



TIS

TRONIC 260u

Operating and installation manual

Declaration of conformity
№ 0057/20

**Temperature controller: TIS Tronic 260U meets the
requirements of the relevant directives:
2014/35/UE low voltage Directive (LVD), 2014/30/UE
electromagnetic compatibility Directive (EMC)
Based on agreed standards:**

**PN-EN 60730-1:2012
PN-EN 60730-2-9: 2011 product**

Marking CE: 05/2020



1. Safety warnings



1. General safety guidelines

Please read the following rules before using it. Failure to follow these rules may result in personal injury and damage to the boiler and regulator. In order to ensure the safety of life and property, you must follow the precautions described in this manual. The manufacturer is not responsible for damages caused by improper use of the equipment or negligence on the part of the User.

1.2. Warnings

2. The regulator must not be used for boilers operating in the system in installations that do not comply with PN-EN 303-5. The device is designed to control a Central heating boiler that has its own independent safety system, for example, against overpressure in the system
3. The device is under electric voltage. It is forbidden to perform any work on connecting pumps, fans and other electrical devices to the regulator connected to the power supply, if this instruction is not followed, it is dangerous for human health and life. Before performing any work on the regulator, it is necessary to turn off the power and take all necessary measures against accidental switching on.
4. Installation of the device must be carried out by persons who have the appropriate authority of the boiler manufacturer, and the appropriate electrical permit.
5. Before starting the controller, it is necessary to measure the ground resistance of electric motors (pumps), as well as to measure the insulation resistance of electrical wires.
6. The regulator can only be served by adults.
7. Incorrect connection of wires and cables may cause damage to the controller!
8. The controller can not be exposed to any liquids, and is located in rooms with high humidity, it is unacceptable to get dirt and conductive dust inside the controller.
9. For reliable and stable operation of the regulator, it is recommended to install a voltage stabilizer with an appropriate load.
10. A lightning bolt can damage the regulator, so during a thunderstorm, disconnect the regulator from the mains by unplugging the power cord from the wall outlet.
11. The controller cannot be used for other than its intended purpose.

1.3 Warranty

- The controller can be connected and put into operation by an accredited representative
- Unauthorized activation, making changes to the device and repairs may cause deterioration of the boiler's operating parameters and its safety. Carrying out such operations leads to the loss the guarantee for both the regulator and the boiler as a whole.
- The fuse failure is not covered by warranty.

2. General information

Boiler regulator **TIS Tronic 260u** , is a modern electronic device intended to control operation solid fuel boiler and heating system

The regulator controls a fan with speed control system, controls the operation of the circute. It has the function of preparing hot water (DHW) in SUMMER, WINTER mode with or without priority. The controller has a large color LCD display with a simple user interface that facilitates maintenance of the boiler and heating system.

The device has 3 modes of operation of the boiler:

Standard mode - the controller set to reach designated temperature of the boiler, and the device operation is based on the settings configured by the user.

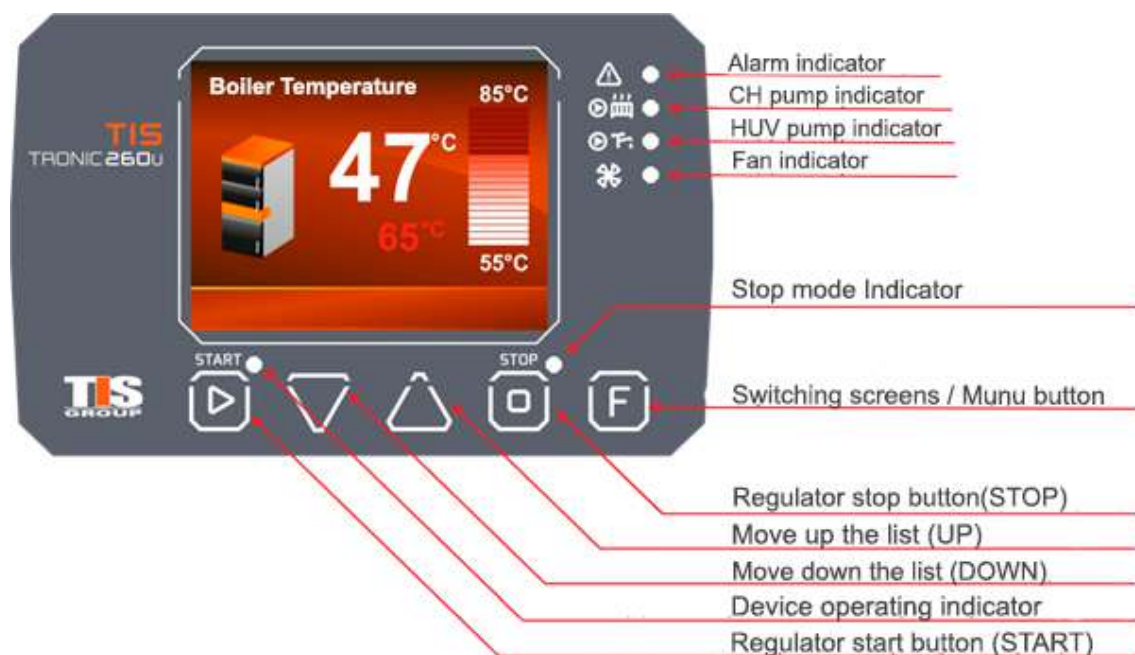
Brager Expert Mode - the controller set to reach designated temperature of the boiler. The aim of the algorithm is to automatically select the optimal operating settings in order to adapt the current boiler output to the existing heat demand.

