperature setpoint for heating (CC S)	Can be set between 0.5 and 4°C (0.8°C)
62	Dead band around temperature setpoint for cooling	Can be set between 0.5 and 1.0°C (0.8°C)
64	PID factors of temperature control	<i>Do not change these settings, unless on Biddle's instructions.</i>
64.0		
64.5		
70	CC M: From speed 2 to speed 3 when heating	1-5, Off (1.5) This is the difference between the temperature setpoint and the room temperature where the unit operating in the Auto mode will switch over to another speed. For speed 2 to speed 3, the value of speed 1 to speed 2 must be added to the value. With the CC M, the speeds 1 and 2 are controlled automatically.
70.5	CC S: From speed 2 to speed 3 when heating	
71	CC M: From speed 2 to speed 3 when cooling	
71.5	CC S: From speed 2 to speed 3 when cooling	

Table 3-1 Functions in the installation menu

No.	FUNCTION	OPTIONS
72	Time-based speeding-up, heating	0 = Off
73	Time-based speeding-up, cooling	1 = On (default) If the temperature setpoint is not reached within a specified period of time, the fan will start rotating one speed higher. If the temperature is not reached within a specified period of time, the fan will start rotating one speed lower again. This works only with the CC S at the fan speed AUTO.
74	Minimum running time at a fan speed	1-5 minutes, Off (Off)
76	Choice between room temperature control or fixed discharge temperature (CC V) <i>Use the fixed discharge temperature setting only for ventilation units.</i>	0 = room temperature control 1 = fixed discharge temperature setpoint <i>If the discharge temperature is fixed, the room temperature control is disabled. When you press the ⊕ or ⊖ key, the 🖱 symbol appears in the display.</i>
77	Fixed discharge temperature (only if 76=1)	12-55°C (20°C)
78	Night cooling (CC-V only)	0 = no night cooling 1 = night cooling With night cooling, the unit cools to the preset day temperature with free cooling. This will happen only if the outside temperature is 2°C lower than the day temperature.
78.5	Night cooling starting time (CC-V only)	Starting time in whole hours Settable between 0 and 23 hours (3 hours)
79	Change-over sensor option (CC C with Change-over system)	0 = room temperature sensor 1 = water temperature sensor
80	Unit is controlled by CO ₂ sensor on 0-10VDC input	0 = no control by CO ₂ sensor 1 = control by CO ₂ sensor
81	• Input voltage at speed 1	0-99 (30) in tenths of Volts
82	• Input voltage at speed 2	0-99 (40)
83	• Input voltage at speed 3	0-99 (50)
85	0-10VDC output This output can be used, for instance, to control an extraction fan or an air damper..	0 = not enabled 1 = enabled
86	• Output voltage at fan speed 1	0-99, on (40) in tenths of volts
87	• Output voltage at fan speed 2	0-99 (60)
88	• Output voltage at fan speed 3	0-99 (80)

Table 3-1 Functions in the installation menu

No.	FUNCTION	OPTIONS
90.x	Function of input for external controls	See table 3-2 for input functions See table 3-3 for output functions value x.5: 0 = Make contact (NO) 1 = Break contact (NC) In- and output functions work for all connected units.
91.x	Function of output O1	
92.x	Function of output O2	
93.x	Function of output O3	
96.0	Minimum temperature setpoint, heating	10-30°C (15)
96.5	Maximum temperature setpoint, heating	10-30°C (30)
97.0	Minimum temperature setpoint, cooling	10-40°C (15)
97.5	Maximum temperature setpoint, cooling	10-40°C (40)
98.0	Minimum fan speed, ventilation units	0-3 (0)
98.5	Maximum fan speed, ventilation units	1-3 (3)
99	Setting the unit code	To enter the unit code, change the value 0 to 1 (see section 8.11). -- = function not available

3.3 External controls

3.3.1 Particulars of the input

Function 90 in the installation menu allows you to choose the function you want the input on the unit to have. See table 3-2 for the possible settings for the input.

Multiple units operated from one controller

A signal to one unit has the same effect in all units connected to the controller.

3.3.2 Particulars of the outputs

The functions 91, 92 and 93 allow you to choose the functions you want the outputs on the units to have. See table 3-3 for the possible settings for the input.

The functions of the outputs can be set individually.

Multiple units operated from one controller

The output signals are always the same in all units connected to the controller.

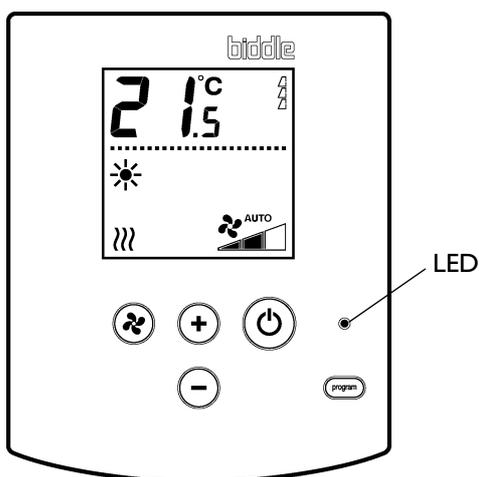
Table 3-2 Functions of the input

No.	INPUT SIGNAL	DESCRIPTION
0	No function	
1	Change-over input signal, heating/cooling	If a signal is sent to the input, the unit will switch from heating mode to cooling mode.
2	Release of unit by low-limit thermostat	The fan will not switch on until hot water is supplied to the unit, thus preventing cold air from being blown out.
3	Unit always on	The unit keeps on running, at fan speed 1 as a minimum, even if the controller is set to the night/standby mode.
4	Ventilation unit on or one speed higher	The ventilation unit is switched on or, if already on, is set to one speed higher.
5	Ventilation unit off	The ventilation unit is switched off.
6	Unit always on	The unit keeps on running, at fan speed 2 as a minimum, even if the controller is set to the night/standby mode.
7	Unit always on	The unit keeps on running, at fan speed 3 as a minimum, even if the controller is set to the night/standby mode.
10	Summer setting (CC H)	By making contact to the input, the unit's temperature control is switched off. The ⊕ and ⊖ keys will have no function anymore – when they are pressed, -- appears in the display. The fan speed can still be regulated and can be used in the summertime to obtain cooling thanks to additional circulation. The display will read  ON.
11	External switching on and off	The unit is switched on or off by making or breaking a contact to the input.

