OPERATING INSTRUCTIONS

Wood chips & pellets heating system

firematic

20-60
80-101
130-201
249-301
349-499

INTRODUCTION

Dear Customer!

Your heating system is powered by a HERZ firematic boiler system and we are pleased to be able to count you as one of our many satisfied owners of a HERZ system. The HERZ boiler is the result of years of experience and continuous improvement. Please remember that in order to be able to work properly, a well-designed product also needs to be operated and maintained correctly. We definitely recommend that you should read this documentation carefully while paying particular attention to the safety instructions. Compliance with operating procedures is required for any claims made under the manufacturer's warranty. In the event of any faults or defects, please contact your heating specialist or the HERZ Customer Service department.

Yours sincerely

HERZ – Energietechnik

Warranty / Guarantee (general information)

HERZ boiler systems come with a 5-year warranty on the boiler body, storage tanks and HERZ solar collectors. We generally guarantee freedom from defects of mobile objects purchased for a period of 2 years, to a maximum of 6.000 hours of operation. For non-moving purchased items, the guarantee is generally for a period of 3 years to a maximum for 9.000 hours of operation. Parts subject to wear are excluded from the warranty/guarantee. Furthermore, claims under warranty will not be applicable if there is no return flow temperature boost or it is not working properly, if commissioning[1] is not carried out by specialist personnel authorised by HERZ, in the case of operation without a buffer storage tank with a heating load of less than 70% of the rated output (manually stoked boilers must always be operated with a sufficiently dimensioned buffer storage tank), if hydraulic diagrams[2], not recommended by HERZ are used and if a non-prescribed fuel[3], Wood pellets for non-industrial use after ENplus, Swisspellet, DINplus or ÖNORM M 7135 resp. pellets after EN14961-2; Wood chips after EN 14961-1/4 according to the following specification: Property class A1, A2, B1 respectively G30, G50 according to ÖNORM M7133 resp. log wood is used.

Any claim to warranty services requires maintenance to be carried out on an annual basis by specialist personnel authorised by HERZ.

The general warranty period will not be extended if work is carried out under warranty. In the event of a warranty claim, the due dates for payments owed to us will not be deferred. We will only provide a guarantee if all the payments owed to us for the product supplied have been made.

The warranty will be carried out at our discretion by repairing the item purchased or replacing any defective parts, by exchanging the item or by reducing the price. Parts or goods replaced are to be returned to us at our request free of charge. Wages and costs paid out in connection with installation and removal are to be paid for by the purchaser. The same applies to all warranty services.

The Supplier shall under no circumstances be liable to the Customer, for any direct, indirect or consequential costs incurred by the Customer for works carried out on HERZ equipment.

Subject to technical modifications,

Version 04/2015

[1] Maintenance by the manufacturer

[2] Recommended hydraulic diagrams can be found in the installation manual while hydraulic balancing will be carried out by the heating contractor

[3] Furthermore, the quality of the heating water must be in accordance with ÖNORM H5195 (current version) or VDI 2035

TABLE OF CONTENT

1 SAFETY NOTES

- Before commissioning, please read the documentation carefully and pay attention to the safety instructions given in particular. Please consult this manual if anything is unclear.
- Make sure that you understand the instructions contained in this manual and that you are sufficiently informed regarding the way in which the biomass boiler system works. Should you have any queries at any time, please do not hesitate to contact HERZ.
- For safety reasons, the owner of the system must not make any changes to the construction or the state of the system without consulting the manufacturer or his authorised representative.
- Make sure that there is a sufficient supply of fresh air to the boiler room (please heed the relevant national regulations)
- All connections are to be checked before the commissioning of the system in order to make sure that they are leak-tight.
- A portable fire-extinguisher of the prescribed size is to be kept by the boiler room. (Please heed the relevant national regulations).
- When opening the door to the combustion chamber, make sure that no flue gas or sparks escape. Never leave the combustion chamber door open unattended as toxic gases may escape.
- Never heat the boiler using liquid fuels such as petrol or similar.
- Carry out maintenance regularly (in accordance with the maintenance schedule) or use our Customer Service department. (The minimum maintenance intervals specified in the TGPF are to be observed).
- When carrying out maintenance on the system or opening the control unit, the power supply is to be disconnected and the generally valid safety regulations are to be heeded.
- In the boiler room, no fuels may be stored outside the system. It is also not permitted for objects which are not required for the purpose of operating or carrying out maintenance on the system to be kept in the boiler room.
- When filling the fuel bunker using a pump truck, the boiler must always be switched off (this is stamped on the cover of the filling connection). If this instruction is not heeded, flammable and toxic gases may get into the storage room!
- The fuel storage room is to be protected against unauthorised access.
- Always disconnect the power supply if you need to enter the fuel storage room.
- Always use low-voltage lamps in the fuel storage room (these must be approved for this type of use by the relevant manufacturer).
- The system is only to be operated using the types of fuel prescribed.
- Before the ash is transported further, it must be stored temporarily for at least 96 hours in order to let it cool down.
- Should you have any queries, please call us on +43 / 3357 / 42840-840.
- Initial commissioning must be carried out by the HERZ Customer Service department or an authorised specialist (otherwise any warranty claim will not be applicable).
- Ventilate the pellet storage room for ~ 30 minutes before going in.
- The boiler meets the requirements of the Association of Swiss Canton Fire Insurance Companies or national fire safety regulations. The customer himself shall be responsible without exception for ensuring that these regulations are complied with on site!

1.1 Basic safety information

Due to its functionally limited electrical and mechanical characteristics with regard to usage, operation and maintenance, if the equipment is not able to work according to its appropriate use or improper interference occurs, it may cause serious health and material damage. It is therefore conditional that the planning and implementation of all installations, transportation, operation and maintenance will be carried out and supervised by responsible, qualified persons.

When operating electrical systems, certain parts of those systems will always carry a hazardous electrical voltage or be exposed to a mechanical load. Only appropriately qualified personnel may carry out work on the system. They must be thoroughly familiar with the content of this and all other manuals. In order for this system to function safely and without any problems, transportation, storage, operation and maintenance must be carried out properly and carefully. Instructions and information on the systems must also be heeded.

1.2 Installation

General notes

In order to ensure that the system will function properly, the relevant standards and the manufacturer's installation instructions are to be heeded during the installation of the system!

Documents from the manufacturer relating to the heating devices and components used are available from HERZ on request.

1.3 Operation and maintenance

1.3.1 General notes

	Don´t open the boiler doors until "HEATING OFF" is displayed, otherwise a risk of deflagration (explosion) is given.
	In order for the system to be operated and maintained safely, it must be operated and maintained properly by qualified personnel while heeding the warnings in this documentation and the instructions on the systems.
	In unfavourable operating conditions, the temperatures of parts of the housing may exceed 80 °C.
	If the door to the ash container is opened during operation, the fuel supply will be shut off and the boiler will switch to the burnout phase. Afterwards the boiler will switch to the operating mode "HEATING OFF".

Ambient conditions		
Operating temperature:		+10 to +40 °C
Warehouse-/ transport temperature:		-20 to +70 °C
Humidity:	operation	5 to 85 %
	storage	5 to 95 %

1.3.2 Operation

	Covers which prevent contact with hot or rotating parts or which are required in order to direct the flow of air correctly and thus ensure the effective functioning of the system must not be opened during operation.
	In the event of a fault or unusual operating conditions such as the emission of smoke or flames, the system is to be switched off immediately by operating the emergency stop button. Notify the HERZ Customer Service department immediately.

- If the boiler room door main switch is operated or if a power failure occurs, the system will be taken out of operation immediately. The remaining quantity of residual fuel will burn independently without giving off any toxic gases, if the chimney draught is sufficiently. Therefore the chimney must be designed and produced in accordance with DIN 4705 or EN 13384. When the boiler is switched on again, the system has to be checked in order to make sure that it is fully functional and a safe operation of the whole system must be guaranteed!

- The generated system noise during operation does not present any danger to the operator´s health.
- If the residual flue gas oxygen content drops below the required minimum of 5 %, the fuel supply will be stopped automatically and will not be activated again until the residual oxygen content has risen to more than 5 % (fault text: MIN O2 [%] 5.0, see chapter 1.1.1)

1.3.3 Maintenance

Before starting to carry out any work on the system, but especially before opening covers protecting live parts, the system is to be properly disconnected from the power supply. Besides the main circuits, attention is also to be paid to any existing additional or auxiliary circuits in the process. The normal safety rules according to ÖNORM are:

- Disconnect all poles and all sides!
- Ensure that the system cannot be switched on again!
- Check to ensure that no voltage is connected!
- Earth and short-circuit!
- Cover adjacent live parts and locate hazardous areas

	These above-mentioned measures must not be reversed until the system has been fully installed and maintenance has been completed.
	Personal dust masks and gloves must be worn when carrying out maintenance in the combustion chamber or the ash collector or on flue gas-carrying parts and when emptying the ash container, etc.!
	Extra-low-voltage lamps are to be used when carrying out maintenance in the fuel storage room. Electrical equipment in the fuel storage room must be designed in accordance with ÖN M 7137!

In order to prevent any maintenance errors, if maintenance is not carried out properly, it is recommended to be carried out regularly by authorised personnel or by the HERZ Customer Service department.

Spare parts must be obtained directly from the manufacturer or a distribution partner. The customer will not be exposed to any health risks as a result of the noise generated by the machine.

2 WARNING NOTES

	Risk of injury and damage to property due to improper handling of the system.
	Caution – hot surface
	Warning – against hand injuries.
	No admittance without authorisation.

However, adherence to guidelines for transportation, installation, operation and maintenance notices as well as technical data (in the operating instructions, product documentation and on the equipment itself) which are not specifically highlighted, is also vital to avoid breakdowns which may directly or indirectly cause major personal or material damage.

General note

For reasons of clarity and possible permutations, this documentation does not contain all detailed information and cannot take account of every conceivable operating or maintenance scenario. Should you require further information or encounter specific problems, which are not handled in detail in the documentation supplied, you can obtain the required information from your specialist dealer or direct from HERZ.

People (including children) who, because of their physical, sensory or mental capabilities or because of their lack of experience or knowledge, are unable to use the equipment safely must not use this equipment unless they are supervised or instructed by a responsible person.

3 FUELS

The HERZ firematic boiler should be operated with the fuels and their properties which are described in this chapter.

3.1 Wood chips

Wood chips for non-industrial use with low fines content according to EN 14961-1/4 with following specification:

- Property class A1, A2, B1
  - G30 respectively G50[4] according to ÖNORM M 7133
- Particle size P16B, P31,5 and P45A
- Water content min. 15 % up to max. 40 %
- Ash content in m-%: <1.0 (A1), <1.5 (A2), <3.0 (B1)
- Calorific value in as-delivered condition > 3.1 kWh/kg
- Bulk density (BD) in as-delivered condition > 150 kg/m³

The property classes A1 and A2 represent fresh wood and chemically untreated wood residues. A1 contains fuels with low ash content, which indicates little or no bark and fuels with lower water content, while class A2 has a slightly higher ash content and/or water content. B1 extends origin and source of class A and includes additional materials, such as short rotation plantation wood, wood from gardens and plantations etc., as well as chemically untreated industrial wood waste. Class B2 also includes chemically treated industrial wood waste and used wood.

3.2 Wood pellets

Wood pellets for non-industrial use according to ENplus, Swisspellet, DINplus or ÖNORM M 7135 resp. pellets according to EN 14961-2 with following specifications:

- Property class A1, A2[5]
- The maximum permissible fines content in the fuel storage room must not exceed 8 % of the fuel volume (determined using a perforated screen with holes 5 mm in diameter)!
- Fines content at loading: < 1.0 m-%
- Calorific value at as-delivered condition > 4.6 kWh/kg
- Bulk density (BD) at as-delivered condition > 600 kg/m³
- Mechanical Strength (DU), EN 15210-1 at as-delivered condition in m-%: DU 97.5 ≥ 97.5
- Diameter 6 mm

The nominal power and the emission values can be guaranteed up to a maximum water content of 25 % and a minimum calorific value of 3.5 kWh/kg of the permissible fuel.

From a water content of about 25 % and a calorific value < 3.5 kWh/kg a reduced output is expected.

Prevent the entering of debris such as stones or metal particles into the system! Sand and soil lead to higher level of ash and slagging precipitation.

There may be a formation of slag according to the fuel quality, which has to be removed by hand.

In the case of non-compliance, any warranty or guarantee will be rendered null and void. The burning of unsuitable fuels could lead to uncontrolled combustion. Operational faults and consequential damage are likely to occur.

If a different fuel is named explicitly on the order respectively the order confirmation, the system can be operated with the mentioned fuel.

Note: The system is set to the agreed fuel at the commissioning. This setting (ID-fan speed, fuel, flow and backflow, cycle times, etc.) should not be changed when using constant fuel quality.

[4] Only if using an agitator with 3x400 Volts

[5] Property class A2 only at firematic 80 – 301

4 SAFETY DEVICES

The safety devices must be dimensioned and installed according to ÖN B 8133.

The safety valve in the boiler circulation serves as a final safety device against malfunctions of the equipment.

All legal safety regulations must be adhered to on-site via the authorised specialist company.

Earthing or potential equalisation must be carried out on the whole heating system according to EN 60204-1 by an authorised specialist company.

1 Safety temperature limiter

Should the boiler temperature exceed 95 °C, the equipment must be switched off for safety reasons. The safety temperature limiter (STL) locks in this event.

Possible causes may be:

- Performance decrease in the boiler was interrupted abruptly. This can occur due to the switching off a pump or sudden shutting of the heating circuit mixer.
- The load pumps are being controlled by the HERZ Control. The so-called excess temperature flue gas would be automatically activated by the HERZ Control. This avoids higher boiler temperatures.
- The boiler is too large.
- The fuel level is set too high.
- Loss of power supply
- Etc.

At First the cause of the failure must be found and be corrected, afterwards the safety temperature limiter can be unlocked.

The boiler temperature must be lower than 75 °C before unlocking.

Only after the temperature fell below 75 °C the malfunction can be rectified. To acknowledge the malfunction unscrew the STL covering and put gentle pressure, using a sharp object, to the STL.

2 and 3 automated extinguishing device

The Boiler features an automated extinguishing device. The device consists of a thermal safety valve, a thermostat valve (3) and a water tank (2). If the feeding screw temperature gets exceeded, the valve opens independently and flushes the feeding pipe. This extinguishing device is used as a safety device at burn back.

4 Burn-back safety unit

The burn-back safety unit prevents a burn-back into the fuel storage room. The unit separates the burning chamber and the fuel storage room. The burn-back safety unit is conducted like a fire flap and opens only when fuel is fed to the boiler.

5 Safety valve

The safety valve automatically releases, when the pressure or temperature exceeds preset limits. The safety valve has to release at the maximum allowable pressure (according to boiler plate).

6 Safety heat exchanger

The safety heat exchanger is a built in safety device and has to be connected to a thermal release valve and installed, according to applied standards. The safety heat exchanger has to be connected directly to a cold water pipe (pressure ≤ 3 bar)

7 Ash container and burning chamber safety device

The ash containers are connected contact-free (inductive sensor) to the boiler.

Fuel storage room temperature monitoring

The fuel storage room temperature monitoring is placed directly above the transport screw. If the storage room temperature exceeds its preset limit, the boiler will switch to the operate condition „HEATING OFF“ and displays a fault report. Additionally a fault sensor output gets active. Conduct alerting in accordance with national standards.

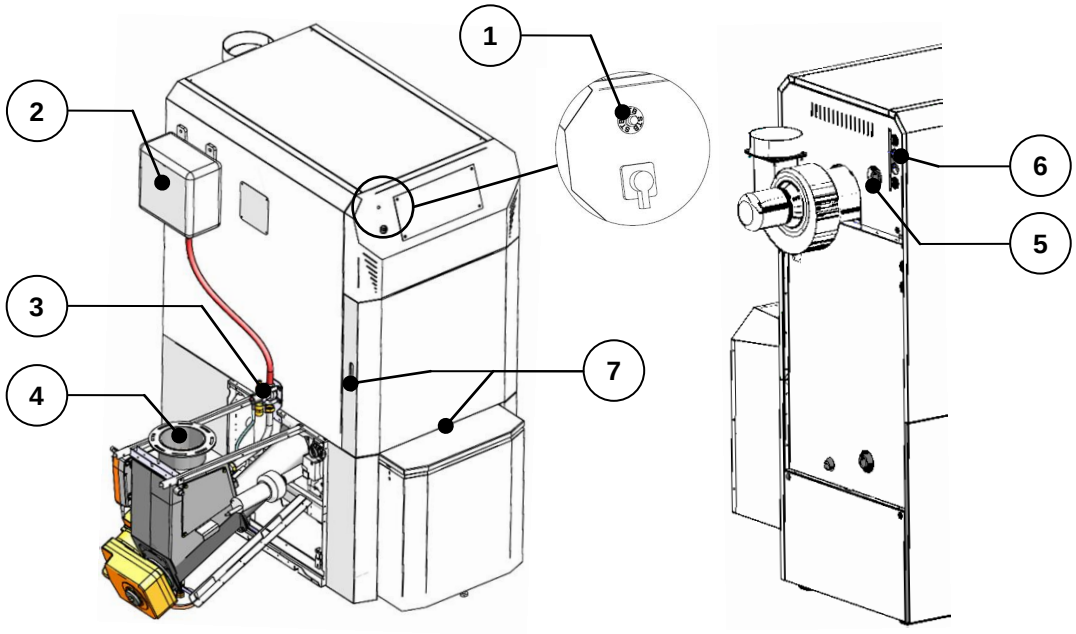


figure 4.1: Safety devices

1	**Safety temperature limiter**
2	**Quench water container**
3	**Feeding pipe valve**
4	**Burn back protection device**
5	**Safety valve connection**
6	**Safety heat exchanger connection**
7	**Safety contact ash container and combustion chamber door**

5 SYSTEM

5.1 System overview

In figure 5.1 an example of a system with the following three components is shown:

(1) Storage room filling system

(2) Boiler

(3) Room discharge system

In the pictured case a rigid pellets-screw system with modular agitator system (3) is shown. The filling of the fuel storage room is carried out with vertical filling screws (1). Please consider that the installed room discharge and storage room filling system can be different to the displayed system. If all room discharge and storage room filling systems of HERZ would be presented, the scope of this guide would be exceeded considerably. More information can be provided by the company HERZ.

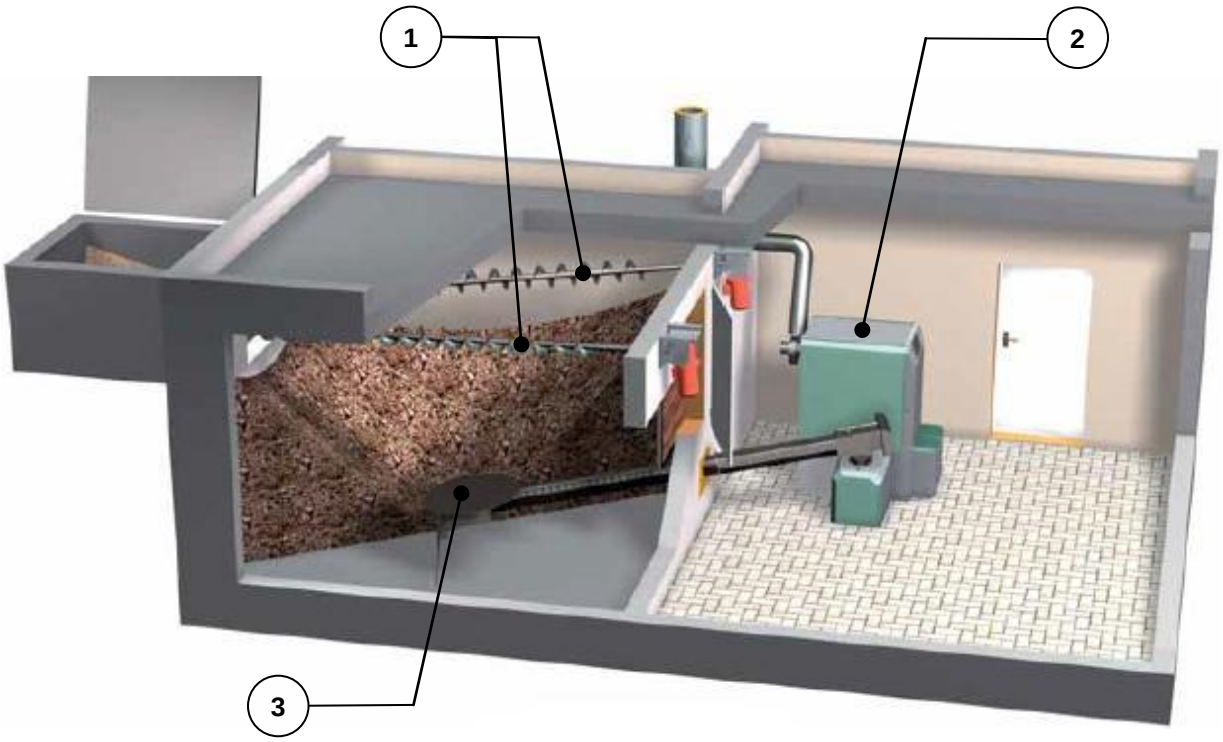
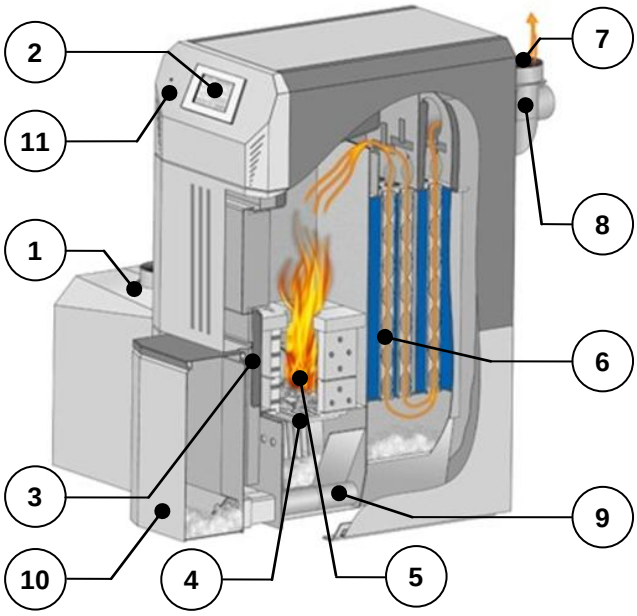
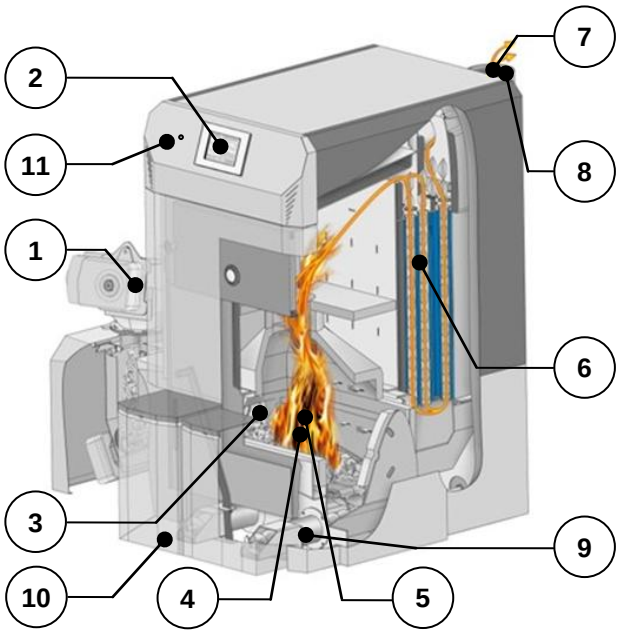


figure 5.1: System overview

In the following chapter the boiler (2) and the room discharge system (3) and its individual components are described and displayed.