Brager Expert exhausting gases mode-the aim of the algorithm is to automatically select the optimal boiler operation settings to maintain a constant temperature of the exhaust gases.

The controller has a large color and precise display with an accessible and friendly user interface that makes it easier to control the boiler and the entire heating system.

3. Control panel

3.1. Panel view and character designation



Warning indicator  informs about a malfunction, such as overheating, damage to the temperature sensor (short circuit, breakage)

The CH pump diode -  notifies of Central heating pump operation

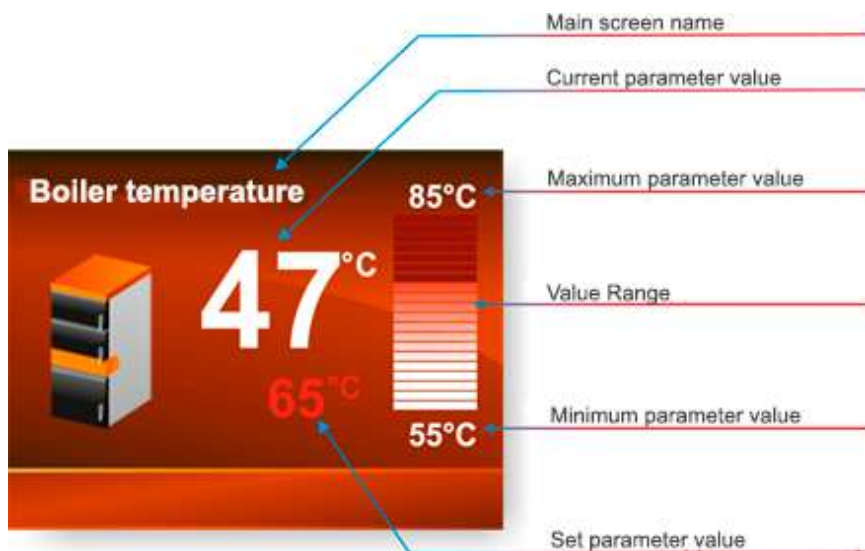
HUV pump diode  -notifies about the operation of the hot water pump

Fan indicator  alerts you when the fan is in operation. Glows until the designated temperature is reached and during purge operation.

Start - flashing indicator indicates the ignition process, constant glow informs about the controller automatic operation mode.

Stop - the indicator notifies you when the device is stopped.

3.2. Display view and description



3.3. Button functions

F **Function** - this button is used: in normal operation mode, to observe the operation of the heating and hot water modules, hold the button **F** for 3 seconds to enter the controller Menu. In this mode, you can change parameters using the buttons that increase $\triangle$ ∇ or decrease their value. When editing parameters, clicking the button let you exit configuration mode . After switching on the controller, a screen with boiler temperature reading is displayed.

▶ **START/WORK** use this button to switch the controller to the operating state. In manual mode, it is used to turn on and off the connected mechanism. In the controller menu, the START/WORK button (on the YES screen) is used for entering and editing of the selected parameter, and after making changes, to confirm them.

□ **STOP** use this button to stop the controller (in the main temperature screens mode) and turning off the connected devices in manual mode. In the controller menu, the STOP button on the NO screen) is used to cancel the selected parameter without saving changes. The next time you click it, you will return to the menu one level up.

This button is also used to reset alarm warnings.

Navigation and value change buttons - regardless of the screen / parameter we are in, these buttons perform the same functions-navigation and changing the $\triangle$ ∇ value of the selected parameter. For example, in programming mode, by pressing a $\triangle$ button, we increase the value of the selected parameter by one unit. Similarly, by pressing the ∇ button, we reduce the value of the selected parameter by one unit. After pressing and holding the button, the parameter value will change faster. These buttons are also used to navigate and navigate the device menu.

4. Controller maintenance

4.1 First launch

When you turn on the controller **TIS** TRONIC 260U using the switch located on the back panel, welcome screen will appear on the display, followed by one of the main screens of the controller. The controller is in inactive mode. This state is indicated by the yellow STOP light on the front panel, which is constantly illuminated.

The Users can configure the controller at any time to suit their needs: select the fan type, activate the necessary modules, and make changes of the values of all editable parameters.

To simplify the operation of the device, the most important settings and temperature readings are located on the main screens, which can be switched by briefly pressing the button

(Figure. 1).



Figure. 1

You can also change the settings on the main screens, in addition to displaying the current parameters,. The example screen (Fig.2) shows the boiler temperature readings and parameters associated with it. Increasing and decreasing the set value of the boiler temperature is  performed using the buttons and is displayed on the screen (the value 65°C in the example of Fig. 2), above this value is the current boiler temperature reading. The values above and below the ruler indicate the available range in which we can change the boiler temperature.



