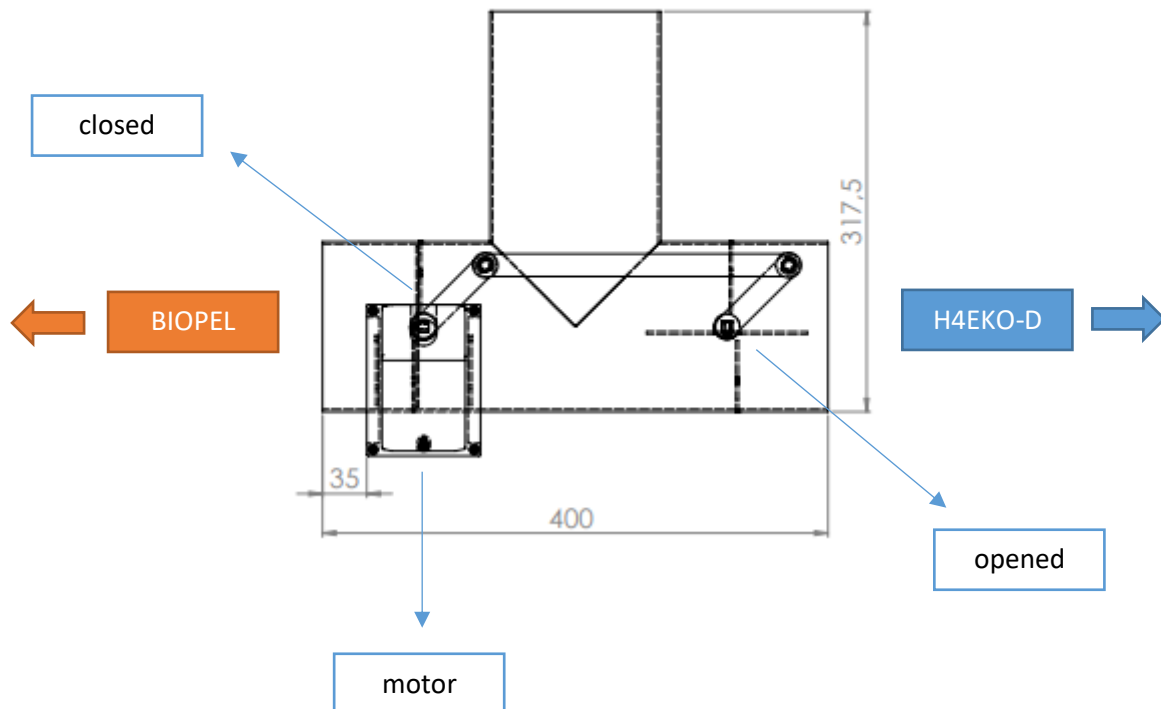


BIOPEL KOMBI

- The T-piece serves as a connection point for the flue of Biopel and H4 eko-D boilers
- Both boilers are controlled by the Biopel v9 combi unit which is mounted on the Biopel boiler
- A motor is placed on the T-piece, which rotates the flaps in the T-piece by 90°, which causes that 1 flap is always in the closed position and the 2nd flap in the open position.