5.2 Boiler

firematic 20 – 60	firematic 80 – 499
 figure 5.2: firematic 20-60 components	 figure 5.3: firematic 80-499 components

1	**Burn back protection device** The burn back protection prevents burn back in the fuel storage room. It separates additionally the combustion chamber and the fuel storage room.
2	**Integrated control** The system is controlled and operated centrally via a user-friendly touch display on the firematic boiler.
3	**Automatic ignition using hot air fans**
4	**firematic 20 – 60: Tipping grate provides grate cleaning** **firematic 80 – 499: Combined step-/moving grate and tipping grate**
5	**2-zone combustion chamber**
6	**Standing pipe heat exchanger with integrated turbulators and cleaning mechanism** The heat exchanger surface gets cleaned automatically via the integrated turbulators, even during heating operation, no manual cleaning necessary.
7	**Automatic flue gas and combustion monitoring via lambda probe control** A built in lambda probe, which monitors continuously the flue gas content values, detects fuel quality changes and ensures optimum combustion and low emission values. The lambda probe controls the primary and secondary air supply and ensures a complete combustion, even during minimum load.
8	**Speed-controlled ID-fan** The ID-fan on the backside of the boiler generates low pressure within the boiler. The secondary- and primary air get sucked out due low pressure.
9	**Combustion and fly ash discharge** Via two ash discharge screws the combustion and fly ash get automatically fed into the ash container(s).
10	**Ash container(s)** The removable ash container(s) with wheels enables simple and convenient emptying of the ash.
11	**Safety temperature limiter STL** The STL is a safety device and locks the boiler if the boiler temperature exceeds 95 °C (see chapter 4).

5.3 Room discharge system

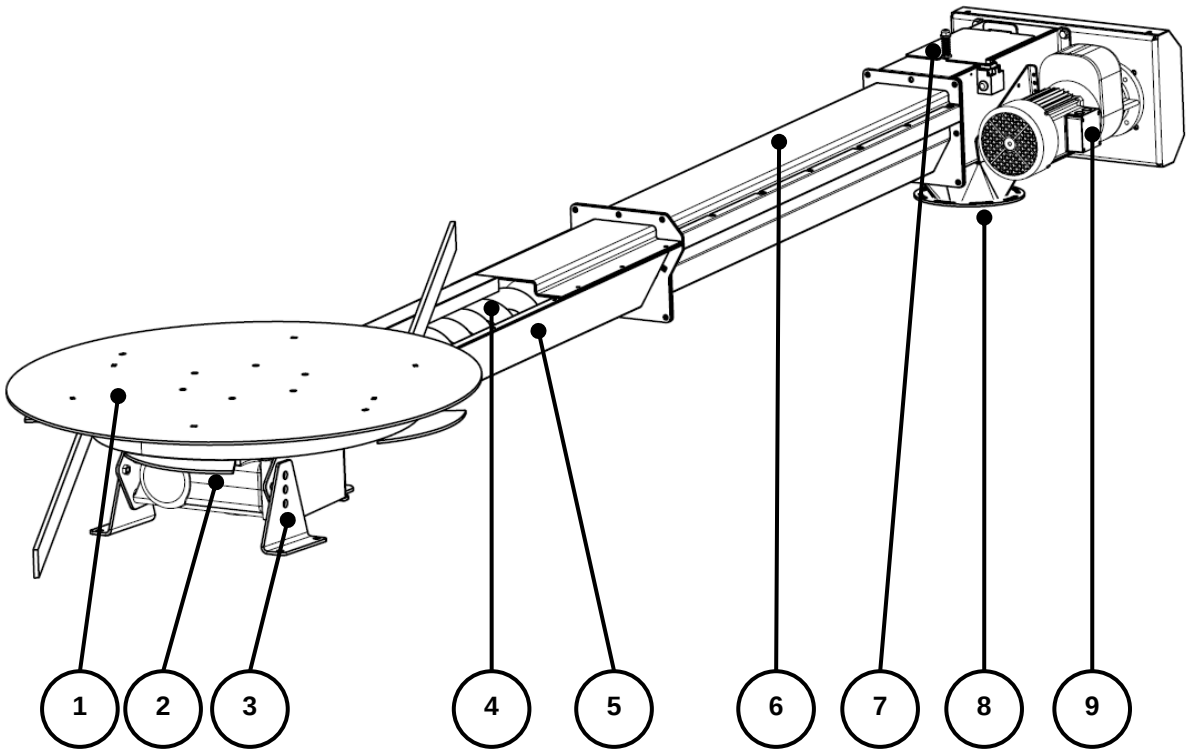


figure 5.4: Modular agitator system

1	**Stirring disc**
2	**Drive**
3	**Gear mounting**
4	**Feed screw**
5	**Open screw channel (in the fuel storage room)**
6	**Closed screw channel (outside the fuel storage room)**
7	**Overflow protection (end switch)**
8	**Release shaft**
9	**Drive motor**

6 MODE OF OPERATION

6.1 Feeding system

The fuel is fed from the fuel storage room by the room discharge system to the burn back protection device. Fuel passes the hopper first, afterwards the back burn flap. The back burn flap gets steered by a spring loaded servo motor. If the servo motor operates current less, the back burn flap will close independently. Next the fuel is fed towards the burning chamber by the feeding screw. The achieved fuel level is a crucial factor of the boiler heat output and operating mode.

6.2 Feeding type

The operation of the firematic is based on a pulse-no-pulse ratio, which controls the feeding system. The feeding values are set up via the menu “Fuel values” (only available in the service area) and modulated by the combustion control system.

6.3 Combustion air control

The supplied combustion air is differentiated between primary and secondary air. The primary air is initiated directly into the embers. The secondary air gets used to actuate the developed flame to a completely. The air supply is piped via vents on the burner side (underneath side cover).

The ID-fan on the backside of the boiler generates low pressure within the boiler. The secondary- and primary air get sucked out due low pressure. The ID-fan speed is controlled according to the boiler temperature and the lambda probe control.

6.4 Boiler operation

The boiler starts up automatically with its built-in automatic ignition, when heat is required. The heat requirement can be controlled by the weather or by a remote sensor (optional), depending on any heating circuit. A room thermometer can also be used to generate an external requirement. The boiler can also be started up by the requirement of a hot water tank.

The boiler output can be controlled by set up values and adjusted to local conditions.

The boiler control prevents too low boiler temperatures to avoid effect on the durability of the system. Too high boiler temperatures are not permissible.

Expansion cracks at insulating plates, respectively burning chamber stones, don´t affect their capacities and don´t represent warranty claim.

6.5 Commissioning

The commissioning must be carried out by HERZ factory customer service or an authorised specialist.

A pressure measurement is conducted additionally after boiler has been operated with the actual fuel for > 1 hour and a flow temperature of 70-85 °C.

The result of the pressure measurement represents a characterisation of the draught during normal operation and shows, if the required draught has been reached. If a deviation occurs, the existing chimney has not been dimensioned correctly or dimensioning underlying installations have not been carried out correctly (e.g.: faulty connections, false air inflow, too long connection pipe,...) and the boiler does not operate properly.

During initial operation and commissioning the system controls and safety devices must be checked and the handling of the boiler as well as the system maintenance schedule must be explained to the operator.

The hydraulic balancing of the equipment (pipe installation) must be carried out by an authorised specialist company (installer). The installer’s duty according to ÖNORM 12170 is to create documentation of the heating system. The documentation has to be retained in the boiler room.

6.6 Operating and impermissible temperatures

Boiler temperature

The HERZ firematic boiler operates at a boiler temperature between 65 to 90 °C. If the return flow temperature is lower than 55 °C, flue gas will condense on the inside of the boiler. So if the boiler starts up, the operating temperature (from 65 to 90 °C) must be reached as quickly as possible in order to avoid condensation. The back flow temperature may also be lower than the permissible value at correct boiler operating temperature. This condition should be avoided by a back flow temperature increase.

Note!

All guarantee or warranty claims are invalidated in the event of damage by corrosion arising due to impermissible operation temperatures.

Back flow temperature

The back flow temperature must exceed 55 °C (60 °C) as quickly as possible, depending on the boiler type. Temperature level retention of the back flow or the boiler temperature is achieved using a so-called back flow bypass or back flow temperature monitoring. In this case the flow is admixed via a pump and a valve to the back flow.

The boiler´s heat energy can only be used after the back flow temperature has exceeded 60 °C.

Too high boiler temperatures

The HERZ firematic boiler can be operated with a maximum boiler temperature up to 90 °C. If the decrease of performance drops suddenly (mixers shut-off, hot water tank load pump switches off) the boiler´s saved heat energy can overheat the boiler.

The firematic boiler has three different pre-installed safety devices to prohibit a further temperature increase:

- Overheat temperature (higher than 92 °C boiler temperature)

  At this temperature the connected consumer pumps get switched on in order to conduct overheat (consumer pump connection to the HERZ controls is required). If the consumer pumps aren´t connected to the HERZ controls, a higher probability of overheating, resulting in failure, is given.

- Thermal release valve

  The thermal release valve must be connected to the built in safety heat exchanger, according to applied standards.

- Safety temperature limiter – STL

  If the boiler temperature exceeds 95 °C, a fault report gets indicated, the boiler gets switched off and the safety temperature limiter locks itself.

Flue gas temperature

The flue gas temperature depends on the boiler operation conditions, the fuel, the ventilator setting and the boiler type.

Observe:

The chimney must be insensitive to moisture and calculated and dimensioned according to DIN 4705 or EN 13384. HERZ does not carry out chimney calculations. The chimney calculation must be calculated by authorised personnel. A miscalculated or undimensioned chimney may lead to a malfunction of the system.

7 OPERATING CONDITIONS

Heating off

During this phase the boiler is switched off, i.e. the burner is blocked.

Ready

The boiler- respectively the buffer temperature is sufficiently high to provide the required heat load, or the boiler temperature has reached the switch off temperature.

Ignition preparation

During this phase the grate gets cleaned and the lambda probe gets pre-heated.

Pre-aeration

During the pre-aeration phase the burning chamber and the chimney get purged with fresh air.

Cold start

If the boiler room temperature is lower than the identified boiler room ignition temperature (150 °C), the boiler performs a cold start and fuel is fed to the burning chamber. At the same time the fuel gets ignited by the ignition fan. An ignition monitoring is conducted during this phase.

After successful ignition, the boiler switches to the burning phase and the ignition fan stopping time (1 minute) starts to cool down the ignition fan heating element.

If ignition wasn´t possible prior the maximum ignition period (3x set up time), the boiler will switch off and the fault “IGNITION” (see fault 66) will appear in the fault list.

Scorch phase

During the scorch phase the boiler control tries to achieve an even fire bed. The length of the scorch phase can be set in the fuel value settings (only available in the service area). Pay attention to a higher oxygen content at the combustion to achieve an even fire bed faster.

Start up phase

During the start up phase the boiler operates at nominal heat output. If the boiler set temperature is reached, the boiler will switch to the regulation phase.

Regulation phase

During the regulation phase the boiler is modulated between nominal load and partial load. If boiler oversupplies heat, i.e. if the boiler target temperature + control hysteresis gets exceeded, the boiler will switch to the operating condition „ready".

Burn out phase

If the boiler will be switched off the remaining quantity of residual fuel will burn independently. Pay attention to the burn out phase time setup, if chosen too short, fuel will not be burned accordingly.

Burner cleaning

During the burner cleaning phase ash gets removed off the grate. The boiler switches to the burn out phase and remaining fuel gets burned out. Afterwards the grate gets cleaned and the boiler switches to normal operation. The burner cleaning interval is calculated by the feeding screw operating time. The cleaning interval is set up with the parameter "cleaning interval" in the service area.

Heat exchanger cleaning

The Heat exchanger gets cleaned automatically. The cleaning interval and duration is set up in the service area with the parameter "heat exchanger cleaning interval" respectively „heat exchanger cleaning duration".

Boiler output control

The boiler output gets modulated by the boiler set temperature + control hysteresis (= regulation end). If the regulation end is reached, the boiler will switch to the burn out phase.

Flue gas temperature control

If the maximum flue gas temperature is exceeded, the boiler output will be reduced. If the actual flue gas temperature is lower than the maximum flue gas temperature, the boiler will switch to normal output control.

Flame monitoring (burning chamber temperature)

If the burning chamber temperature fluctuates greatly during operation, the boiler will switch off.

Freezing protection

If the freezing protection operates, the back flow bypass pump will switch on only if the boiler is in operating mode "HEATING OFF" or "BURNER STOP". Otherwise (freezing protection disabled) the boiler will start up and heat up to minimum boiler temperature 65 °C.

Lambda control

The amount of material and the rotation speed of the ID-fan are controlled by the lambda control. The control is able to detect marginal deviations of the fuel quality and induces a combustion improvement.

8 TEMPERATURE MANAGER

The heat demand of the individual modules (boiler, hot water tank, heating circuit, solar, etc.) is controlled by the temperature manager. The below-mentioned scheme (see figure 8.1) explains the functionality of the temperature manager. A module contains of an in- and output. Every module sends a required demand temperature to the temperature manager. The sent required demand temperature is a sum of an internal calculated temperature demand + set up increase. The heat supplier (= heat generator respectively boiler/hot water tank), which receives the different module demand temperatures from the temperature manager, must supply the required temperature demand to the different modules. The temperature manager calculates the maximum demand temperature of all modules.

Example:

Heat supplier = boiler
Module 1 & 2 = heating circuit 1 & 2
Module 3 = hot water tank
Module 4 = buffer

	Heating circuit 1	*Heating circuit 2*	*Hot water tank*	*Buffer*
calculated required temperature [°C]	60	30	55	75
Temperature increase [°C]	5	3	2	2
Required temperature of the modules [°C]	**65**	**33**	**57**	**77**
Maximum temperature requirement				**77**

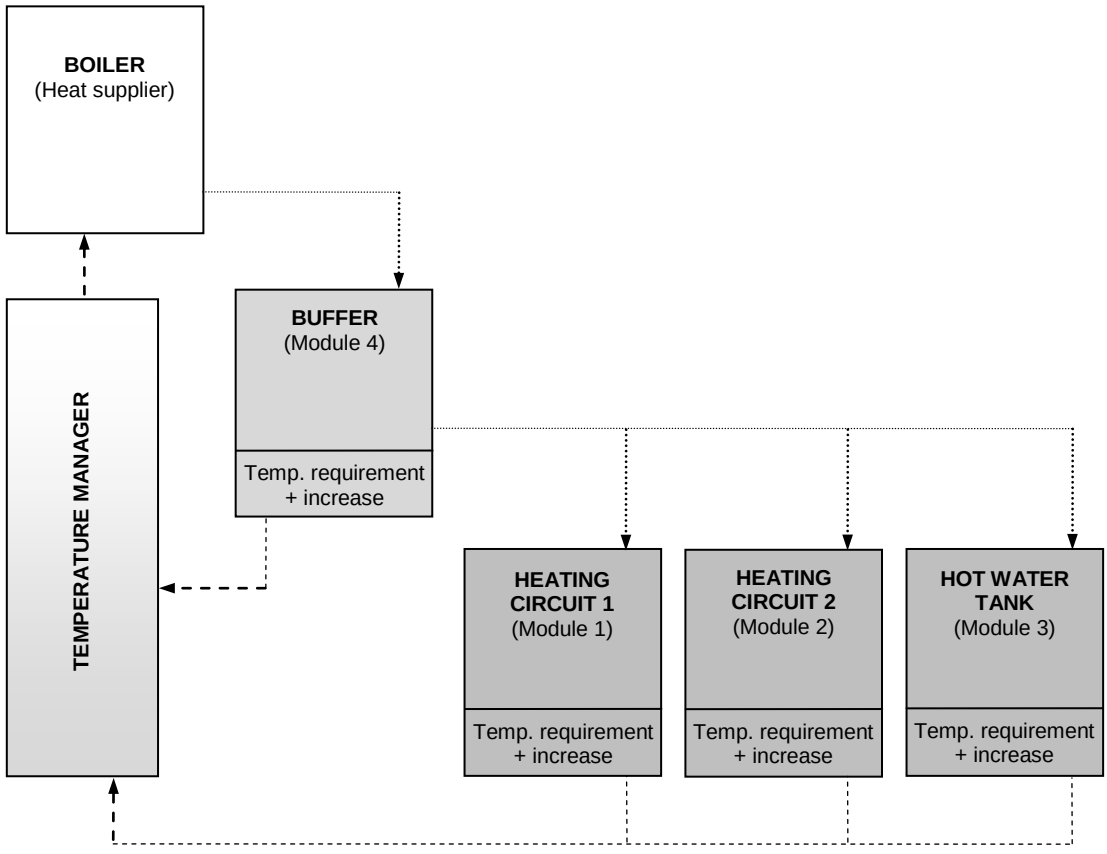


figure 8.1: Temperature manager (simplified schema – example)

9 T-CONTROL

The handling and menu navigation are described in this chapter. Every single T-CONTROL parameter is explained in chapter 9.11 (page 27).

figure 9.1: T-CONTROL

9.1 Starting the system

To switch on the display, two conditions must be fulfilled:

- The boiler must be connected to the power supply
- The main switch (1) on the boiler front must be switched on *(only by firematic 80 – 499, see* figure 9.1*)*

If these two conditions are fulfilled, the starting process of the display, which takes 1-2 minutes, starts.

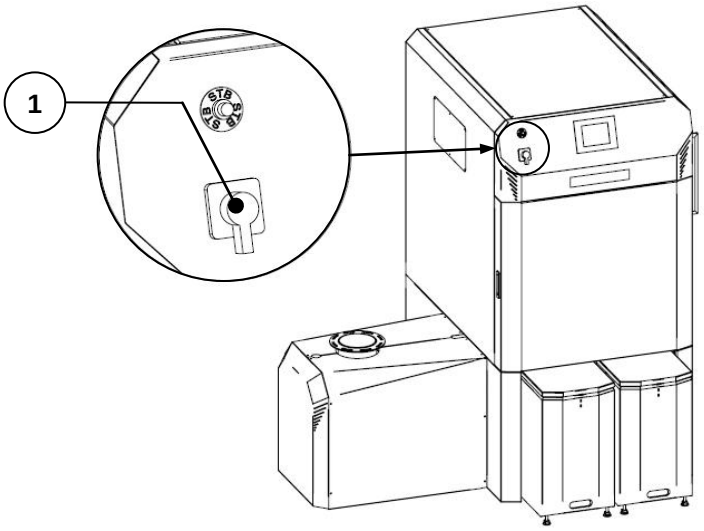


figure 9.1: Boiler main switch (only firematic 80 – 499)

9.2 Operation and handling

The touch panel is a touch-sensitive screen and control unit. By touching the screen you can change released values or move to other pages. The screen navigation and input can be done with finger, pen, pencil, etc.

9.3 Main menu

After start up figure 9.2 will appear. In the centre of the screen important values according the boiler, buffer, hot water tank, heating circuit and so on are shown. The shown values can be adapted individually (see chapter 9.8).

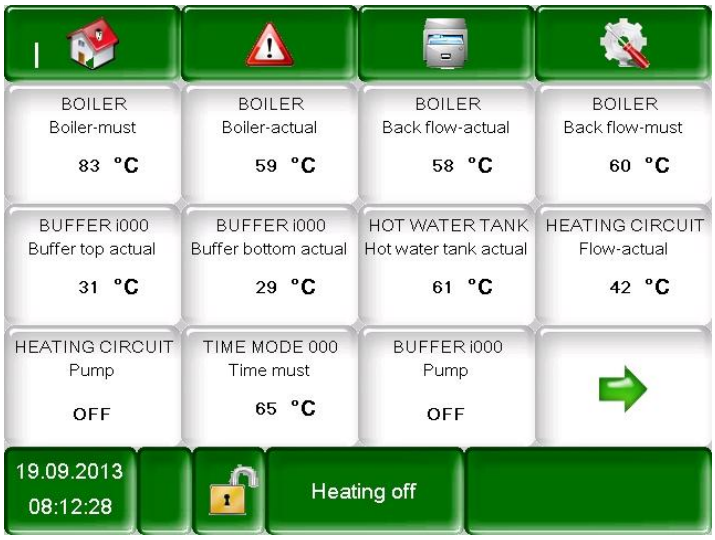


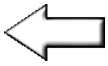
figure 9.2: Main menu

If the following symbol is pressed:

	the main menu will be displayed *(see figure 9.2)*
	fault messages (warnings & alarms) will be displayed *(see chapter 9.9)*
	the individual modules (boiler, hot water tank, buffer, heating circuit, solar, hydraulic compensator, net pump, zone valve, external demand) will be displayed. *(see chapter 9.10)*
	the menu settings (network configuration, E-Mail, screen saver) will be displayed *(see chapter 9.13)*
	the date & time can be set up *(see chapter 9.7, changing with code only!)*
	the code input screen will be shown *(see chapter 9.5)*
	the heating system can be switched on or off. *(see chapter 9.6)* In general the field is used to display the operating conditions (see chapter 7)
	more important values will be shown on the second page

9.4 Symbols explanation

In this section important symbols are explained.

	The **CHIMNEY SWEEPING FUNCTION** provides a test mode for the chimney sweeper. The boiler is operated steadily at nominal output and all consumer values are set to its maximum during the chimney sweeper carries out its measurements. **The measurements must be carried out after "chimney sweeping mode" appears** on the display and a developed flame exists. If the maximum boiler temperature or the permissible chimney sweeping time is exceeded, the chimney sweeping function will abort. The chimney sweeping time is 25 minutes by default, the remaining time counts after boiler status **"chimney sweeping mode"** starts.
	With the **aggregate-test** connected components can be tested individually. The symbol is only visible, if: • the code has been entered (see chapter 9.5, page 20) and • the boiler is in the "heating off" operation mode (only at the boiler aggregate-test!) If the Aggregate-Test is active, the symbol will turn green and the message "AGG-Test ACTIVE" is shown on the display.
	**Information** such as firmware-module, hardware-module, software version etc., of each module (boiler, hot water tank, buffer, solar, heating circuit).
	These symbols (**navigation**) can be used to navigate in each module (boiler, hot water tank, buffer, solar, heating circuit, hydr. compensator, net pump, zone valve, ext. demand). An alternative to the illustrated navigation method is the wiping to the right or left.
	Back to the modules overview (boiler, hot water tank, buffer, solar, heating circuit, hydr. compensator, net pump, zone valve, ext. demand).