Fig. 2

Figure 3 shows the main screen of the exhaust gases temperature, which displays the current gas temperature reading (value 153°C) and a ruler with a lock symbol. A blocked change bar indicates that the set temperature (143°C in the example screen) cannot be changed. If the reason for blocking this change is the active **STANDARD operating mode**, see 4.3 for the description.



Fig. 3

Inactive home screens are grayed out (Figure 4). This means that this module is not configured and its current state is disabled. The state can be changed in the controller settings (for Fig. 4, this change is made in the "HUW menu").



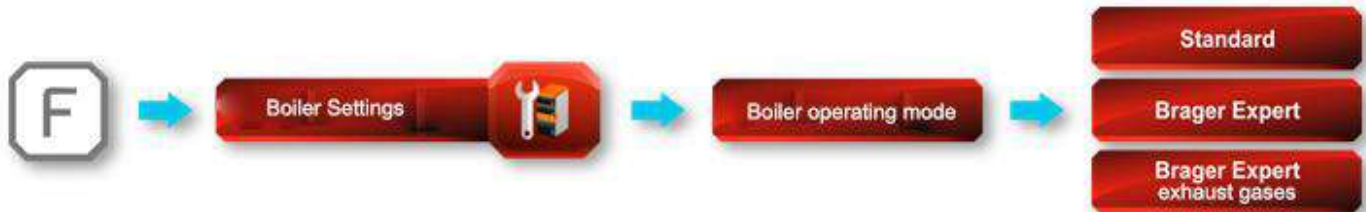
Fig. 4

4.2 Initial Setup

You can enter the main menu by pressing button **F** for 3 seconds

The most important settings available in the main **TIS TRONIC 260U** menu as follows:

Boiler operation mode:



Fan type



Pumps start-up temperature



The exhaust gas sensor activating



Fuel shortage detecting method



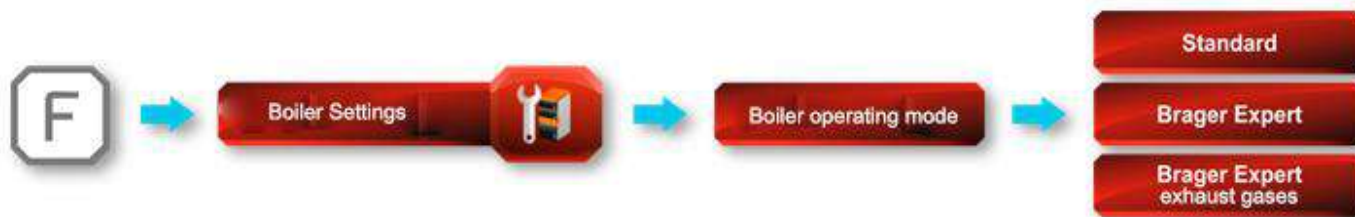
Temperature scale



4.3 Boiler operation modes

TIS TRONIC 260U

The controller has functions that allow you to work in three modes. Pre-configured in the standard operating mode the boiler operates in two stages. Operation mode is changed in Boiler Settings - **Operation mode Tab** (Standard, Brager Expert, Brager Expert exhaust gases)



Standard Mode (Standard) – the boiler operates in two stages: Operation and **Supervision**.

In Operation, the settings that determine the process of burning include: •

- Maximum fan capacity
- Minimum fan capacity
- Threshold fan deceleration

In Supervision Mode:

- Fan capacity in Supervision
- Fan blowin time
- Time between fan blowin cycles

Brager Expert Mode allows you to run smart algorithm of the combustion process control, which automatically selects the parameters to adapt the current boiler output to the actual needs in thermal energy. In the Brager expert Mode, the controller constantly strives to reach boiler set temperature. Parameters describing algorithm performance are in the user menu.

- Maximum fan capacity
- Minimum fan capacity

Brager Expert Mode-exhaust gases-the algorithm aim is to automatically select the optimal fan settings to maintain a constant exhaust gas temperature.

Attention!!! - Operation in the Brager Expert mode exhaust gases, require connecting the temperature sensor (PT-1000) and activating it in the controller main menu:



Brager Expert Mode-exhaust gases activates the following parameters:

Firing-up time-this parameter determines how long the exhaust gas temperature will be set to 300°C. This causes the fan to operate with the highest possible capacity, and results in faster fuel ignition. (Available range: 0-250 min, Factory default setting: 10 min).

4.4 Activation and settings of the HUW module

To activate the HUW module, switch the DHW pump operation mode from the " off " state to one of the two active modes:



Switching hot water pump in Winter or Summer Mode causes the transition of the home screen from Inactive (grey background) in to Active mode. From this moment on, the HUW pump operates in one of the selected modes. The value of the set HUW temperature can be changed directly on the main DHW screen using the buttons ▽△

Summer Mode - In this mode, the main purpose of the boiler is to prepare hot water in the boiler. All other pumps are switched off (except when boiler reaches a temperature higher than the maximum boiler temperature parameter, after which all pumps switch on to protect the boiler from overheating).