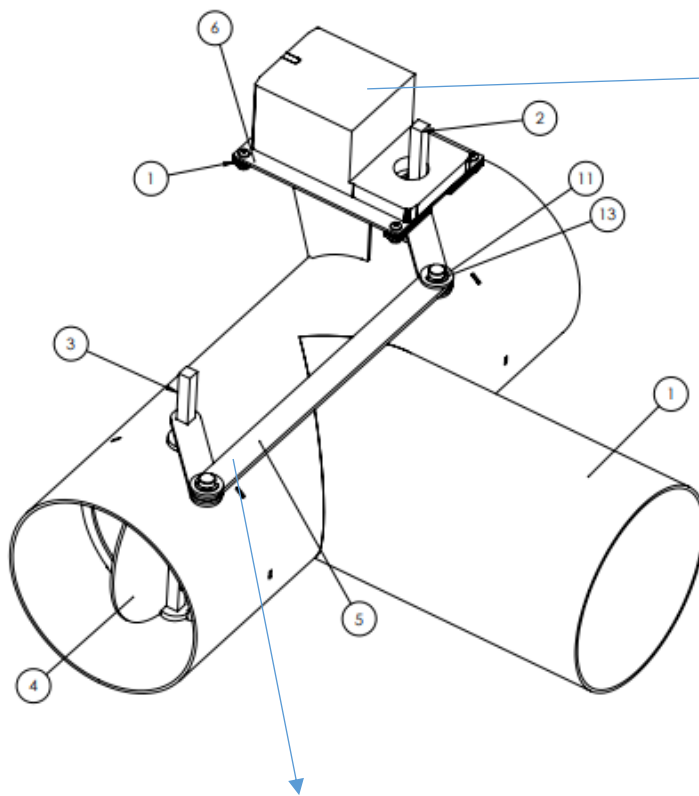


Flue gas connection diagram



- The dampers are controlled by the Belimo motor, which is controlled by the boiler control unit according to the set heating mode.
- There are 3 heating modes:
 - Pellets: when entering "pellet heating", the motor moves to the position where the flap on the Biopel side is open and the flap on the H4EKO-D side is closed. The flue gas flow is thus directed from the Biopel to the chimney and at the same time the flue gas path to the H4EKO-D is prevented.

- Wood: when entering "wood heating", the motor moves to the position where the flap on the Biopel side is closed and the flap on the H4EKO-D side is open. The flue gas flow is thus directed from H4EKO-D to the chimney and at the same time the flue gas path to the Biopel is prevented.
- Automatic transition: when entering "automatic transition", the motor moves to the position where the flap on the Biopel side is first closed and the flap on the H4EKO-D side is open. The user manually ignites the wood in the H4EKO-D chamber. The control unit monitors the flue gas temperature at the H4EKO-D outlet. The flue gas temperature first rises after being ignited by the wood and is then kept between 90 and 130 °C. As soon as the wood in the H4EKO-D hopper starts to burn, the flue gas temperature at the H4EKO-D outlet starts to drop. As soon as the flue gas temperature drops below 30 °C, the pellets in the Biopel boiler are automatically ignited. Before igniting the pellets, the motor moves to the second limit position, which means that the flap on the Biopel side will be opened and the flap on the H4EKO-D side will be closed.

