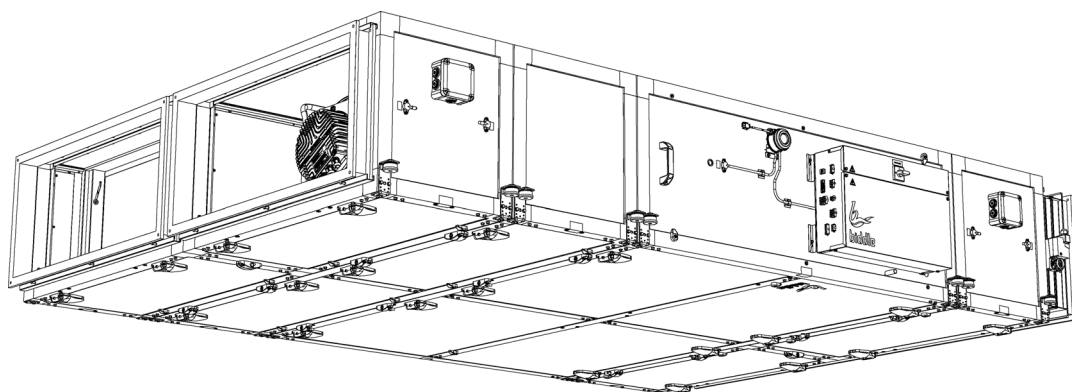


Manual

Heat recovery unit

Model HR 25/35/45



Version 4.1
Original Manual

English

CE

biddle

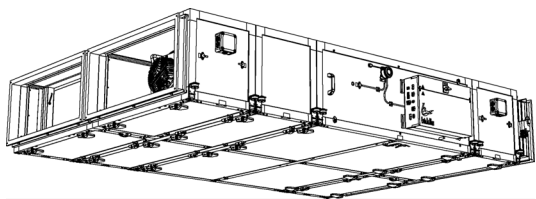
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1. Introduction

1.1 About this manual



This manual describes the installation, operation and maintenance of the heat-recovery unit HR. The manual also provides instructions and information for servicing activities.

1.2 How to read this manual

1.2.1 Designations used in the manual

The following symbols are used in the manual:



Note:

Refers to an important section in the text.



Caution:

If you do not carry out the procedure or action correctly, you may cause damage to the unit.

Follow the instructions precisely.



Warning:

If you do not carry out the procedure or action correctly, you may cause physical injury and/or damage.

Follow the instructions precisely.









Danger:

Is used to designate actions that are not permitted.

Ignoring this prohibition may lead to serious damage or to accidents resulting in physical injury.

1.2.2 Symbols used on the unit and in the manual

The following symbols indicate possible risks or hazards. The same symbols will also be found on the unit.

SYMBOL	DESCRIPTION
	 <p>You have accessed a section of the unit containing components which carry a voltage.</p> <p>Access restricted to qualified maintenance staff only.</p> <p>Caution is required.</p>
	 <p>This surface or component may be hot. Risk of burns on contact.</p>
	 <p>You have accessed a section of the unit with running fans.</p> <p>Caution is required.</p>

1.2.3 Images

The images in this manual can deviate from your specific device type. The functioning is the same, unless indicated otherwise.

1.2.4 Related documentation

In addition to this manual, the following documentation is also supplied with the unit:

- wiring diagram for installation and servicing.

1.3 About the unit

1.3.1 Application

The unit is designed to use heat recovery on ventilation air, with or without additional heating.

Other versions and intended use



Warning:

Applications other than those described above are deemed to be 'usage other than for the intended purpose'. Biddle is not liable for damage or loss resulting from usage other than for the intended purpose. Usage for the intended purpose also entails observance of the instructions in this manual.

1.3.2 Type designation

In combination, the type designations constitute the type code.

Type code basic units

The type code of a basic unit is, for example, HR 35

TYPE CODE ELEMENT	DESIGNATION	MEANING
product series	HR	general designation for the series
capacity	25	2500 m ³ /h
	35	3500 m ³ /h
	45	4500 m ³ /h

Type code additional modules

The type code for additional modules is a combination of the type code for the corresponding basic unit, combined with the indication for the additional module.

For example, for a recirculation module this is HR 35-RM






TYPE CODE ELEMENT	ADDITIONAL DESIGNATION	MEANING
battery type	HC6	water heating, cooling and/or ventilation
	DX	heating via direct expansion
accessory	RM	recirculation module

I.3.3 Symbols on the unit





The modules are equipped with stickers and symbols. These symbols provide information on:

- function
- airflow

components

FUNCTION	SYMBOL
heat exchanger	
recirculation damper	
fan	
filter	
heating/cooling	


airflow

AIRFLOW	SYMBOL
supply air	
extract air	
exhaust air	
fresh air	

I.3.4 Type plate

The type plate is located on the side of the basic unit.

Supplemental modules have their own type plate.

biddle Biddle bv Markowei 4 NL-9288 HA Kootstertille Made in the Netherlands 	Type	XX XX-XX-XX	
	Code	xxx	U xxx V xN- xx Hz
	N°	xxxxxx/x-x xx-xx	I _{max} L1 xxx A
			I _{max} L2 -
	M	xx kg	I _{max} L3 -
	Medium	XXXX	P _{motor} xxx kW
	P _{max} xxxx kPa	P _{heating} -	

Designations on the type plate

DESIGNATION	MEANING
Type	complete type code of the unit
N°	serial number, production week and year
M	weight of unit
Medium	medium
P _{max}	maximum permissible operating pressure
U	power supply voltage
I _{max}	max. current
P _{motor}	max. power consumption by fans

I.3.5 Field of application

Observe the following limits for the unit:

Operating limits for all models

Ambient conditions	Temperature	5 °C to 40°C
	Relative air humidity	20% - 95%, not condensing
Power supply voltage		see type plate
Power		see type plate

Parameters of use for water-heated models



Note:

Consult Biddle if you want to connect a unit to a water flow-path with higher temperatures and higher pressure.



Warning:

The unit may not be used in potentially explosive environments, outdoors or in very dusty or aggressive air conditions.

Biddle shall not be held liable for damage caused by use under these conditions.

Sound levels

Maximum sound power level in ducts

SOUND POWER LEVEL (L_w RE. 10^{-12} W)	OCTAVE BAND CENTRE FREQUENCY (Hz)								L_{WA} dB(A)
	63	125	250	500	1000	2000	4000	8000	
HR 25									
supply air	69.8	65.6	76.4	75.1	78.8	80.4	78.5	74.1	85.5
extract air	65.7	60.5	70.6	69.9	67.4	70.8	70.9	66.7	76.6
exhaust air	69.8	65.6	76.4	75.1	78.8	80.4	78.5	74.1	85.5
fresh air	65.7	60.5	70.6	69.9	67.4	70.8	70.9	66.7	76.6
HR 35									
supply air	75.8	70.7	78.6	78.4	81.3	81.2	78.3	75.4	86.6
extract air	68.6	65.8	75.5	72.3	69.2	70.2	68.2	67.2	76.7
exhaust air	75.8	70.7	78.6	78.4	81.3	81.2	78.3	75.4	86.6
fresh air	68.6	65.8	75.5	72.3	69.2	70.2	68.2	67.2	76.7
HR 45									
supply air	71.9	74.0	86.7	78.8	80.3	79.8	77.5	71.5	86.2
extract air	69.1	70.3	81.8	74.1	68.7	70.1	67.8	62.8	78.0
exhaust air	71.9	74.0	86.7	78.8	80.3	79.8	77.5	71.5	86.2
fresh air	69.1	70.3	81.8	74.1	68.7	70.1	67.8	62.8	78.0

Maximum sound power level in unit housing

TECHNICAL SPEED	dB(A) (L_{WA} RE. 10^{-12} W)		
	HR 25	HR 35	HR 45
10 V DC (high speed)	74	74	78
8 V DC	68	69	75
6 V DC	63	64	68
5 V DC	58	60	62

Maximum sound pressure level in standard room

TECHNICAL SPEED	dB(A) (L_{PA} RE. 2×10^{-5} N/M ²)		
	HR 25	HR 35	HR 45
10 V DC (high speed)	66	66	70
8 V DC	60	61	67
6 V DC	55	56	60
5 V DC	50	52	54

Maximum number of units to be connected

The number of ventilation units that can be connected to the heat recovery unit depends on the unit's capacity and the effective capacity of the ventilation units that are to be connected. If in doubt, consult your Biddle advisor.

See also:

1.3.4 "Type plate" on page 8

1.3.6 CE declaration

The unit is compliant with the applicable CE standards. The complete CE Declaration of Conformity can be found at: www.biddle.info.

1.3.7 Modifications and changes

Without the approval of Biddle, no changes or modifications may be made to the unit that could adversely affect safety. The CE declaration is no longer valid if the unit has been modified or changed in any way.

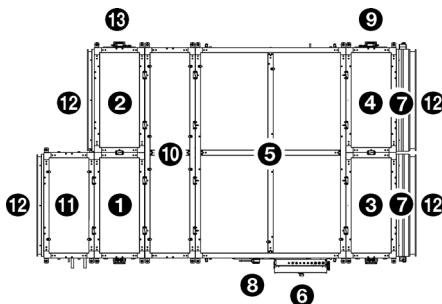
1.4 Components and accessories

1.4.1 Components supplied



Note:

The illustration shows the unit from above, whereby the air exchange with the interior takes place on the left side and the air exchange with the fresh air takes place on the right side.



- Modules:
 - supply fan ①
 - extract air filter ②
 - extract fan ③
 - fresh air filter ④
 - heat exchanger ⑤
- Electronics module ⑥
- Air dampers to fresh air ⑦
- Pressure switch over the heat exchanger ⑧
- Pressure switch over the fresh air filter ⑨
- Fastening material for linking the modules to each other.

1.4.2 Accessories

- Recirculation module ⑩
- Heating/cooling module ⑪
- Flexible manchets ⑫
- Pressure switch over extract air filter ⑬
- Dirty filter warning lamp (during transport, this is stored in the electronics module)
- *b-touch* operating panel with Biddle control cable
- Water-side control:
 - valve and drive
 - temperature sensor
- Sensor for control:
 - CO₂ sensor
- Smoke detector

1.4.3 Components not supplied

The following components required for installation must be obtained from third parties:

- threaded rods M10
- mains power cable
- control cable to building management system
- drain pipe with trap for condensate drainage

1.5 Safety instructions

1.5.1 Safety in use



Warning:

Do not put any objects into the inlets and outlets.



Warning:

Do not obstruct the unit's inlets or outlets.



Warning:

The upper surface of the unit becomes hot during operation.



Caution:

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

1.5.2 Safety issues relating to installation, maintenance and servicing

**Danger:**

The unit may only be opened by qualified technical staff.

**Warning:**

Perform the following actions before opening the unit:

1. Switch the unit off.
2. Allow the unit to cool down.

**Caution:**

The heat exchanger or, as the case may be, the heating elements, can get very hot.

3. Disconnect the mains supply (switch off the isolation switch).
4. If you are going to carry out maintenance or repairs on electrical components: switch the mains supply group off.
5. **For water-heated models:**
shut off the central heating feed (if possible).

**Warning:**

The fins of the heat exchanger are sharp.

2 . . Installation



Warning:

Installation activities may only be performed by technical staff qualified for this purpose.



Warning:

Before starting installation: read the safety instructions.

See also:

1.5 "Safety instructions" on page 11

2.1 Inspection on delivery

- Check the unit and the packaging to ensure that they have been delivered in good order. Notify the driver and the supplier immediately if any shipping damage is detected.
- Ensure that all components are present. Notify supplier of any missing parts immediately.

See also:

1.4 "Components and accessories" on page 10

2.2 Hanging the unit up





2.2.1 Determining the location of the unit

- Make sure that the structure from which the unit is about to be suspended can bear at least 4 times the weight of the unit. The unit's weight is indicated on its type plate.
- The distance between the floor and the unit's underside must be more than 2.7 m due to the accessibility of the inspection hatch.
- Make sure that the electronics and the pressure meters on the unit's long side remain easily accessible.

For this, keep 50 cm of space free on the side of the electronics box.

- The plate heat exchangers are wedged between the side panels. To be able to remove them, space must be created by removing a side panel.

Keep 30 cm of space free on the side of the unit.

- In exceptional situations, water may run out of the unit. Make sure that this cannot cause any damage or dangerous situations.
- *For models with heating:* The distance between the ceiling and the top of the unit must be more than 25 mm.
- Consult the symbols on the unit for the right position:
 -  and  : channels to the interior space
 -  and  : channels to the outside

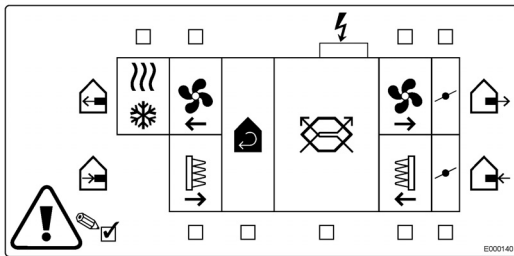
See also:

1.3.4 "Type plate" on page 8

2.2.2 Hanging the unit up

This manual explains how to suspend the unit for each module. Depending on the situation, a different sequence of suspending the units may be selected.

