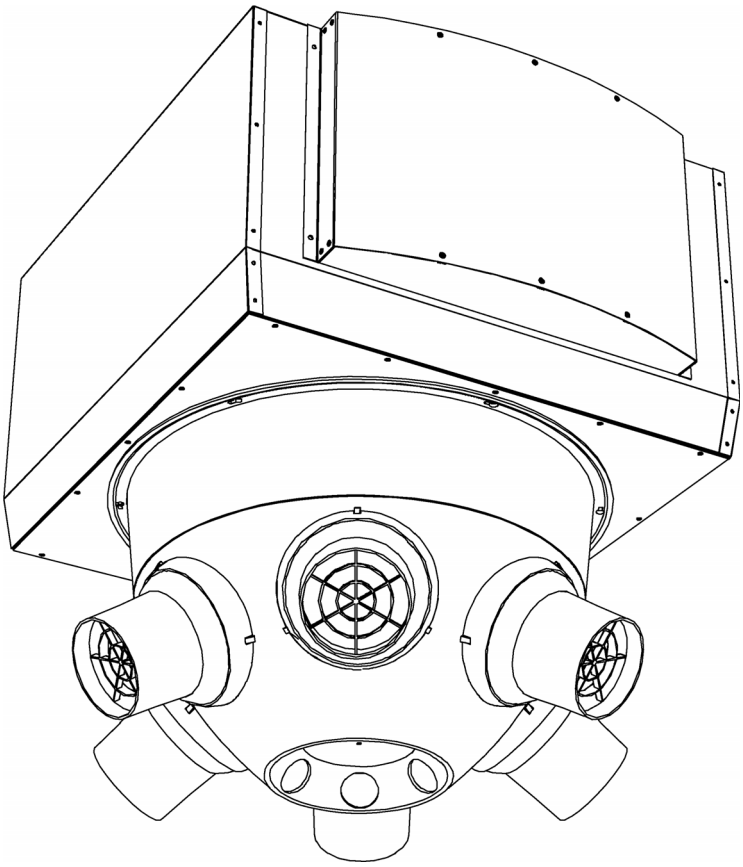
Manual
Gas-fired air heater

Model NOZ2 G



Version 4.0 - North America
Original Manual

English

biddle

⚠ WARNING

FIRE OR EXPLOSION HAZARD

Failure to follow safety warnings exactly could result in serious injury, death or property damage.

Be sure to read and understand the installation, operation and service instructions in this manual.

Improper installation, adjustment alteration, service or maintenance can cause serious injury, death or property damages.

— Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.

— WHAT TO DO IF YOU SMELL GAS

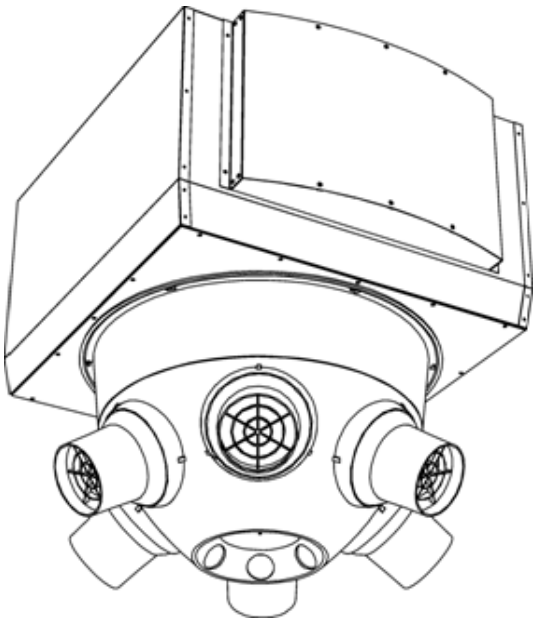
- Do not try to light any appliance.
- Do not touch any electrical switch; do not use any phone in your building.
- Leave the building immediately.
- Immediately call your gas supplier from a phone remote from the building. Follow the gas supplier's instructions.
- If you cannot reach your gas supplier, call the fire department.

— Installation and service must be performed by a qualified installer, service agency or the gas supplier.

. . . Contents

1 . . Introduction

1.1 About this manual



This manual describes the installation, commissioning and maintenance of the gas-fired air heater model NOZ_2 G. It also provides tips and information for servicing activities and for the remedying of errors.

1.1.1 Countries where manual is applicable

This manual is applicable in **North America** (United States and Canada).

If a country code for another country is listed on the packaging and/or type plate of the unit, please contact your supplier.

1.2 How to use this manual

The manual contains important instructions for promoting the proper and safe functioning of the unit, and for the prevention of accidents and damage.

Read through this manual carefully before performing any operation on the unit.

Leave this manual with the unit.

1.3 How to read this manual

1.3.1 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.

1.3.2 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
	 **You have accessed a section of the unit containing components which carry a voltage.** Access restricted to qualified maintenance staff only. Caution is required.
	 **This surface or component may be hot. Risk of burns on contact.**

1.3.3 Related documentation

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

- wiring diagram for installation and servicing.
- table of technical data
- list of required components, and spare parts

Manual for the control panel

The method of operation for everyday use and the settings are described in the manual for the MultiTherm control panel.

1.4 About the unit

1.4.1 Application and operation of the air heater

The air heater is intended for the heating of large, open spaces. The unit is placed (free-hanging) at the top of the space concerned.

The unit blows currents of warm air downwards. The airflow rate ensures that the warm air is spread over a large area.

1.4.2 Operation of the gas heating

The discharged air is heated by a built-in gas burner. The burner takes in fresh air from outside and conveys the combustion gases out of the building. This is separated from the air that the unit takes in and discharges inside the building. The burner has an electronic control system, and is automatically operated.

1.4.3 Control of the unit

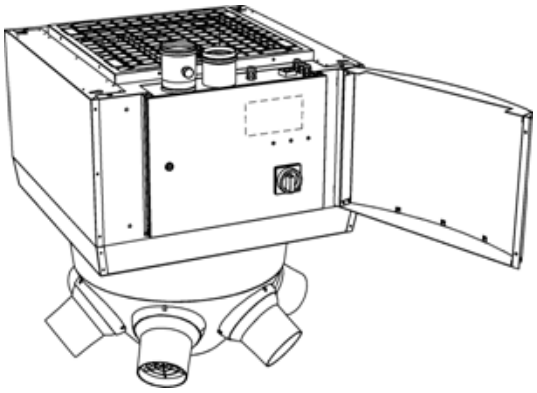
The unit is controlled by the MultiTherm C clock thermostat. The burner starts automatically when the unit's fan is rotating, and there is demand for heat.

