TECH CONTROLLERS

USER MANUAL

EU-24 SIGMA

EN

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EU DECLARATION OF CONFORMITY

Hereby, we declare under our sole responsibility that **EU-24 SIGMA** manufactured by TECH STEROWNIKI, head-quartered in Wieprz Biała Droga 31, 34-122 Wieprz, is compliant with Directive **2014/35/EU** of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of Member States relating to **the making available on the market of electrical equipment designed for use within certain voltage limits** (EU OJ L 96, of 29.03.2014, p. 357), **Directive 2014/30/EU** of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of Member States relating to **electromagnetic compatibility** (EU OJ L 96 of 29.03.2014, p.79), Directive **2009/125/EC** establishing a framework for the setting of ecodesign requirements for energy-related products as well as the regulation by the MINISTRY OF ENTREPRENEURSHIP AND TECHNOLOGY of 24 June 2019 amending the regulation concerning the essential requirements as regards the restriction of the use of certain hazardous substances in electrical and electronic equipment, implementing provisions of Directive (EU) 2017/2102 of the European Parliament and of the Council of 15 November 2017 amending Directive 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment (OJ L 305, 21.11.2017, p. 8).

For compliance assessment, harmonized standards were used:

PN-EN IEC 60730-2-9:2019-06, PN-EN 60730-1:2016-10.

PAWEŁ JURA JANUSZ MASTER

Wieprz, 29.03.2022

Safety

Before using the device for the first time the user should read the following regulations carefully. Not obeying the rules included in this manual may lead to personal injuries or controller damage. The user's manual should be stored in a safe place for further reference. In order to avoid accidents and errors it should be ensured that every person using the device has familiarized themselves with the principle of operation as well as security functions of the controller. If the device is to be sold or put in a different place, make sure that the user's manual is there with the device so that any potential user has access to essential information about the device.
The manufacturer does not accept responsibility for any injuries or damage resulting from negligence; therefore, users are obliged to take the necessary safety measures listed in this manual to protect their lives and property.

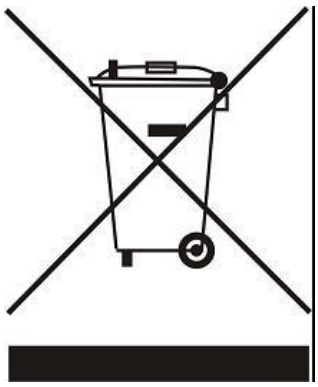
WARNING

- High voltage! Make sure the regulator is disconnected from the mains before performing any activities involving the power supply (plugging cables, installing the device etc.)
- The device should be installed by a qualified electrician.
- Before starting the controller, the user shoud measure earthing resistance of the electric motors as well as the insulation resistance of the cables.
- The regulator should not be operated by children.

WARNING

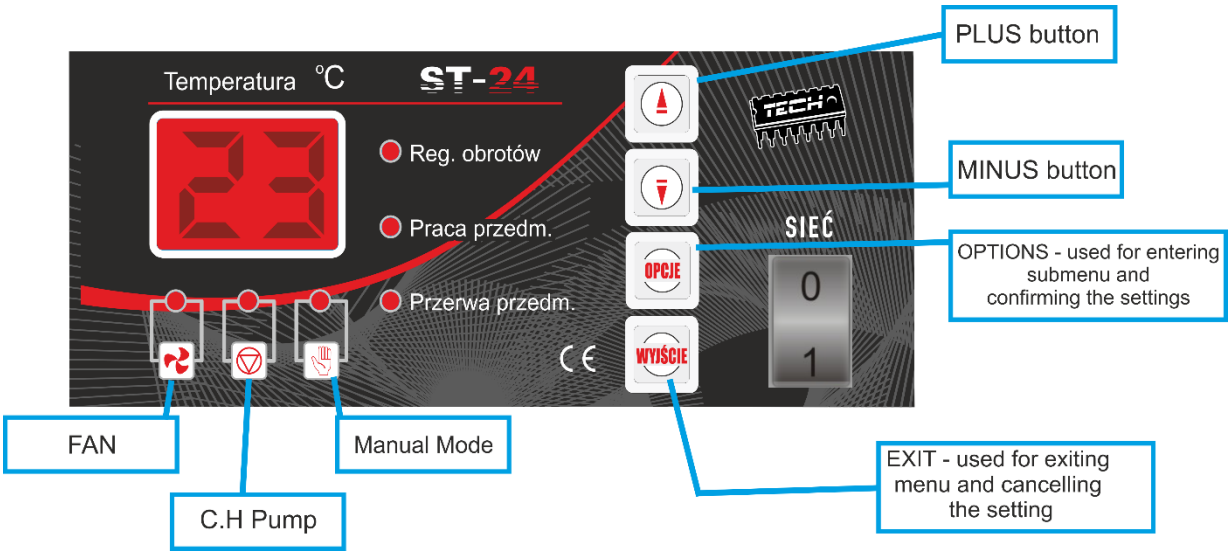
- The device may be damaged if struck by a lightning. Make sure the plug is disconnected from the power supply during storm.
- Any use other than specified by the manufacturer is forbidden.
- Before and during the heating season, the controller should be checked for condition of its cables. The user should also check if the controller is properly mounted and clean it if dusty or dirty.

Changes in the merchandise described in the manual may have been introduced subsequent to its completion on 2022.03.29. The manufacturer retains the right to introduce changes to the structure. The illustrations may include additional equipment. Print technology may result in differences in colours shown.



We are committed to protecting the environment. Manufacturing electronic devices imposes an obligation of providing for environmentally safe disposal of used electronic components and devices. Hence, we have been entered into a register kept by the Inspection For Environmental Protection. The crossed-out bin symbol on a product means that the product may not be disposed of to household waste containers. Recycling of wastes helps to protect the environment. The user is obliged to transfer their used equipment to a collection point where all electric and electronic components will be recycled.

Principle of operation



Microprocessor-based ST-24 Sigma regulator is intended for controlling CH boilers equipped with blow and CH pump. Its main task is to maintain the pre-set temperature with the use of a fan.

In order to fire up the boiler (when the boiler temperature is below **30°C)**, press EXIT button – it will enable the fan and both the "manual mode" LED and "fan" LED on the controller will go on. Pressing the button again disables the fire-up function (i.e. the manual mode). If enabled, the fire-up process is active until the boiler temperature reaches 30°C (it is the threshold temperature of pump activation and entering the operation mode). When the preset temperature is reached, the controller enters the sustain mode. In this mode, the controller activates blow-by at a frequenz set by the user.

Temperature setpoint

Temperature setpoint is the temperature which the user wants the boiler to reach. Its value may be changed from the main screen through pressing button (raising the temperature) and (reducing the temperature) when the screen is flashing. After 4 seconds the display will show the current boiler temperature.

Controller functions (user menu – options)

Speed regulation function - (activated through pressing OPTIONS button - "regulacja obrotów" LED goes on). This function is used to control the fan speed. The setting range is 1-6 or 1-10, depending on the software version (the values may be regarded as fan gears). The higher the gear is, the faster the fan works. Gears may be changed using and buttons. Setting an appropriate gear prevents the fire going out and ensures effective combustion.

After the preset temperature is reached, the boiler enters *the sustain mode* (to prevent further temperature rise). To ensure correct operation of the boiler, the user sets two parameters – blow-by operation and blow-by pause.

Minimum speed setting – In order to set the minimum fan speed, press OPTIONS button ("Regulacja obrotów" LED will go on). Next, press the button again (the LED will start to flash) and set the minimum fan speed, i.e. the gear in which the fan reaches its minimum speed when the temperature drops 1°C below the preset value.(see: **Automatic speed control**).

Blow-by operation function is activated by pressing OPTIONS button until "praca przedmuchu" LED goes on. Here, the user should set the blow-by operation time (in seconds)

in sustain mode.

Blow-by pause function is activated by pressing OPTIONS button until "przerwa przedmuchu" LED goes on. Here, the user should set the blow-by pause time (in minutes) in sustain mode.

The sustain mode (when the CH temperature remains above the preset value) prevents the boiler fire going out and limits further temperature rise.

ATTENTION: Incorrect setting of both the blow-by operation and pause may lead to constant increase in temperature! The user should especially ensure that the blow-by pause time is no too short and the blow-by operation time is not too long.

Automatic speed control (SIGMA)

When the boiler temperature rises, the controller gradually lowers the fan speed until it reaches the preset minimum speed.

For example, when the minimum speed is set to 2nd gear, the preset temperature is 60°C and the boiler temperature is 49°C and it is rising, every 1°C the fan slows down and changes into a lower gear until the temperature of 1°C below the preset value is reached (in the 2nd gear) When the temperature is reached, the fan stops and operates according to the preset blow-by operation and pause cycle.

When the boiler temperature drops below the preset value, the fan gradually speeds up (it changes into a higher gear every 1°C) until it reaches the maximum rotational speed.

Fan START/STOP

(function available depending on the software version)
EXIT button is used to enable the fan during the fire-up process. When the function is activated, both the "fan" and "manual mode" LEDs go on. When the boiler temperature exceeds 30°C, instead of "manual mode" LED "CH pump" LED goes on and the CH pump is enabled whereas the controller enters the operation mode.
In operation mode of the controller, the button is used to switch the fan on and off (e.g. when adding fuel). Then, after the fan is disabled, "manual mode" LED starts to flash. The function ensures safe operation of the boiler. When the fan is on, the boiler door must not be opened.

CH pump operation

CH pump operation depends on the boiler circulation temperature. When the temperature reaches 30°C, the pump is activated. When the temperature remains above this value, the pump operates without pausing. The pump is disabled when the temperature drops below 28°C to prevent unnecessary operation of the pump. When the pump is operating, a corresponding LED with the pump symbol is on.

Safeguards

In order to ensure safe operation, the controller has been equipped with a range of safeguards. All errors are shown on LED display:

E4 – boiler temperature has exceeded its maximum value (set to 85°C)
E5 – temperature sensor has been damaged

In both cases the fan is disabled, the CH pump is enabled (if so far it was disabled) and an alarm sound appears. In the case of E4 error, the alarm may be cancelled with the use of OPTIONS button when the temperature drops to a safe level. In the case of E5 error, the sensor must be replaced (after checking that there was no short-circuit and the sensor cable was plugged in correctly).

Moreover, the controller is equipped with a bimetallic mini-sensor (thermal overload relay), which automatically disconnects the fan from the power supply when the temperature of about 85°C is reached (CH pump works all the time)

It prevents the water in the installation form boiling in the case of boiler overheating or controller damage. After this protection has been activated and the temperature has dropped to a safe level, the sensor will automatically unlock itself and the alarm will be turned off. In the case when the thermal overload relay is damaged, the fan does not operate either in manual mode or in automatic mode.

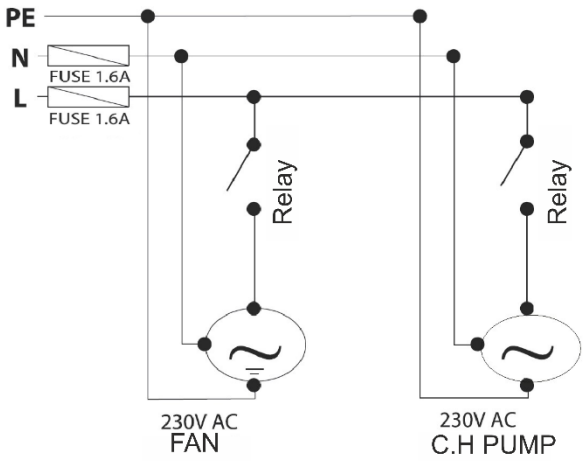
ST-30 regulator features two WT1,6A tube fuses as a network protection. Using a higher amperage fuse may damage the controller.

TECHNICAL DATA

No.	Description	
1	Power supply	230V ±10% /50Hz
2	Maximum power consumption	3W
3	Ambient temperature	5÷50
4	Pump max. output load	0,5A
5	Fan max. output load	0,6A
6	Temperature measurement accuracy	1°C
7	Sensor thermal resistance	-30÷99°C
8	Fuse	2x 1,6A

Maintenance

Before and during the heating season, the ST-24 *sigma* controller should be checked for condition of its cables. You should also check if the controller is properly mounted and clean it if dusty or dirty. It is advisable to measure earthing parameters for the motors (pump and fan)



Controller wiring diagram

PE - EARTHING (YELLOW - GREEN)
N - NEUTRAL (BLUE)
L - PHASE (BROWN)

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