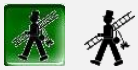
9.5 Code – entry

If entering the code, the following operations can be performed:

- Setting up values
- Activation of the aggregate-test *(see chapter 9.4)*
- Setting up or changing of date & time *(see chapter 9.7)*
- Navigation in the menu settings *(see chapter 9.13)*

Navigation 1: 	**Navigation 2:** 
Screen:  figure 9.3: Code - entry	**Screen:**  figure 9.4: Code - entry
If the following button is:	**Note:**
	figure 9.4 is displayed.
	the main menu will be displayed (if you have already entered a code, the control will be locked)
	the previous page will be displayed
	Enter the corresponding code (see below) and press „OK“ to confirm. Code: **111**
	the open padlock-icon appears: 

9.6 Switching on/off

SWITCH-ON		SWITCH-OFF	
Navigation:	Heating off	**Navigation:**	Prepare ignition
Screen:  figure 9.5: Boiler switch-on		**Screen:**  figure 9.6: Boiler switch-off	
If the following button is pressed:		**If the following button is pressed:**	
	the boiler will be switched on.		the boiler will be switched off.
	the boiler will switch off, remains off and the previous page will be displayed.		the boiler remains on and the previous page will be displayed.
			If **"chimney sweeping mode"** is active, the remaining time can be raised in 5 minutes steps by pushing the  -button.
			Raises the remaining time (chimney sweeping mode) by 5 minutes steps
Note:		**Note:**	
The system can only be switched on, if the code (see chapter 9.5) has been entered.		The boiler will switch to the operating condition "burn out phase" (except "cold start" or "ready"). If the boiler gets switched off during "burn out phase", the cold start will be completed. Afterwards the "burn out phase" will start to prevent an unacceptable amount of fuel within the burning chamber. The system can only be switched off, if the code (see chapter 9.5) has been entered.	

9.7 Date and time

Navigation 1:		Navigation 2:	

Screen:

figure 9.7: Date and time selection

Screen:

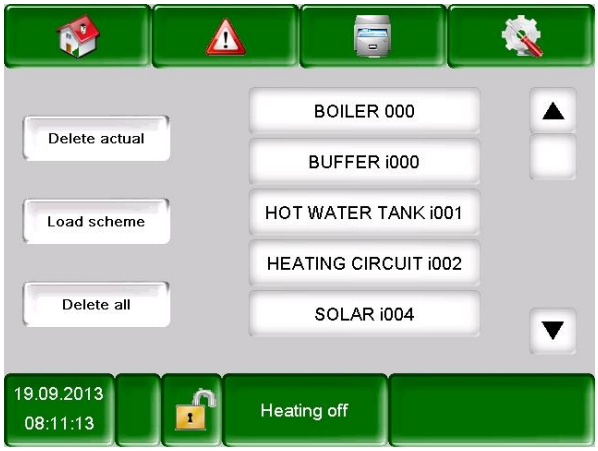
figure 9.8: General settings for NTP

If the following button is pressed:		**If the following button is pressed:**	
	the language can be set up.		the language can be set up.
	the time can be set up.	NTP Server	the server name can be set up. (The server receives automatically an IP-address from the network)
	the date can be set up	Time zone	the time zone can be set up
	NTP can be activated (time and date will be updated automatically). If NTP is active, time and date will be updated automatically via network (= connection to the internet via LAN cable).	Act. interval	the update interval of date and time, in hours, can be set up (i.e.: every 12 hours)
	the summer of winter time gets selected.	NTP Update	a NTP update can be carried out. The time and date will be updated immediately.
	the screen is locked (cleaning possible)		
	the main menu will be displayed.		

Note:	
NTP (Network Time Protocol) is used to synchronize date and time automatically via the network. A valid network connection via a LAN cable to the internet is required.	*In case of power blackout:* If NTP is active, the date and time will be updated automatically after switch-on. If NTP is not active, the date and time will be updated via an internal memory up to 10 days (manufacturer's data). If boiler is more than 10 days out of service, date and time must be set manually.

9.8 Main menu values

9.8.1 Adding values

Navigation 1:	Code – entry (chapter 9.5)	**Navigation 2:**	Show value
Screen:  figure 9.9: Adding display values		**Screen:**  figure 9.10: Determining display values	
If the following field is pressed:		**If the following field is pressed:**	
Show value	an overview of available values will be displayed (see figure 9.10)	Delete actual	the selected value can be deleted (see figure 9.14)
	the second page of the main menu will be displayed.	Load scheme	a default scheme gets loaded (see figure 9.11)
		Delete all	All values will be deleted (see figure 9.13)
		BOILER 000	the boiler values, which can be selected manually, will be displayed (see figure 9.12)
		BUFFER i000	the buffer values, which can be selected manually, will be displayed
		HOT WATER TANK i001	the hot water tank values, which can be selected manually, will be displayed
		HEATING CIRCUIT i002	the heating circuit values, which can be selected manually, will be displayed
		TIME MODE 000	the time mode values, which can be selected manually, will be displayed
		SOLAR i004	the solar values which, can be selected manually will, be displayed

Navigation 3:	Load scheme

Screen:

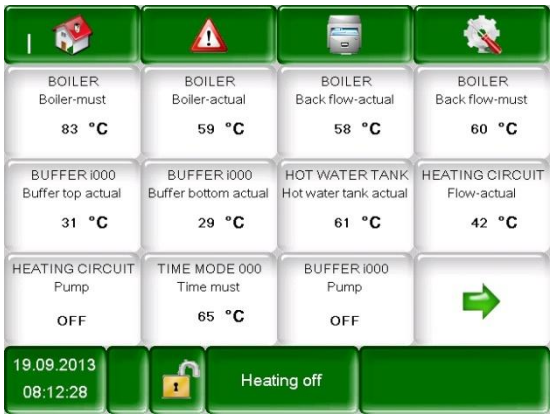


figure 9.11: Load scheme

Navigation 4:	Show value → Boiler 000

Screen:

figure 9.12: Determining display values

Note:

The values of the default scheme can also be adapted individually. Thereby press 3-5 seconds on the value and follow the procedure described in figure 9.12.

If the following field is pressed:

Power, Back flow-must, etc.	the value will be confirmed and displayed at the main menu.
	the page previous page of the individual modules will be displayed (see figure 9.10)
	the second page will be displayed

Note:

The same procedure can be applied to all other modules.

9.8.2 Delete values

Delete all display values		**Delete optional display value**	
Navigation:	Code – entry (chapter 9.5) → symbol → show value → delete all	**Navigation:**	Code – entry (chapter 9.5) → press display value for 3-5 seconds → delete actual

Screen:

figure 9.13: Delete all display values

Screen:

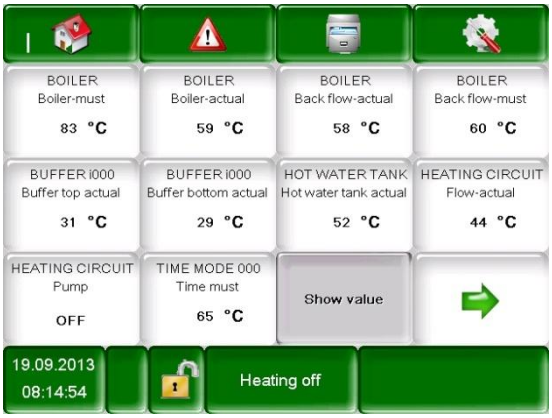


figure 9.14: Delete optional display value

9.9 Fault messages and warnings

Navigation:	

Screen:

figure 9.15: Fault messages

If the following field is pressed:	
Actual	the current fault messages will be displayed.
Archive	all fault messages will be displayed.

Note:

- A red highlighted field represents an active fault (appears in the lower right box).
- An orange highlighted field represents a warning.
- A yellow highlighted field represents information (no fault has occurred).
- A highlighted green field with crossed text represents a fault or a warning which had occurred (only visible in the archive)

An overview of all errors and its correction is shown in chapter 10 (starting on page 59).

9.10 Modules overview

Navigation:	

Screen:

figure 9.16: Modules overview

If the following field is pressed:	
BOILER 000	the „boiler values“ menu will be displayed *(see chapter 9.12.1 – page 28)*
BUFFER i000	the „buffer values“ menu will be displayed *(see chapter 9.12.2 – page 32)*
HOT WATER TANK i001	the „hot water tank values“ menu will be displayed *(see chapter 9.12.3– page 34)*
HEATING CIRCIUT i002	the „heating circuit values“ menu will be displayed *(see chapter 9.12.4 – page 37)*
TIME MODE 000	the „time mode“ menu will be displayed *(see chapter 9.12.5 – page 42)*
SOLAR i004	the „solar values“ menu will be displayed *(see chapter 9.12.6 – page 43)*
HYDR. COMPENSATOR i000	the „hydr. compensator “ menu will be displayed (see chapter 9.12.7 – page 45)
NET PUMP i001	the „net pump“ menu will be displayed (see chapter 9.12.8 – page 46)
ZONE VALVE e003	the „zone valve“ menu will be displayed (see chapter 9.12.9 – page 47)
EXT: REQUIREMENT e004	the „external requirement“ menu will be displayed (see chapter 9.12.10 – page 48)
ADDITIONAL. BOILER e005	the „additional boiler“ menu will be displayed *(see chapter 9.12.11 – page 50)*
	it is possible to navigate the module menu (up and down)

9.11 Module configuration

Boiler
- Overview
- Status
- Settings
- Outputs
- Inputs
- Operating hours

Buffer
- Overview
- Status
- Settings
- Agg-Test

Hot water tank
- Overview
- Status
- Settings
- Time program
- Circulation time
- Agg-Test

Heating circuit
- Overview
- Status
- Operation modes
- Parameter
- Heat curve
- Time program
- Agg-Test

Time mode
- Time program
- Settings

Solar
- Overview
- Status
- Settings
- Agg-Test

Hydraulic compensator
- Overview
- Settings
- Agg-Test

Net pump
- Overview
- Settings
- Agg-Test

Zone valve
- Overview
- Status
- Settings
- Agg-Test

Ext. requirement
- Overview
- Settings

Additional boiler
- Settings

9.12 Terms and definitions

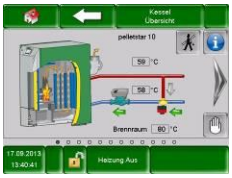
In this chapter all parameters and terms of the different modules are explained.

- Some terms can be a display value and a setting value. To recognize these, they are marked with a *.
- The term is a display value if aggregate test is inactive → the symbol of the aggregate test is: ✋
- If the aggregate test is active (by pressing the symbol ✋ - the hand will change to green and the aggregate test gets activated) the individual components can be tested by pressing the control lamp. Now the term is a so-called setting value.

9.12.1 Boiler

Menu structure

Overview



Status I

Boiler temperature
Back flow temperature
Boiler power
Back flow mixer
Back flow pump

Status II

Flue gas temperature
Burning chamber temp.
Stoker temperature
ID fan
Rotation speed
Secondary air flap

Status III

ID fan correction
Material correction
Insertion - tact
Insertion - pause
O2 [%]
CO2 [%]

Settings

Residual heat temperature
Control hysteresis
Minimum requirement
Power max
Fuel

Outputs I

Grate cleaning
Stoker screw
BFP open
Discharge screw
Ash screw
Moving grate
ID-fan correction

Outputs II

Lambda heating
Heatexchanger cleaning
Ignition heating
Ignition fan
ID-fan
Secondary air flap

Outputs III

Back flow pump
Back flow mixer open
Back flow mixer close
Output temperature control
Sum annoyance
Operating alarm unit

Inputs I

Grate closed
Tank empty
BFP closed
BFP open
STL
Temp. control storage room
Additional input

Inputs II

Motor prot. discharge screw
Burner stop
Burning chamber door opened
Ashscrew controlling
Endswitch room discharge
Barrier level available

Operating hours

Nominal load
Modulation
Part load
Scorch- /burn out
Boiler run time
Total

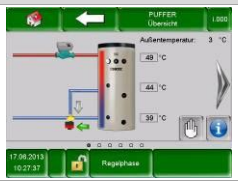
Term	Description	Unit
Status I	○ ● ○ ○ ○ ○ ○ ○ ○ ○ ○	
Boiler temperature	Indicates the boiler temperature	°C
Back flow temperature	Indicates the back flow temperature	°C
Boiler power	Indicates the boiler output	%
Back flow mixer	Indicates the actual state of the back flow mixer (OPEN/CLOSE)	-
Back flow pump	Indicates the actual state of the back flow pump (ON/OFF)	-
Status II	○ ○ ● ○ ○ ○ ○ ○ ○ ○ ○	
Flue gas temperature	Indicates the flue gas temperature	°C
Burning chamber temperature	Indicates the burning chamber temperature	°C
Stoker temperature	Indicates the stoker screw temperature (= feeding screw temperature)	°C
ID Fan	Indicates the actual ID-fan power	%
Rotation speed	Indicates the actual ID-fan rotation speed	%
Secondary air flap	Indicates the secondary air flap value	%
Status III	○ ○ ○ ● ○ ○ ○ ○ ○ ○ ○	
ID fan correction	Indicates the actual ID-fan correction of the lambda probe control	%
Material correction	Indicates the actual material correction of the lambda probe control	%
Insertion - tact	Indicates the stoker screw (= feeding screw) interval (fuel gets fed to the burning chamber) ▪ Interval is set up by the customer service!	0.1 s
Insertion - pause	Indicates the stoker screw (= feeding screw) interval (fuel gets not fed to the burning chamber) ▪ Interval is set up by the customer service!	0.1 s
O2 [%]	Indicates the actual fuel gas O_2-content (oxygen content)	%
CO2 [%]	Indicates the actual fuel gas CO_2-content (carbon dioxide content)	%
Settings	○ ○ ○ ○ ● ○ ○ ○ ○ ○ ○	
Residual heat temperature	Setting up the residual heat temperature (30-65) e.g.: minimum boiler temperature after fuel burnout, when (at the latest) return flow pump gets turned off	°C
Control hysteresis	Setting up the control hysteresis (3-20). It is a temperature, which exceeds regulated the required boiler temperature. ▪ Value gets set up by service staff!	°C
Minimum requirement	Setting up the minimal boiler set temperature (65-75) during operation	°C
Power max	Setting up the maximum boiler power (30-100). Enable boiler power regulation (limitation)	%
Fuel	Setting up predefined fuels (e.g.: pellets, wood chips, etc.)	-
Outputs I	○ ○ ○ ○ ○ ● ○ ○ ○ ○ ○	
Grate cleaning*	Indicates the state of the grate cleaning ▪ If the indicator lamp lights up, the grate will be cleaned automatically	-
Stoker screw*	Indicates the state of the stoker screw ▪ If the indicator lamp lights up, the fuel will be fed	-

Term	Description	Unit
BFP open*	Indicates the state of the back burn flap (OPEN/CLOSE): ▪ If the indicator lamp lights up, the back burn flap is open ▪ The burn back protection prevents burn back in the fuel storage room. It separates additionally the combustion chamber and the fuel storage room.	-
Discharge screw*	Indication of the state of the discharge screw (=room discharge). ▪ If the indicator lamp lights up, fuel is discharged from the storage room	-
Ash screw*	Indicates the state of the ash screw. ▪ If the indicator lamp lights up, ash gets fed	-
Pusher grate* (only firematic 80-499)	Indicates the state of the step- /moving grate: ▪ If the indicator lamp lights up, the fuel will be moved forward on the moving grate during the fuel is burning.	-
Outputs II	○ ○ ○ ○ ○ ○ ● ○ ○ ○ ○	
Lambda heating*	Indicates the status of the lambda probe heating. ▪ If the indicator lamp lights up, the lambda heating is active ▪ The lambda heating is in every operating mode (except “Heating off”) active.	-
Heat exchanger cleaning*	Indicates the status of the heat exchanger cleaning. ▪ If the indicator lamp lights up, the heat exchanger is cleaned automatically. ▪ The interval while the heat exchanger is cleaned is adjusted by the customer service	-
Ignition heating*	Indicates the state of the ignition heating. ▪ If the indicator lamp lights up, the ignition heating gets activated and the fuel is ignited	-
Ignition fan*	Indicates the status of the ignition fan: ▪ If the indicator lamp lights up, the fan gets activated (only at start-up)	-
ID fan*	Indicates the ID-fan rotation speed and ID-fan excitation/control	%
Secondary air flap*	Indicates the state of the secondary air flap	%
Outputs III	○ ○ ○ ○ ○ ○ ○ ● ○ ○ ○	
Back flow pump*	Indicates the state of the back flow pump: ▪ If the indicator lamp lights up, the back flow pump is operating	-
Back flow mixer open*	Indicates the state of the back flow mixer: ▪ If the indicator lamp lights up, the back flow mixer is open	-
Back flow mixer close*	Indicates the state of the back flow mixer: ▪ If the indicator lamp lights up, the back flow mixer is closed	-
Output temperature control*	Indicates the state of the fuel storage room temperature control: ▪ If the indicator lamp lights up, the permissible fuel storage room temperature is exceeded	-
Sum annoyance*	Indicates a common alarm	
Operating alarm unit*	Indicates the boiler operation. If the indicator lamp lights up, the boiler is operating. ▪ If the operating condition “HEATING OFF” is active, the indicator lamp doesn´t light up.	-

Term	Description	Unit
Inputs I	○ ○ ○ ○ ○ ○ ○ ○ ● ○ ○	
Grate closed	Indicates the state of the grate: ▪ If the indicator lamp lights up, the tipping grate is closed	-
Tank empty	Indicates the state of the intermediate hopper: ▪ If the indicator lamp lights up, the intermediate hopper is empty	-
BFP closed	Indicates the state of the burn back flap: ▪ If the indicator lamp lights up, the back burn flow protection is closed	-
BFP open	Indicates the state of the burn back flap: ▪ If the indicator lamp lights up, the back burn flow protection is open	-
STL	Indicates the state of the safety temperature limiter: ▪ If the indicator lamp lights up, the safety temperature limiter is active, i.e.: the boiler turns off, if boiler temperature exceeds 95°C	-
Temp. Control storage room	Indicates the state of the storage room temperature control: ▪ If the indicator lamp lights up, the maximum storage room temperature is exceeded (the storage room temperature control sensor is active).	-
Additional input	Indicates the state of the additional input: ▪ If the indicator lamp lights up, the additional input is active ▪ An additional input can be e.g. a CO-indicator, a system pressure control, etc.	-
Inputs II	○ ○ ○ ○ ○ ○ ○ ○ ○ ● ○	
Motor prot. Discharge screw	Indicates the status of the stoker screw motor and the ash screw motor protection: ▪ If the indicator lamp lights up, the motor protection (stoker- or ash screw) has released	-
Burner stop	Indicates the status of the boiler: ▪ If the indicator lamp lights up ,the burner has stopped (digital input)	-
Burning chamber- / ash door opened	Indicates the state of the burning chamber door/ash door: ▪ If the indicator lamp lights up, the burning chamber door or the ash door is open	-
Ashscrew controlling	Indicates a blockade of the ash screw: ▪ If the indicator lamp lights up alternately during operation, the ash screw works correct. Otherwise the ash screw blocks.	-
Endswitch room discharge	Indicates the state of the room discharge endswitch: ▪ If the indicator lamp lights up, the fuel is blocked in the back burn protection device (cover end switch).	-
Barrier level available	Indicates the state of the barrier level: ▪ If the indicator lamp lights up, a barrier level exists, i.e. it is enough material in the stoker screw channel available	-
Operating hours	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ●	
Nominal load	Displays system operation hours during rated load phase	h
Modulation	Displays system operation hours during modulation phase	h
Part load	Displays system operation hours during part load phase	h
Scorch- / burnout	Displays system operation hours during burning, born down and burnout phase	h
Boiler run time	Displays the sum of nominal load-, modulation-, part load- and burn down- /burn out phase	h
Total	Displays total burner (incl. “HEATING OFF”) hours	h

9.12.2 Buffer

Menu structure

Overview	Status I	Status II
● ○ ○ ○ ○ ○	○ ● ○ ○ ○ ○	○ ○ ● ○ ○ ○
	Buffer top temperature Buffer middle temperature Buffer bottom temperature Switching temperature Outside temperature	Required temperature Buffer loading pump Fastrun heating

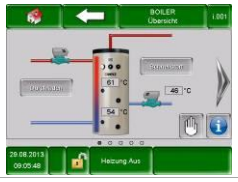
Settings I	Settings II	Agg-Test
○ ○ ○ ● ○ ○	○ ○ ○ ○ ● ○	○ ○ ○ ○ ○ ●
Winter must temperature Summer must temperature Difference temperature Switching temperature Temp. increase	Balance tank Fastrun heating Buffer re-layering Outside temp. sensor Balancing outside sensor	Buffer loading pump Fastrun open Fastrun close

Term	Description	Unit
Status I	○ ● ○ ○ ○ ○	
Buffer top temperature	Indicates the buffer top temperature	°C
Buffer middle temperature	Indicates the buffer middle temperature	°C
Buffer bottom temperature	Indicates the buffer bottom temperature	°C
Switching temperature	Indicates switching temperature (= average daytime temperature). In general the switching temperature conduces to switch between winter set temperature and summer set temperature.	°C
Outside temperature	Indicates the actual outside temperature	°C
Status II	○ ○ ● ○ ○ ○	
Required temperature	Indicates the required temperature of the module. ▪ The required temperature is the sum of the winter/summer set temperature, temperature difference and temperature increase. (→ temperature manager, see chapter 8)	°C
Buffer loading pump	Indicates the state of the buffer loading pump.	-
Fastrun heating	Indicates the state of the fastrun heating valve. ▪ The term is only visible, if “fastrun heating” is activated. ▪ If fastrun heating is active, the hot water tank upper zone gets heated up with the consumer´s highest requested flow temperature (see chapter 8). So the requested flow temperature gets achieved quickly.	-

Term	Description	Unit
Settings I	○ ○ ○ ● ○ ○	
Winter must temperature	Setting up the winter set temperature (20-95). That´s the hot water tank bottom temperature, which will be provided during winter operation	°C
Summer must temperature	Setting up the summer set temperature (15-95). That´s the hot water tank temperature (hot water tank bottom- respectively if installed hot water tank centre temperature), which will be provided during summer operation.	°C
Difference temperature	Setting up the temperature difference between heat supplier (= boiler) and buffer temperature bottom for excitation of the buffer loading pump.	°C
Switching temperature	Displays switching temperature (= average daytime temperature). In general the switching temperature conducts the switching between winter set temperature and summer set temperature.	°C
Temp. increase	Setting up the temperature increase (5-15) of the required buffer temperature. ▪ Compensates heat loss by exceeding the temperature requirement.	°C
Settings II	○ ○ ○ ○ ● ○	
Balance tank	Setting up the balance tank (ON/OFF) ▪ If the boiler is switched off (e.g.: burner cleaning) and the buffer top temperature is equal to the maximum required temperature, the boiler won´t restart, even if the buffer bottom temperature is not reached.	-
Fastrun heating	Setting up the fastrun heating (ON/OFF) ▪ If fastrun heating is active, the hot water tank upper zone gets heated up with the consumer´s highest requested flow temperature (see chapter 8). So the requested flow temperature gets achieved quickly. ▪ If fastrun heating is active, the term fastrun heating will be displayed in status 2.	-
Buffer re-layering	Setting up the buffer re-layering (ON/OFF) ▪ Re-layering of hot water from heat supplier to hot water tank respectively from hot water tank to hot water tank. ▪ If the buffer is connected directly to the boiler, this parameter must be activated!	-
Outside temp. sensor	Selection of the outside temperature sensor ▪ If multiple outside temperature sensors are installed, the desired one can be assigned to the chosen buffer.	-
Balancing outside sensor	Adjusting the balancing of the outside temperature (-5 to 5)	°C
Agg-Test	○ ○ ○ ○ ○ ●	
Buffer loading pump*	Indicates the state of the buffer loading pump: ▪ If the indicator lamp lights up, the buffer loading pump is activated and the buffer gets charged.	-
Fastrun open*	Indicates the state of the fastrun heating valve: ▪ If the indicator lamp lights up the fastrun heating valve is open and the hot water tank gets heated up with the consumer´s highest requested flow temperature (see chapter 8).	-
Fastrun close*	Indicates the state of the fastrun heating valve: ▪ If the indicator lamp lights up, the fastrun heating valve is closed	-