Consult the overview sticker (bottom view) for the module positions in the specific composition of your unit. If required, tick the applicable modules.



Fixing the threaded rods

Fix threaded rods M10 in accordance with the dimensions in the table. Make sure the threaded rods are perpendicular.



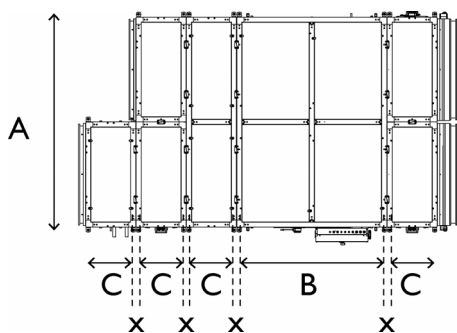
Note:

Only fix the threaded rods for the modules in the specific composition of your unit. See the overview sticker.



Note:

The illustration shows the unit from above, whereby the air exchange with the interior takes place on the left side and the air exchange with the exterior takes place on the right side.

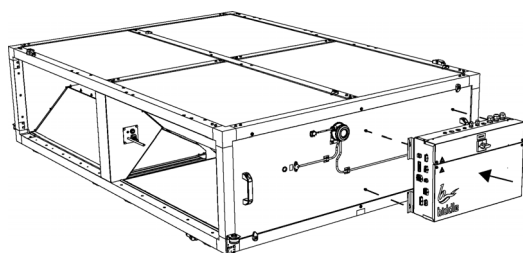



SIZE	TYPE	DIMENSIONS
A	HR 25	1558 mm
	HR 35	2158 mm
	HR 45	2758 mm
B	all models	1450 mm
C	all models	450 mm
x	all models	54 mm

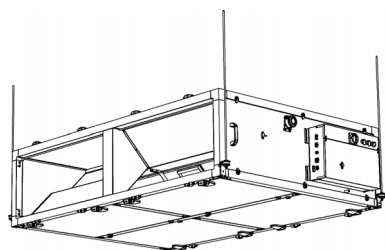


Note:
The threaded rods must be secured, otherwise the unit may fall down.

Hanging the unit up

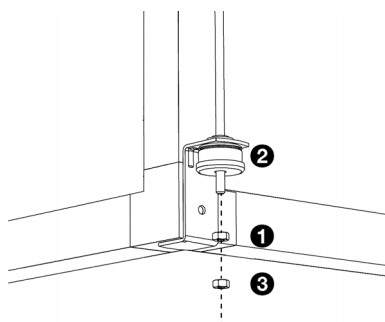


1. Mount the electronics module on the side of the heat exchanger module .



2. Move the heat exchanger module  into position.

3. Attach the module to the threaded rods with nuts ❶.



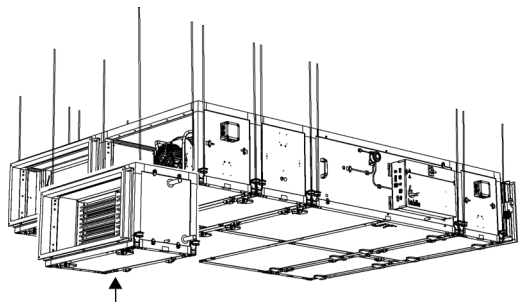
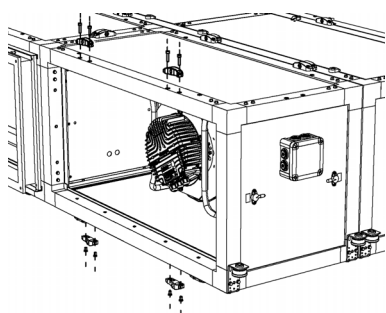
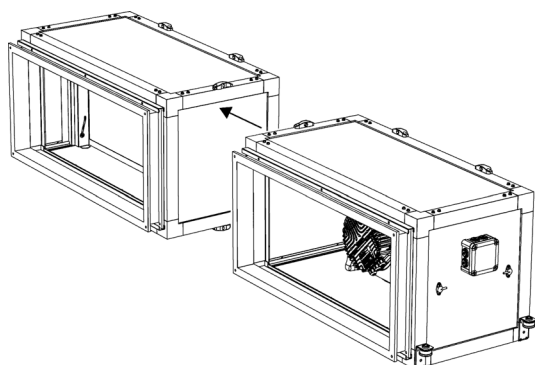
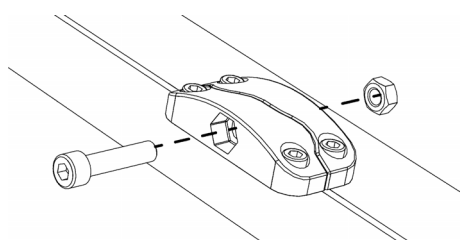
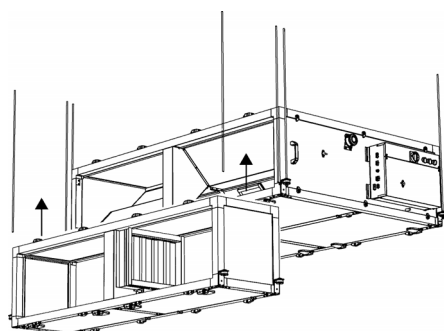
Note:
Make sure the rubbers and rings ❷ for damping stay in the right place.



Caution:
Make sure that the module is hanging level in both directions.

With type HR 45, the heat exchanger can sag slightly. After all the modules are linked, this will be minimalised.

4. To each threaded rod, apply a lock nut ❸.



5. Move the recirculation damper module  into position.



Note:

Ensure that the wiring is on the side of the electronics module.



6. Attach the module in the same way as the heat exchanger module (steps 3 and 4).



7. Connect the modules to each other with the coupling elements at top and bottom.



Caution:

Adjust the modules individually before they are connected to each other.

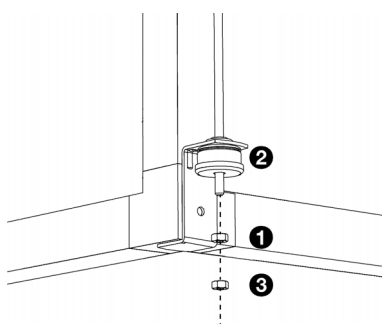
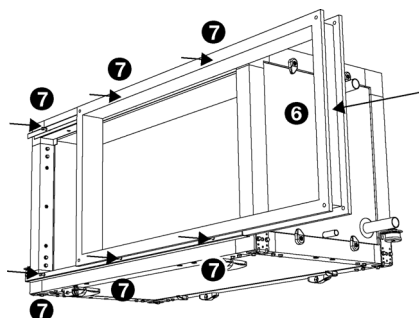
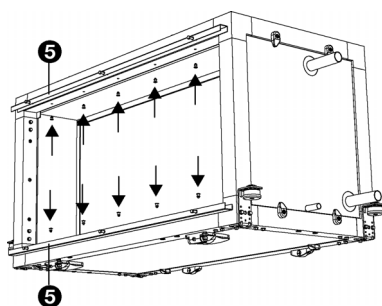
8. Connect the supply fan module  and the extract air filter module  M5 to each other with the coupling elements at top and bottom.

9. Connect the extract fan module  and the fresh air filter module  F7 to each other with the coupling elements at top and bottom.

10. Repeat steps 5 to 7 for both linked assemblies.

11. Only applicable to units with a heating module

- Mount the coupler elements supplied on the fan module.
- Mount and connect the heating module in the same way as for the other modules.



12. Place manchets (accessory)

- Mount the clamping profiles **5**. To do so, use the supplied screws.
- Install the manchet **6**.
- Tighten the clamping screws **7**.

Securing the unit

1. Secure the suspension to the threaded rods by tightening all lock nuts **3**.



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

2.3 Connecting the unit to the ventilation system

Using channel sections, connect the unit to the fresh air, the inside air and to the ventilation units.



Note:
Take into account any sensors for the controls which have to be placed in the ducts.

See [2.10 Installing sensors for control \(accessory\)](#)

When opting for the duct cross-section, take into account:

- The maximum allowable pressure difference for the required capacity. (see diagram under [2.13.5 Calibrate air volume](#))
- The desired maximum air velocity.

**Note:**

If the duct cross-section is too small, this may lead to reduced capacity and/or noise nuisance.

**Note:**

When adapting to different duct diameters, use sufficient length in order to prevent turbulence.

**Note:**

In order to prevent condensation, Biddle recommends insulating the channel sections between the HR unit and the fresh air.

See also:

2.13 "Switching on and checking operation" on page 29

2.4 Connecting the unit to the central heating and heat recovery system

2.4.1 Connecting the water-side control (accessory)

Only for models with water heating/cooling module:

The heating/cooling module can be fitted with a water-side control to control the temperature of the water battery.

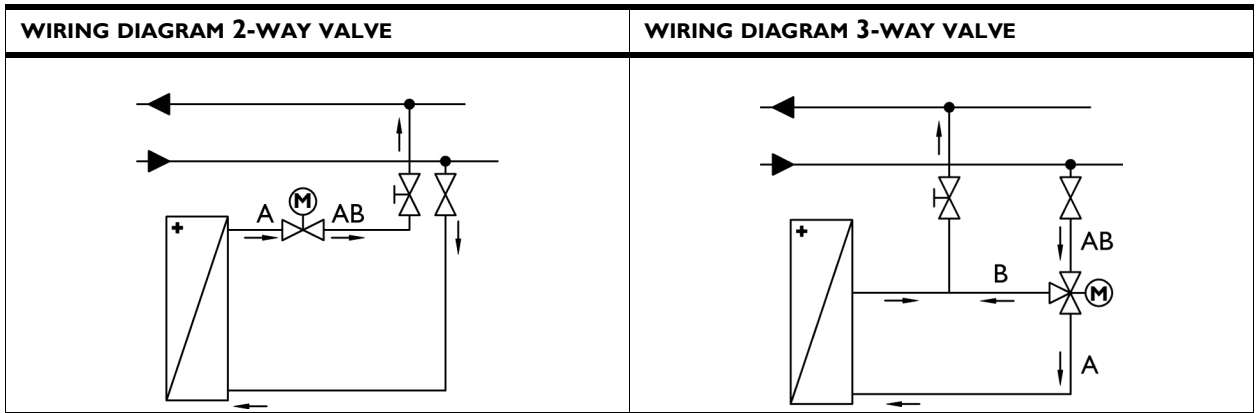
**Caution:**

Biddle supplies suitable 2-way and 3-way valves as accessories.

1. Connect the control valve and the drive to the heat exchanger, in accordance with the diagram. In doing so, follow the instructions given in the control valve manual.

**Note:**

Ensure that the axis of the valve is in the correct position when connecting the drive. See the control valve manual.



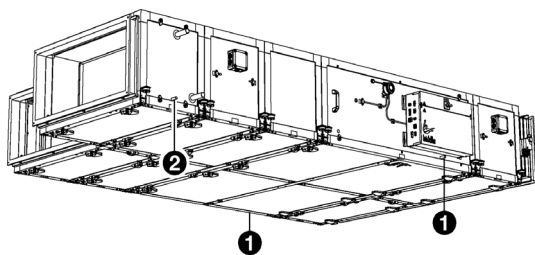
2. Connect the drive to the valve in accordance with the wiring diagram.
3. Connect the drive to the building management system or another control system.

2.4.2 Connecting the unit

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

2.5 Installing condensate drain

The cooling of the air can cause condensation. The unit is fitted with a drain tray(s) to catch condensation water.

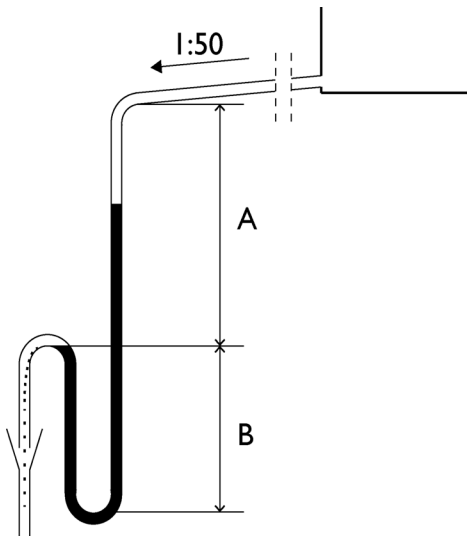


1. Connect one of the connection points ❶ (15 mm) of the heat exchanger to a drainage system.



Caution:

On models that are used for cooling, also connect the connection point of the cooling module ❷ (15 mm) to a drainage system.



Pay attention to the following installation criteria:

- Make sure the drainage pipe has a drop of at least 1:50.
- Fit the drainage pipe with a trap with dimensions as shown in the illustration. Fill this with water before the unit is used for the first time.

A	160 mm
B	110 mm



Caution:

The trap must always be filled with water.