Tabel 3-3 Functions of the outputs

No.	OUTPUT SIGNAL	DESCRIPTION
0	no function	
51	maximum filter life lapsed	On expiry of the maximum filter life (see also setting 51), this contact is made.
52	freezing risk	If the temperature in the room falls below 5°C, this contact is made.
53	general failure	If any fault occurs, this contact is made.
54	freezing risk or general failure	Combination of Nos. 52 and 53.
55	heating demand	To be used to have a CH system switched on by the unit.
56	cooling demand	To be used to have a cooling system switched on by the unit.
57	change-over output signal, heating/cooling	To be used to have the change-over system switch between heating and cooling. When cooling the contact is made.
58	fan running	If the control unit controls the fan, this contact is made. Note: This is no real check on the operation of the fan.
59	Unit on/off	If the unit is on (☀), this contact is made. If the unit is off (☾) or in the pause mode, this contact is broken.
62	ventilation unit at speed 2	The ventilation unit is active at fan speed 2. Note: This is no real check on the operation of the fan.
63	ventilation unit at speed 3	The ventilation unit is active at fan speed 3. Note: This is no real check on the operation of the fan.
70	<i>Only CC V:</i> The fan is running.	If the discharge temperature falls below 6°C, the contact will be broken and the fan will be switched off. If one or more ventilation units are connected, output O3 is permanently set to function 70.

4 . . Operation



This section describes the functions you should know for the day-to-day use of the Comfort Circle.

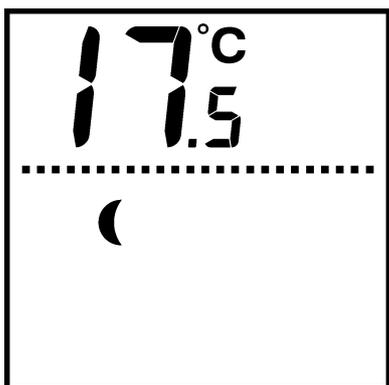
All functions can be operated from the controller. The controller allows you to:

- switch the Comfort Circle on and off;
- regulate the temperature in the room;
- set the speed of the fan.

Multiple units operated from one controller

If multiple units are connected to the controller, its settings will be the same for all units. An exception to this are combined recirculation and ventilation units, which provide individual ventilation control.

4.1 Switching on and off



4.1.1 Switching the unit on and off

You can switch the Comfort Circle on and off manually. Independently of this, the unit can be controlled by external controls (see section 4.6.3).

- To switch the unit on (☀) or off (☾), press the Ⓞ key briefly.

If the unit is switched off, the LED in the controller will be lit. If the temperature in the room falls below the night temperature setpoint (default value of 15°C), the unit will start running until the night temperature is reached.

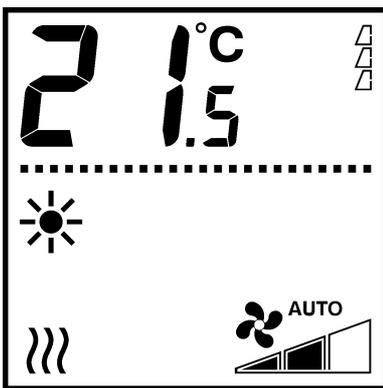
4.1.2 Pause mode

In the pause mode, the unit does not respond to signals from external controls. Frost protection will remain enabled, though.

- To switch the unit to the pause mode, press the  key for 3 seconds.
- To exit the pause mode, press the  key briefly.

When the unit is in pause mode, the controller LED will be lit and the display will be blank.

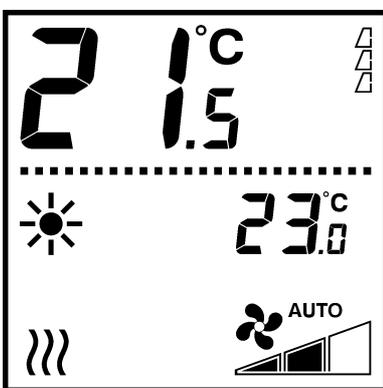
4.2 Regulating the fan speed



- To set the fan speed, press the  key:
 - Low 
 - Medium 
 - High 
 - AUTO 

In the AUTO mode, the fan speed is automatically set by the Comfort Circle controller.

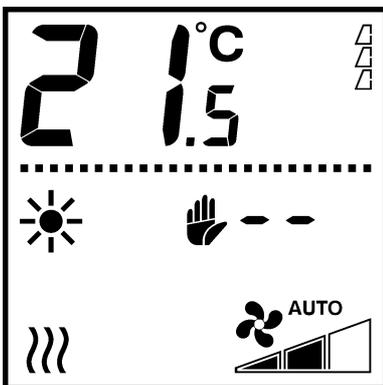
4.3 Regulating the temperature



22°C

- To set the desired room temperature, press  or .

The unit will try to reach the desired temperature. The fan of units with standard control switches off when the desired temperature is reached. The fan of units with modulating control either keeps on rotating at low speed, with the discharge temperature being lowered, or it switches off, depending on settings.

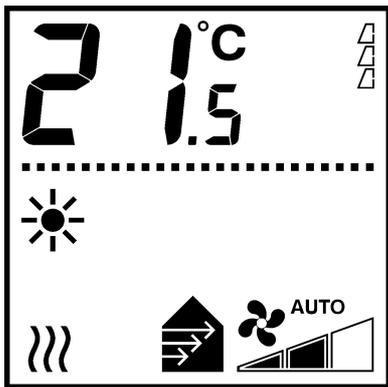
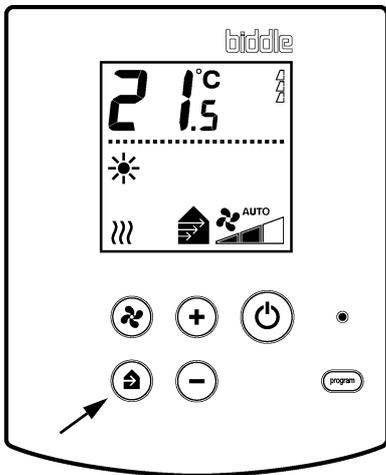


If the  symbol appears in the display when you press the  or  key, you cannot regulate the room temperature. The unit is set such that it has a fixed discharge temperature.

The large digits indicate the current room temperature.

The smaller digits indicate the (desired) room temperature setting.

4.4 Regulating the ventilation



Units with ventilation only

- Press the button to set the ventilation volume.

The setting is indicated as described in Section 4.2.

Units with ventilation sections

Ventilation units that feature the ventilation sections have the control panel (with the button) shown opposite.

