



[www.saunatechnics.com](http://www.saunatechnics.com)

# Installation, operation and service manual

Gas fired sauna heaters models Etna, Olympic and Classic



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This manual is valid for standard installation. SAUNATEchnics can therefore not be held liable for any damage resulting from specifications of the installation supplied to you that deviate from the standard version. The delivery conditions of SAUNATEchnics apply to all delivered parts.

For information on adjustments, maintenance or repairs not covered by this manual, please contact your supplier's technical service.

This manual has been compiled with every possible care, but SAUNATEchnics cannot be held responsible for any errors in this book or for the consequences thereof.

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## Introduction

The SAUNATechnics pyramid sauna heater is an extremely userfriendly and energy saving gas fired heater for (commercial) saunas.

Sauna Technics Pyramid Sauna heater is suitable for:

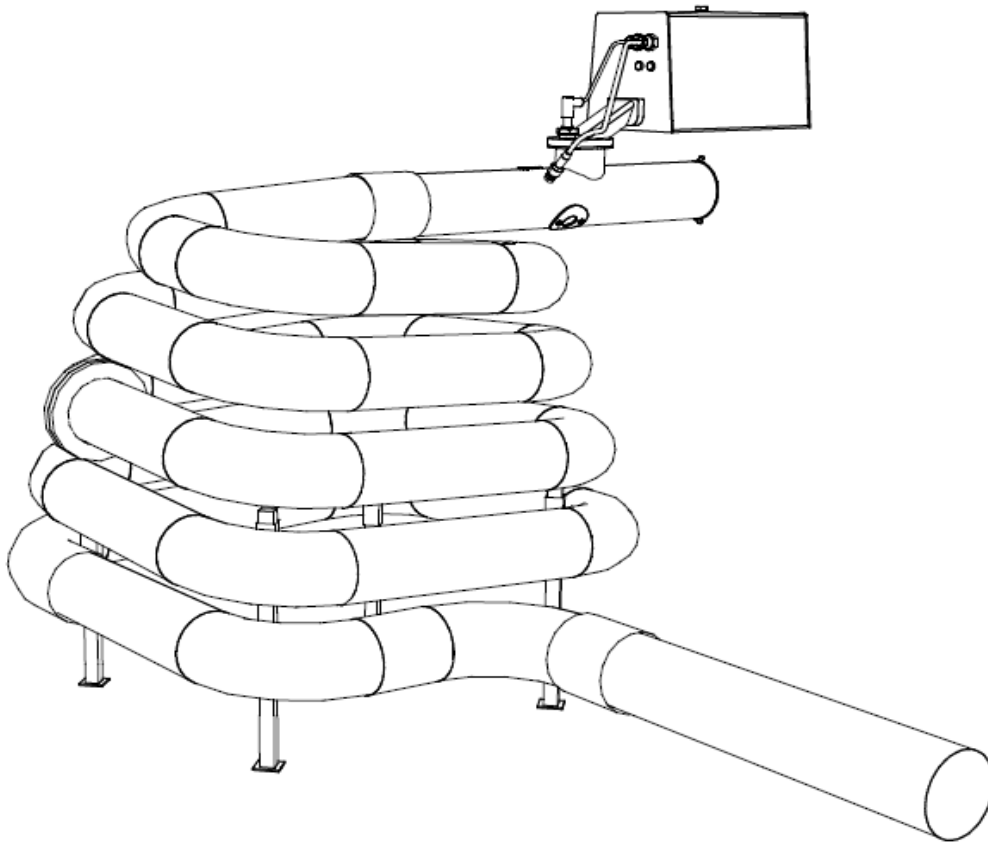
- good but also less well insulated spaces
- propane gas or Natural gas
- large or smaller spaces

For a good result it is very important to install the system professionally.

Please take the time to read and understand these instructions before installing. The time invested in reading this manual, will be earned back effortlessly, because the installation process will be easier and smoother.

If situations arise in which these instructions do not provide, please contact your supplier or SAUNATechnics

Keep this manual in a safe place and within easy reach for your service representative to consult it if necessary.



## Chapter 1. Inspection and instructions

### 1.1 Inspection of the goods

Inspect the goods on delivery for number and any damage. Missing materials must be written on the bill of lading and be reported to SAUNATEchnics.

### 1.2 Safety

In this manual the following warning symbols are used:



#### **Please note!**

A comment with additional information to alert you to possible issues that may lead to damage to properties.



#### **Caution!**

A comment with additional information to alert you to possible issues that may lead to minor accidents or injuries.



#### **Warning!**

A comment with additional information to alert you to possible issues that may lead to serious or even fatal accidents or injuries.

### 1.3 Measures



#### **Warning!**

It is only allowed to perform a system change after prior written permission from SAUNATEchnics.

### 1.4 Qualification of the installer

The warranty is only granted if it can be demonstrated by means of an invoice, that an approved installer did perform the installation work.

### 1.5 Responsibility of the installer

The sauna heater system is installed based on the design drawings, subject to the applicable regulations. The installer is responsible for the proper implementation of the installation according to the applicable standards. SAUNATEchnics only supplies materials related directly to the system. The gas pipe and the electrical wiring are not included.

A change to the system can only be implemented after consultation with SAUNATEchnics.

### 1.6 General considerations

If the system is properly installed, it is a flexible and safe system that works to your full satisfaction. For installation of the system one should take into account the following requirements:

- Sufficient distance and / or insulation from flammable and heat-sensitive materials, in particular in the wall duct.
- The tubing system must be installed in a sufficiently flexible manner, since the tubes expand significantly due to the heat.
- Sufficient clearance for maintenance and service of the burners. If necessary, choose a different burner location. Discuss this with the designer.

## Chapter 2. Product information

A proven and frequently applied principle is used for heating the sauna heater; heating a steel tube with a gas flame by means of under-pressure. In addition to the sauna industry, this method of heating is

also used in industrial halls, drying kilns and glass furnaces. It has proven its reliability for dozens of years.

In a commercial sauna in particular, the use of a gas heater will lead to lower energy costs compared to an electric heater for instance.



**Scope:**

The burner may only be connected to closed heating systems with a flue gas duct.

We can supply a gas heater from our product range for any sauna. The following types are available:

Type of sauna heater	Etna	Olympic	Classic
<b>Size</b>	Max. 20m <sup>3</sup>	Max. 40 m <sup>3</sup>	Max. 56 m <sup>3</sup>
<b>Gas burners</b>	1 x 9 kW	1x 21 kW	1 x 28 kW
<b>Ventilator (W / Pa / m<sup>3</sup>/uur)</b>	165 / 1000 / 410	370 / 2000 / 700	370 / 2000 / 700
<b>Spiral (L x B x H cm)</b>	36x36x85	57 x 57 x 85	80 x 80 x 85
<b>Saunacontrol</b>	Abatec A2-9	Abatec A2-9/FCU3000	FCU3000
<b>Power tube</b>	-	Max. 12 m	Max. 12 m

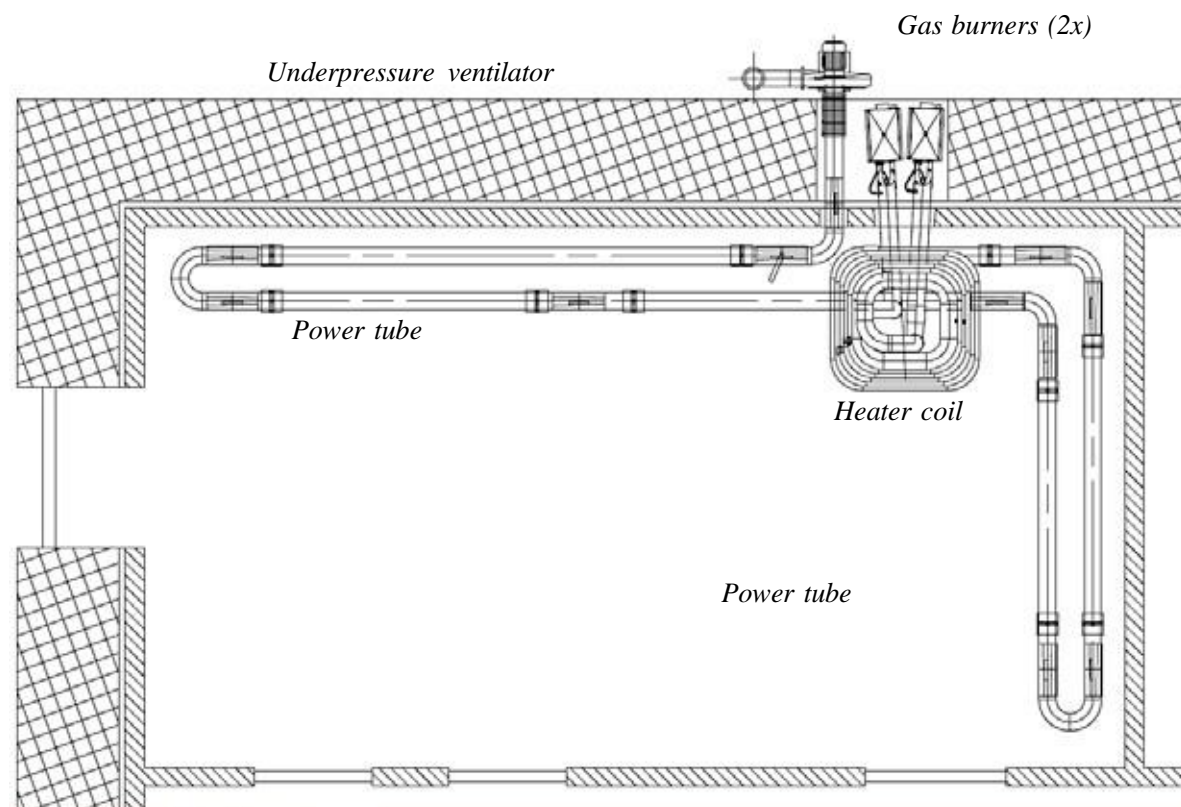


Image 1 Example of a Classic 50 piramide gas heater in a sauna with power tube.

## 2.1 General Operation

In case of heat demand, the temperature control will activate the ventilator. Once sufficient suction is created in the burners (> 3 – 4 mbar) an air pressure switch will turn on the power supply (230 V) of the gas burner.

A burner control is the intelligent heart of the gas burner. She controls when gas is allowed to flow, can be ignited and also issues malfunction signals. After a pre-rinse period, the gas valve will be opened. The released gas will mix with the aspirated combustion air into a flammable mixture. This mixture then flows through the burner head until it reaches the burner tube, where it will be ignited into a gas flame. An ionization safeguard is in place to check whether the gas is actually burned. If a flame is not established or if the flame is blown out, the ionization pin will immediately shut the gas supply.

Only in case of insufficient underpressure, the gas will be able to flow and the burner will be able to ignite. In absence of underpressure, the gas burner will shut down effectively preventing an unsafe situation.

The tubes of the coil of steel tubes is heated up to a maximum of 350°C. The tubes provide both radiant and convection heat.

After the flame and the hot gases have left the pyramid, the combustion air, which is still hot at that point, can be sent through a power tube. This power tube is located about 10 cm above the floor (allowing cleaning of the floor) and ensures that the hot combustion gases issue even more heat to the sauna area. This means extra utilization of the supplied energy, further increasing the return.

The underpressure is generated by means of an underpressure ventilator at the end of the tubing system. The ventilator used is a special, low-noise and heat resistant type. Optionally, a silencer may be used to suppress the noise even further on.

The coil consists of a steel tube welded in a pyramid shape. The pyramid shape provides better upward heat emission and a larger contact surface in infusion sessions. The pyramid is also available in parts, so that the heater can also be transported into a sauna with a narrow door.

In protection of the coating to the heater, it is recommended to place a housing around the heater. This will shield a brickwork or glued wall from the infra-red radiation of the hot heater. This heat may cause tears in the brickwork over time.

You can also mount a metal grid to the housing, for storing infusion stones.

Especially if you use the heater as infusion heater it is important to fill the pyramid heater with a heat buffer. Usually (natural) stones are used to this purpose. As these stones get hot, the heater won't immediately cool down during infusion, guaranteeing good steam production.

A power tube is not necessary using underpressure burners means the burners adapt themselves to the suction power. The output temperature will be higher however, and energy saving will be less. Therefore installation of a powertube is recommended.

## 2.2 Integrated safety measures

Safety is an extremely important factor in the design and construction of a gas fired sauna heater. Below a selection of these safety measures are described.

## **Air pressure switch**

First of all, the gas burner has a double air pressure switch in the power supply of the burner. It will only switch on the gas burner when there is sufficient underpressure. This means that when the transport air is blocked, the burner shuts down.

Should the fan fail or be switched off unintentionally or if a blockage occurs in the system, the suction power at the gas burner will disappear and the air pressure switch will turn off the gas burner.

## **Pre-rinse cycle**

After switching on the gas burner, a pre-rinse cycle will be initiated. If, for any reason whatsoever, there are any residual gases in the burner tube they will be exhausted by the ventilator. This prevents that, when the gas flame is ignited, any residual gas is ignited into an uncontrollable flame, causing an unintended blowpipe flame.

## **Preventing combustion gases**

The use of an underpressure burner prevents any combustion air from the tube from ending up in the sauna in case of an unintended hole or cavity in the system. Only air will be extracted from the sauna into the tube. Although it will cause the system as a whole to perform less efficiently, it will not lead to any unsafe situations. In extreme cases, in which the tube would become leaking, the underpressure switch in the gas burner will immediately interrupt the gas supply.

## **Double gas valve**

The gas block used in the gas burner has two valves (one open/closed and one controllable). If one coil breaks or experiences blockage, this won't lead to an undesirable gas flow, since there is a second valve.

