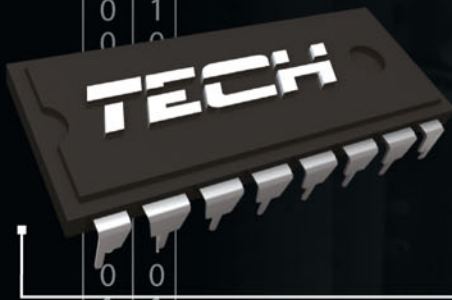




# TECH



MICROPROCESSOR  
TEMPERATURE  
REGULATORS



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# TECH TECH CONTROLLERS



## Ladies and Gentlemen

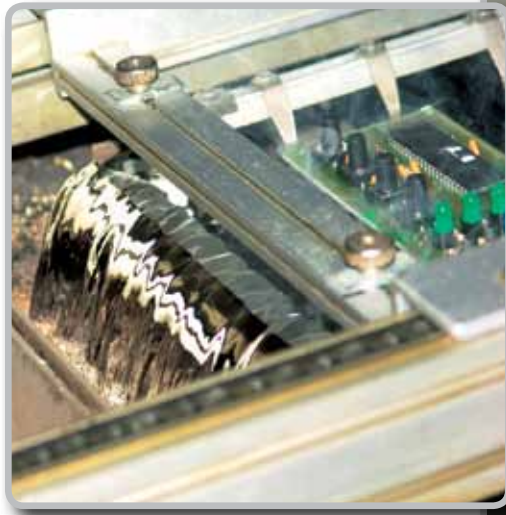
Our company's operations include production of microprocessor devices for functional electronics. We are the largest Polish manufacturer of controllers for boilers fired with solid fuels. We were trusted by the leading boiler companies in Poland and abroad. Our devices are characterized by the highest quality and reliability, confirmed by many years of experience.

We specialize in construction and production of controllers for CH boilers fired with coal, fine coal, pellet, wood and biomass (oats, corn grain, dried seeds). Apart from controllers for CH boilers, we also manufacture regulators for coolers, refrigerated display cases, sewage treatment plants, mushroom farms, as well as three- and four-way valves, room regulators, scoring boards for sports playfields.

We have already sold hundreds of thousands of various controllers and we are successfully expanding our offer, taking care of customer satisfaction. Quality Management System ISO 9001 and a number of certificates confirm the top standard of our products.

The history of our company are, first of all, the people who create it, their knowledge, experience, involvement and persistence. Our plans for the future include maintenance of good relations with the recipients of our products, acquisition of new customers, creation of new, high-quality products.





▶ Kince KWA-350 Super EP soldering wave is used for industrial soldering of boards with three-dimensional components or made in mixed technology. It enables effective and economical production of electronic boards.



▶ Mirae Pick&Place type automatic unit of MX-110 P and MX-200 series for installation of SMD components on electronic boards is an excellent device for simultaneous laying of chip-type components and a wide range of fine-pitch circuits, and it is equipped with four fast heads and one precise head. Dynamic, vibration-reducing analysis and unique technology of linear drive enables precise installation of components from 0.6 x 0.3 mm to 50 x 50 mm with irregular shapes with maximum efficiency up to 11000 elements per hour (according to IPC-9850 standard).

▶ Mimaki JFX-1631 printing plotter is the newest printing desk plotter in the innovative UV-LED technology. The machine has a new system of positioning based on high-resolution linear motors enabling printing of the controller's fronts with ultra-high accuracy of up to 1200 dpi. The technology enables printing on practically every flat material up to the thickness of 50mm, even large formats of up to 1.6x3.1m. Eight printing heads significantly affect the printing speed. LED lamps do not emit heat which may deform some media, e.g. PVC, they also consume much less energy, thus saving the costs of labour. The plotter prints both with hard ink (with WHITE colour) as well as with flexible ink extending by up to 200% for thermal forming, which significantly expands the scope of its applications.





▶ Cutting-milling Mimaki CF3-1631 type plotter with the maximum size of cutting/milling 1602 x 3100 mm is perfect for cutting any shapes of foil fronts of the controller and advertising materials of any type. Its universal possibilities also allow to cut such materials as teflon, rubber, leather, etc. Replaceable milling head also enables treatment of rigid materials, such as aluminum or acrylic.

▶ Our company offers a wide base of hydraulic injection moulding machines which perfect in the production of any kind of casings for controllers made of high quality plastics. Highly efficient injection moulding machines enable economical applications of the technology of injection in the case of all processable materials, along with ceramic materials and metal powders.