9.12.3 Hot water tank

Menu structure

Overview	Status	Settings
● ○ ○ ○ ○ ○	○ ● ○ ○ ○ ○	○ ○ ● ○ ○ ○
Fast start Full-loading 	Hot water tank temperature Loading valve Hot water tank pump Hot water tank temperature bottom Load-through valve Circulation temperature Circulation pump	Must temperature Min. loading / temperature Temp. increase Max. Loading time Legio temperature Circulation pump Loading valve

Time program	Circulation time	Agg-Test
○ ○ ○ ● ○ ○	○ ○ ○ ○ ● ○	○ ○ ○ ○ ○ ●
Time	Time	Hot water tank pump Loading valve Load-through valve Circulation pump

Term	Description	Unit
Overview	● ○ ○ ○ ○	
Fast start	Activates the fast start up (ON/OFF) ▪ If fast start up is activated, the hot water tank is heated independently (maximum loading time) to the requested set temperature.	-
Full-loading	Activates a full loading of the hot water tank (ON/OFF) ▪ If full-loading is activated, the hot water tank is heated up to the requested set temperature ▪ (→ only available, if second temperature sensor is installed)	-
Status	○ ● ○ ○ ○	
Hot water tank temperature	Indicates the hot water tank upper zone temperature	°C
Loading valve	Indicates the state of the loading valve (→ only visible, if hot water tank pump is activated)	-
Hot water tank pump	Indicates the state of the hot water tank pump (→ only visible, if loading valve is inactivated)	-
Hot water tank temperature bottom	Indicates the hot water tank bottom zone temperature (→ only visible, if second temperature sensor is installed	°C
Load-through valve	Indicates the state of the load-through valve (→ only visible, if load-through valve is activated and a heat pump is installed)	-
Circulation temperature	Indicates the circulation temperature (→ only visible, if circulation pump is activated)	°C
Circulation pump	Indicates the state of the circulation pump (→ only visible, if circulation pump is activated)	-

Term	Description	Unit
Settings	○ ○ ● ○ ○	
Must temperature	Setting up the hot water tank set temperature (50-85)	°C
Min. loading / temperature	Indicates/activates the min. loading / temperature (20-55) (ON/OFF) ▪ If the hot water tank min. loading / temperature is activated and the state out of max loading time, the hot water tank temperature will be set equal to min. loading / temperature. ▪ If hot water tank temperature is lower than the min. loading / temperature value, the hot water tank loading will start	°C
Temp. increase	Setting up an increase (0-15) of the required hot water tank temperature ▪ Compensates heat loss by exceeding the hot water tank set temperature	°C
Max. Loading time	Setting up maximum hot water tank loading time (0-10), when hot water tank is loaded to hot water tank set temperature	h
Legio temperature	Setting up the legionella temperature (0-95) ▪ Hot water tank will be heated up, within the given hot water tank loading time, to the legionella temperature weekly to kill bacteria ▪ A deactivation of this parameter is done by setting up the legionella temperature to 0 °C.	°C
Circulation pump *Circulation temperature*	Activates the circulation pump (ON/OFF) ▪ During the hot water tank loading time the circulation pump is switched on 2 minutes for every 10 minutes ▪ If circulation pump is activated, „circulation pump“ is available at the agg-test Setting up the circulation temperature (0-85) ▪ Limited by hot water tank set temperature	-
Loading valve	Activates the loading valve (ON/OFF) ▪ If loading valve is activated, „loading valve“ is available at the agg-test (→ only if loading valve is installed)	-
Time program	○ ○ ○ ● ○	
Time 1	Three different time options are available: ▪ time 1: 08:00 – 10:00 ▪ time 2: 15:00 – 21:00 ▪ time 3: 00:00 – 00:00	-
08:00 – 11:00	Setting up individual hot water tank loading times of every weekday	-
	Monday preset gets assigned to remaining weekdays	-
Circulation time		
Time 1	Two different time options are available: ▪ time 1: 08:00 – 10:00 ▪ time 2: 15:00 – 21:00	-
08:00 – 11:00	Setting up individual circulation pump times of every weekday	
	Monday preset gets assigned to remaining weekdays	
Agg-Test	○ ○ ○ ○ ●	
Hot water tank pump*	Indicates the state of the hot water tank pump: ▪ If the indicator lamp lights up, the hot water tank pump is running ▪ Only visible, if “loading valve” is not activated	-
Loading valve*	Indicates the state of the loading valve: ▪ If the indicator lamp lights up, the loading valve is open ▪ Only visible, if “loading valve” is activated	-

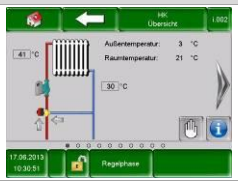
Term	Description	Unit
Load-through valve*	Indicates the state of the load-through valve: ▪ If the indicator lamp lights up, the load-through valve is open and the hot water tank is loaded faster (= fast start) ▪ Only visible, if “loading valve” is activated	-
Circulation pump*	Indicates the state of the circulation pump: ▪ If the indicator lamp lights up, the circulation pump is running ▪ Only visible, if “circulation pump” is activated	-

9.12.4 Heating circuit

Menu structure

Overview

● ○ ○ ○ ○ ○ ○ ○ ○ ○



Status I

○ ● ○ ○ ○ ○ ○ ○ ○ ○

Flow temperature
Back flow temperature
Outside temperature
Room temperature
Room correction

Status II

○ ○ ● ○ ○ ○ ○ ○ ○ ○

Switching temperature
Heating circuit mixer
Heating circuit pump
Screed days

Operation modes

○ ○ ○ ● ○ ○ ○ ○ ○ ○

Heating circuit
· Heating time mode
· Durable heat
· Durable kneeling
· Flow fixed
· Remote control
· Screed drying
Actual heating circuit mode
Remote control number
Balancing room sensor
Kneeling barrier

Parameter I

○ ○ ○ ○ ● ○ ○ ○ ○ ○

Room set temperature
Kneeling temperature
Flow fixed temperature
Room influence
Correction
Kneeling influence
End run

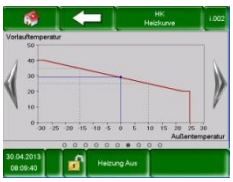
Parameter II

○ ○ ○ ○ ○ ● ○ ○ ○ ○

Switching temperature
Temp. increase
Outside temp. sensor
Balancing outside sensor
Hot water tank priority
Kneeling barrier

Heat curve

○ ○ ○ ○ ○ ○ ● ○ ○ ○



Heat curve settings

○ ○ ○ ○ ○ ○ ○ ● ○ ○

Flow max. temperature
Root point temperature
Flow temperature at +10°C
Flow at outside temperature
Adjustable outside temperature
Actual outside temperature
Switch off temperature

Time program

○ ○ ○ ○ ○ ○ ○ ○ ● ○

Time

Agg-Test

○ ○ ○ ○ ○ ○ ○ ○ ○ ●

Heating circuit pump
Heating circuit mixer OPEN
Heating circuit mixer CLOSE

Term	Description	Unit
Status I	○ ● ○ ○ ○ ○ ○ ○ ○ ○	
Flow temperature	Indicates the flow temperature of chosen heating circuit	°C
Back flow temperature	Indicates the back flow temperature of chosen heating circuit	°C
Outside temperature	Indicates the actual outside temperature	°C
Room temperature	Indicates the room temperature	°C
Room correction	Indicates the room correction	°C
Status II	○ ○ ● ○ ○ ○ ○ ○ ○ ○	
Switching temperature	Indicates the switching temperature (= average daytime temperature). In general the switching temperature conducts the switching between winter set temperature and summer set temperature.	°C
Heating circuit mixer	Indicates the state of the heating circuit mixer (OPEN/CLOSE)	-
Heating circuit pump	Indicates the state of the heating circuit pump (ON/OFF)	
Screed days	Setting up screed drying heat day ▪ Only visible, if operation mode “screed drying” is activated	-
Operation modes	○ ○ ○ ● ○ ○ ○ ○ ○ ○	
Heating circuit	Activation heating circuit (ON/OFF)	-
Operation mode	Selection operation modes: ▪ Heating time mode: Heating corresponds to the set heating time ▪ Durable heat: Constant heat up to required set room temperature or to the calculated feed flow target temperature ▪ Durable kneeling: Constant heat up to setback temperature respectively calculated flow temperature during setback time ▪ Flow fixed: A defined feed flow set temperature will be held constantly during the set heating time. ▪ Remote control: Modus corresponds to the remote control setting. Only available, if remote control is connected. ▪ Screed drying: Modus of screed drying. The operation of the screed drying is described on page 41.	-
Actual heating circuit mode	Indicates the actual heating circuit operating mode	-
Remote control number	Selection of heating circuit´s remote control	-
Balancing room sensor	Setting up balancing room sensor (-5 to +5)	°C
Kneeling barrier over room temperature	Activates the kneeling barrier (ON/OFF) → only possible with remote control: ▪ If actual room temperature is higher then set room temperature, the option „ Kneeling barrier over room temperature “ provides a lock of the heating circuit.	-

Term	Description	Unit
Parameter I	○ ○ ○ ○ ● ○ ○ ○ ○ ○	
Room must temperature	Setting up the required room temperature during heating time. This setting is only used in connection with a remote control (FBR 1)	°C
Kneeling temperature	Setting up required room temperature during lowering time.	°C
Flow fixed temperature	Setting up the flow temperature (20 to maximum flow set temperature) during the set heating time (operation mode “flow fixed”)	°C
Room influence	Room influence (0-10) influences the flow temperature as a function of the room temperature: ▪ Depending on the level of this value (0-10), the difference of required room- and room set temperature exerts more influence on the calculation of the flow set temperature.	-
Correction	The correction influences respectively adjust the flow set temperature: ▪ This value (-5 to +5) gets multiplied by 2 and added to the flow set temperature	°C
Kneeling influence	Setting up the factor (0-10) of the lowering temperature influence	-
End run	Setting up the outside temperature (-25 to 10) which conducts a permanent running of the pump to avoid freezing.	°C
Parameter II	○ ○ ○ ○ ○ ● ○ ○ ○ ○	
Switching temperature	Setting up the switching temperature (10-35). That´s the average daytime temperature that conducts the switching between winter set temperature and summer set temperature. A higher level of the switching temperature will delay the switching to summer operation.	°C
Temp. increase	Setting up an increase (0-15) of the required heat circuit temperature ▪ Compensates heat loss between buffer and heat circuit by exceeding the hot water tank set temperature ▪ High heat loss assumes a higher value	°C
Outside temp. sensor	Selection of the outside temperature sensor ▪ If multiple outside temperature sensors are installed, the desired one can be assigned to the chosen heat circuit.	-
Balancing outside sensor	Adjusting the balancing of the outside temperature sensor ▪ Adjustment with a reference thermometer (actual outside temperature)	°C
Hot water tank priority	Activation hot water tank priority (ON/OFF) ▪ The hot water tank is loaded prior compared to the heating circuit.	-
Kneeling barrier	Activation kneeling barrier (ON/OFF) ▪ Heating circuit gets locked during permanent reduction respectively beyond heating time	-
Heat curve settings	○ ○ ○ ○ ○ ○ ○ ● ○ ○	
Flow max. temperature	Setting up the maximum flow temperature (30-95) of chosen heating circuit	°C
Root point temperature	Setting up the minimum flow temperature (20-70) of chosen heating circuit	°C
Flow temperature at +10°C	Setting up the flow temperature (20-90) of chosen heating circuit at +10°C outside temperature	°C
Flow at adjustable outside temperature	Setting up the flow temperature (25-95) of chosen heating circuit at a adjustable outside temperature	°C
Adjustable outside temperature	Setting up the outside temperature (-20 to -10) of chosen heating circuit regarding flow set temperature	°C
Actual outside temperature	Indicates the actual outside temperature	°C

Term	Description	Unit
Switch off temperature	Setting up the outside temperature (10-40) regarding deactivation of chosen heating circuit	°C
Time program	○ ○ ○ ○ ○ ○ ○ ○ ● ○	
Time 1	Three different time options are available: ▪ time 1: 08:00 – 10:00 ▪ time 2: 15:00 – 21:00 ▪ time 3: 00:00 – 00:00	-
08:00 – 11:00	Setting up individual hot water tank loading times of every weekday	-
	Monday preset gets assigned to remaining weekdays	-
Agg-Test	○ ○ ○ ○ ○ ○ ○ ○ ○ ●	
Heating circuit pump*	Indicates the state of the heating circuit pump: ▪ If the indicator lamp lights up, the heating circuit pump is running	-
Heating circuit mixer OPEN*	Indicates the state of the heating circuit mixer: ▪ If the indicator lamp lights up, the heating circuit mixer is open	-
Heating circuit mixer CLOSE*	Indicates the state of the heating circuit mixer: ▪ If the indicator lamp lights up, the heating circuit mixer is closed	-

Operation mode „Screed drying“

Bake out day	Flow set temperature in °C
1	25
2	30
3	35
4	40
5 – 12	45
13	40
14	35
15	30
16	25
17 – 23	10
24	30
25	35
26	40
27	45
28	35
29	25

If screed drying gets interrupted, resume drying as follows:	
Day of interruption	**resume from day**
0 – 15	1
16	16
17 – 23	17
24 – 28	24
29	29

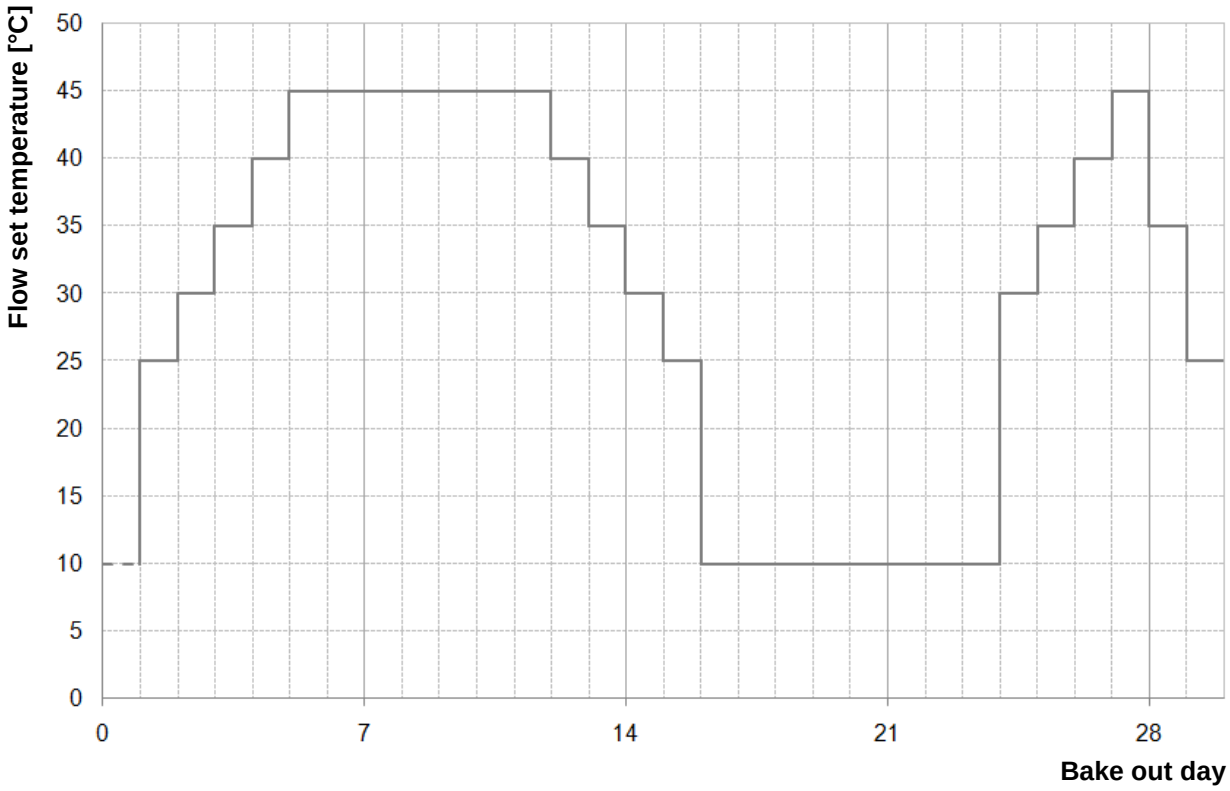


figure 9.17: Flow set temperature as a function of bake out days at „Screed drying”

9.12.5 Time mode

Menu structure

Time program
● ○
Time

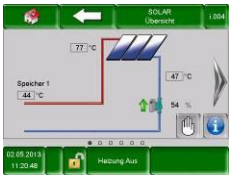
Settings
○ ●
Time requirement

Term	Description	Unit
Time program	● ○	
Time 1	Three different time options are available: ▪ time 1: 08:00 – 10:00 ▪ time 2: 15:00 – 21:00 ▪ time 3: 00:00 – 00:00	-
08:00 – 11:00	Setting up individual hot water tank loading times of every weekday	-
	Monday preset gets assigned to remaining weekdays	-
Settings	○ ●	
Time requirement	If the boiler works only as a heat supplier (no heating circuit installed), the set up boiler set temperature (20-100) gets supplied during the set heating times.	°C

9.12.6 Solar

NOTE: At the solar module 5 resp. 6 (only at external solar module) program numbers are available, which are set up by the service technician. The only differences of the programs are the integration and the number of tanks (e.g. hot water tank, buffer). The hydraulic schemes of the different modules are described in appendix 14.2.

Menu structure

Overview	Status I	Status II
● ○ ○ ○ ○ ○	○ ● ○ ○ ○ ○	○ ○ ● ○ ○ ○
	Collector flow temperature Collector back flow temperature Tank 1 temperature Tank 2 temperature	Actual yield Daily yield Total yield Collector pump Loading pump Switching valve

Settings I	Settings II	Agg-Test
○ ○ ○ ● ○ ○	○ ○ ○ ○ ● ○	○ ○ ○ ○ ○ ●
Program number Antifreeze Flow rate Rotation speed control Min. rotation speed Must value Control difference	Pump trigger Tank 1 must temperature Difference 1 Tank 1 max. temperature Tank 2 must temperature Difference 2 Tank 2 max. temperature	Collector pump Loading pump Switching valve OPEN Switching valve CLOSE

Term	Description	Unit
Status I	○ ● ○ ○ ○ ○	
Collector flow temperature	Indicates the collector flow temperature	°C
Collector back flow temperature	Indicates the collector backflow temperature	°C
Tank 1 temperature	Indicates the temperature of tank 1 (e.g.: hot water tank, buffer)	°C
Tank 2 temperature	Indicates the temperature of tank 2 (e.g.: hot water tank, buffer) (only visible, if program 3, 4, 5 or 6 is chosen)	°C
Status II	○ ○ ● ○ ○ ○	
Actual yield	Indicates actual energy yield	W
Daily yield	Indicates daily energy yield (0 – 24h)	Wh
Total yield	Indicates total measured energy yield	kWh
Collector pump	Indicates the state of the collector pump	-
Loading pump	Indicates the state of the loading pump ▪ only visible, if program number 2 or 6 is chosen	-
Switching valve	Indicates the state of the switching valve ▪ only visible, if program number 3,4,5 or 6 is chosen	-

Term	Description	Unit
Settings I	○ ○ ○ ● ○ ○	
Program number	Indicates the program number (1 to 6)	-
Antifreeze	Setting up the minimum outside temperature (-45 to 5), which conducts a permanent running of the solar pump to avoid freezing.	°C
Flow rate	Setting up the flow rate (0-99,9) for calculating of solar output respectively the yield	l/min
Rotation speed control	Setting up the rotation speed control (ON/OFF)	-
Min. rotation speed	Setting up the minimum solar pump rotation speed (20-100)	%
Must value	Setting up the solar pump rotation speed set point	°C
Control difference	Setting up the rotation speed control difference (if active)	°C
Settings II	○ ○ ○ ○ ● ○	
Pump trigger	Setting up the minimum collector temperature (15-70) to startup the solar pump	°C
Tank 1 must temperature	Setting up the set temperature (25-90) of tank 1	°C
Difference 1	Setting up the collector difference (5-30) of tank 1	°C
Tank 1 max. temperature	Setting up the maximum temperature (25-95) of tank 1	°C
Tank 2 must temperature	Setting up the set temperature (25-90) of tank 1 (→ only visible, if program number 3, 4, 5 or 6 is chosen)	°C
Difference 2	Setting up the difference (5-30) between collector and tank 1 (→ only visible, if program number 3, 4, 5 or 6 is chosen)	°C
Tank 2 max. temperature	Setting up the maximum tank temperature (25-95) of tank 1 (→ only visible, if program number 3, 4, 5 or 6 is chosen)	°C
Agg-Test	○ ○ ○ ○ ○ ●	
Collector pump*	Indicates the status of the collector pump: ▪ If the indicator lamp lights up, the collector pump is running	-
Loading pump*	Indicates the state of the loading pump (→ only visible, if program number 2 or 6 is chosen) ▪ If the indicator lamp lights up, the loading pump is running	-
Switching valve OPEN*	Indicates the state of the switching valve (→ only visible, if program number 3, 4, 5 or 6 is chosen) ▪ If the indicator lamp lights up, the switching valve is open	-
Switching valve CLOSE*	Indication of the state of the switching valve (→ only visible, if program number 3, 4, 5 or 6 is chosen) ▪ If the indicator lamp lights up, the switching valve is closed	-

9.12.7 Hydraulic compensator module

Menu structure

Overview	Status	Settings
● ○ ○ ○	○ ● ○ ○	○ ○ ● ○
	Hydr. compensator temperature Existing temperature Required temperature Pump 1 Pump 2	Switch on barrier Temp. increase