## **Ionization security**

An ionization safeguard is in place to check whether the gas is actually burning. If a flame is not established or if the flame is blown out, the ionization pin will cool down and immediately shut off the gas supply.

## **Motor security switch (apply only for the models Olympic and Classic)**

The underpressure ventilator comes with a motor security switch that will turn off the ventilator should it get stuck or obstructed. This will prevent the motor from overheating.

## **Temperature protection**

The sauna control consists of a thermostat control with temperature sensor and safety sensor. The safety sensor should be positioned near the heater. If the temperature gets too high (e.g. To an erroneous measurement) the temperature protection will melt. This physical melt value is approximately 120-130 °C and will cause an interruption in the circuit. The sauna control will switch off immediately.

Often, a bench sensor is used for comfort. The average temperature will be considered the control temperature.

All in all, the Pyramid sauna heater is not only a safe system (combustion gases can never reach the sauna area), it is also an efficient system.



## 2.3 The hart of the system: The gas burner

Unique to this gas burner is the automatic control for a proper gas / air mixture. Despite of gas- and air pressure changes, wind speed and other environmental influences, this mixture remains stable. In other burners the right airflow must be programmed, which may change. This automatic control, allows the burner to be used in various configurations without having to be adjusted over and over again.



The required underpressure is generated by an underpressure ventilator at the end of the power tube. This suction power both extracts gas, combustion- and transport air.

In the gas burner, a zero-pressure controlled gas block ensures the fixed ratio of the gas/air mixture. This also means that the capacity of the system can be adjusted by adjusting the underpressure.

The use of underpressure burners, also allows you to simultaneously use multiple burners. Gas heaters come with one, two or three burners, depending on your sauna cabin. Another option is to combine several gas heaters, connecting them to one power tube. This allows the heat to be utilized to an optimal extent.

The SAUNATEchnics gas burner is suitable for various types of gas. The most common gases are natural gas, both high calorific (German/Russian gas) and low calorific. Other gases may be used as well, such as propane (50 mbar) and butane.

The burners comes in 9 kW, 9,5 kW, 21 kW and 28 kW.

### Technical specifications:

<b>Gas connection:</b>	3/8" gaslang
<b>Minimum gas pressure:</b>	20 mbar
<b>Maximum gas pressure:</b>	60 mbar
<b>Electrical connection:</b>	230 Volt / 10 VA
<b>Electrical connection :</b>	3 x 1 mm <sup>2</sup> (fase, nul, aarde)
<b>Underpressure in the burner:</b>	see chapter 5.1

The sauna gas heaters have been approved as a complete system in accordance with European standards (EN 419) by the renowned Dutch inspection institute „Kiwa“. The gas burners will display the Kiwa code as “CE 0063CS3981”

## 2.4 The driving force: Underpressure ventilator

In the SAUNATechnics pyramid gas heater, the underpressure, or in other words, the suction power is the driving force behind the gas burners. This underpressure is generated by an underpressure ventilator (also referred to as a vacuum pump) at the end of the system. In addition, this ventilator serves to discharge the flue gases.

The type of ventilator used is low-noise and comes with an additional heat barrier for use in a sauna. The use of a 230 V motor, an extra heavy power supply is not required for the gas heater.



Depending on the number of burners, the following types are used:

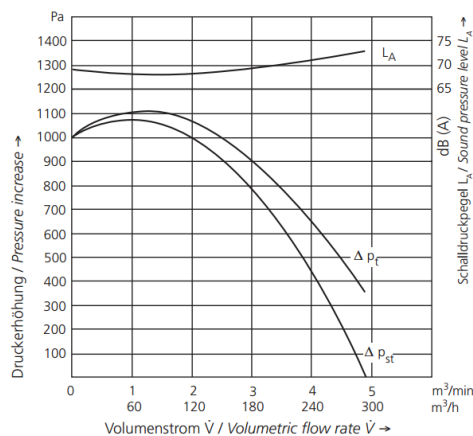
Type Aaco for use with 9 kW burner (model Etna)

Type E10 for use with 1 or 2 gas burners

Type E2 for use with 2 to 4 burners or systems in combination with a power tube.

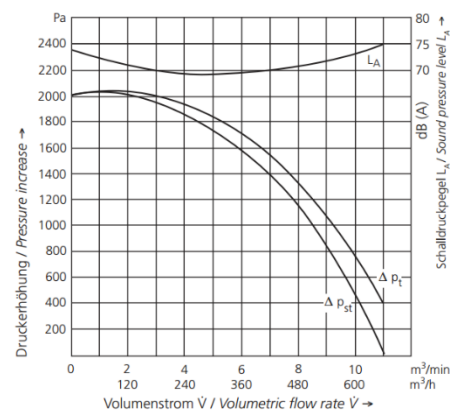
Type E4 for use with 5 or more burners

Technical specifications	Aaco	E10	E2	E4
Voltage	230 Volt			
Power consumption	~ 0,75 A [165 W]	~ 0,55 A [75W]	~ 1,73 A [370 W]	~ 2,5 A [550 W]
Electrical connection	3 x 1,5 mm <sup>2</sup> (phase, null, earth)			
Maximum air temperature	180 °C			
Air flow rate	6,8 m <sup>3</sup> /min	4,9 m <sup>3</sup> /min	12,1 m <sup>3</sup> /min	13,5 m <sup>3</sup> /min
differential pressure	530 Pa	1000 Pa	2100 Pa	2400 Pa



E10 ←

E2 →



If the system is properly designed and installed, the correct choice of fan should create an underpressure at the gas burner between - 3.8 mbar and -4.9 mbar (depending on burner type). The underpressure is described per burner type in chapter 5.1.

If this is higher, it is good to know that the suction power can still be adjusted with a control valve in the downstream side.

Incidentally, the fan will always be able to generate a higher underpressure in the cold state than in the warm state. This is due to the fact that warmer air is thinner and the fan easier here, meaning that the ventilator faces less “resistance”. This difference is approx. 1 mbar.

The ventilator must be connected by means of a motor security switch. This not apply for the model Etna. An optional silencer for the outlet nozzle is available to reduce teh (low) noise even more.

## 2.5 The heating coil

The heating coil is the heat source used to heat the sauna area. The hot air generated by the gas burner(s) is sucked through the tubes by the ventilator.

This heats the metal tubes to a serious extent, allowing them to, in turn, issue the heat to the air in the sauna area. The pipes located directly behind the gas burner and the combustion chamber will be the hottest. In these areas, the temperature of the tube can get as high as 350 °C.

Elsewhere in the tubing system, the temperature will drop to about 200 °C when leaving the heater. By means of a power tube, this heat can be utilized for the sauna (see next chapter).

The special pyramid shape of the heater provides better heat transfer to the ascending air. This allows the heater to properly distribute the heat, by means of convection).

In addition to convection heat, the heater will also issue its heat by means of infra-red radiation. This heat radiation will further heat the area.



The heater can be finished by treating it with heat-resistant paint.

This paint layer slows down corrosion. Before initiating the infusion process, the paint layer must have been allowed to cure several hours during first use.

Hot air will ascend above the heater. This generates a suction effect on colder air under the heater. Therefore, it is essential to provide sufficient space (cavities) under the housing around the heater.



**Tip!** Provide air vents under the heater for air supply.

### Technical Specifications

**Material:** Steel  
**Diameter:** Ø101,6 mm (4 inch)  
**Finish:** Heat resistant black paint or unpainted



## 2.6 The powertube

The power tube is the portion of the tubing system between the exit of the heating coil and the ventilator. In most cases, this power tube is located underneath the sauna benches.

By using this power tube, the hot air that emerges from the spiral is cooled down to about 80 °C. This heat is then issued to the sauna area instead of being blown outside. This further increases the return of the sauna heater.

In addition, the power tubes allows the heat to be better distributed across the entire sauna area. The heat doesn't just come from one central heater, but also from underneath the benches.

Last but not least, the lower outlet temperature increases the lifespan of the ventilator.

In general, the length of the power tube is determined by the sauna area and the location of the heater. Normal lengths vary between 6 and 18 meters.

A power tube is recommendable, but not necessary if in a certain sauna area, a power tube is not possible or desirable, it can be left out.

Another option is to wrap the power tube around the gas heater. This creates a second coil. The extra surface of the heater tubes provides the same effect as the power tube in this case.



### Warning!

The power tube can reach temperatures of about 100 °C. The tube must be placed in such a way that they cannot injure guests.

### Technical specification

**Material:** Steel  
**Diameter:** Ø101,6 mm (4 inch)  
**Finish:** Heat resistant black paint or unpainted



## 2.7 Saunacontrol Olympic en Classic

The gas burners and the ventilator are controlled by a sauna control. A great variety of sauna controls is available. Some of them have been specially developed for gas heaters.

The standard control for the Classic line of heaters is the FCU3000 control.

The sauna control can be placed with the gas burners or in a separate utility area. The wiring may not exceed 60 meters.

This control also allows the gas burners to be switched in two groups. Using this option, one group can be switched off just before reaching the programmed sauna temperature (two-stages control). The other group will then evenly heat the sauna until the desired temperature has been reached.

The control has one or two temperature sensors, also referred to as sauna sensors. In a small sauna, one sensor (combined with an over-temperature protection) shall suffice. In case of a larger sauna, one sensor near the heater would reflect a representative temperature. That is why, in those cases, a second sensor is placed in a corner of the sauna (usually above a sauna bench, hence the name "bench sensor").



### Warning!

The connection of the sensors with the sauna control must be made with heat resistant cables.

A common question is how to switch on the sauna control. By default, a sauna control must be switched on manually. The reason for this is that, would the control be switched on automatically, there is no guarantee that the sauna area has been left behind safely. If a towel is left on the heater, this may cause a sauna fire. When switching on manually, it is assumed that the person who switches on, also inspects the sauna area.



### Please note!

When switching on the sauna, please check whether any objects (such as towels) are placed on the sauna heater.

If the sauna control is placed in a separate (Utility) area, a malfunction of one of the burners cannot be detected. To this end, a small control box is available that can be placed with the sauna control. It contains one malfunction indicator and a reset button.

Should one of the gas burners malfunction, this indicator will light up. By pressing the reset button, the malfunctioning burner will be reset.

This is mainly recommendable if the burners are located in a less accessible place, (in the cellar; chimney etc.)

## Operating the sauna control

A very detailed description of the sauna control is sent separately. The main operating functions will be briefly described below.

### Setting the desired temperature and the remaining time

The temperature setting is explained; the other parameter "remaining time" can be set in the same way.

This control also allows the gas burners to be switched in two groups. Using this option, one group can be switched off just before reaching the programmed sauna temperature (two-stages control). The other group will then evenly heat the sauna until the desired temperature has been reached.



The control is on, but nothing has been activated yet. The button 'Sauna heater' will be flashing however.







Button Sauna heater

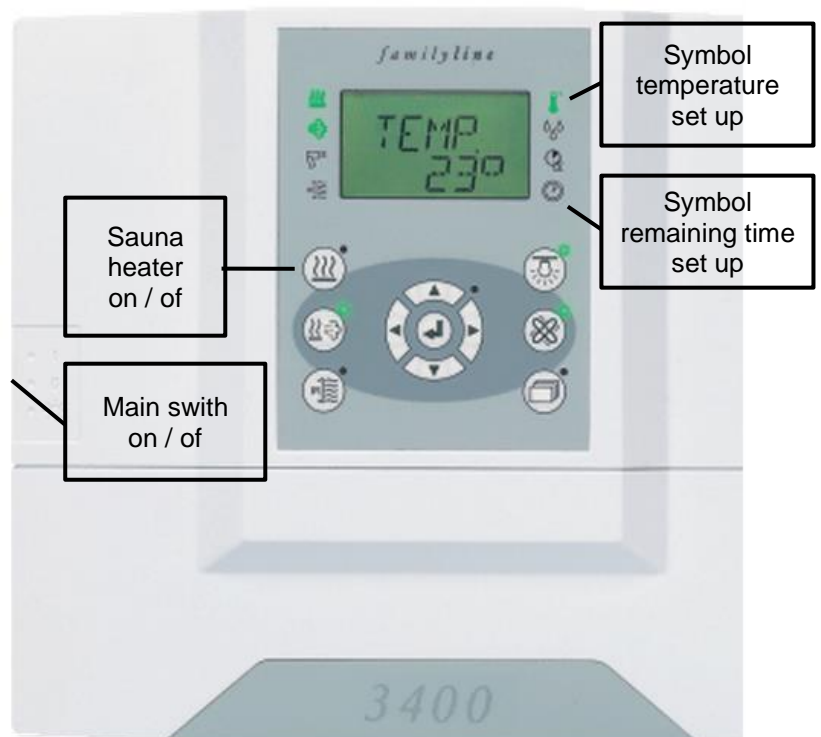
By pressing this button the sauna gas heater will actually be switched on and the cabin temperature brought to the set temperature.

Parameters that can be adjusted by the user are "temperature" and "(time) duration". An indicator light at the right next to the display

indicates this (  is temperature  is (remaining)duration. By pressing the arrow keys up or down, the correct feature will be selected.

Configuration the desired temperature is done as follows

1. Press the button „Sauna“ . The indicator light next to the button will be on or flashing.
2. Press the button  until the light  "Configure temperature" starts flashing
3. Press the enter button  to adjust the temperature control
4. For example, the display will show the following:
5. The last digit will blink



6. Set the desired temperature:

▼ = decrease value  
▲ = increase value


7. Tip: By holding these keys, the desired value can be found. Using the ◀ and ▶ keys you can also jump directly to another figure.


8. ◀ Press button to set the desired temperature.