1.4.4 Type designation

The table below gives an overview of the available models of the air heater and the corresponding type designations. In combination, the type designations constitute the type code, for instance: NOZ_2 25-G20/3-230/22.

Explanation of the type code

TYPE CODE ELEMENT	DESIGNATION	MEANING
product series	NOZ_2	general designation for the series
capacity	25	short range
gas type	G20/3	gas heating, gas type Nat. G20
	G31/3	gas heating, gas type LP G31
mains supply	230/22	230V, split phase, 60 Hz



1.4.5 Type plate

The type plate can be found behind the front panel, on the door of the service compartment.

Designations on the type plate

DESIGNATION	DESCRIPTION
Type	complete type code of the unit
N°	order number (including production date)
Category	flue pipe category
Gas	type of gas
p_{gas} nom.	normal manifold pressure
p_{gas} min.	minimal supply pressure
Qn (gross)	rated power consumption of the gas burner
Pn (net)	heating capacity of the gas burner
ηth	thermal efficiency of the gas burner
CO_2	CO_2 control value of the flue gases
U	power supply voltage
I_{max}	maximum current (per phase)
P	maximum power consumption
M	weight of unit

1.4.6 Modifications and changes

Without the approval of Biddle, no changes or modifications may be made to the unit that could adversely affect safety.

1.5 Components and accessories

1.5.1 Components supplied

- adjustment aid, nozzle angles.

1.5.2 Accessories

The accessories are described in the list of components supplied.

1.5.3 Components not supplied

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

- threaded rods
- other cabling

1.6 Restrictions on use

1.6.1 General restrictions

Warning:
The unit may only be used if all these conditions have been met:

- The unit must be installed and maintained by qualified technical staff.
- The unit must be installed in accordance with the instructions.
- All restrictions on use must be complied with.
- The installation must comply with the local building codes or, in the absence of local codes, with the National Fuel Gas Code (National Fuel Gas Code),ANSI Z223.1/NFPA 54, or the Natural Gas and Propane Installation Code (Natural Gas and Propane Installation Code),CSA B8149.1.

1.6.2 Required skills

- In order to perform installation, maintenance, or servicing work on the unit, you must be technically qualified to work with gas and electrical equipment, in accordance with the locally applicable laws, regulations and standards.
- For operation in daily use, no special skills are required.
- The unit is not intended for use by children or people with an intellectual disability.

Danger:

NEVER attempt to perform installation, maintenance, or servicing work on the unit unless you are sufficiently qualified.

1.6.3 Country in which unit is intended to be used

- This unit is exclusively intended for use in North America (United States, Canada).

1.6.4 Type of gas

- The unit has been pre-adjusted and tested for the gas type indicated on the type plate.
- If you wish to use the unit with a different type of gas: contact Biddle.

Danger:

NEVER use the unit with a different type of gas than specified. An incorrect combination of gas type and unit version can result in carbon monoxide formation and lead to overheating.

1.6.5 Field of application

- The unit may only be used indoors.
- The unit is suitable only for dry and non-dusty environments.
- The unit may not be used in an environment in which corrosive or chemically aggressive gases or vapours are present.
- The unit is suitable for ambient temperatures from (0°C tot 40°C (32°F to 104°F).

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

1.7 Safety instructions

1.7.1 Safety issues relating to installation, maintenance and servicing

Danger:
NEVER try working on the unit unless you are technically qualified.

Warning:
When opening the unit and/or the control unit:

The unit contains electrically-live and/or hot parts. Be careful not to touch these when opening the unit and/or control unit.

Warning:
If you assemble or disassemble any part of the unit, and/or make or break any connection:

Decommission the unit and disconnect it from the power source in accordance with the instructions. NEVER interrupt the mains supply abruptly.

Warning:
Do not break any seals.

See also:

5 "Decommissioning" on page 33

1.7.2 Safety in use

Danger:
NEVER put any objects into the inlet and discharge openings of the unit.

Danger:
NEVER block the inlet and discharge openings of the unit, otherwise overheating may occur.

Warning:
The surface of the unit and the flue pipe can become hot. Keep flammable materials away from it.

Warning:
Keep flammable materials out of the range of the discharge of the unit.

Warning:
If you smell gas:

- **DO NOT operate the unit.**
- **Make sure no sparks occur in the same space: do NOT touch electrical switches, and do NOT use any telephone.**
- **Leave the building immediately.**
- **Once at a distance from the building, ring your gas supplier immediately. Follow the gas supplier's instructions.**
- **Ring the fire service if you cannot reach your gas supplier.**

Caution:
Always decommission the unit in accordance with the prescribed procedure. NEVER turn off the unit abruptly using the operating switch, and NEVER abruptly interrupt the mains supply.

See also:
5 "Decommissioning" on page 33

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:

1.7.1 "Safety issues relating to installation, maintenance and servicing" on page 11

1.6.2 "Required skills" on page 10

2.1 Preliminary checks

2.1.1 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:

1.5 "Components and accessories" on page 9

2.1.2 Check before installation

Warning:
Check the following before unpacking the unit. Install the unit only if all conditions have been complied with.

- The unit must be suitable and have been adjusted for the locally available gas supply (type of gas and gas pressure).
- The electrical connection data on the type plate must correspond to the locally available electricity supply.
- All restrictions on use must have been complied with.

See also:
1.4.5 "Type plate" on page 8
1.6.4 "Type of gas" on page 10
1.6 "Restrictions on use" on page 9

2.2 General instructions

2.2.1 Sequence of operations

When installing the unit, stick to the following sequence of operations:

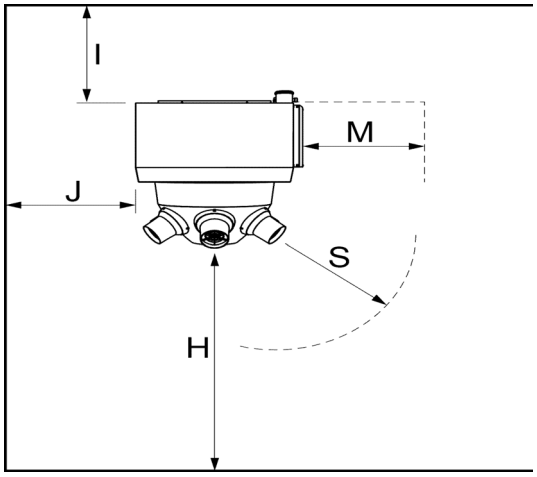
1. Perform the checks in advance.
2. Install the unit and plug it in, in the order described.
3. Commission the unit and check the operation.
4. Enter the necessary settings.

2.2.2 Measures to be taken in the event of construction work

Intake of dust, cement, grit, etc., can damage the unit. As long as such substances are present in the space:

- do not commission the unit;
- cover all inlet and discharge openings.