▶ Mikron UCP600 Vario five-axis milling centre is a top-class and top-precision machine tool with unlimited possibilities, based on Heidenhain iTNC 530 software platform. The machine is equipped with the most advanced high speed electric spindle, a high capacity store for tools, an optimally designed changer of pallets as well as an efficient system for the discharge of chips and coolant. The main stream of this device's operation in our company are injection forms of casings for controllers as well as blanking dies and production instrumentation.





▶ AgieCharmilles FORM 20 type penetrating electric erosion machine is used for electro-erosion treatment of all types of steel, cast-iron, sinters, aluminum - conductive materials. FORM 20 electro-erosion centre is used by our company when performing injection moulds and blanking dies.

▶ Chucking, three-axle lathe of TAE-35N type with SINUMERIK 802D SOLUTION LINE control system perfectly complements our machinery stock for production of any kind of injection moulds, blanking dies and instrumentation.

▶ Feutron Climatic chamber allows to simulate the operation of our controllers or particular details under exceptionally adverse climatic circumstances. Temperature settings range from - 75 to+ 180°C, while relative air humidity can be adjusted from 10 to 95%. The required climates are set and controlled in a simple way, with high accuracy and repeatability.

▶ Semi-automatic 1-colour screen-printing machine of new generation intended for printing on large flat surfaces is suitable as a supplement of the production process of fronts as well as production of any non-standard overprints. The machine has safety covers with photocells, foot-operated, as well as a movable table with vacuum. Microprocessor control system provides accurate and problem-free operation of the machine.







▶ Thanks to rich equipment and a number of professional devices as well as sensors, our company's research laboratory allows us to run complex tests of controllers during the boiler's operation. We are testing our controllers both in terms of correct functioning as well as proper cooperation with various types of boilers, at the same time conducting detailed analysis of waste gas emission and power efficiency of the boiler along with data archiving.

▶ Flexibility and professionalism are the features we are characterized by. We cooperate with many producers of CH boilers in Poland and Europe.

▶ Algorithm of the controller's operation, its appearance and functions are the result of our cooperation with boiler manufacturers. The final product is adapted to needs and requirements of customers.

▶ We have CE certificates for all controllers that we manufacture, confirmed with appropriate tests which guarantee safety and provide compliance with European standards.



# ST-19

- ▶ **Functions performed by the controller**
  - \* CH pump control
  - \* anti-stop function
- ▶ **Controller's equipment**
  - \* potentiometer to adjust the set temperature
  - \* CH temperature sensor



# ST-20

- ▶ **Functions performed by the controller**
  - \* CH pump control
- ▶ **Controller's equipment**
  - \* potentiometer to adjust the set temperature
  - \* CH temperature sensor



▶ **Technical data ST-19 and ST-20:**

NO.	SPECIFICATION	UNIT	
1.	Power supply	V	230V/50Hz +/-10%
2.	Maximum power consumption of the controller	W	2
3.	Ambient temperature	°C	5+50
4.	Maximum output load of the circulation pump	A	1
5.	Range of temperature settings	°C	25+85
6.	Hysteresis (constant)	°C	2
7.	Accuracy of measurement	°C	1
8.	Temperature strength of the sensor	°C	-25+90
9.	Sensor duct length	m	1,5
10.	Fuse insert	A	1,6

▶ **Description ST-19 and ST-20:**

ST-19 anti-stop and ST-20 regulators are intended for control of the pump of the central heating water circulation. The set temperature can be adjusted by using a potentiometer. The controller's task is to switch the pump on when the temperature reaches the set value and to switch the pump off when the boiler cools down 2 °C below the set value. Such a functioning mode prevents unnecessary operation of the pump, which allows to save electric energy and prolongs life of the pump as well as improves its reliability. ST-19 controller also has an additional anti-stop function which prevents too long period of the circulating pump's operation standstill after the season (the pump is switched on approx. every 10 days for 1 minute).

### ► Functions performed by the controller

- \* CH pump control
- \* possible operation as a thermostat
- \* anti-stop function
- \* anti-freeze function

### ► Controller's equipment

- \* LED display
- \* CH temperature sensor

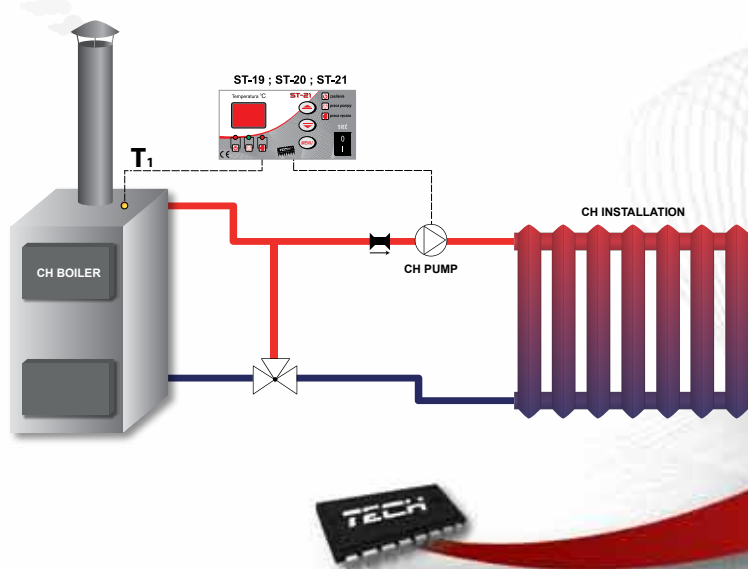
### ► Technical data ST-21

NO.	SPECIFICATION	UNIT	
1.	Power supply	V	230V/50Hz +/-10%
2.	Maximum power consumption of the controller	W	2
3.	Ambient temperature	°C	5÷50
4.	Maximum output load of the circulation pump	A	1
5.	Range of hysteresis settings	°C	1÷10
6.	Accuracy of measurement	°C	1
7.	Range of temperature settings	°C	5÷90
8.	Temperature strength of the sensor	°C	-25÷90
9.	Sensor duct length	m	1,5
10.	Fuse insert	A	1,6

### ► Description

ST-21 controller with LED display is intended to control the central heating water circulation pump. The controller's task is to switch the pump on when the temperature reaches the set value and to switch it off when the boiler cools down below the set hysteresis value. Such a functioning mode prevents unnecessary operation of the pump, which allows to save electric energy and prolongs life of the pump as well as improves its reliability. ST-21 controller may also serve as a thermostat switching the pump off after reaching the set temperature. The controller also has an anti-stop function which prevents too long period of the circulating pump's operation standstill after the season (the pump is switched on approx. every 10 days for 1 minute). An additional protection is the anti-freeze function which prevents water freezing in the system (when the temperature drops below 60 C, the pump is switched on permanently).

### ► Sample installation (simplified scheme)





► **Functions performed by the controller**

- \* CH pump control
- \* possible operation as a thermostat (D1)
- \* anti-stop function
- \* anti-freeze function

► **Controller's equipment**

- \* LED display
- \* two temperature sensors (does not apply to ST-21 D1)

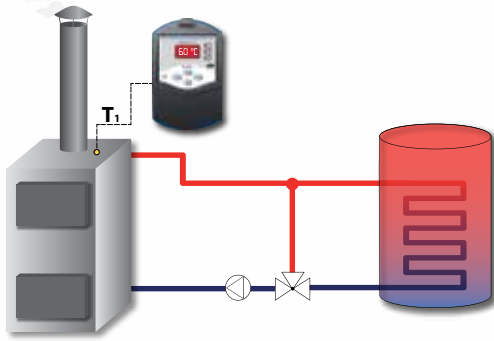
► **Technical data:**

NO.	SPECIFICATION	UNIT	
1.	Power supply	V	230V/50Hz +/-10%
2.	Maximum power consumption of the controller	W	4
3.	Ambient temperature	°C	5÷50
4.	Maximum output load of the circulation pump	A	1
5.	Range of hysteresis settings	°C	1÷10
6.	Accuracy of measurement	°C	1
7.	Range of temperature settings	°C	5÷90
8.	Fuse insert	A	1,6

► **Funkcije:**

	D1	D2	D3	D4	D5
Manual operation	✓	✓	✓	✓	✓
Hysteresis	✓	✓	-	-	-
Activation threshold 1	✓	✓	-	-	-
Activation threshold 2	-	✓	-	-	✓
Pump / thermostat selection	✓	-	-	-	-
Activation delta	-	-	✓	✓	✓
Factory settings	✓	✓	✓	✓	✓
Anti-stop	✓	✓	✓	✓	✓
Anti-freeze	✓	✓	✓	✓	✓
Strength of sensor 1	(-25÷90) °C	(-25÷90) °C	(-25÷90) °C	(-25÷90) °C	(-25÷90) °C
Strength of sensor 2	-	(-30÷180) °C	(-30÷480) °C	(-25÷90) °C	(-25÷90) °C

