

DIRECTIONS FOR USE

INSTALLATION INSTRUCTIONS

ECO 410

NAME	OUTPUT	DESCRIPTION
ECO 410 Soap stone Serial no:	8.0 kW	Stove with oven and wood niche and curved door



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1. INTRODUCTION

1.1. PREFACE

We would like to congratulate you on your purchase of this modern BARBAS stove. This quality product will give you years of heating pleasure as you enjoy the play of the flames and the cosy glow of the fire.

This manual contains directions for both positioning the appliance and for its environmentally-friendly use. It also contains technical data for the appliance, parts information and directions in the event of problems. Study this manual carefully before using the stove. We recommend you keep this manual in a safe place for reference purposes.

1.2. SAFETY

- Do not place flammable objects within 80 cm of the appliance. Pay special attention to furnishings and ornaments around the fire.
- To ensure safe working of the stove, at least 20 cm must be left between the sides/rear and the wall (temperature $\leq 90^{\circ}\text{C}$).
- If your floor contains flammable material, an extra floor plate is required. Keep a minimum distance of 50 or 30 cm respectively from the front/sides.
- When you use your stove, the exterior will become hot. Always wear the glove or use the accessories supplied when filling etc. Protect yourself and others (especially children!) from burns. Do not leave children unattended when the stove is burning.
- Watch your clothing. Synthetic clothing in particular can easily catch fire and burn intensely.
- Do not approach the appliance with flammable materials or liquids. Any work with solvents, adhesives etc. in the space heated by the fitted fireplace can be very dangerous.
- Make sure you know what state your chimney is in. Cracks in the chimney may not only lead to damp, staining of walls and leaking of smoke, they can also impair the carrying off of smoke. Make sure you get proper advice from your Barbas dealer or other specialist company.

- Avoid chimney fires! Have your chimney swept at least once per year - more often if you use your fire a lot. Prevent excessive deposits of soot inside the chimney by not burning freshly-cut wood. Instead, burn clean, dry chopped wood.
- Do not use your stove as a barbecue. This can cause (flammable) fat deposits to be left in the chimney and hastens the chimney becoming clogged. Prevent your chimney being soiled from above (birds' nests etc.) by fitting a suitable cap to the chimney pot.
- In case more than one stove is connected to a chimney, as is often the case in Germany, the stove has self-closing doors (Bauart 1).

1.3. ADVICE BEFORE USE

- Wood and wood briquettes may be stoked in the stove.
If you want to use coal, please contact your dealer beforehand.
- **Never** use the heater to burn rubbish.
- Please read all instructions/stickers on and around the appliance.
The information is based on practical experience.
- Please also study the directions for use before using the appliance for the first time. When you first fire up your appliance, there are a number of extra points you should take into account. See section 5.
- In transit, some parts of the appliance may have moved from their original place. Check that the door opens and closes, the brake plate is fitted correctly to the brackets at the top of the fire, the cast-iron fins are fixed to the walls and the stones on the bottom have not moved. Check that the ridling grill is in the correct position and slides properly. Check that there is nothing in the ash drawer that should not be there.

2. LOCATION**2.1. INCLUDED**

Documentation	Warranty Manual
Smoke connection set box	Connecting washer Sealing plate 4 Attachment bolts including nuts and washers Protective plate for rear of appliance 2 Screws for fastening the protective plate
In the appliance	Glove Poker
In wood niche	Handle
Soap stone panel set	Top plate with through-feed hole Left-hand panel Right-hand panel Wood niche plate

ENGLISH

N.B. If any part is missing, please contact your dealer.

2.2. PREPARATION FOR POSITIONING

Barbas can provide scale drawings for each type of appliance in its range. They are intended for preparation for positioning. Never work on the basis of other sources such as folders.

If necessary, disassemble the soap stone set. This makes it easier to access the stove. There is an information sheet on the stove with directions.

3. INSTALLATION INSTRUCTIONS

3.1. PREFACE

When fitting the stove local and/or national regulations relating to fire safety must be followed. In case of doubt, consult the fire safety department of the local fire brigade, particularly if the stove is to be fitted in a home with walls and/or floors containing flammable material.

Position the appliance sufficiently far away from the wall behind it. If the walls are not fire-proof, the distance should be such that the wall in question cannot become hotter than 80 °C, even when the stove is stoked up to high temperatures. In case of doubt, insert a fire-proof protective plate.