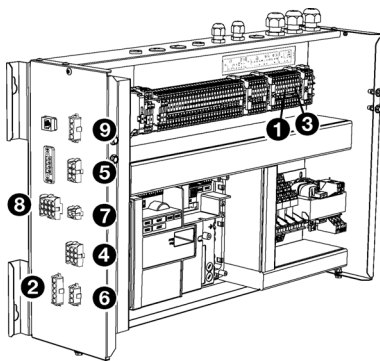
2. Cap off other connection points.



Caution:

If the connection points are not shut off, water may run out of the unit.

2.6 Connecting components to electronics module








1. Connect the various unit components to the electronics module in accordance with the wiring diagram:



Note:

Some components are optional (accessories).

- supply fan module  :
- power supply: XI ① (via cable gland in box)
- control system + input valve: ②
- extract fan module  :
- power supply: XI ③ (via cable gland in box)
- control system: ④
- recirculation damper module  : ⑤
- heat exchanger module  :
- by-pass damper: ⑥
- pressure difference meter: ⑦
- temperature sensors: ⑧
- fresh air filter module  : ⑨

See also:

1.3.3 "Symbols on the unit" on page 7

2.7 Connecting the unit to Modbus

2.7.1 Communication parameters

Standard values of the communication parameters for Modbus are:

COMMUNICATION PARAMETER	VALUE
Baud rate	9600
DATA	8
Parity	none
Stop bits	1

The turnaround time between the unit and Modbus is 4.2 msec.

The default value for the Modbus node address is 1.



Note:

You can modify the parameters via *b-touch* menu > Maintenance > Modbus settings or via Modbus register addresses 460-464.

2.7.2 Wiring

A twisted-pair cable must be used for connection to the Modbus system. The cable must also have a third core for the GND (grounding). Normally, a four-pole, twisted-pair cable is used; one pair is used for communication and one core from the other pair is used as the GND.

Modbus A = -

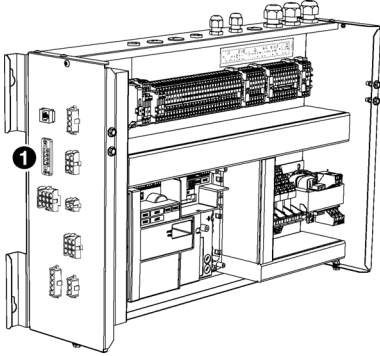
Modbus B = +

GND = ground



Note:

If there is no communication, this may be caused by incorrectly connected wiring. Swap the A- and B+ wires.



2.7.3 Connecting the unit to Modbus

1. Lay a cable between the Modbus system and the unit.
2. Connect the cable to the electronics module ❶, in accordance with the wiring diagram.



Note:

For a more reliable signal, it is possible to connect a 120 Ohm resistor. For this purpose, place a bridge between positions I and B of terminal 52X3 on the control circuit board in the unit.



Note:

The *b-touch* control panel is no longer necessary for the operation. After going through the installation guide, it can be removed. However, make sure to keep it to be able to adjust the settings in a later stage.

2.8 Installing the *b-touch* control panel (accessory)

2.8.1 Special points regarding the control panel

Positioning

- You can attach the control panel to the electronics module, to the wall or to a standard junction box.

Cabling



Note:

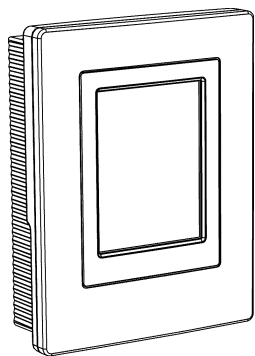
Take the following into account, otherwise errors may occur:

- The length of the control cable between the control panel and the unit connected may not exceed 50 m.
- Keep control cables away from electromagnetic fields and interference sources such as high-voltage cables and fluorescent light starters.
- Lay control cables out straight or roll them in a bifilar coil by folding cables in half before rolling them. As a result, the magnetic fields will cancel each other out to an important extent.

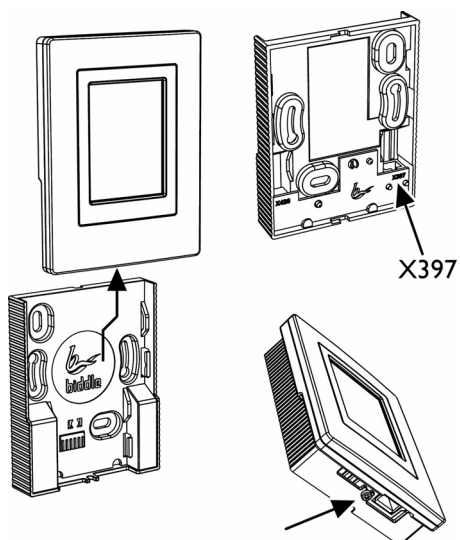


Note:

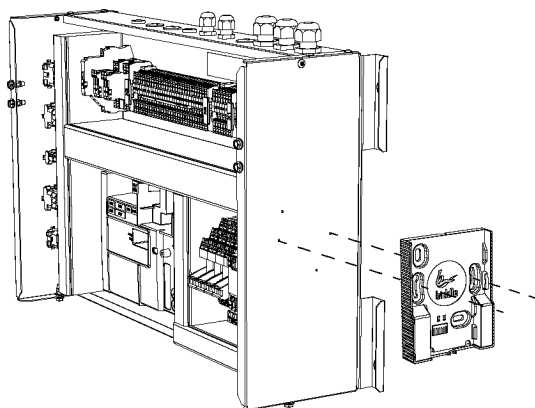
Use Biddle control cables only. Standard modular telephone cable is NOT suitable.



2.8.2 Mounting and connecting the control panel



1. Lay the control cable.
2. Slide the control panel out of the wall holder.
3. Connect the control cable to terminal X397.



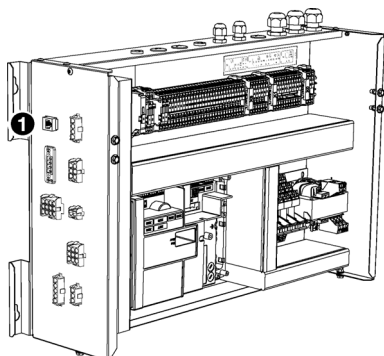
4. Screw the wall holder onto the electronics module, the junction box or against the wall.



Caution:

Ensure that the wall behind the wall holder is even.

2.8.3 Connecting the b-touch panel to the unit



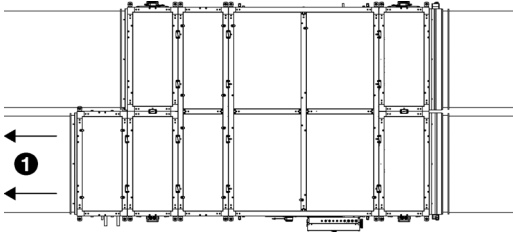
1. Connect the control cable to the electronics module ❶ according to the wiring diagram.

2.9 Connecting the temperature sensor (accessory)

Only for models with HC6 heating/cooling module with water-side control

A temperature sensor is included with the water-side control valve.

1. Position the temperature sensor in the channel for the supply air ❶.



Caution:

Insofar as is possible, position the sensor in the centre of the channel.

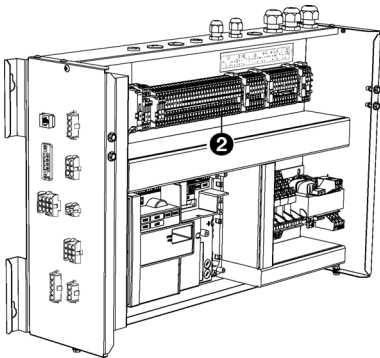
Place the sensor as far as possible from the heating/cooling module. Bear in mind the cable length of the sensor.

2. Feed the cable of the sensor through a cable gland into the electronics module.
3. Connect the sensor at positions 24 and 25 of terminal X2 ❷, in accordance with the wiring diagram:



Note:

If required, remove any existing connections to positions 24 and 25 of terminal X2.

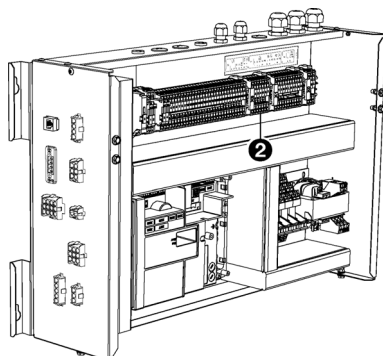
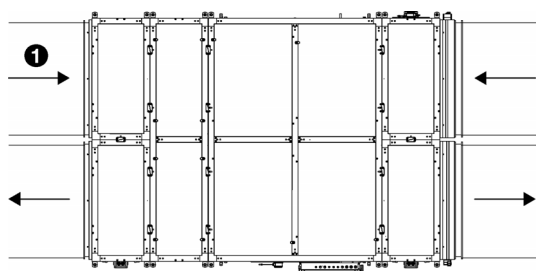


2.10 Installing sensors for control (accessory)

For some controls, a sensor is required to provide the input:

- automatic CO₂ control

Connect the sensor that is to be used to the appropriate connection point in the electronics module.



2.10.1 Installing CO₂ sensor

With automatic CO₂ control, the CO₂ level is supplied by the building management system (BMS). If this information is not available, a CO₂ sensor must be connected.

1. Place the CO₂ sensor (accessory) in extract channel ❶, in accordance with the supplied instructions.
2. Connect the sensor to X3 (G UI 24VAC) ❷ in the electronics module in accordance with the wiring diagram.

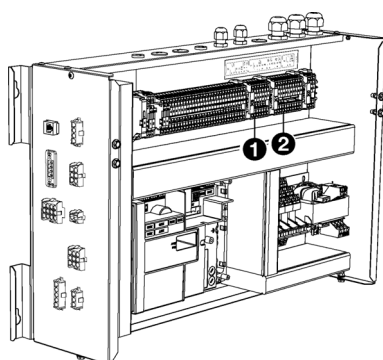


Note:

The CO₂ level in the room must be optimal at least once per week so that the sensor can maintain a good calibration level.

If this situation does not occur naturally, you can make it happen by (for example) having the unit start up an hour earlier once per week.

2.11 Installing external controls



2.11.1 Special points regarding external controls

Unit input

The unit has an input signal interface. As examples, a smoke detector or fire alarm can be connected to this.

Connection X3 ❶ is suitable for input signals that are externally powered.

Connection XI ❷ is suitable for supplying the sensor that is to be connected with a 230V power supply from the unit. When using this, link connection XI to X3 with a bridge.



Caution:

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



Note:

When using the input, indicate what response must be given to an input signal. (Via the *b-touch* control panel: [menu > Configuration > 60. Function of inputs](#) or via the building management system: register address 337 Alarm functions)

Unit output

The unit has an output signal interface (X3). A warning lamp for dirty filters can be connected to this.



Caution:

Keep the cable length to a maximum of 3 metres.

2.11.2 Installing smoke detector or fire alarm (accessory)

In emergencies, the unit can emit an alarm signal or even actively deal with the problem by functioning in a special mode. (See [menu > Configuration > 60. Function of inputs](#))

This function can be activated by the building management system (register address 435) or by an external sensor.

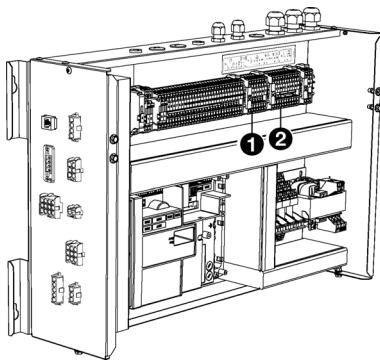
If an external sensor is used:

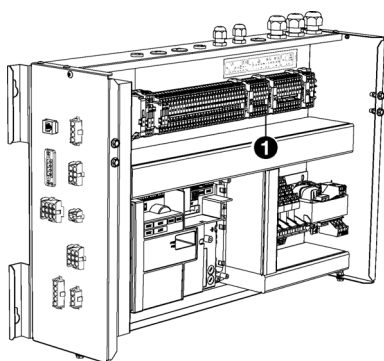
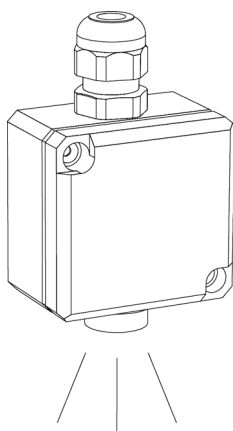
1. Place a smoke detector or fire alarm (not supplied) at a suitable location.
2. *Without using the power supply (230V) from the unit:*
 - Connect the sensor to X3 ❶ in the electronics module in accordance with the wiring diagram
3. *Using the power supply (230V) from the unit:*
 - Connect the sensor to XI ❷ in the electronics module in accordance with the wiring diagram
 - Place a bridge between XI and X3



Note:

When starting the unit, indicate what response must be given to a signal from the sensor. (Via the *b-touch* control panel: [menu > Configuration > 60. Function of inputs](#) or via the building management system: register address 337 Alarm functions)





2.11.3 Installing dirty filter warning lamp (accessory)


The *b-touch* control panel gives an alert if one of the filters is dirty. If the control panel is not available or is hung out of sight, a warning lamp must be installed.