2.3 Determining the location of the unit



Warning:
Observe the following rules. Take into account the safety dimensions.

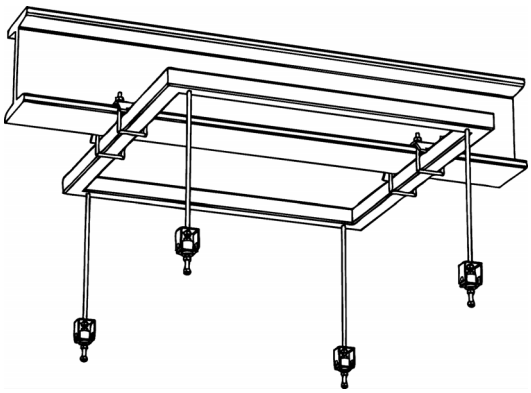
- The unit may only be installed and used in rooms with adequate ventilation.
- Make sure that the structure from which the unit is about to be suspended can bear the weight of the unit. The unit's weight is indicated on its type plate.
- The connections on the unit should not be mechanically burdened by the suspension of the unit.
- The unit must hang freely in the room. Note the following dimensions:

SIZE	DESCRIPTION	VALUE
H	minimum mounting height	280 cm (10 ft.)
I	minimum distance between ceiling and unit (with inlet from room)	70 cm (28")
J	minimum distance to walls	3 m (10 ft.)
S	minimum required free discharge range	50 cm (20")
M	required free space for maintenance	50 cm (20")

- The unit must be able to freely take in and discharge air.
- No combustible materials may be located:
  - within 20 cm (8 inches) of the unit;
  - above the inlet opening;
  - within 50 cm (20 inches) of the nozzle discharge.
- It should not be possible to reach the nozzles without the use of mechanical aids.

See also:
1.4.5 "Type plate" on page 8

2.4 Hanging the unit up



2.4.1 Hanging the unit up

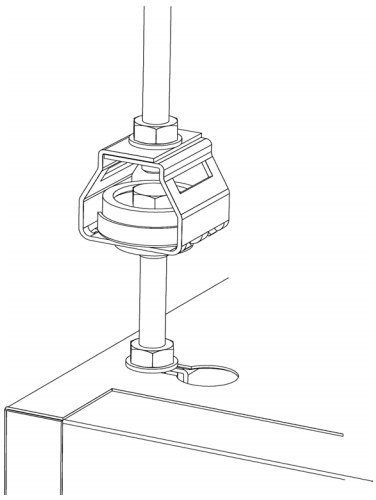
1. If you are using the suspension frame (accessory):
   - Attach the suspension frame.

   If you are not using a suspension frame:
   - Insert four threaded rods. Make sure that the threaded rods are hanging perpendicularly.

Dimensions for suspending from threaded rods

	NOZ_2 25
distance between threaded rods	710 x 640 mm (28" x 25 13/64")
screw thread	M8 (1/4 “)

2. Onto each threaded rod, screw two bolts a few centimetres apart.
3. Hang the unit from the threaded rods:
   - Hook the threaded rods with the lowest set of bolts in the key holes on the top of the unit.
   - Internally, there is a locking edge under every keyhole. The bolts must lock in place behind these.
4. Secure the unit by tightening the top bolts against the plating.

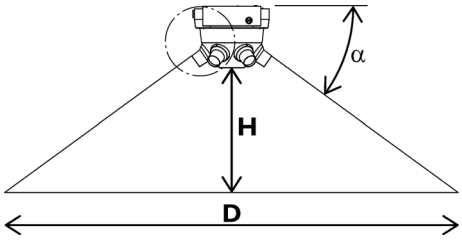


Warning:
The suspended unit must be secured.

2.5 Regulating the discharge direction

Set the nozzles to the angle which produces the most optimal effect of the unit for the situation. For this purpose, the nozzles are equipped with a ball-and-socket joint.

The optimal angle of the nozzles depends on the mounting height of the unit and on the floor surface to be reached.

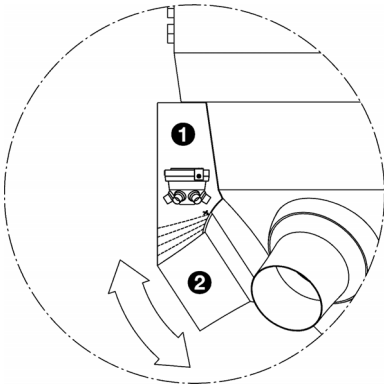


Note:
Measure all the values in metres.

1. Determine the diameter (**D**) of the floor surface that must be reached;
2. Measure the mounting height (**H**) of the unit. This is the distance between the floor and the underside of the unit;
3. From the table, read out the angle (**α**) at which the nozzles must be set;

Nozzle angle

D [m]	10	12.5	15	17.5	20	22.5
H [m]						
3.0	42	36	31	27	24	22
4.0	50	44	39	34	31	28
5.0	-	50	45	41	37	34
6.0	-	-	50	46	42	39
7.0	-	-	-	50	46	43
8.0	-	-	-	-	50	47



4. Snip off the adjustment aid ❶ (supplied) along the dotted line which corresponds to the correct angle (**α**);
5. Hold the snipped-off adjustment aid ❶ against the unit and turn the nozzle ❷ against the underside of the adjustment aid;

Caution:
Do not aim the nozzles at walls or other obstacles (such as scaffolding).

6. Repeat step 5 for all nozzles.

2.6 Connecting the air supply and flue pipe

2.6.1 Special points regarding the air supply and flue pipe

- Special duct sections and pipe components must be used with the unit: the unit was approved with these components.
- Both the air supply and the flue pipe are routed to the outside world. These can be routed through both the wall and the roof.
- With both the wall duct and the roof duct, the air supply and flue pipe are combined.

2.6.2 Requirements for the air supply and flue pipe

Warning:
Danger of carbon monoxide formation and flue gases. You must observe the following rules:

- The air supply and flue pipe must be routed to the outside world.
- The total **equivalent length** of the parts must not be greater than the **maximum feed-through length** (specified in the technical data).
- The air supply and flue pipes must not be burdened with the weight of the unit.
- The air supply and the flue pipe must comply with all nationally and locally applicable standards, regulations and laws or, in the absence of local codes, with the National Fuel Gas Code (National Gas Fuel Code), ANSI Z223.1/ NFPA 54, or the Natural Gas and Propane Installation Code (Natural Gas and Propane Installation Code), CSA B8149.1.

Warning:
The flue pipes become very hot.

- Make sure that the flue pipes cannot be touched, either by placing them out of people's reach, or by shielding them off.
- Ensure that there are no combustible materials near the flue pipes.