Agg-Test
○ ○ ○ ●
Pump 1 Pump 2

Term	Description	Unit
Status	○ ● ○ ○	
Hydr. compensator temperature	Indicates the hydraulic compensator temperature ▪ The hydraulic compensator has a built in temperature sensor	°C
Existing temperature	Indicates the flow temperature of the upstream module (e.g.: boiler, buffer)	°C
Required temperature	Indicates the required temperature of the downstream module (e.g. heating circuit)	°C
Pump 1	Indicates the state of pump 1 (ON/OFF) ▪ Pump 1 is the pump in the back flow on the primary side	-
Pump 2	Indicates the state of pump 2 (ON/OFF) ▪ Pump 2 is the pump in the flow on the secondary side	-
Settings	○ ○ ● ○	
Switch on barrier	Setting up the switch on barrier of pump 2: ▪ If the flow temperature of the upstream module (e.g. boiler, buffer) is higher than the set up “switch on barrier”, pump 2 is turned on otherwise pump 2 will stay switched off.	°C
Temp. increase	Setting up the temperature increase of the required temperature ▪ Compensates heat loss by exceeding the downstream module temperature requirement.	°C
Agg-Test	○ ○ ○ ●	
Pump 1*	Indicates the state of pump 1: ▪ Pump 1 is the pump in the back flow on the primary side ▪ If the indicator lamp lights up, pump 1 is switched on	-
Pump 2*	Indicates the state of pump 2: ▪ Pump 2 is the pump in the flow on the secondary side ▪ If the indicator lamp lights up, pump 2 is switched on	-

9.12.8 Net pump

Menu structure

Overview	Status	Settings
● ○ ○ ○	○ ● ○ ○	○ ○ ● ○
	Existing temperature Required temperature Pump	Switch on barrier Temp. increase

Agg-Test
○ ○ ○ ●
Pump

Term	Description	Unit
Status	○ ● ○ ○	
Existing temperature	Indicates the temperature of the upstream module (e.g.: buffer top temperature)	°C
Required temperature	Indicates the required temperature of the downstream module (e.g. buffer)	°C
Pump	Indicates the state of the net pump	-
Settings	○ ○ ● ○	
Switch on barrier	Setting up the switch on barrier for the net pump: ▪ If the flow temperature of the upstream module (e.g. boiler, buffer) is higher than the set up “switch on barrier”, net pump is turned on otherwise the net pump will stay switched off.	°C
Temp. increase	Setting up the temperature increase of the required temperature ▪ Compensates heat loss by exceeding the downstream module temperature requirement.	°C
Agg-Test	○ ○ ○ ●	
Pump*	Indicates the state of the net pump: ▪ If the indicator lamp lights up, the net pump is switched on	-

9.12.9 Zone valve

Menu structure

Overview	Status	Settings
● ○ ○ ○	○ ● ○ ○	○ ○ ● ○
	Existing temperature Required temperature Zone valve	Switch on barrier Temp. increase

Agg-Test
○ ○ ○ ●
Zone valve OPEN

Term	Description	Unit
Status	○ ● ○ ○	
Existing temperature	Indicates downstream module temperature (e.g.: buffer top temperature)	°C
Required temperature	Indicates the required temperature of the downstream module (e.g.: buffer)	°C
Zone valve	Indicates the state of the zone valve	-
Settings	○ ○ ● ○	
Switch on barrier	Setting up the switch on barrier of the zone valve: ▪ If the flow temperature of the upstream module (e.g. boiler, buffer) is higher than the set up “switch on barrier”, the zone valve is opened otherwise the zone valve will stay closed.	°C
Temp. increase	Setting up the temperature increase of the required temperature ▪ Compensates heat loss by exceeding the downstream module temperature requirement.	°C
Agg-Test	○ ○ ○ ●	
Zone valve OPEN*	Indicates the state of the zone valve: ▪ If the indicator lamp lights up, the zone valve is opened	-

9.12.10 External requirement

The external requirement module provides an interface to an external foreign control loop (e.g. central building control system). The requirement, which can be digital or analogue, is registered as a required temperature (e.g. boiler must temperature by the boiler or buffer top temperature by the buffer) in the heat supplier (e.g. boiler or buffer).

Menu structure

Overview	Status	Settings
● ○ ○	○ ● ○	○ ○ ●
External demand Analogue must temperature	Demand active Analogue must Analogue must	External must temperature Analogue must active Analogue must temperature 4 mA Analogue must temperature 20 mA Analogue must temperature Max. Analogue must temperature Min. Line monitoring

Term	Description	Unit
Overview	● ○ ○	
External demand	Indicates a digital input signal of the external control loop (requirement): ▪ If the indicator lamp lights up, the external control loop sends a requirement to the digital input	-
Analogue must temperature	Indicates the actual analogue set temperature	°C
Status	○ ● ○	
Demand active	Indicates the state of the external demand	-
Analogue must [°C]	Indicates the actual analogue set temperature	°C
Analogue must [mV]	Indicates the actual analogue set temperature ▪ The analogue set temperature gets inverted by calculation in compliance with Ohm's law into a voltage (see figure 9.18)	mV
Settings	○ ○ ●	
External must temperature	Setting up the (digital) external set temperature: ▪ The boiler will operate with the external set temperature (fixedly) as long as the analogue set temperature does not exceed the set up temperature	°C
Analogue must active	Activates the analogues set point setting	-
Analogue must temperature 4 mA	Setting up lower limit of analogue set temperature at 4 mA (see figure 9.18). ▪ If input is a analogue signal of 4 mA, the boiler operates with the set up temperature	°C
Analogue must temperature 20 mA	Setting up upper limit of analogue set temperature at 20 mA (see figure 9.18). ▪ If input is a analogue signal of 20 mA, the boiler operates with the set up temperature	°C
Analogue must temperature Max.	Setting up maximum analogue set temperature	°C
Analogue must temperature Min.	Setting up minimum analogue set temperature	°C
Line monitoring	Activates the line monitoring (ON/OFF)	-

External requirement at digital input:

At a digital request the external set temperature gets transmitted as value to the heat supplier.

External requirement at analogue input

At an analogue request a calculated (= linearly interpolated) temperature gets transmitted to the heat supplier (see figure 9.18). The graph in figure 9.18 gets regulated by the parameters „analogue must temperature 4 mA“ and „analogue must temperature 20 mA“.

For example at an analogue request with an current signal of 12 mA, a temperature of 60 °C is registered at the heat supplier, provided that the digital requirement (= external must temperature) is not higher.

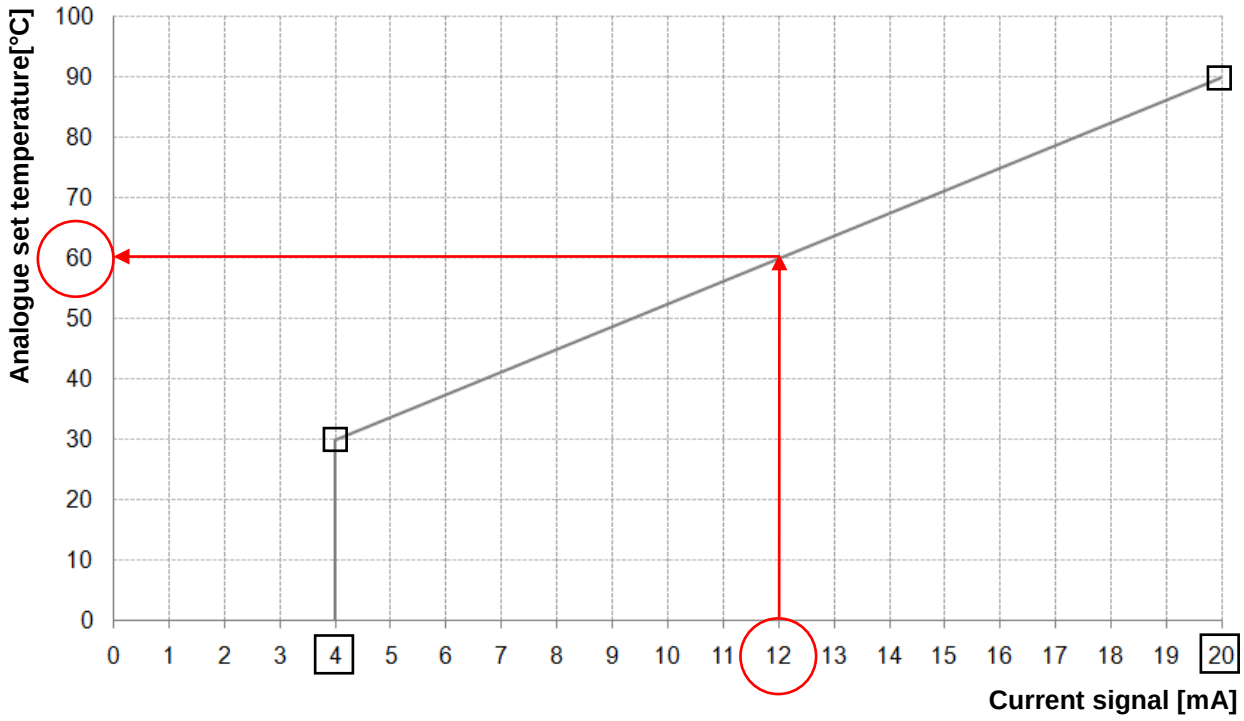


figure 9.18: Analogue set temperature as a function of the applied current signal of the external requirement

At the input of the external requirement module a current signal between 4 and 20 mA should be given, because a current signal is compared to a voltage signal insensitive to electromagnetic disturbances and voltage losses at the cables. With an internal resistor (500 Ohm) the current signal is converted into a voltage signal.

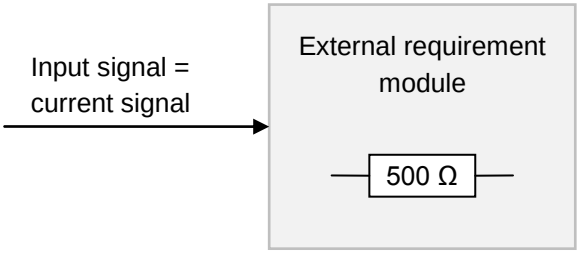


figure 9.19: Input signal of the external requirement module

9.12.11 Additional boiler

The recommended hydraulic schemes are shown in appendix 14.1.

Menu structure

Settings
●
Boiler type
Waiting period
Pump trigger
Pump difference
Pump after run
Flue gas min. temperature
Boiler min. temperature
Minimum requirement
Control hysteresis

Term	Description	Unit
Settings	●	
Boiler type	Selection boiler type: ▪ **Automatic:** If using automatic additional boilers (e.g.: oil-boiler) ▪ **Manually:** If using lock wood boilers ▪ **Oil burner:** burner control	-
Waiting period	▪ **Automatic / Oil burner:** additional boiler waiting time (if required) ▪ **Manually:** additional boiler minimum operation time till additional boiler is available again	-
Pump trigger	Setting up pump trigger	-
Pump difference	Setting up pump turn off difference	-
Pump after run	Setting up additional boiler stopping time	-
Flue gas min. temperature	Setting up minimal flue gas temperature (→ only visible, if manual was chosen)	-
Boiler min. temperature	Setting up minimum boiler temperature (→ only visible, if manual was chosen) ▪ If this boiler temperature is exceeded, additional boiler will get active (0 °C = no monitoring)	-
Minimum requirement	Setting up minimum requirement (→ only visible, if burner was chosen) ▪ If this minimum additional boiler temperature is exceeded, the additional boiler will supply heat	-
Control hysteresis	Setting up control hysteresis (→ only visible, if burner was chosen) ▪ If additional boiler temperature exceeds required additional boiler temperature + control hysteresis, the additional boiler will be turned off.	-

9.13 Menu settings

Navigation:	 →  → [redacted] →111 → OK

Screen:

figure 9.20: Overview menu settings

If touching symbol:	
	the network configuration will be displayed. *(see chapter 9.13.1– page 52)*
	the Modbus – settings will be displayed. *(see chapter 9.13.2 – page 53)*
	the screensaver settings will be displayed. *(see chapter 9.13.3 – page 54)*
	information such as software version operating system number, … will be displayed. *(see chapter* 9.13.4 *– page 54)*
	you can send messages by E-mail. *(see chapter 9.13.5 – page 55)*
	E-mail times setting will be displayed (when an E-mail has to be sent) *(see chapter 9.13.6 – page 57)*
	the mail server settings will be displayed. *(see chapter 9.13.7 – page 58)*

9.13.1 Network configuration

Navigation 1:		**Navigation 2:**	DNS
Screen:		**Screen:**	

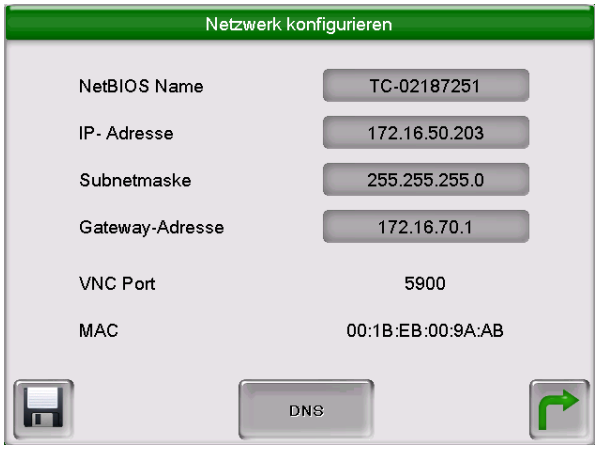
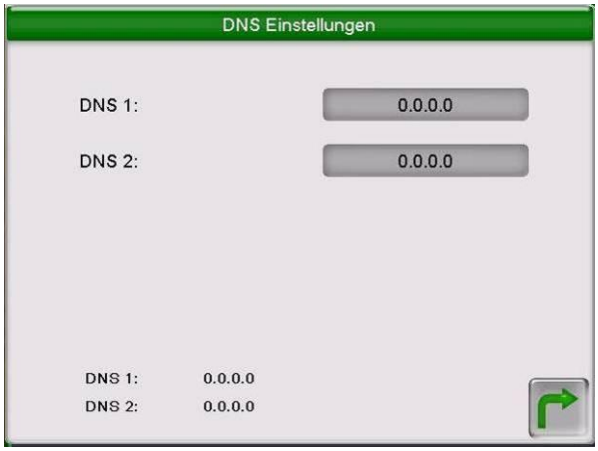

		

figure 9.21: Network configuration		figure 9.22: DNS settings	
If the following field is pressed:		**If the following field is pressed:**	
NetBIOS Name	the NetBIOS name can be set up	DNS 1 / DNS 2	the IP address of the DNS server can be set up
IP-Address	The boiler IP address can be set up		the network configuration page will be displayed again (see (figure 9.21)
Subnetmaske	the subnet mask can be set up		
Gateway-Address	the gateway address can be set up		
	the settings can be saved		
DNS	the submenu for the DNS settings will be displayed (see figure 9.22)		
	The menu settings will be displayed again		
		Note:	
		DNS means **D**omain **N**ame **S**ystem which unpacks a domain into the corresponding IP address. That means, by setting up the DNS server, the T-CONTROL is able to send E-mails. We recommend the following configuration: **DNS 1: 8.8.8.8** (= DNS Server of Google, it is public and free. That can be an alternative to the internet provider's server) **DNS 2:** DNS – Server of the internet provider	

9.13.2 Modbus – settings

Navigation:	Modbus TCP

Screen:

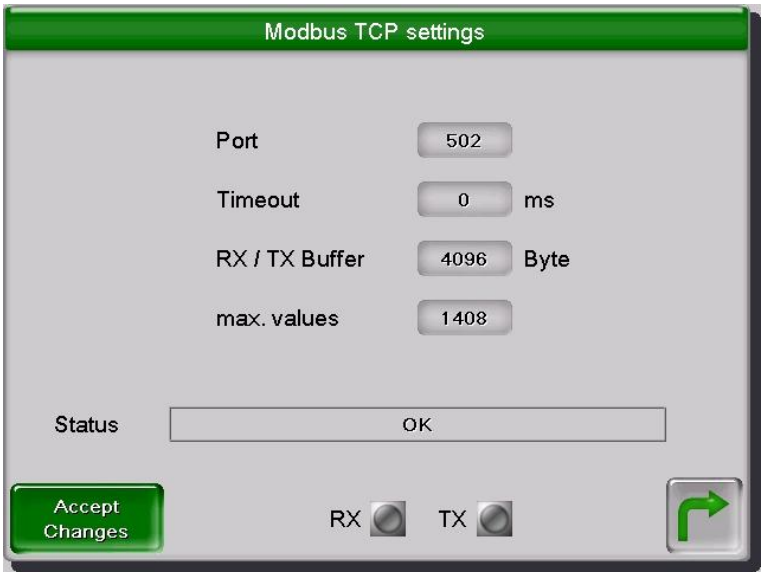


figure 9.23: Modbus – settings

If the following field is pressed:	
Port	Setting up the TCP port number. 502 is reserved for Modbus-TCP.
Timeout	Setting up the time delay of the data transfer
RX / TX Buffer	Setting up the buffer size in byte
max. values	Setting up the maximum values of the servers.
Accept Changes	Save changes
	the network configuration page will be displayed again.

Note:

Modbus is an application protocol to exchange messages between intelligent Modbus controllers in the building management system. The Modbus protocol “TCP” is used in the HERZ control. This protocol transmits the encoded data via LAN cable. Modbus ensures that connected controllers in the building management system receive the transmitted data from the boiler, so they can continue processing.

9.13.3 Screensaver

Navigation:	

Screen:

figure 9.24: Screensaver

If the following field is pressed:	
1	the screensaver gets activated / deactivated.
2	the screen saver waiting time can be set up.
3	the screensaver standby mode gets activated / deactivated.
4	the standby mode waiting time can be set up
	the menu settings will be displayed again

9.13.4 Information overview

Navigation:	

Screen:

figure 9.25: Information overview

Note:

The information shows an overview of the current software versions, operating system, firmware and also the hydraulic scheme. If a USB-Stick is plugged in, the hydraulic scheme can be saved.

9.13.5 Sending E-mails

ACTIVATE E-MAIL DISPATCH	CREATE RECEIVER LIST

Navigation 1: 

Screen:

figure 9.26: Mail Settings

If the following field is pressed:

Receiver list	the E-mail receiver list gets displayed (see figure 9.27)
E-Mail subject	The E-mail subject can be set up.
	E-Mail dispatch can be activated / deactivated.
	the menu settings will be displayed again

Navigation 2:  → receiver list

Screen:

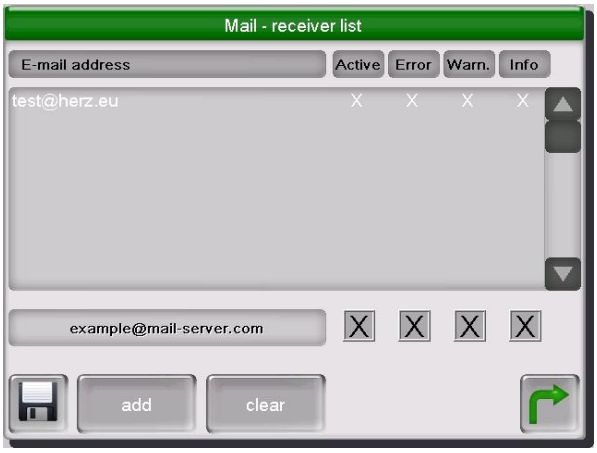


figure 9.27: Mail receiver list

If the following field is pressed:

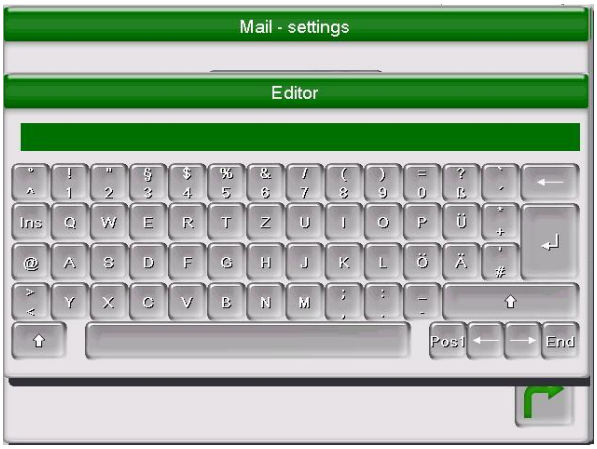
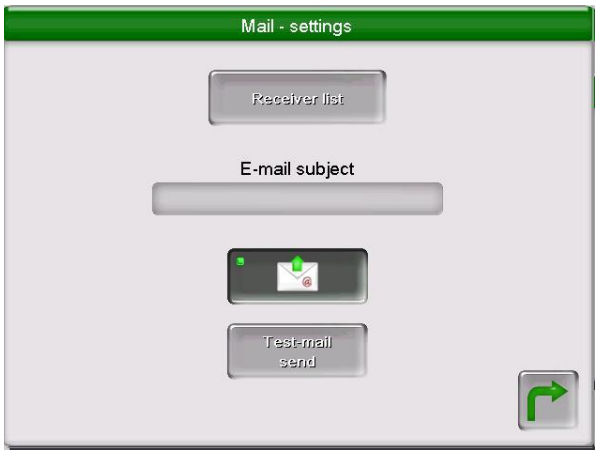
beispiel@mail-server.com	the receiver's E-mail addresses can be set up
add	the entered E-mail address gets added to the receiver list
clear	the selected E-mail address gets deleted off the receiver list
	several values (errors, warnings, info) can be chosen.
	the selected E-mail address and values (error, warnings, info) are saved.
	the mail settings will be displayed again (see figure 9.26).

