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PRODUCT INFORMATION

SOLARBAYER WOOD LOG BOILER

HVS E *ECONOMIC*

HVS LC *LAMBDA CONTROL*

boiler sizes
from 16 kW to 100 kW

Instruction manual

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General information

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Principle of operation

The Solarbayer wood log boiler HVS is a state-of-the-art device for heating with solid wood. It is easy to handle after the installation has been carried out by a professional installer. All national and local regulations and the requirements stated in this manual (see page 6) have to be fulfilled both during installation and operation by the installer and the operator of the system.

The Solarbayer HVS LC wood log boiler is characterized by a modern and modular control concept which ensures more performance and a low, environmentally friendly pollutant emission due to the serially integrated lambda sensor which permanently observes the exhaust gas value.

With the help of the integrated boiler and exhaust gas logic the intelligent control recognizes the requirements of energy. Due to the modulating air supply the boiler is able to react to a possible power reserve and can therefore ensure an almost perfect exploitation of combustibles. This means the highest possible comfort for you and a steady and even combustion for your wood.

You can only achieve an optimal efficiency factor with a perfectly aligned system. Therefore, we generally recommend our high quality stratification tanks SPS with integrated, patented, stratification system. The produced heat of the wood log boiler can be perfectly stored in this kind of tank. The stored thermal energy is relieved into the heating system when needed.

This keeps your fuel consumption as low as possible and even preserves the environment.

The HVS wood log boiler is easy to handle, it can be refuelled and cleaned without the slightest effort. Just fill in logs, ignite them and everything else is working just by itself. The large fuel chamber provides a long combustion period. The integrated fan guarantees an unproblematic start. The fuel chamber door and its bolt do not give way for smoke emission. Moreover, the combustion is stabilized throughout the whole combustion period by the fan and enables an unproblematic operation.

For planning means please refer to the following pages, especially the calculation example for dimensioning the wood log boiler.



The usage of the Solarbayer wood log boiler HVS in smokeless zones in the UK is **NOT granted** by the DEFRA since the company Solarbayer did not apply for it (dated March 1st 2013)

General Information

Codes of practice, regulations, norms, safety regulations

Please read the manual carefully to prevent damages due to improper installation. The installation has to be carried out by a specialized company in accordance with the „generally accepted codes of practice“ as well as with the valid regulations and norms. Non-professional installation as well as other than the intended use will lead to the expiration of warranty.

❗ All national and local regulations concerning the installation, operation and maintenance have to be regarded.

The following engineering rules have to be particularly regarded:

DIN 1988	Codes of practice for drinking water systems It has to be checked before the installation if the drinking water installation, especially the connection to the public drinking water network, fulfill the requirements of DIN 1988 and if the regulated maintenance (as described in Part 8) had been carried out. The proper function of security-relevant parts (e.g. pressure relief valve) has to be checked in any case.
DIN 4751	Safety requirements for heating installations
DIN 4753	Water heaters and water heating installations for drinking water and service water; requirements, marking, equipment and testing
DIN 4807	Expansion vessels
DIN EN 12828	Heating systems in buildings - Design for water-based heating systems
DIN 18380	Systems for heating and central water heating
DIN 18381	Gas, water and sewage plumbing works inside of buildings
VDI Richtlinie 2035	Prevention of damage in water heating installations
DIN 18382	Electric Cable and Wiring Systems Inside Buildings
VDE 0100	Erection of power installations
VDE 0105	Operation of electrical installations
VDE 0190	Potential equalizing of electrical installations

Fireplace regulations in the relevant version

- The boiler has to be installed in a closed, suitable boiler room
- The boiler has to be placed on solid, sustainable ground
- The boiler room has to be aired by a permanent opening with a diameter of at least 250 cm². The opening for the air supply has to be almost the same size as the one for the air exhaust.
- The intended application of the wood log boiler involves the exclusive application for hot water heating systems in accordance with DIN EN 12828.
- The wood log boilers have to be equipped with a type-tested safety valve. The connection between boiler and safety valve has to be non-lockable.
- The thermal discharge safety valves applied have to be tested and registered in accordance with DIN 3440.
- Safety and monitoring devices are not allowed to be removed, bridged or shut off in any other way.
- The opening temperature of the boiler charging unit should be set at 72°C to prevent condensation and corrosion.
- Installation dimensions and wall distances have to be regarded, [see chapter: \[General Information\] Technical data.](#)
- The central heating has to be designed in such a way that a minimum of power drain is guaranteed in case of a breakdown of the boiler circuit pump (the pipe routing to the buffer tank has to be designed according to the principles of gravity).
- The boiler has to be connected to the chimney in the correct and shortest way. Carefully seal the exhaust gas pipes.
- No further heating systems have to be connected to the flue except oil/gas boilers that are equipped with an automatic locking device (exhaust gas thermostat).

Safety regulations for fire protection

The boiler has to be installed in accordance with the valid fire protection regulations and norms. The determined clearance distances from inflammable material have to be regarded when installing the boiler. For wood log boilers up to 50 kW a safety distance from material labeled with level B, C1 and C2 of at least 200 mm and labeled with level C3 a distance of at least 400 mm has to be maintained. The safety distance could be reduced to half the distance if an incombustible plate with a thickness of at least 5 mm is applied 25mm away from the inflammable object/material. The plate has to overlap the boiler's outline (full length: including the exhaust stack) at least 150 mm. Above the consumer's upper area there has to be a clearance distance of at least 300 mm.

Level A: incombustible building material (concrete, mortar, clay bricks, glas, fireclay, etc.)

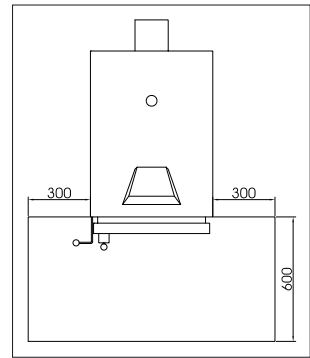
Level B: very difficult to ignite (drywall, etc.)

Level C1: difficult to ignite (lignate plates, chipboards, etc.)

Level C2: normal combustibility (wood – oak, alder, larch, spruce, chipboards, etc.)

Level C3: easily ignited (wood – pine, beech, ash, poplar, fibreboards, cork, foil, polystyrene, polyethylene, bituminized boards, cellulose, plywood, etc.)

The SOLARBAYER wood log gasification boiler has to be placed on a protection plate (see sketch above) in case of doubt. In case of ambiguity please inquire with the local supervisory body (chimney sweeper ...) beforehand.



Example for placing the protection plate on inflammable floor (dimensions in mm)

Safety regulations for operation and maintenance

1. No interventions at the electrical devices and electric conducts are allowed during the operation of the boiler, f. e.:
 - removing the casing of the electric device (electronics assembly, forced draft fan ...)
 - exchanging fuses
 - repairing defective boiler insulation, etc.
2. Maintenance and repair are only to be carried out by authorized qualified persons.
3. Before removing the boiler's casing or any other electrical appliance connected to the boiler it is necessary to disconnect the power supply of all devices.
4. If defects are detected at the electric installation or damages at the boiler installation it is necessary to observe the following rules:
 - do NOT touch any part of the boiler,
 - IMMEDIATELY disconnect the boiler's power supply; inform an authorized service technician who solves the problem

Sectional model

- 1 Control unit**
graphic display with permanent presentation of the system's operating status
- 2 Fuel chamber door**
large-size fuel chamber door
- 3 Forced draught fan**
the quantity of air, necessary for a perfect combustion, is supplied by the infinitely variable forced draught fan equipped as standard

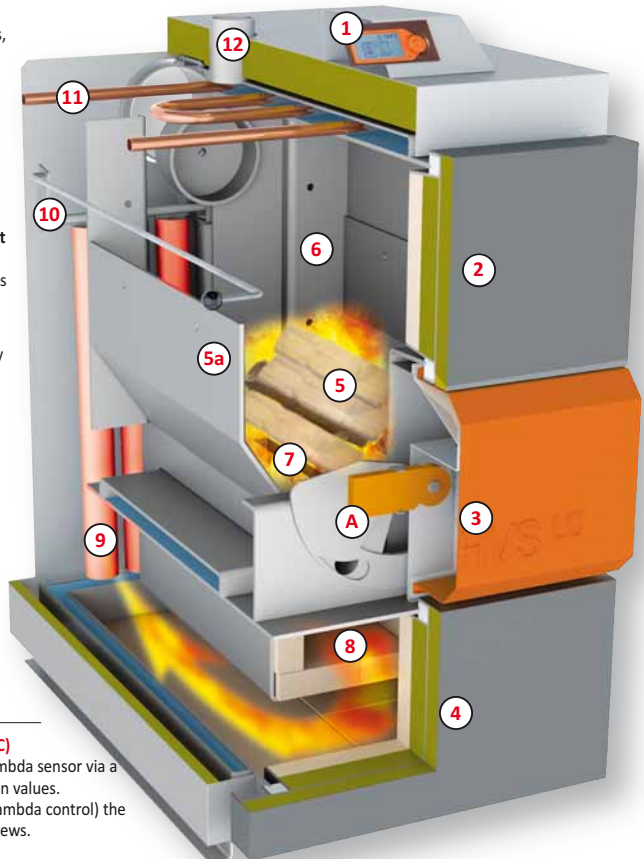


Graphic display with pre-defined Solarbayer hydraulic scheme.



Complete combustion of the wood gases in the lower combustion chamber

- 4 Bottom door**
cleaning door for the removal of ash
- 5 Fuel chamber**
large fuel chamber (0,5m up to 1m logs, depending on boiler size)
- 5a Conical fuel chamber walls***
for a steady inlet of embers to the ceramic nozzle
- 6 Primary air duct**
pre-heated primary air is lead into the fuel chamber by the rear air duct
- 7 Ceramic nozzle with secondary air duct**
creates the perfect gas mixture and guarantees a clean downward wood gas flame
- 8 Slide-in combustion chamber**
with high temperature resistant fireclay bricks for a complete burnout of the wood gases
- 9 Exhaust gas heat exchanger with turbulators**
for best possible hand-over of exhaust gas heat to the heating water
- 10 Exhaust gas damper with draft bar**
prevents outlet of flue gas when refueling the boiler
- 11 Safety heat exchanger**
for cooling down in case of overheating
- 12 Boiler flow line**



- A Lambda servo motor (only with HVS LC)**
The secondary air is adjusted by the lambda sensor via a servo motor, depending on the emission values. With the boiler series HVS E (without lambda control) the secondary is adjusted via regulating screws.

*only with HVS 16, HVS 25 and HVS 40

sectional model shows HVS LC

Calculation example for dimensioning the wood log boiler

Please note that with solid fuel boilers the specified output is guaranteed under full load only. You heat up the boiler and it will take about 30 minutes until the boiler will operate with its maximum output. The stated output will last for approximately 2,5 hrs. Now the burn-off period begins for about an hour with decreased performance. The firebed remaining in the combustion chamber will post-heat for about an hour. Afterwards the combustible is completely used up.

For an easier calculation we presume a burning period of approximately 4 hrs (at nominal output).

Note: This is imperative for the rating of the boiler to avoid that the boiler output is rated too weak

Rough estimation of the boiler size by means of living space:

Example: building (new building) with 150 m² living area, desired boiler size HVS 25 kW

Required heat output per m² living area:

old building	0,12 Kilowatt per m ²
new building	0,08 Kilowatt per m ²
low energy building	0,05 Kilowatt per m ²

Required heat output of the building (at an outside temperature of –16°C)

e. g. living area 150 m², new building => 0,08 kW per m²

$$150 \text{ m}^2 \times 0,08 \text{ kW per m}^2 = 12 \text{ kW}$$

The heat requirement of the new building with an outside temperature of –16°C is thus 12 kW.

Calculation of the building's daily heat requirement (with an outside temperature of –16°C):

$$24 \text{ Std.} \times 12 \text{ kW} = 288 \text{ kWh}$$

The necessary heat energy with an outside temperature of –16°C is 288 kWh/day.

Calculation of the required heat energy per filling (example HVS 25 kW):

$$25 \text{ kW} \times 4 \text{ hrs. (equivalent full load burning period)} = 100 \text{ kWh}$$

The burn-off energy of the 25 kW boiler in 4 hrs full load is thus approx. 100 kWh.

Estimation of the daily fillings (with an outside temperature of –16°C):

$$288 \text{ kWh} : 100 \text{ kWh (burn-of energy)} \approx 3 \text{ boiler fillings}$$

With an outside temperature of –16°C the boiler has to filled approx. 3x in order to guarantee the required energy demand of the building. With milder temperatures you have less fillings.

This calculation is for general information only and does not replace professional planning!

* If the boiler is dimensioned too small you will achieve a boiler temperature of 70 – 80 °C but the desired heating flow line temperature is not achieved.

[e.g. building size 220 m² (old building): a desired nominal boiler output of 25 kW would be miscalculated. Correct would be a nominal boiler output of 40-60 kW].

Technical data

technical facts		HVS 16 LC	HVS 25 E HVS 25 LC	HVS 40 E HVS 40 LC	HVS 60 E HVS 60 LC	HVS 100 E HVS 100 LC
nominal output in kW	kW	16	25	40	60	100
boiler output with	kW	12-18	5 - 31	8 - 41	15 - 72	25 - 100
efficiency factor	%	86 – 92 %				
water capacity	Liter	60	75	93	180	215
max. operating pressure	bar	3	3	3	3	3
pressure loss at nominal load (Δt 10 K)	mbar	9,35	9,75	10,48	12,77	11,5
pressure loss at nominal load (Δt 20 K)	mbar	1,00	1,05	2,55	3,19	2,82
permissible pressure range safety valve	bar	min. 1 to max. 4				
water inlet temperature safety valve	°C	4 - 15°C				
opening temperature safety valve	°C	at 95°C				
noise level	dB	45,0	45,5	47,7	51,4	54,2

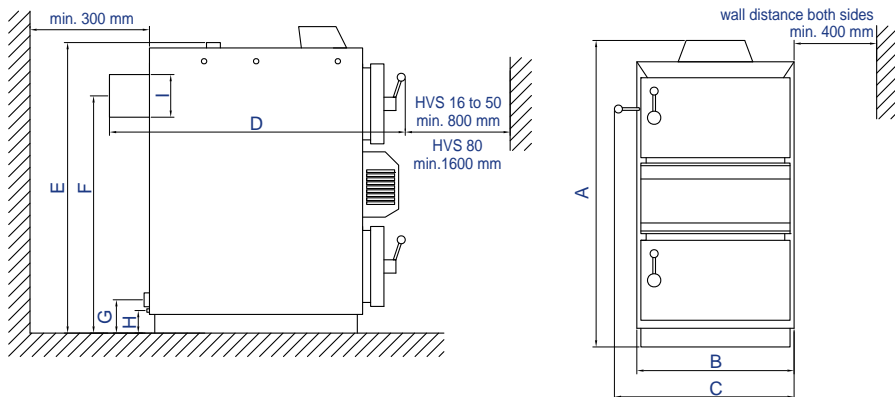
fuel chamber/fuel consumption		HVS 16 LC	HVS 25 E HVS 25 LC	HVS 40 E HVS 40 LC	HVS 60 E HVS 60 LC	HVS 100 E HVS 100 LC
admissible fuel		untreated, split wood log with residual moisture of <20%				
max. wood log length	mm	350	550	550	700	1000
fuel chamber depth	mm	370	560	560	750	1085
fuel chamber height	mm	490	490	750	730	730
fuel chamber width	mm	440	440	440	575	575
dimension of the filling hole w/h	mm	435/255	435/255	435/255	575/318	575/318
fuel chamber capacity, volume liter approx.	Liter	80	116	180	310	455
max. filling weight (beech) approx	kg	20	30	48	80	120
fuel consumption at nominal load (beech) approx.	kg/h	4,5	7,1	11,2	17	25
combustion period at nominal load (beech) approx.	hrs	4,4	4,2	4,3	4,5	4,5

chimney/draft requirements/ exhaust gas values		HVS 16 LC	HVS 25 E HVS 25 LC	HVS 40 E HVS 40 LC	HVS 60 E HVS 60 LC	HVS 100 E HVS 100 LC
recommended min. chimney cross section Ø	mm	140	150	180	180	200
draft requirements	Pa	15-25	15-25	15-25	15-30	15-30
effective minimum chimney height	meter	approx. 7 Meter				
exhaust gas mass flow (Bezug 13% CO ₂)	kg/s	0,019	0,023	0,029	0,035	0,035
modulating exhaust gas temperature	°C	approx. 150-260				
barometric damper		recommended				

Hydraulic		HVS 16 LC	HVS 25 E HVS 25 LC	HVS 40 E HVS 40 LC	HVS 60 E HVS 60 LC	HVS 100 E HVS 100 LC
recommended min. buffer tank volume ¹	Liter	1000	1500	2200	3300	5500
manufacturer's recommendation ¹	Liter	1500	2000	3000	5000	6000
min. tube dimension (CU-/steel presision tube) ²	mm	Ø 28	Ø 28	Ø 35	Ø 42	Ø 54
min. tube dimension (steel tube) ²	–	DN25/1"	DN25/1"	DN32/1½"	DN40/1½"	DN50/2"
recommended boiler return line temperature	°C	70°C				

¹Regulatory framework and government grants should to be paid attention to.

²Depending on tube length, number of elbows installed, mixing valves, changeover valves, etc., you might need a bigger dimension. The above mentioned tube dimensions are only a recommendation and do not replace professional technical planning.



It is necessary that you follow the minimal installation distances

dimension and weight			HVS 16 LC	HVS 25 E HVS 25 LC	HVS 40 E HVS 40 LC	HVS 60 E HVS 60 LC	HVS 100 E HVS 100 LC
height	A	mm	1135	1135	1370	1420	1420
width	B	mm	590	590	590	760	760
width including slider	C	mm	645	645	645	785	785
depth	D	mm	840	1070	1070	1260	1650
height flow line	E	mm	1075	1075	1310	1400	1400
height exhaust pipe (middle)	F	mm	890	890	1110	1170	1170
height return line	G	mm	115	115	125	215	215
height draining	H	mm	55	55	70	135	135
flue spigot	Ø	mm	Ø 159	Ø 159	Ø 196	Ø 196	Ø 196
boiler flow line/boiler return line	Ø	inch	2" IG	2" IG	2" IG	2" IG	2" IG
safety heat exchanger	Ø	inch	¾"	¾"	¾"	¾"	¾"
immersion sleeve for safety heat exchanger	Ø	inch	½"	½"	½"	½"	½"
draining	Ø	inch	½"	½"	½"	¾"	¾"
boiler weight		kg	400	430	460	760	950
Electrical data			HVS 16 LC	HVS 25 E HVS 25 LC	HVS 40 E HVS 40 LC	HVS 60 E HVS 60 LC	HVS 100 E HVS 100 LC
mains voltage/frequency	V/Hz				230/50		
power consumption – standby	W				0,35		
power consumption – operation	W			63		126 (2x 63)	

Technical changes and errors reserved

Installation



Both installer and wood log boiler have to be protected during transport



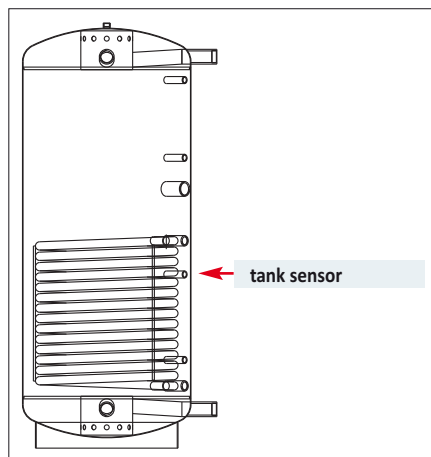
Since the wood log boiler has a heavy weight (up to 950 kg depending on boiler size) it is mandatory to follow all necessary PPE* and CoSHH** requirements such as protective foot wear and gloves, etc.

* PPE = Personal Protective Equipment
** CoSHH = Control of Substances Hazardous to Health

Tank sensor

The buffer tank sensor (PT 1000) has to be installed at the corresponding position in the buffer tank.
The measurement of the tank temperature is for information use only and has no influence on the control of the boiler.

Installation



The buffer tank sensor should be installed after $\frac{2}{3}$ of the buffer tank volume.

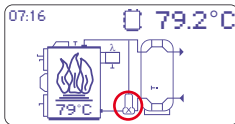
Boiler charging unit (mandatory)

A boiler charging unit is obligatory for the operation of a SOLARBAYER wood log boiler in order to prevent the accumulation of condensing water and corrosion at the boiler body as a result of that. We recommend to only use the Solarbayer boiler charging units. With those a boiler flow line temperature of approx. 70-85°C is achieved.

The unit's pump is directly connected to the wood log boiler control unit,
see chapter: [\[Installation\] Electric circuit diagram](#)

When in „heating“ mode the pump will be switched on at a temperature of approx. 40°C. The pump is working permanently, independent of the operating mode, when the pre-set boiler flow line temperature is exceeded (overheat control).

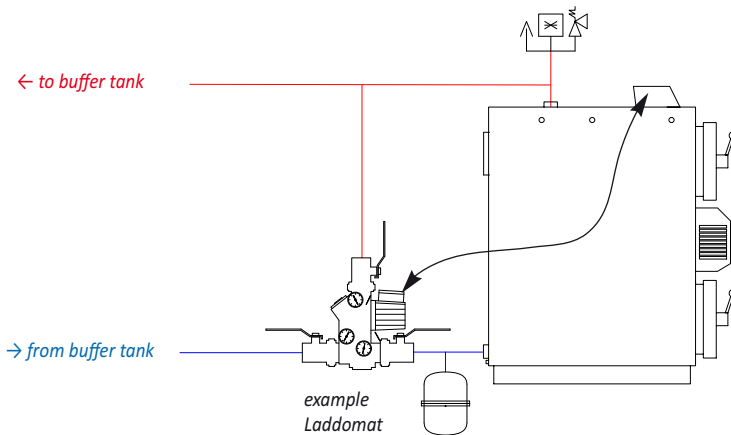
In case of breakdown/failure of the boiler/exhaust gas sensor the pump is working permanently for safety reasons.



The activity of the pump is displayed by a rotating line on the control panel.



Technical information and instructions for the installation come with the product and could be downloaded on: www.solarbayer.de



Thermal discharge safety valve (mandatory)

In accordance with DIN 4751-2 a thermal discharge safety valve is prescribed for heating systems with solid fuels.

Safety heat exchanger and thermal discharge safety valve:

The safety heat exchanger with the thermal discharge safety valve conduces to the boiler's protection against overheating.

Installation of the thermal discharge safety valve:

It is important that the thermal discharge safety valve is installed in such a way that the heat exchanger is depressurized during regular operation, meaning that it is not in a closed system. The thermal discharge safety valve has to be connected unlockable to a pressurized mains water network. The drain outlet has to lead free.

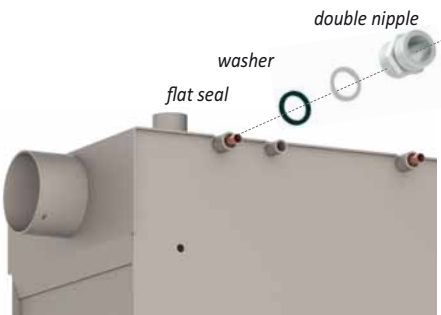
Operating mode:

The valve that is independent of pressure opens a waterway at a flow line temperature of approx. 95 °C and thus prevents a temperature increase over a maximum of 110 °C.

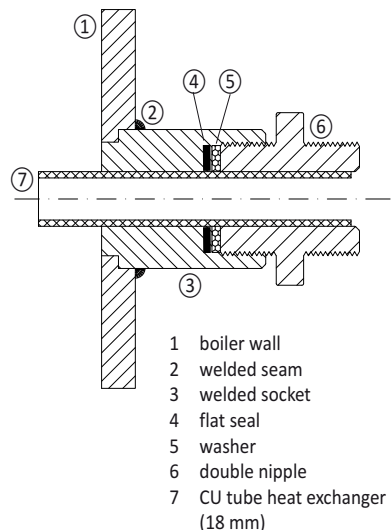


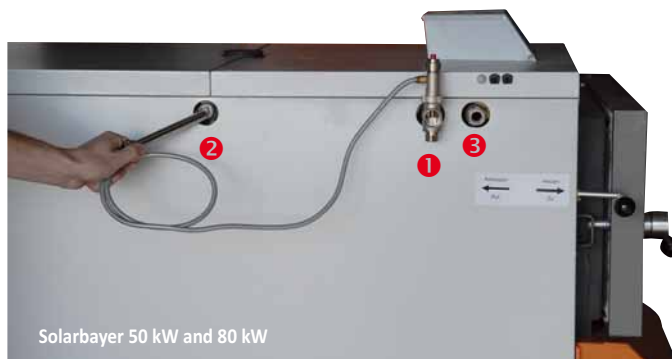
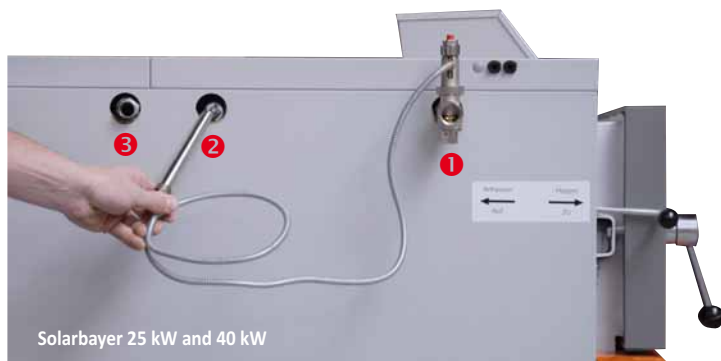
The double nipple together with the flat seals and the shims for sealing the safety heat exchanger from the boiler water are already equipped by the manufacturer.

Do not turn the double nipple in order to adjust or to hold in place. In case of a leakage at the safety outlet the double nipple have to be retightened with a pipe wrench.



Sealing of the copper tube for the thermal discharge safety valve





- ❶ Thermal discharge safety valve $\frac{3}{4}$ " cold water inlet
- ❷ Immersion sleeve with double temperature protector
- ❸ Cold water outlet

Please check the safety valve's function when heating up the boiler for the first time by heating up the boiler to opening temperature.

Thermal discharge safety valve



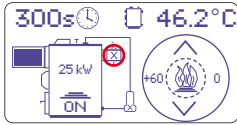
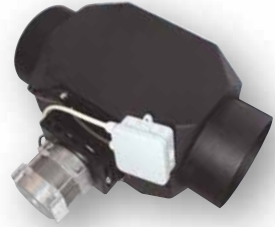
According to regulation DIN 4751-2 the operator of the system is obligated to get the thermal discharge safety valve checked by a specialist at least once a year.

Exhaust gas fan (optional accessory)

In order to support the fume outlet while putting more fuel into the boiler an exhaust gas fan can be retrofitted.

Thus, the fume outlet is minimized while the fuel chamber door is open.

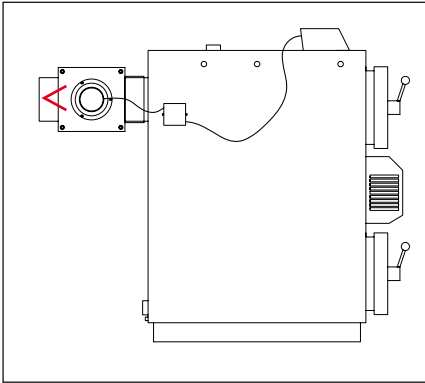
The exhaust gas fan is directly connected to the HVS control unit, see chapter: [\[Installation\] Electric circuit diagram](#)



The activity of the exhaust gas fan is displayed by a rotating line on the control panel.

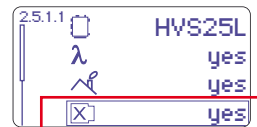


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When operating the system with an exhaust gas fan this mode has to be activated on the control panel!

see chapter: [\[Operation\] Expert level \(2.5: Configuration\)](#)

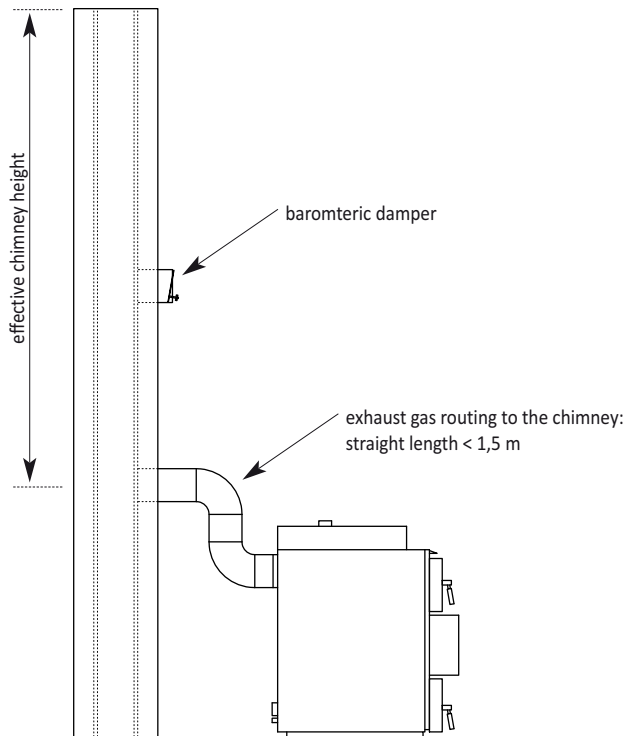


Flue pipe and barometric damper (optional accessory)

- The chimney has to be designed according to DIN 4705 respectively EN 13384. Please contact the responsible inspecting authority (e.g. chimney sweeper) in case of ambiguities.
- The fume outlet tube has to be connected to the chimney ascending, in the correct and shortest way. A maximum of two bends may be installed, each other formed part causes a higher decrease in pressure.
- When connecting a fireplace to an exhaust gas system a secure exhaust gas outlet has to be provided. The exhaust gas systems have to be designed according to clear section, height and thermal resistance in such a way that the exhaust gases are, during all normal operating modes, only lead to the outside through the chimney, no overpressure occurs and that the fireplaces have enough combustion air.
- It is NOT allowed to connect more than one fireplace to the chimney when using a wood gasification boiler due to the forced draft fan.



In order to guarantee a clear combustion we recommend to install a barometric damper that ensure the required chimney draft (see diagram).



Electrical connection

The regulations and standards of the VDE (German Association for Electrical, Electronic & Information Technologies) and of the local power utilities have to be regarded.

The connection has to be carried out by a concessionary electrician.

Disconnect all components from power!

Never touch any current-carrying parts, danger to life exists!

The boiler is equipped with a shockproof plug.

The following components have to be connected at site:

boiler circuit pump (original Solarbayer boiler circuit unit)

cable 3x 1,5 mm²

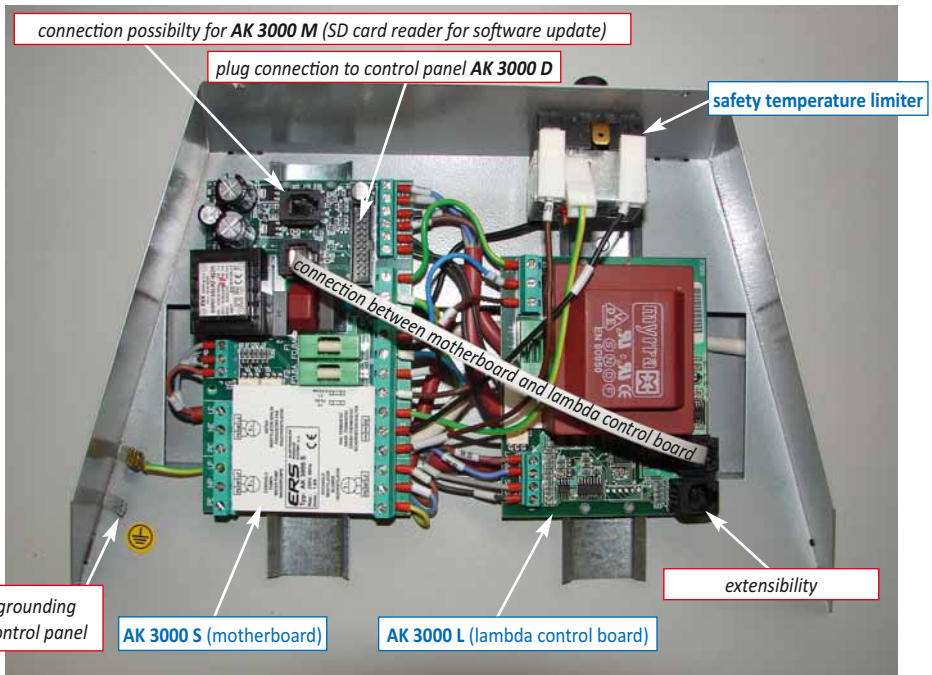
exhaust gas fan (optional)

cable 3x 1,5 mm²

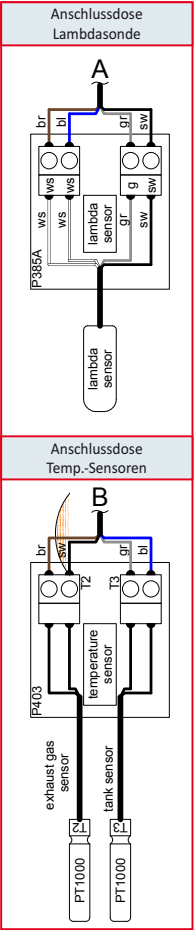


Disconnect power before opening the control unit's casing.

Never touch any system component that is current-carrying – danger to life exists!



Installation



Initial operation of the boiler



The following aspects have to be checked:

- ☐ correct hydraulic installation
- ☐ rinse pipes and boiler thoroughly after the installation, **fill heating system in accordance to VDI 2035 with treated water** and de-aerate it, please pay attention to the BDH information flyer n° 8.
- ☐ operability of all safety devices of the heating system
- ☐ correct installation of the exhaust gas pipes to the chimney
- ☐ correct fitting of the fireclay bricks
- ☐ start-up flap and turbulators
- ☐ secondary air settings (only HVS E)
- ☐ heat consumption of the heating system has to be guaranteed
- ☐ expansion vessel: capacity: _____ Liter primary pressure expansion vessel: _____ bar
- ☐ operating pressure of the system: _____ bar
- ☐ power supply of the boiler
- ☐ functional test of the boiler circuit pump *see chapter: [\[Operation\] Expert level \(2.12: functional test\)](#)*
- ☐ get familiar with the boilers operating mode and the control unit
- ☐ when operating the boiler with exhaust gas fan you have to activate this function over the control panel *see chapter: [\[Operation\] Expert level \(2.5: configuration\)](#)*



Record the pressure test and the correct filling of the system in accordance with VDI 2035 and let the customer confirm this.

boiler type

production number

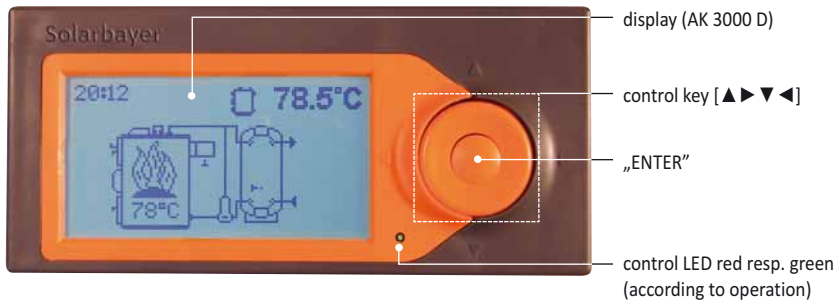
Herewith I confirm the proper initial operation

stamp / date / signature installer

Operation

Operation

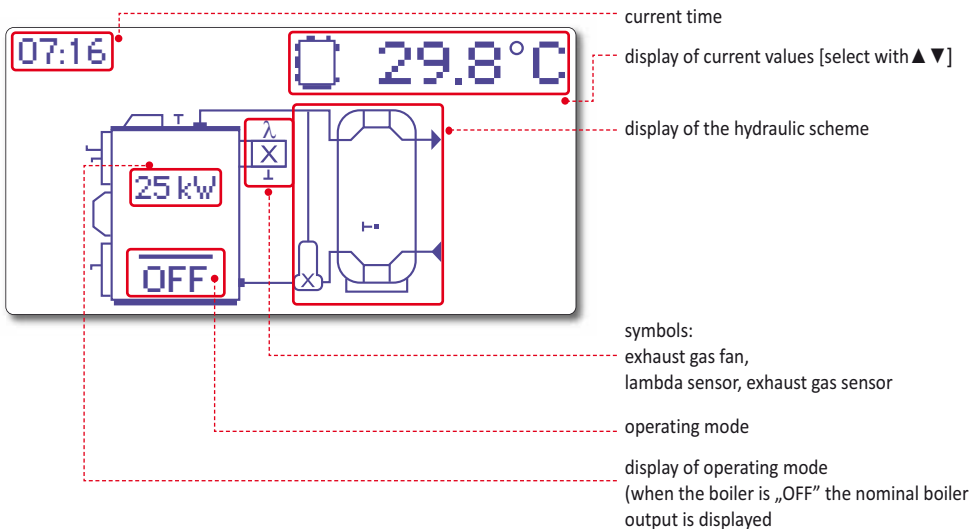
Description of control panel and display



How to use the control key

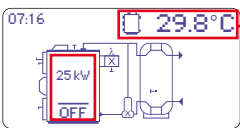
-  confirm (Enter)
-  escape (ESC)
-  select
-  mode of operation

Operation

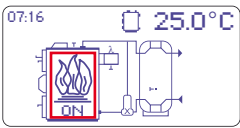


Description of icons and basic parameters

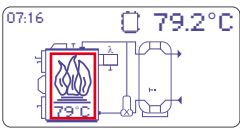
Operating modes



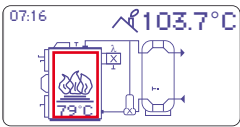
boiler off (starting menu)



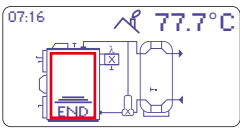
heating mode starts



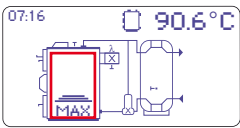
heating mode



leave heating mode



stop heating mode



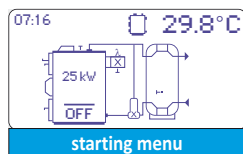
maximum temperature exceeded



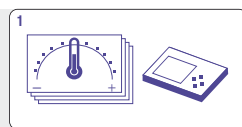
Monitoring the different values

date	Mon 2011/06/27
exhaust gas temperature	196.4°C
buffer tank temperature	85.4°C
boiler temperature	82.3°C
performance of forced draft fan	95%
current lambda value of exhaust gas <small>(only with HVS LC)</small>	λ 1.33
position of lambda servo motor <small>(only with HVS LC)</small>	servo 90%

Basic menu



1]
boiler max.
temperature



How to use the control key



confirm (Enter)



escape (ESC)

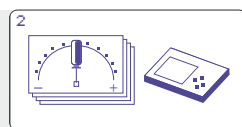


select



mode of operation

2]
Control panel settings



3]
Time



4]
Error search

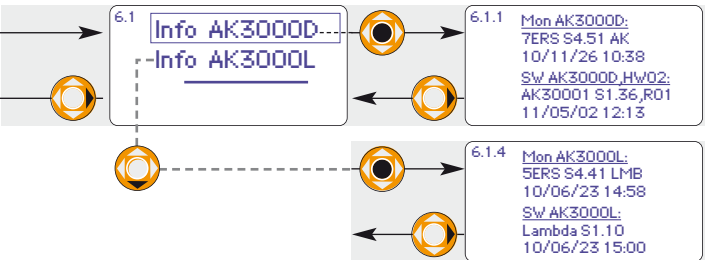
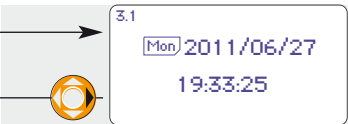
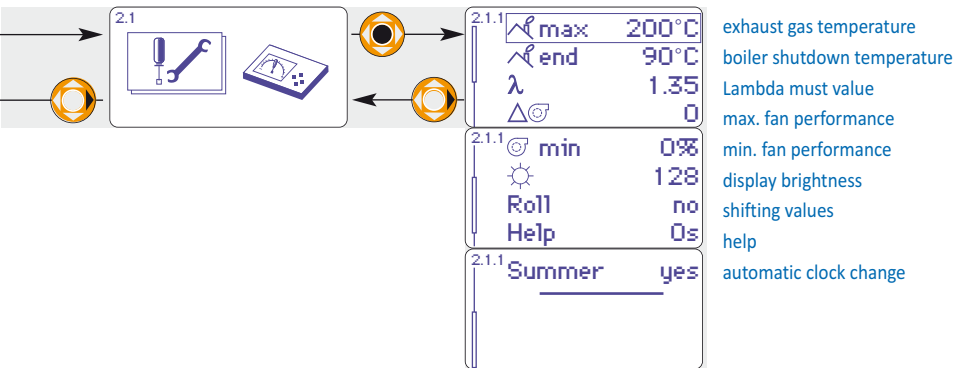


6]
Software information

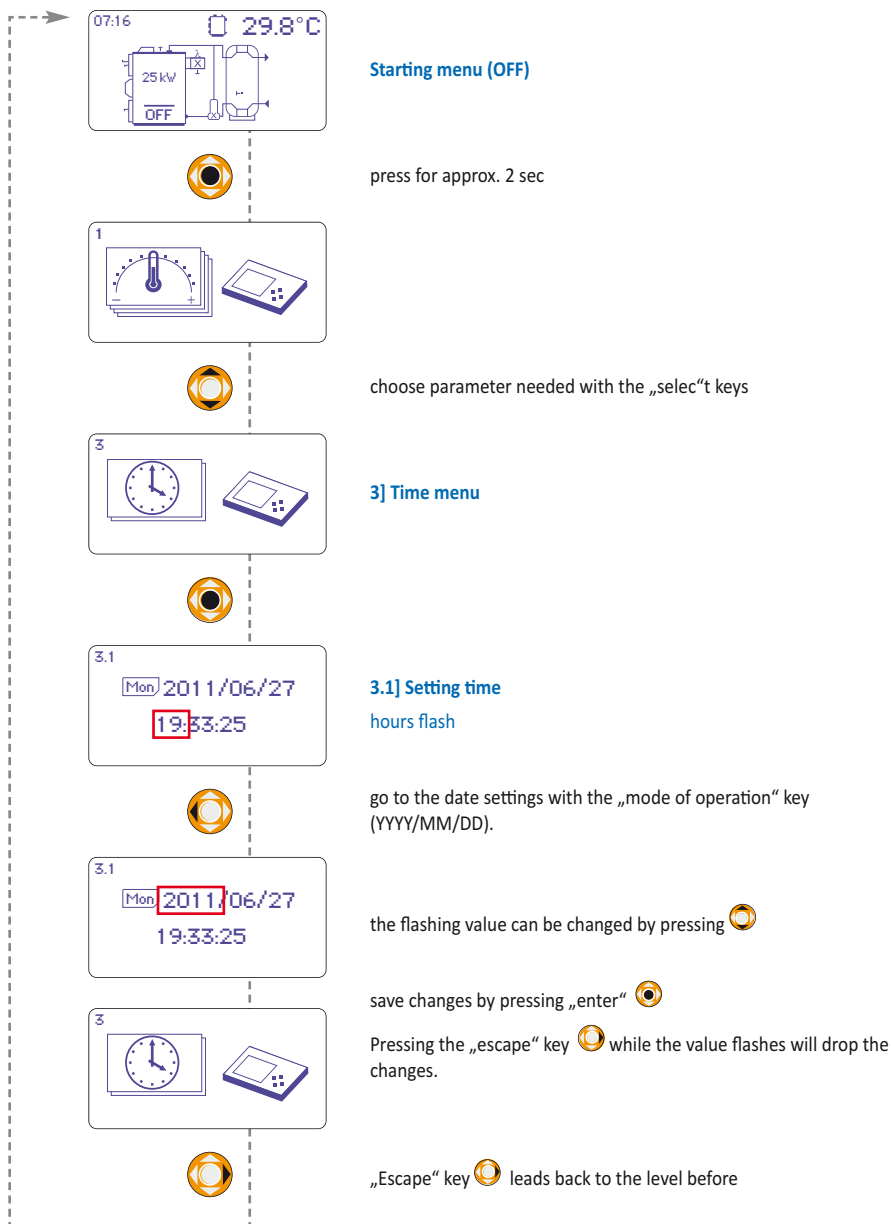




Setting details can be found on the following pages.

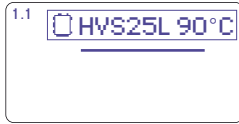


How to set the parameters (example: time)



Important parameters

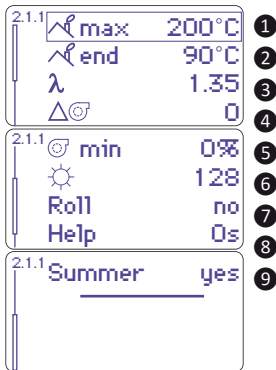
Boiler max. temperature



Boiler max. temperature (maximum value): **recommendation 90°C**

The performance of the forced draft fan is reduced when the the set value is approached. The fan will be shut down when the set value is reached. When the boiler temperature falls below the set value the forced draft fan is starting again.

Control panel settings



The setting is working in the same way as shown in the example on the page before. auf der vorhergehenden Seite beschrieben!

1 Exhaust gas temperature (maximum value): **recommendation 200°C**

When approaching or exceeding this value the performance of the forced draft fan is infinitely reduced.

2 Boiler shutdown temperature (exhaust gas temperature): **recommendation 90°C**

The boiler shuts down as soon as the exhaust gas temperature falls below this value during operation.

3 Lambda must value: **recommendation 1.35, only for boilers with lambda control**

The boiler should be operated with an optimal oxygen mixture. This is controlled by the lambda sensor in the exhaust gas. On this basis the right amount of oxygen is added by the aid of the servo motor.

4 Maximum fan performance: **recommendation 0**

This value enables the increase or decrease of the fan performance in 3 levels. Each level corresponds to approx. 14% increase or decrease in performance. Modifications should only be made with difficult chimney conditions.

5 Minimum fan performance: **recommendation 0%**

The control panel is able to infinitely adjust the motor speed between the minimum performance and the chosen maximum fan performance.

6 Display brightness

Adjusting the background light of the control panel.

7 Shifting values

with [yes] the values displayed are shifting automatically
with [no] the values can be inquired manually.

8 Help (setting time)

After the set standby time a graphic help appears for several functions. The setting „0s“ deactivates this function.

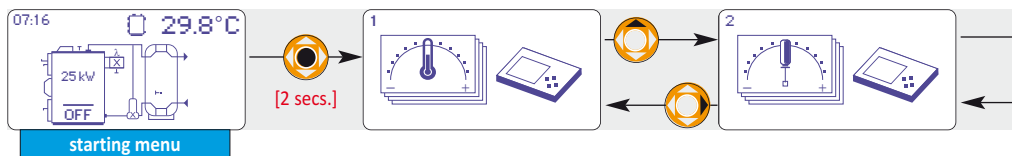
9 Automatic clock change (summer- / wintertime)

with [yes] the automatic clock change is activated



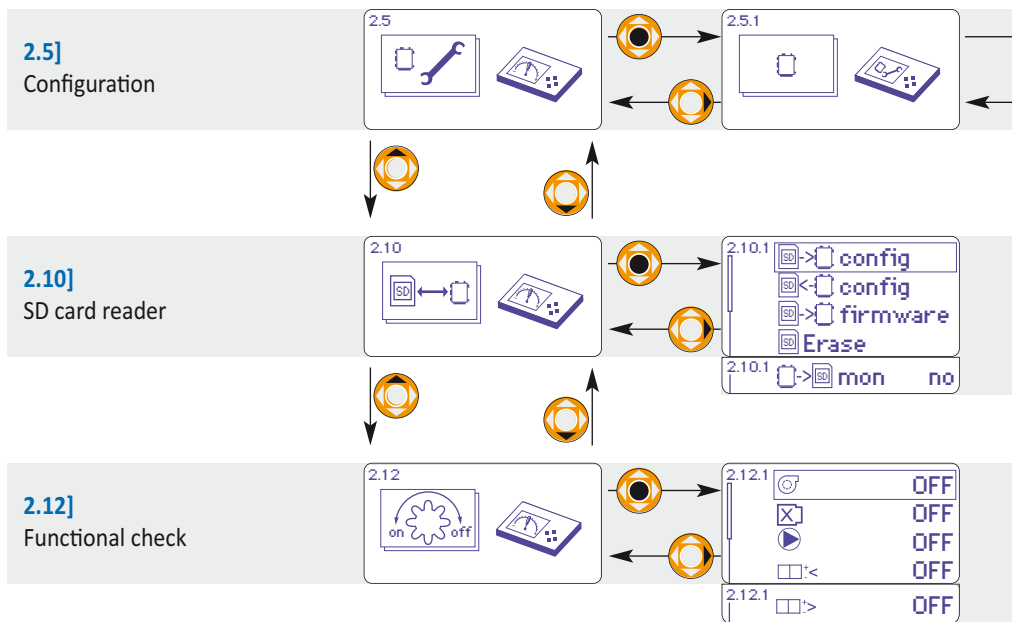
Return to factory settings:
see chapter: [\[operation\] expert level](#)

Expert level

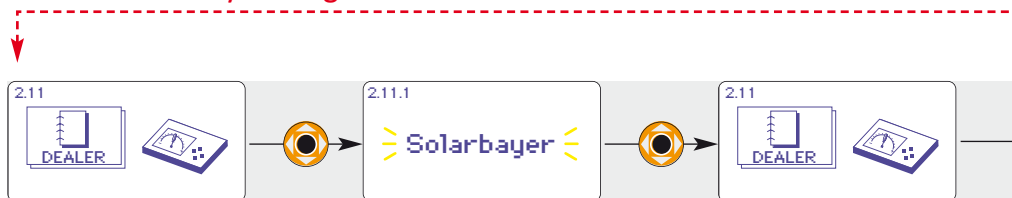


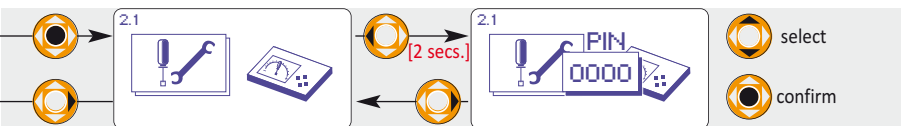
Password area (expert level)

This is only possible when the boiler is turned off (starting menu „OFF“)



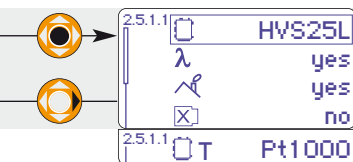
Return to factory settings





PIN: 0000

PIN: 1961



boiler type*

lambda control [yes/no] with HVS LC: yes

exhaust gas measurement [yes/no] recommended: yes

exhaust gas fan [yes/no] if installed: yes

boiler sensor [PT1000/KTY]

load parameter to control unit
readout parameter from control unit
load operating software to control unit
delete all information on SD card
(not available at the moment)

forced draft fan
exhaust gas fan (when installed)
pump
servo motor [open]
servo motor [closed]

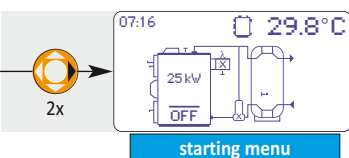


When the boiler is retrofitted from the „HVS T” to the „HVS E” model the boiler type has to be adjusted to **AK2000**.

Note for the technician:

The electrical outlets can be operated manually.

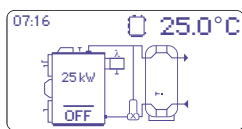
This is only possible when boiler is turned „OFF”.



ATTENTION:

- set correct boiler type
- activate exhaust gas when installed

Heating up the boiler – control panel function (without exhaust gas fan)



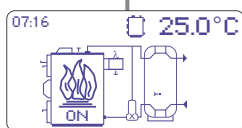
Boiler off

This is displayed by „OFF“ in the display.



The boiler starts by a pressing the „enter“ key shortly.

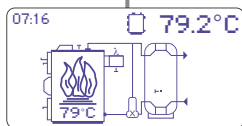
The control LED is green



Heating mode begins

The boiler is in heating up mode as long as the temperature is lower than the pre-set boiler shut down temperature $\text{end } 90^{\circ}\text{C}$ plus additional 20°C

Note: If the temperature does not cross this mark in between 30 minutes the boiler will automatically turn to **END**

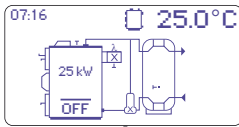


Heating mode

After several minutes the boiler turns to heating mode when the shut down temperature is exceeded by approx. 20°C $\text{end } 90^{\circ}\text{C}$

Note: The pump starts at a boiler temperature of approx. 40°C .

Heating up the boiler – control panel function (with exhaust gas fan)



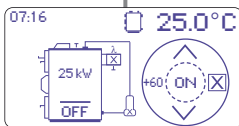
Boiler off

This is displayed by „OFF“ in the display.



The boiler starts by a pressing the „enter“ key shortly.

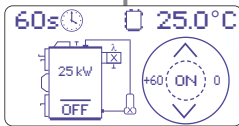
The control LED is green



Activate exhaust gas fan

select parameter

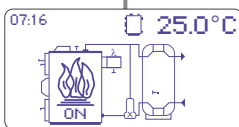
+60	exhaust gas fan is activated for 60 secs
ON	turn on boiler
0	cancel and return
▲ ▼	select the values that are going to be displayed



Exhaust gas fan is activated

select parameter

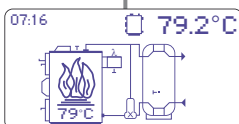
+60	running time of the fan is elongated for 60 s/press
ON	turn on boiler
0	turn off exhaust gas fan
▲ ▼	select the values that are going to be displayed



Heating mode begins

The boiler is in heating up mode as long as the temperature is lower than the pre-set boiler shut down temperature $\text{end } 90^{\circ}\text{C}$ plus additional 20°C

Note: If the temperature does not cross this mark in between 30 minutes the boiler will automatically turn to END



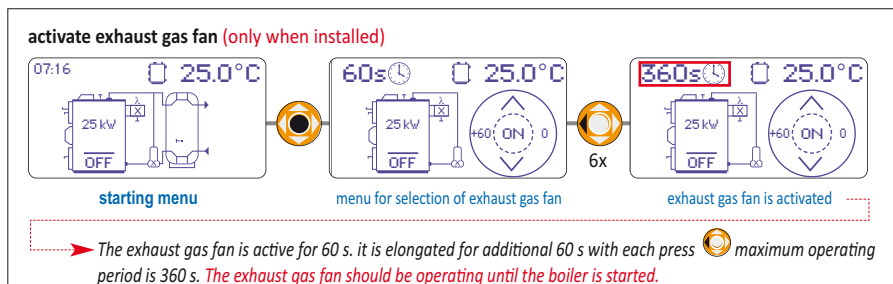
Heating mode

After several minutes the boiler turns to heating mode when the shut down temperature is exceeded by approx. 20°C $\text{end } 90^{\circ}\text{C}$

Note: The pump starts at a boiler temperature of approx. 40°C .

Heating up the boiler - ignite the fire

The draft bar of the boiler guarantees a safe opening of the upper door. Before opening the door the draft bar has to be pushed to the correct position: „open“ (see picture 1) in order to open the exhaust gas damper. Thus, pressure/flue gas can escape through the chimney.



Set the draft bar to position „open“ / „heating-up“



Place charcoal leftovers over the fireclay nozzle



Ignite a heat tablet



Place the tablet on the charcoal leftovers



Position 2 wood ogs on each side of the boiler wall (left and right side)



Place some splinters on the heat tablet



Open bottom door.
And let it burn for approx. 5 minutes.



Completely close the bottom door and fill upper fuel chamber with logs.

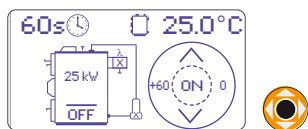


Lock the door now.

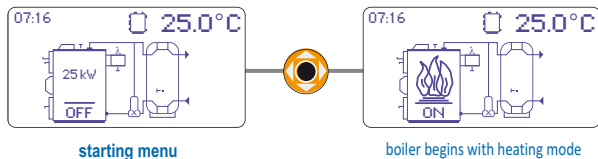


Set the draft bar to position „close“ / „normal heating mode“.

11 Boiler start (when exhaust gas fan is installed)



11 Boiler start (without exhaust gas fan)



The control LED is green

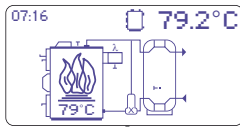


A couple of minutes later you can see a nice gas flame in the slide in combustion chamber.



The boiler has to monitored during the heating up phase.

Refueling

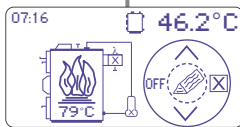


heating mode

the control LED is green



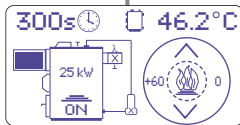
If you want to switch to the refueling mode you have to press „ENTER”



Refuel – select –

select parameter

OFF	boiler can be switched off manually
	refuel
	cancel and return
▲ ▼	select the values that are going to be displayed



Refuel

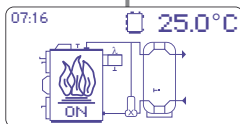
The exhaust gas fan, if one is installed, is activated automatically.

The forced draft fan will be deactivated.

The opening of the boiler door will be displayed on the control panel.

select parameter

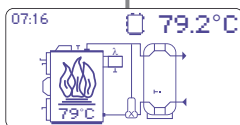
+60	elongate running time of the fan (only when installed)
	start boiler
0	turn off exhaust gas fan (only when installed)
▲ ▼	select the values that are going to be displayed



Heating mode begins

The boiler is in heating up mode as long as the temperature is lower than the pre-set boiler shut down temperature 90°C plus additional 20°C

Note: If the temperature does not cross this mark in between 30 minutes the boiler will automatically turn to



Heating mode

After several minutes the boiler turns to heating mode when the shut down temperature is exceeded by approx. 20°C 90°C

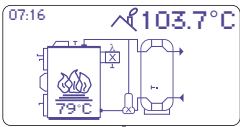
Note: The pump starts at a boiler temperature of approx. 40°C.



Set the draft bar to the position „open/heating-up” before refueling.

After having closed the boiler door set the draft bar to the position „close/normal heating mode”

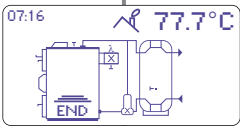
Turn-off the boiler (automatically)



Escape heating mode

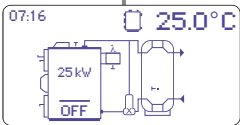
When the boiler temperature falls below the set turn-off temperature 90°C plus approx. 20°C the control unit starts escaping the heating mode.

The control LED does not shine.



Stop heating mode

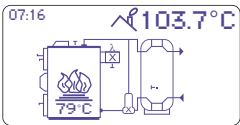
When the boiler temperature is falling below the set turn-off temperature 90°C the heating mode is stopped automatically.



Boiler off

The control panel automatically switches to the starting menu.

Turn-off the boiler (manually)



Heating mode

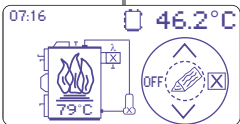
The control LED is green

The heating mode can be stopped manually



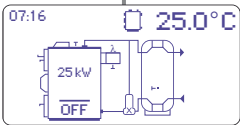
For this press the „ENTER” key during operation.

The control LED does not shine



The control panel now shows different parameters to select. Press the left key „OFF” to turn-off the boiler.

select parameter	
OFF	the boiler can be turned-off manually
	refuel
<input checked="" type="checkbox"/>	cancel and return
▲▼	select the values that are going to be displayed



Boiler off

The control panel automatically switches to the starting menu.

Type of fuel

The SOLARBAYER wood log boilers are suitable for the combustion of dry wood (split wood logs with less than 20% residual moisture) with a length that fits the fuel chamber and a maximum edge length of approx. 8x14 cm. Wood shavings and splinters have to be burned in combination with wood logs. The inside of the boiler consists of a fuel chamber that dries out the fuel and gasifies it. The produced wood gas is lead through the nozzle into the combustion chamber where it starts burning by adding secondary air. The hot exhaust gases are cooled down in the heat exchanger.

Heat value chart

Spruce		4,61	4,32	4,02	3,73	3,44
Spruce	kg	4,61				
Spruce	kg	4,61	4,32	4,02	3,73	3,44
379 kg TM/fm	fm	1942	1925	1906	1885	1860
	rm	1360	1348	1334	1319	1302
Pine	kg	4,61	4,32	4,02	3,73	3,44
431 kg TM/fm	fm	2209	2189	2168	2144	2116
	rm	1546	1533	1518	1500	1481
Birch	kg	4,43	4,15	3,86	3,58	3,30
558 kg TM/fm	fm	2748	2723	2695	2664	2627
	rm	1923	1906	1887	1864	1839
Oak	kg	4,43	4,15	3,86	3,58	3,30
571 kg TM/fm	fm	2812	2786	2758	2726	2689
	rm	1968	1951	1931	1908	1882
Pine	kg	4,43	4,15	3,86	3,58	3,30
353 kg TM/fm	fm	1738	1723	1705	1685	1662
	rm	1217	1206	1193	1179	1163

¹⁾ values in kg dry residue (TM) per solid cubic meter (fm)

Storing of split timber

Freshly cut timber contains between 45 to 60% water. With log wood boilers, however, you can only use timber with a maximum moisture content of 20%. Therefore, it is necessary to dry (season) the timber before use.

We recommend the following for an optimal storing of split timber:

- store stack of woods protected from rain
- split into logs before storing
- create dry ground for storing and keep of the ground to ensure air circulation (e.g. pile on long timbers, etc.)
- store in wind exposed places if possible (e.g. at the edge of the forest not inside it)
- when stored closed to buildings ensure gap is left between buildings and logs,
- try to store logs south facing,
- put daily requirement of logs in heated rooms (e.g. boiler room to preheat the fuel!)
- when stored in buildings without special fire protection equipment you have to regard the maximum allowable amount of fuel

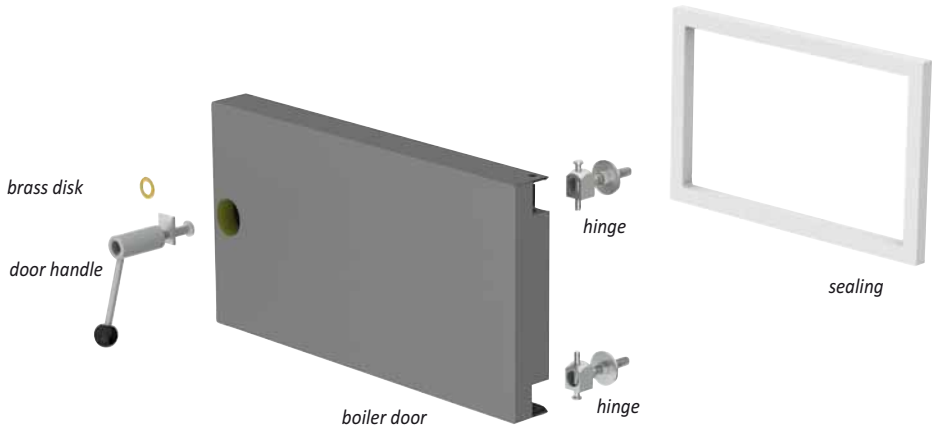
Maintenance

Maintenance

Doors

Adjusting the doors

The boiler doors are fastened at 3 points: with 2 hinges and the closing. in case of leakages the door could be adjusted at the hinge side. The door hinge can be adjusted by turning the hinge screw. Therefore you have to loosen the screw nuts a little. Afterwards tighten them again.



The threads of the hinge and the closing have to be greased from time to time.

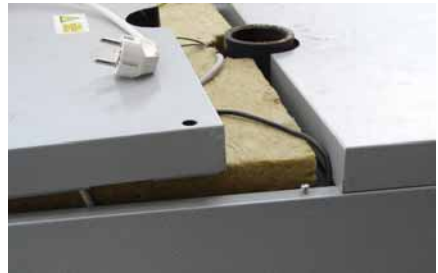


Adjustable door hinge at the right side of the boiler.

Boiler casing

Upper casing

when removing the front top plate you have to unscrew the 2 self-cutting screws at the front. Afterwards remove the caps which are located in the corners of the front plate with a slotted screwdriver. Underneath the caps are self-cutting screws which only should be loosened. Pull the front plate approx. 2 cm to the front and then tilt it carefully to the front.



Left and right casing

First of all you have to remove the upper front plate as described above. Afterwards the back top plate is going to be removed as well. The upper and bottom boiler doors have to be closed tightly. When removing the top plate at the side of the hinges the screw nuts that are rested against the galvanized support have to be loosened. At the side of the closing you have to remove the two screws that are next to the door closing. Afterwards, remove the casing of the forced draft fan. Unscrew all self-cutting screws at the backside of the boiler casing to free both side plates. Afterwards those can be removed.

Door casing

First off all, demount the complete door by removing the pintle from the hinges. Demount the door handle as well. Place the door with the inner side facing downwards on a stable ground. Now the casing can easily be removed.



Disconnect boiler from the mains supply before removing the casing.
Never touch conducting devices – danger to life exists!



Ceramic nozzle/nozzle brick

The nozzle is made of heat resistant fireclay and takes care of the mixing of the exhaust gases with the secondary air. This results in an absolute combustion. The operating life of the nozzle is depending on the wood moisture and on mechanical damages which might occur when the boiler is refueled incautiously. Cracks are no reason for a replacement of the nozzle.

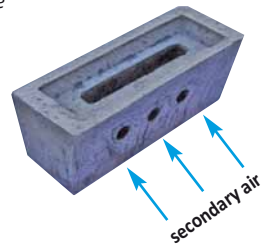
The conical form enables an easy exchange of the nozzles. If the nozzle is damaged it is necessary to replace it. Afterwards you put the new nozzle into the opening. Please check if the nozzle fits in tight. If it does not fit in tight, the opening has to be adjusted NOT the nozzle. After the new nozzle is put in you have to check if the single holes of the nozzle are permeable.

The **nozzle** is a wear part and has to be replaced when necessary.

Only use original spare parts!



fuel chamber with nozzle



Protection bricks

In order to improve the performance the HVS 16 LC has 3 protection bricks both on the left and right side of the inner walls of the combustion chamber.

The **protection bricks** are wear parts and have to be replaced when necessary.



Only with HVS 16 LC:

3 protection bricks are placed on both, the left and the right side of the fuel chamber.

Combustion chamber

Fireclay bricks:

the heat resistant fireclay bricks are loosely placed in the steel tub, as shown in the picture. If the fireclay bricks are arranged incorrectly, the flame may hit the steel tub unhindered and therefore the tub might be destroyed ahead of time.



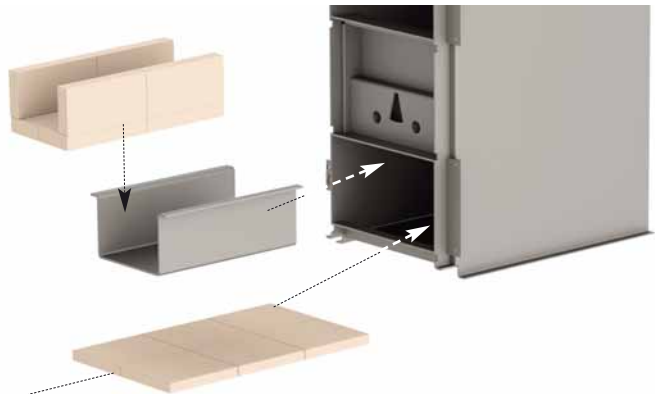
The fireclay bricks have to overlap the front edge of the steel tub approx. 20 mm.

Steel tub (exchangeable):

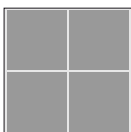
A deformation or an erosive burning of the steel tub do not affect the furnace capacity and are not a defect. This is a normal process.



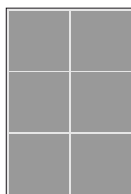
Push up the steel tub to the back wall of the boiler and never operate it without the fireclay bricks.



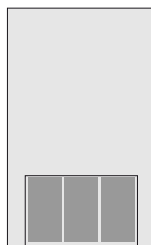
Position of the fireclay plates on the boiler floor



HVS 16



HVS 25
HVS 40



HVS 60
HVS 100

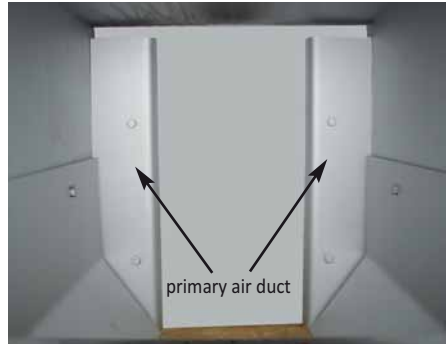
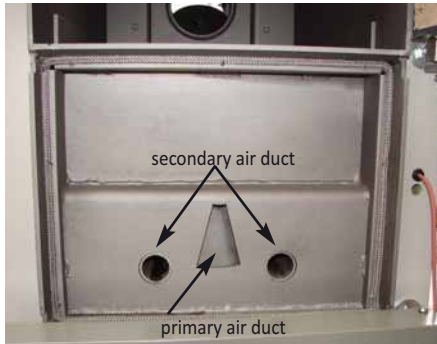
Fireclay plates:

In order to protect the boiler's ash chamber against too much heat impact and possible damages our wood log boilers are equipped with refractory plates that are placed underneath the combustion chamber.

Fireclay bricks, fireclay plates as well as the **steel tub** are wear parts and have to be replaced when necessary. **Do only use original parts!**

Primary and secondary air duct

After having removed the assembly group the way to the pipes of the primary and secondary air is cleared. The margin pipes lead the primary air and the inner pipes lead the secondary air towards the nozzle. The primary air mass is not firmly adjusted because it is depending on the fan performance.



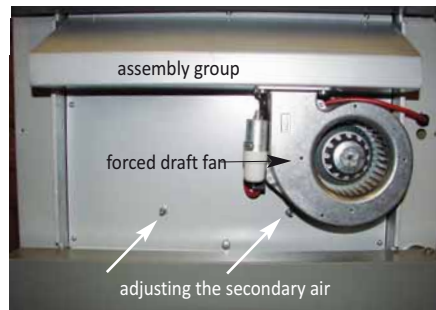
Adjusting the secondary air (only with HVS E)

For a good combustion you should try to achieve an oxygen proportion of approx. 5,5%. This is controlled by secondary air.

Adjusting the secondary air:

- Loosen the lock nuts at the screws
- turn screws clockwise as far as it is possible
- turn screws anti-clockwise for 2 or 3 turns.
(reference values - exact adjustment in accordance with local conditions [chimney draft ...]).

The adjustments have to be repeated after each demounting and remounting of the assembly group!



Note:

A deficiency of air might lead to an incomplete combustion and as result of that to load noises (steam hammering) inside the boiler.



The secondary air has to be adjusted before the boiler's initial operation and, if necessary, adapted to the given chimney conditions (only with HVS E).

Forced draft fan

The forced draft fan is mounted on the fan carrier sheet.

The boilers HVS 16, 25 and 40 have one forced draft fan, and the HVS 50 and 80 have two fans.

The forced draft fan consists of 4 components: forced draft fan body; motor; capacitor; fan wheel.

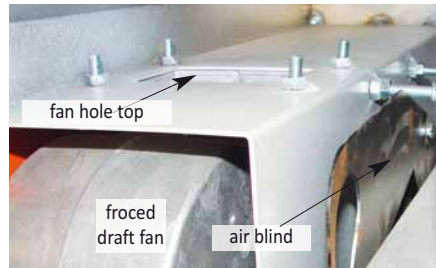
Note: A clean and dust-free environment is the basis for a reliable operation of the fan. Dirt on the wings causes loud operation and leads to a changing of the parameters. Thus, a clean combustion is no longer guaranteed. The fan wings should be cleaned from time to time.



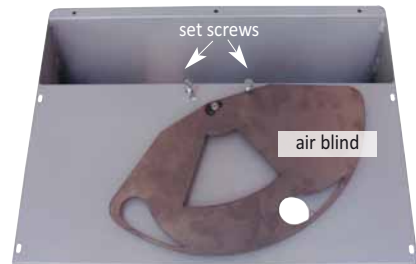
Disconnect boiler from the mains supply before removing the forced draft fan.
Never touch conducting devices – danger to life exists!

Lambda servo motor and air blind (only with HVS LC)

The automatic adjustment of the air supply is carried out electronically. With the aid of the servo motor the lambda sensor measures the air supply via the air blind.



The position of the air blind is found automatically by the servo motor. The final positions in both directions are regulated by the set screws.



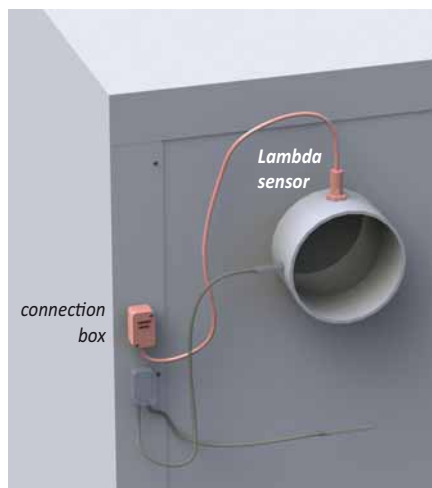
When demounting the lambda servo motor with the air blind you have to take care that the air blind is as close to the boiler body as possible when installing it again.

Push the shaft as far as it goes to the boiler body.



Lambda sensor (only with HVS LC)

The HVS LC boiler has an integrated lambda sensor in the flue outlet.
The connection is made by the connection box at the boiler's backside.

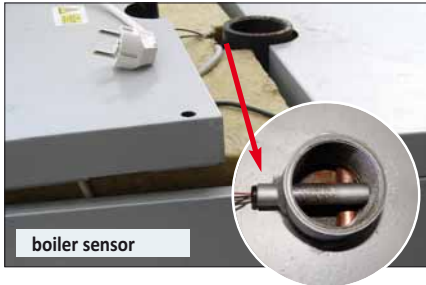


Position the draft bar during heating phase is „normal heating mode”/”close”.

An open exhaust gas damper may harm the lambda sensor when touched by the flames.

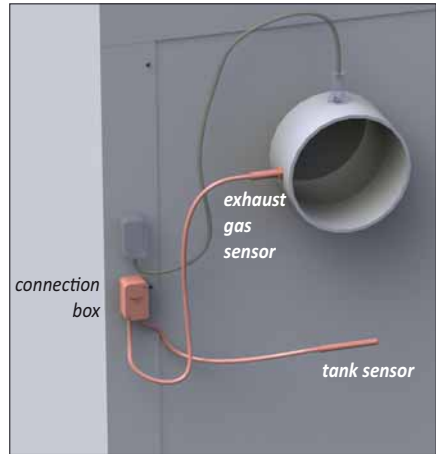
Sensor

PT1000/600 sensors are used for the recording of the boiler, exhaust gas and tank temperature.



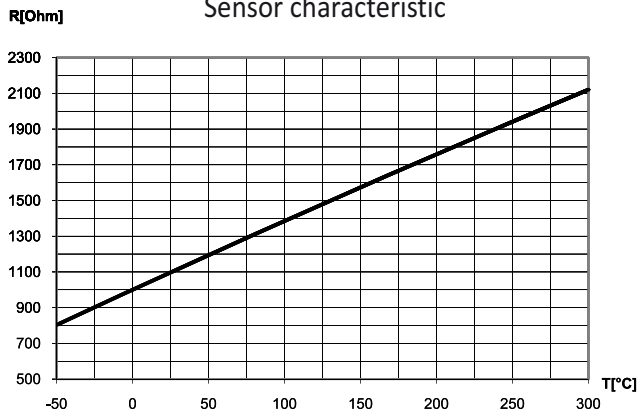
position of the boiler sensor (in the boiler flow line)

When removing the front top plate you have to unscrew the 2 self-cutting screws at the front. Afterwards remove the caps which are located in the corners of the front plate with a slotted screwdriver. Underneath the caps are self-cutting screws which only should be loosened. Pull the front plate approx. 2 cm to the front and then tilt it carefully to the front.



Disconnect mains supply before removing the boiler casing.
Never touch conducting devices – danger to life exists!

Sensor characteristic



Safety temperature limiter - STB

The boiler is equipped with a safety temperature limiter.



sensor of the safety temperature limiter STB in the boiler flow line

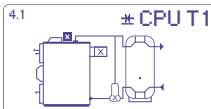


unlocking device of the STB

Mode of operation when the boiler is overheated:

The STB is released when the boiler is overheating.

The control panel displays the following warning:



additionally the LED is RED

The forced draft fan is going to be deactivated, the boiler circuit pump (Laddomat) is activated, the boiler shuts off [OFF] and a starting of the boiler is impossible.

Mode of operation for starting the boiler again:

The safety temperature limiter can only be unlocked manually after the boiler temperature falls below the set „boiler maximum temperature“. Remove the black safety cap of the STB and press the green release knob.

By pressing the „ENTER“ key afterwards the control unit is returning to the main menu again, the error message disappears.

Now the boiler can be operated again.

Exhaust gas turbulators



The exhaust gas turbulators can be inserted into the exhaust gas heat exchangers, like demonstrated in the picture.

**Number of turbulators needed:**

HVS 16 to 40	6 turbulators
HVS 60	16 turbulators
HVS 100	24 turbulators



When heating with very resinous wood and/or with scrap wood the turbulators should not be installed

Cleaning the fuel chamber

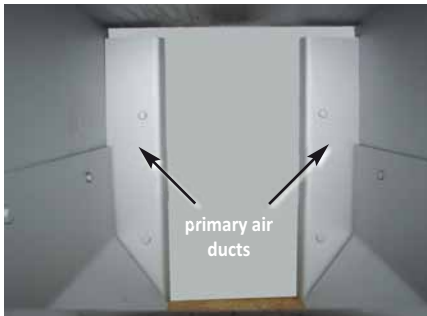
With an optimal combustion and when the minimal temperature of the return line water is kept at 72°C the fuel and combustion chamber and the heat exchangers will be contaminated to a minimal extend.

Only clean the boiler when cooled down.

Cleaning the fuel chamber

The formation of tar in the upper fuel chamber is a normal process. Already after the first heating tar layer forms itself at the walls of the fuel chamber. You do not have to remove this tar layer, it does not affect the boiler performance. Never try to remove this tar layer mechanically (e.g. by scarping with a putty knife, etc.) because this might cause a damage at the boiler walls.

If there is a large amount of ash in the fuel chamber, that cannot slide through the nozzle this as has to be removed.



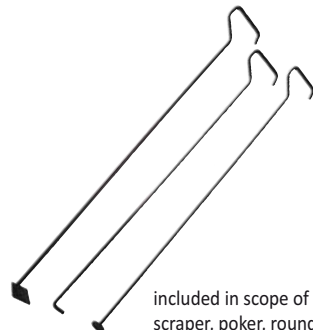
A new combustion chamber



Combustion chamber after several days of operation. The formation of tar is absolutely normal and is going to be burned off again during the regular heating.



Attention - danger of burns!
Only clean boiler when cooled down!



included in scope of delivery:
scraper, poker, round scraper

Cleaning the heat exchanger

When operating the boiler without turbulators it is recommended to clean the boiler's pipe system at least once a month; when operating it with turbulators a weekly interval is necessary.



The boiler has to be cooled down when cleaning it.
Take care of good air ventilation during the cleaning process (dust formation).



1 Remove the casing of the heat exchangers
(without tools).



2 Loosen the cover of the heat exchangers
(flat wrench n°13).



3 Clean the heat exchangers with the round scraper.
In order to clean the heat exchanger pipes the turbulators have to be removed. Put the turbulators back in place after cleaning.



A weekly cleaning interval is necessary when operating the boiler with turbulators.
Depending on the degree of dirt the cleaning interval might be extended.



Attention - risk of burns! Only clean the boiler when cooled down!

Cleaning the primary and secondary air ducts

The aeration is one of the most important premises for a perfect combustion. The primary and secondary air ducts should be cleaned at least once a season. By dismantling the fan casing and the fan's assembly group the way to the air ducts is cleared. The air ducts have to be cleaned with a vacuum cleaner. Afterwards the air permeability has to be tested.

After cleaning the HVS LC boiler the position of the air blind has to be checked when installing it again, [see chapter: \[Maintenance\] Lambda servo motor and air blind](#)

With the HVS E boiler the secondary air settings have to be checked and maybe readjusted, [see chapter: \[Maintenance\] Adjusting the secondary air](#)



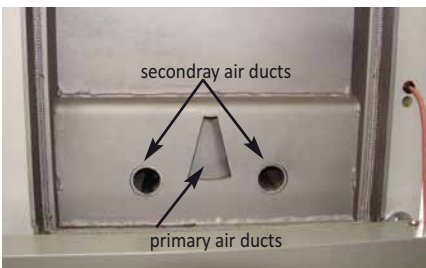
Disconnect boiler from the mains supply before removing the forced draft fan.
Never touch conducting devices – danger to life exists!



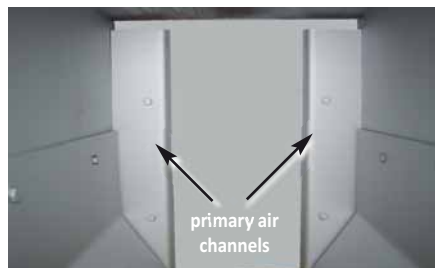
- 1 Release the screws of the fan casing and remove the cover.



- 2 Disconnect the electrical connections. Release the screws of the assembly group and remove the plate together with the forced draft fan. Take care that the seals reside correctly when reinstalling it again.



- 3 Clean the primary and secondary air ducts with the vacuum cleaner



- 4 If the mouthpieces of the primary air ducts are blocked they have to set free again. Check if air is coming out of the primary air ducts (with compressed air). If the primary air duct is blocked it can be demounted and cleaned. Test on operability after reinstalling.

Exhaust gas measurement

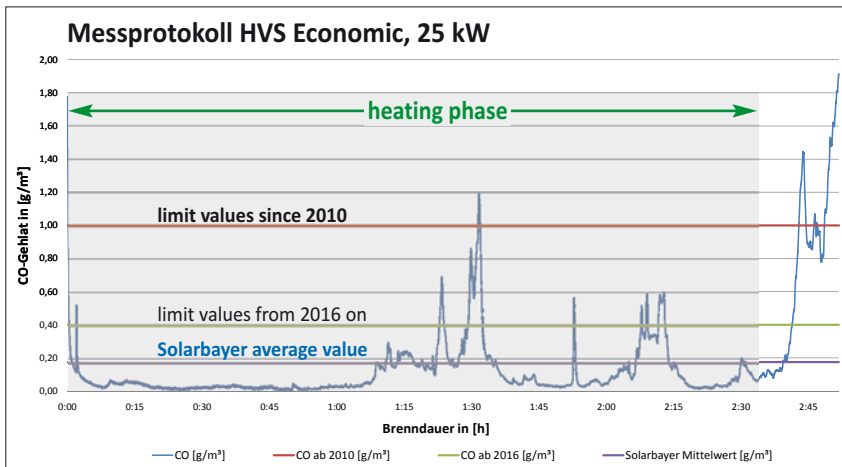
Please pay attention to the following aspect for the exhaust gas measurement:

1. clean the boiler approx. 3 days before the measurement
2. maybe increase the exhaust gas temperature (forced draft fan should run on full power, 100%)
3. the buffer tank has to have enough heat capacity, thus, open all mixing and radiator valves
4. use dry, all-natural hard- and softwood in good quality with a max. residual moisture of 10–20%, the log length has to correspond to the length of the fuel chamber, edge length approx. 8x14 cm
5. heat up the boiler approx. 1,5 - 2 hrs before the measurement to create a firebed only fill the boiler half-way and put more logs in when necessary
6. compress the firebed
7. put wood logs on the firebed, fill the fuel chamber
8. wait for about 10 minutes
9. start with the measurement



The exhaust gas measurement has to be carried while the boiler is operating in full load. The forced draft fan has to run on full power (100%).

The sensory determined value at the boiler corresponds to the average value of the exhaust gas. Thus, it is possible that the temperature during the measurement in the core stream of the exhaust gas might be higher.



The test record displays the heating phase. Pay attention to the fact the a firebed has been created over a period of 1,5 hrs before the heating phase. The exhaust gas measurement by the chimney sweeper has to take place during the heating phase. During the heating phase the carbon monoxide value is at its lowest point (see diagram above). This is why the measurement has to take place during the heating phase.

Maintenance instruction

To guarantee a permanently safe and proper operation of the boiler the following service notes have to be regarded.

The operator is responsible for regular checks and the maintenance of the boiler. During operation it is necessary to check the system pressure, the sealing of the doors, the tightness of all boiler components and the proper operation of the fan.

Tightness of boiler doors:

The boiler doors are stabilized at three points, at two hinges and at the closing. If the boiler door shows a leakage it is possible to lock the closing and readjust the angle. By loosening and readjusting the counter nut, the screw of the hinge can be turned and the door can be adjusted.

Tightness of the exhaust gas damper:

When cleaning the heat exchangers you also have to clean the start-up flap to guarantee a tight closing of the flap. A leak might lead to an decrease in boiler performance.

Operation of the forced draft fan:

The most important premise for the proper operation of the fan is a clean and dust-free environment. This has to be taken care of.

Wear parts:

- refractory nozzle
- sealing for boiler doors
- sealing for cleansing lid
- combustion chamber
- turbulators
- all flame-swept parts

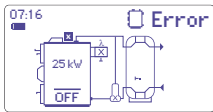
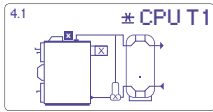
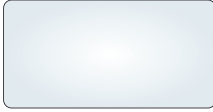
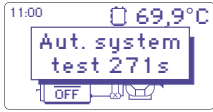
Service notes:

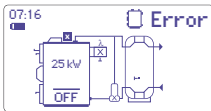
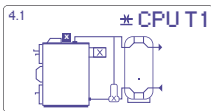
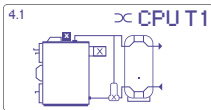
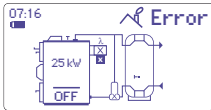
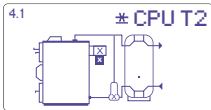
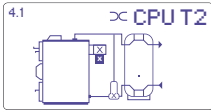
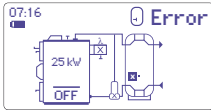
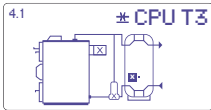
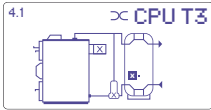
- hinges and moving parts have to be greased regularly
(copper paste, temperature resistant up to approx. 1100°C, order n°: 3300009)
- fan and air ducts have to be cleaned in yearly intervals
- pressure nipples of the thermal discharge safety valve have to be checked in yearly intervals
- safety devices have to be checked regularly
- regular boiler cleaning intervals, depending on necessity

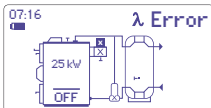
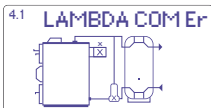
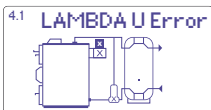
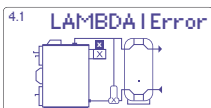
Trouble shooting

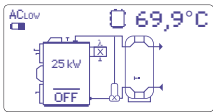
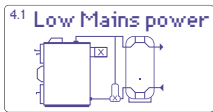
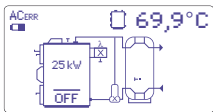
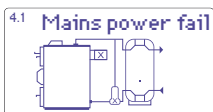
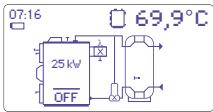
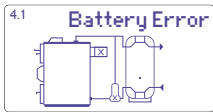
Problem	Possible reason	Solution
Power drop of the boiler, boiler does not burn although the fan runs with 100%	Boiler is extremely dirty Nozzle is broken The moisture content of the fuel used is too high, wrong log length Primary air ducts are blocked due to wood that is too moist	Clean the boiler Check nozzle, exchange if necessary Use dry wood, adjust log length Check primary air ducts and clean them see chapter: [Maintenance] Cleaning...
After having closed the damper the boiler burns for a little while and then only smokes	Secondary air adjustment is incorrect The moisture content of the fuel used is too high, wrong log length	Check secondary air adjustment Check if the damper (explosion flap) of the forced draft fan opens Adjust log length
After closing the door smoke escapes through the door sealing	Hinge adjusted incorrectly Sealing is broken	Adjust door see chapter: [Maintenance] Doors turn around or replace sealing
The damper does not open	The damper is covered with tar The moisture content of the fuel used is too high, wrong log length	Adjust the boiler, exhaust gas and switch off temperature to the Solarbayer settings. Adjust log length
Smoke comes into the boiler room after opening the damper and the fuel chamber door	Low chimney draft	The chimney has to match the technical requirements (chapter „Technical Data“) Retrofit an exhaust gas fan Install a barometric damper
Deformation of the steel tank Cracks in lining		No defect
Forced draft fan does not work	Starting capacitor is broken STB has released No power supply	Replace capacitor Unlock STB Check operability see chapter: [Operation] Expert level
Boiler switches off after heating up	Wrong temperature set as boiler switch off temperature	Set parameters correctly see chapter: [Operation] Basic menu
Boiler does not switch off	Boiler switch off temperature is set too high	Set parameters correctly see chapter: [Operation] Basic menu
Boiler circuit pump (Laddomat) does not operate	No power supply Fuse F1 on the control board is broken Control board (AK 3000 S) is broken	Check fuse and replace when necessary replace control board (AK 3000 S)

Error message

Error message	Cause / solution
<p>maximum boiler temperature</p>  <p>LED is red</p> <p>additional safety function:</p> <ul style="list-style-type: none"> - boiler circuit pump is activated - forced draft is deactivated 	<p>- boiler temperature has exceeded the maximum temperature</p> <p>When the boiler temperature falls below the max. temperature the boiler will automatically return to heating mode again</p>
<p>Safety temperature limiter</p>  <p>LED is red</p> <p>additional safety function:</p> <ul style="list-style-type: none"> - boiler circuit pump is activated - forced draft is deactivated - boiler turns off [OFF] - starting the boiler is not possible 	<p>- boiler overheating</p> <p>- safety temperature limiter has released</p> <p>After falling below the set boiler max. temperature the STB can be released manually. Remove the black cap of the STB and press the green release button.</p> <p>Afterwards the control unit is reset by pressing the „ENTER“ key, the error message disappears.</p> <p>The boiler can now be started again.</p>
<p>No display</p> 	<p>- power blackout, power cable removed or broken</p> <p>- fuse F2 on the control board (AK 3000 S) broken</p> <p>- control board (AK 3000 S) or control unit (AK 3000 D) broken</p> <p>Check cables and contacts</p> <p>Check fuse F2 on the control board (AK 3000 S) and replace when necessary</p> <p>Replace control board (AK 3000 S) or unit (AK 3000 D)</p>
<p>Service message</p> 	<p>routine check (summer mode)</p> <p>In order to maintain the operability of the electrical components over a longer period of idleness the boiler initializes a service check each Sunday at 11:00 am. This process which only takes a couple of minutes will only take place when the boiler is [OFF] at this moment. After having finished the check the control unit will automatically return to the initial function.</p> <p>Older software version show: [SERVICE]</p>

Error message	Error identification	Cause/solution
error boiler sensor  LED is red additional safety function: <ul style="list-style-type: none"> - boiler circuit pump is activated - boiler switches off - starting the boiler is impossible 	boiler sensor disconnected 	- disconnection in sensor circuit check contacts check resistance of sensor replace sensor when necessary
	short circuit of boiler sensor 	- short circuit in the sensor circuit check contacts check resistance of sensor replace sensor when necessary
error exhaust gas sensor  LED is red additional safety function: <ul style="list-style-type: none"> - boiler circuit pump is activated - boiler switches off - starting the boiler is impossible 	exhaust gas sensor disconnected 	- disconnection in sensor circuit check contacts check resistance of sensor replace sensor when necessary
	short circuit of exhaust gas sensor 	- short circuit in the sensor circuit check contacts check resistance of sensor replace sensor when necessary
error tank sensor  LED is red	tank sensor disconnected 	- disconnection in sensor circuit check contacts check resistance of sensor replace sensor when necessary
	short circuit of tank sensor 	- short circuit in the sensor circuit check contacts check resistance of sensor replace sensor when necessary

Error message	Error identification	Cause/solution
<p>error lambda sensor</p>  <p>LED is red</p>	<p>communication error</p> 	<p>- communication between control board (AK 3000 S) and lambda board (AK 3000 L) incorrect</p> <p>check plug-in connections and replace communication cable when necessary, replace control or lambda board (AK 3000 L)</p>
	<p>no electric tension</p>  <p>LED is red</p> <p>error message is not displayed when boiler is [OFF]</p>	<p>- power supply of the lambda board (AK 3000 L) is interrupted</p> <p>Check fuse F1 at the lambda board (AK 3000 L), replace when necessary</p> <p>Check plug-in connections of the lambda board (AK 3000 L), replace board (AK 3000 L) when necessary</p>
	<p>lambda heating defect</p>  <p>LED is red</p> <p>error message is not displayed when boiler is [OFF]</p>	<p>- power supply of the lambda sensor heating is interrupted</p> <p>Check plug-in connections to the lambda sensor, replace lambda sensor or board (AK 3000 L) when necessary</p>

Error message	Error identification	Cause/solution
<p>power supply voltage too low</p>  <p>LED is red</p>	<p>voltage too low</p> 	<p>Get power supply voltage checked by an electrician</p>
<p>critical power supply voltage</p>  <p>LED is red</p>	<p>voltage swing</p> 	<p>Get power supply voltage checked by an electrician</p>
<p>battery status</p>  <p>LED is red</p>	<p>battery empty</p> 	<p>replace battery only with HVS LC</p>

Maintenance report

We recommend a yearly maintenance carried out an authorized specialist in accordance with the valid safety and technical regulations. So that the boiler system is in accordance with the most recent state of the technology at all times.

Stamp:

Date / Signature

Stamp:

Date / Signature

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Declaration of conformity

We herewith declare on our own responsibility that the following products answer the momentarily valid European Directives and Regulations



Product: Wood log boiler HVS
Type: HVS 16^{LC},
HVS 25^E, HVS 25^{LC}
HVS 40^E, HVS 40^{LC}
HVS 60^E, HVS 60^{LC}
HVS 100^E, HVS 100^{LC}

Manufacturer: SOLARBAYER GmbH

Directives and regulations used:

machinery directive 2006/42/EG
DIN EN 303-5
EMV directive 2004/108/EG
directive 97/23/EG
directive 2006/95/EG

Pollenfeld, 01.04.2012

Kraus Martin
Geschäftsführer Solarbayer GmbH

Manufacturers Declaration

The Solarbayer wood gasification boilers type HVS E Economic and HVS LC Lambda Control are designed solely for the use of timber based biomass fuels. Seasoned logs are the preferred biomass fuel type. The Solarbayer wood gasification boilers are not suitable for the combustion of fossil fuels including oil or solid fuels such as coal or smokeless ovoid coals. The use of any fuels other than timber based biomass fuel will void the manufacturer warranty.

Kraus Martin

Geschäftsführer Solarbayer GmbH



We develop for your future

Storage systems

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Wood log boiler

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