Note:

During transport, the warning lamp is stored in the electronics module.

1. Place the warning lamp in a position where it is visible.

2. Using a two-core cable, connect the lamp to terminal X3  ❶ of the electronics module, in accordance with the wiring diagram.



Caution:

Keep the cable length to a maximum of 3 metres.



Note:

The positions of the + and – contacts in the lamp are indicated by: + 28V -

2.12 Connecting the unit to the mains supply

2.12.1 Special points regarding the mains supply



Warning:

The unit must be earthed.



Warning:

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



Caution:

For emergency situations and maintenance, it must be possible to render the entire system electrically dead.

Every unit has an isolation switch in order to render the unit electrically dead in the event of emergency situations and for maintenance.

**Note:**

The circuit breaker (if modified) must be at least **type B**.

To prevent rapid disconnection, **type K** is recommended preferably with 300 mA.

**Warning:**

However, do make sure to switch the mains supply off if you are going to conduct maintenance on or repair electrical components.

**Caution:**

Do **not** turn the unit on and off at the power supply. Use the control panel of the building management system for that.

2.12.2 Connecting the unit

**Warning:**

Make sure that the mains supply is switched off.

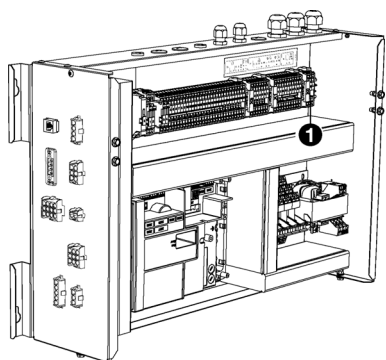
1. Bring the mains power cable to the unit.
2. Feed the cable into the electronics module.
3. Connect the cable on terminal X0 ❶, in accordance with the wiring diagram.

**Caution:**

Do not switch on the mains supply yet.

See also:

2.12.1 "Special points regarding the mains supply" on page 27



2.13 Switching on and checking operation

2.13.1 Introduction



Danger:

Make sure that all channel sections are connected to fresh air, inside air and ventilation units before you test the operation of the unit.

2.13.2 Visual checking

1. Check the following attachments:
 - lock nuts of the suspension;
 - coupling elements between the modules;
 - channel sections correctly connected and in the right positions.
2. Check that the trap of the condensate drain is filled with water.
3. Check the connections to the electronics module.
4. **For models with heating/cooling module**

Check whether:

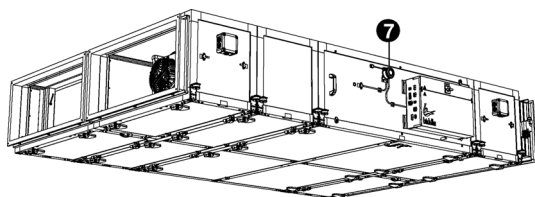
 - the heat exchanger is connected correctly.
 - the temperature sensor in the supply channel is connected.
 - the heating/cooling system is switched on.

2.13.3 Switching ON

1. Switch on the mains supply.
2. Set the isolation switch to I.
3. Check that no error messages are given.

2.13.4 Checking operation

1. Check the operation of the pressure switch ⑦ over the heat exchanger:
 1. Check in menu > Maintenance > Unit control that the value of the fourth input (1-2-3- 4) is a nil: x-x-x-0
 2. Open the pressure switch.



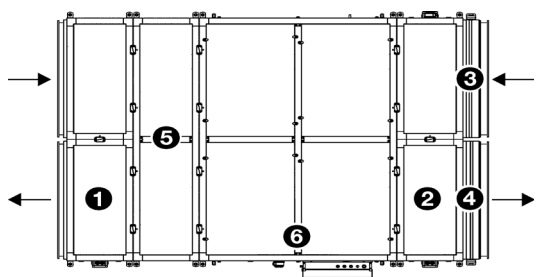
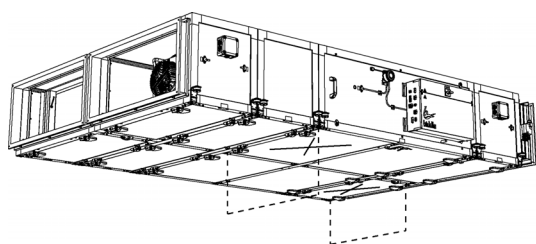
3. Make a bridge between the two switch contacts (NO/NC).



Caution:

Do not allow the bridge to remain for longer than 1 minute. Check the input value (step 4) within that time. If this takes longer, the unit must be powered down to reset the pressure switch.

4. Check that the value of the fourth input (1-2-3-4) a one is: x-x-x-I
5. Remove the bridge.
2. Open the indicated panels to check the operation of the dampers and fans.



3. Connect a pressure difference meter over the extract fan ②.
4. Check the operation of different fans and dampers in each test mode. Use the table below for this purpose.



Note:

The extract fan 2 and the exhaust air damper 4 are not visible. Check this with reference to the pressure difference over the extract fan.

In the final test mode (7), the fan runs but there is no pressure difference because the air damper is closed.



Note:

The opening and closing of the dampers can take a little while.

MODE		FANS (SPEED)		VALVES			
No.	DESCRIPTION	① SUPPLY	② EXTRACT	③ FRESH AIR	④ EXHAUST AIR	⑤ RECIRCULATION	⑥ BY-PASS
1	unit off	off	off (no pressure difference)	closed	closed (no pressure difference)	open	closed
2	heat recovery speed 1	1	1 (pressure difference)	open	open (pressure difference)	closed	closed
3	heat recovery speed 2	2	2 (pressure difference)				
4	heat recovery speed 3	3	3 (pressure difference)				
5	recirculation	1	off (no pressure difference)	closed	closed (no pressure difference)	open	closed
6	night cooling	2	2 (pressure difference)	open	open (pressure difference)	closed	open
7	exhaust air damper closed	off	1 (CAUTION: no pressure difference)	closed	closed (no pressure difference)	open	closed

5. Close the inspection panels.

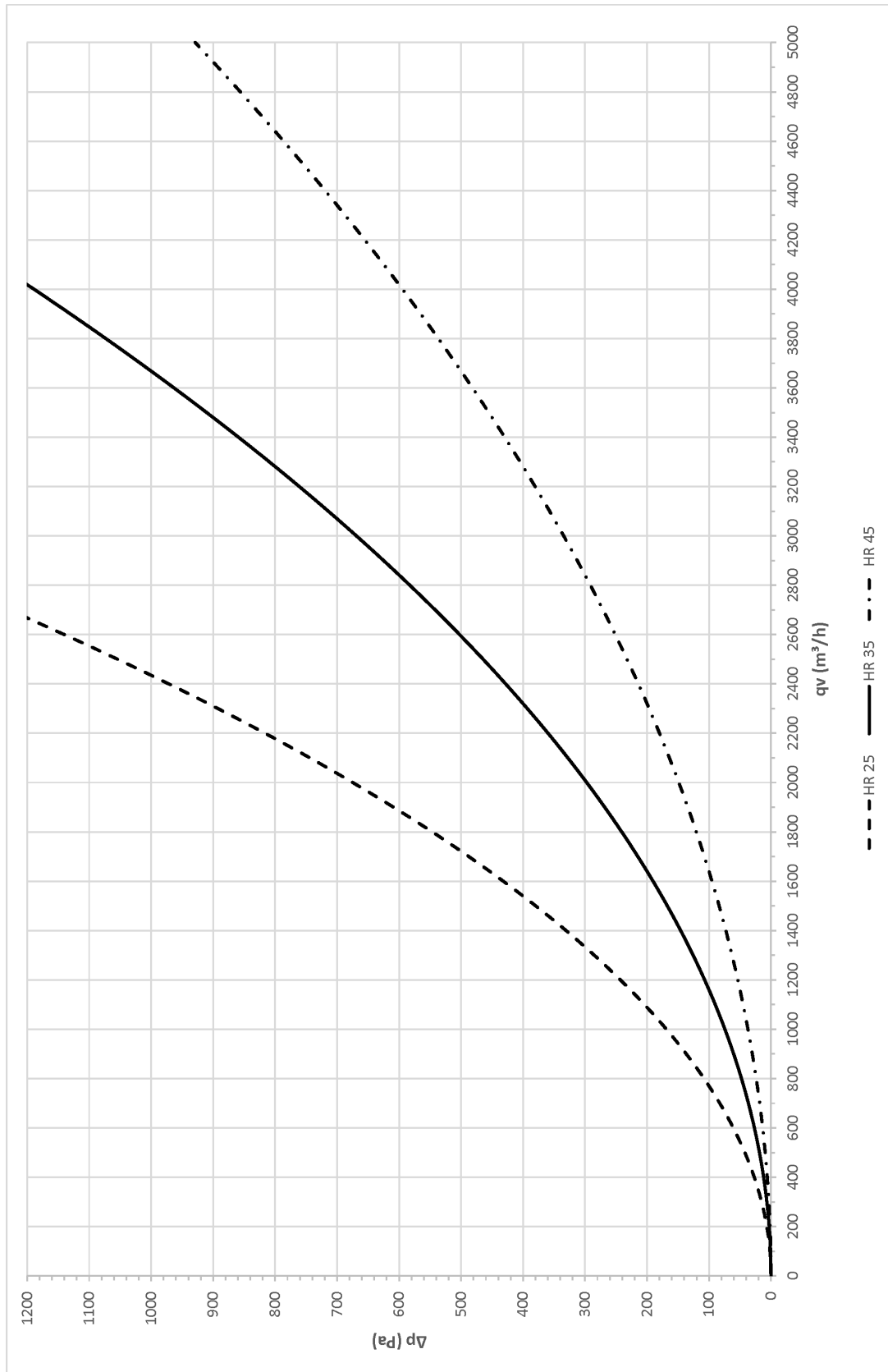


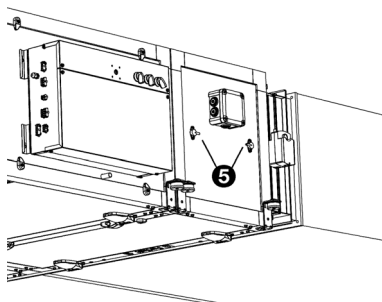
Note:

Leave the pressure difference meter on the extract fan.



2.13.5 Calibrate air volume

Set the three speeds for each airflow.





Calibrate the extract fan:

1. Set the unit to 'manual' and to ventilate  via the home screen of the *b-touch* control panel.
2. In the *b-touch* control panel, open the function menu > Maintenance > Calibrate air volume.
3. Enter the PIN code and press .
4. Calibrate the extract fan:





Caution:

Adjust the highest speed (3) maximally to the capacity of the unit (2500/3500/4500 m³/h).

For cooling with a cooling module use 500 m³/h less (2000/3000 m³/h).



Note:

Use the pressure difference meter over the extract fan  .



Note:


Use the chart to establish which pressure difference gives the required flow rate.

Make sure to use the curve for the unit type that is being used. (See type plate.)



Note:

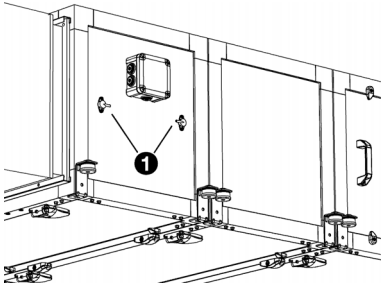
Always set all three settings. Even if you only want to change one setting.

- Set all and any connected ventilation units to the setting appropriate to setting 1 (low) of the HR unit.
- Set the desired flow rate for setting 1 (low) by adjusting the percentage until the appropriate pressure difference is reached.
- Store by pressing .
- In the same way, set the desired flow rate for setting 2 (medium) and setting 3 (high).
- Check if all speeds are set correctly.




Note:

Note the flow that is used for fan speed 3 of the extract fan. This will be used later to calibrate the pressure switch.



Calibrate the supply fan:

1. Connect the pressure difference meter to the pressure measurement points ❶ of the supply fan  .
2. Calibrate the supply fan. Use the same method for this as described for the extract fan.

2.13.6 Setting the pressure switch

The unit is fitted with freezing protection for the plate heat exchangers. If ice formation is identified, the unit will defrost the exchangers by blowing warm indoor air over the exchangers. The airflow from outside in will be turned off.

This function will be active if the pressure difference across the plate heat exchanger becomes too great.



Note:

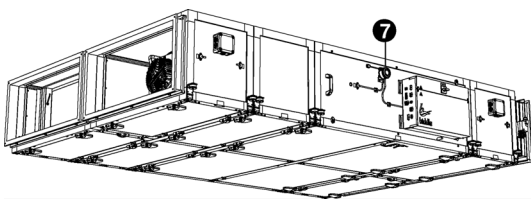
The pressure difference must be measured in fan speed 3 (high).

At outside temperatures that form the risk of freezing, the unit will carry out a check by measuring the pressure difference at fan speed 3.