3.2. CHIMNEY

Be sure that existing chimneys are completely air-tight and in good condition. In terms of dimensions, the chimney must have a diameter of at least 150 mm for the entire length (including the chimney pot).

Ensure that the chimney is fitted with an appropriate cap to avoid rain and dirt getting in (as well as bird's nests).

The draught flowing through the chimney determines how well your stove will burn (advised draught 0.15 mbar).

In the event of problems, a solution may be a different chimney cap, if necessary one with a smoke fan. Contact a specialist if you have any doubts about any of the above points.

If your chimney is unsuitable, or if your home does not have a chimney, we recommend the use of double-walled stainless steel chimney sections. Chimneys must comply with the prevailing building regulations. Make sure the building is carried out by a specialist. When purchasing such chimneys, be sure to check that the casing is sufficient.

A few points for your attention:

- chimneys must be free-standing, i.e. they must not rest on the appliance itself.
- All connections between the appliance and the chimney must be properly insulated.
- flammable material must be kept clear (outside the casing/insulation zone) of all through-feeds in the floor or wall (remember the roof decking).

Between the stove and chimney, use thick-walled smoke piping. The first pipe connected to the appliance must have a diameter of 150 mm at both ends. This will prevent any condensation from the chimney running over the external end of the pipe. Connect the pipes to the existing chimney (ceiling) using a sliding sleeve (niche pipe). Check all connections for air-tightness.

If there is too much draught running through your chimney (e.g. if the chimney is long and straight in a tall building), it may be possible to insert a check valve in the pipe near the appliance. Before doing this, be sure to obtain sound advice from a specialist.

Do not make any horizontal connections. Deposits and soot will accumulate here (unless it is a short horizontal connection directly behind the stove).

3.3. FITTING THE STOVE

3.3.1 Chimney connection to the ceiling

If the connection is at the top of the appliance, fit the washer at the top and sealing cap at the back (see the drawing accompanying the connection set). Then fit the protective plate to the wall behind the stove to hide the sealing cover from view.

The precise position of the stove must be determined relative to the location of the connection in the ceiling. As the soap stone panels have to be positioned before the chimney pipes, it is difficult to move the appliance thereafter.

Fit the side panels (drop into place from above).

Fit the soap-stone top plate.

Insert a pipe into the sliding sleeve to the ceiling as deep as possible. Position a chimney pipe on the top plate and mark off where the top pipe should be shortened. Shorten the top pipe and insert it, once more, as deep as possible into the sliding sleeve in the ceiling. Position the lower pipe over the sealing washer. Now pull the top pipe down and over the bottom pipe.

3.3.2 Chimney connection behind the stove

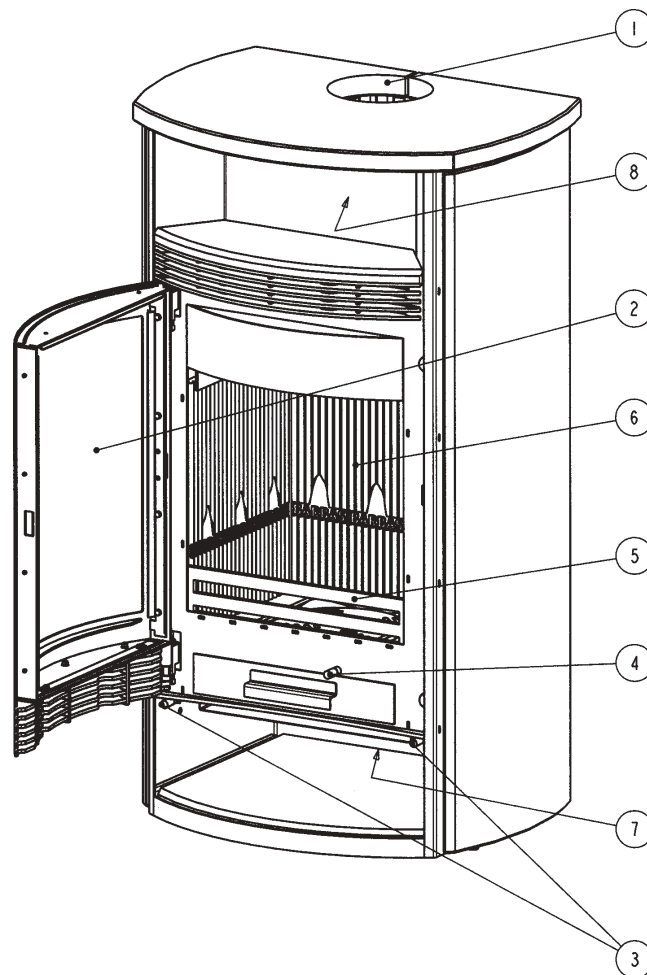
If the chimney is connected behind the stove, position the sealing cover on the top (see the drawing with the connection set). Then fit the protective plate on the top wall of the stove to protect the soap-stone top plate from excessive radiation from the sealing cover. Using three adjusting bolts, place the soap-stone disk in the top-plate opening. This covers the opening for the upper connection.