Note:

Selection:	 1 2 3 4

1	If the box is not checked, no E-mail will be sent to the recipient.
2	If the box is checked, errors will be transmitted
3	If the box is checked, warnings will be transmitted
4	If the box is checked, information will be transmitted

MAIL SUBJECT	TEST-MAIL SENDING

Navigation:	→ Subject	**Navigation:**	
Screen:		**Screen:**	
 figure 9.28: Mail subject		 figure 9.29: Test-Mail sending	
If the following field is pressed:		**If the following field is pressed:**	
	the entry will be confirmed.	Test-mail send	Send E-mail to recipient. (only visible/possible if sending is active)
	the last character will be deleted.		
	characters will be written in uppercase		

9.13.6 E-Mail status report

Navigation:	

Screen:

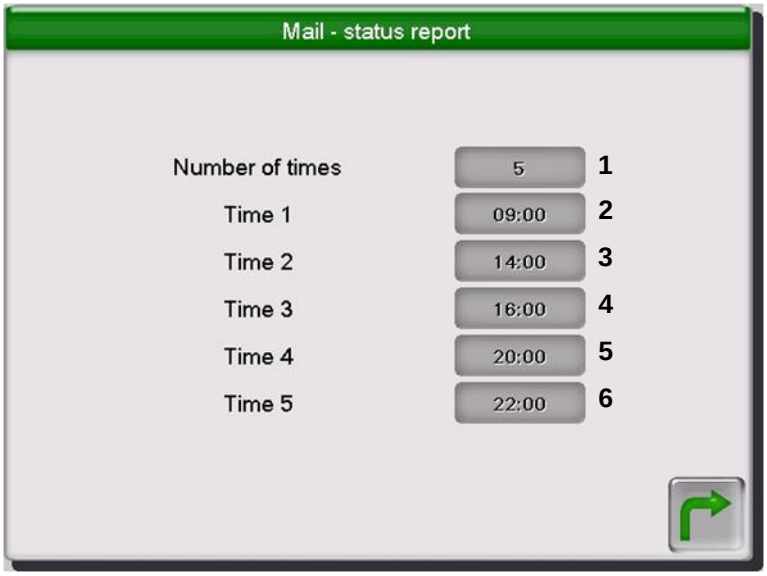


figure 9.30: E-Mail status report

If the following field is pressed:	
1	the quantity of times (maximum 5) can be set up
2-6	individual sending times (error, warning, information → see figure 9.27) can be set up
	the menu settings will be displayed again

9.13.7 Server settings

Navigation:	

Screen:

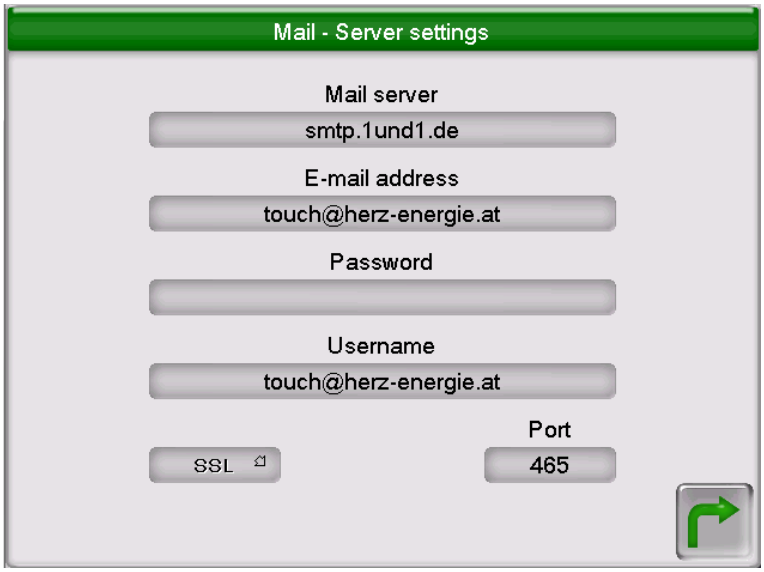


figure 9.31: Server settings

If the following field is pressed:	
smtp.1und1.de	the mail server address can be entered (=outgoing mail server)
touch@herz-energie.at	the boiler's E-mail address can be entered
Password	the password can be entered
touch@herz-energie.at	the username can be entered
SSL	the encoding can be chosen (no, SSL, TLS)

Note:

To send mail at the adjusted values (error, warning, information according to figure 9.27), the boiler has to have a valid E-mail address. After the successful creation of an E-mail address you can set up the exemplified values shown in figure 9.31.

Look up the data of the mail server and the port number at your provider (for example GMX).
After successful configuration of the mail server settings the boiler will send E-mail with the set up values

10 FAULT REPORTS AND THEIR CORRECTIONS

	You should always take particular note of the safety instructions! (see chapter 1)
	If a fault arises, the fault must always be rectified first and afterwards cleared by switching the system on again. If several faults arise at the same time, they will be displayed in order of their occurrence.

	010	020	030	040	050	060		080	090	180
001	011	021	031	041	051	061	071	081	091	181
002	012	022	032	042		062	072	082	092	182
003	013	023	033	043	053	063	073	083	093	
004	014	024	034	044	054	064		084		
005	015	025	035	045	055	065		085	095	
006	016	026	036	046	056	066	076	086	096	
007	017	027	037	047	057	067	077	087		
008	018	028	038	048	058	068	078			
009	019	029	039	049	059	069	079			189

I	Info / indication	
W	Warning	
F	Fault; error / component failure; control failure; malfunction	

10 Fault reports and their corrections

No.	Fault report	Cause of fault	Fault correction
001	BOILER SENSOR	Failure boiler temperature sensor	▪ Check sensor, replace as necessary ▪ Check plug, replace as necessary ▪ Check wiring incl. Connections, replace as necessary ▪ ✆ - contracting party
002	COMBUSTION ROOM SENSOR	Failure burning chamber temperature sensor	▪ Check sensor, replace as necessary ▪ Check plug, replace as necessary ▪ Check wiring incl. Connections, replace as necessary ▪ ✆ - contracting party
003	FLUE GAS SENSOR	Failure flue gas temperature sensor	▪ Check sensor, replace as necessary ▪ Check plug, replace as necessary ▪ Check wiring incl. Connections, replace as necessary ▪ ✆ - contracting party
004	BACK FLOW SENSOR	Failure back flow temperature sensor	▪ Check sensor, replace as necessary ▪ Check plug, replace as necessary ▪ Check wiring incl. Connections, replace as necessary ▪ ✆ - contracting party
005	STOKER SENSOR	Failure feeding screw temperature sensor	▪ Check sensor, replace as necessary ▪ Check plug, replace as necessary ▪ Check wiring incl. Connections, replace as necessary ▪ ✆ - contracting party
006	KESSEL-AUSSENFÜHLER	defekter Kesselaußenfühler	▪ Check sensor, replace as necessary ▪ Check plug, replace as necessary ▪ Check wiring incl. Connections, replace as necessary ▪ ✆ - contracting party
007	BUFFER SENSOR TOP	Failure buffer top temperature sensor	▪ Check sensor, replace as necessary ▪ Check plug, replace as necessary ▪ Check wiring incl. Connections, replace as necessary ▪ ✆ - contracting party
008	BUFFER SENSOR BOTTOM	Failure buffer bottom temperature sensor	▪ Check sensor, replace as necessary ▪ Check plug, replace as necessary ▪ Check wiring incl. Connections, replace as necessary ▪ ✆ - contracting party

No.	Fault report	Cause of fault	Fault correction
009	BUFFER SENSOR OUTSIDE TEMP.	Failure buffer outside temperature sensor	▪ Check sensor, replace as necessary ▪ Check plug, replace as necessary ▪ Check wiring incl. Connections, replace as necessary ▪ ✆ - contracting party
010	BUFFER SENSOR MIDDLE	Failure centre temperature sensor	▪ Check sensor, replace as necessary ▪ Check plug, replace as necessary ▪ Check wiring incl. Connections, replace as necessary ▪ ✆ - contracting party
011	HOT WATER TANK SENSOR	Failure hot water tank temperature sensor	▪ Check sensor, replace as necessary ▪ Check plug, replace as necessary ▪ Check wiring incl. Connections, replace as necessary ▪ ✆ - contracting party
012	CIRCULATION SENSOR	Failure circulation temperature sensor	▪ Check sensor, replace as necessary ▪ Check plug, replace as necessary ▪ Check wiring incl. Connections, replace as necessary ▪ ✆ - contracting party
013	HC-FLOW SENSOR	Failure heating circuit flow temperature sensor	▪ Check sensor, replace as necessary ▪ Check plug, replace as necessary ▪ Check wiring incl. Connections, replace as necessary ▪ ✆ - contracting party
014	HC-BACK FLOW SENSOR	Failure heating circuit back flow temperature sensor	▪ Check sensor, replace as necessary ▪ Check plug, replace as necessary ▪ Check wiring incl. Connections, replace as necessary ▪ ✆ - contracting party
015	HC-ROOM SENSOR	Failure room temperature remote control (FBR1)	▪ Check sensor, replace as necessary ▪ Check plug, replace as necessary ▪ Check wiring incl. Connections, replace as necessary ▪ ✆ - contracting party
016	HC-ROOM CORR.	Failure room temperature remote control (FBR1)	▪ Check sensor, replace as necessary ▪ Check plug, replace as necessary ▪ Check wiring incl. Connections, replace as necessary ▪ ✆ - contracting party

10 Fault reports and their corrections

No.	Fault report	Cause of fault	Fault correction
017	HC-OUTSIDE SENSOR	Failure heating circuit outside temperature sensor	▪ Check sensor, replace as necessary ▪ Check plug, replace as necessary ▪ Check wiring incl. Connections, replace as necessary ▪ ✆ - contracting party
018	SENSOR COLLECTOR	Failure solar collector temperature sensor	▪ Check sensor, replace as necessary ▪ Check plug, replace as necessary ▪ Check wiring incl. Connections, replace as necessary ▪ ✆ - contracting party
019	SENSOR COLLECTOR BACK FLOW	Failure solar collector back flow temperature sensor	▪ Check sensor, replace as necessary ▪ Check plug, replace as necessary ▪ Check wiring incl. Connections, replace as necessary ▪ ✆ - contracting party
020	SENSOR SOLAR TANK 1	Failure solar tank 1 temperature sensor (hot water tank/buffer)	▪ Check sensor, replace as necessary ▪ Check plug, replace as necessary ▪ Check wiring incl. Connections, replace as necessary ▪ ✆ - contracting party
021	SENSOR SOLAR TANK 2	Failure solar tank 2 temperature sensor (hot water tank/buffer)	▪ Check sensor, replace as necessary ▪ Check plug, replace as necessary ▪ Check wiring incl. Connections, replace as necessary ▪ ✆ - contracting party
022	SOLARFÜHLER RES.	Failure solar sensore (reserve)	▪ Check sensor, replace as necessary ▪ Check plug, replace as necessary ▪ Check wiring incl. Connections, replace as necessary ▪ ✆ - contracting party
023	ADDITIONAL BOILER SENSOR	Failure additional boiler sensor; cable break; short-circuit; failure connection	▪ Check sensor, replace as necessary ▪ Check plug, replace as necessary ▪ Check wiring incl. Connections, replace as necessary ▪ ✆ - contracting party
024	HYDR. COMP. SENSOR	Failure hydraulic compensator temperature sensor; cable break; short-circuit; failure connection	▪ Check sensor, replace as necessary ▪ Check plug, replace as necessary ▪ Check wiring incl. Connections, replace as necessary ▪ ✆ - contracting party

No.	Fault report	Cause of fault	Fault correction
025	OVERHEAT BOILER MAX	Boiler temperature exceeded 98 °C	▪ Check settings ▪ Check back flow mixer ▪ Check back flow pump
026	OVERHEAT	Boiler temperature exceeded 92,5 °C	▪ Check settings ▪ Check back flow mixer ▪ Check back flow pump
027	SOLAR OVERHEATING	Fault is shown, if collector temperature exceeds 140 °C	▪ Check solar pump ▪ Check solar tank level
028	SOLAR MAX. LOADING	collector temperature exceeds 120 °C	-
029	ANTIFREEZE BOILER	Boiler temperature respectively operation room temperature under 7 °C	-
030	ANTIFREEZE BUFFER	Buffer bottom sensor temperature under 7 °C	-
031	ANTIFREEZE HOT WATER TANK	Hot water tank under 7 °C	-
032	ANTIFREEZE HEATING CIRCUIT	Heating circuit- or heating circuit back flow temperature under 7 °C	-
033	ANTIFREEZE SOLAR	Collector temperature under set up antifreeze temperature	-
034	ANTIFREEZE HYDR. COMPENSATOR	Hydraulic compensator temperature under 7 °C	-
036	ANTIFR. ADD. BOILER	Additional boiler temperature under 7 °C	-
037	HOT WATER TANK LOADING	Hot water tank didn´t reach set temperature during loading time; hot water tank loading gets blocked till fault correction	▪ Adapt loading time ▪ Activate hot water tank priority ▪ Hot water tank settings (min. / set)
038	MAINTENANCE	This fault text occurs after 1000 operating hours	▪ Conduct maintenance according to maintenance schedule (see chapter **11**) ▪ Fault has to be receipted manually: Settings → Code ▪ If code is already set → Settings
039	SERVICE	This fault text occurs after 3000 operating hours	Carry out boiler system maintenance by authorised personnel
040	OVERHEAT ADD.BOILER	This fault text occurs if additional boiler temperature exceeds 92 °C	-
041	HEATING OFF	Boiler operation mode “HEATING OFF” is activated	-
042	BLOCKING PROTECTION	Blocking protection is active	-
043	TIMEOUT ADD. BOILER	Additional boiler minimum flue gas temperature wasn´t reached within 1 hour (operation mode: automatic/burner)	▪ Check additional boiler
044	LEGIONELLA PROTECTION.	Tank thermal disinfection active; Tank will be heated up to 70 °C	-

10 Fault reports and their corrections

No.	Fault report	Cause of fault	Fault correction
045	CHIMNEY SWEEP. MODE	Chimney sweep function active	(see chapter 9.4)
046	MOD.ERR EXT.	Communication error of CAN 2 to external module	▪ Check module CAN connection ▪ Check module ▪ ✆ - contracting party
047	MOD.ERR INT.	Communication error of CAN 1 to external module	▪ Check module CAN connection ▪ Check module ▪ ✆ - contracting party
048	MOD.ERR BOILER	Communication error to boiler module	▪ Check module CAN connection ▪ Check module ▪ ✆ - contracting party
049	DATAERROR MEMORY EXTERNAL	Data adjustment error at external module	✆ - contracting party
050	DATAERROR MEMORY INTERNAL	Data adjustment error at internal module	✆ - contracting party
051	DATAERROR MEMORY BOILER	Data adjustment error at boiler module	✆ - contracting party
053	ADDITIONAL FLUE GAS SENSOR	Additional boiler flue gas temperature out of range	▪ Check sensor, replace as necessary ▪ Check plug, replace as necessary ▪ Check wiring incl. Connections, replace as necessary
054	EXTERNAL SET POINT	No Signal of external requirement or control (if line monitoring is active)	▪ Check sensor, replace as necessary ▪ Check plug, replace as necessary ▪ Check wiring incl. Connections, replace as necessary
055	BACK FLOW SET	Back flow set temperature could not be reached during operation	▪ Function check mixer with mixer motor ▪ Function check pump ▪ Check sensor position
056	SCREED BAKE OUT	Failure at screed bake out; Flow set temperature could not be reached	▪ Function check mixer with mixer motor ▪ Function check pump ▪ Check sensor position ▪ Required heat output to high
057	CHECK DATA MODUL	Module parameter is not in the specified range	▪ Restart T-Control ▪ Check boiler parameter
058	CHECK DATA BOILER	Boiler parameter is not in the specified range	▪ Restart T-Control ▪ Check boiler parameter
059	CAN-ID	Set up module CAN-ID not useable	-
060	INSERTION IN ACTION	Feeding screw temperature exceeded 70 °C during operation	▪ Check fuel quality ▪ Check fuel storage room (fuel level) ▪ Clean intermediate hopper level sensor

No.	Fault report	Cause of fault	Fault correction
061	INSERTION NOT IN ACTION	Feeding screw temperature exceeded 70 °C outside of operation	▪ Chimney draught to high ▪ Feeding channel leakage ▪ Check fuel quality ▪ Shortening burn out time ▪ Underrun minimum running time
062	INSERTION BACKFIRE	Feeding screw temperature didn´t fall below 70 °C after 30 minutes	▪ Chimney draught to high ▪ Boiler system leakage ▪ Check fuel quality ▪ Shortening burn out time ▪ Underrun minimum running time ▪ ✆ - contracting party
063	OPEN BFP	Failure during burn back flap opening	▪ Check BFP-motor ▪ Check fuel temperature ▪ Clean intermediate hopper level sensor ▪ Check drive arm ▪ ✆ - contracting party
064	CLOSE BFP	Failure during burn back flap closing	▪ Check BFP-motor ▪ Check fuel temperature ▪ Clean intermediate hopper level sensor ▪ Check drive arm ▪ ✆ - contracting party
065	CONTACTS BFP	Failure at burn back flap end switch	▪ ✆ - contracting party ▪ Carry out check BFP by specialist personnel
066	IGNITION	Heat supplier didn´t ignite fuel within 15 minutes	▪ Check fuel level ▪ Check burning parameters, adjust as necessary ▪ Check fuel level at firing
067	FIRE OUT	Flame monitoring device indicates no burning	▪ Check fuel level ▪ Check burning parameters, adjust as necessary ▪ Clean intermediate hopper level sensor
068	TEMP. CONTROL	Fuel storage room temperature sensor has exceeded the maximum permissible temperature	▪ Check fuel storage room
069	STL	Boiler temperature has exceeded the maximum permissible boiler temperature	▪ Cool down boiler (< 75 °C) ▪ Quit STL
071	LAMBDA FUEL	Failure lambda probe	✆ - contracting party
072	CAN FAULT	Failure CAN bus	✆ - contracting party
073	LAMBDA CALIBRATION	Failure during lambda probe calibration	✆ - contracting party

10 Fault reports and their corrections

No.	Fault report	Cause of fault	Fault correction
076	FUEL	Failure “FIRE OUT” (067) occurs for the second time within 2 hours.	▪ Check fuel level ▪ Check burning parameters, adjust as necessary ▪ Clean intermediate hopper level sensor
077	ADDITIONAL INPUT	Additional input (e.g.: system pressure, CO-sensor) active	▪ Check failure at additional input aggregate
078	NIVEAU LEVEL	Active intermediate hopper level sensor; low fuel level at intermediate hopper	▪ Check fuel level ▪ Check discharge system (motor, screw, springs)
079	BARRIER LEVEL	Active feeding screw channel sensor; low fuel level in feeding system	▪ Check fuel level ▪ Check discharge system (motor, screw, springs)
080	MP ROOM DISCHARGE	Active discharge screw motor protection	▪ Check discharge system (motor, screw, springs) to debris
081	SPEED ID-FAN	Connection failure to ID fan	▪ Check connection rotation speed sensor ▪ Check ID-fan ▪ ✆ - contracting party
082	GRATE CLEANING 1	Grate cleaning failure; motor damaged; grate linkage damaged or loosened; misaligned grate sensor	▪ Check grate cleaning motor ▪ Check grate linkage ▪ Check grate cleaning end switch ▪ ✆ - contracting party
083	GRATE CLEANING 2	Failure grate cleaning; impossible to close grate; grate got stuck; grate linkage damaged or loosened	▪ Remove debris ▪ Check grate cleaning motor ▪ Check grate linkage ▪ Check grate cleaning end switch ▪ ✆ - contracting party
084	GRATE CLEANING 3	Grate was opened during the combustion	▪ Check grate cleaning motor ▪ Check grate linkage ▪ Check grate cleaning end switch
085	SUCTION MODE	Failure at pellet suction; fuel storage room empty; misaligned vacutrans flap; defect vacutrans flap sealing; hose leakage; suction hose leaks or is loose; suction turbine defect	▪ Adjust suction cycles ▪ Check discharge system (motor, screw) ▪ Check fuel quality
086	SUCTION VALVE	Empty level container at compact container	▪ Check vacutrans damper ▪ Check end switch vacutrans damper ▪ ✆ - contracting party
087	ASH CONTAINER	Ash container door is opened	▪ Connect ash container ▪ Close ash container door
090	COMB. ROOM SENSOR	Burning chamber door end switch active; burning chamber door is open	▪ Close burning chamber door
091	WARNING ASH DISCHARGE	Ash discharge did not clean respectively screw did not turn; ash container full; debris block ash screw; motor defect	▪ Empty ash container ▪ Remove debris

No.	Fault report	Cause of fault	Fault correction
092	ERROR ASH DISCHARGE	Ash discharge did not clean repeatedly; ash container full; debris block ash screw; motor defect	▪ Empty ash container ▪ Remove debris ▪ ✆ - contracting party
093	ENDSW. ROOM DISCHARGE	Room discharge system end switch active	▪ Blockage; remove trapped fuel ▪ Check fuel quality ▪ Clean intermediate hopper level sensor
095	CHECK ASH BOX	Set up ash container maintenance interval exceeded	▪ Check ash container
096	BRENNER HALT	Operation mode „burner stop“ active	-
180	KAS CHKDATA	Cascade parameter out of setted range	▪ Restart T-CONTROL ▪ Check cascade parameter
181	KAS VERBINDUNG	Cascade connection failure	▪ Check cascade connection
182	KAS OFFLINE	Boiler is not available to cascade	▪ Set up connection
189	KAS ALARM	Leading boiler didn´t start or got stopped	▪ Restart leading boiler ▪ ✆ - contracting party

10.1 Not indicated faults

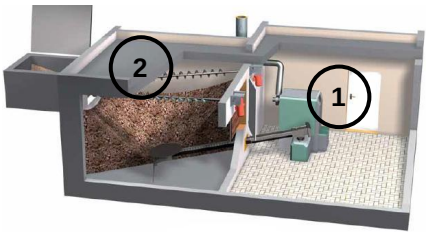
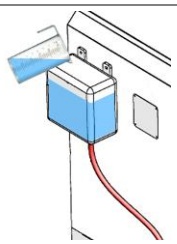
Fault	Cause of fault	Fault correction
Boiler output gradually decreases	Ash/slag on the grate; fly ash container is full; heat exchanger heavily clogged/sooted; inferior quality fuel	Reduce cleaning intervals or clean manually; empty the fly ash container; clean heat exchanger
Desired operating temperature is not reached	Inferior quality fuel; previous boiler output higher than current boiler output; fuel level too low	Replace fuel if necessary, install larger boiler; increase fuel level
Ash is emitted from the chimney	Fly ash container full; fuel contains of excessive finds or super fines; fan speed too high; chimney draught to high	Remove fly ash; replace fuel if necessary or retrofit flue gas deduster; reduce speeds; retrofit chimney draught regulator

11 MAINTENANCE SCHEDULE

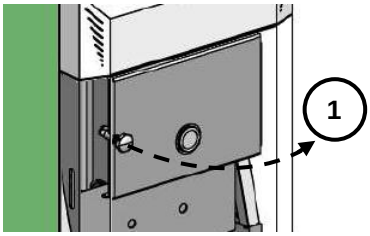
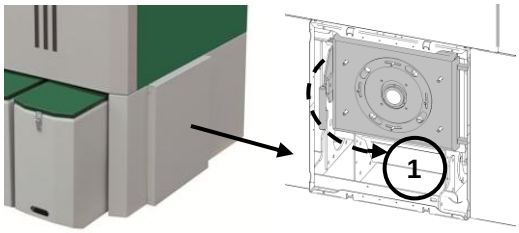
(Some points have also been prescribed in accordance with TGPF H 118!)

	For safety reasons, maintenance must only be carried out with the main switch turned off. However first of all, the system must be switched off by means of the On/Off button and you must wait for the burnout phase. If you have to climb into the storage tank or bunker, always make sure that there is a second person available to supervise you. Potential carbon monoxide enrichment may put your life in danger.