- Press the button to regulate the ventilation volume.

You can choose from 4 ventilation volume settings:

- ventilating at speed 1, 2 or 3:
The ventilation units will run at low, medium or high fan speed. The arrows indicate the speed.
- recirculation only.

In the recirculation mode, you regulate the fan speed using the button. In the ventilation mode, the unit will operate at the highest setting.



Note:

If, in the installation menu, you set function 98.5 to 1 (see Chapter 3), you can use the button to choose between ventilating and recirculating during normal operation. You regulate the fan speed using the button.



Note:

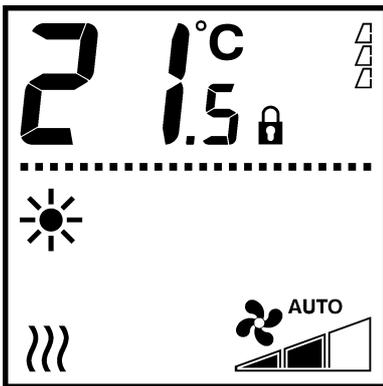
The number of speeds may be limited by some settings.

Combination of recirculation units and ventilation units

If both recirculation units and ventilation units are connected to the control panel, and you have the above control panel (with the button), you can regulate the ventilation volume independently of the recirculation volume. You regulate the recirculation volume using the button, as described in Section 4.2.

- Press the  button to regulate the ventilation volume. In the recirculation mode, ventilation units are deactivated.
- Press the  button to regulate the recirculation volume.
- Ventilation units featuring CC VR ventilation modules work as described above.

4.5 Locking the keys

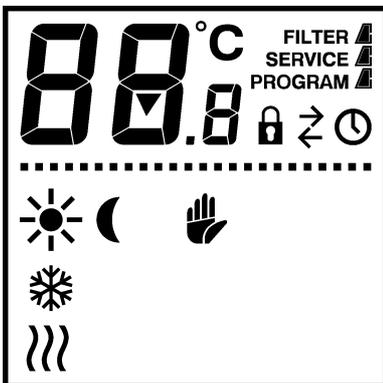


It is possible to lock the controller keys to prevent unwanted use.

- To lock or unlock the keys, press ,  and  simultaneously.

The  symbol will appear in the display. Pressing any keys will have no effect on the operation of the unit.

4.6 Display messages



4.6.1 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 (see section 6.2).

4.6.2 Heating or cooling



The  symbol indicates that the unit operates as a heating device.



The  symbol indicates that the unit operates as a cooling device.

4.6.3 External controls



The  symbol in the display indicates that the Comfort Circle is switched on or off by a timer in or on the controller. In that case, the  key does not work.



The ⇄ symbol indicates that an external control signal is active in a connected unit.

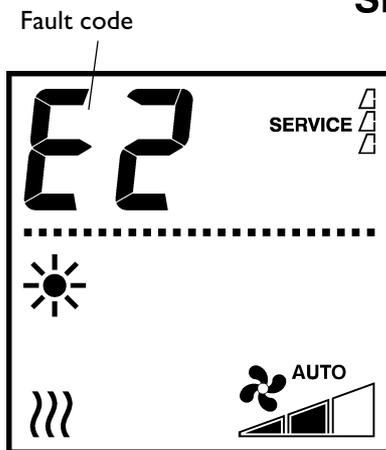
The working of the unit depends on the external control settings (see section 3.3). Some functions may not work, or only to a limited degree.

If settings are changed by the external control, the display will show the actual settings.

4.6.4 Faults

SERVICE

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



Warning:

Some faults may cause material damage or physical injury if disregarded. If **SERVICE is displayed, refer to section 7.4 and, if necessary, alert the installer or other expert, or contact Biddle.**



Note:

The fault code will disappear when you press a key. The message **SERVICE** will however remain visible as long as the fault is not corrected.

If a fault code is displayed without the message **SERVICE**, the fault occurred in your absence, and has been resolved in the meantime. You need not undertake action unless the fault keeps returning.

5. . Timer

The Comfort Circle comes standard with a week timer. The timer allows you to switch the unit on/off each day of the week. The switching moments can be set at 30-minute intervals.



Note:

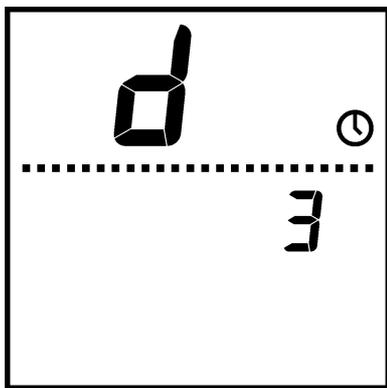
If you wish to control the switching on and off more precisely, you can use an external timer, which is to be separately connected to the controller.



Note:

The controller has a battery, so that the time will keep on running when there is a power outage. The battery has a minimum life of 10 years. When its life has lapsed, the day and time will have to be entered again after a power outage.

5.1 Setting the current time



1. Press the  key briefly, and the display will show a “d” and the  symbol.
2. Set the day using  and , and close using the  key (Monday = d1 ... Sunday = d7).
3. Set the hour *H* using  and , and close using the  key.
4. Set the minutes *m* using  and , and close using the  key.
5. Store the day and time by holding the  key down for five seconds. The display will return to the normal user mode.
To exit the menu without storing the settings, briefly press the  key.

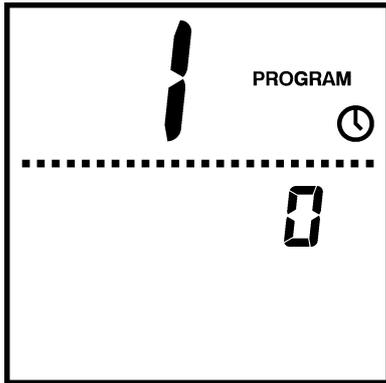
5.2 Setting the timer

1. Press the  key for three seconds.



Note:

The access to the timer menu may be limited through the controller switch (see section 3.2.3).



2. The display now shows a large *1*. Now, using the \oplus and \ominus keys, choose between:
 - 0 = The unit can still be switched on and off using the \odot key, independently of the timer;
 - 1 = The unit can be switched on and off by the timer only. In the latter case, the \odot key does no longer work. If this option is chosen for, the \odot symbol appears in the display.

3. To go to the next setting, press the  key. The display now shows a large *2*.

4. Now, using the \oplus and \ominus keys, choose between:
 - 0 = use no timer or use an external timer;
 - 1 = use the timer in the controller.