Determine the position of the stove in relation to the pipe. In this case, the pipes (to the ceiling or wall behind the stove) may be connected before the soap stones are put in place. The stove is, at this point, still relatively mobile.

Determine the lengths of the pipes required.

If the pipes are connected to the ceiling, refer to the instructions for appliances with connections to the ceiling.

4. OPERATION OF THE STOVE



ENGLISH

- | | |
|----------------------------|---------------------------------|
| 1 Smoke outlet | 5 Wood rack |
| 2 Ceramic heat-proof glass | 6 Cast-iron fins |
| 3 Primary air-supply slide | 7 Convection air-supply slide |
| 4 Ridling grill handle | 8 Convection air escape opening |

5. STOKING UP FOR THE FIRST TIME

If you have had your chimney breast modified or newly built, first allow your home to dry properly. Walls which have not been allowed to dry properly are a magnet for dust such as any smoke particles created when stoking up the fire or suddenly opening the door. Even scorched dust can easily be retained by damp walls. Think also of dust on the outside of the appliance or on hot radiators etc.

Check that all packaging, stickers etc. and/or all dust and waste has been cleaned up after the installation work (to avoid it getting scorched/causing a bad smell).

Check again that all moving parts are in order and that loose parts such as the brake plate, fins, ridling grill etc. are in the correct position. They may have moved during installation.

The fireplace has a heat-proof finish. It only hardens at high temperatures. When unpacked, it is therefore not fully hardened. It can easily be damaged at this time.

Begin stoking up the fire with a low flame (see section 6). Increase the heat gradually for approx. 2 Hours until you reach the correct output. Keep it at this level for another 2 - 3 hours. The finish will now be properly hardened and can be touched without damaging. The hardening process creates a nasty, though harmless, smell/vapour.

Adequate ventilation is of the utmost importance.

6. USE

6.1. VENTILATION

Air is a vital component of the combustion process. Ensure that there is a sufficient supply of fresh air. For each kilo of wood that you put on the fire (door closed), 10 - 15 m³ of extra air is needed. That means 50 m³ per hour! As you can see, a plentiful supply of air is essential.

6.2. GETTING THE FIRE GOING

When you start the fire, the chimney is still cold and there is little draught. This means that the chimney's capacity to draw in air is limited. Consequently the air supply has to be helped by opening the door, slides and ash drawer. Use dry, fine wood and some scrunched-up paper or firelighters to start the fire.

Leave the door(s) ajar for 10 minutes. Do not open the door wide, as the window will remain cold. If the door is shut during this time, smoke will condense on the glass and form soot.

6.3. WHILE STOKING

After approx. 10 minutes, the fire will be burning fiercely. You can now top it up with a few larger blocks of wood. Close the door(s) when the new wood catches fire.

After another 10 minutes, close the ash drawer.

If the fire is still burning well, close the ridling grill ④ and the primary air supply slide ③.

N.B. The primary air supply slide ③ should be kept closed except during the lighting procedure. Your fire will then be much cleaner and more efficient (more heat, less topping up). The supply of secondary air is through the top of the door and cannot be controlled.

We recommend that you maintain a substantial layer of ash (2 - 3 cm). This not only forms a protective layer for the base of the appliance but also significantly reduces consumption of fuel and allows new wood to catch light easier.

USING COAL AS A FUEL

The ECO 410 is primarily a wood-burning stove. If you wish to burn coal, consult your dealer first.

Method: Prepare a fire as if you were going to burn wood.