The same method can be used to set ⏰ remaining duration.



### Please note!

The difference here is whether the  is switched on or not on the sauna control.

When the duration is adjusted with the heater switched on (the  indicator light is on) the remaining time will be changed once only for this session.

When the duration is adjusted with the heater switched off (the  indicator light blinks) the remaining time will be changed in the system for all subsequent sessions.

## 2.8 Saunacontrol Etna

The gas burner and the ventilator are controlled by a sauna control. There are many different saunacontrols available.

The standard control for the Etna heater is the A2-9.

The sauna control can be placed near the gas burners or in a separate technical room. The cabling may be up to approx. 60 meters long.

The control has one or two temperature sensors or "sauna sensors".

With a small sauna, one sensor (combined with an over temperature protection) is sufficient.

Optionally, an extra sensor can be placed to regulate the average temperature and you can also read the sauna temperature on the control. This is then placed in a corner of the sauna (usually above a sauna bench, hence the name "bank sensor").



### Warning!

The connection of the sensors with the sauna control must be made with heat resistant cables.

The sauna control has an adjustable lead time. You can then determine how much time the heater will be switched on.

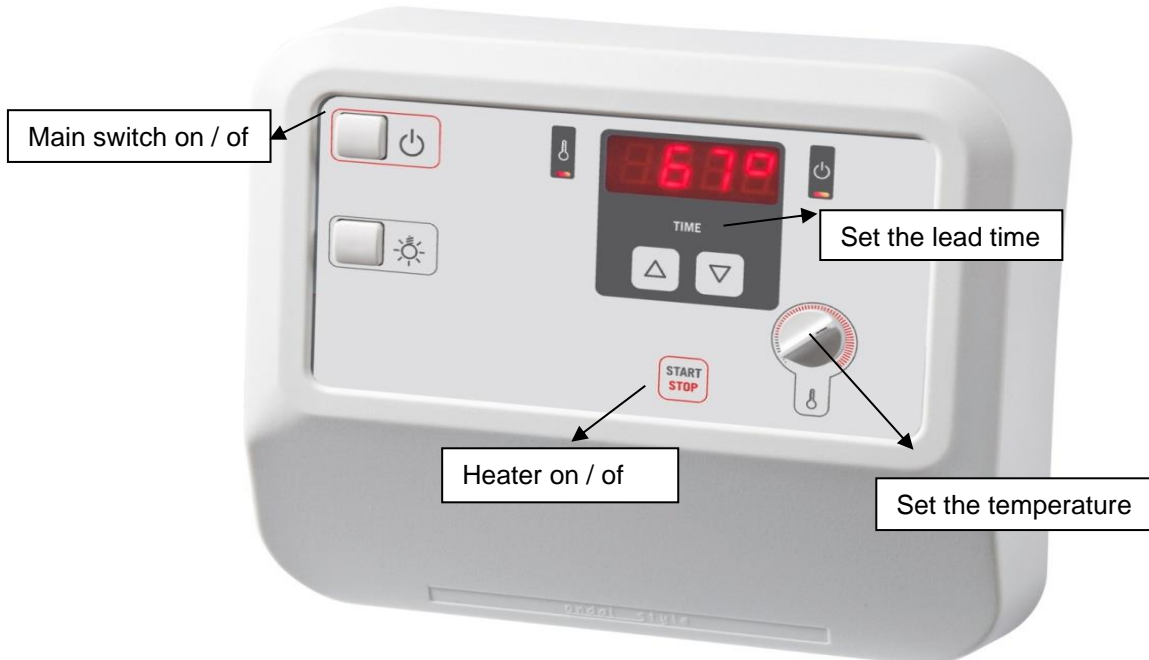


### Warning!

When switching on the sauna, check that there are no objects (e.g. towels) on the sauna heater.

## Operating the sauna control

A very detailed description of the sauna control is sent separately. The main operating functions will be briefly described below.



First of all, the sauna control must be switched on with the main switch (see figure). The control is on, but nothing is enabled yet.

By pressing the “Start / Stop” button, the sauna gas heater will actually be switched on and the cabin temperature brought to the set temperature.

Parameters that can be adjusted by the user are "temperature" and "duration".

The desired temperature can be set using the rotary knob. Turning clockwise increases the set temperature while counterclockwise decreases the set temperature. The set temperature cannot be read..

The lead time can be set with the arrow buttons. The pre-run time is the length of time before the stove automatically switches on. With the up / down arrows you can select the correct duration. The maximum lead time is 30 min.

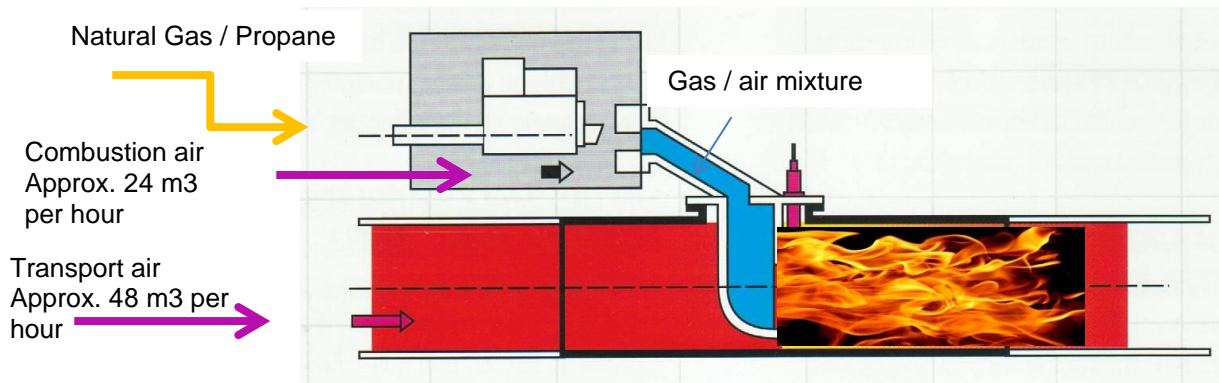
The value shown on the display is set by default to the number of minutes (countdown) before the stove switches on. If you want to display the actual measured cabin temperature, you must remove the first bridge that bridges the bank sensor in the control and replace it with a bench sensor.



## 2.9 Transport air

Transport air is the air required to distribute the heat of the gas flame through the tubing system. The total surface of these holes also affects the temperature of the tubes, and with that, the heater.

The air is drawn in under the burner at the end of the combustion chamber. A transport air plate with a number of holes (2) is mounted on it. The size of these holes is adjusted to the capacity of the burner.



## 2.10 Flue gases

The flue gases at the end of the system consist of the combustion gases mixed with the transport air. The temperature depends on the system around 100 °C. Any chimney or flue gas outlet must therefore consist of material that is suitable for use at this temperature. Plastic is certainly not suitable.

An approved chimney system consisting of double-walled stainless steel pipes and bends can be supplied as desired.

## 2.11 Outdoor air supply

The nature of a underpressure burner means that the combustion air is drawn in. The use of a filter is possible, but it must also be monitored for blockage. In the standard version, the combustion air drawn in enters the gas burner unfiltered. The best maintenance is therefore to keep the burner head clean from dust, etc.

Because prevention is better than cure, it is advisable to connect the burners with (clean) outside air using a hose or duct. After all, clean air is very important for every beautiful clean combustion.

If used, care must be taken that the resistance of this air duct does not negatively affect the entire system. 100 mm pipe can be used at short distances. One size larger at longer distances.

The outside air supply can be provided with a grid or mesh to keep vermin out. Also provide adequate protection against rain and wind.

Total air supply per burner (is combustion air + transport air) is approximately 72 m3 per hour

If the air is not drawn in from the outside, it must be ensured that sufficient fresh air can enter the room. This can be sucked in from the inside, but keep in mind that air from a storage room is generally not "fresh".

## Chapter 3 Installation

Installing the sauna stove does not require any special tools. In this chapter the different parts are discussed one by one. The order of description is usually also the easiest order for mounting the system.

### 3.1 Sauna spiral

The sauna spiral comes with adjustable legs. This allows the height of the spiral to be adjusted. The adjustment range is approx. 5 cm.

The spiral is the heart of the system and the heat will collect in it. This must therefore be taken into account during installation.



#### Warning!

There should be no flammable or highly flammable substances near the heating spiral.

The spiral should be placed so that there is approximately 10 cm space between the bottom of the pipes and the floor. Optionally, the spiral can be placed on an insulation plate or radiation plate.

A 24 kW spiral on legs. The legs are adjustable. The inlet of the heater is centered. The outlet is at the back.



The spiral can be delivered in parts for larger heaters. These can then be attached to each other on site.

The different parts are then pushed together with welded sliding sleeves.

Use a heat-resistant sealant and secure the two parts with self-tapping screws.



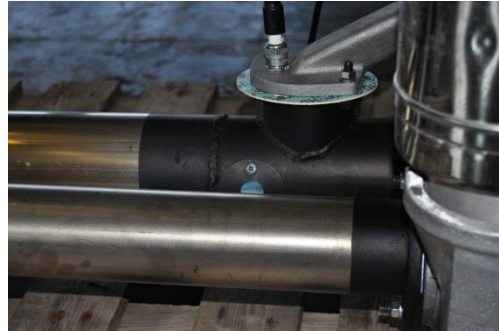
- First place the spiral on an even floor
- Fill the spiral with periodietstones.
- Place the mantle over the spiral.
- Put kit in the oversized sock.
- Slide the stainless steel combustion chamber (tube  $\varnothing$  101.6 mm) in the oversized sock in the middle. Push the pipe to the end.
- Slide the sock off the steel fan tube (tube piece  $\varnothing$ 108) over the tube at the end of the welded spiral. Push it through to the end.
- Secure both pipes with self-tapping screws and heat resistant sealant on the coil. Use 2 to 3 screws.



**Warning!**

Secure always two separate parts.  
Otherwise, the parts will slowly move apart.!

- Place the sauna control in the desired position.
- Place the sensor (s) of the sauna control in the sauna.
- Connect the cable between the gas burner and the sauna control.



## 3.2 Combustion Chamber

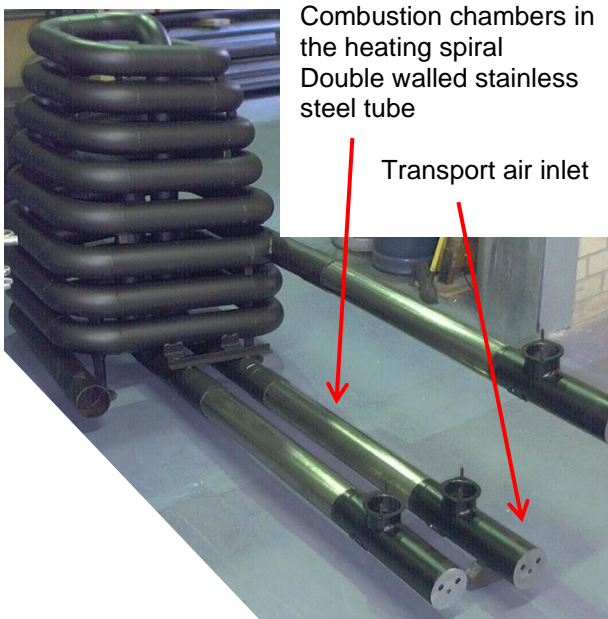
The gas burners are mounted on a combustion chamber. The gas flame is located in this combustion chamber during operation. The openings for the transport air are located at the back of the combustion chamber. The front of the combustion chamber consists of a double-walled stainless steel tube of approx. 80 cm. This stainless steel tube must be pushed into the socket of the spiral. For a wall duct, a double-walled stainless steel duct can be supplied.



### Warning!

When the tube is pushed into the socket, it must be secured. The tube will slowly slide out of the socket due to the hot / cold cycle.

Securing can take place by self-tapping a few self-taps through the tube / socket in combination with heat-resistant heater sealant.



Securing the tube in the socket with self-tapping screws.

The burners are normally located in a technical room. The combustion chambers will then be pushed through the wall.



### Warning!

The stainless steel tube behind the burner is the hottest part of the system with a temperature of approx. 350 °C. Sufficient space or insulation must therefore be provided for a wall duct. Particular attention should be paid to this with wooden walls.



Double walled stainless steel wall duct piece.

## 3.3 Connecting various Tube pieces

There are 3 ways to connect the tubes:

### 1. Welding

The tubes, bends and socks of the end tube can be pushed together and then welded shut. Either with a tack weld of a few centimeters; either with a full weld. The advantage of full welding is that the connection is therefore airtight. The tubes, bends and socks of the end tube can be pushed together and then welded shut. Either with a tack weld of a few centimeters; either with a full weld. The advantage of full welding is that the connection is therefore airtight.



### 2. Application of stainless steel couplings (this option is only used as emergency repair)

These couplings can be easily used by clamping them around both pipe pieces and then fixing them with the bolts. The advantage of this is that they can also be disassembled.



### 3. Applying oversized connection sleeves

These sleeves are dimensioned in such a way that they can be slid over the pipe pieces. Often they are already welded on one side of a pipe piece and the next pipe piece can then simply be pushed in here.



#### Caution!

The tube must be secured in the socket in combination with heat resistant heater kit and by screwing a few self-taps (> 5 mm) through both tubes.