5. To go to the next setting, press the  key. The controller now displays *d1.0* as well as the  symbol. This is the starting time on Monday.

6. Set the desired starting time using the \oplus and \ominus keys.

7. To go to the next setting, press the  key. The controller now displays *d1.5* as well as the  symbol. This is the stopping time on Monday.

If the starting time and the stopping time are the same, the unit will not switch on.

8. Set the desired stopping time using the \oplus and \ominus keys.

9. Repeat steps 5-8 for the other days (*d2* through to *d7*).

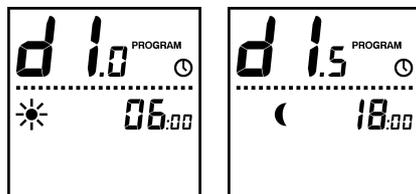
10. By pressing the  key for three seconds, the settings are stored.

To exit the menu *without* storing the settings, briefly press the \odot key.



Note:

If after setting the timer the \odot symbol is blinking in the display, you still have to set the current time (section 5.1).



6. . Maintenance

6.1 Cleaning the unit

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



Warning:
Make sure no water runs into the unit.



Warning:
Do NOT clean the electronics module with a damp cloth.

6.2 Cleaning the filter

6.2.1 Introduction

The filter must be cleaned regularly. A dirty filter may lead to inadequate heating as well as a high noise level. The interval at which the filter is to be cleaned depends on the local conditions.

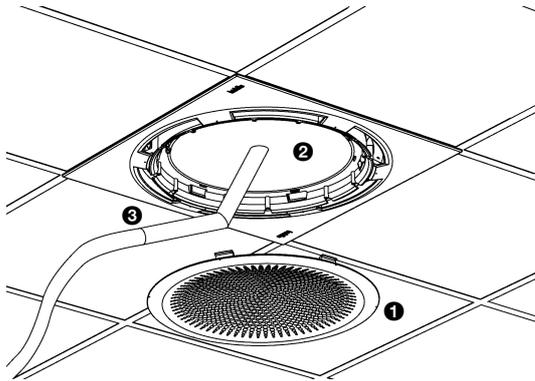
The Comfort Circle is designed such that the filter can stay in the unit when cleaned. You may however want to remove the filter from the unit for cleaning, or for renewal.



Warning:
If the filter is damaged, it must be renewed immediately.

6.2.2 Monitoring the filter service life

The controller monitors the service life of the filter. In the installation menu (see section 3.2.2), you can set the maximum life (the service life on expiry of which the filter is considered dirty).



6.2.3 Cleaning the filter

1. Switch the unit off using the controller.
2. Remove the air inlet grille ❶.
3. Clean the filter ❷ using a vacuum cleaner ❸.
4. Replace the air inlet grille.
5. Switch the unit on.
6. Reset the filter's service life by pressing ⊕ and ⊖ simultaneously.

6.2.4 Removing and replacing the filter



Danger:

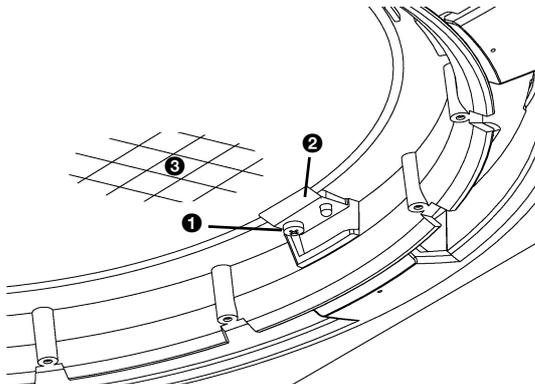
This may be carried out by qualified staff only.



Warning:

Replace the filter if it is damaged.

1. Switch the unit off.
2. Disconnect power supply (remove plug from socket or move main switch to Off).
3. Remove the air inlet grille.
4. Loosen screw ❶, but do not remove it from the unit.
5. Remove the locking plate ❷.
6. Take out the filter ❸.
7. Clean or renew the filter.
8. Replace the filter.
9. Re-apply the locking plate to the filter.
10. Tighten screw ❶.
11. Replace the air inlet grille.
12. Switch the power on again. Reset the filter's service life by pressing ⊕ and ⊖ simultaneously.



Danger:

For safety reasons, the unit may not be used without a filter.

6.3 Scheduled maintenance

Biddle recommends to have the following inspection and maintenance works performed by an installer or other technical expert each year.

- Check if the heat exchanger is clean. Settled dust may cause unpleasant smells.
- Gently remove dust with a vacuum cleaner.



Caution:

The fins of the heat exchanger are delicate parts.



Warning:

The fins of the heat exchanger are sharp.

- Check the operation of the fans.
- Clean the unit's drip tray (for removing the drip tray, see section 8.4.1).
- Remove the filter from the condensate pump (see section 6.4).

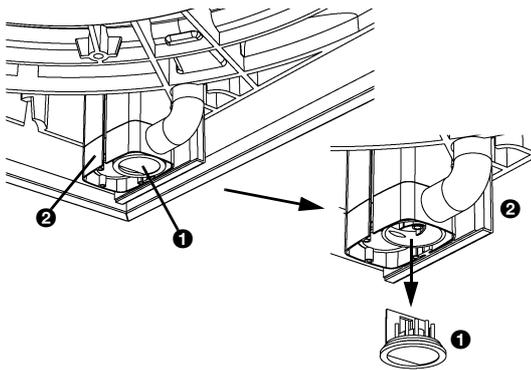
6.4 Cleaning the condensate pump filter



Warning:

This may be carried out by qualified staff only.

1. Switch the unit off.
2. Disconnect power supply (remove plug from socket or move main switch to Off).
3. Remove the air inlet cover (see section 8.5).
4. Remove the filter element ① from the condensate pump ②. Use a flat screwdriver to remove it.
5. Clean the filter.
6. Replace the filter.



Caution:

Check the filter for leaks by pouring water into the external drip tray.

7. Replace the cover.
8. Switch power and unit on.

7 . . Faults

7.1 Safety instructions



Danger:

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



Danger:

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

7.2 Resolving simple problems

If you suspect a fault, first try to resolve the problem using table 7-1. You need not be an expert for this.

7.3 Fault-finding by the installer

If table 7-1 does not provide the solution to the problem, table 7-2 can be used to investigate the fault further.

If a fault code is displayed (see section 7.4), table 7-3 can be used to resolve the fault.