▶ Sample schemes of connections:



▶ ST21 - D1

If:

$$T_1 \geq T_{Set}$$

THE PUMP IS WORKING

THERMOSTAT MODE

If:

$$T_1 \leq T_{Set}$$

THE PUMP IS WORKING

If:

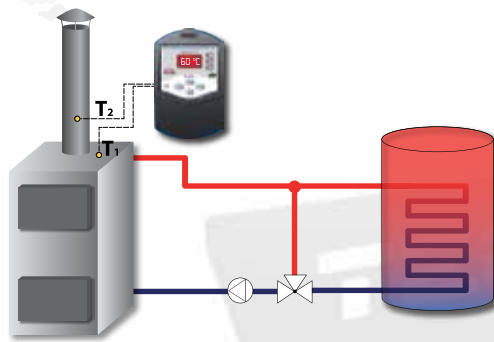
$$T_1 \leq T_{Set} - Hyst$$

THE PUMP IS NOT WORKING

If:

$$T_1 \geq T_{Set} - Hyst$$

THE PUMP IS NOT WORKING



▶ ST21 - D2

If:

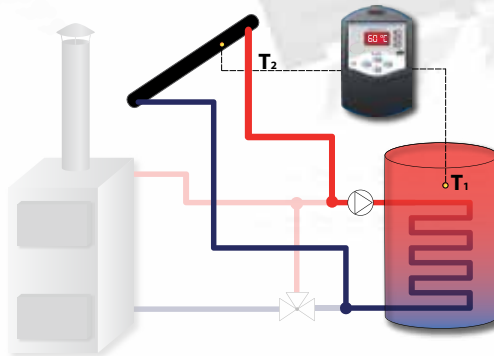
$$T_1 \geq T_{1Set} \text{ or } T_2 \geq T_{2Set}$$

THE PUMP IS WORKING

If:

$$T_1 \leq T_{1Set} - Hyst \text{ and } T_2 \leq T_{2Set} - Hyst$$

THE PUMP IS NOT WORKING



▶ ST21 - D3

If:

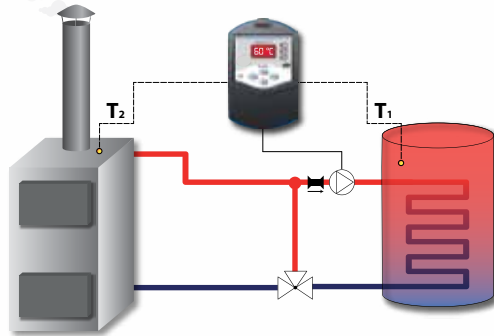
$$T_2 - T_1 \geq \Delta$$

THE PUMP IS WORKING

If:

$$T_2 \leq T_1$$

THE PUMP IS NOT WORKING



▶ ST21 - D4

If:

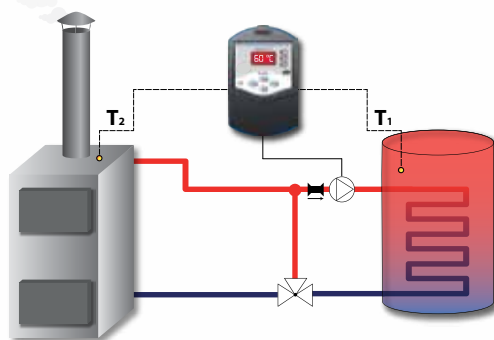
$$T_2 - T_1 \geq \Delta$$

THE PUMP IS WORKING

If:

$$T_1 \geq T_2$$

THE PUMP IS NOT WORKING



▶ ST21 - D5

If:

$$T_2 - T_1 \geq \Delta \text{ and } T_2 \geq \text{Próg}_{zat}$$

THE PUMP IS WORKING

If:

$$T_1 \geq T_2 \text{ or } T_2 < \text{Próg}_{zat} - 2^\circ$$

THE PUMP IS NOT WORKING



**ST-27 i**

**ST-427 i**



► **Functions performed by the controller**

- \* CH pump control
- \* control of additional HUW or floor pump
- \* anti-stop function
- \* anti-freeze function

► **Controller's equipment**

- \* LCD display
- \* CH temperature sensor
- \* temperature sensor of the additional pump
- \* knob of the pulse generator
- \* casing made of high quality materials resistant to high and low temperatures

► **Functions performed by the controller**

- \* control of three pumps on the basis of the measurement of temperatures or on a time basis
- \* anti-stop function
- \* anti-freeze function
- \* the possibility of setting any priorities of pumps
- \* the possibility of connecting room regulator

► **Controller's equipment**

- \* LCD display
- \* three temperature sensors
- \* knob of the pulse generator
- \* casing made of high quality materials resistant to high and low temperatures

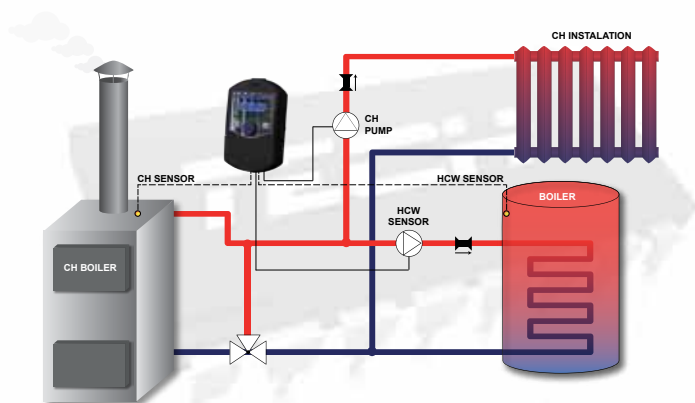
► **Technical data:**

NO.	SPECIFICATION	UNIT	
1.	Power supply	V	230V/50Hz +/-10%
2.	Maximum power consumption of the controller	W	4
3.	Ambient temperature	°C	5+50
4.	Maximum output load of pumps	A	1
5.	Range of temperature settings CH	°C	30+75
6.	Range of temperature settings HUW	°C	20+75
7.	Range of temperature settings floor	°C	20+50
8.	Hysteresis	°C	1+20
9.	Accuracy of measurement	°C	1
10.	Temperature strength of the sensor	°C	-25+90
11.	Fuse insert	A	3,15

▶ **Principle of operation :**

ST-27 regulator is intended to control the operation of CH circulation pump and of the additional pump (HUW or floor pump). The controller's task is to switch the CH pump on if the temperature exceeds the threshold value of activation and to switch the pump off when the boiler cools down (e.g. as a result of burnout). For the second pump, apart from activation temperature, the user adjusts the set temperature up to which the pump will operate.

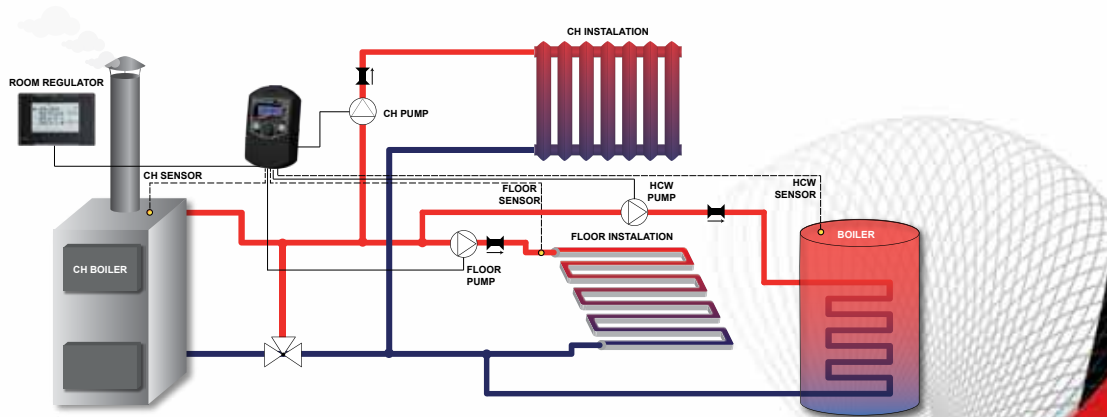
▶ **Sample installation of ST-27i controller with CH pump and HUW pump (simplified scheme):**



▶ **Principle of operation :**

ST-427i regulator is intended to control the operation of three pumps. The controller's task is to switch the pumps on (temporarily if the temperature exceeds the threshold value of activation) and off when the boiler cools down (e.g. as a result of burnout). If a selected pump is not a CH pump, apart from activation temperature, the user adjusts the set temperature up to which the pump will operate. There is a possibility to set any priorities of the pumps' operation.