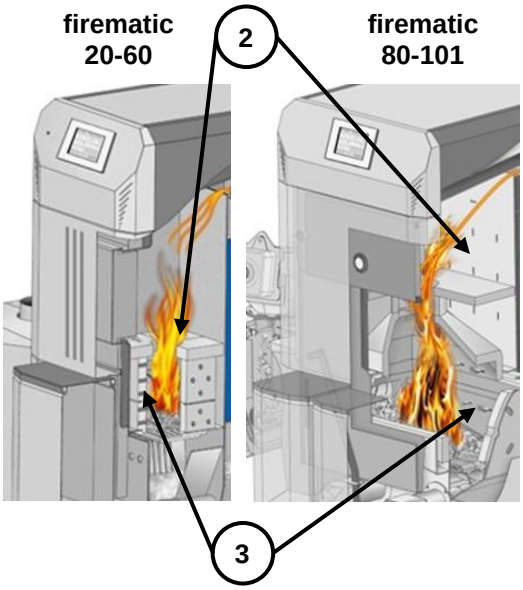
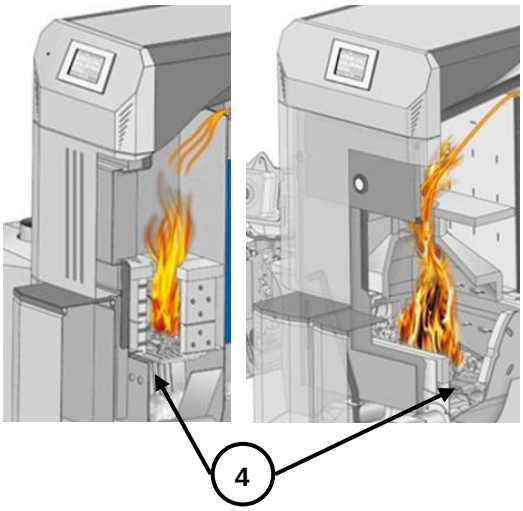
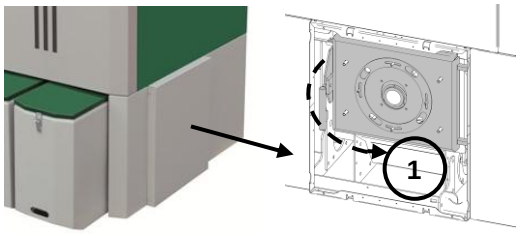
11.1 Weekly Inspection

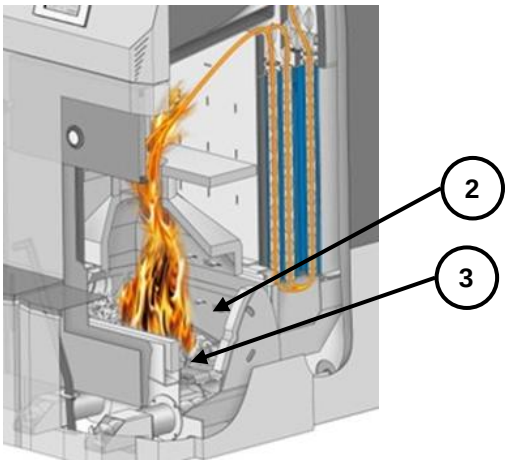
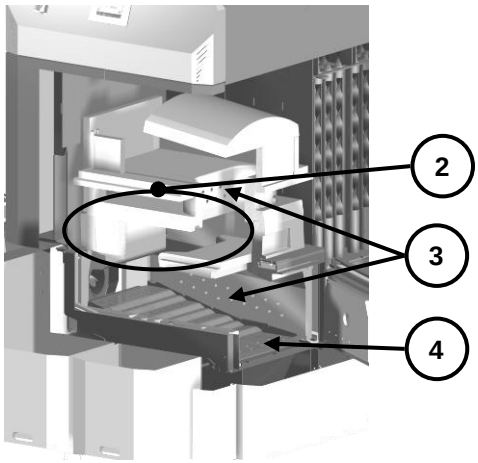
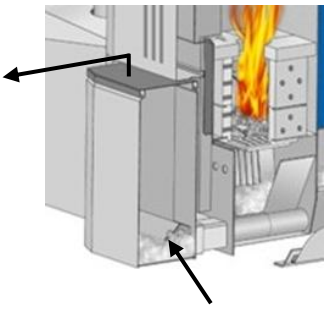
Item		Procedure
Total system		Check the whole boiler system (1) including the fuel storage room (2) visually for damages and wear. Repair discovered faults immediately.
Extinguisher container		Check extinguisher container filling level and refill if necessary. If re-filling occurs frequently, contact your contracting party.

11.2 Monthly inspection

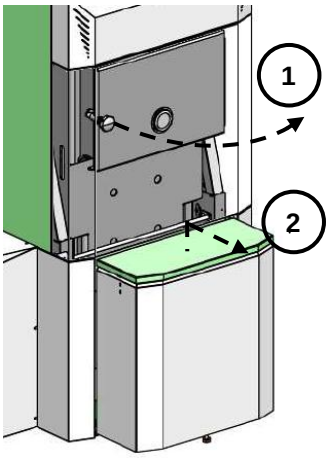
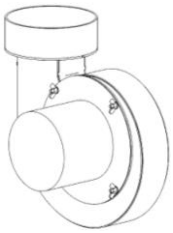
Item		Procedure
Pivoting und step grate **Burning chamber**	**firematic 20-60**  **firematic 80-301** 	Open burning chamber door (1) Demount cover and open burning chamber door (1).

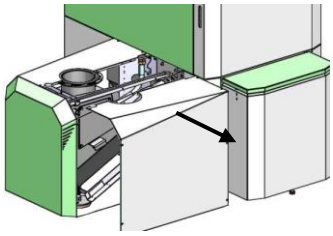
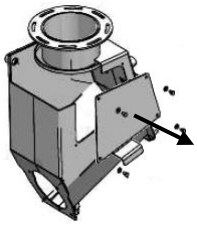
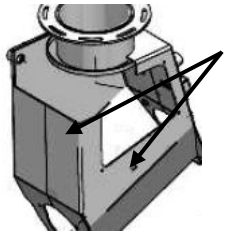
11 Maintenance schedule

Item		Procedure
Pivoting und step grate **Burning chamber**	**firematic 20-60** **firematic 80-101** 	**firematic 20-60** Check burning chamber stones and walls visually for damages and wear and conduct cleaning with scraper and broom (2), afterwards remove ash off burning chamber. Check and clean burning chamber vents (3). **firematic 80-101** Check burning chamber stones and walls visually for damages and wear and conduct cleaning with scraper and broom (2), afterwards remove ash off step grate and hoover. Check and clean burning chamber vents (3).
	firematic 20-60 **firematic 80-101** 	Check pivoting grate (4) visually for damages and wear Conduct function test of pivoting grate using the aggregate test
	firematic 80-301 	**firematic 80-499** Demount cover and open burning chamber door (1). Check burning chamber stones and walls visually for damages and wear and conduct cleaning with scraper and broom, afterwards remove ash off step grate and hoover. Check and clean burning chamber vents.

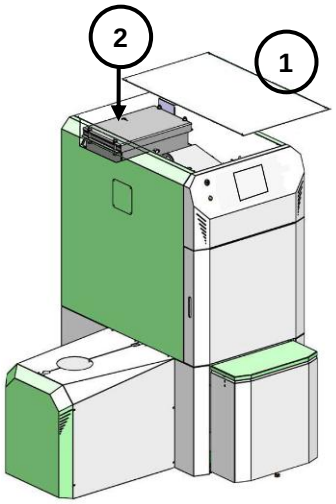
Item		Procedure
Pivoting und step grate **Burning chamber**	**firematic 80-101**  **firematic 130-301**  	**firematic 80-101** Check and clean burning chamber vents (2). Check pivoting and step grate (3) visually for damages and wear. **firematic 130-301** Check burning chamber visually for damages and wear and conduct cleaning with scraper and broom (2). Check and clean burning chamber vents (3). Check pivoting and step grate (4) visually for damages and wear. **firematic 349-499** Demount side cover, unscrew and remove burning chamber maintenance door and remove insulation. Check burning chamber visually for damages and wear and conduct cleaning with scraper and broom. Check and clean burning chamber vents. Check pivoting and step grate visually for damages and wear.
Ash container		Demount ash container cover and check ash level and empty ash container if necessary.

11 Maintenance schedule

Item		Procedure
Control - functioning		Check display, operation and faults list (see chapter 9 and 10) Restart T-Control
Control - faults		Open burning chamber door (1) or remove ash container cover (2).
		Check fault recognition and fault report Check if fault report e.g.: ASH CONTAINER FAULT is shown
ID-fan		Function test of ID-fan using the aggregate test
		Check ID-Fan for abnormal or conspicuous running noises
Thermal safety device		Check thermal safety valve tightness
Safety valve		Check safety valve tightness
System pressure		Check system pressure Minimum pressure: 1,5 bar (cold) Maximum pressure: see boiler plate

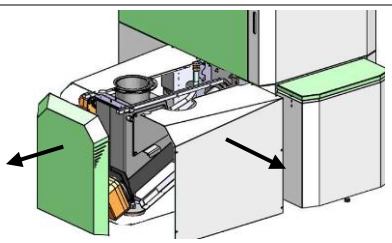
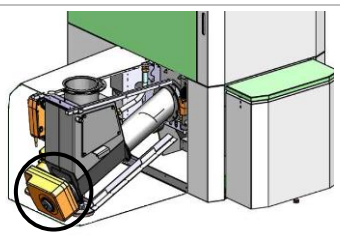
Item		Procedure
Fire extinguisher		Check fire extinguisher securing and seal as well as hose and nozzle (according to national standard)
Sensor barrier		Demount intermediate hopper cover
		Unscrew revision cover
		Clean sensors on the inside of the intermediate hopper with soft tissue on the left and right
Ash storage		Ash has to be stored in a non flammable, air tight container till disposal.
Boiler room		Remove flammable materials, except wood chips or pellets stored in a appropriate container, from the operating room
Fire protection		Check structural fire protection and fire doors (e.g.: self-locking fire door)

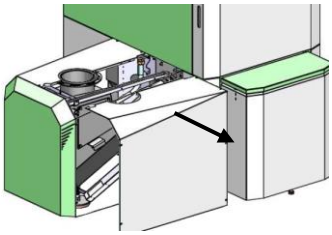
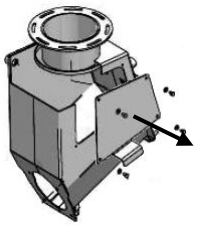
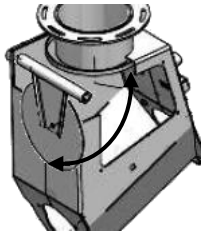
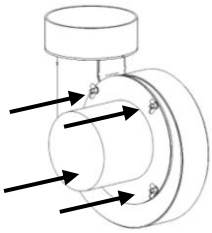
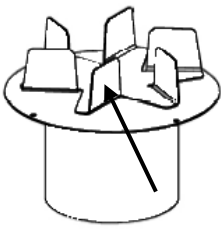
11.3 Biannual inspection

Item		Procedure
Heat exchanger		Demount top boiler cover (1)
		Unscrew and remove heat exchanger insulation cover
		Remove deposit and check heat exchanger visually for damages and wear.
		Conduct function test of heat exchanger using the aggregate test

11.4 Annually inspection

	Annual inspection, at least every 3000 operating hours

Item		Procedure
Maintenance		Conduct system maintenance by authorised personnel
Drives and motors		Demount intermediate hopper covers
		Check gear motor for abnormal or conspicuous running noises by using the aggregate test
		Check gear motor visually for damages and wear.
Flange bearing (from firematic 130)		Check flange bearing visually for damages and wear.

Item		Procedure
Burn back protection device		Demount intermediate hopper cover
		Unscrew revision cover
		Check BFP flap visually for damages, wear and tightness
		Open BFP flap by using the aggregate test
		Position paper strip between hopper flange and BFP flap and close BFP flap afterwards.
		Try to pull out paper strip. If possible, adjust BFP flap.
		Conduct paper strip test at different positions
ID-fan		Unscrew 4x wing nut
		Remove and clean ID-fan witch a brush

11.5 As needed

Item		Procedure
Chimney		Maintenance respectively Cleaning and inspection according to national standards
Fuel storage room		Fuel storage room emptying (at least after 3 fillings) and check visually for damages and wear (e.g.: stones, damaged walls,...)

12 EC DECLARATION OF CONFORMITY CE

Manufacturer address: **HERZ Energietechnik GmbH**
Herzstraße 1, 7423 Pinkafeld
Österreich/Austria

Declaration of machine: **HERZ firematic**

Type:

HERZ firematic 20	**HERZ firematic 180**
HERZ firematic 35	**HERZ firematic 199**
HERZ firematic 45	**HERZ firematic 201**
HERZ firematic 60	**HERZ firematic 249**
HERZ firematic 80	**HERZ firematic 251**
HERZ firematic 100	**HERZ firematic 299**
HERZ firematic 101	**HERZ firematic 301**
HERZ firematic 130	**HERZ firematic 349**
HERZ firematic 149	**HERZ firematic 401**
HERZ firematic 151	**HERZ firematic 499**

Machine type: **Biomass furnace inclusive discharge system**

We declare herewith, that the above described machine / the above described product complies with the corresponding regulations of the following EC-Directives. The conformity is verified by the complete compliance with the following standards:

EU – directive	Standard
2006/95/EG Low tension units decree	EN 60335-1:2012 EN 60335-2-102:2007 EN 62233:2008
2004/108/EG Electromagnetic compatibility	EN 55014-1:2007 EN 61000-3-2:2006 EN 61000-3-3:2009 EN 61000-6-2:2006 EN 61000-6-3:2007
2006/42/EG Machine Guideline	ISO/TR 14121-2:2012 EN ISO 13849-1:2009
305/2011 Construction Products Guideline	EN 303-5:2012 TRVB H 118:2003
97/23/EG Pressure equipment	EN 287-1:2012

Person authorized to compile technical documentation:

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Pinkafeld, December 2014

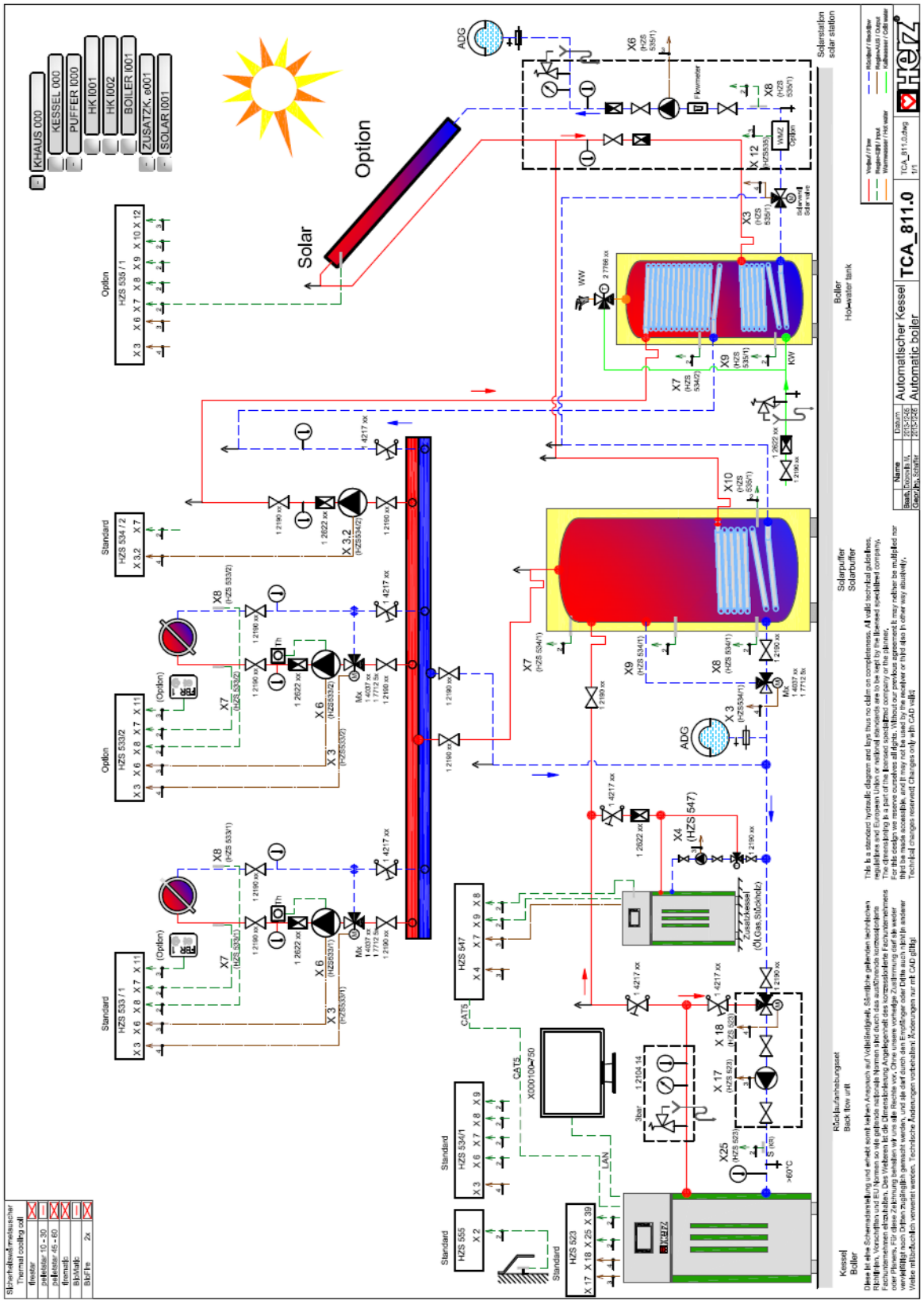
DI Dr. Morteza Fesharaki - Managing director