Contact the supplier if tables 7-2 and 7-3 do not provide the solution either.



Caution:

First run through table 7-1 before considering the actions in table 7-2.



Danger:

The actions in tables 7-2 and 7-3 may be performed by competent staff only.

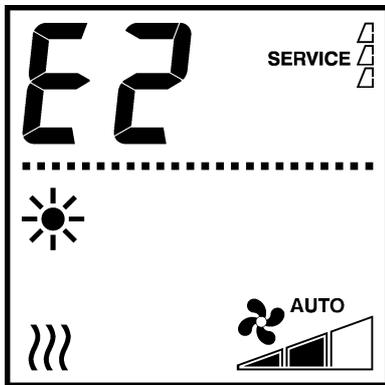
Table 7-1 Correcting simple faults

PROBLEM	LIKELY CAUSE	WHAT TO DO
The unit does not work, and the controller display is blank.	<i>If the LED is lit:</i> the unit is in pause mode.	Exit the pause mode by pressing the  key.
	<i>If the LED is not lit:</i> no power is supplied to the controller.	Check the mains power supply: <ul style="list-style-type: none"> • plug in power point; • isolation switch; • unit live.
One or more keys do not work.	<i>If the display only shows the room temperature:</i> the unit is switched off.	Switch the unit on using the  key.
	If the  symbol is displayed: the keys of the controller are locked.	To unlock the keys, press  ,  and  simultaneously.
	If the display shows the  symbol or the  symbol: the unit is controlled by an external control.	This is not a fault. Operation is limited by the input signal from the external control.
One or more units do not work.	If the display shows more symbols.	For CC S: This is normal – the room temperature has been reached, and the fan switches off.
		For CC M in AUTO mode: the room temperature has become too high (when heating) or too low (when cooling).
	If you have a 6-key controller, and the  symbol is displayed.	Press the  key to switch on the ventilation units – the  symbol appears in the display.
	If the display shows the  symbol or the  symbol: the unit is controlled by an external control.	This is not a fault. Operation is limited by the input signal from the external control.

Table 7-2 Fault finding by the installer

PROBLEM	LIKELY CAUSE	WHAT TO DO
The controller displays an E- or F-code.	A fault has occurred in the unit.	<ol style="list-style-type: none"> 1. Press any key of the controller. 2. If the code disappears, the fault is no longer current, and there is no need for immediate action. 3. Refer to table 7-3 for resolving the fault if the code does not disappear, or if the code shows up frequently.
The controller works normally but the unit does not respond.	The fan is dead.	<ol style="list-style-type: none"> 1. Check the fuse on the electronics module (see section 8.8). 2. Check the wiring between the PCB and the fan. 3. Replace the transformer.
The unit does not work, the controller display is blank, and the LED is not lit.	The unit is dead.	Check the power connections, the wiring and the fuse of the electronics module.
	The connection between the controller and the unit is not correct.	Check the control cable.
	The PCB does not work.	<ol style="list-style-type: none"> 1. Check the feeder cable. 2. Replace the PCB.
	The controller is defective.	<ol style="list-style-type: none"> 1. Check the controller by connecting it to another unit. 2. Replace the controller if it does not work.
The fan does not work.	The fan is dead or defective.	<ol style="list-style-type: none"> 1. Check the fuse on the electronics module (see section 8.8). 2. Check the fan wiring. 3. Replace the fan.
The fan does not operate at a certain speed.	The connection for the relevant speed is not correct.	<ol style="list-style-type: none"> 1. Check the wiring between transformer and PCB. 2. Replace the transformer.
Not all connected units are working.	The controller does not communicate with one or more connected units.	<ol style="list-style-type: none"> 1. Check if mains power is supplied to all connected units. 2. Check the control cables (see section 2.15.3). 3. Check the fuses in all connected units (see section 8.8).

7.4 Fault messages in the controller



7.4.1 Reading faults

Current faults

If the message **SERVICE** appears in the display, there is a fault. Next to it, the fault code is displayed.

The fault code will disappear when you press a key. The message **SERVICE** will however remain visible as long as the fault is not corrected.

Try to remedy faults that come with a fault message using table 7-3. No technical expertise is needed for this.

No-longer-current faults

If a fault occurred in your absence but has been automatically cleared in the meantime, only the fault code is displayed. It will disappear when you press a key.

In the service menu, you can read out the codes and times of the latest faults (see section 8-1, functions nos. 23 to 27).

7.4.2 Deleting faults

Most fault messages will disappear automatically when the problem is resolved. Some faults can be corrected by reconfiguring the controller in the service menu: the controller will then search again for connected units (see table 8-1, function 20).

Table 7-3 Fault codes

CODE	LIKELY CAUSE	WHAT TO DO
E1	<p>The controller does not communicate with one or more connected units.</p> <p>This fault may occur:</p> <ul style="list-style-type: none"> • when a connected unit has been removed or replaced; • due to a short failure in the power supply to a connected unit; • due to incorrect cabling; • due to a defect. 	<ol style="list-style-type: none"> 1. Reset the controller (see section 8.3). 2. Check if mains power is supplied to all connected units. 3. Check the control cables.
E2	Units that have an unallowed or unknown unit code, or an unallowed combination of unit codes, are connected.	<ol style="list-style-type: none"> 1. Check and compare the unit codes on the type plate (see sections 1.3.4 and 2.15).
	The controller is live but does not communicate with some unit.	<ol style="list-style-type: none"> 1. Reset the controller (see section 8.3). 2. Check the control cables.
E4	<p>There is a failure in the condensate pump.</p> <p>The unit is switched off to prevent damage caused by leaking condensate water.</p>	<ol style="list-style-type: none"> 1. Reset the controller (see section 8.3). 2. Check if there is extreme condensation due to high air humidity. 3. Check if the condensate pump float is not stuck (see Section 6.4). 4. Check the condensate pump's connections and wiring. 5. Replace the condensate pump.
E6	<p>Freezing risk due to too low discharge air temperature. Frost protection has been activated (see section 2.5.2).</p> <p>Freezing may cause damage to the heat exchanger.</p>	<ol style="list-style-type: none"> 1. Ensure that the temperature in the room gets higher than 8°C. 2. Check the operation of the CH system. 3. Check the discharge temperature sensor's wiring and connection (connector X350). <p>You can prevent this fault by instructing the unit to switch on the CH system in case of freezing risk (see section 2.17.4 and table 3-1).</p>
FI	Fault in the automatic angle adjustment.	<ol style="list-style-type: none"> 1. Delete the fault message (see section 7.4.2). 2. In the controller, change the desired room temperature such that the controller switches from heating to cooling, or the other way around, and check if the angle adjustment ring moves. 3. Remove any obstacles from the angle adjustment ring's range. 4. Check wiring and connectors between the adjustment motor, the microswitch and the PCB. 5. Replace the angle adjustment drive.