▶ **Sample installation of ST-427i controller with CH, HUW and floor pump (simplified scheme):**



# ST-24



► **Functions performed by the controller**

- \* control of the fan
- \* CH pump control
- \* slower fan operation when the central heating approaches the set temperature  
- in a version with software **SIGMA** (option)

\* also available in **SIGMA** version

► **Controller's equipment**

- \* LED display
- \* CH temperature sensor
- \* has temperature protection (thermal overload relay)
- \* casing intended for assembly on the boiler, made of high quality materials resistant to high and low temperatures

► **Technical data:**

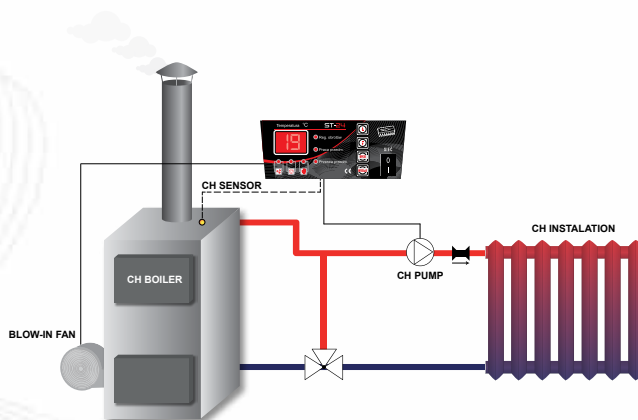
NO.	SPECIFICATION	UNIT	
1.	Power supply	V	230V/50Hz +/-10%
2.	Maximum power consumption of the controller	W	4
3.	Ambient temperature	°C	5+50
4.	Maximum output load of CH pump	A	0,5
5.	Maximum output load of fan	A	0,6
6.	Accuracy of measurement	°C	1
7.	Range of temperature settings	°C	45+80*
8.	Temperature strength of the sensor	°C	-25+90
9.	Fuse insert	A	2x 1,6

\* applies to the controller version with standard software

► **Principle of operation :**

Microprocessor ST-24 regulator is intended to control the charging CH boiler equipped with blow-in and a CH water circulation pump. Its task is to maintain the set temperature by means of a fan. The controller's casing is adjusted to be installed on the boiler.

► **Sample installation (simplified scheme):**







## ► Functions performed by the controller

- \* control of the fan, CH pump and HCW pump
- \* the possibility of connecting room regulator
- \* slower fan operation when the central heating approaches the set temperature - in a version with software Sigma (option)

\* also available in **SIGMA** version

## ► Controller's equipment

- \* LCD display
- \* CH temperature sensor
- \* HUW temperature sensor
- \* has temperature protection (thermal overload relay)
- \* casing intended for assembly on the boiler, made of high quality materials resistant to high and low temperatures

## ► Technical data:

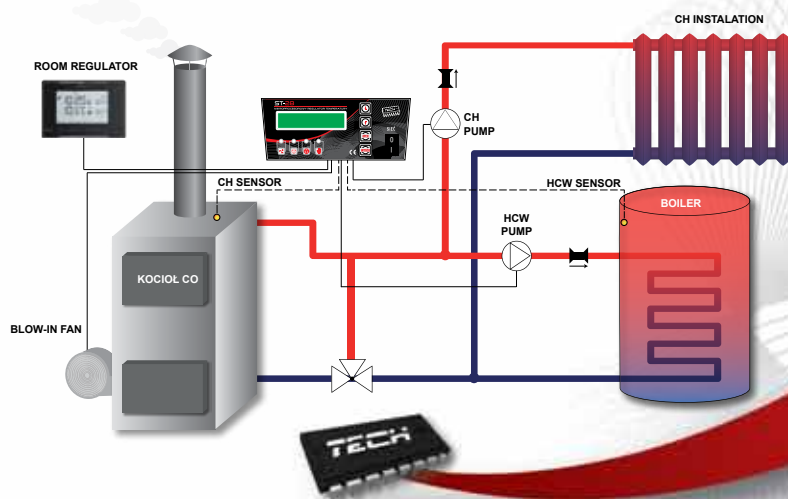
NO.	SPECIFICATION	UNIT	
1.	Power supply	V	230V/50Hz +/-10%
2.	Maximum power consumption of the controller	W	5
3.	Ambient temperature	°C	5÷50
4.	Maximum output load of CH pump	A	0,5
5.	Maximum output load of HUW pump	A	0,5
6.	Maximum output load of fan	A	0,6
7.	Accuracy of measurement	°C	1
8.	Range of temperature settings	°C	45÷80*
9.	Temperature strength of the sensor	°C	-25÷90
10.	Fuse insert	A	2x 3,15

\* applies to the controller version with standard software

## ► Principle of operation :

ST-28 temperature regulator is intended for charging CH boilers. It controls the water circulation pump, hot usable water pump and the fan. Four optional modes of the pumps' operation: house heating, boiler priority, parallel pumps, summer mode. The controller's casing is adjusted to be installed on the boiler.