2.6.3 Requirements for the condensate drain

If the total **extended length** of the parts of the flue pipe is greater than the **maximum dry flue length** (specified in the technical data), a condensate drain must be used.

This is subject to the following requirements:

- The water outlet of the condensate drain piece must be fitted with a trap.
- The condensate drain and the trap must comply with all nationally and locally applicable standards, regulations and laws or, in the absence of local codes, with the National Fuel Gas Code (National Gas Fuel Code), ANSI Z223.1/ NFPA 54, or the Natural Gas and Propane Installation Code (Natural Gas and Propane Installation Code), CSA B8149.1.

Warning:
The trap must be filled with water, otherwise flue gases can escape.

2.7 Connecting the unit to the gas supply

2.7.1 Special points regarding the gas connection

Warning:
You must observe the following rules:

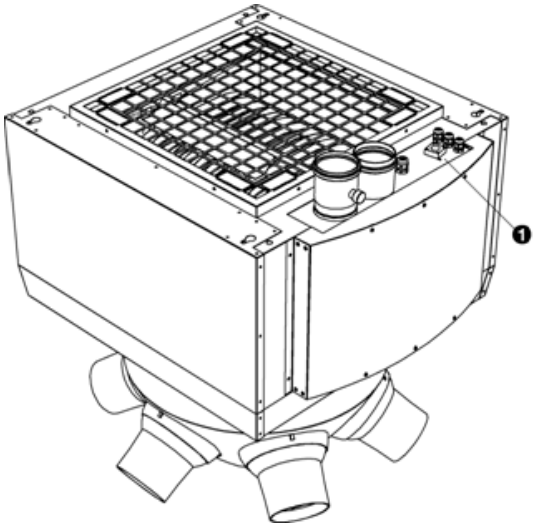
- A gas tap with valve (not supplied) must be within reach of the unit.
- If the gas might contain particles or dust, a gas filter should be applied.
- The gas connection must not be burdened with the weight of the unit.
- The gas connection and the gas tap must comply with all national and local applicable standards, regulations and laws.In the absence of local codes, follow the National Fuel Gas Code (National Fuel Gas Code), ANSI Z223 / NFPA 54, or the Natural Gas and Propane Installation Code (Natural Gas and Propane Installation Code), CSA B8149.1.

2.7.2 Checking the gas connection

- Blow through the gas pipe, in accordance with the nationally and locally applicable standards, regulations and laws.
- Check the entire gas connection for leaks, in accordance with the nationally and locally applicable standards, regulations and laws.

Caution:
When pressurising the connecting pipe above 24 inAq (6.0 kPa), the gas tap must be closed.

2.7.3 Connecting the gas supply



1. Connect the gas connection to ❶.

2.8 Connecting the unit to the mains supply

2.8.1 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.

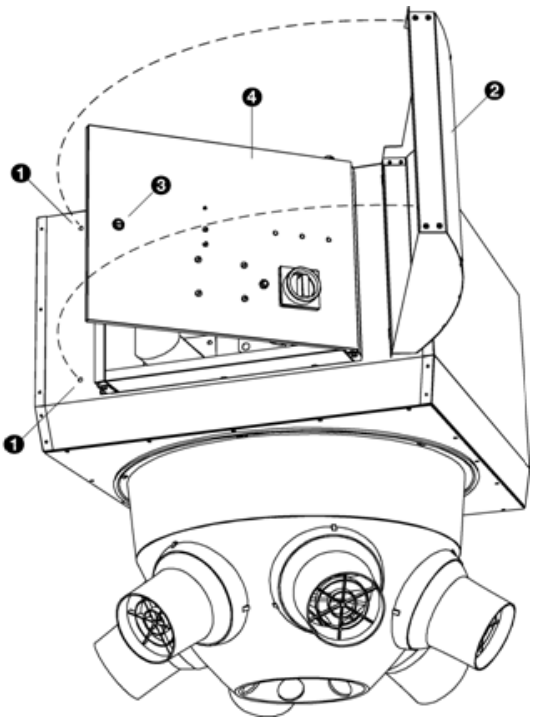
Warning:
Also, do be sure to switch off the mains supply if you are going to conduct maintenance on, or make repairs to, electrical components.

2.8.2 Accessing the service compartment

About the service compartment

The service compartment contains, among other things:

- the burner
- the burner fan
- the control electronics and display
- electronic connections
- connections for the mains supply and the thermostat



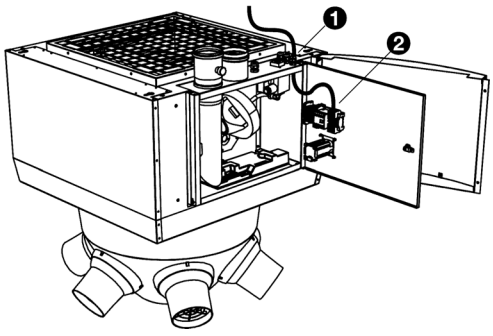
Opening the service compartment

1. Remove the screws ❶.
2. Open the front panel ❷. You can remove it, if so desired.
3. Give lock ❸ a quarter turn to the left.
4. Open the door ❹.

Warning:
The service compartment contains hot and electrically-live parts. Do not touch them when the mains supply is on.

2.8.3 Connecting the mains supply

Warning:
Make sure that the mains supply is switched off.



1. Route the mains power cable through the free cable gland ❶.
2. Connect the mains supply cable to the terminal block ❷, in accordance with the wiring diagram.
3. Tighten the cable gland.

Caution:
Do not switch on the mains supply yet.

2.9 Installing the MultiTherm C clock thermostat

The gas burner in the unit is controlled by the MultiTherm C clock thermostat.

2.9.1 Special points regarding the clock thermostat

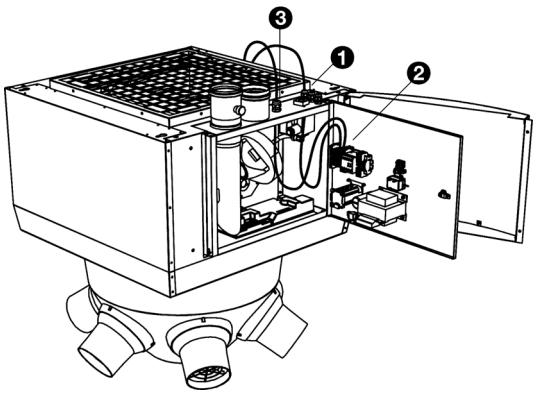
- The gas burner in the unit is controlled by the MultiTherm C clock thermostat. The clock thermostat is connected to the control electronics in the unit by means of the Argus Link bus system.
- Up to a maximum of 5 units can be connected to a single clock thermostat.
- For special points regarding connection and the requirements relating to the control cable, see the clock thermostat manual.