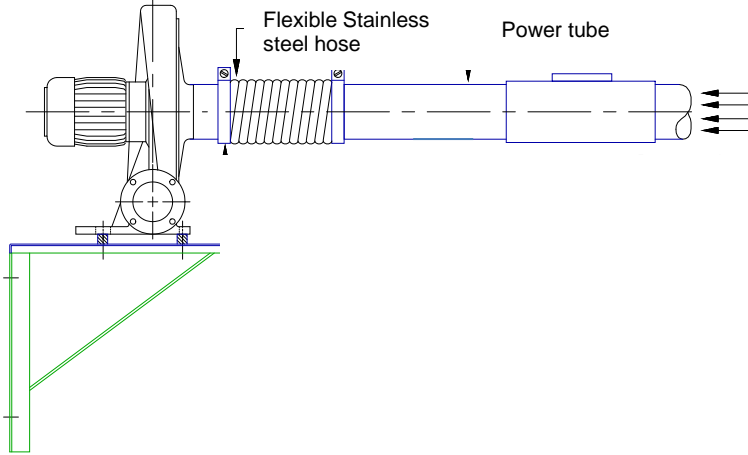


#### Caution!

Make sure that the tube is pushed into the sock as far as possible, so that there is sufficient grip

### 3.4 Connecting the ventilator

The correct underpressure at the gas burners is the main condition for the optimal performance of the heating system.



Due to condensation moisture from the combustion process, it is recommended to place the ventilator at the lowest point of the installation. As a result, the water will not accumulate in the pipe system. It is also advisable to drill a 5mm hole at the bottom of the ventilator to drain any condensation water.

The ventilator used is a low-noise version. Ideally suited for use in a sauna where no disturbing noises are desired. Some noise will still be heard at the output of the flue gas outlet. Buildings in the area can suffer from this or reflect it. To prevent this, a silencer can be placed. This should be placed on the outgoing side of the fan.

Silencer

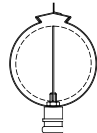
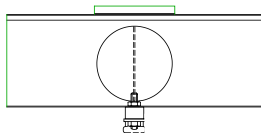


The ventilator for sauna use are equipped with an additional heat shield and are therefore suitable for temperatures up to 180 ° C.

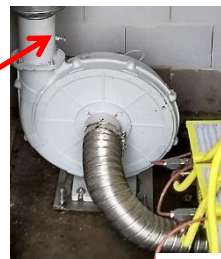
The suction side of the ventilator is connected to the pipe system by means of a stainless steel hose with hose clamps. This flexible connection still allows some freedom when placing the ventilator and gives room for expansion when the pipes get hot. Also, no sound is transmitted to the pipe system.

If the ventilator is mounted on a ventilator chair on a wall, this must be a solid wall. A wall that is too thin can transmit vibrations from the ventilator. This can cause annoying noises..

In order to control the underpressure, a control valve can be placed in the outlet of the ventilator. The underpressure can be reduced with this valve. Always open this valve during installation.



Control valve to vary the underpressure



Flexible Stainless steel hose



**Caution!**

The impeller of the ventilator is carefully balanced during the production process. Therefore, must be handled with care, to prevent a disruption of the balance.

A correct outlet with a low resistance for the flue gases is therefore extremely important. Bends and other resistance-increasing elements should be avoided as much as possible.

The temperature of the flue gases will normally be around 80 to 90 degrees. Occasionally, it may be higher (when starting up the sauna). Therefore, the material of the flue gas outlet must be metal (thick-walled aluminum or stainless steel).

A motor protection switch must be placed in the immediate vicinity of the fan. This can be used as a maintenance maintenance switch and will also switch off the fan if the motor starts to warm up, for example when the impeller starts up.

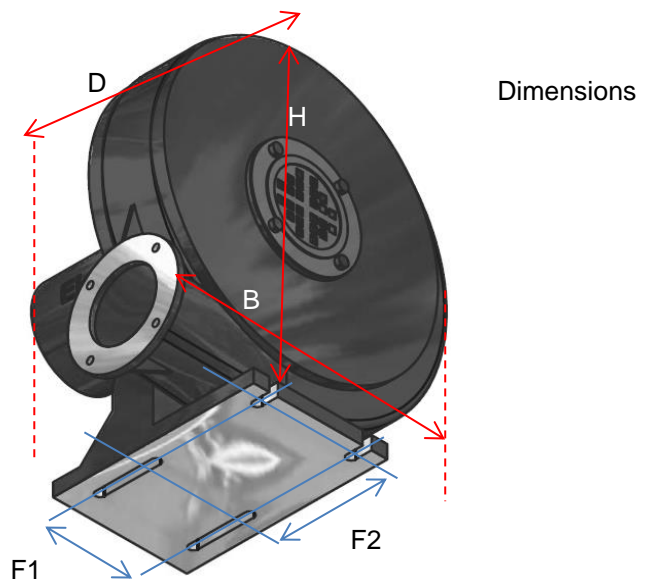


**Please note!**

When connecting the ventilator it is necessary to check the direction of rotation of the motor. The blades must rotate in the direction of the motor. There is an arrow on the ventilator. If the ventilator turns in the wrong direction, the bridge connection in the terminal box must be adjusted. The data is on the inside of the lid.

**Technische Specificaties van de ventilatoren**

Ventilator Type	Power [V]	Volume power [m <sup>3</sup> /min]	Electric consumption [A]	Motor capacity [kW]	H [mm]	B [mm]	D [mm]	F1 [mm]	F2 [mm]
E10	230	4,9	0,55	0,075	321	312	242	80	100
E2	230	11	1,73	0,37	507	445	355	140	160
E4	230	13,5	2,50	0,55	515	456	349	140	200



### 3.5 Connecting the ventilator Model Etna

The ventilator used is a specific one chosen for this heater.



Some noise will be heard at the output of the flue gas outlet. Buildings in the area can suffer from this or reflect it. To prevent this, a silencer can be placed. This should be placed on the outgoing side of the ventilator.

The ventilator for sauna use are equipped with an additional heat shield and are therefore suitable for temperatures up to 180 ° C.



Silencer



**Caution!**

The impeller of the ventilator is carefully balanced during the production process. Therefore, must be handled with care, to prevent a disruption of the balance.

A correct outlet with a low resistance for the flue gases is therefore extremely important. Bends and other resistance-increasing elements should be avoided as much as possible.

The temperature of the flue gases will normally be around 80 to 90 degrees. Occasionally, it may be higher (when starting up the sauna). Therefore, the material of the flue gas outlet must be metal (thick-walled aluminum or stainless steel).

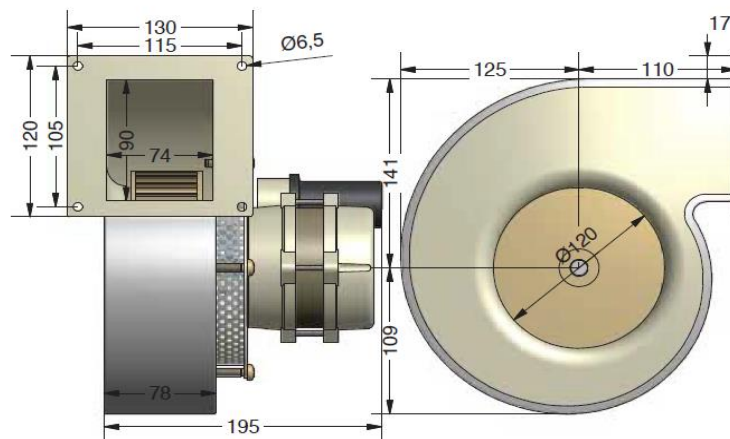


**Please note!**

When connecting the ventilator, it is necessary to check the direction of the motor. The blades must turn in the direction of the motor. There is an arrow on the ventilators. If the ventilator turns the wrong way, the bridge connection in the terminal box must be adjusted. The details are located at the inside of the lid.

**Technical details of the ventilator**

Ventilator Type	Power [V]	Volume power [m <sup>3</sup> /min]	Electricity consumption [A]	Motor capacity [kW]
AACO	230	8	0,83	0,075





## 3.6 Assembly of the flue gas outlet



### **Please note!**

The required flue gas outlet may be subject to national standards. Always use certified systems.



### **Please note!**

To narrow tubes, too many curves and long tubes behind the ventilator cause excessive pressure loss of the ventilator and condensation in the system.

### **Application**

The recommended chimney system MF is intended for use for, among other things, gas-fired systems. The material is suitable for mounting both inside and outside buildings. Saunatechnics generally uses double-walled tubes with an inner diameter of 130 mm for its systems. This can differ per installation. Let yourself be well informed about this !. The maximum length for the flue gas discharge is 8 meters.

### **Preparation**

The correct choice for the diameter of the system depends on the sauna heater used (how many burners); the fan and the length of the chimney system. The correct choice must be determined for each project.

The minimum distance from the flue gas-carrying part to flammable materials (for example with roof or wall penetrations is 50 mm. Chimney construction / location

The outlet of a flue in a roof surface must be determined with care. The best place is in the ridge of the roof or else as close as possible here. For roofs with a roof angle smaller than 23°, the outlet must protrude 0.5 meters above the roof. For roofs with a roof angle greater than 23° the following formula applies for the calculation of the height:  $h = (0.5 + 0.16 * (\alpha - 23)) * a$  where: h = height,  $\alpha$  = roof angle, a = horizontal distance from the ridge to the centerline of the outlet.

In the case of a flat roof, the outlet must be at least 0.5 meters above the roof surface. It must be avoided that an excessively large duct length must be installed outside the roof. In such a case, the channel can cool down too much, which will certainly not promote the draft. So preferably place the outlet as close to the ridge as possible.

Furthermore, unnecessary dragging of the channel should be prevented. Bends etc. increase the air resistance in the duct and slow down the flue gas velocity and consequently adversely affect the draft. Avoid moving too long distances when you have to drag the channel at a certain angle and over a certain distance. Installation

Once the diameter and parts to use for the system have been determined, select the appropriate sections and lengths. The connection between two sections must not coincide with a duct or support. Avoid contact of the flue gas outlet with flammable materials and therefore keep a minimum distance of 75 mm. Use fire separation plates when passing through the roof or floor. Brackets are used to secure the system to the building structure. Place the first around the first section after connection. You must then install floor support per floor and between the floors every 1.5 meters of wall brackets (at least 2) must be applied evenly long the length.

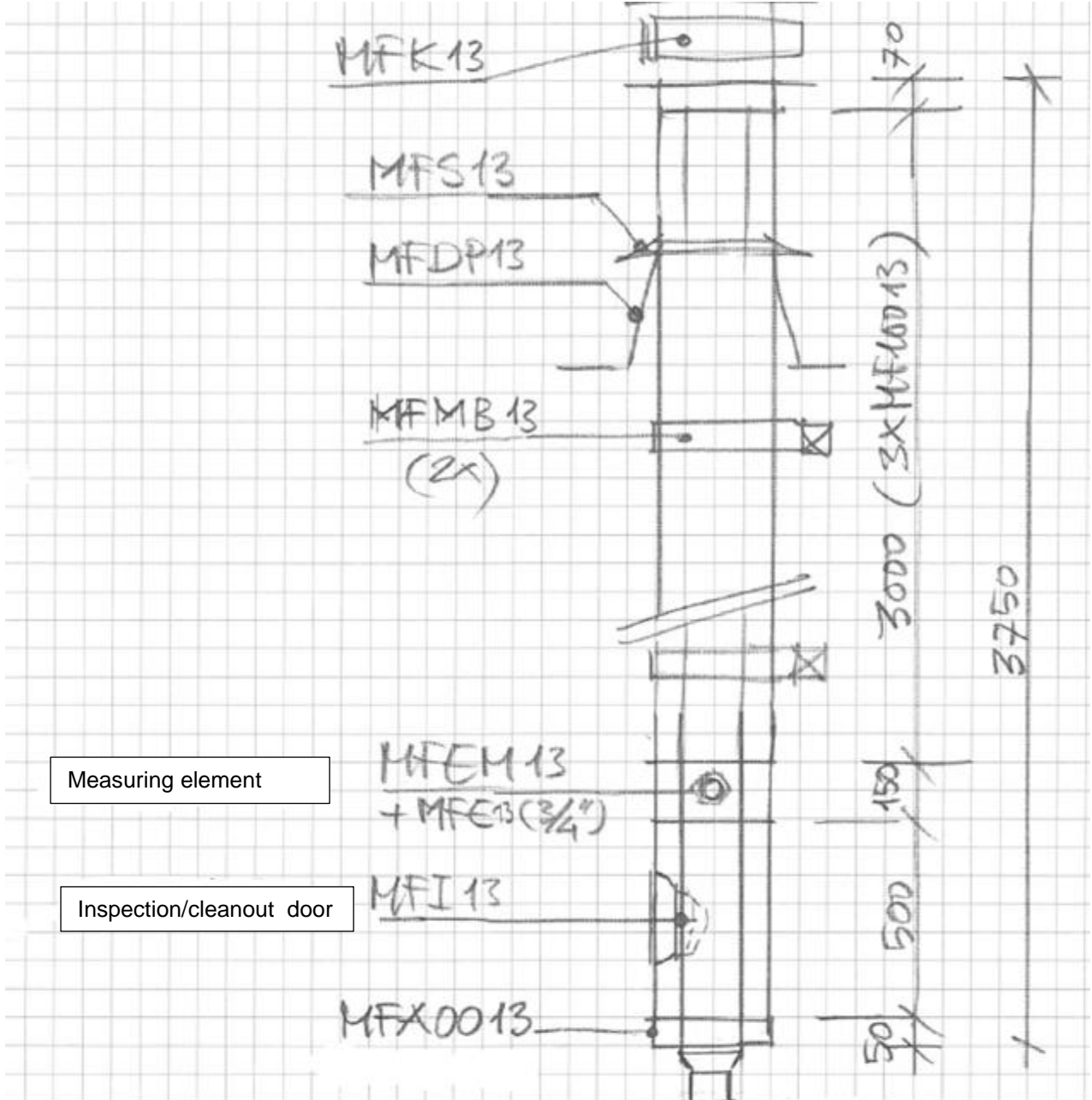
### **Maintenance**

Gas burners burn considerably cleaner than wood-burning stoves. However, have the chimney inspected or cleaned regularly (e.g. 1x per year)