Table 7-3 Fault codes

CODE	LIKELY CAUSE	WHAT TO DO
F4	The temperature sensor in the controller is defective.	1. Replace the controller.
F5	The temperature sensor in the discharge section does not work.	1. Check the sensor's wiring and connection (connector X350). 2. Replace the sensor.
F6	The temperature sensor in the air intake section does not work (CC V).	1. Check the sensor's wiring and connection (connector X360). 2. Replace the sensor.
F7	The change-over sensor does not work.	1. Check the sensor's wiring and connection (connector X360). 2. Replace the sensor.
F8	Fault at 0-10VDC input: <ul style="list-style-type: none"> • voltage exceeds 10 V; • voltage is 0 V. 	1. Check the wiring at the 0-10VDC input. 2. Check the working of the accessory at this input. 3. Replace the accessory at this input.

8 . . Service

8.1 Safety instructions



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



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

8.2 Service menu

In the service menu, you can read values that provide information on the operation of the unit

- Press the  key and the  key simultaneously.
- To browse through the menu, press the  key.
- To exit the menu, press the  key.

8.3 Resetting and reconfiguring the controller

In some situations it may be necessary to reset and reconfigure the controller. Use this function:

- to remedy fault E1 or E2 (see section 7-3);
- after replacing a PCB (see section 8.11);
- after removing or replacing a connected unit.

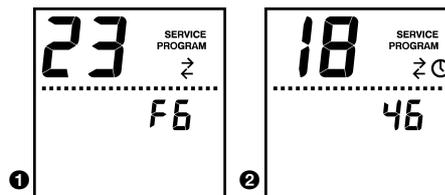
To reset and reconfigure:

- press  and  simultaneously.

The controller will then search again for connected units (see table 8-1, function 20). Next, you return to the user level.

Tabel 8-1 Reading values in the service menu

No.	FUNCTION
20	Resetting and reconfiguring the controller (see section 8.3) Custom settings will remain stored.
21	Current max. filter life, in weeks (1 week = 50 operational hours)
22	Software version control
23	Fault history (23 = oldest, 27 = latest fault message) First, the number along with the fault code ❶ and, then, the time ❷ (in hours) lapsed since the occur- rence appear in the display.
24	
25	
26	
27	
28	Number of units connected to the controller
29	Input voltage at the 0-10VDC input in tenths of Volts
30	Status of the input (I = made)
31	Status of output O1 (on/off)
32	Status of output O2 (on/off)
33	Status of output O3 (on/off)
34	Value of change-over temperature sensor
35	Average air inlet temperature, ventilation units
36	Average air outlet temperature, ventilation units
37	Average air inlet temperature, recirculation units
38	Average air outlet temperature, recirculation units
39	Average valve position, heating
40	Average valve position, cooling
41	Target value of air outlet temperature (set by controller)



8.4 Accessing the interior of the unit

8.4.1 Recirculation units

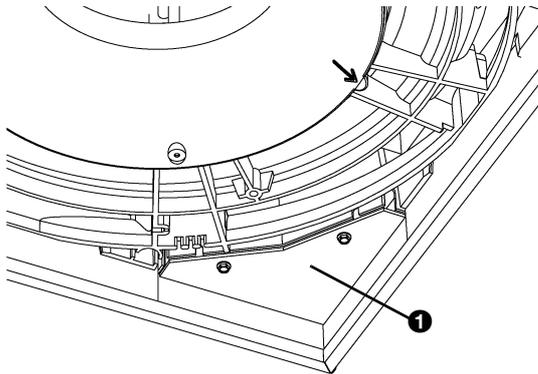
1. Switch the unit off using the controller.



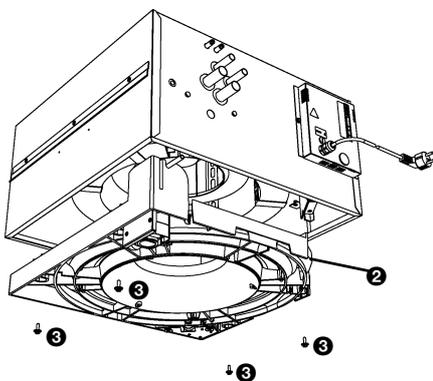
Warning:

Disconnect the power supply (pull plug from socket or move isolation switch to Off).

2. Remove the main cover (see section 8.5).



3. Remove the electronics module's cover **1**.
4. Detach the connections of fan, condensate pump, angle adjustment motor and temperature sensors from the PCB.
5. Detach the cables of fan, condensate pump and angle adjustment motor from their guides.



Caution:

The drip tray comes completely loose when you remove the screws. Ensure it does not fall down.



Caution:

The drip tray may still contain some water.



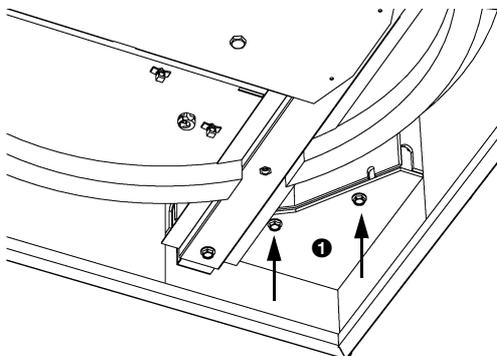
Warning:

The heat exchanger can be hot.

6. Remove the drip tray **2** using screws **3**.

8.4.2 Ventilation units

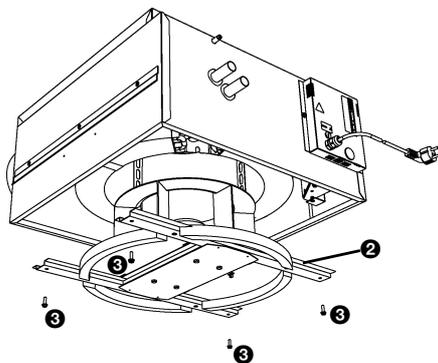
1. Switch the unit off using the controller.



Warning:

Disconnect the power supply (pull plug from socket or move isolation switch to Off).