2.9.2 Installing the clock thermostat

Caution:
Observe the following rules, otherwise errors may occur:

- Follow the instructions given in the manual of the MultiTherm C clock thermostat.
- The control cable inside the unit must be shielded at all times.
- The shielding of the control cable must ALWAYS and ONLY be connected to the unit's earth connection.

Warning:
Check that the unit is electrically dead.



1. Install the clock thermostat in accordance with the relevant manual.
2. Route the control cable through the free cable gland ❶.
3. Connect the control cable to the terminal block ❷, in accordance with the wiring diagram.
4. Tighten the cable gland.
5. Connect the control cable to the clock thermostat, in accordance with the relevant manual.
6. If necessary, set the DIP switches on the control electronics in the air heater, in accordance with the clock thermostat manual.

Multiple units daisy chained with a single clock thermostat.

- Route the control cable to the next unit through the free cable gland ❸.
- Follow the instructions given in the manual of the Multi-Therm C clock thermostat.

3 . . Commissioning

3.1 About commissioning

The procedure for commissioning should be performed in the following situations:

- once when the unit is commissioned after installation;
- each time after maintenance or servicing work has been performed on the unit;
- each time the unit is recommissioned after it has not been used for extended periods of time.

The procedure – including all checks – must be performed fully and in the described sequence.

Before starting, be sure to familiarise yourself with the correct operation and functioning of the unit.

3.1.1 Safety instructions

Warning:
The unit may only be commissioned by technically qualified personnel.

Warning:
Before you begin: read the safety instructions.

See also:

1.7.1 "Safety issues relating to installation, maintenance and servicing" on page 11
1.6.2 "Required skills" on page 10

3.2 Checks before commissioning

Warning:
Check the following before commissioning the unit. Only do so if all the conditions are met.

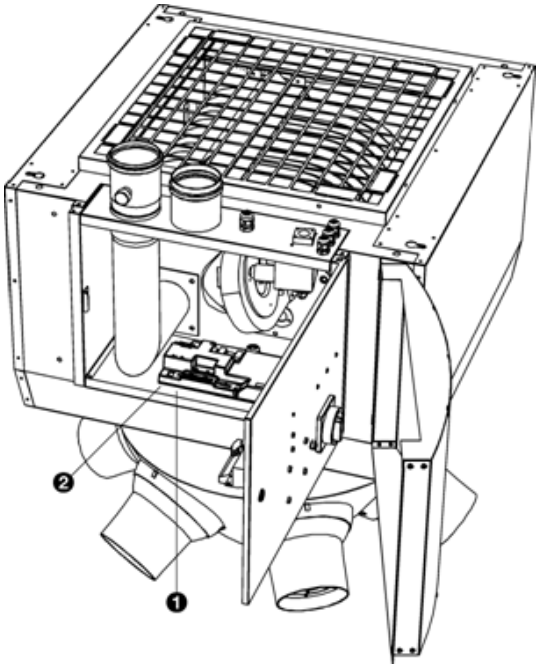
- The unit must be fully installed and in compliance with all regulations.
- All electrical connections, and all piping for the gas supply, the air supply and the flue pipe must be present and in good condition.
- All restrictions on use must have been complied with.
- It must be possible to use the unit safely, in accordance with the safety instructions.

See also:

2.3 "Determining the location of the unit" on page 15
1.7.2 "Safety in use" on page 12
1.6 "Restrictions on use" on page 9
2.6.2 "Requirements for the air supply and flue pipe" on page 18
2.6.3 "Requirements for the condensate drain" on page 19
2.7.1 "Special points regarding the gas connection" on page 19
2.8.1 "Special points regarding the mains supply" on page 21

3.3 Operating mode

Service button ❶ and status display ❷ in the service compartment



The operating mode serves both to start the unit and to test it.

Warning:
The service compartment contains hot and electrically-live parts. Do not touch them when the mains supply is on.

1. Keep the service button ❶ pressed down for 10 seconds in order to start the unit.

   The unit begins to start up in low mode. The status display ❷ will display L alternating with status codes, after which the unit will start shining in low mode.

2. Press the service button once again.

   The unit will start operating in high mode. The display will show H alternately with a status code.

3. Press the service button once again.

   The unit will start working in normal mode. The unit will always remain on for at least 4 minutes.

If the service button is not pressed for 5 minutes, the unit will automatically switch to normal mode.

3.3.1 Status codes on the status display

General status codes

STATUS CODE	MEANING	OPERATION
F	summer ventilation	The system fan is running because summer ventilation is turned on.
F blinking	Delta T regulation	In low mode, the system fan runs in Delta T regulation mode
L and code alternating	low operating mode	The system was started in low mode with the service button. If the unit starts burning, it will do so in low power mode.
H and code alternating	high operating mode	The system was started in high mode, using the service button. If the unit starts burning, it will do so in high power mode.
A and a number, alternating	lock-out error	In order to remove the error, this must be reset.
E and a number, alternating	block-out error	The error is automatically cancelled when the cause is removed.

Status codes of the operation phases

STATUS CODE	OPERATION STEP	OPERATION
0	stand-by	Ready for operation
1	pre-purging	The system will carry out internal checks and a 30-second air purge if there is enough air circulation.
2	ignition	The igniter will spark for 5 seconds and the gas valve will open. There should be flame detection within 5 seconds.
b	burner on	After a 15-second stabilisation period, the burner in the unit will start at the desired power. The unit will remain on for at least 4 minutes.
P	post-operation ventilation	The unit will after-cool the heat exchanger for 3 minutes with the fan in low mode. The flue fan will continue to ventilate for 1 minute.

3.4 Switching on and checking operation

3.4.1 Switching on the mains supply

1. Switch on the mains supply.
2. Set the isolation switch on the unit to position 1 (On).

3.4.2 Testing in operating mode

1. Turn on the gas tap.
2. Start the unit in operating mode by holding down the service button for 10 seconds, and check on the status display that the unit starts up properly and starts to operate in low mode.
3. Press the service button once again, and check on the status display that the unit is working properly in high mode.
4. Press the service button again, and wait until the unit is ready for operation.

See also:
3.3 "Operating mode" on page 27

3.4.3 Starting in normal operation

In normal operation, the burner and the system fan are started and stopped automatically. This is controlled by the MultiTherm thermostat.

Starting up takes about 1 minute. The unit will always remain on for at least 4 minutes.

The unit defaults to the Delta T regulation. (This is described in the MultiTherm thermostat manual.)