13 INDEX DIRECTORY

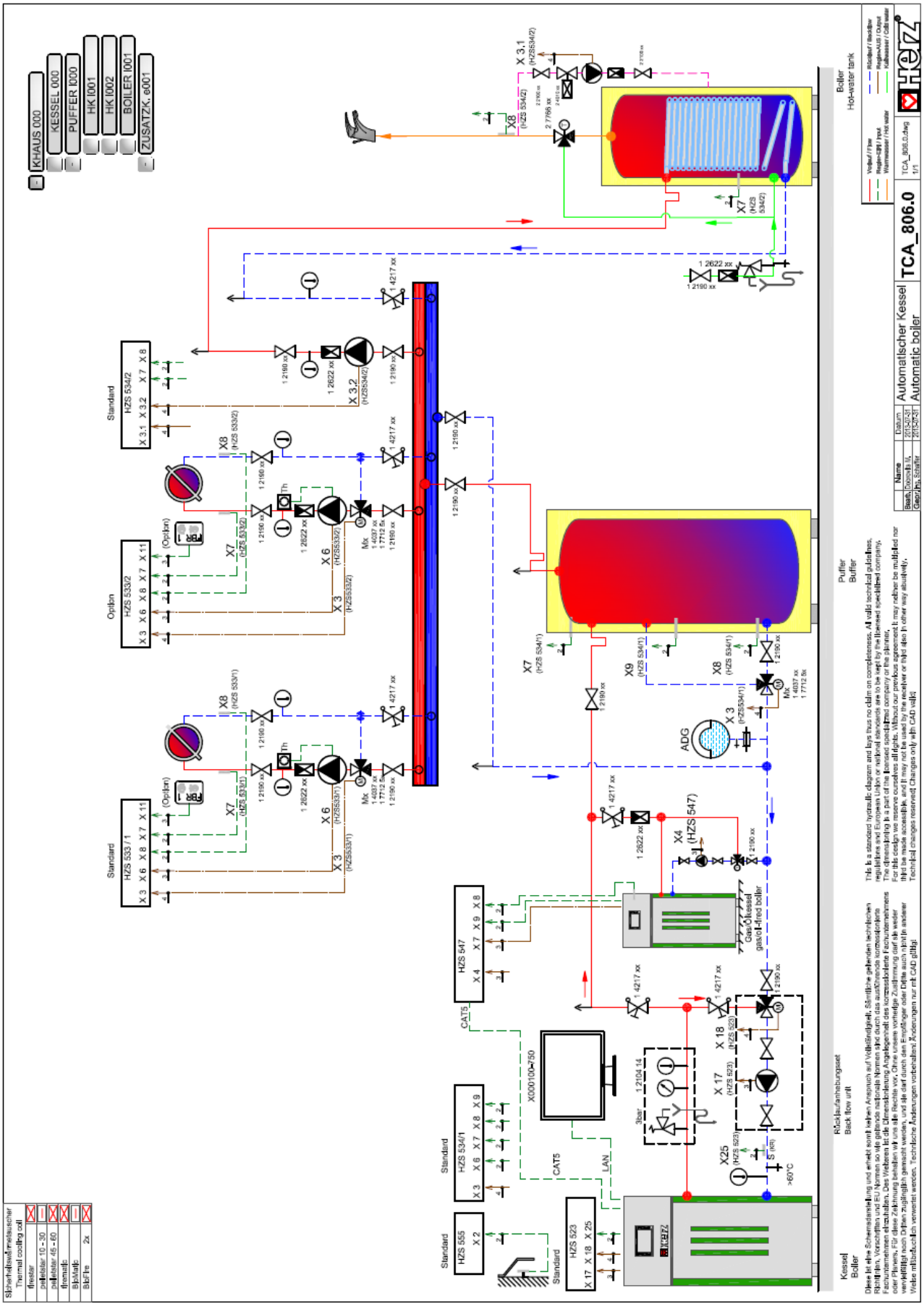
14 ANNEX

14.1 Additional boiler module

Hydraulic recommendation 1

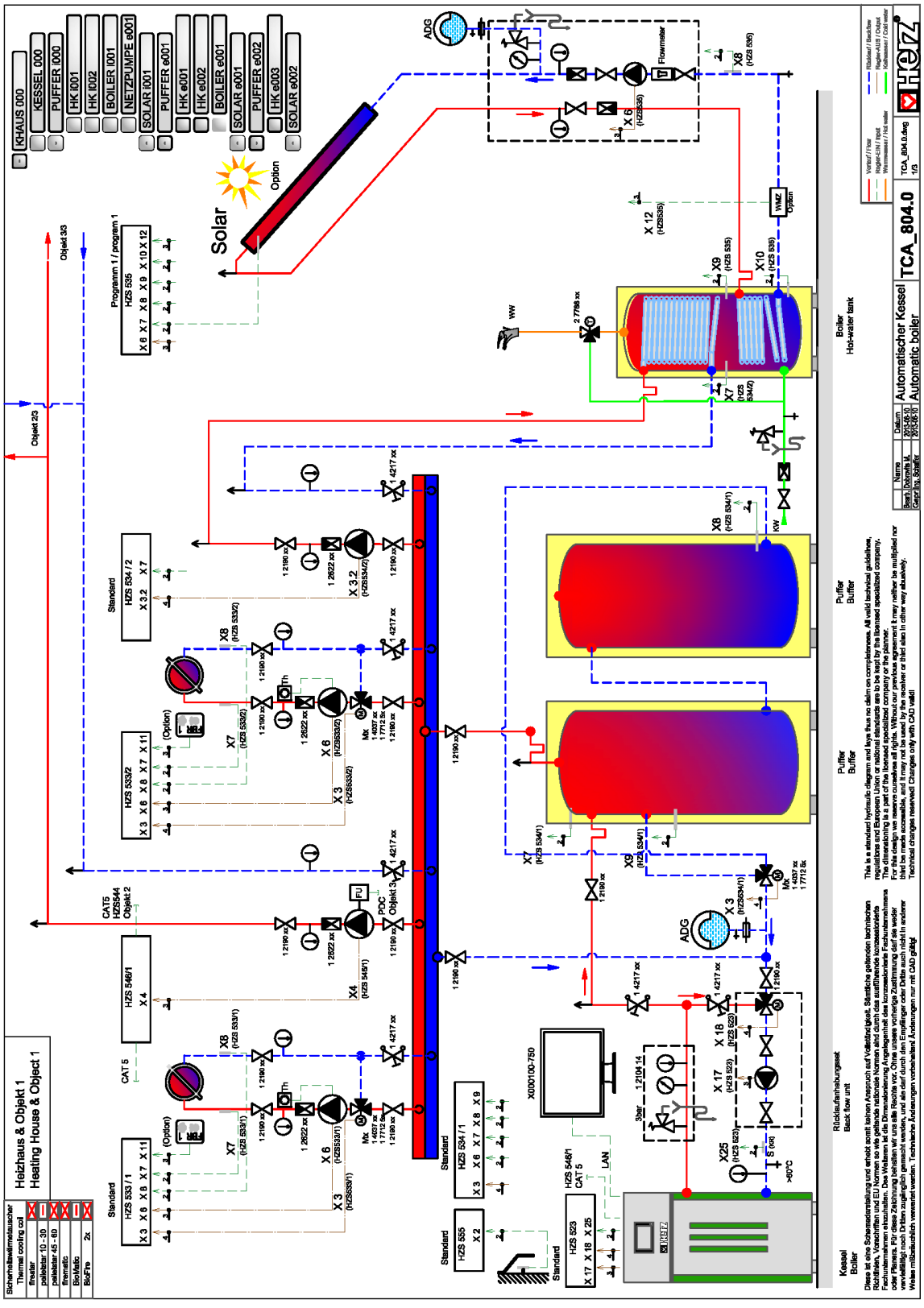


Hydraulic recommendation 2

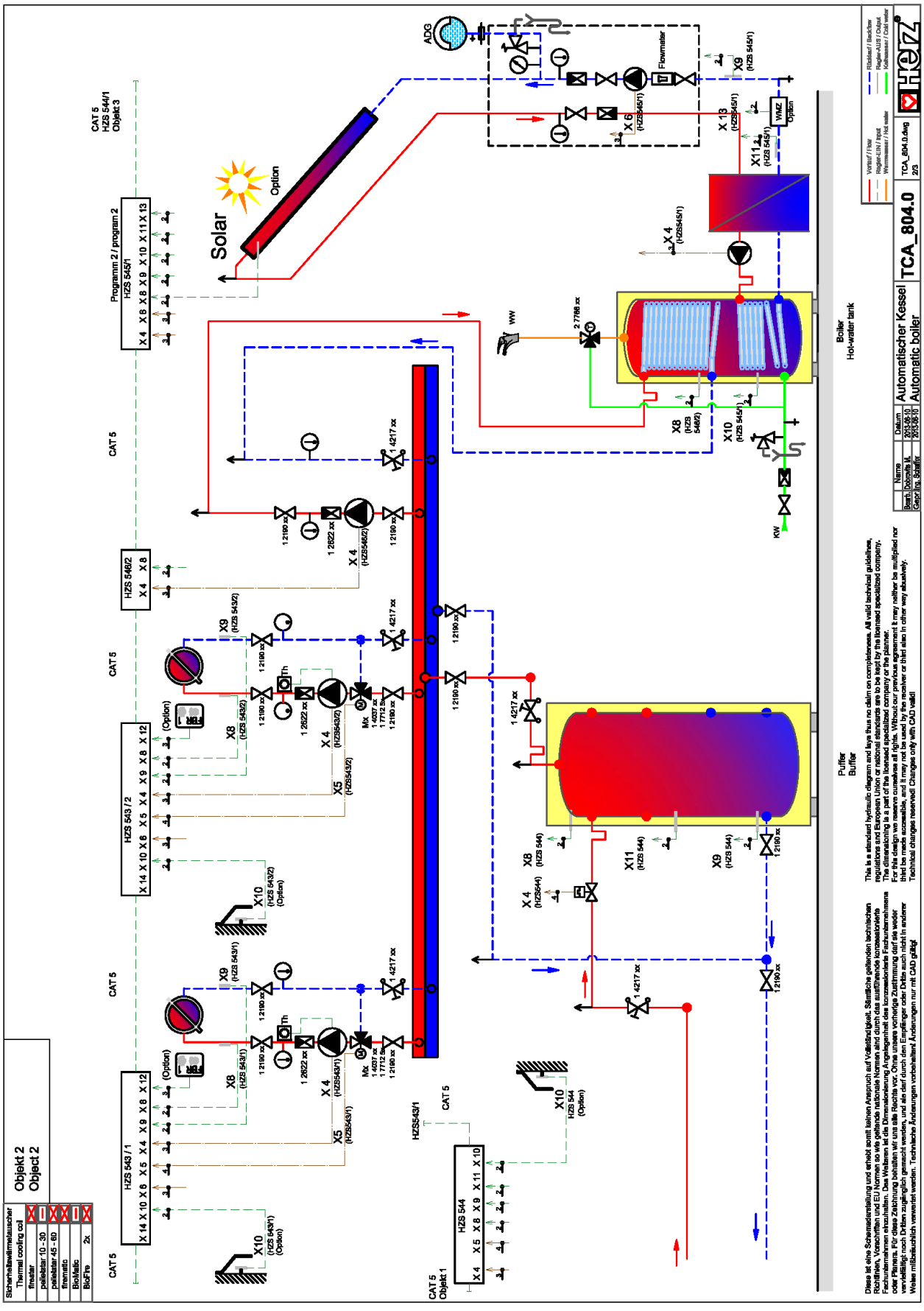


14.2 Solar module

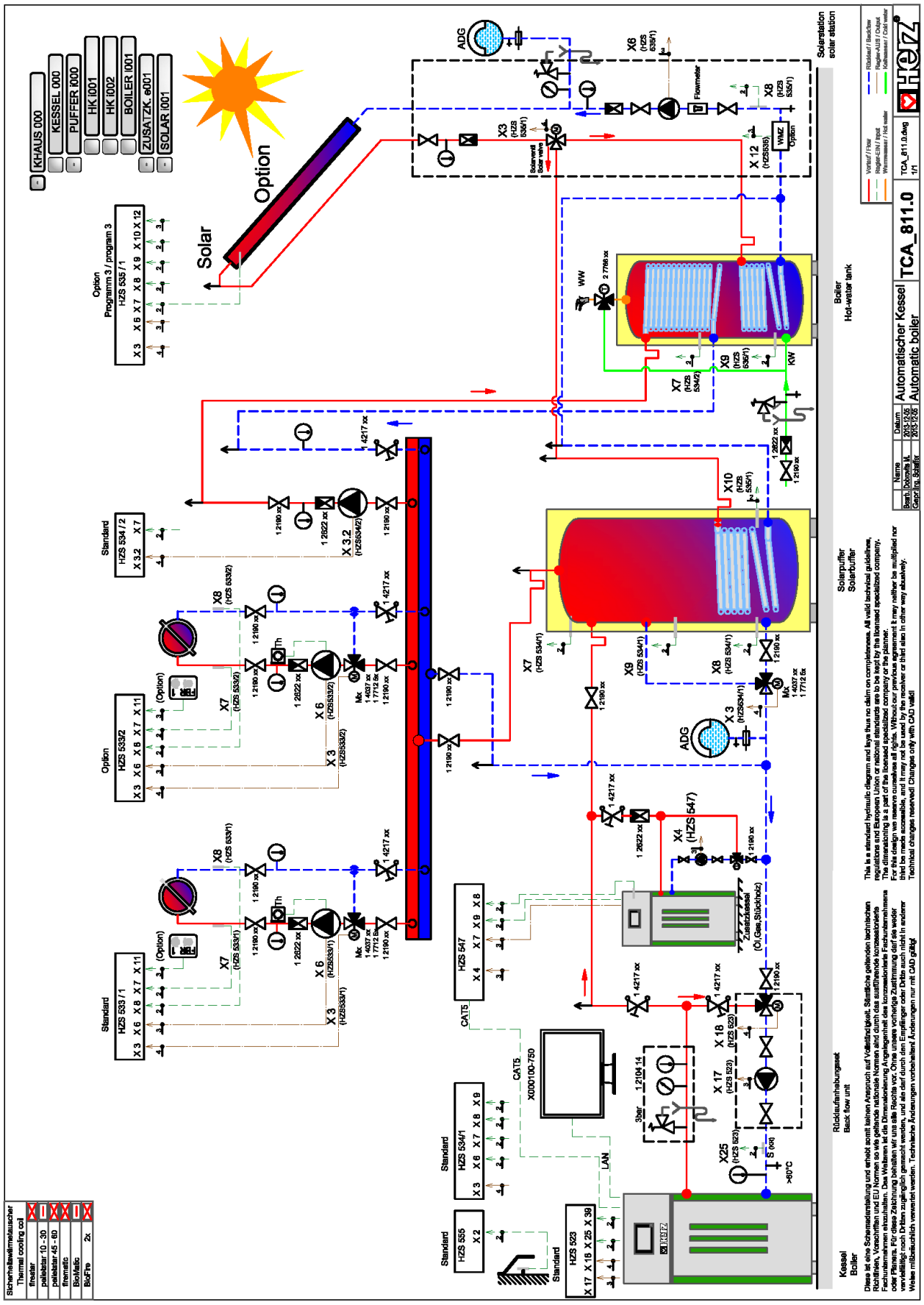
Program 1



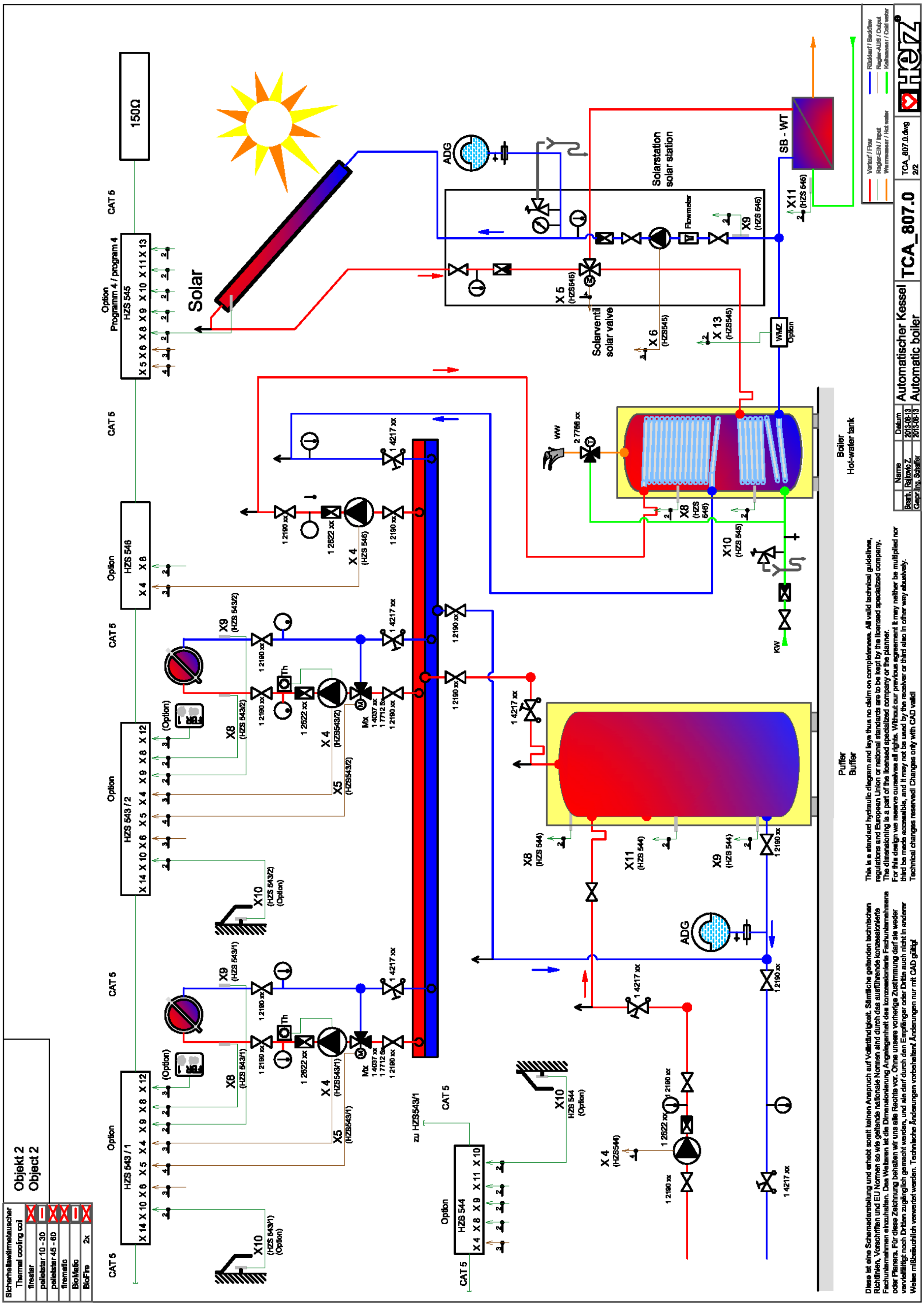
Program 2


Solar
Option
Automatischer Kessel
Automatic boiler
TCA_804.0
Boiler
Hot-water tank
Puffer
Buffer
Flowmeter
ADG
WW
KW
Objekt 2
Object 2

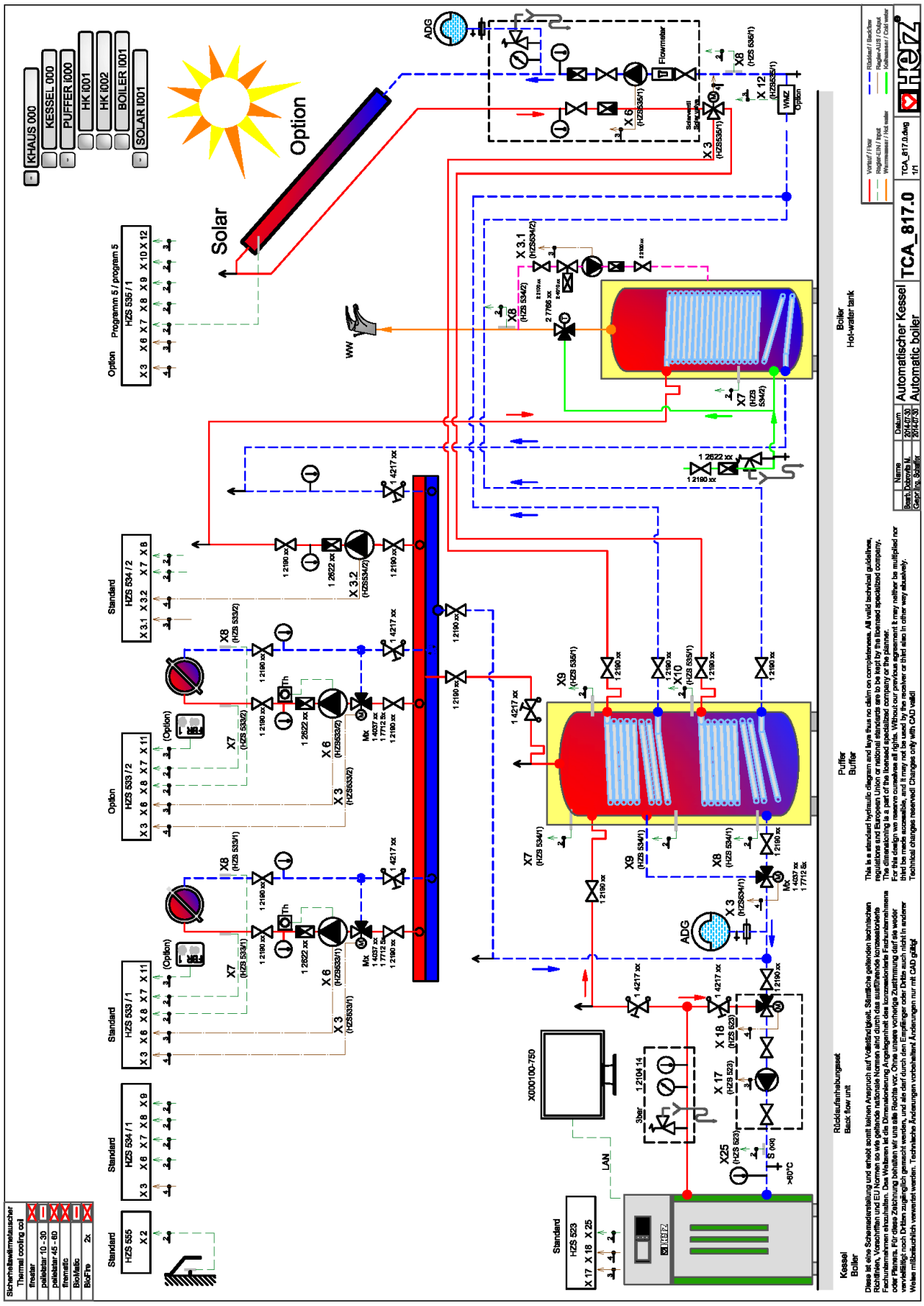
Program 3


KHAUS 000
KESSEL 000
PUFFER i000
HK i001
HK i002
BOILER i001
ZUSATZK. e001
SOLAR i001
Option
Solar
Option Programm 3 / program 3 HZS 535 / 1
Standard HZS 534 / 2
Option HZS 533/2
Standard HZS 533 / 1
Standard HZS 534/1
Standard HZS 555
Standard HZS 523
HZS 547
Solarbuffer
Boiler
Hot-water tank
Solarstation
solar station
Rücklaufanhebungsset
Back flow unit
Kessel
Boiler
Automatischer Kessel
Automatic boiler
TCA_811.0
Sicherheitswärmetauscher
Thermal cooling coil
firestar
pellestar 10 - 30
pellestar 45 - 60
firematic
BioMatic
BioFire
2x

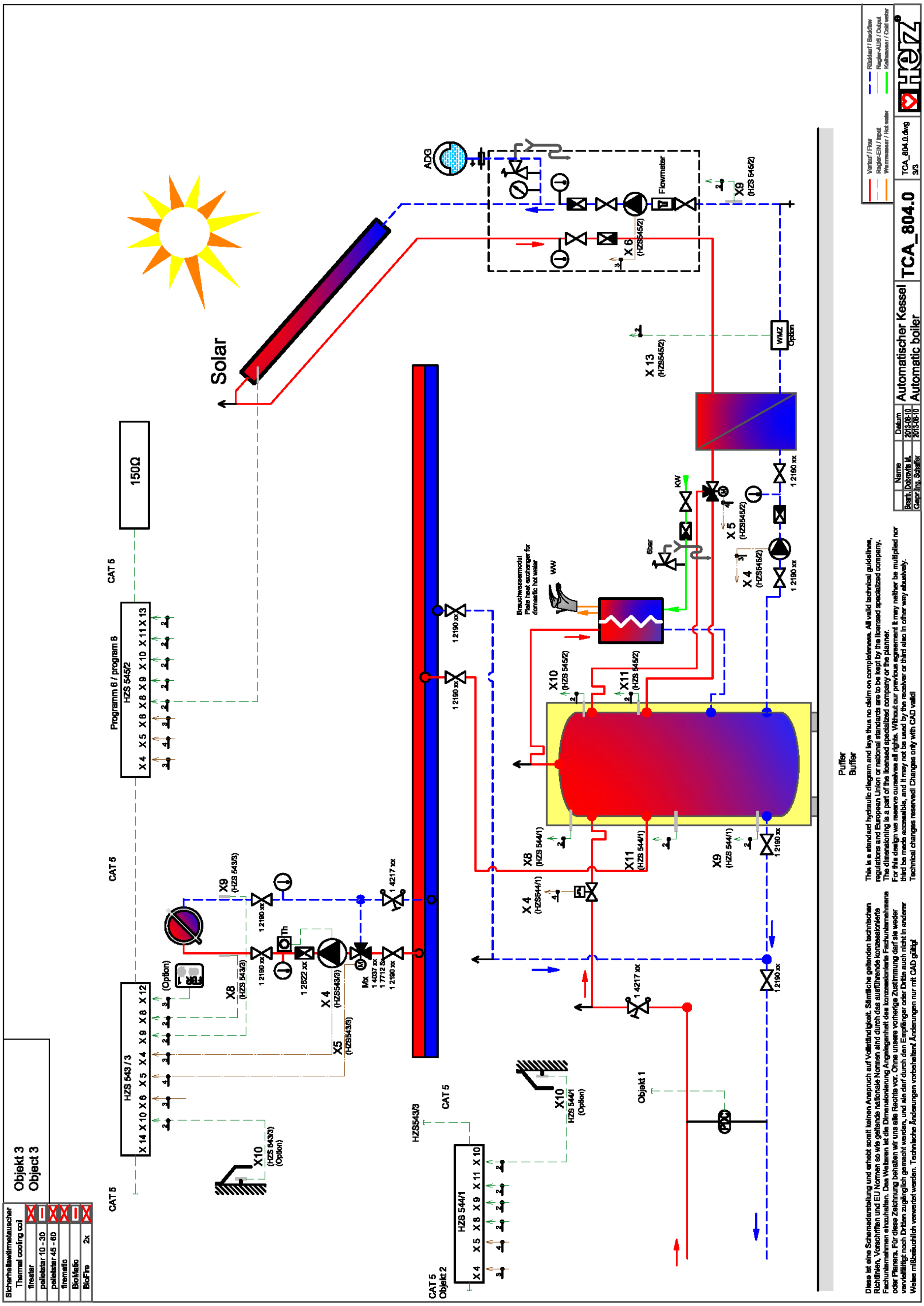
Program 4


Solar
Solarstation
solar station
Solarventil
solar valve
Boiler
Hot-water tank
Puffer
Buffer
Option
Programm 4 / program 4
HZS 545
HZS 546
HZS 543 / 1
HZS 543 / 2
HZS 544
CAT 5
150Ω
SB - WT
Objekt 2
Object 2
Automatischer Kessel
Automatic boiler
TCA_807.0

Program 5


KHAUS 000
KESSEL 000
PUFFER 1000
HK 1001
HK 1002
BOILER 1001
SOLAR 1001
Option
Solar
ADG
Flowmeter
WMZ
WW
Boiler
Hot-water tank
Puffer
Buffer
Kessel
Boiler
Rücklaufanhebungsset
Back flow unit
LAN
Standard
Option
HZS 534 / 1
HZS 533 / 1
HZS 533 / 2
HZS 534 / 2
HZS 535 / 1
HZS 555
HZS 523
Programm 5 / program 5
Automatischer Kessel
Automatic boiler
TCA_817.0
Automatic boiler
Sicherheitswärmetauscher
Thermal cooling coil
firestar
pelletstar 10 - 30
pelletstar 45 - 60
firematic
BioMatic
BioFire
2x

Program 6


Solar
150Ω
Programm 6 / program 6
HZS 545/2
HZS 543 / 3
HZS 544/1
Puffer
Buffer
Objekt 3
Object 3
Objekt 1
Objekt 2
ADG
Flowmeter
WMZ
KW
WW
6bar
Automatischer Kessel
Automatic boiler
TCA_804.0
herz

15 NOTES

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Versionsnummer: V 1.42 **Artikelnummer:** 0000137-100 **SW:** V 1.70