## ► Sample installation (simplified scheme):



# ST-28 zPID



zPID

▶ **Functions performed by the controller**

- \* automatic control of the fan
- \* CH pump control and HCW
- \* zPID software

▶ **Controller's equipment**

- \* LCD display
- \* CH temperature sensor, HCW, waste gas
- \* has temperature protection (thermal overload relay)
- \* casing intended for assembly on the boiler, made of high quality materials resistant to high and low temperatures

▶ **Technical data**

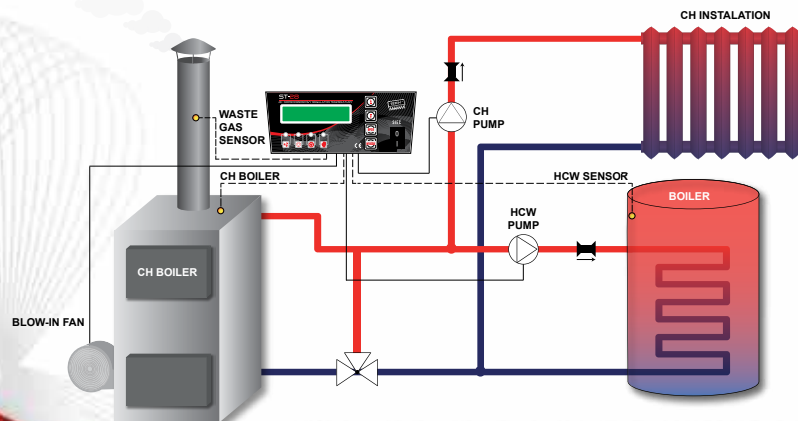
NO.	SPECIFICATION	UNIT	
1.	Power supply	V	230V/50Hz +/-10%
2.	Maximum power consumption of the controller	W	5
3.	Ambient temperature	°C	5+50
4.	Maximum output load of CH pump	A	0,5
5.	Maximum output load of HUW pump	A	0,5
6.	Maximum output load of fan	A	0,6
7.	Accuracy of measurement	°C	1
8.	Range of temperature settings	°C	45+80*
9.	Temperature strength of the sensors	°C	-25+90
10.	Temperature strength of the sensor spalin	°C	30+480
11.	Fuse insert	A	2x 3,15

▶ **Principle of operation :**

\* applies to the controller version with standard software

ST-28 zPID temperature regulator is intended for charging CH boilers. It controls the water circulation pump, hot usable water pump and the fan. The controller's casing is adjusted to be installed on the boiler.

▶ **Sample installation (simplified scheme):**





### ► Functions performed by the controller

- \* control of the fan, CH pump and HCW pump
- \* the possibility of connecting room regulator

### ► Controller's equipment

- \* LCD display
- \* CH temperature sensor
- \* HUW temperature sensor
- \* has temperature protection (thermal overload relay)
- \* casing intended for assembly on the boiler, made of high quality materials resistant to high and low temperatures