3.4.4 Simulating an error in the gas burner

1. Simulate an error by turning off the gas tap.
2. Try restarting the unit by operating the thermostat, and verify that the unit goes into error mode:
   - The status display in the service compartment must display an error message (alternating code A and 1).
   - The thermostat must display an error message (code 1).

3. Simulate solving the error by turning on the gas tap.
4. Remove the error by briefly pressing the service button.
5. Restart the unit by operating the thermostat, and verify that the unit is working correctly.

See also:
3.3 "Operating mode" on page 27

3.4.5 Checking the flue gases

The unit has a sample aperture for checking the flue gases. This is located on the connection of the flue pipe.

1. Measure the CO_2 value of the flue gases, and record them for future reference.

Warning:
ALWAYS use a calibrated flue gas meter.

2. Verify that the measured CO_2 value corresponds to the technical specifications of the unit.

Warning:
If the specifications do NOT match:

- **Decommission the unit in accordance with the instructions.**
- **Contact the supplier.**

Danger:
NEVER try to adjust the gas burner, unless you are instructed to do so by Biddle.

See also:
1.4.5 "Type plate" on page 8

3.4.6 Adjusting the discharge range

Adjust the discharge speed so that it produces the most optimal operation of the unit for the situation, both with and without heating.

1. Ensure that the nozzles are adjusted to the correct angle, as described in 2.5 Regulating the discharge direction.
2. Via the clock thermostat, set the unit to operate without heating.
3. Open the front panel.
   - Remove the screws.
   - Open the front panel. You can remove it, if so desired.
4. Adjust controller Rc to the lowest possible setting at which the airflow still just reaches the ground. (Feel just above the ground to see whether the airflow is reaching the ground.)

Caution:
Do not turn the controller off.

5. Via the clock thermostat, set the unit to operate with heating.
6. Adjust controller Rh to the lowest possible setting at which the airflow still just reaches the ground. (Feel just above the ground to see whether the airflow is reaching the ground.)

Caution:
Do not turn the controller off.

7. Close the front panel and fasten the screws.

See also:

2.5 "Regulating the discharge direction" on page 17

4. . Operation

4.1 General

For information about settings and operation, please consult the manual for the MultiTherm C clock thermostat.

5 . . Decommissioning

5.1 About decommissioning

The unit must be put out of service in accordance with the following procedure:

- if you want to switch off the unit and then not use it for a long time;
- if you wish to perform maintenance or service work.

Warning:
When you re-commission the unit, follow the prescribed procedure.

5.2 Procedure for decommissioning

1. Allow the unit to stop by controlling it with the thermostat.
2. Allow the unit to cool down, and wait until both the fan and the burner have stopped.

Danger:
NEVER interrupt the mains supply abruptly. This can cause the unit to overheat.

3. Set the isolation switch on the unit to position 0 (Off).
4. Disconnect the mains supply, using the isolation switch.
5. Turn off the gas tap.

6. . 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.

6.1 Resolving simple problems

If you suspect an error, first try to resolve the problem, using the table below.

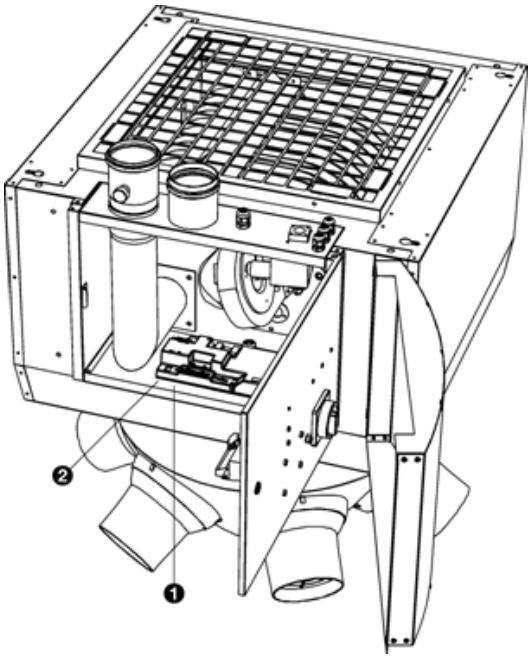
Note:
You do not have to be an expert in order to do this.

PROBLEM	PROBABLE CAUSE	WHAT TO DO
The unit does not work.	The unit has no power supply.	Check the mains supply.
	The (set) room temperature has been reached.	This is not an error. If necessary, set a higher temperature.
	The fan has switched off the unit, because the temperature has become too high.	1. Turn the unit off. 2. Allow the unit to cool down. 3. Turn the unit on.
The unit is not discharging much air.	The unit is set at too low a strength.	Set the unit to a higher strength.
The unit is not heating or not heating sufficiently.	The unit is set at too low a strength.	Set the unit to a higher strength.

See also:

5 "Decommissioning" on page 33
6.2 "Reading out and resetting error messages" on page 35

6.2 Reading out and resetting error messages



Errors reported by the unit are shown on the status display ❷ in the unit by means of an error code.

Note:
You can also read out and reset error messages with the MultiTherm thermostat. Consult the appropriate manual.

There are two types of errors:

- (A displayed alternating with a number)

  In order to reset these errors: press briefly on the service button ❶.

- (E displayed alternating with a number)

  These errors are automatically cancelled when the cause has been removed.

6.3 Remedying errors without an error message

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

1. Using the preceding section, examine whether the problem can be remedied in a simple manner.
2. Try to resolve the problem using the table below. Technical expertise is required for this.

Warning:
The actions listed below may only be carried out by personnel who are technically qualified to do so.

PROBLEM	PROBABLE CAUSE	WHAT TO DO
The unit does not work.	The unit has not been put into operation.	Put the unit into operation in accordance with the procedure.
	The unit is not receiving power.	• Check that the isolation switch is set to position 1 (ON). • Check the connections and wiring of the power supply.
	There is no gas supply.	Check the gas supply: • is there a gas supply present? • has the gas tap been opened?
	The air intake and/or the flue pipe of the gas burner are blocked.	Remove obstacles.
The unit is not discharging much air.	The inlet and/or discharge section is blocked.	Remove obstacles.
	The nozzles are not working optimally.	Check the nozzles: • Are the openings free of obstacles? • Is the unit hanging at the correct height? • Are the nozzles set properly?

See also:
3 "Commissioning" on page 25
2.5 "Regulating the discharge direction" on page 17

6.4 Remedying errors that are accompanied by an error message

If the thermostat and/or the service display indicates an error, then try to reset the error.

Opmerking:
Lock-out errors (type A) must be manually reset.

Block-out errors (type E) disappear as soon as the cause has been removed.

If this does not resolve the issue, or if the problem occurs repeatedly, then act as follows:

1. Note down the error code if one is displayed.
2. Decommission the unit in accordance with the prescribed procedure.
3. Contact Biddle. Please report the error code when doing so.