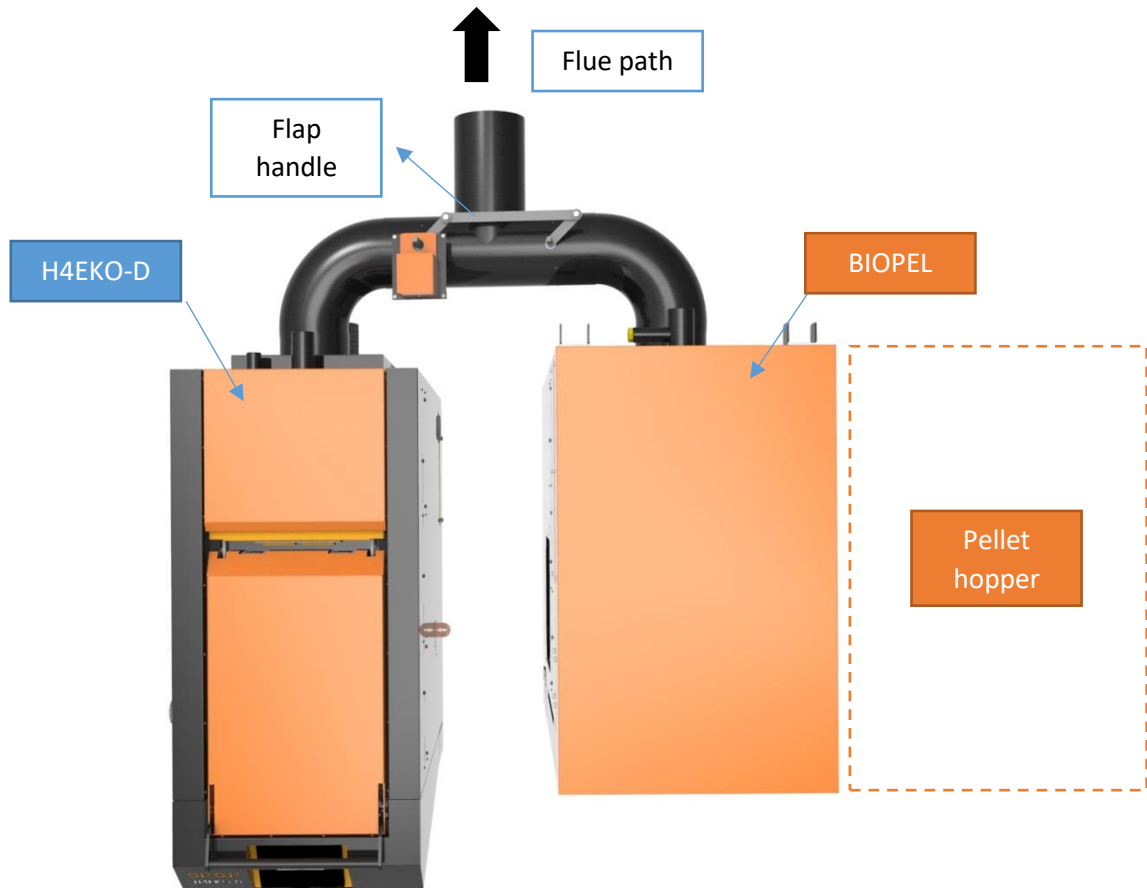


motor

1	T-piece with motor holder
2	Moving handle for the flap 1
3	Moving handle for the flap 2
4	Flap

The motor moves both flaps at the same time. He opens one and closes the other at the same

- The control unit contains 2 flue gas temperature sensors. One controls the temperature on the outlet side of the Biopel, the other controls the flue gas temperature on the H4EKO-D side.
- If the flue gas temperature on one of the branches is higher than 35 °C, this branch will not be closed for safety reasons. Even in manual mode or by selecting another type of ignition, see above - heating modes.



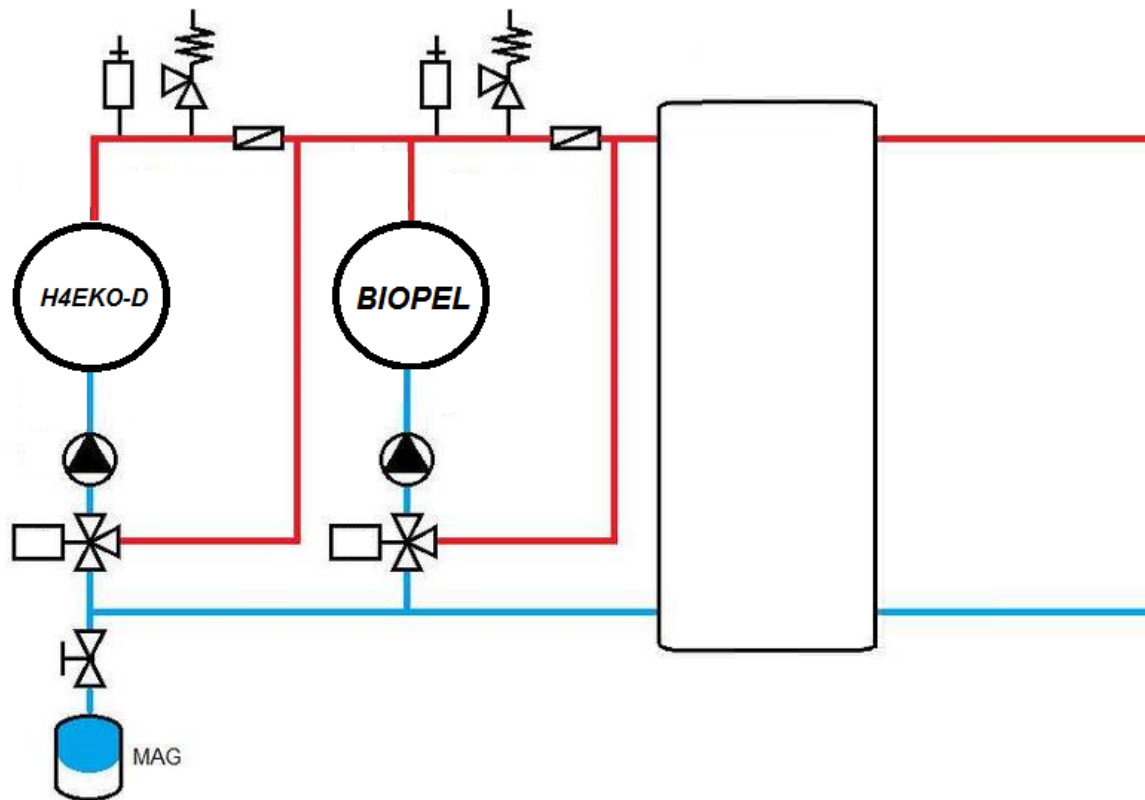
The connection of the boilers is predetermined. Biopel pellet boiler on the right side and wood boiler H4EKO-D on the left side.

The heating system is then controlled by one control unit, which operates the following processes:

- Combustion of pellets in automatic operation (Biopel)
- Burning of wood in automatic operation (H4EKO-D)
- Flap position control according to the type of heating
- Control of pumps and valves of heating circuits, temperatures in the buffer tank and hot water heating.
- Boiler return water temperature control



Hydraulic connection



Each of the boilers has its own primary circuit, which includes a mixing / thermostatic valve and a circulation pump. The primary circuits ensure the required return water temperature so that the boiler does not cool with the return water and condensation can occur, which could damage the steel weldment of both boilers.

Thanks to the fact that there are 2 primary circuits, one for each boiler, we can set the desired temperature on each boiler separately using the control unit of the boiler.

The recommended return temperature for the H4eko-D boiler is 65 ° C, for the Biopel boiler 55 ° C. The boiler control unit can control 2 mixing valves in the basic configuration, therefore it is possible to connect both valves, including pumps, and directly control it with the v9 combi control unit.

Secondary circuits can also be operated using this control unit. If one or more mixing valves are used in the system on the secondary side, these can be controlled using additional modules marked 431N.

Hot water heating, maintaining the temperature in the buffer tank are also controlled in the standard way using the v9 combi unit. In addition, it can be connected to an Internet interface that allows you to monitor the entire system online on your PC or mobile phone.

Heating modes

1. Wood heating

When wood heating is activated, the exhaust fan of the H4eko-D boiler is activated. The flue flap rotates to the pellet position - closed / wood - open. Indicated by a mark on the T-piece. The user manually heats the wood. The flue gas temperature rises above the heating limit, which is 50 °C. At this point, the boiler switches from ignition mode to PID operation.

The wood burns and the unit modulates the fan speed so that the boiler temperature does not exceed the desired temperature set by the user.

If the required boiler temperature is reached, the boiler switches to the attenuation mode when the fan is deactivated and reactivated for a few seconds at regular intervals. After the boiler has cooled down and the flue gas temperature has fallen below 50 °C, it is indicated by flue temperature that the boiler can be refilled.

If the temperature drops below 35 °C, the boiler reports that it is extinguished and it is possible to fill it again with wood or to select another operating mode.

2. Automatic transition from wood to pellets

First, wood heating is activated. The user ignites the wood by hand as described above. After the wood burns out and the flue gas temperature drops on the H4eko-D boiler side, the pellets are automatically ignited. The pellet boiler works according to the set boiler temperature or until it is deactivated by the room thermostat.

The flue flap rotates according to the active heating mode, ie first wood heating (pellets - closed / wood - open) and then pellet heating when the flap rotates to the opposite position (pellet - open / wood - closed).

3. Pellet heating

When the pellet heating is activated, the pressure fan of the Biopel boiler is activated. The flue flap rotates to the pellet position - open / wood - closed. Indicated by a mark on the T-piece.

The boiler automatically ignites the pellets and keeps the flame in the boiler until the required boiler temperature is reached or the heating system is switched off by the room thermostat.

To change the heating mode, the user first presses the switch-off button so that the pellets burn out and can then activate any other operating mode.

If you activate wood heating right after you switch the pellet heating off. The controller won't allow you to activate wood heating till the flame from Biopel pellet boiler disappear. The when the fotosensor on the burner stops to detect the light you can activate wood heating mode with H4EKO-D.