2. Remove the main cover (see section 8.5).
3. Remove the electronics module's cover **1**.
4. Detach the fan connection to the PCB.
5. Remove the fan frame **2** using screws **3**.



Caution:

The fan frame comes completely loose when you remove the screws. Ensure it does not fall down.



Warning:

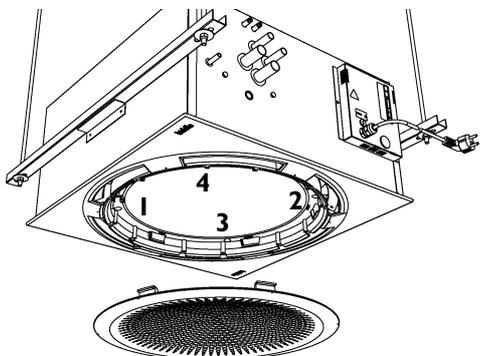
The fan frame is heavy.



Warning:

The heat exchanger can be hot.

8.5 Removing the main cover



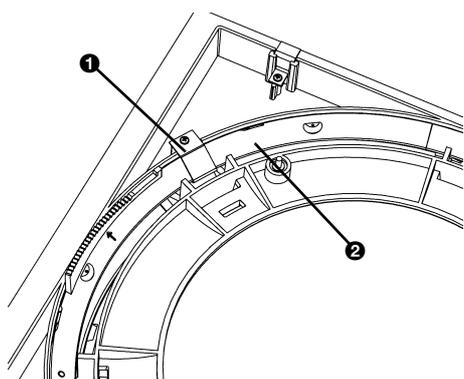
1. Switch the unit off using the controller.

Warning:

Disconnect the power supply (pull plug from socket or move isolation switch to Off).

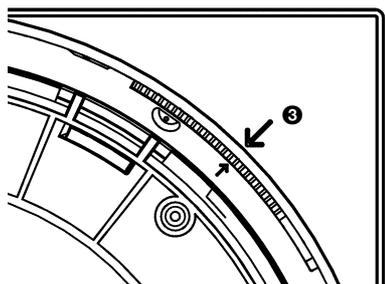
2. Remove the grille by turning it anticlockwise (bayonet catch).
3. Loosen the screws in the indicated order.
If anti-loss rings were mounted upon installation, the screws stay in the cover.

8.6 Positioning the angle adjustment ring

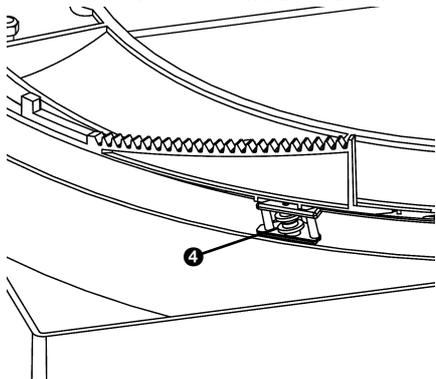


If the angle adjustment ring is out of true in the cover, the ring must be repositioned.

1. Remove the cover (see section 8.5).
2. Remove the locking plate ❶.
3. Turn the angle adjustment ring ❷ out of the cover.



4. Orientate the arrows ❸ on the ring and cover.
5. Turn the ring into the cover.

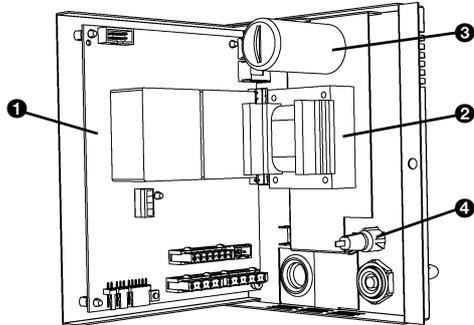


Caution:

Ensure that the thread in the cover is positioned in all six bearing rings ❹.

6. Mount the locking plate ❶.
7. Replace the cover.

8.7 Electronics module



8.7.1 Introduction

The unit offers one electronics module. It includes:

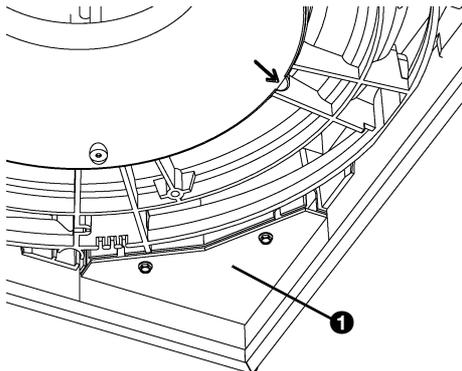
- the PCB ①;
- the transformer ②;
- the fan capacitor ③;
- the fuse ④.

If necessary, the connections of fan, condensate pump, angle adjustment motor and temperature sensors can be accessed via the bottom of the unit. The complete module is accessible via the side of the unit.



Note:

The PCB in your unit may look different from the PCB illustrated here.



8.7.2 Accessing the electronics module from the bottom

1. Switch the unit off using the controller.



Warning:

Disconnect the power supply (pull plug from socket or move isolation switch to Off). Remove the main cover (see section 8.5).

2. Remove the electronics module's cover ①.

8.7.3 Removing the electronics module

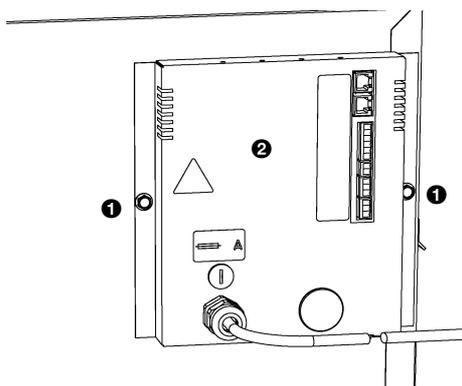
1. Switch the unit off using the controller.



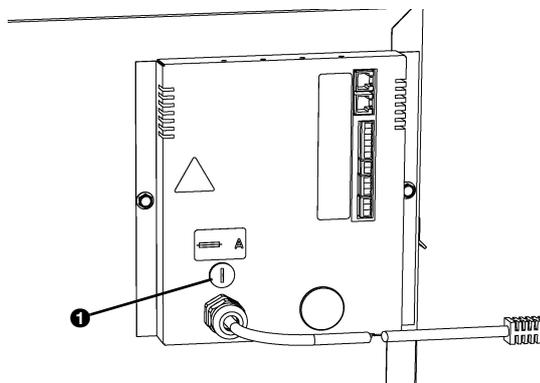
Warning:

Disconnect the power supply (pull plug from socket or move isolation switch to Off).