Gevaar:

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

Opmerking:

In the event of malfunctions, always contact Biddle.

Lock-out errors

CODE	MEANING	PROBABLE CAUSE	WHAT TO DO
A / 0	Internal error	Faulty circuit board	Replace the circuit board
A / 1	Flame detection error	No flame	• Check the gas pressure. • Check the gas/air mixture and the setting of the gas valve. • Check the power supply to the gas valve. • Check whether the ignition electrode is producing a spark.
		Flame keeps going out.	• Check the ionisation electrode and the cabling. (The resistance of the ignition cable is approx. 1 kOhm. • Check the earth connection of the unit. • Check the control system.
A / 2	Heat exchanger too hot.	The heat exchanger has become too hot.	• Check the fans. • Check the settings of the gas valve.
A / 3	Sensor error	The two internal temperature sensors are differing too much.	• Turn the sensor a quarter turn, so that the temperature is measured at a different point. • Measure the resistance of each sensor. This should be 20K at 25° and 25K at 20°. Replace the resistor if it differs too much from this.
A / 4	Ionisation protection	Flame goes out often.	• See actions listed under error A / 1 • Check the earth connection of the unit. • Check the settings of the gas valve. • Check the flue gas channel for blockages.
A / 5	Internal error	Faulty circuit board	Replace the circuit board.
A / 6	Safety relay error	The safety relay does not switch.	• Check plug J4. • Check the bridge between contacts 5 and 11. • Replace the circuit board.
A / 7	Flame protection	A flame is being falsely detected.	Check the ionisation plug and the cables.

CODE	MEANING	PROBABLE CAUSE	WHAT TO DO
A / 8	Fan error: The burner fan does not rotate, or does not rotate at the correct speed.	The burner fan is not receiving power.	• Check the wiring. • Check the motor.
		The burner fan is blocked.	• Check whether the burner fan can rotate freely. • Check the flue fan for dirt.
A / 9	Pressure switch error	Insufficient transportation of combustion gases through the heat exchanger.	• Check the heat exchanger for flue gas leakage. • Check the connection and operation of the pressure switch.

Block-out errors

CODE	MEANING	PROBABLE CAUSE	WHAT TO DO
E / 0	Internal error	Faulty circuit board	Replace the circuit board
E / 1	1st temperature safety device	The heat exchanger has become too hot.	• Check the fans. • Check the settings of the gas valve.
E / 2	Selection resistor	Unit recognition does not work.	• Check the connection of the selection resistor to the circuit board. • If necessary, fit a new unit selection.
E / 3			
E / 9	Reset button error	The reset button has been pressed too often within a short period.	• After a waiting period, the error disappears automatically. • Possibly switch the unit off so that it electrically dead for a brief period.

7 . . Maintenance

7.1 Daily inspection

Biddle recommends that you perform these checks during everyday use. Visual observation is sufficient here. Specific expertise is not required.

- Check that the fan is running.
- Check the thermostat for error messages.
- Check that the inlet and discharge openings are not blocked by objects or dirt; Remove these if necessary.

See also:
3.3 "Operating mode" on page 27

7.2 Scheduled maintenance

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

7.2.1 Inspection and preventive maintenance once a year

The following checks and maintenance activities must be performed annually by qualified technical staff.

- Inspect the casing, the suspension or mounting structure, and the securing of the unit.
- Inspect the gas lines.
- Inspect the air intake opening and the flue pipe.
- Inspect all wiring between the components in the unit, and the mains supply.
- Check the inlet and discharge openings for dirt and clean them if necessary.
- Inspect the inside of the burner and clean it if necessary.
- Inspect the ignition electrode, and adjust if necessary.
- Check that the safety shut-off valve is gastight.

- Clean the trap of the condensate drain and refill it with water.

Warning:
The trap must be filled, otherwise flue gases can escape.

- Measure the CO_2 value of the flue gases, and ensure that they comply with the technical specifications.

See also:

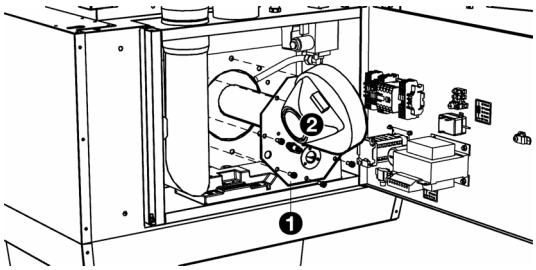
1.7.1 "Safety issues relating to installation, maintenance and servicing" on page 11
7.3 "Inspecting the gas burner" on page 40
7.4 "Adjusting the ignition electrode" on page 42
7.5 "Cleaning the unit" on page 42
3.4.5 "Checking the flue gases" on page 30

7.3 Inspecting the gas burner

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

The gas burner should be internally inspected and cleaned out annually by technically qualified staff.

Removing the burner



1. Decommission the unit in accordance with the instructions.
2. Open the service compartment.
3. Loosen the 6 socket screws ❶.
4. Remove the burner ❷, including the flange and the premix fan.
5. Check the inside of the heat exchanger for dirt or damage.
6. Check the burner for damage.
7. If necessary, clean the ignition electrode with fine sandpaper.

Caution:
Do not bend the electrode.

8. Check air supply and air discharge.
9. If necessary, clean the inside of the burner with a vacuum cleaner.
10. If the outside of the heat exchanger is very dirty: clean it with a soft brush.

Caution:
Never use a steel brush.

11. Clean the fan grille with a vacuum cleaner and a brush.
12. Replace the burner.

Caution:
Use new gaskets.

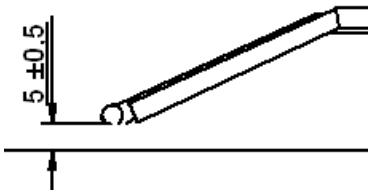
13. Commission the unit and check its operation in accordance with the instructions.

See also:

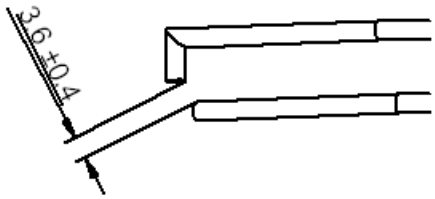
3 *"Commissioning" on page 25*
5 *"Decommissioning" on page 33*
1.7.1 *"Safety issues relating to installation, maintenance and servicing" on page 11*
3.2 *"Checks before commissioning" on page 26*
8.1.2 *"Accessing the gas burner" on page 44*
8.1 *"Access" on page 43*

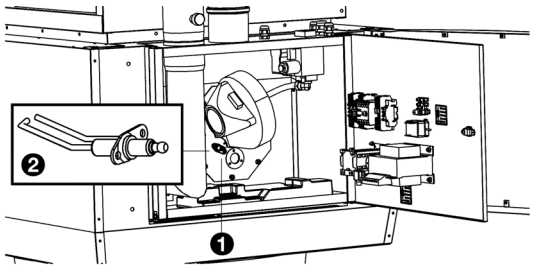
7.4 Adjusting the ignition electrode

Correct distance between the electrode and the burner (in mm)



Correct distance between the electrodes mutually (in mm)





In order to ignite the gas burner, the ignition electrode must be properly adjusted. The spark must be formed between the two electrodes, but must not arc over from the electrode to the burner. Improper adjustment can result in violent ignition.