HUW Hysteresis

The parameter value determines at what temperature value HUW pump starts from initially set in HUW tank value. For example, when the set temperature is 40°C and the hysteresis is 2°C, the DHW pump will start working after the temperature drops to 38°C. (Available range: 1-15°C, factory default setting: 5°C).



Winter Mode- Central heating pumps and a hot water pump operate simultaneously. Switching the HUW operation mode to "winter" activates the following settings:

HUW priority

Setting this parameter to "on" causes the central heating pump to turn off, and the water in the hot water boiler is prepared first. The temperature for hot water gets a higher priority than the temperature set on the boiler

HUW working hours

When temperature in the hot water tank drops by 5°C from the user-set temperature, the HUW pump is switched on again until the set temperature is reached in the tank. The HUW pump operating time parameter allows you to set the maximum time during which the HUW pump will try to reach the set temperature. Correct choice of the value will allow you to heat the water in the tank and prevent intense water cooling in the Central heating system. This function only available if the HUW pump is running in Winter Mode with Priority enabled. (available range: 10min-240min, factory default setting: 30 minutes)

Temperature encrease for HUW

This function allows you to determine how many degrees the temperature on the boiler can increase for faster hot water preparation. For example, when the boiler temperature is set to 50°C, the HUW is set to 60°C, and **the HUW temperature increase value** is set to 5°C, the boiler temperature will be increased up to 65°C during the hot water preparation period. (range: 5°C-15°C, factory default setting: 5°C)

TURN OFF MODE - The HUW pump is turned off, it is gray screen responsible for displaying information about the HUW temperature.

4.5 Working with the room thermostat

The regulator is equipped with a connector for connecting a room thermostat. It is used to control the temperature in the room (where the thermostat is) via the switching on and off of the central circulation pump. The Controller socket for connecting the room thermostat is indicated as "I2" for a Detailed connection diagram, see in section 7.1.

Attention!!! For correct controller operation, you need a thermostat that disconnect the contacts when the room temperature is reached and connect the contacts when the temperature is lower than the temperature value set by the user.



When the room thermostat function is enabled, the circulation pump starts every time the room temperature falls below the value set on the thermostat (closed contact). When the room temperature reaches the temperature set on the thermostat (open contact), the controller cycles start of the circulation pump to maintain the room temperature.

The circulation pump operation time when the temperature in the room is reached to that set on the thermostat, this defines the operation time of circulation pump setting (available range: 30 – 250 seconds, factory default 30 seconds)

The circulation pump OFF TIME determines a pause between next circulation pump start up, the parameter is active only when room temperature set on the thermostat is reached. Setting this parameter to a value of "0" makes the circulation pump not active. (available range: 0-240 minutes, factory default setting is 1 min.)

Attention!!! If the boiler temperature exceeds the maximum **boiler temperature value set**, the room thermostat control is switched off to protect the boiler from overheating.

4.6 Boiler quenching settings

The controller is equipped with functions that control the boiler quenching process. As standard, without connected exhaust gases temperature sensor, the boiler quenching (switching off) is based on the boiler temperature.

When exhaust gas temperature sensor (PT1000) is connected:



function is activated that allows you to choose the method of the boiler switching off:



If the chosen method based on the boiler temperature sensor readings, the boiler switches to quenching mode reaching up the value specified in the boiler temperature of switching off. The controller will turn off the fan, and the START diode on the front panel will turn off and the STOP diode will light up.

In addition, the user can set whether the circulation pump will turn off during the quenching stage:



And time the Central heating system pump should be turned off after entering the quenching Mode



If the select method is based on the exhaust gas sensor readings for switching the boiler to quenching mode, the **exhaust gas temperature will be available for setting value to detect fuel shortage.**



After the temperature drops below the value specified in the exhaust gas temperature parameter for fuel shortage detection, the controller turns off the fan, and the START diode on the front panel turns off and the STOP diode lights up.

In addition, in the **fuel shortage detection time parameter**, the user can specify the delay time, the length of time during which the exhaust gas temperature will fall or stay below the value specified in the **exhaust gas temperature of the fuel shortage detection threshold.**



4.7 Parameter values and settings

You can enter the controller menu by holding the button  for 3 seconds. The menu has been grouped into category sections, for easy navigation. The buttons allow   us to navigate through the menu. To enter the "step forward" in the setting  we are interested in, click the button  and exit the General menu. At any time, we can return to the home screens by briefly clicking on the button. 

User menu



This menu contains a list of the most necessary controller settings, the number of parameters depends on the controller configuration.

Maximum fan output - This parameter defines the maximum fan speed in operation mode. (available range: minimum setting + 1 to 100%, factory default setting: 50%).

Minimum fan output - The parameter defines the minimum value of the fan speed. (available range: 1% to maximum setting -1%, factory setting: 10%).

Fan performance in supervision - With this parameter we can set the fan power during blowing-up, in a situation when the boiler has reached the user set temperature and its cyclic start-ups. (available range: 1-100%, factory default setting: 25%).

Purge time - The parameter determines for how long (how many seconds) the fan will be turned on. The function is activated when the set temperature is reached on the boiler. (available range: 5 - 60 seconds, factory default setting: 10 seconds)

Attention!!! The purging time should not be too long so that the boiler temperature in does not rise too high, but it should not be too short so that the coals do not go out.

Pause between blowups - When the boiler has reached the set temperature, the fan switches to the cyclic start mode to maintain the combustion process and blowdown the boiler chamber, you can set the length of the intervals between these cycles. (available range: 1-20 minutes, factory default setting: 5 minutes)

Attention!!! The pause between blowups should not be too long so that the coals are not extinguished, but it should also not be too short so that the boiler temperature does not rise too high.

Thermostat menu



The menu contains functions for controlling the room thermostat. Detailed control and configuration are described in section 4.5..

HUW menu



This menu contains the functions for controlling the domestic hot water pump. Detailed control and configuration are described in section 4.4.

Boiler Settings



Boiler operating mode - The parameter allows you to set one of three boiler operating modes. Detailed configuration is described in section 4.3.

Brager Expert exhaust gases - Firing up time - This parameter determines how long the boiler will operate at maximum fan power. The parameter can be accessed when the boiler operating mode is set to Brager Expert exhaust gases. Detailed configuration of operating modes is described in section 4.3. (available range: 0-250 minutes, factory setting: 10 minutes)

Fan deceleration threshold - The parameter determines range of decrease of the fan speed in deg. before reaching the set temperature. The parameter applies to all operating modes (Standard, Brager Expert and Brager Expert exhaust gases modes) (available range: 3-30 ° C, factory setting: 12 ° C)

Boiler hysteresis - the hysteresis value determines with what delay (how many degrees Celsius) the regulator will again switch from the supervision mode to the operating mode (the fan will start). For example, when the preset boiler temperature is 60 ° C and the hysteresis is set to 2 ° C, the boiler will switch from supervision mode to operating after the temperature drops to 58 ° C. (available range: 1-3 ° C, factory default setting: 2 ° C)

Maximum boiler temperature - The parameter defines the maximum permitted limit value of the boiler water temperature. This parameter is displayed above the ruler on the main boiler temperature screen.

Increase of this temperature in the boiler is considered by the regulator as a condition in which the operation of external devices, such as a room thermostat, is ignored until the boiler operation becomes stable. In addition, when the maximum boiler temperature is exceeded, the fan control functions are disabled. (available range: 70-90 ° C, factory setting: 85 ° C)

Boiler shutdown temperature - When the boiler temperature drops below this value, the regulator switches off the fan and go over to STOP mode, which is highlighted by the yellow LED on the front panel.

The shutdown of the regulator can be caused by a shortage of fuel, in the event of a malfunction of the boiler by incorrect settings or prolonged power outages. (available range: 30-45 ° C, factory setting: 35 ° C)

Pump start temperature - The parameter defines the temperature on the boiler, after which all active pumps in the controller are switched on. Pump shutdown occurs when the temperature drops 5 ° C below the pump start temperature. (available range: 35-60 ° C, factory setting: 35 ° C)

Fan type – regulator allows to select the type of the fan; the most popular versions are supported. Thus, you can be sure that the parameters of the fan performance will not have a so-called "dead band", in which, despite the changes in the parameters, no changes in the fan operation will be noticeable. (Available fan types: 07 / DM85, 06/145 / DM80).

Firing up time - The parameter sets the maximum time at which the fire up can last. The regulator will consider ignition successful if the boiler temperature rises during the specified time above the **boiler shutdown temperature + 2 ° C**. (Available range: 30 - 120 minutes, factory setting 120 minutes)

Boiler cooling temperature - sets the maximum temperature value, above which all circulation pumps in the heating system will be started. (Available range 70-85 ° C, factory setting: 78 ° C)

Exhaust gases temperature sensor - This parameter allows you to activate the **exhaust gas temperature sensor**. An additional main screen appears and the regulator can operate in the **Brager Expert exhaust gases mode**. Detailed config of operating modes is described in section 4.3.

Fuel shortage detection method - The parameter allows you to select the way the boiler switches quenching mode, detailed configuration is described in section 4.6.

Exhaust gases temperature for detecting fuel shortage - The parameter allows you to select the exhaust gases temperature, below which the boiler will switch to the extinguishing mode. Detailed extinguishing mode configuration is described in section 4.6.

Fuel shortage detection time - The parameter defines the time (countdown) after which the boiler will switch to extinguishing if the exhaust gases temperature drops below the value specified in the exhaust gases temperature parameter to determine the fuel shortage. Detailed configuration is described in Section 4.6.

Switching off the pump in case of fuel shortage - The function allows you to determine whether the central heating pump will be switched off during the extinguishing mode of the boiler. Detailed suppression configuration is described in section 4.6.

Central pump off delay - The parameter determines after what time the central pump is switched off if the boiler goes into the extinguishing mode and the Function "Central pump off in case of lack of fuel" must be set to "YES". Detailed extinguishing configuration is described in Section 4.6.

Brager Expert



This menu contains advanced options for the Brager Expert algorithm.

Detailed control and configuration are described in section 4.3.

Software version



The informative point shows the current version of the controller software installed.

Reset to factory settings



This option allows you to return to the default settings.

Choosing language



5. Device parameters

5.1 Technical data

Power	230V/50Hz AC
Relative humidity	30 - 75%
Ambient temperature	5 - 40°C
Temperature measurement range of sensors	100°C
Output loading:	
Fan	1A
Central pump	1A
HUW pump	1A
Power consumption (external devices not connected)	4,5W

5.2 Device parameters

User Menu	
Fan maximum capacity	Fan minimum capacity
Fan capacity in supervision	Purge time
Time between blowups	

Thermostat menu	
CH room thermostat	CH pump pause time
CH pump operating time	

HUW menu	
HUW operating mode	HUW priority
HUW temperature increase	HUW operating time
HUW hysteresis	

Boiler settings

Boiler operating mode	Brager expert exhaust gases firing up time
Fan slowdown threshold	Boiler hysteresis
Maximum boiler temperature	Boiler shutdown temperature
Pump start temperature	Fan type
Firing up time	Boiler cooling temperature
Exhaust gases temperature sensor	Fuel shortage detection method
Fuel shortage detection exhaust gases temperature	Fuel shortage detection time
CH pump shutdown in case of fuel shortage	CH pump off delay time

Language selection

Software version

Reset to default settings

6. Alarms description

During the regulator operation, malfunctions and alarm conditions can occur, which are directly displayed on the main screen of the regulator (Fig. 5). In addition, alarm conditions are indicated by a pulsing red LED located on the right of the front panel. Using the  button, we activate the screen displaying the list of occurred alarms (Fig. 6). The buttons   are used to scroll through the list, and the  button is responsible for deleting errors.

Fig. 5



Fig. 6

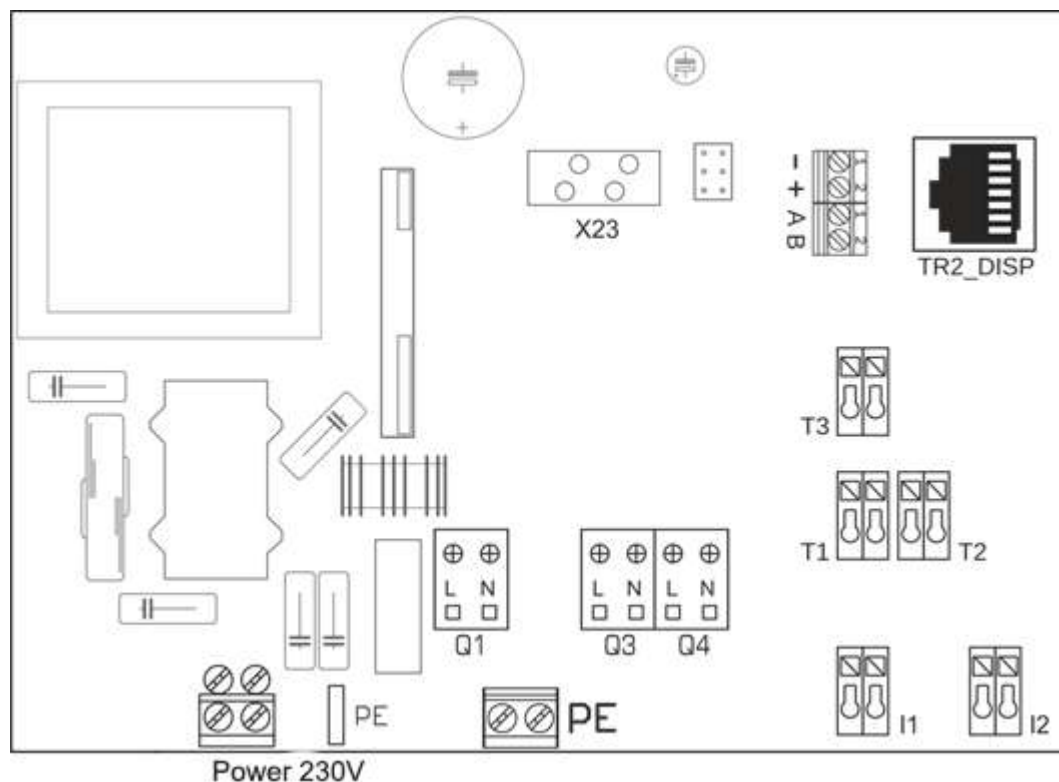


The following failures may occur:

- Boiler temperature measurement error - sensor missing or damaged
- HUW overheating - the temperature in the boiler has exceeded 85 ° C
- Temperature measurement error HUW sensor missing or damaged
- Exhaust gas temperature measurement error - sensor missing or damaged
- Lack of fuel
- Failed fireup - the time specified in the fire up time function has expired
- Exceeding the boiler emergency temperature threshold - the boiler temperature has exceeded 94 ° C (the device switches to the boiler protection mode)
- Overheating STB - external safety thermostat has tripped. To clear the alarm, the boiler temperature must fall below 60 ° C

7. Device connecting and preserving

7.1 Board view and connection diagram



Symbol	Designation
Q1	Fan outlet
Q3	CH pump outlet
Q4	HUW pump output
I1	Emergency thermostat STB
I2	Central heating room thermostat
T1	Boiler temperature sensor
T2	HUW temperature sensor
T3	Exhaust gas temperature sensor
TR2_DISP	Panel connector
X23	Additional alarm (optional)
- + AB	Alternative slot for additional modules

7.2 Connecting and replacing temperature sensors



Before performing any repair work be sure to disconnect the regulator plug from the 220V power supply.

After disconnecting the power plug from the electrical outlet, unscrew the fixing screws on the back of the housing, and then remove the top cover. The controller sensors do not have polarity, it is not significant wiring sequence. Find socket of interest using diagram and pressing the connector with a flat screwdriver, release the fastening clip and disconnect the wire. Correctly installed wires in the connectors provide a reliable connection, it is impossible to disconnect the wire without pressing the terminal.

Sensor name	Wire length	Type
CH sensor (boiler)	0,8m	Kty-81-210
HUW	3m	Kty-81-210
Exhaust gases	-	PT1000
STB	1m	Biometal

Attention!!! Exhaust gas sensor (type PT1000) is not included in the regulator standard kit

Attention!!! - The sensor should be installed in a dry place, i.e. without the use of oil, water, etc..

7.3 Boiler temperature protection and hydraulic connecting diagram

7.3 Boiler temperature protection and hydraulic connection diagram

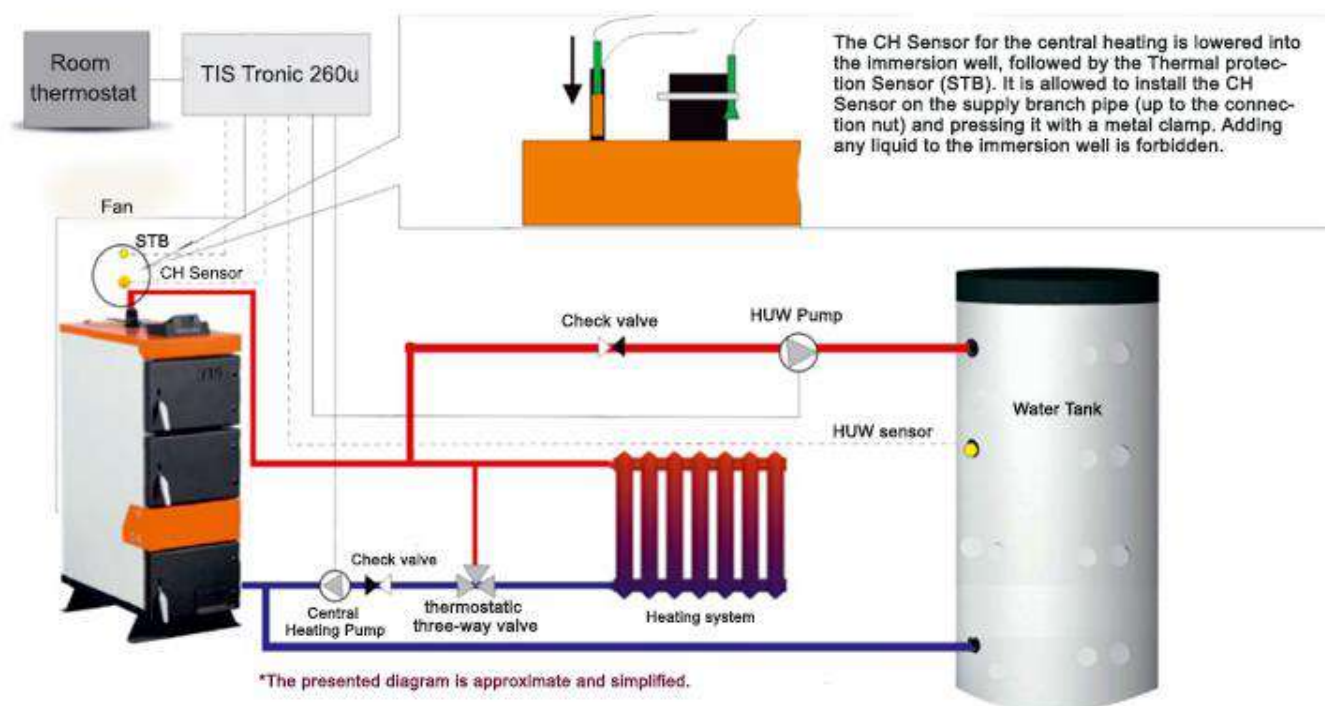
An additional thermal protection is connected in the regulator. It is an independent bimetallic sensor, which is triggered in case of the water temperature increase in the boiler.

The sensor turns off the fan if the water temperature in the boiler rises above 90 ° C; its action prevents water boiling process in the system in case of boiler overheating.

In accordance with the PN-EN 303-5: 2012 standard, when the water temperature in the boiler drops to a safe value, it is not possible to independently turn on the fan operation. The fan can be turned on again after the water temperature in the boiler drops below 60 ° C and only after manual error reset on the control panel.

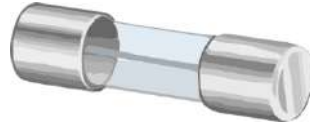
The protection sensor has 2 wires. It is connected (the polarity of the wires does not matter) to the connector of the STB emergency thermostat, indicated in the figure in paragraph 7.1.

The figure below shows the options for connecting the STB sensor, as well as the recommended hydraulic circuit.



7.4 Fuse replacement

If the fuse blows, only replace it with a new one. The fuse holder is located directly on the control unit motherboard, on the back of the regulator housing. Please note that the new fuse must have the same rating as the broken fuse. The parameters and dimensions of the fuse are shown in Figure 7.7.



Voltage: 250V
Current: 3.15 A
Diameter: 5mm
Height: 20mm

fig. 7



Before the heating season and during its period, it is necessary to check the technical condition of the wires, check the fastening of the regulator, clean it from dust and other contaminants.

Disposal of used electrical and electronic equipment



V. 1.00

Caring for the environment is our top priority. The knowledge that we manufacture electronic devices obliges us to dispose of used components and electronic devices in a nature-safe manner. Thus, the company received a registration number provided by the chief inspector for environmental protection.

000002627

The crossed out wheeled bin symbol on a product means that the product must not be disposed of in regular waste bins. By separating waste for recycling, we help protect the environment. It is your responsibility to return your used equipment to a designated collection point for the collection of waste generated from electrical and electronic equipment.

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Warranty conditions and requirements

Usage and warranty cases specified in the operating manual

1. The guarantee for the equipment is provided _____ in case of proper usage. Period is 24 months from the date of sale to the consumer, but not more than 36 months from the date of manufacture of the regulator. The date from which the warranty period begins is the date of sale indicated in the Warranty Card.
2. Defects found during the warranty period will be eliminated free of charge
3. The warranty covers equipment malfunctions caused by defective parts and / or manufacturing defects.
4. The defective equipment must be sent by the applicant (after receiving the consent of the guarantor) to the address of the service institution.

Parcels sent with a Post Office Courier and shipping companies with cash on delivery will not be accepted.

Conditions for accepting equipment for repair: carefully check the damaged equipment and describe the type of damage in the appropriate warranty repair certificate, a description of the damage, as well as the damaged equipment and the warranty card, deliver to the plant's service department.

5. The warranty does not cover damage or defects resulting from: any mechanical impact (scratches, dents, ingress of moisture or other substances on the body or inside the regulator) incorrect or inconsistent with the instruction manual of use, self-repair, modification, modifications or design changes, damage to the case, wires, cables, sensors made by the client / user.
6. Warranty claims and questions regarding the regulator must be directed to the seller, to the seller's service department
7. The manufacturer independently decides to repair or replace the entire device, the period for correcting defects cannot exceed 14 working days, but not less than 6 working days from the date the equipment arrives at the service center.
8. After the repair / replacement, the equipment is transferred to the Client.

Repairs Notes

Date of Repairs	Failure description	Signature

3.R-T Datasheet

Celsius Degrees	Fahrenheit Degree	CT4 Boiler Sensor				
°C	°F	%/(K)	(Ω)			(K)
			MIN	TYP	MAX	
-50	-58	0.98	1000	1030	1059	±2.92
-40	-40	0.96	1105	1135	1165	±2.74
-30	-22	0.93	1218	1247	1277	±2.55
-20	-4	0.91	1338	1367	1396	±2.35
-10	14	0.88	1467	1495	1523	±2.14
0	32	0.85	1603	1630	1656	±1.91
10	50	0.83	1748	1772	1797	±1.67
20	68	0.80	1901	1922	1944	±1.41
25	77	0.79	1980	2000	2020	±1.27
30	86	0.78	2057	2080	2102	±1.39
40	104	0.75	2217	2080	2102	±1.64
50	122	0.73	2393	2417	2451	±1.91
60	140	0.71	2557	2597	2637	±2.19
70	158	0.69	2737	2785	2832	±2.49
80	176	0.67	2924	2980	3035	±2.80
90	194	0.65	3118	3182	3246	±3.12
100	212	0.63	3318	3392	3466	±3.46
110	230	0.59	3523	3607	3691	±3.93
120	248	0.53	3722	3318	3912	±4.70
125	257	0.49	3815	3915	4016	±5.26
130	266	0.44	3901	4008	4114	±6.00
140	284	0.33	4049	4166	4283	±8.45
150	302	0.20	4153	4280	4407	±14.63

Notes

[illegible]

Device warranty card

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Symbol and serial number

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Manufacturing date

.....
(Date of Sale)

.....
(Seller signature and stamp)