2. Remove the screws ① from the electronics module ②.
3. Take out the electronics module ②.
4. Disconnect all unit-connected connectors and earth connections from the electronics module.



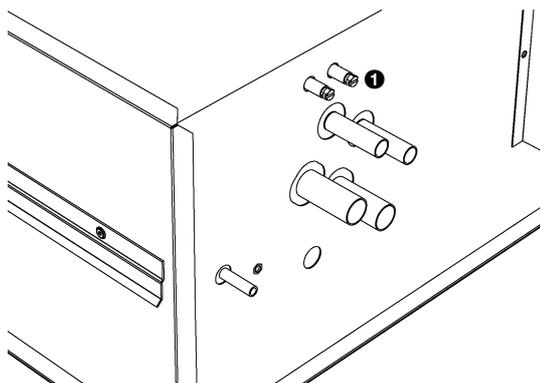
8.8 Fuse



The unit's electronics module has one fuse. The fuse rating is specified on a sticker near the fuse.

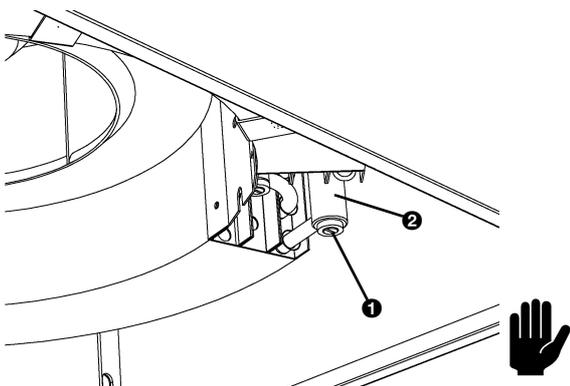
1. Disconnect the power supply (pull plug from socket or move isolation switch to Off).
2. Loosen fuse holder ❶.
3. Replace the fuse.

8.9 Venting the heat exchanger



The vent valve ❶ is above the CH connections. The CC HI/C2 has two vent valves.

8.10 Draining the heat exchanger



The heat exchanger can be completely drained.

1. Recirculation units: Remove the main cover and the drip tray (see section 8.4).
Ventilation units: Remove the main cover (see section 8.5).
2. Open the drain plug ❶ of collector ❷.
The CC HI/C2 has two drains.

Caution:

After refilling the system, check the sealing of the drain plug.

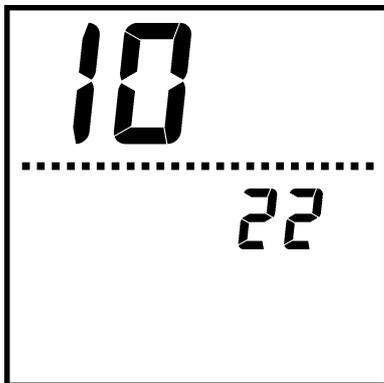
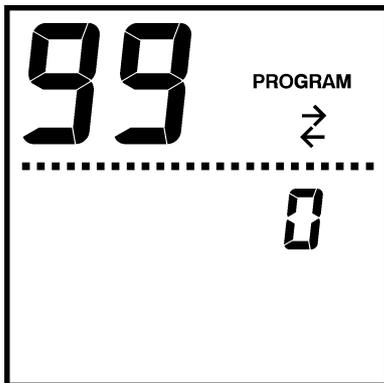
8.11 Setting the unit code

After replacing the PCB, you must enter the unit code. The unit code depends on the unit type and is indicated on the type plate.



Caution:

Entering the unit code can be done only if one unit is connected to the controller. If necessary, connect the controller separately to the unit concerned.



1. Reset the controller (see section 8.3).
2. Go to the installation menu by pressing the  key and the  key simultaneously for five seconds.
3. Using the  key, go to function 99.
4. Using the  key, change the value from 0 to 1.
5. Press  for three seconds.
This will take you to the screen for entering the unit code.
6. The controller displays four numbers, which, together, constitute the unit code. The first number starts blinking.
7. To increase or decrease the number, press  or .
8. To go to the next number, press the  key.
9. Repeat the previous two steps until you entered all four numbers. No number will be blinking any more.
10. Store the unit code by pressing the  key. The unit code has now been set.

If multiple units are connected to one single controller:

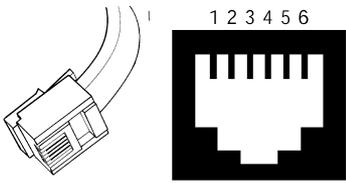
11. Reconnect the other units to the controller.
12. Reset the controller (see section 8.3).

8.12 Composition of Biddle control cable

The control cable for Biddle units is different from standard modular telephone cables.

The plugs are of the RJ-11 type but the sockets are 'straight' – at both ends of the cable, the core is connected to the same pin.

Table 8-1 Colour codes of Biddle cables

	PIN	COLOUR
	1	(not used)
	2	black
	3	red
	4	green
	5	yellow
	6	(not used)

(This page is intentionally blank.)



Declaration of Conformity

Manufacturer: Biddle BV,
Address: Markowei 4
9288 HA Kootstertille
THE NETHERLANDS

We declare that the following product.

Product description: Comfort Circle
Brand: Biddle
Model: CC
Type: CC 60-....
CC 60V-....

In accordance with the following Directives:

73/23/EEC

the Low Voltage Directive

89/336/EEC

the Electromagnetic Compatibility Directive

Has been designed and manufactured to the following specifications:

EMC:

- **EN 61000-3-2:2000** Emission harmonic current
- **EN 61000-3-3: 1995** Emission voltage fluctuations and flicker
- **EN 61000-6-3: 2001** Emission
- **IEC 61000-4-2:2001** Immunity electrostatic discharge
- **IEC 61000-4-3: 2002** Immunity electromagnetic field
- **IEC 61000-4-8:2001** Immunity 50 Hz. Magnetic field
- **IEC 61000-4-4: 2004** Immunity fast transients
- **IEC 61000-4-5: 2001** Immunity surges
- **IEC 61000-4-6: 2003** Immunity ports
- **IEC 61000-4-11: 2004** Immunity voltage dips and interruptions

LVD:

- **EN 60335-1-30: 2002 Safety** of household and similar electrical appliances. Part-1: General requirements.

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 essentials requirements of the directives.

Signed by

: P. Stoelwinder, Managing Director, 10-09-2005