Adjust pressure switch

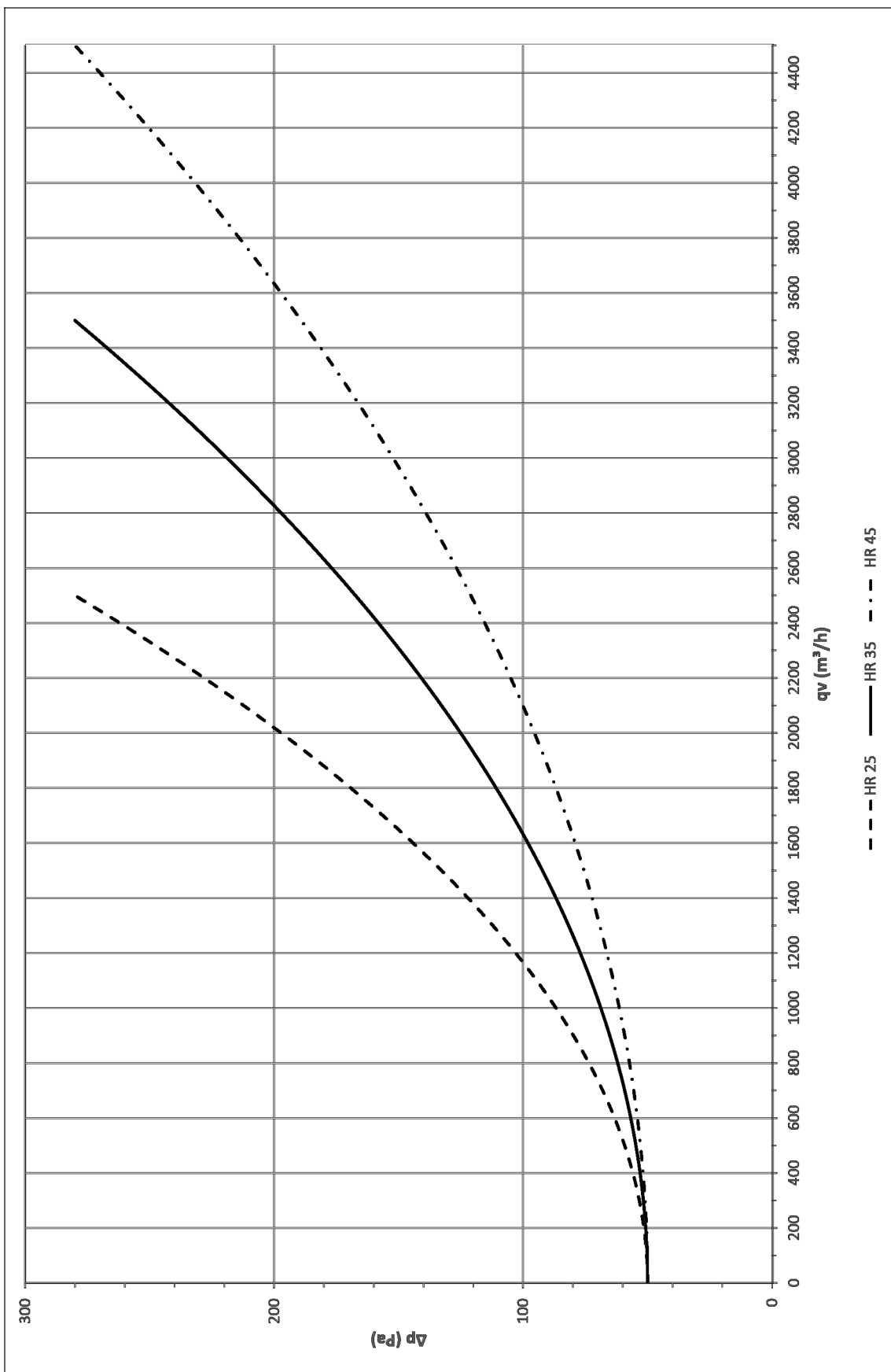
Adjust the pressure switch ❷ to fan speed 3 (high):

1. Use the flow rate that is used for fan speed 3 of the extract fan (see [2.13.5 Calibrate air volume](#)).
2. Determine the corresponding pressure difference for the pressure switch. To do so, use the graphic.



Note:

Use the curve for the unit type that is being used. (See type plate.)



3. Set the pressure switch **7** to the pressure difference as specified in step 2.
4. Check whether the frost protection is not unnecessarily active:
 1. Set the unit to fan speed 3.

**Note:**

If the unit was at a different speed, it will take approximately two minutes before the valve positions are adjusted.

2. Check in [menu > Maintenance > Unit control](#) that the value of the fourth input (1-2-3- **4**) is a nil: x-x-x-**0**

2.13.7 Checking temperature sensors

The unit contains temperature sensors.

1. Check in [menu > Maintenance > Unit control](#) that the sensors measure realistic values (T_{fresh}-T_{supply}, T_{extract}-T_{exhaust})

2.13.8 Checking the CO₂ sensor (accessory)

If a CO₂ sensor is used:

1. Check in [menu > Maintenance > Unit control](#) that the sensor is measuring a realistic value (Analog in)

2.13.9 Checking the heating / cooling (accessory)

1. Check that the heating/cooling module responds to the connected heating/cooling system.
2. Limit the minimum temperature for cooling to prevent condensation on the outside of the device and channels. ([menu > Settings > 7. Minimum air temperature cooling](#))

2.13.10 Finishing the unit

1. Close all inspection hatches.
2. Place the *b-touch* control panel in the holder.

3 . . Operation via *b-touch*

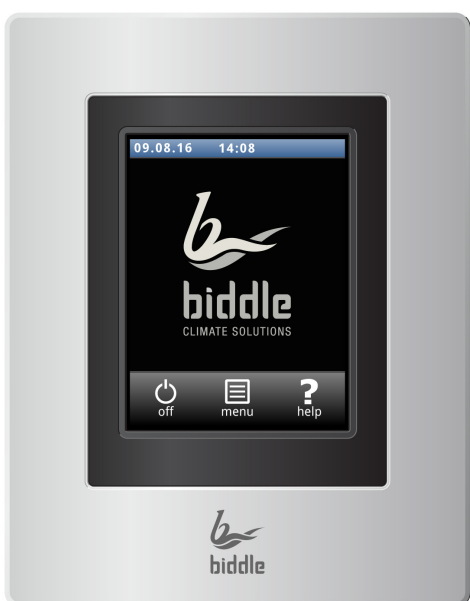
The unit can be operated via the *b-touch* control panel and via Modbus. This chapter describes operation with the *b-touch* control panel



Note:

Some settings and functions can only be used via the *b-touch* control panel or, conversely, only via Modbus.

3.1 Control panel



b-touch

The *b-touch* control panel is equipped with a touchscreen (touch screen) with which all the functions can be set:

- Turning the unit ON and OFF;
- Adjusting the strength of the unit;
- Switching the heating ON and OFF;
- Enter settings to adapt the function of the unit to your situation.

3.1.1 Settings



Select ✓ to save the settings and return to the previous screen.



Select ✗ to return to the previous screen without saving the changes.

3.2 The Home screen



On the home screen, information can be read and entered by touching the symbols:

- ❶ on/off
- ❷ main menu
- ❸ extra information about the current point in the control panel.
- ❹ manual or automatic control
- ❺ temperature
- ❻ fan strength
- ❼ recirculation/ventilation
- ❽ brief information on the operation of the unit

3.2.1 Symbols



The symbol ⌚ indicates that the timer is switched on.



The symbol 'i' indicates that there is currently a tip to be read. Touch the symbol in order to read the tip.

3.2.2 Turning the unit ON and OFF

You can switch the unit ON and OFF manually, using the control panel.

- Touch **on/off** in order to turn the unit ON or OFF.

If the unit is on, the screen will become darker after some time, in order to save energy. When the screen is touched, it lights up again. This function cannot be deactivated.

If the unit is switched off, the screen will go black after some time. Touch the screen to activate it again.

The unit can also be switched ON and OFF in other ways:

- Using external controls (see function [60. Function of inputs](#)).
- Via the internal timer or via an external release signal on the unit.

In these cases, the ON/OFF button can be hidden via [Configuration > 21. User interface options > Display on/off button](#).

3.2.3 Automatic or manual control

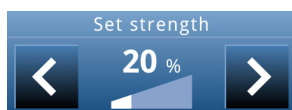
The unit has an automatic mode and a manual mode. Select the desired setting by touching the upper part of the symbol. You can restrict the user's choice via [menu > Settings > I. Select modes](#).

Manual

In manual mode, the unit operates in a variety of fan settings (which can be manually selected).

Automatic

In automatic mode, the fan setting is automatically adjusted to the CO₂ level.



3.2.4 Regulating the strength

In automatic mode, the strength of the airflow is controlled automatically.


In the manual mode, the strength can be set manually (3 settings).



Note:

For minimum energy consumption, Biddle recommends selecting the lowest strength at which the desired air quality is achieved.


3.2.5 Errors

The symbol  indicates that there is an error. The error message is displayed alongside.

- Touch this message for further information on the error and for instructions as to how to react.




Warning:

Some errors may cause damage or danger to persons if they are disregarded. If  is displayed, follow the instructions on the control panel as regards how to act.

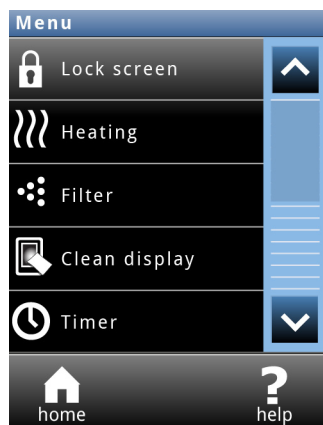


Note:

The symbol  and the error message remain displayed as long as the error has not been remedied.

If an error has remedied itself, a corresponding message will be displayed. Touch this message to display the [Error history](#) and to read out the errors and the times of their occurrence. This list can also be read out via [Maintenance > Error history](#).

3.3 Main menu




Touch [menu](#) to open the Main menu.

- Touch [home](#) in order to return to the Home screen.
- You can use the arrows to browse through the list.

If the control panel is not operated for some time, it returns automatically to the Home screen without saving the changes.

Lock screen

Select to prevent unauthorised access. The  symbol appears on the screen.

Unlocking

Touch the screen for 5 seconds to unlock it.

Switch temperature control on and off

Only for units with HC6 module with water control or using free (night) cooling.

The unit's temperature control can be switched on and off manually.

Switching the temperature control off disables the room temperature control and any [Heating on](#) output functions.

This function can be deactivated via setting 21 in the configuration menu.

If the heating has been switched on via this function, it may occur that the automatic control switches the heating off again. This may be due to an external signal, for example, or because the desired temperature has been reached.

The heating can also be switched off by the control itself:

- by an external signal at the input of the unit, see [menu > Configuration > 60. Function of inputs](#), setting [Heating off](#);

Filter

Dirty filters make the unit less effective. It is therefore necessary to clean or replace the filters at regular intervals. The contamination of filters is measured with the optional filter sensor or calculated on the basis of the lifespan.

The lifespan of the filter is calculated on the basis of the usage of the unit if no filter sensor has been installed. You can adjust this by setting the maximum lifespan of the filter.

When the filters are contaminated or when the maximum lifespan has elapsed, a message appears on the Home screen. Also, a signal can be generated on one of the outputs.

New filters are available from Biddle.

Cleaning the display

The screen can be cleaned using a damp, soft cloth.

Use this function to disable the touch screen for 20 seconds in order to be able to clean it.

Timer

The b-touch control panel has a week timer. You can set two start and stop times for each day of the week. The unit is on between the start time and the stop time. The second start and stop times are optional. When the ON/OFF button is displayed on the screen, the unit can also be switched ON or OFF manually. From the next switching moment, the unit follows the timer again. When the timer is switched on, the symbol \odot is displayed on the Home screen.

3.4 Preferences

Preferences

The menu [Preferences](#) allows you to make settings for the use of the control panel.

Set language

The control panel offers a choice of languages. Choose your preferred language from the list.

Set date and time

The date and time are necessary for the timer function, the lifespan of the filter and for tracking usage statistics regarding the unit.

The automatic summer time function switches the clock to summer or winter time in accordance with the applicable European rules. If you do not use this function, you can switch to summer time manually. The clock is then set one hour forward.

Celsius / Fahrenheit

Choose between a temperature display in degrees Celsius or degrees Fahrenheit.

Display brightness

Set the brightness of the screen to your personal preferences or to the specific situation.

Show tips

The control panel can show tips about the usage of the unit. The display of these tips can be enabled or disabled.

3.5 Settings

The Settings menu allows you to enter settings which influence the day-to-day use of the unit.

1. Select modes

The control panel has an automatic mode and a manual mode. With the function Select modes, you can set which of these modes can be selected in the HOME screen.

5. Room temperature

Here, set the temperature which is to be used by default as the room temperature when starting up the unit.

The desired room temperature can temporarily be adjusted on the home screen until the next start-up moment.

6. Minimum air temperature**For units with water heating module:**

Set the minimum difference between the room temperature (extract air) and the discharge temperature (supply air).

This difference can be increased for more comfort. A smaller difference saves energy.