In order to reach the ignition electrode:

- Open the service compartment.
- Loosen screws ❶ and remove the electrodes ❷, or take the burner out in its entirety.

See also:

8.1 "Access" on page 43
8.1.2 "Accessing the gas burner" on page 44

7.5 Cleaning the unit

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

Caution:
Make sure that no water runs into the unit.

8 . . Servicing

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:

1.7.1 "Safety issues relating to installation, maintenance and servicing" on page 11

1.6.2 "Required skills" on page 10

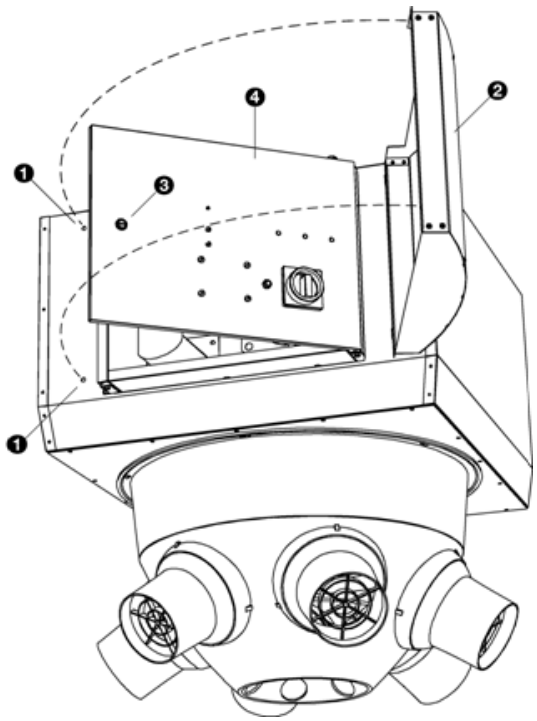
8.1 Access

8.1.1 Accessing the service compartment

About the service compartment

The service compartment contains, among other things:

- the burner
- the burner fan
- the control electronics and display
- electronic connections
- connections for the mains supply and the thermostat



Opening the service compartment

1. Remove the screws ❶.
2. Open the front panel ❷. You can remove it, if so desired.
3. Give lock ❸ a quarter turn to the left.
4. Open the door ❹.

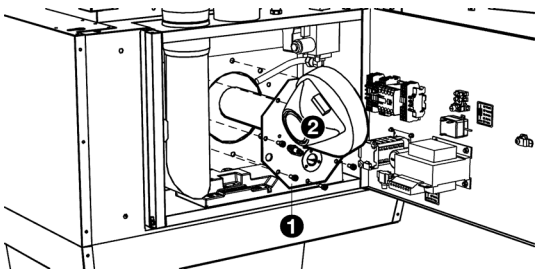
Warning:
The service compartment contains hot and electrically-live parts. Do not touch them when the mains supply is on.

8.1.2 Accessing the gas burner

The gas burner contains:

- the ignition electrode
- the burner bed

Removing the burner



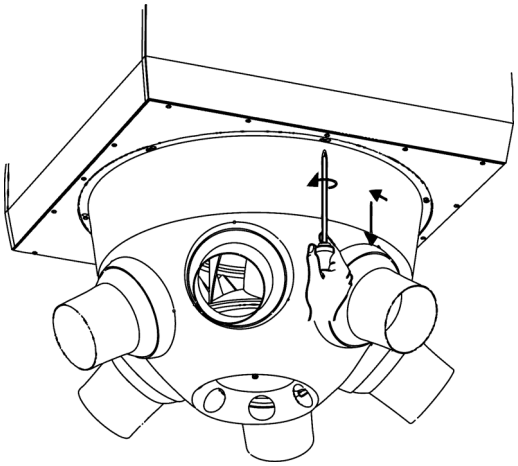
1. Open the service compartment.
2. Loosen the 6 socket screws ❶.
3. Remove the burner ❷ with fan and all.

See also:
8.1 "Access" on page 43

8.1.3 Removing the discharge cone

The system fan is located in the discharge cone.

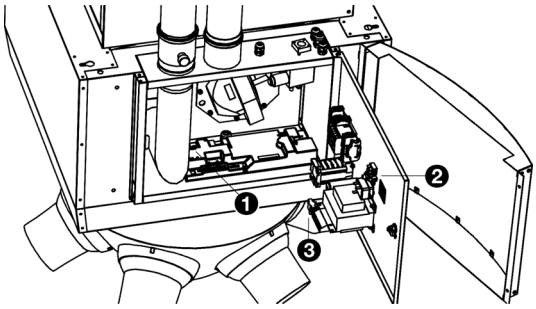
Disconnecting the discharge cone



In order to remove it:

- Remove screw ❶.
- Slightly loosen the screws ❷.
- Turn the cone slightly and remove it.

8.2 Fuses



Specifications of the fuses

LOCATION	DESCRIPTION	SPECIFICATION
❶	fuses F1 and F2 for the electronics	T 5A (2x)
❷	fuses F7 and F8 for the power supply	T 3.15 A (2x)

9 . . Dismantling

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

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.

10. Addresses

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

Biddle bv
P.O. Box 15
9288 ZG Kootstertille
The Netherlands

T +31 (0)512 33 55 55
E info@biddle.nl
I www.biddle.nl

Biddle Air Systems Ltd.
11 King St. Unit #3
Barrie, ON L4N 6B5
Canada

T 705 797 0007
E biddle@biddle.ca
I www.biddle.ca

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Liability as regards the manual

Although great care has been taken to ensure the correct and, where necessary, complete description of the relevant components, Biddle shall not be held liable for damages as a consequence of errors and/or imperfections in this manual.

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

Should you nevertheless discover any errors or ambiguities in the manual, we shall be glad to learn that from you. It helps us to improve the documentation still further.

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 10 Addresses.

Biddle bv
P.O. Box 15
9288 ZG Kootstertille
The Netherlands

T +31 (0)512 33 55 55
E info@biddle.nl
I www.biddle.nl

Name and telephone number of installer: