Operating and Assembly Manual

Control Panel 212
for the
KÜNZEL
Wood Gasification Boiler

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1 Operating and installation instructions for the Control Panel 212

1.1 General advice concerning the operating

Before using the control panel, please read the manual carefully and keep it within reach. Don't pass the control panel on to others without the manual. The producer isn't liable in cases of wrong handling or of use for divergent purposes. The device has been designed according to safety regulations. The improper use can cause damage to persons and property. The Control Panel 212 is made for KÜNZEL wood gasification boilers type HV and HV-S only.

Divergent use of the control panel is at your own risk. The producer is not liable for damage caused by wrong handling or improper use. The correct application of the control panel is the responsability of the installation company. In case you have any questions, please ask your heating technician.

Unauthorized persons, especially children, should not have access to the control of your heating system. Don't let children touch the control panel or the boiler when heating is in process.

Caution! Danger of burning! The boiler produces very high temperatures! Don't leave the control panel and the boiler unattended while running. The control panel must be installed with suitable tools and by experts only. Wrong installation can cause severe problems and even lead to the destruction of the device.

Before connecting up the control panel check it's electronic data (voltage and frecuency). It has to coincide with your electricity supply. In case of doubts, please ask your electrician.

Don't pull the plug of the control panel when it is switched on, it has to be switched off beforehand. To avoid touching electric parts, use the control panel only when mounted to the boiler.

Electrical safety and protection of malfunction and faults are given only if the control panel ist connected to a protection ground according to the regulations. In case of doubts consult an expert on electrical installations. The producer is not liable for damage or malfunction caused by missing or interrupted protection ground.

The Control Panel 212 must be opened by the producer or by authorized KÜNZEL customer service personnel only.

1.2 Manual

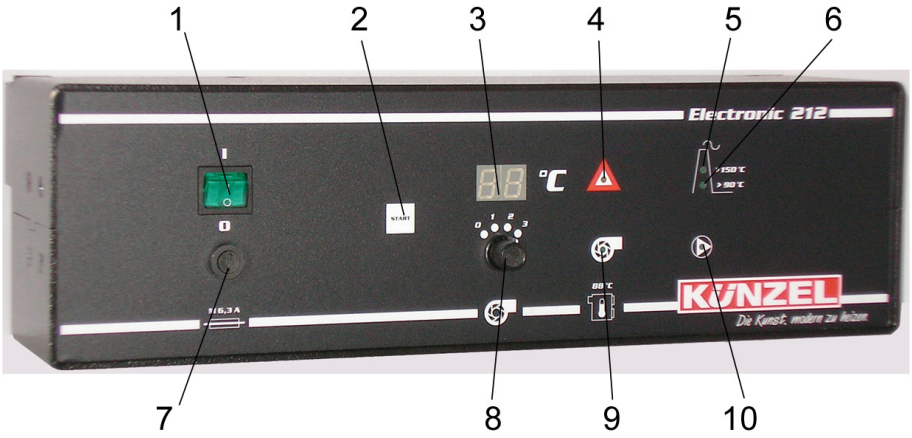

Figure 1: Control Panel 212

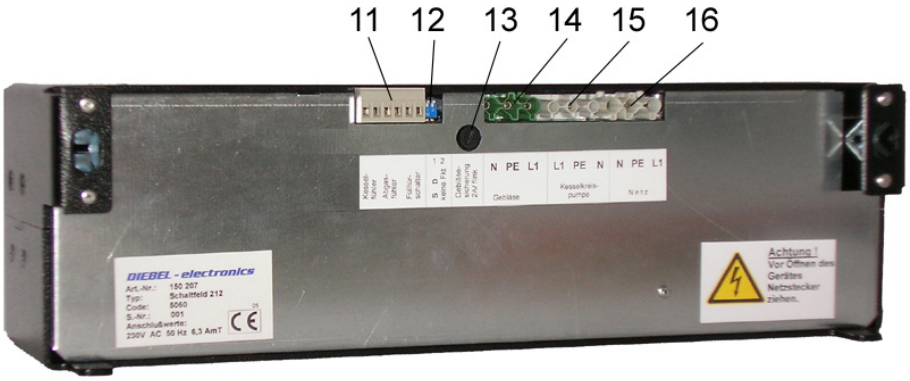

Figure 2: Control Panel 212, back

1. ON / OFF switch
2. START button
3. Temperature display
4. LED Upper door open
5. LED Exhaust gas temperature above 90°C
6. LED Exhaust gas temperature above 150°C
7. Main fuse 6,3 amp
8. Regulator for fan reduction

9. LED for fan activity
10. LED boiler circulation pump working
11. Multi connector for sensors and door contact
12. DIP switch
    1 Switch for waste gas fan / non waste gas fan
    2 Without function
13. Fan fuse 2A/fast
14. Fan
15. Boiler circulation pump
16. Network

The electronic Control Panel 212 for the KÜNZEL wood gasification boiler HV offers all functions necessary for the control of a wood gasification boiler and boiler circulation pump.

1.3 Settings

The Control Panel 212 has got one regulator at the front as well as one DIP switch and one potentiometer (to be handled with a screwdriver) at the back. With these actuators it is possible to change the most important parameters of the control panel.

1.3.1 Type of Fan

Before using the control panel for the first time, please set the type of fan with switch [12]. The Control Panel 212 usually is preset for the use of a normal (non waste gas–) fan (position „D“) . Thus, if your wood gasification boiler is equipped with a waste gas fan, the switch has to be moved to position „S“.

1.3.2 The target temperature of the boiler

The target temperature of the boiler is fixed at 87°C and can’t be changed.

1.3.3 Setting the fan reduction

To optimize the efficiency of the boiler and to avoid smouldering fire, the Control Panel 212 can reduce the rotational speed of the fan. Always if the parameters described as follows below are fulfilled, the Control Panel 212 reduces automatically the rotational speed of the fan and, at the same time, the output of the boiler.
The reduction offers 4 alternative grades. „0“ stands for no reduction and „3“ means maximum reduction. If the exhaust gas temperature exceeds 180°C the control panel will work automatically on maximum fan reduction, no matter what fan reduction level has been chosen at regulator [8].

2 Description of functioning

2.0.4 General functioning

Switch the Control Panel 212 on with the ON / OFF switch, prepare the wood gasification boiler according to the manual and light the fire.
As soon as the firebed is thick enough, put on wood according to the manual, close the upper door and press the START button. The fan starts running continuously now.
If the waste gas temperature exceeds 90°C the control panel switches from the operation mode „Star “ in into the operation mode „Activity“and the boiler circulation pump starts running.
If the boiler temperature nearly reaches 87°C (about 5°C below) the fan reduction is activated, indicated by the flashing of lamp [9]. How much the rotational speed of the fan is beeing reduced, depends on regulator [8]. There are four different possible grades of reduction: „0“ stands for **no** reduction.
The fan reduction will be activated as well, if the exhaust gas temperature exceeds the value necessary for the nominal output of the boiler. This helps avoiding unnessecarily high exhaust gas temperatures and lowering of the boiler efficiency. As well burner parts wear out less. In case the boiler temperature exceeds 87°C in spite of fan reduction, the fan stops and you can hear a sound signal. If then the temperature falls below 85°C, the fan starts again and the sound stops.
If the exhaust gas temperature stays below 90°C for longer than 15 minutes, the control panel switches to the operation mode „burn–off“ and turns off the fan and the boiler circulation pump. If this happens while loading the combustion chamber with fire wood, the control panel has to be restarted afterwards by pressing the START button.

2.1 Fan control

2.1.1 System with waste gas fan

If your boiler works with a waste gas fan, you have to put the DIP–switch [12] at the back of the control panel in position „S “.This type of fan then doesn’t stop if the upper boiler door is being opened. In case the fan stands still because it just hasn’t been turned on yet or because the boiler target temperature has been exceeded, the fan will be started when you open the door to avoid deflagration. Attention: With boiler temperatures above 90°C the fan won’t start running even if the door is open.
If you open the upper door of the boiler, the waste gas fan - if running at reduced rotational speed - will start running at full speed as long as the door is open.
Important: If DIP-switch [12] is set to operation mode „waste gas fan“ , the heat–up flap mustn’t kept open for longer than one minute.

2.1.2 System with „normal“ (non waste gas) fan

This type of fan stops running as soon as you open the upper boiler door. To support the process of heating up you can switch on the fan for a short time, even if the door is open. Just push the START button and stay with your finger on there.

2.2 Boiler circulation pump

The boiler circulation pump starts if the exhaust gas temperature exceeds 90°C, and stops again if the exhaust gas temperature falls below 90°C and stays there for more than 15 minutes.
In case that the boiler temperature exceeds 90°C the boiler circulation pump will work as long as the temperature stays above 90°C (Hysteresis 2°C).

2.2.1 Electrical power outage

In case of an electrical power outage the control panel reacts as follows:
After the electrical power has been restored, the fan starts running again due to the still high exhaust gas temperature. The control panel starts automatically.
During an electrical power outage may occur the development of large amounts of carbonization gas inside the boiler.

2.3 Assembly instruction

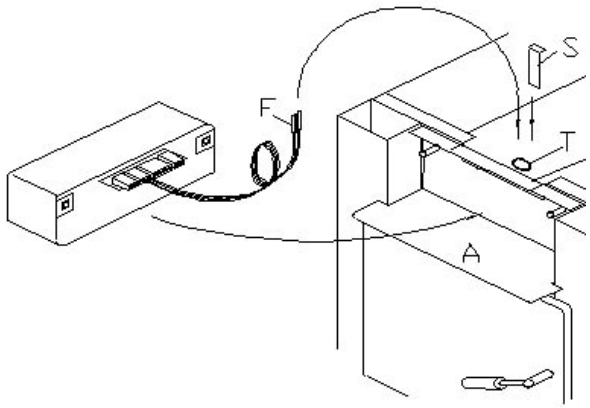

Figure 3: Mounting of the control panel

2.3.1 State at delivery

The Control Panel 212 comes enclosed in an environment–friendly cardboard box. Inside you find the necessary mating plugs for the network (white plug) and for the boiler circulation pump (white socket). A boiler sensor with a cable of 0,7m lenght is included as well.
The contact for the fan is ready for use. It has only got to be connected to the control panel. All plugs are encoded and not interchangeable. The cables for the upper door switch and for the exhaust gas sensor have to be joint with the according contacts of the sensor terminal. Make sure that all contacts fit well and that no bits of insulation get in the way.

2.3.2 Assembly

The relevant regulations for electrical installations have to be observed. The electronics must be mounted by professional electricians only. Use cables resistant to permanent high temperature of at least 120°C inside the boiler. We recommend the use of silicon cables. The control panel has to be connected to earth and in-phase. An emergency heating switch outside the heating room as well as protection by fuses with 10 A is obligatory. We recommend the use of a fault current protection switch.

For mounting the control panel, take the top part of the red casing off the boiler. Above the upper door you find a shiny aluminium reflector. For mounting the control panel you have to break the upper middle part of it out of the perforation or fold it backwards. Take off the white plastic foil completely. When delivered, you find inside the immersion shell (T) a tension spring (S), which has to be taken out. **Careful:** The immersion shell is located between the lifting lug and the nozzle for the flow and is welded to the boiler.

The sensors should be placed into the immersion shell that way that they keep to the wall of the shell with light pressure. Fit in too loosely they've got a bad heat transfer which leads to hook-up errors. For optimal switching exactness we recommend filling the immersion shell with thermally conductive paste or thermo-oil.

Caution: Conductions for sensors, network and consumer loads have to run separately.

Important: For working at the sensors the control panel has to be disconnected at all poles.

Attention: Before working at the electricity network, take out the fuse! Extreme danger!

Power cable and pump cable are connected according to the applied hydraulic of the installation.

After connecting all plugs and sensors with the control panel, push it carefully onto the fastening nuts until it snaps in. Now close the casing of the boiler again. The control panel is ready for use.

3 Technical data

3.1 Electronic data

Supply voltage	50 Hz, 230 Volt
Power consumption without consumer load	10 VA
Fuse	6,3 A, medium slow, ICE–127–2–4 DIN 41668
Relais exits	4 A inductive at 230 Volt 50 Hz

3.2 Sensors

For the boiler sensor KTY 81 semiconducting sensors are applied. 0°C to 120°C correspond to 815 Ohm up to 1900 Ohm.

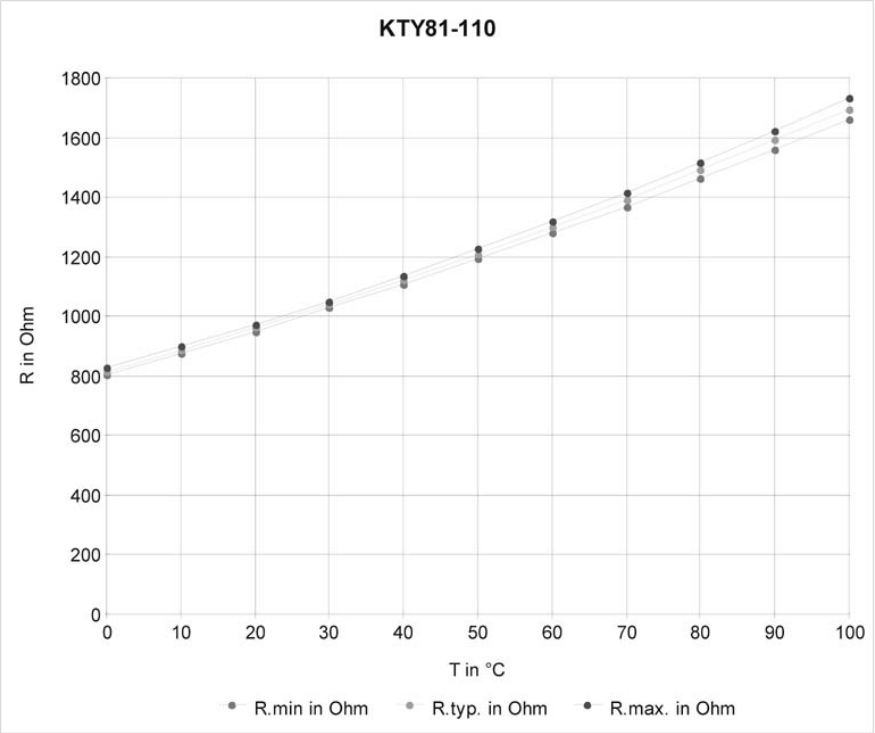

Figure 4: KTY81 Values of resistance

4 Alarm messages

If the temperature at one of the sensors exceeds the allowed limits, both decimal points light up. Please check the corresponding sensor.