7. Minimum air temperature, cooling

In order to increase the level of comfort, a minimum discharge temperature for cooling can be set.

8. Night temperature

The night temperature is used when the unit is switched off. When the room temperature drops below this set value, the unit will start working in order to keep the room at the night temperature.

**Note:**

This function only operates when the heating is switched on.

**Warning:**

Be aware that the airflow of the unit can set objects in motion. This might set off an alarm system in the building at night time.

9. Calibration

Adjust the temperature reading if this deviates from the actual temperature.

3.6 Configuration

The menu **Configuration** allows you to enter settings in order to adjust the operation of the unit to the room and the system. Usually, this menu is used only for installation, maintenance and service purposes.

20. Access control

Pin code

Access to the entire control panel or to the menu only can be protected with a four-digit PIN code.

The default PIN code is 0000.

Access level

The control panel can be safeguarded at different access levels.

21. User interface options

Display on/off button

The unit can be switched ON and OFF manually. This can also be done via the internal timer or via an external release signal on the unit. In this case you can disable the manual on/off option. The on/off button is then not displayed on the Home screen.

Temperature display

By default, the room temperature (exhaust air) is displayed. With this function, you can select another temperature to display or switch off the temperature display.

If the temperature display is switched off, there is no temperature control.

Temperature control OFF option

Use this function to enable or disable the option for the user to switch the temperature control ON/OFF manually.

Error display

Some error messages may be caused by external factors such as the central heating system and do not necessarily have an influence on the functioning of the unit.

Use this function to suppress these messages. Safety-related warnings will always be displayed.

31. Auto: fan speed



Note:

These settings only have influence on usage in the automatic mode.

Maximum fan speed

To restrict the noise level, the maximum fan speed can be limited.

Use of this function can reduce comfort.

Minimum fan speed

In order to increase the level of comfort, a minimum fan speed can be set per operation:



Note:

Set a lower value than that for the maximum fan speed. In the event of conflicting values, the set maximum fan speed takes priority.

- Unheated
- Heating (*dependent on unit type*)
- Cooling

You can set a post-rotation time for the fan. Here, set the period of time it should take for the fan to decelerate from maximum speed to standstill.

33. Boost function

Only applicable to units with a heating module.

If there is a great difference between the desired and the actual room temperatures, the fan speed can be increased in order to reach the desired temperature more quickly.

Set the temperature difference at which the boost function should be activated and the fan's increase in speed.

35. Ventilation settings

Ventilation control

Only applicable to units with a recirculation module.

The relationship between ventilation air and recirculated air can be determined in various ways:

- Manual selection: Manual switching between ventilation and recirculation.
- Valve regulation: Manual regulation of the position of the ventilation valve.
- Automatic selection: The quantity of ventilation air is determined by a CO₂ sensor. Manual switching between ventilation and recirculation is possible.
- Fully automatic: The quantity of ventilation air is always determined by a CO₂ sensor.

Maximum position of ventilation valve

Only applicable to units with a recirculation module.

The maximum opening percentage of the ventilation valve can be limited.

Minimum fan speed during ventilation

Set the minimum percentage of the fan speed for ventilation.

Maximum fan speed during ventilation

Set the maximum percentage of the fan speed for ventilation.

46. Maximum discharge temperature

The controller limits the discharge temperature to a maximum of 50°C. Possibly set a lower value in order to save energy.

47. Overheat protection

If the actual room temperature becomes higher than the pre-set room temperature, the heating can be switched off in order to prevent the room from becoming too warm.

Set the temperature above which the heating must be disabled.



Note:

This function can only be used if the unit is set to automatic.



Note:

If this function is activated, then function 6. **Minimum air temperature** is ignored.

60. Function of inputs

The unit has an input (terminal block X1) which can be used to enable a function to be controlled by an external accessory such as a smoke or fire alarm.

Values for input

VALUE	OPTION	DESCRIPTION
0	No function	The input has no function.
1	Unit off locally - NO	The unit is switched OFF when the contact is closed. (This only works in units to which the input signal is directly connected (locally).)
51	Unit off locally - NC	The unit is switched OFF when the contact is open. (This only works in units to which the input signal is directly connected (locally).)
21	Switch all units on	All units are switched ON when the contact is closed.
71	All units off	All units are switched OFF when the contact is closed.
6	Heating off	The heating is switched OFF when the contact is closed.
56	Heating on (dependent on software version)	Heating is available when the contact is closed.
7	change-over signal, cooling	The unit switches from heating to cooling when the contact is closed. <i>In the event of conflicts between different inputs, cooling has priority.</i>
57	change-over signal, heating	The unit switches from cooling to heating when the contact is closed. <i>In the event of conflicts between different inputs, cooling has priority.</i>
9	Release - NO	The user is allowed to switch the unit on and off when the contact is closed.
59	Release - NC	The user is allowed to switch the unit on and off when the contact is open.
10	Dirty filter – NO	Displays a “dirty filter” warning if the contact is closed for longer than 60 seconds.
60	Dirty filter – NC	Displays a “dirty filter” warning if the contact is open for longer than 60 seconds.
30	Smoke extraction	When the contact is closed: <ul style="list-style-type: none"> • air is extracted. • no air is supplied. • an alarm signal (smoke) is sent to the building management system.
31	Fire mode	When the contact is closed: <ul style="list-style-type: none"> • the unit is switched off. • any air dampers are closed. • an alarm signal (fire) is sent to the building management system.
41	Fire alarm	When the contact is closed: <ul style="list-style-type: none"> • an alarm signal (fire) is sent to the building management system.
40	Smoke alarm	When the contact is closed: <ul style="list-style-type: none"> • an alarm signal (smoke) is sent to the building management system.

Release delay input I

When you use input I, you can make the effect of an input signal persist for some time after the signal has been given ('release delay').

62. Automatic CO₂ control

Only with use of automatic CO₂ control

The unit can automatically adjust the fan speed and, if required, the recirculation damper to the CO₂ level.

The default values for the CO₂ levels can be adjusted in this menu.

Fan speeds with stepped controls

CO ₂ LEVEL		FAN SPEED
< 1	without recirculation module	0 (off)
	with recirculation module	1 (recirculation)
< 2		1 (ventilation)
< 3		2 (ventilation)
> 3		3 (ventilation)

CO ₂ LEVEL	DEFAULT VALUE
1	800 ppm
2	1000 ppm
3	1200 ppm



Note:

The current CO₂ level must be measured via the building management system (BMS) or via a sensor connected to the unit.



Note:

If no CO₂ sensor is detected, the device will operate in fan setting 1 (ventilation).



Note:

In the building management system (BMS) you can indicate (register address 350) whether the speed is to operate in a continuously variable manner or at set speeds. The curve for continuously variable operation is also based on the three CO₂ levels to be indicated.

65. Control panel input

Not applicable.

3.7 Maintenance

The **Maintenance** menu contains information on the use of the unit and offers a number of functions which are necessary for remedying errors.

Status

The status screen displays general information about the installation and specific information per group and per unit connected.

Current errors

Gives an overview of current errors. The error messages can also be deleted here.

Error history

Gives an overview of the errors which have occurred.

Capacity test

Use this function to test the capacity of the unit and your heating installation.

The unit will run for 120 minutes at the highest fan speed and with the highest heating capacity. You can check the discharge temperature and the heating capacity. The discharge temperature is limited to 50°C.

For units with water heating:

If the heating capacity is too low, check the supply and return water temperatures and the water flow.

Valve check

Use this function to test the operation of the water valve:

1. Set the opening percentage of the valve to 0%;
2. Press start. The fans will start rotating at the highest speed;
3. Check whether the discharged air is cold;



Note:

It may take some time before the valve reaches the adjusted opening percentage.

4. Repeat steps 1 and 2 for the percentages 50% and 100% as well. In doing so, check whether the discharged air gets warmer per step.

Installation

This installation guide leads you through the most frequently required settings.

The installation guide is started up automatically during the first start-up of the unit or after the resetting of the factory configuration.

Unit code

For entering the unit code after replacement of the control circuit board in a unit.

Calibrate air volume

Use this function to set the fan speeds.

In [2.13.5 Calibrate air volume](#) a description is provided of how you can calibrate the fans.

Unit check

Use this function to check the operation of the unit.

Run through the various modes in this function to check the operation of the dampers and fans, as indicated in [2.13.4 Checking operation](#).

Modbus settings

The settings for Modbus can be adjusted:

- Baud rate
- Communication:
 - DATA bits
 - Parity (N = none, E = even, O = odd)
 - Stop bits
- Modbus node address (0 = use code dip switches of the control circuit board)

Default settings

Restores the default factory settings of the setup menu. The settings entered in the configuration menu are retained.

Factory configuration

Restores the standard factory configuration. All settings are then lost.



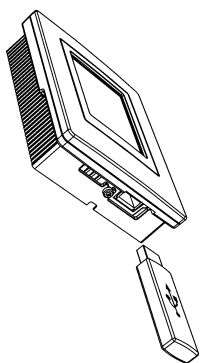
Note:

The installation guide will be restarted.

Reset system

The control panel searches for connection with the attached units again. Use this function when remedying errors and during connection or disconnection of units.

3.8 USB



The control panel is equipped with a USB port to which only a USB flash drive can be connected. This is used for:

- updating the software
- importing and exporting settings
- exporting usage data

This menu is automatically activated when a USB flash drive is connected. The menu is closed again when the USB flash drive is removed.



Caution:

Do not remove the USB flash drive during the updating or during the importing or exporting of data. This can take several minutes.



Warning:

Connection of other electronic devices to the USB port can cause serious damage to the control panel or to other electronic components.

Software update

Biddle is working continuously on improving its products and recommends that you update the software of the control panel when updates become available. Consult www.biddle.info/software to see if updates are available.

- The installed version of the software can be read out from [Maintenance > Status](#).
- Download the latest version of the software via Biddle's website.

See also: [7.8 Updating the software](#)

Upload logo

It is possible to use your own logo or image as background for the display.

Requirements for the image:

- Windows bitmap;
- Filename: logo.bmp;
- Dimensions: maximum 240 x 320 pixels;
- Colour depth: 8-bit grayscale or 24-bit colour.



Note:

Uploading your own logo replaces the standard Biddle logo.

Export/import settings

For copying settings between control panels.

See also: [7.7 Copying the settings](#)

Exporting system info

Export the file 'system_info' for an overview of all connection control circuit boards and control panels with corresponding software versions.

Export log...

The Export log functions write data concerning the operation of the unit to the USB flash drive. These files can then be analysed on a computer.

The files contain the following data:

- log_func: Data concerning the operation of the unit.
- log_error: Error report history.
- log_user: User settings history.
- log_stat: *not in use*.
- system_info: Overview of connected control circuit boards and control panels.



Note:

The process of exporting can take several minutes. Repeat if 100% is not achieved.

4. . Operation via Modbus

The unit can be operated via the *b-touch* control panel and via Modbus. This chapter describes the operation via Modbus.



Note:

Some settings and functions can only be used via the *b-touch* control panel or, conversely, only via Modbus.

4.1 Frequently used register addresses

This paragraph describes frequently-used functions and their corresponding register addresses.



Caution:

Do **not** adjust other register addresses without consulting Biddle.



Note:

It may occur that the system applied uses a value of *I* higher than the register addresses given here. In that case, use *I0I* for register address *I00*, for example.



Note:

For functions that are also in the *b-touch* panel, the corresponding menu parameter is shown between brackets after the register address.

Menu parameters 0 - *I* are functions in the home screen.



Note:

Settings in the *b-touch* control panel can cause Modbus settings to be ignored. In register addresses 410 to 419 inclusive, it can be specified whether settings may be altered via the *b-touch*.

Register addresses 410 - 419 are related to 400 - 409 and 420 - 429 respectively.

REGISTER ADDRESS		DESCRIPTION
400 - 409	ro	User functions: Current status
410 - 419	rw	User functions: Changes via the <i>b-touch</i> control panel: 0 = permitted (default) 1 = not permitted
420 - 429	rw	User functions: Modbus setpoint

4.1.1 General Operation

REGISTER ADDRESS	DESCRIPTION	RO/RW*	UNIT	MINIMUM	MAXIMUM	DEFAULT
420 (0.1)	Turning the unit ON and OFF	rw	-	0	2	1
425 (0.6)	Automatic or manual control	rw	-	0	1	1
*ro = read only (read only) *rw = read & write (read and write)						

420 (0.1) Turning the unit ON and OFF

VALUE	OPTION	DESCRIPTION
0	off	Switching the unit OFF. • Special functions (register address 337) are still working.
1	on	Switching the unit ON (normal operation).

425 (0.6) Automatic or manual control

The unit has an automatic mode and a manual mode. When the unit is switched on, it will begin operating in the automatic mode.

VALUE	OPTION	DESCRIPTION
0	manual	The unit is operating in various settings (can be switched manually).
1	automatic	The unit automatically operates at the correct fan and damper settings.



Note:

Via register address 275 (1), it can be specified which settings are allowed.