After approx. 10 minutes, when the fire is burning fiercely, add some coal.

Now close the door(s) completely and a little later the ash drawer.

The ridling grill ④ and the primary air-supply slide ③ should be left open.



Once the layer of coal begins to glow, you can dampen the fire by reducing the primary air supply. Limit the layer of coal to 3 - 4 times the average dimensions of the coal grade used, so that there is a good flow of oxygen through the coals (if the layer is too thick, the fire will 'explode').

UNLIKE WHEN USING WOOD: NEVER CLOSE THE PRIMARY AIR SUPPLY COMPLETELY.

6.4 HEATING ECONOMICALLY

The most environmentally-friendly and economic way of heating with wood is to have your fire hot but calm. The ash should appear to glow a soft red-orange and should not glow like a blacksmith's fire. Fires like that burn quickly and intensely, leaving little time for complete combustion.

Your fire is at its most economical when:

- Burning with the door closed. This makes the fire hotter and improves combustion.
- Using dry and clean wood (as described further in section 8).
- Combustion is regular. When burning, shut the ridling grill and primary air supply.
- The bed of the fire should be composed of one material, though the fire must have easy access to air. Position the blocks of wood (loosely and evenly) horizontally on the bed of ash, so that they are separate and several centimetres away from the walls.

7. GENERAL HINTS

7.1. TIPS

- Burn dry wood only. Damp wood not only burns poorly, it causes more pollution in the appliance (window), the chimney, your room (when opening the door of the appliance, for instance) and the environment. Wood can only be classified as dry if it has been stored under a Dutch barn for at least two years (not covered with plastic). Never use painted or impregnated wood. The gases emitted when burning painted or impregnated wood are aggressive and will affect the appliance, the environment and your health.
- Ensure that your fire burns well. The smoke generated should be translucent or white and the windows of the fire will remain clean. We recommend that you do not 'pinch off' your fire (by closing all air openings). Doing so will hinder combustion which, apart from polluting the atmosphere, will lead to deposits of soot and tar in your chimney (which, unchecked, will increase the risk of chimney fire).
- Keep the door(s) shut when the fire is burning. Doing so improves the performance of your fire 8 - 10 times, benefiting the environment and the heat in your home (less topping up, see section 7.2). You will also prevent fire damage from any particles the fire 'spits' out (this is a particular problem with softwood from conifers). If your floor contains flammable material, an extra floor plate is required.
- Avoid lighting a fire in misty or still conditions. If the wind is still, there is hardly any draught in the cold chimney. As smoke is heavier than air, there is a chance that smoke will enter the room. If there is mist in the air, smoke coming out of your chimney will cool quickly and fall, causing problems in your area.
- Do not extinguish your fire with water - let it burn out. The part of the inner lining that is in direct contact with the fire is clad with cast iron sections or fire-resistant material. Sudden changes in temperature may lead to it deforming or cracks appearing.

7.2. OUTPUT

In practice, combustion is all about loss. This entails:

- Loss through excess heat leaving the chimney, rather than going into the room.
- Loss through insufficient combustion, such as CO (carbon monoxide) and soot particles.
- Loss through excessive unburnt fuel in the ash.

The rate at which fuel can burn completely is called the output. A well-stoked fire achieves output of 75% and thus falls into the category of high-output/low emissions fires. This means that you benefit directly by using less wood to achieve the same level of heat. The environment benefits as well: a well-stoked, high-output appliance means less pollution and fewer odours.

Adverse effects on the output are:

- Burning the fire with the door open. A warm chimney works in the same way as an extractor. When the door is open, the chimney draws in much more air than is necessary for combustion. This relatively cool air cools down the fire.
- Excessive chimney draught. The combustion air does not reach the fuel, but leaves the appliance via the chimney. The fire cools and the combustion quality decreases.
- Using too much wood. This is a problem if your fire is too small. In that case, it becomes overloaded and burns more wood than heat emitted. In this case too the fuel cannot burn completely. More to the point, there is not enough air to mix with the flames. This has an extra impact on the environment.
- Admitting too much air under the fuel (primary air slides). Combustion is raised to high intensity (like a blacksmith's fire). Combustion really needs time. If combustion is too intense, there is insufficient time for the fire to radiate all the heat. The chimney will become excessively hot and the same will be true of the escaping smoke. This heat is thus lost.

7.3. GOVERNMENT POLICY

In view of the above, it will not surprise you to learn that an open fire has lower output, 8 - 10% lower in fact. It puts a much greater burden on the environment. That is why the government discourages new **OPEN** fires. It does this, for example, by forbidding the construction of chimneys. Armed with this information, you can tell that a high-output fire is something completely different and does **NOT** fall under the scope of the discouragement policy.

8. FUELS

8.1. WOOD

Suitable fuels are:

- All sorts of clean wood (forested). The wood must have been dried for at least two years. Well-dried wood has a humidity percentage between 10 and 20%.
- Compressed wood blocks without binder.
- Hard woods burn slowly and easily form charcoal; for example hornbeam, oak, ash, beech, elm and birch. Softwood burns with more flame, but forms less charcoal and radiates less heat. Examples are spruce, pine, poplar and linden.

Unsuitable fuels are:

- Painted, bonded (chipboard, MDF etc.) or impregnated wood, plastic and other flammable waste. Stoking a fire with this is completely forbidden. To re-iterate: the combustion gases released by these materials are aggressive and will attack your fire and the environment.
- Paraffin-containing open fire lighters are not suitable for a closed stove. A closed stove generates more heat than an open fire, thus the paraffin will melt out of the blocks prematurely.
- Damp wood burns poorly, is unsuitable and produces too much smoke (including in the room when you are topping up the wood), dirties the glass, leaves deposits in the chimney and delivers about half the heat output of dried wood.

8.2. COAL

If your stove is made for coal, you may burn it. You can obtain best results with a medium-fine grade coal made from a hard, shiny sort of anthracite. Avoid coal mixed with synthetic anthracite (products derived from oil products). They cause more pollution to both the environment and your fire and may affect the inside of your fire.

9. AMOUNT OF FUEL

9.1. AMOUNT OF FUEL

Each appliance is constructed for a certain maximum amount of fuel. Remember that the more fuel you put into your fire, the hotter it will become and overheating may even occur. If this happens, there is a risk of fire. It may also damage your appliance and chimney. BARBAS will not assume liability for damage caused by overheating.

If you have chosen the right appliance for your room, it will provide sufficient heat with a single layer of wood blocks (a wood block is approx. 30 cm long and 30 cm around the edges).

Burning one layer of wood can lead to varying outputs. When used correctly, one load will burn in around one hour. Putting in too much wood at once can lead to the appliance being overloaded.

You can best vary the capacity of your appliance with the amount of fuel.

Example:

Your fire has an output of 10 kW:

Wood	:	3 blocks, each around 1 kg
Briquettes	:	5 briquettes, each around 0.5 kg
Coal	:	1.5 kg

Your fire has an output of 6 kW:

Wood	:	2 blocks, each around 1 kg
Briquettes	:	3 briquettes, each around 0.5 kg
Coal	:	1 kg

9.2. HEAT RADIATION

The table below shows the temperatures which can theoretically be achieved by burning wood, brown coal and anthracite.

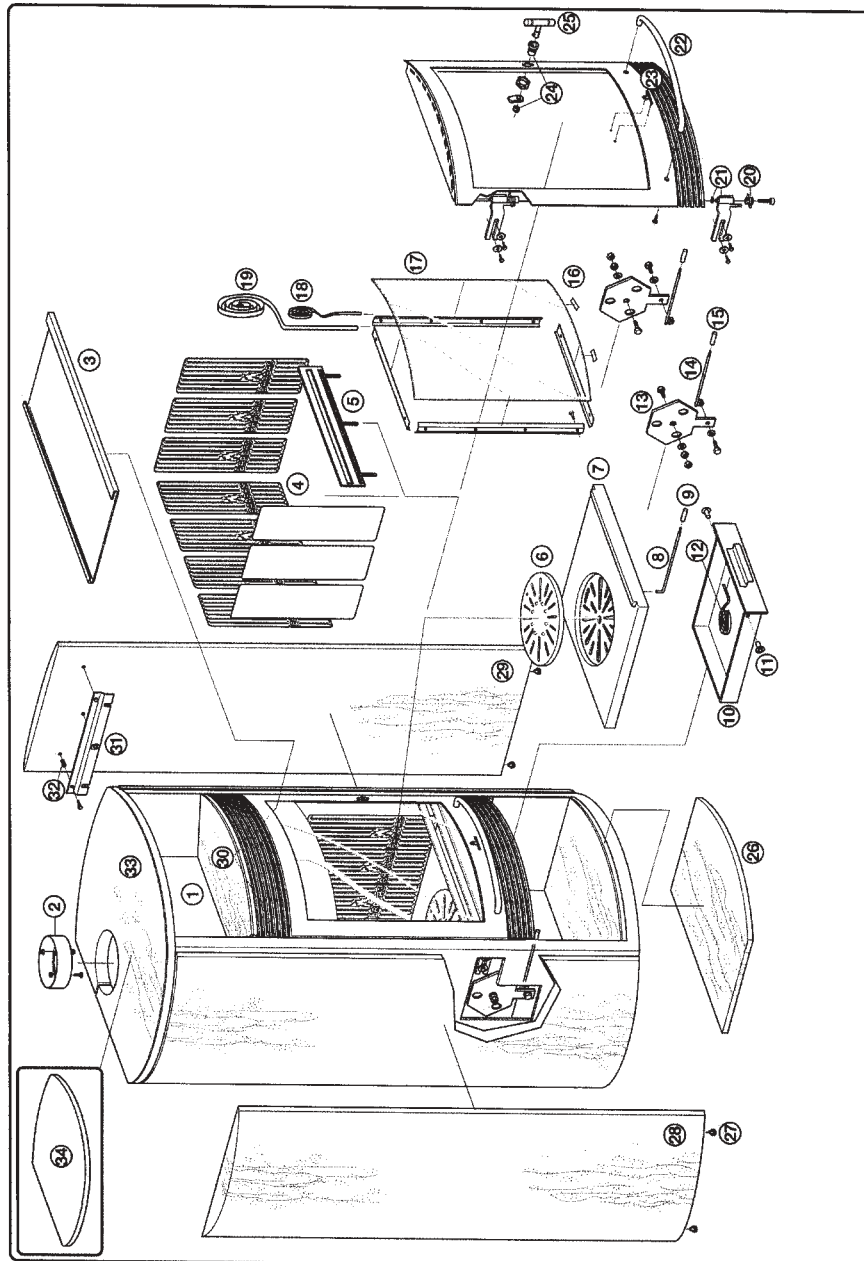
Heat radiation	
Sort of fuel	kWh/kg
Dry wood (average)	4.3
Brown coal briquettes	5.4
Coal (anthracite)	9.3

The heating value of wood (18.7 MJ/kg at 0% humidity) is not affected by the sort of wood. What does make a difference is the relative humidity of the wood (15.6 MJ/kg at 15% humidity).

10. REGULAR MAINTENANCE

- Emptying the ash tray/container : Weekly, 48 hours after last heating
- Cleaning the glass : As required
- Door/ash drawer seals : Check annually before heating is resumed. Replace as necessary
- Sweep and inspect chimney : Annually before heating is resumed
- Fins/Skamolex plates : Check annually
 - * Clean fins as necessary with wire brush
 - * Replace plates as necessary
- Ridling grill : Check annually for cracks/breakage
- Slides/flaps : Check function annually
- Convection channels : Clean annually
- Paint : Annually, if necessary touch up with BARBAS heat-resistant paint
- Parts : Individual parts for replacement/ accessories are available from your BARBAS dealer. Be sure to keep the enclosed parts list. This shows the serial number of your appliance which you will need for ordering the correct parts. The serial number is also stamped into your fire just above the ash drawer.

11. REPLACEMENT PARTS



ECO 410 Replacement parts		
Item no	Description	Number
1	Body	1
2	Smoke connection	1
3	Brake plate	1
4	Cast-iron fins	10
5	Wood rack	1
6	Ridling grill rosette	1
7	Ridling grill container	1
8	Ridling pin	1
9	Ridling-pin knob	1
10	Ash drawer	1
11	Ash drawer snap-on cover	1
12	Ash drawer cord	1
13	Air slide	1
14	Air slide rod	1
15	Air slide button	1
16	Glass clamp	4
17	Glass	1
18	Door-glass cord	1
19	Door-body cord	1
20	Spring	2
21	Hinge	2
22	Decorative strip	1
23	Nickel emblem	1
24	Lock	1
25	Handle	1
26	Soap stone wood niche	1
27	Soap stone side panel cap	4
28+29	Soap stone side panels (L+R)	1
30	Soap stone oven niche	1
31	Side panel support	2
32	Plug for side panel support	6
33+34	Top plate with/without through-feed hole	1
When ordering, please give the serial number. (see stamped number above ash drawer and the cover of this manual)		

12. TECHNICAL DATA

Type:	ECO 410
Dimensions (hxbxd)	1.11 x 0.61 x 0.47 m
Weight	280 kg
Combustion:	
Nominal output	8.0 kW Measured in compliance with DIN 18891 (Bauart 1-D)
Smoke output	6.2 g/s (for chimney calculation) measured at a smoke temperature of 343°C and at a draught setting of 12 Pa
Inside:	
Dimensions	Surface area 0.115 m ² Clear fire opening 480 x 380 mm
Fins	Cast iron
Bottom stones	Fire-proof concrete
Inner lining	Steel
Retardant plate (brake plate)	Stainless-steel
Ridling grill	Cast iron
Outside:	
Construction	Sheet-steel casing Top and rear plate may be connected to a Ø150 mm smoke pipe
Doors	Large, curved, matt-chrome door, hinged on left Shutter with removable chrome handle Hinges with screw springs make it a self-closing door (mandatory in Germany among other countries) Curved screen of heat-resistant ceramic glass
Cladding	Soap stone consisting of top plate with loose disk, oven, door and wood niche plate and two soap stone side panels

ECO 410



Operation:	Two handles for controlling the air under the fuel (primary air)
Ash collection:	Ash drawer with ridling grill

ENGLISH

13. FREQUENTLY ASKED QUESTIONS

How often should I have my chimney swept?

At least once a year. If you use your fire more than three times a week on average, have your chimney swept more often. Have the chimney swept by a recognised company. Your fire insurance policy may make this a condition and ask for proof.

In terms of stoking up the fire, what is the difference between a stone and cast-iron lining?

Both linings serve to protect the wall of the stove against flames. The advantage of a cast-iron lining is that it is much stronger than a stone lining. It will not break after a few years; cast iron will not be damaged if you push in the wood into the stove any harder than usual. Cast iron radiates more heat out to the room than stone. This improves the output.

Are there any plans to prohibit open fires/fitted fires and/or wood-burning stoves?

The Dutch government currently has a discouraging policy towards new open fires. An open fire in this sense is one without a door and air slides. Fitted fires and stoves with a Dutch approval mark or the much more stringent VHR approval mark are not covered by this policy.
(See also sections 7.2 and 7.3).

Does a fitted fire have better output than an open fire?

Yes, a fitted fire has between 7 and 8 times the efficiency of an open fire. (See also sections 7.2 and 7.3).

What is the difference between yield, strain and output?

Yield or capacity represents the net amount of heat that the appliance generates.

Strain is the gross figure.

Output is the percentage of fuel converted into useful heat. It is the ratio of output to strain.

How can I keep the glass clean?

By making a point of using dry, clean wood in the stove. Wood that is too damp immediately gives off lots of ash.

Make sure the seals are in good working order. Any air seeping out around the glass part of the door will cool the air, resulting in the fire not burning cleanly.

How much wood will I use?

That depends entirely on how you heat your room, what sort of appliance you have and the size of the room you are heating. As a general rule, a fire used in accordance with our guidelines (no air under the fuel, topped up once an hour) produces an output of about 3 kW.

In an averagely-insulated house, the general rule is that in a room of 80 m³, you need a fire with an output of around 7 kW. For each subsequent 10 m³, add on 0.6 kW.

In a relatively well-insulated house, the general rule is that in a room of 80 m³, an appliance of 5.5 kW is adequate, and for each subsequent 10 m³, you need to add a further 0.4 kW.

Can a wood-burning stove/fitted fire be connected to a central heating installation?

The Barbas range does not have any stoves/fires that can be connected to central heating installations. We do not advise attempting it.

At what temperature does/do the convection fan(s) cut in?

Wood-burning stoves are not fitted with convection fans.

Fitted fires with a fan controlled by a built-in dimmer have no automatic temperature control. The on/off switch is part of the dimmer.

If your fitted fire is equipped with a transformer plug and dimmer, it will also have an automatic temperature control. If the two fans are about to overheat, they will cut in when the area to the left and right of the ash drawer becomes warm. This is at approx. 45°C.

How do I know if I'm heating correctly?

Follow the instructions in this manual.

The flames should play softly across the wood and the wood should burn evenly.

Once the fire has been burning for a short time, the smoke from the chimney should be almost translucent.

What is wrong with a smoking chimney?

A seriously smoking chimney means that combustion is less than optimum. There may be a number of reasons for this. If the fire has only just caught on, or has recently been topped up, some smoke is normal. By opening the door(s) for a short period, the wood will catch fire quicker and the smoky period will be shorter.

If you leave the fire door open, and especially if you burn damp wood, the result will be a lot of smoke. In both cases, the combustion temperature is too low. This leaves numerous dangerous compounds intact, which means more deposits in your chimney and more waste into the environment.

What is the influence of soap stone on a stove?

Soap stone functions as a heat buffer. Its combination of chalky composition and sedimentary structure means that soap stone heats up more quickly than other sorts of stone and emits heat more gradually than other stone. This evens out the irregularities associated with burning wood (heat radiated is initially double; later half the average). However, this means that a soap stone fire has a longer warm-up period.

The soap stones are not like the ones in the brochure. Is this right?

Soap stone is a type of stone that is found in mountain walls (it is sawn out). Depending on the place in the mountain, the structure may vary. It may be more or less porous, its structure may be wild or calm. This means that the colour and finish may also vary. Stone quarried in the past will thus look different to stone quarried today.

What should I do if the wood does not catch fire?

This probably means that the wood is damp. Remove the wood and replace it with dry wood. If necessary, make a fire with wood briquettes. They are always dry (they have a moisture content of <10%).

The wood burns up too quickly. What should I do?

Ensure that air cannot get in underneath the fuel. Close the primary air slides, ash drawer and ridling grill. Under these conditions, the layer of ash should no longer burn bright orange/white but red.

If there is a draught (due to strong wind), air intended as secondary air for above the fuel may enter through the openings above the door and flow straight down beneath the wood. If this happens, close the secondary air slides slightly.

There may be too much of a draught in your chimney, particularly if it is very high (in excess of 8 m). Ask your supplier to fit a check valve or damper. This may not be possible in all cases.

Can I burn coal?

Yes, if your fire has a ridling grill. Only then can you hold the air gaps in the grill open from the outside (which you need to be able to do when burning coal).

Can I leave my fire unattended?

Only when it is burning peacefully with little wood and if the doors are closed as well as the primary air slides. Do not leave children unattended while the fire is burning.

Do I have to take any extra measures if the room I am heating has an extractor fan?

Select a closed fire, i.e. a fire with completely separate combustion air inlet. The combustion air will then be drawn in from outside the appliance.

What is creosote?

Creosote is a tar-like deposit which is left in the chimney. It is formed in poor combustion conditions when burning wood (damp wood, pinching off the air supply to the fire or burning impregnated or painted wood for example). Creosote ignites at approx. 500°C. This temperature can easily be reached if the fire is raging. This means that deposits of creosote in your chimney could cause a chimney fire.

What happens when wood is burnt?

The combustion process.

The combustion of wood involves the following steps.

Drying

The first step is that the fuel (wood) dries out. Even at low temperatures ($<100^{\circ}\text{C}$), any moisture still in the wood will evaporate. This drying procedure implies a significant loss of energy if wood which is 'too' damp is burnt. The right degree of moisture is achieved after 1.5 - 2 years of drying. The moisture content is then 15 - 17%.

Decomposition

At moderate - high temperatures (150°C - 350°C), the decomposition process can be discerned. This is when the chemical structure of the fuel breaks down. This process involves the creation of volatile compounds such as carbon monoxide (CO), water vapour (H_2O) and methane (CH_4). In addition, substances which are volatile at decomposition temperature but condense at lower temperatures are often released. These are the tar-like components (this by-product is also known as creosote, which is deposited in the chimney and cold parts of the fire in poor burning conditions).

Combustion of the products of decomposition

The volatile compounds burn in the gas phase if O_2 (air) is added. The ignition temperature of these volatile compounds is approx. 550°C .

Combustion of solid hydrocarbons

The solid component that remains consists of pure hydrocarbons, which will burn at approx. 800°C if O_2 (air) is added.



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