### 3.7 Technical characteristics twin wall insulated flue system type MF

<b>Application</b>	Chimney/Flue system															
<b>Operating mode</b>	Dry/wet															
<b>Pressure</b>	Negative/positive pressure															
<b>Max. working pressure</b>	5000 Pa															
<b>Operating temperature</b>	600 °C negative pressure 200 °C positive pressure															
<b>Maximum temperature allowed</b>	1000 °C negative pressure (max. 30 min.) 200 °C positive pressure															
<b>Innerwall</b>																
Material	AISI 316L/EN 1.4404															
Thickness	Ø100 - Ø250: 0,4 Ø300 - Ø400: 0,5 Ø450 - Ø700: 0,6 Ø800 - Ø1000: 0,8															
<b>Outerwall</b>																
Material	AISI 304/EN 1.4301															
Thickness	Ø100 - Ø400: 0,5 Ø450 - Ø700: 0,6 Ø800 - Ø1000: 0,8															
<b>Insulation</b>																
Type	Mineral wool															
Thickness	Ø100 - Ø400: 25 mm Ø450 - Ø600: 37,5 mm Ø700 - Ø1000: 50 mm															
<b>Fuel type</b>	Oil/wood/coal/pellets/gas															
<b>Sealant</b>	Elastomer (in case flue gas temperatures exceed 200°C, sealants as well as the cap and door seals have to be removed before installation)															
<b>Binnendiameter (mm)</b>																
100	130	150	180	200	250	300	350	400	450	500	600	700*	800*	900*	1000*	
<b>Buitendiameter (mm)</b>																
150	180	200	230	250	300	350	400	450	525	575	675	800	900	1000	1100	
<b>Doorlaat (cm<sup>2</sup>)</b>																
79	133	177	254	314	491	706	962	1256	1590	1963	2826	3848	5027	6362	7854	
<b>Weight ±kg/m</b>																
6	7	8	9	10	12	16	19	21	26	28	34	44	58	65	72	

Example construction Flue gas discharge



### 3.8 Mounting the gasburner on to the combustion chamber

The burner is mounted on the combustion chamber using two M8 nuts. Between the burner and the flange of the combustion chamber, another burner gasket must be placed.

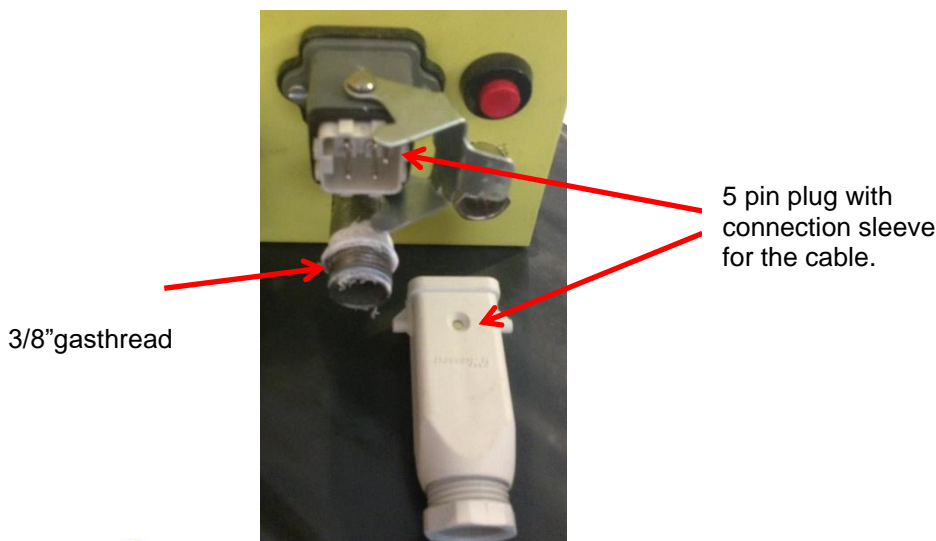
This allows the burner be disassembled easily in case of maintenance or repairs. (Of course the gas hose and electrical control must be disconnected as well).

It is important that there is no air gap between the head and the flange. The reason for this is that this may draw in air, preventing the establishment of a stable gas flame.



Usually, the burner is placed horizontally, but it can also be placed at the side of vertically.

Each burner is equipped with a 3/8" male threaded pipe nipple to connect the gas burner to the gas supply. In the Netherlands this can optionally be fitted with a 3/8" x M24 comfort connection to which a flexible stainless steel gas hose can be easily connected. We advise to use a stainless steel hose. A rubber hose can only be used for a limited number of years.



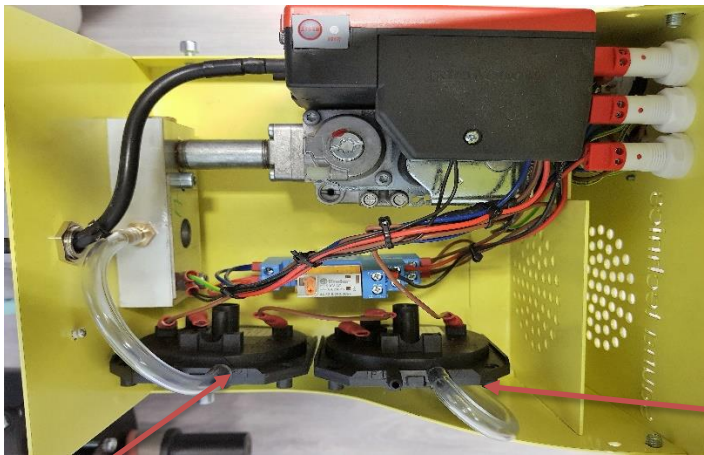
**Warning!**

The combustion chamber with the tubes will expand during the heating phase. The gas connection must be able to absorb some movement.

A 10 cm steel tube with grid is mounted at the end of the burner tube (the air inlet). A valve is mounted on this. This tube is supplied loose with the burner tube. You press the tube with valve  $\pm 5$  cm at the back of the burner tube.



The burner is equipped with 2 air pressure switches.



2nd airpressure switch

The 1st air pressure switch is connected to the mixing block. This ensures that sufficient combustion air is drawn in so that the released gas can mix into a flammable mixture. The 2nd air pressure switch ensures that when the burner tube is blocked (the negative pressure is lost), the burner is switched off.

An air hose is also connected to the 2nd air pressure switch, which comes out from under the burner. Push the air hose onto the valve.



Connect the airhose

Secure the console with an Allen key (M6)

### 3.9 Sauna control

A very extensive installation manual of the sauna control is sent separately. The main points will be briefly described below.



**Caution!**

The SAUNATEchnics Pyramid System can be phase sensitive. It is important for the connection of the burners that the phase is actually the phase. If the phase and null are switched, no proper ionization flow will be generated, due to which the burner will shut down after a couple of seconds.

The applied sauna control is specially made for gas heaters. Install it as described in the separate manual.

The sauna control can be placed near the gas burners or in a separate technical room. The wiring may be up to approx. 60 meters long.



**Please Note!**



The connection of the sensors to the sauna control must be done with heat resistant cables.


After installation and connecting, a number of parameters must to be set in the menu.

The sauna arrangement is delivered as standard with a maximum burn time of 6 hours. This will generally be too short for a commercial application in a public sauna.

According to standard EN 60335-2-53, the maximum burning time may only be increased when there are supervisory staf at the sauna. The duration can then be extended to 20 hours. From a safety perspective, this is the maximum. The control will then have to be switched on again consciously.

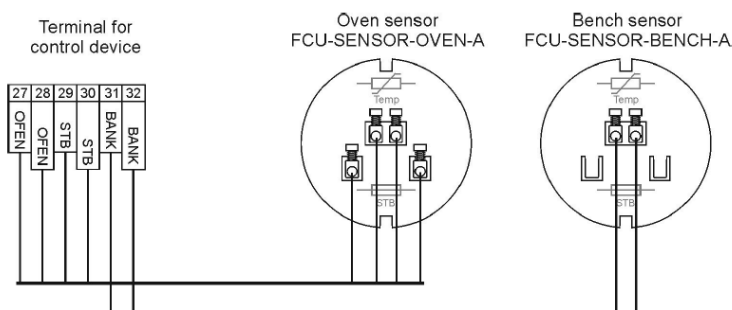
The maximum duration can be changed as follows (see also the service manual):

Simultaeously press the buttons  and  and the small menu will appaer on screen. To change parameter, a pin needs to be provided. This pin disclosed in the service manual. Use the arrow to navigate up and down to the parameter "Max. Heizdauer" and change this value into 20 hours.

Confirm this by pressing the  button.


**Placing the sensors**

The sensors can be installed in the following places:



**Technical specifications Fasel Control**

**Input**

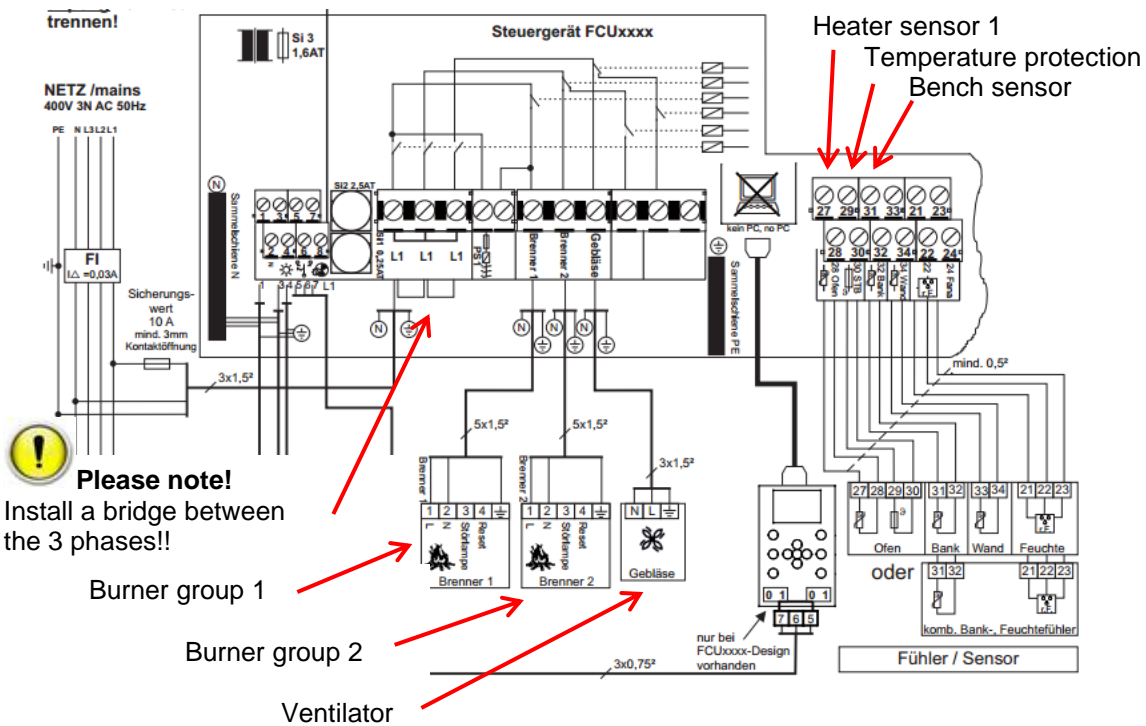
Power: 230 V (  please note, connect the three phases); 16 A

**Output**

- Ventilator: 230 V (3 x 2,5 mm<sup>2</sup>)
- Gasburner 1: 230 V (5 x 1,0 mm<sup>2</sup>) – only phase, neutral and earth are connected
- Gasburner 2: 230 V (5 x 1,0 mm<sup>2</sup>) – only phase, neutral and earth are connected

**Temperature sensor**

- Sensor 1: 4 x 1,0 mm<sup>2</sup> - 2x temperature sensor (Oven); 2x overtemperature protection (STB)
- Sensor 2: 2 x 1,0 mm<sup>2</sup> - 2x temperature sensor (Bank)
- Finish:** Heat resistant paint or unpainted




**Technical specification A2-9 control**

**Input**

Power : 230 V (  Please note! use L1); 16 A

**Output**

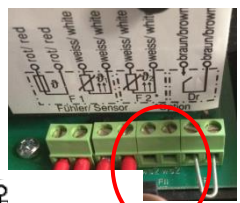
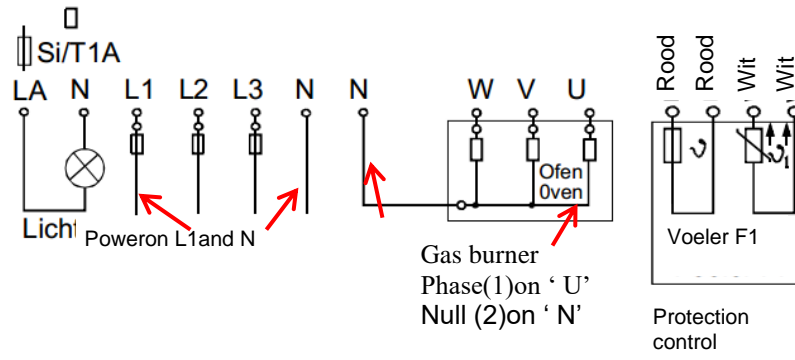
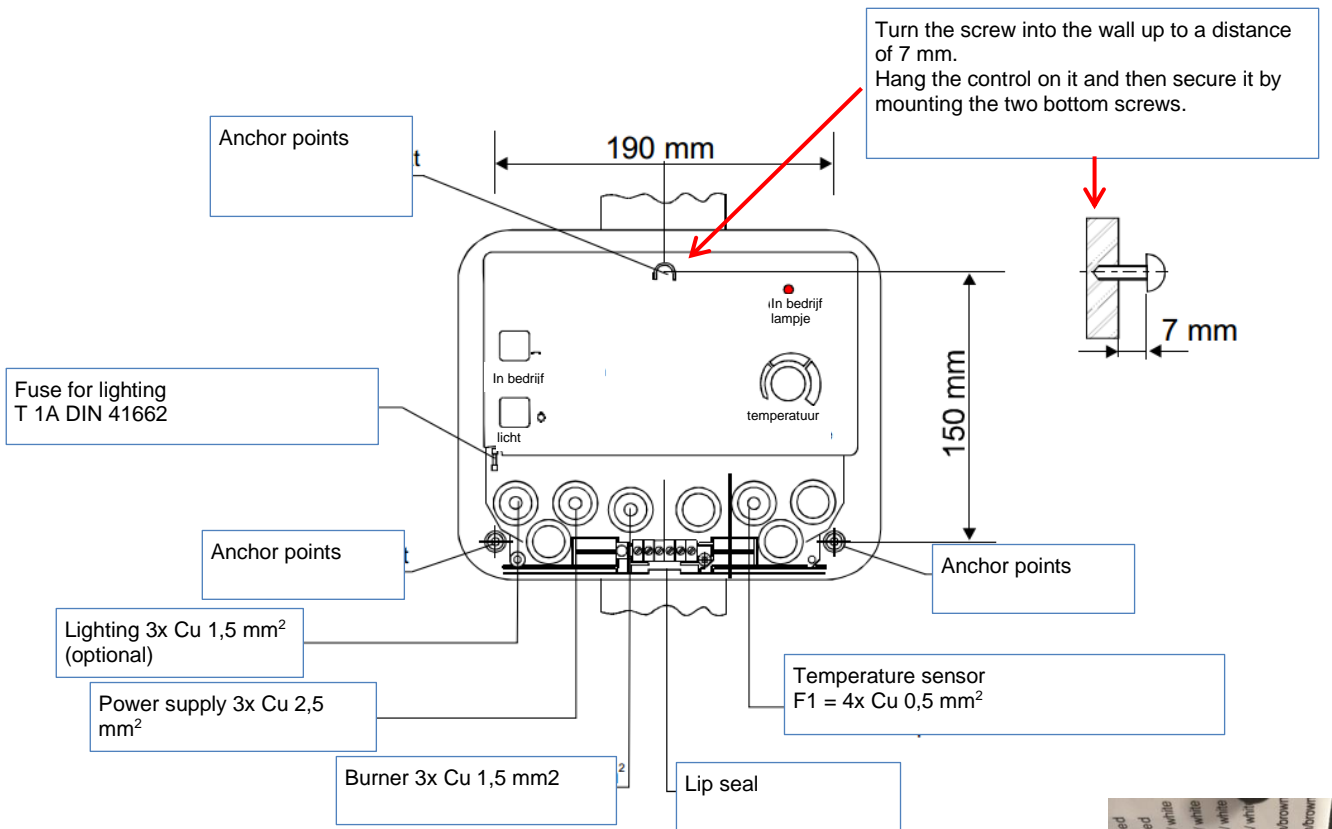
Ventilator : 230 V (3 x 2,5 mm<sup>2</sup>)

Gasburner : 230 V (3 x 1,5 mm<sup>2</sup>) –phase, null en earth V (  Please note! use U)

**Temperature sensor**

Sensor 1 : 4 x 1,0 mm<sup>2</sup> - 2x temperature sensor (heater); 2x overtemperature protection (STB)

Sensor 2 : 2 x 1,0 mm<sup>2</sup> - 2x temperature sensor (Bench) (Optional)



Sensor F2  
Disconnect the bridge to display the sauna temperature. Install the bank sensor. This is not supplied as standard.



## 3.10 Housing



### Caution!

When the gas heater is operational, the infrared radiation will heat up the housing. Only finish the housing using heat resistant materials.

Most gas heaters are professionally concealed with beautiful tiling or other material.

To protect this, it is advisable to place a metal housing around the heater. This housing will absorb the majority of the infrared radiation from the heater and pass it into the air.

Should no housing be used, glue and cement may crack and brickwork in particular will tear.

On top of the housing, a metal grid can be placed on which special fusion stones can be placed. The gas heater itself will be filled with other stones.

The housing can also be adjusted in height during installation. This is mainly convenient to compensate for undesired unevenness of the floor.



### Please note!

It should always be possible for sufficient air to flow under the housing to the bottom of the heater. This will allow the heat of the heater to better distribute across the sauna by means of convection.



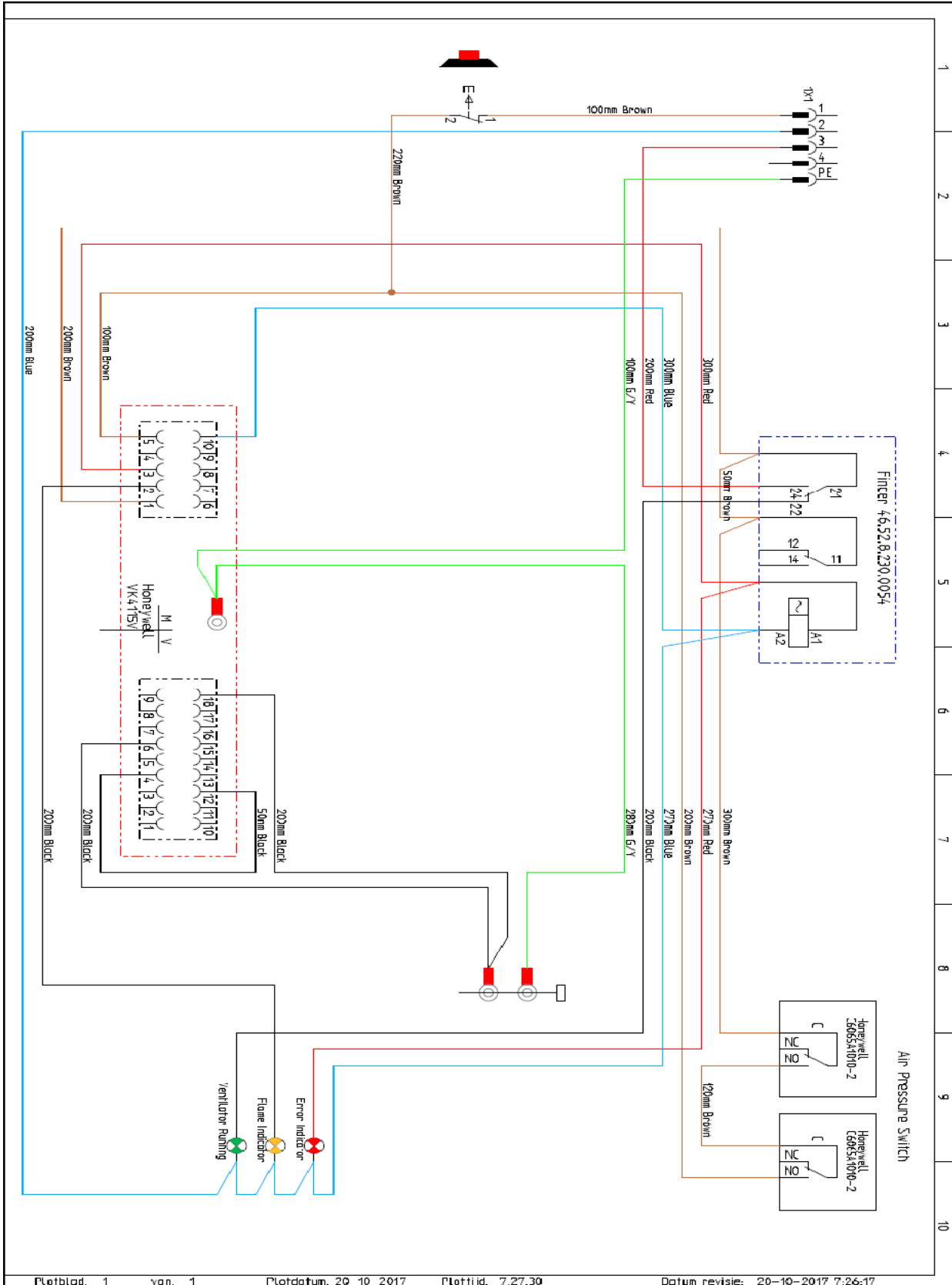
Metal grid to place on top of the housing





Various finishing materials to decorate the gas heater



## 3.11 Electrical diagram burner



## 3.12 Type plate

	
www.saunatechnics.com	
SAUNATECHNICS BV/ Magnesiumweg 20/ 8471 XM Wolvega	
Telefoonnummer: +31 (0)561 618553	
I: www.saunatechnics.com / E: info@saunatechnics.com	
<b>Model:</b>	<input type="checkbox"/> Etna (9 kW – 10 kW) <input type="checkbox"/> Olympic (21 kW – 24 kW) <input type="checkbox"/> Classic (25 kW – 32 kW)
<b>Nominale belasting/Nennwärme Belastung/ Nominal Load/ Charge nominale:</b>	<input type="checkbox"/> Etna G25/G25.3: 9 kW, G20: 10 kW, G30: 9.5 kW <input type="checkbox"/> Olympic G25/ G25.3: 21 kW, G20: 24 kW <input type="checkbox"/> Classic G25/G25.3: 28 kW, G20: 32 kW
<b>Nox klasse 2</b>	
<b>Gassoort/ Gasart/ Gastype/ Type de gaz:</b>	<input type="checkbox"/> Aardgas/ Erdgas/ Natural gas H (20) <input type="checkbox"/> Aardgas/ Erdgas/ Natural gas L (G25) <input type="checkbox"/> Aardgas/ Erdgas/ Natural gas K (G25.3) <input type="checkbox"/> Propan – Butaan/ Propan – Butan/ Propane- Butane (G30/G31)
<b>Aansluitdruk min./ Anschlussdruck min./ Connection pressure min./ Pression de raccordement min:</b>	20 mbar
<b>Aansluitdruk max./ Anschlussdruck max./ Connection pressure max./Pression de raccordement max:</b>	60 mbar
<b>Uitvoering/Bauform/Version/ Exécution:</b>	B22, B32
<b>Categorie/ Kategorie/ Category/ Catégorie:</b>	
AT I2H 20mbar, I3B/P 50mbar	DE I2ELL 20mbar, I3B/P 50mbar
BE I2E(S) 20/25mbar, I3+ 29/37mbar	GB I2H 20mbar, I3B/P 30 mbar
CH I2H 20mbar, I3B/P 50mbar	NL I2EK 25mbar, I3B/P 30 mbar
<b>Elektrische aansluiting/ Elektr. Anschluss/ Electric connection:</b>	230 V ~ 12 W
<b>Bescherming/ Schutz/ Protection/ La protection:</b>	IP 20
<b>Jaar/ Jahr/ Year/ Année:</b>	202
<b>Seriennummer/Seriennummer/Serial Number/Numéro de série:</b>	
<b>Kiwa :</b>	CE 0063CS3981

## Chapter 4 Testing and commissioning the system

### 4.1 Connecting the burners and the gas connection

1. The gas pipes must be vented as much as possible.  
All burners need to have a gas supply.
2. Connect all burners to the gas pipe. Preferably with flexible stainless steel gas hoses. Open the gas taps and check the gas hose and couplings for leakage.
3. Perform a visual inspection on the burner such as:
  - The electrical connection plug is properly connected
  - The ignition pin and cables are properly connected
  - Connect the burner head properly to the combustion chamber
4. Check the electrical wiring of the installation.
5. Disconnect the electrical connector of burners prior to first start-up.



#### **Caution!**

The wiring of the 3 cores (earth, phase, neutral) must not be mixed up. When the phase and zero are switched, no ionization current can be built up and the burner will switch off within a few seconds. Reversing the reset and fault lamp will cause a short circuit and the burner controller can be irreparably damaged.

### 4.2 Configuring the underpressure in the system

As described earlier, the underpressure is the driving force behind these burners. The nominal capacity of the burners has been achieved at an underpressure of 7 mbar. At a higher underpressure, the burner will have a greater power.

1. If present, check that the control valve in the fan is set to "open". This can be seen because the slot in the wire end runs in the direction of the tube. The valve is closed when the slot is perpendicular to the pipe. Switch on the sauna control and set the desired temperature to a higher value than the current room temperature. There will be a heat demand.
2. The sauna control will switch on the fan and the burner (s) (however the burners are still disconnected).
3. Now measure the underpressure at the gas burner. If the system has several burners, all burners are measured. Measuring is initially possible at the holes of the transport air plates to get a rough idea. A finer measurement can take place at the mixing block or the air pressure switch.
4. The underpressure per burner type is described in chapter 5.1.
5. The pressure differences between several burners can be balanced with the holes in the transport air plates at the back of the combustion chamber..



#### **Please Note!**

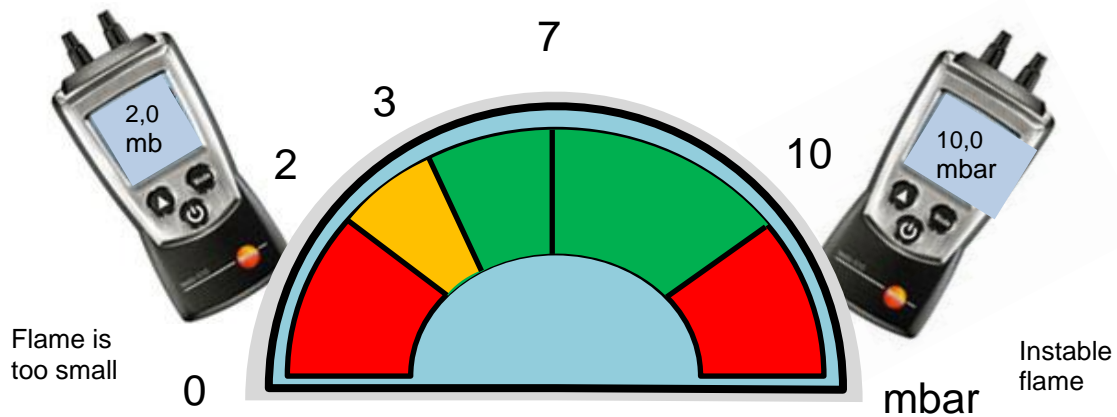
Take into account that the underpressure will drop by approx. 1 mbar when the system is heated up. This is due to the fact that the fan will generate less suction in hot (thinner) air.

6. Check the underpressure again approx. 30 minutes after starting up the system.

The underpressure has an absolute lower limit at approx. 3 mbar. A underpressure around this value or slightly below it can result in a combustion chamber weakened by fatigue. A small but intense flame will make the combustion chamber glow. Due to the low underpressure, there is also not enough air flow to transfer the heat to the spiral.

The underpressure has a maximum upper limit of approx. 10 mbar. Above this value, startup will cause a problem. Due to the high underpressure, the flame is literally extracted from the burner head and no stable flame can be created.

Since the underpressure is so essential, it must always be measured and configured during each service (preventive or malfunction).



## 4.3 Commission the system

1. Check whether the gas valve is open.
2. Connect the electrical plug to a gas burner.
3. Check whether the burner ignites (a ticking sound is audible) and a stable gas flame is created.
4. When the burner functions properly, please check the malfunction button by simulating a failure. To do this, shut the gas valve. The burner will switch off and after some time (and a new start-up attempt) the burner will fail after 3 attempts. The red fault light on the burner goes on. Open the gas tap again and press the red reset button. The burner will ignite again and the green light and orange will come on.
5. Repeat step 1 to 4 for all present burners.



### **Caution!**

With a new sauna, the temperature should not be set directly to a normal sauna temperature. The cabin should be slowly brought up to temperature so that the wood can slowly warm up. This typically takes about a week, in which the temperature can be increased every day.



### **Please note!**

At the first start-up, the grease and paint present in and on the pipes will cure or burn further, due to the high temperature. This will cause the spiral to emit an unpleasant odor. This will end after about an hour and is completely normal. If necessary, ensure good ventilation. Also make sure to provide proper ventilation.

#### 4.4 Logic diagram of the heating process

**Status: The sauna temperature is lower than the configured temperature**

- The underpressure ventilator is switched on.
- A brief rinsing period of about 10 seconds is awaited.
- The underpressure ventilator will generate underpressure in the tubing. See Chapter 5.1.
- The air pressure switch will switch on the automatic burner.
- In addition, the green indicator light will turn on.
- After some waiting and safety time the automatic burner will open the gasblock.
- A mixture of air and fuel will flow through the burner head.
- The ignition pin will ignite the gas/air mixture just before the burner head..
- The ignition pin will pass an ionization current through the flame
- The orange light will then light up. It indicates that there is a flame.

**Status: The sauna temperature has reached the desired value**

- The underpressure ventilator is switched off.
- The underpressure in the tubing system will drop.
- The air pressure switch will switch off the entire burner.
- The gasblock is closed.
- The green indicator light will turn off.

**Status: the gas burner is malfunctioning**

- The red signal indicator on the sauna control is on.
- The malfunction button is also present on the burner itself
- You'll find a reset button on the sauna control as well. Press it for at least 3 seconds. The reset button will only reset the burner that is actually malfunctioning.

## 4.5 Trouble shooting

The following question schedule may be useful for resolving any malfunctions. The most common faults are described herein.

### **The underpressure at the burner does not reach the required level**

- The burner stone is clogged with dust and should be blown clean.
- The direction of rotation of the fan is incorrect, which just creates a small negative pressure.
- There is an opening somewhere in the tubing through which false air is drawn in (check carefully whether the burner head is tight on the burner gasket; whether the sight glasses are in order; in older systems the spiral at the bottom may be corroded).
- Is the control valve at the fan open?
- Is the resistance of the flue gas duct not too high (long length or narrow diameter).

### **The gas burners are not switched on when there is sufficient negative pressure**

- The three phases of the sauna control are connected by a bridge
- Is the wiring properly connected to the clamp of the sauna controller
- Is there a heat demand (is the set value of the sauna control higher than the current temperature)
- The hose from the mixing block to the air pressure switch is connected
- The air pressure switch functions properly

### **No ignition while the burner is switched on (green light is on):**

- The gas valve is still closed during the purge phase (wait 30 seconds)
- The gas block is defective (no audible "click" when switching on)
- The ignition pin is faulty or ignited in the wrong place  
(the smallest distance between the two electrodes should be at the bottom and should be approx. 3 mm)
- The burner control unit is defective (no ticking sound is heard during ignition)

### **A flame starts but after a few seconds it falls out:**

- The ionization pen is defective or not positioned in the flame
- The ionization pen cap is not screwed on the cable properly or the cable clamp is not properly fitted in the machine
- There is no proper grounding for the ionization pin (in the burner or from the electrical supply)
- The phase and neutral wire are reversed somewhere in the power supply (all burners fail after seconds)
- The gas valve is defective (the coils are not working properly or the valves are stiff)
- The burner controller is defective
- There is still air in the gas pipe (try to restart several times).

### **The combustion process is not going well (unstable flame)**

- The injector is wrong or clogged
- The air inlet plate is the wrong diameter (or is missing)
- The negative pressure is too high (> 9 mbar) and draws the flame from the burner head

### **The heat generated by the sauna heater is too little**

- The underpressure in the system is too low
- The injector is wrong or clogged
- The air inlet plate on the back of the combustion chamber has the wrong holes or is clogged

### **The ventilator refuses to rotate**

- The three phases of the sauna control are connected by a bridge
- The fan motor protection switch has been switched off
- Is there a heat demand?
- Is the capacitor on the fan still OK (difficult start-up, but keep on going?)
- The fan motor is defective?



## Chapter 5 Technical details of the heater

### 5.1 Technical Details of the gas burner

In the previous chapters, you'll find a description of the general operation of the heating system. This chapter contains further explanation about various settings and parameters of the gas burner.

The main aspect of this burner is the fact that it is an under pressure burner. The required amounts of gas and air are sucked into the burner, where they are mixed into the proper gas / air mixture for the flame.

This annex provides an explanation of various components of the gas burner that may affect this.

Various components can be exchanged to adjust the gas burner to the circumstances (such as gas type and place in the system):

Parameters that can be adjusted include:

- Fuel (natural gas (L); natural gas (H); propane).
- Capacity (9 kW - 32 kW).
- Under pressure in the burner head (range between -3,8 and -4,9 mbar).
- Transport air inlet holes (depending on the place in the coil; top, middle or bottom).

Comment: Contrary to most gas blocks, the settings of the under pressure blocks used may not be changed. The gas valves have been configured ex-factory to build up a null pressure.

Model	Type of gas				kW Input				Underpressure (mbar)			
	G20	G25	G25.3	G30	G20	G25	G25.3	G30	G20	G25	G25.3	G30
Etna	√	√	√	√	10	9	9	9.5	- 3,8	- 3,8	- 3,8	- 3,8
Olympic	√	√	√	—	24	21	21	—	- 4,7	- 4,9	- 4,9	—
Classic	√	√	√	—	32	28	28	—	- 4,3	- 4,5	- 4,5	—

### Information about the spiral

Type	Weight *	Spiral Tube length *	Dimensions *
Etna	40	6 meter	Ø 39*85 cm
Olympic	50	16 meter	57*57*85 cm
Classic	75	22,4 meter	80*80*85 cm
Double spiral	Please contact the manufacturer		
Special dimensions	Please contact the manufacturer		
Module construction	Please contact the manufacturer		

\* depending on the settings and customization

### Basic information per burner

Combustion air supply	2 * 15,5 mm
Connection voltage	230 volt, 50 Hz
Connection current	12 watt
Electrical connection	3 aderig (phase, null and earth)
Shielding	20 IP
Gas connection	3/8" male
Pressure gas block	0 mbar
Max. flue length	8 meter

## 5.2 Fuel

The gas burner can run on various types of fuels. The most commonly used fuels for the gas burner are propane (G31), natural gas (H) G20, natural gas (L) G25 or natural gas (K) G25. 3.

Because the different types of fuel have different energy densities, the gas burner must be adjusted to achieve the same power.

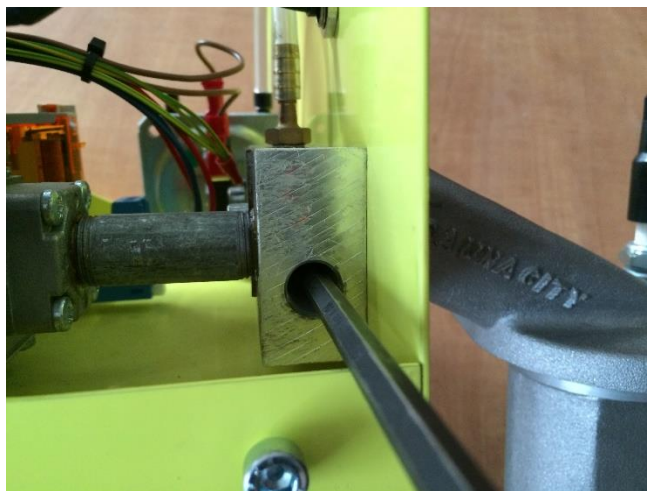
When the type of fuel is changed, the diameter of the injector must be adjusted. For example, propane has more energy per unit than natural gas. To keep the same power, less gas is needed for propane. By reducing the diameter of the injector, less propane will be mixed with the unchanged amount of combustion air.

The following table lists the various injector diameters:



Injector

Fuel type	Diameter van de inspuiter Etna gasbrander	Diameter van de inspuiter Olympic gasbrander	Diameter van de inspuiter Classic gasbrander
Propane (G31)	3.0 mm	-	-
Natural gas H (G20)	3.5 mm	5.2 mm	6.3 mm
Natural gas L (G25)	3.5 mm	5.2 mm	6.3 mm
Natural gas K (G25.3)	3.5 mm	5.2 mm	6.3 mm



An injector can be replaced by removing the sealing cap on the side of the mixing block. The injector can be turned out of the block with an Allen key. Screw the new injector back on.



**Please note!** : That it is turned past the opening of the gas tube. Replace the sealing cap again.



**Please note!**  
The aluminum block can be damaged quickly. A small burr in the gas flow can affect this annoyingly.

Although the modified gas burner will have the same energy level, there will still be several changes in the burner behavior. A flame that burns on propane will have a higher maximum temperature (about 2000 °C) than a flame on natural gas (about 1800 °C). This will lead to small changes in the distribution of heat in the tubing. For example, the first part of the spiral will now get hotter and the last part less hot compared to natural gas.

With a hotter start of the spiral, the heating time of the sauna will be slightly shorter. This is because the heat transfer is better with a larger temperature difference between the heating element (the hot tube) and the air in the stove.

The capacity is ultimately the same.

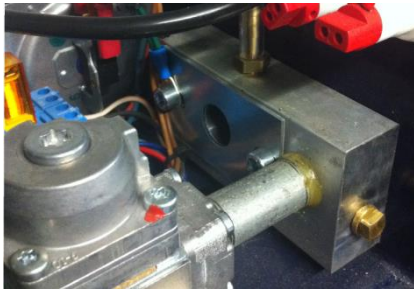
### 5.3 Capacity

To adjust the burner capacity, the total volume of the gas / air mixture must be adjusted. Therefore, in this case, both the injector and the combustion air intake plate must be replaced.

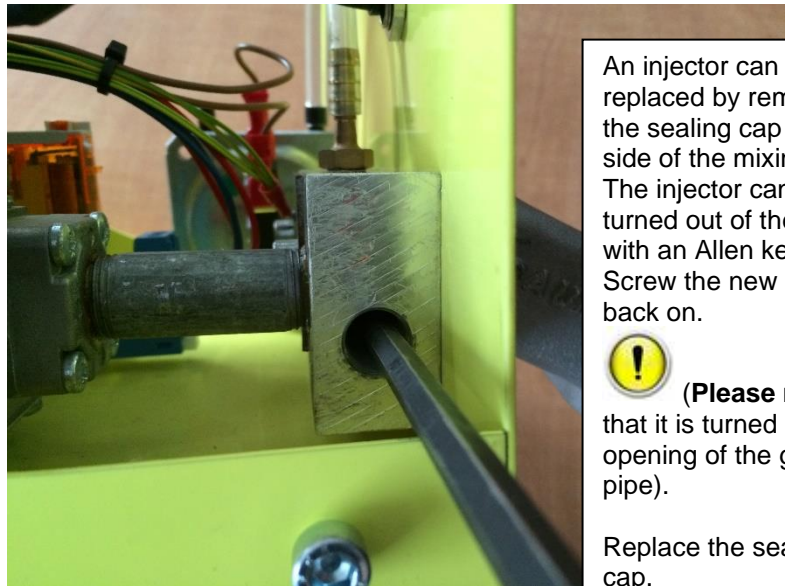
How to replace the injector can be read in an earlier chapter. The combustion air plate can be easily replaced by loosening two Allen bolts.