Register address 275 (1)

VALUE	DESCRIPTION
1	allowed: manual
2	allowed: automatic
3 (default)	allowed: manual, automatic

4.1.2 Manual operation

REGISTER ADDRESS	DESCRIPTION	RO/RW*	UNIT	MINIMUM	MAXIMUM	DEFAULT
422 (0.3)	Manual setting of the strength	rw	%	0	100	50
*ro = read only (read only)						
*rw = read & write (read and write)						

The unit can only be controlled manually if the functions below have been set as follows:

REGISTER ADDRESS	DESCRIPTION	VALUE
275 (1)	Select modes	1 = allowed: manual
		3 = allowed: manual, automatic
425 (0.6)	Automatic or manual control	0 = manual

422 (0.3) Manual setting of the strength

In the manual mode, the strength can be set manually.

VALUE	FAN SPEED
0	0%
1 - 49	35%
50 - 79	65%
80 - 100	95%

**Note:**

For minimum energy consumption, Biddle recommends selecting the lowest strength at which the desired air quality is achieved.

4.1.3 Automatic operation

The unit can only be controlled automatically if the functions below have been set as follows:

REGISTER ADDRESS	DESCRIPTION	VALUE
275 (1)	Select modes	2 = allowed: automatic
		3 = allowed: manual, automatic
425 (0.6)	Automatic or manual control	1 = automatic

4.1.4 Automatic CO₂ control

The unit automatically adjusts the fan speed (and any recirculation damper) to the CO₂ level.

The CO₂ level is supplied by the building management system (BMS) or, if this information is not available, by a CO₂ sensor (accessory) on X377 (via connection X3).



Note:

If no CO₂ sensor is detected, the device will operate in fan setting 1 (ventilation).

Fan speeds with stepped controls

CO ₂ LEVEL		FAN SPEED
< 1	without recirculation module	0 (off)
	with recirculation module	1 (recirculation)
< 2		1 (ventilation)
< 3		2 (ventilation)
> 3		3 (ventilation)

REGISTER ADDRESS	DESCRIPTION	RO/RW*	UNIT	MINIMUM	MAXIMUM	DEFAULT
351 (62.2)	CO ₂ level 1	rw	ppm	200	2000	800
352 (62.3)	CO ₂ level 2	rw	ppm	200	2000	1000
353 (62.4)	CO ₂ level 3	rw	ppm	200	2000	1200
432	CO ₂ level from BMS	rw	ppm	0	2000	0
151	Input voltage, analogue input X377	ro	0.01 V	-	-	-
*ro = read only (read only)						
*rw = read & write (read and write)						

4.1.5 Ventilation/Recirculation/Night cooling

REGISTER ADDRESS	DESCRIPTION	RO/RW*	UNIT	MINIMUM	MAXIMUM	DEFAULT
426	Mode: ventilation/recirculation/ night cooling	rw	-	0	10	0

*ro = read only (read only)
*rw = read & write (read and write)

426 Mode: ventilation/recirculation/night cooling

The unit is designed to use heat recovery on ventilation air. Depending on the type and the settings, the unit can also recirculate or supply ventilation air without heat recovery from extracted air (night cooling).



Note:
Register address 301 must have the value 1 (default) (100% recirculation/ventilation).

VALUE	DESCRIPTION	UNIT FUNCTION ON (DAYTIME)	UNIT FUNCTION OFF (NIGHT TIME)
0	recirculation <i>(only functional in the case of units with a recirculation module and in manual control)</i>	recirculation (no heat recovery)	off
2	ventilation <i>(only functional in manual control)</i>	ventilation (heat recovery from the extracted air)	off
10	ventilation with night cooling	ventilation (heat recovery from the extracted air)	ventilation (fan speed 2) (cooling with fresh air via bypass, no heat recovery)

4.1.6 Alarm functions

In emergencies, the unit can emit an alarm signal or even actively deal with the problem by functioning in a special mode.

This special operation replaces the normal operation of the unit (during the day and at night time) until the signal is no longer active (435 is 0 again).

REGISTER ADDRESS	DESCRIPTION	RO/RW*	UNIT	MINIMUM	MAXIMUM	DEFAULT
337	Alarm functions (activated by input I (il) or by register address 435)	rw	-	0	41	0
435	Activate alarm functions (register address 337) 0 = inactive 1 = active	rw	-	0	1	0
*ro = read only (read only) *rw = read & write (read and write)						

337 Alarm functions

VALUE	OPTION	DESCRIPTION
30	Smoke extraction	When the contact is closed: <ul style="list-style-type: none"> air is extracted (maximum fan speed). no air is supplied. an alarm signal (smoke) is sent to the building management system.
31	Fire mode	When the contact is closed: <ul style="list-style-type: none"> the unit is switched off. any air dampers are closed. an alarm signal (fire) is sent to the building management system.
40	Smoke alarm	When the contact is closed: <ul style="list-style-type: none"> an alarm signal (smoke) is sent to the building management system.
41	Fire alarm	When the contact is closed: <ul style="list-style-type: none"> an alarm signal (fire) is sent to the building management system.

4.1.7 Reading out current operation

The current operation of the unit can be read out in register address 221.

REGISTER ADDRESS	DESCRIPTION	RO/RW*	UNIT	MINIMUM	MAXIMUM	DEFAULT
221	Current mode operation	ro	-	01	51	-
*ro = read only (read only) *rw = read & write (read and write)						

221 Current mode operation

VALUE	OPTION
general	
01	unit off
05	test function
ventilation	
20	ventilation, auto - speed 0
11	ventilation, auto - speed 1
12	ventilation, auto - speed 2
13	ventilation, auto - speed 3
14	ventilation, auto - boost
15	ventilation, manual - speed 0
16	ventilation, manual - speed 1
17	ventilation, manual - speed 2
18	ventilation, manual - speed 3
19	ventilation, manual - boost
recirculation	
20	recirculation, auto - speed 0
21	recirculation, auto - speed 1
22	recirculation, auto - speed 2
23	recirculation, auto - speed 3
25	recirculation, manual - speed 0
26	recirculation, manual - speed 1
27	recirculation, manual - speed 2
28	recirculation, manual - speed 3
special operation	
31	night cooling
41	fire mode (external signal)
42	smoke extraction
51	defrosting

4.2 All register addresses

An extensive list of register addresses for using ModBus is available at: www.biddle.info.

5 . . Errors



Danger:

All work on the inside of the unit may only be carried out by personnel who are technically qualified to do so.



Warning:

Before you begin: read the safety instructions.

See also:

1.5 "Safety instructions" on page 11

5.1 Resolving simple problems

If you suspect an error, first try to resolve the problem using the table below. You do not need to be an expert for this.

If this fails to resolve the problem, there may be a fault; in that case, alert the installer.

PROBLEM	PROBABLE CAUSE	WHAT TO DO
The unit does not work.	The unit has not been switched on	Turn the unit on
	The unit has no power supply.	Check the mains supply: <ul style="list-style-type: none"> • isolation switch; • unit has power.
The unit does not respond to changes in the <i>b-touch</i> control panel.	The unit is running in test mode.	Stop the test mode: in menu > Maintenance > Reset system click stop X .
The unit only moves air from the inside to the outside.	The unit is running in defrost mode.	When the pressure different across the plate heat exchanger is once again correct, defrost mode will remain active for another ten minutes. The unit will then run in the last activated mode.
The unit functions differently from expectations.	The unit is operating in a special mode.	<ul style="list-style-type: none"> • Check which mode the unit is operating in. (Register address 221 or <i>b-touch</i> menu ...)
The unit is not circulating enough air.	One of the inlet sections and/or the connected ventilation units is blocked.	Remove obstacles to the inlet and discharge section.

PROBLEM	PROBABLE CAUSE	WHAT TO DO
Only for models with heating: The unit is not heating or not heating sufficiently.	The maximum discharge temperature is limited.	Check the value at 46. Maximum discharge temperature
	Only for water-heated models: The central heating system is not working properly.	Check the central heating system. <ul style="list-style-type: none"> • Check the connections. • Check the operation. • Check the capacity.

See also:

2.12 "Connecting the unit to the mains supply" on page 27

5.2 Remediating errors that are accompanied by an error message

ERROR MESSAGE	PROBABLE CAUSE	WHAT TO DO
The malfunction lamp is lit up.	The filter is letting insufficient air through, due to contamination.	Check the filter for contamination. Clean or replace it if necessary. You can adjust the pressure difference meter over the filter to make it emit a dirty filter signal either sooner or later.

See also:

6.2 "Replacing the filter" on page 64

5.3 Reading out errors

Errors are recorded with a binary code in two registers.

In the log file "log_error.csv", which can be read out with a USB flash drive, the errors are indicated with a numeric value.

5.4 Error codes registers


Error codes register 216/ErrorFlags[0]

		LOG_ERROR.CSV		
BIT	VALUE	VALUE	CODE	DESCRIPTION
3	8	3	E7	Fan error

Error codes register 217/ErrorFlags[1]

	ERRORFLAGS[1]; MODBUS 217	LOGERROR.CSV		
BIT	VALUE	VALUE	CODE	DESCRIPTION
0	1	16	F1	Filters must be replaced
14	8192	29	F17	Faulty CO ₂ sensor

5.5 Error messages on the control panel**For models with *b-touch* control panel**

Some errors are displayed with a  symbol on the home screen of the *b-touch* panel.

**Note:**

When the error message is touched, the screen displays an explanation, together with a list of the actions to be taken.

**Note:**

The message will disappear from the Home screen when the error has been remedied.

CODE	PROBABLE CAUSE	WHAT TO DO
E7	Fan error	<ol style="list-style-type: none"> 1. Check the fans. If one or more fans do not work, please check: <ul style="list-style-type: none"> - the fan wiring; - the connections on the electronics module; - the transformer fuse; - the transformer itself. 2. If these are in order, then replace the fan.
F1	Dirty Filter	Replace the filters.
F17	<i>With automatic CO₂ control:</i> The CO ₂ sensor in the inlet duct is not working.	<ol style="list-style-type: none"> 1. Check the sensor's wiring and connection (connector X377). 2. If these are in order, then replace the sensor.

5.6 Remediating errors that are not accompanied by an error message

If you suspect an error but no error message is displayed:

1. Referring to the preceding sections, check whether you can easily resolve the problem.
2. Try to resolve the problem using the table below. Technical expertise is required for this.

PROBLEM	PROBABLE CAUSE	WHAT TO DO
The unit does not respond to the building management system.	The building management system is not operating correctly.	Check the building management system.
	The unit has no communication with the building management system.	<ul style="list-style-type: none"> • Check the building management system. • Check the wiring.
The unit functions differently from expectations.	The unit is operating in a special mode.	<ul style="list-style-type: none"> • Check which mode the unit is operating in. • If necessary, set the unit for input I to only emit a signal without adjusting the operation (register address 337 or <i>b-touch</i> menu 60. Function of inputs).
	One or more modules are not properly connected.	<ul style="list-style-type: none"> • Check the connections of the modules • Check the operation of the unit. (See 2.13.4 Checking operation)
The unit is not circulating enough air.	The filter(s) is/are dirty.	Clean or replace filter(s).
	The fan settings are not properly calibrated.	Calibrate the fan settings properly. see 2.13.5 Calibrate air volume
	The duct system is giving too much resistance.	Resolve problems in the duct system: <ul style="list-style-type: none"> • ducts too narrow • bends too sharp • blockages
	An air damper is not working properly.	Check the operation of the damper (See 2.13.4 Checking operation).
	The connected ventilation unit is not working properly.	Check the operation of the connected units.

PROBLEM	PROBABLE CAUSE	WHAT TO DO
<i>With automatic CO₂ control:</i> The unit functions differently from expectations.	The CO ₂ settings are different than expected.	Check the CO ₂ settings (register addresses 351/352/353 of <i>b-touch</i> menu 62. Automatic CO₂ control)
	CO ₂ is not designated as the control system for the automatic control.	Restore the factory configuration (menu > Maintenance > Factory configuration)
	The CO ₂ sensor is not recognised.	Check the connection of the CO ₂ sensor.
The unit is making a lot of noise.	The filter(s) is/are dirty.	Clean or replace filter(s).
	A component is loose.	Check the unit: <ul style="list-style-type: none"> • are the inspection doors closed? • are the rubber seals still in good condition?

See also:

- 2.7 "Connecting the unit to Modbus" on page 21
- 2.13 "Switching on and checking operation" on page 29
- 6.2 "Replacing the filter" on page 64

6. . Maintenance

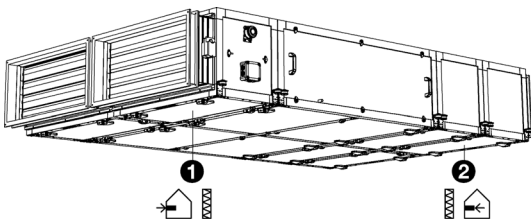
6.1 Introduction

This chapter comprises those maintenance activities that the user himself can perform. Maintenance activities and repairs that must be performed by an installer are described in chapter 7 [Service](#).

See also:

7 "Service" on page 66

6.2 Replacing the filter



The unit is fitted with two filters:

- Fresh air filter: F7 ❶.
- Extract air filter: M5 ❷.

The filters must be replaced regularly. A dirty filter can cause inefficient operation and a high noise level.

Remove the filter:



Warning:
Set the isolation switch to 0.

1. Open the inspection hatch for the relevant filter.
2. Pull the clamps downward ❸.
3. Remove the filter ❹.
4. Replace the filter. New filters are available from Biddle.
5. Return the filter to its place.



Note:
Position the correct filter back into the correct place.



Note:
Position the filter in the correct direction.

The air direction is shown on the filter and on the unit.

6.3 Cleaning the unit

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

6.4 Scheduled maintenance

It is recommended to have the following inspection and maintenance activities performed annually by an installer or other technical expert.

- Check the casing, the suspension or mounting structure, and the securing of the unit.
- Check whether the filters are clean enough and undamaged. Replace the filters if necessary.
- Check that the heat exchanger or the electrical heating elements are clean. Settled dust may cause an unpleasant smell.

Carefully remove dust with a vacuum cleaner.

- Check that the plate heat exchangers are clean. Clean them if necessary.
- Check all connections of the cabling.
- Check the operation of the fans and the valves.
- Check the condensate drain:
 - Clean the drainage container.
 - Flush the drain pipe.
 - Check that the trap is filled with water.

See also:

- 2.13 "Switching on and checking operation" on page 29
- 6.2 "Replacing the filter" on page 64
- 6.3 "Cleaning the unit" on page 65
- 7.1 "Cleaning the plate heat exchangers" on page 66

7. . Service



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



Warning:
Before you begin: read the safety instructions.

See also:

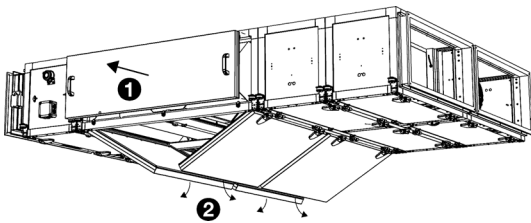
1.5 "Safety instructions" on page 11

7.1 Cleaning the plate heat exchangers

Dirty plate heat exchangers can cause inefficient operation and a high noise level. If they are dirty, clean the exchangers.

The exchangers can be extracted in two ways:

- Via the side.
- Via the underside.



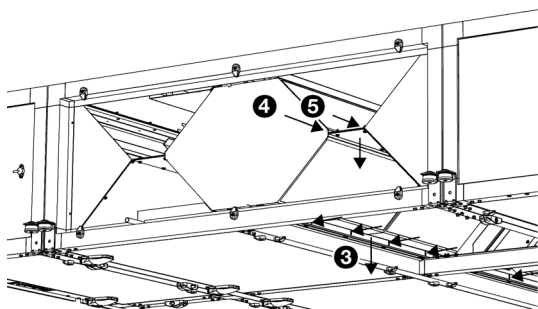
Warning:
Set the isolation switch to 0.

1. Open the side shield ①.



Note:
Preferably, also open the side shield if you extract the exchangers via the underside. This will ensure that the exchangers are no longer clamped fast.

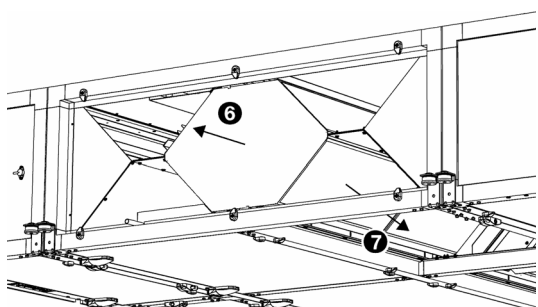
2. Open the two inspection hatches of the heat exchanger module that are located next to the recirculation module ②.



3. Loosen the screws of the clamping strips so as to allow the strips to drop down slightly **3**.

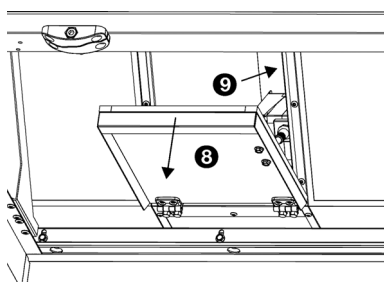
4. Remove the air separation plates:

- Unscrew bolts **4** and **5**.
- Extract the plates.



5. Extract the plate heat exchangers:

- Via the side: **6**.
- Via the underside: **7**.



6. The last exchanger is located behind the by-pass valve. Make room in order to extract the exchanger:

- Open the valve of the by-pass **8**.
- Unscrew the valve motors from the valve **9**.
- *When extracting via the underside:*
Push the by-pass slightly to the side.
- *When extracting via the side:*
Disconnect the cables located on top of the by-pass and extract the by-pass via the underside of the unit.
- Extract the last exchanger.

7. Clean the plate heat exchangers by spraying water through them.

8. Return all components to their places in reverse order.



Note:

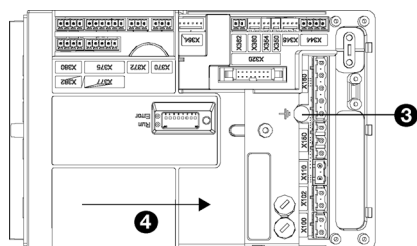
Tighten the screws/bolts of the air separation plates and the clamping strips again, so that the exchangers are clamped fast and no air leaks can arise.

7.2 Removing the control circuit board

1. Switch the unit off using the control panel or the building management system.



Warning:
Shut off the mains supply.



2. Open the electronic housing.
3. Disconnect all unit-connected connectors and grounded connections from the control circuit board.
4. Remove the screw ③.
5. Slide the control circuit board ④ loose and lift it out of the unit.

7.3 Connecting the control circuit board



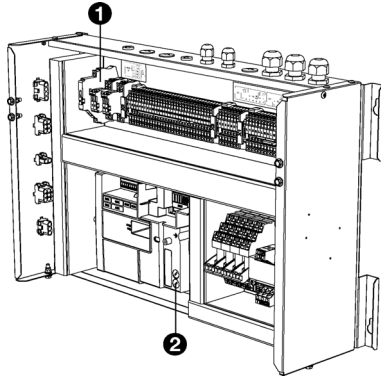
Warning:
Make sure that the mains supply is switched off

1. Slide the control circuit board into its place and screw it in firmly.
2. Connect all connectors and earth connections to the control circuit board again.
3. Switch the unit on and check the operation.



Note:
With a new control circuit board, an EI error may occur because the old control circuit board can no longer be found. Resolve this by reconfiguring the system via [menu > Maintenance > Reset system](#)

7.4 Fuses



The unit is fitted with various fuses:

- In the electronics module ❶.
- On the control circuit board ❷.

The values are indicated on the fuses and/or are listed in the wiring diagram.



Note:

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

7.5 Setting the unit code

The unit code must be set after replacement of the control circuit board in the unit. The unit code depends on the unit type and is indicated on the type plate.

To set the unit code, there are two methods:

- directly via the control panel if a single unit is connected;
- via the control circuit board and the control panel if more than one unit is connected.



Warning:

Entering an incorrect code will result in poor performance of the unit.

7.5.1 Setting the unit code via the control panel

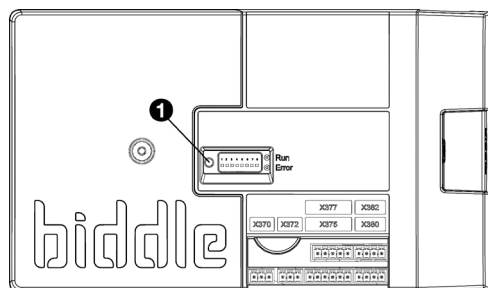


Caution:

Setting the unit code using this method will only work if just a single unit is connected to the control panel. If necessary, connect the control panel separately to the unit in question.

1. Select [menu > Maintenance > Unit code](#).
2. Enter the unit code via the control panel and press [ok](#).

The control panel will now search for the unit again.



7.5.2 Setting the unit code via the control circuit board and the control panel

1. Connect the mains supply (insert the plug into the socket or move the isolation switch to ON).



Warning:
Do NOT touch any live parts.

2. Press down the microswitch ❶ on the control circuit board .

The LED next to the microswitch will start flashing.

The control panel displays numbers: these comprise the unit code.

3. Enter the unit code via the control panel and press **ok**.
4. Press down microswitch .

The LED next to the microswitch will stop flashing.

The unit code is now set.

5. Reset the control panel.

7.6 Resetting the PIN code

The PIN code of the control panel can be reset using a USB flash drive:

1. Connect a USB flash drive to the control panel.

The USB menu is activated

2. Press  for 15 seconds.



Note:
The screen shows no change.

The PIN code has now been reset to the default pin code:
0000

3. Exit the USB menu by removing the USB flash drive.

7.7 Copying the settings

The settings of the unit can be copied to another unit.

7.7.1 What you need

Before copying the setting, check that you have the following:

- An empty USB flash drive. The USB flash drive must be formatted for FAT or DOS. Do not use a USB hard disk for the software update.

7.7.2 Step 1: Copying the settings of the correctly-set unit

1. Check whether the settings to be copied on the original b-touch control panel are all correctly set.
2. Connect the USB flash drive to the USB port of the b-touch control panel.



Note:

If the USB flash drive is not detected, disconnect it and then connect it again.

The control panel detects the USB flash drive and displays the USB menu

3. Select [Export Settings](#)

The progress percentage is displayed.

4. When this has been completed, disconnect the USB flash drive from the control panel.

7.7.3 Step 2: Copying the settings to another unit

1. Connect the USB flash drive (with the settings that are to be copied) to the USB port on the other control panel.
2. Keep the function [Import settings](#) pressed down until the progress of the process is displayed.

The settings are now being imported.



Note:

Below the progress percentage, the name of the file to be imported is visible: 'settings_export.txt'

3. When this has been completed, disconnect the USB flash drive from the control panel.
4. Repeat steps 1 to 3 for each control panel to which you wish to apply the same settings.

7.8 Updating the software

Biddle is working continuously on improving its products and recommends that you update the software of the control panel and of the control circuit board when updates become available. Consult Biddle's website for availability.

7.8.1 What you need.

Before updating the software of the control panel, check that you have the following:

- An empty USB flash drive. The USB flash drive must be formatted for FAT or DOS. Do not use a USB hard disk for the software update.
- A PC with Internet access.

7.8.2 Step 1: Check the current software version

Before you update the software of the control panel or of the control circuit board, you must check the existing software version. If the software version is the same as that of the most recent update file on Biddle's website, you do not need to update the software.

1. Press [menu](#) in the Home screen.
2. Select [Maintenance](#). The version of the current software is displayed in the status overview.

7.8.3 Step 2: Download the most recent software

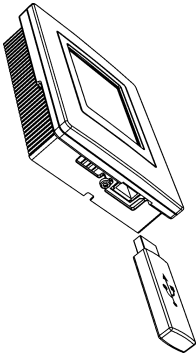
1. Connect the USB flash drive to a USB port on your PC.
2. On your PC, go to Biddle's website and look under Downloads.
3. Look for your product and the available software for your unit.
4. If the software version is more recent than the version on your control panel, click on the software update.
5. Accept the licence agreement and save the file to the main directory of the USB flash drive.
6. Disconnect the USB flash drive from the PC.

7.8.4 Step 3: Updating the software



Warning:

Do not switch off the unit or disconnect the USB flash drive during the software update. Do not disconnect the USB flash drive from the control panel even if there is a power failure during the update. The update will resume as soon as the power returns. If an error occurs during the update, start the procedure again. If the error continues to occur, contact Biddle.



1. Connect the USB flash drive (with the software update) to the USB port on the control panel.



Note:

If the USB flash drive is not detected, disconnect it and then connect it again.

The control panel detects the USB flash drive and displays the USB menu

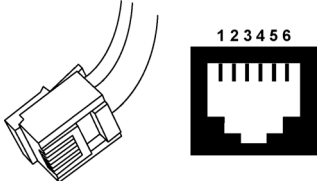
2. Select [Software update](#) to update the software.
3. When this has been completed, disconnect the USB flash drive from the control panel.

7.9 Composition of the Biddle control cable

The control cable for the control system is constructed as follows:

- The plugs are modular connectors of the type 6P4C.
- Connectors are untwisted, i.e. at both ends of the cable, cores are connected to the same electrode.

Colour coding of Biddle cables

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

8 . . Dismantling

The dismantling of the installation and the handling of the coolant, oil and other components must be carried out by a qualified fitter in accordance with the relevant local and national legislation and regulations.

Pursuant to EU legislation, used electrical and electronic appliances must be collected for recycling. By ensuring that this product is disposed of in the correct manner, you are helping to prevent potential negative consequences for the environment and public health. For more information about this, please contact your supplier or the relevant government authority.

9 . . Addresses

If you have any comments or queries relating to this product, please do not hesitate to contact your Biddle branch.

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For more information

If you have any comments or queries relating to this product, please do not hesitate to contact Biddle. You will find the contact information for your Biddle branch in chapter [9 Addresses](#).

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