Injector



Combustion air intake plate



An injector can be replaced by removing the sealing cap on the side of the mixing block. The injector can be turned out of the block with an Allen key. Screw the new injector back on.



**(Please note!:** that it is turned past the opening of the gas pipe).

Replace the sealing cap.

Table diameter of the opening combustion air inlet plate per burner type:

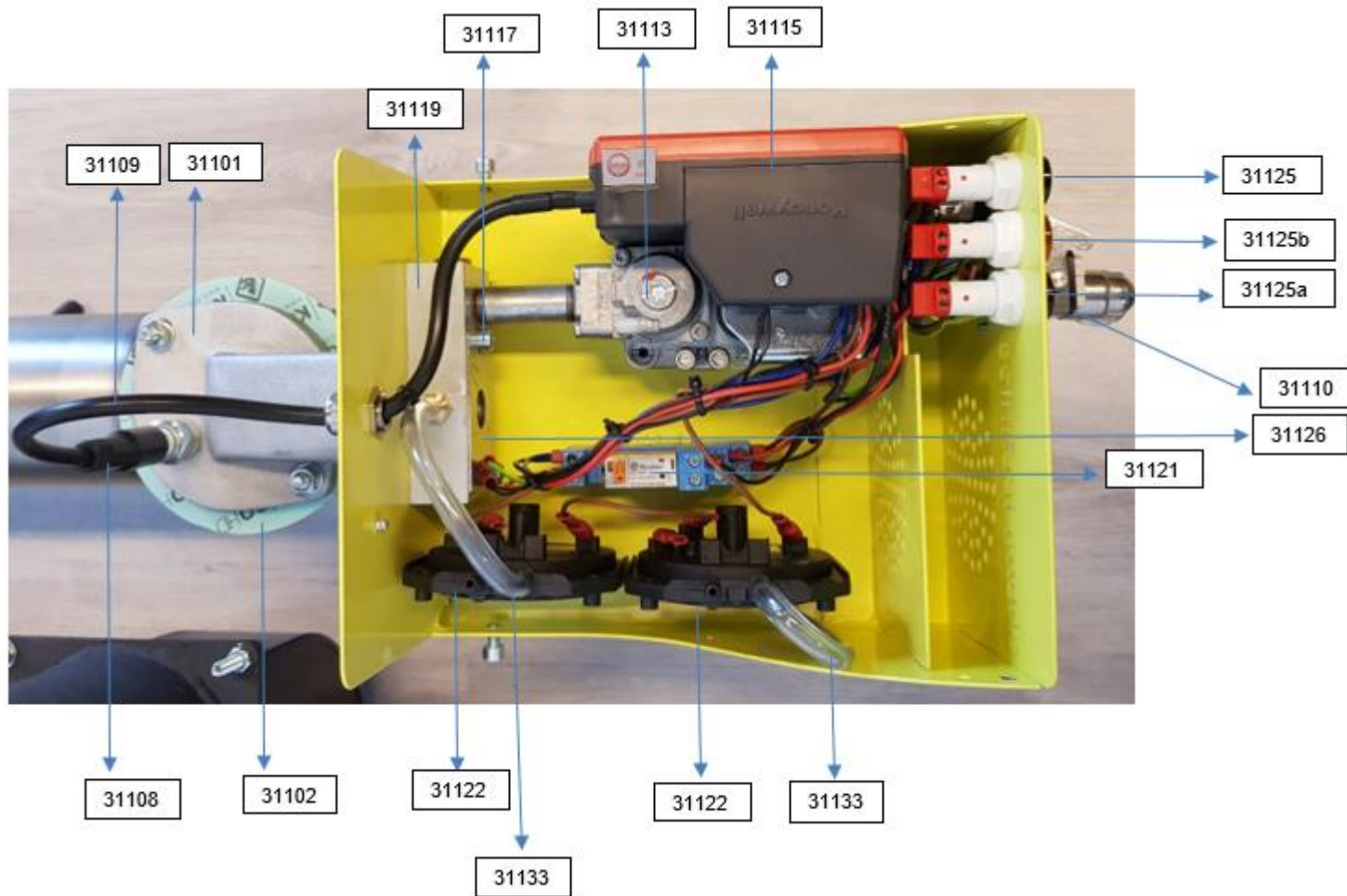
Gastype	Etna burner	Olympic burner	Classic burner
G20	14 mm	17 mm	18 mm
G25	14 mm	17 mm	18 mm
G25.3	14 mm	17 mm	18 mm
G30	14 mm	-	-

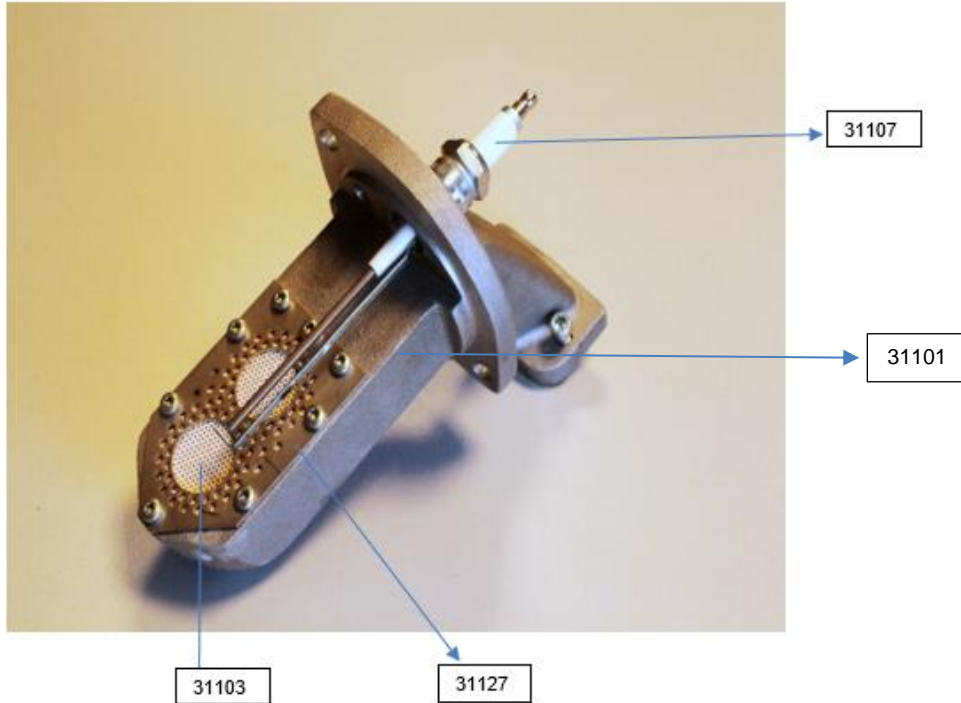


Air intake plate



## Burner





## Chapter 6 Maintenance

To ensure trouble-free operation of the sauna heater, the system must be serviced at least once a year by a skilled person familiar with the system.

In most cases, cleaning different parts will suffice. Environmental factors can influence and require more or less maintenance.



### Warning!

During maintenance, the gas tap must remain closed and the gas burner must be electrically disconnected.

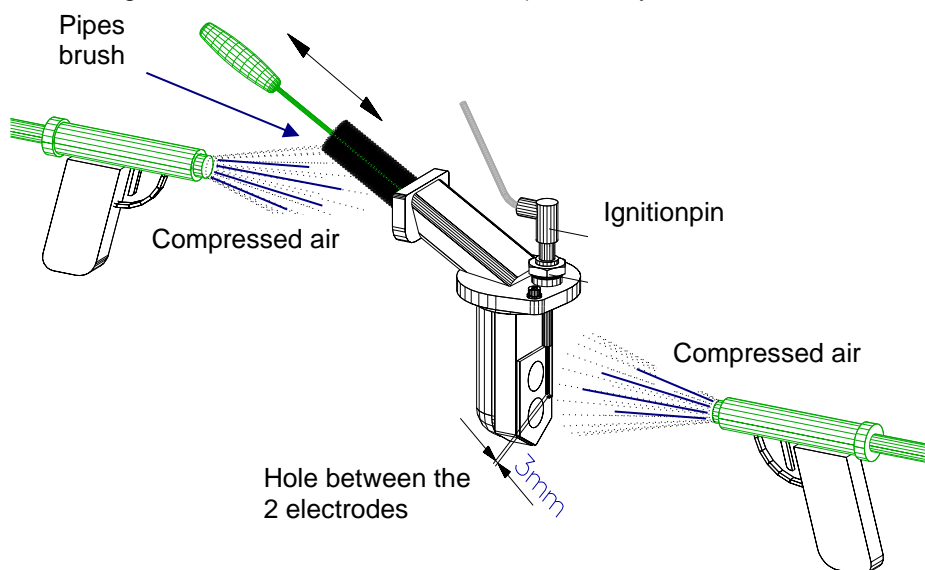
### 6.1 Sufficient air supply

- Check whether blockages have occurred at the transport air and combustion air openings.
- If the air is supplied from outside, also check the tubes and / or hoses for leakage. Also check that the inlet and outlet openings are not blocked by vermin or bird nests.
- If a filter is used, check it and replace if necessary.

### 6.2 Gas burner

- Remove the burner from the combustion chamber by unscrewing the two M8 nuts on the burner head. (And also the gas hose and the power connection)
- Remove the lid from the burner
- Remove the dust from the burner with compressed air
- Remove the burner head from the burner tray by loosening the two Allen bolts
- The burner head can now be cleaned with compressed air (blow into the head from the front) or a pipe brush

Blow compressed air through the burner head several times (alternately from the front and from the back).



### Cleaning of the burnerhead



## 6.3 Ignition and Ionization pin

- Check the ignition pin for wear and tear caused by the hot flame and combustion gases
- Check the distance between the two electrodes (maximum 3 mm apart).
- Check the ignition pin cable and cap for cracks

## 6.4 Ventilator

- Use compressed air to blow the ventilator motor clean
- Replace the bearings in the fan after the following intervals
  - business operations 8 hours a day: at least after 5-6 years
  - business operations 16 hours a day: at least after 3 years
  - business operations 24 hours a day: at least after 18 months

## 6.5 System check

- Return the burners to their original position
- Open the gas valve and switch on the electrical supply
- Measure the underpressure at the gas burners
- The negative pressure should not exceed 10 mbar in a cold state.
- Allow the system to warm up and wait 15-30 minutes for the air temperature in the ventilator to stabilize.
- Measure the underpressure at the gas burners
- The minimum negative pressure at the burners must not be lower than 4 mbar (otherwise the power of the burners will be too low)• Return the burners to their original position

## Chapter 7 Safety Sheet



### Technical Room

- The gas pipe must remain closed during maintenance
- Keep the technical room clean and free of dust
- Do not store flammable material in the technical room
- Provide fresh air circulation
- Do not stack goods on top of the burner or ventilator
- Make sure that the 2 or 3 holes in the back of the burner tube are open
- Do not change the position of the valve, between the ventilator and the chimney. If you change this the underpressure will change and the system will not function correctly.



### Sauna

- Do not cover the sensors in the ceiling of the sauna.
- If there is a tube under the bench, keep it free from leaves / towels and waste.
- Do not cover our system with flammable materials or products such as wood, flammable liquids / materials.
- Do not touch the hot tubes or the heater with bare hands.
- Keep the ventilation openings in the stones around the stove open

Declaration of Conformity

Name Manufacturer: SaunaTechnics BV  
Magnesiumweg 20  
8471 XM Wolvega  
Nederland

Product: Independent space heaters: Sauna heater

Model: Etna, Olympic and Classic

Saunatechnics BV declare the following;

General:

- √ the installation and user's instructions, type plate and packaging inscriptions are translated into the official language of the country of destination, taking into account the national installation regulations of the country concerned;
- x for appliances, not meant for installation by a professional installer (e.g. leisure appliances), the manufacturer has investigated which national and regional regulations are in force and that these regulations (additions / restrictions) are implemented in the installation- and user instructions
- √ marking, required by the standard is clearly legible and durable
- x the materials used in these appliances have been so selected that safety and proper performance of these appliances is ensured and that the materials are resistant to the chemical, mechanical and thermal influences to which the appliances will be exposed during their expected service life; Especially for appliances with fully premixed burners the burner is resistant to G28.3A/G28.4A from group K.
- √ no asbestos and mercury has been used;
- x for gas-carrying parts no soft-soldered joints are applied;
- x settings that should not be altered have been sealed;
- x the components of the appliance which may come into contact with food and/or water used for sanitary purposes must not impair the quality of this food and/or water.
- √ connections to the gas supply (line/bottle etc.) shall be country specific.  
(nozzles, ISO, etc.)

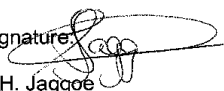
Electrical aspects:

- √ wood, cotton, silk, ordinary paper, hygroscopic material is not used as insulation, unless impregnated; (EN 60335-1 clause 22.21)
- √ oils containing polychlorinated biphenyl (PCB) are not used; (EN 60335-1 clause 22.23)
- x If applicable, Appliances intended to be connected to the water mains shall be constructed to prevent backsiphonage of non-potable water into the water mains; (EN 60335-1 clause 22.48)
- √ the electrical equipment of the appliance, which is not covered in the GAD approval, complies with the requirements of the Low-Voltage Directive (2006/95/EC). (In particular the standards EN 60335-1 and EN 60335-2-102)
- √ Component(s) containing mercury is/are not used (EN 60335-1, clause 22.41)

For modifications to type approval:

- √ For this appliance the manufacturer has investigated the most recent applicable standards (new as well as updated standards) and declares that no modification or assessment of the appliance is necessary, other than assessed in the past (if applicable) and/or are assessed during this modification.

Date: 22-04-2020

Signature   
S.H. Jagge  
Director Saunatechnics BV