### ► Technical data:

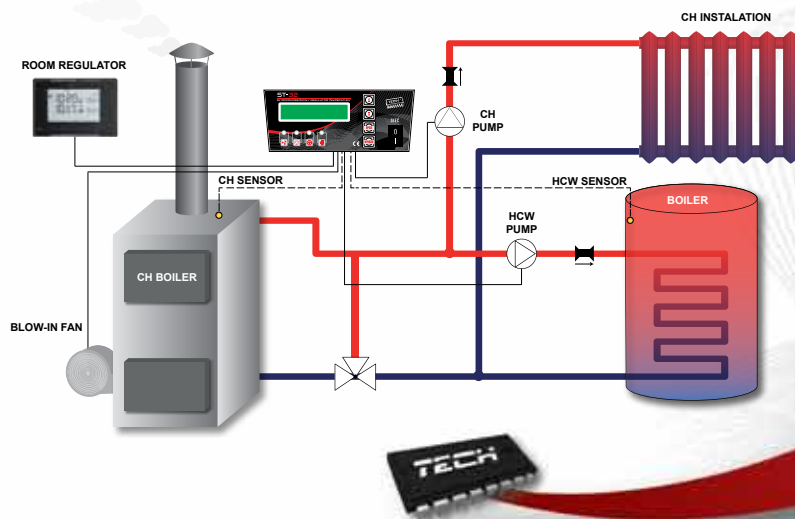
NO.	SPECIFICATION	UNIT	
1.	Power supply	V	230V/50Hz +/-10%
2.	Maximum power consumption of the controller	W	5
3.	Ambient temperature	°C	5÷50
4.	Maximum output load of CH pump	A	0,5
5.	Maximum output load of HUW pump	A	0,5
6.	Maximum output load of fan	A	0,6
7.	Accuracy of measurement	°C	1
8.	Range of temperature settings	°C	45÷80*
9.	Temperature strength of the sensor	°C	-25÷90
10.	Fuse insert	A	2 x 3,15

\* applies to the controller version with standard software

### ► Principle of operation :

ST-32 temperature regulator is intended for charging CH boilers. It controls the water circulation pump, hot usable water pump and the fan. Four optional modes of the pumps' operation: house heating, boiler priority, parallel pumps, summer mode. The controller's casing is adjusted to be installed on the boiler.

### ► Sample installation (simplified scheme):



**ST-32 zPID**



zPID

▶ **Functions performed by the controller**

- \* automatic control of the fan
- \* CH pump control and HCW pump
- \* **zPID** software

▶ **Controller's equipment**

- \* LCD display
- \* CH temperature sensor, HCW sensor and waste gas sensor
- \* has temperature protection (thermal overload relay)
- \* casing intended for assembly on the boiler, made of high quality materials resistant to high and low temperatures

▶ **Technical data**

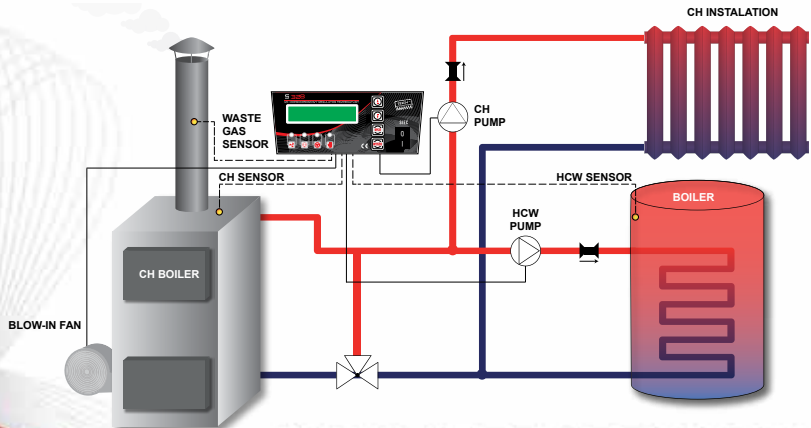
NO.	SPECIFICATION	UNIT	
1.	Power supply	V	230V/50Hz +/-10%
2.	Maximum power consumption of the controller	W	5
3.	Ambient temperature	°C	5+50
4.	Maximum output load of CH pump	A	0,5
5.	Maximum output load of HUW pump	A	0,5
6.	Maximum output load of fan	A	0,6
7.	Accuracy of measurement	°C	1
8.	Range of temperature settings	°C	45+80*
9.	Temperature strength of the sensors	°C	-25+90
10.	Temperature strength of the sensor spalin	°C	30+480
11.	Fuse insert	A	2x 3,15

\* applies to the controller version with standard software

▶ **Principle of operation :**

ST-32 zPID temperature regulator is intended for charging CH boilers. It controls the water circulation pump, hot usable water pump and the fan. The controller's casing is adjusted to be installed on the boiler.

▶ **Sample installation (simplified scheme):**





## ► Functions performed by the controller

- \* control of the fan, CH pump and HCW pump
- \* the possibility of connecting room regulator

## ► Controller's equipment

- \* LCD display
- \* CH temperature sensor and HCW sensor
- \* has temperature protection (thermal overload relay)
- \* panel casing for installation of the boiler, made of high quality materials resistant to high and low temperatures
- \* the possibility of installation on the boiler in OM-01 casing

## ► Technical data:

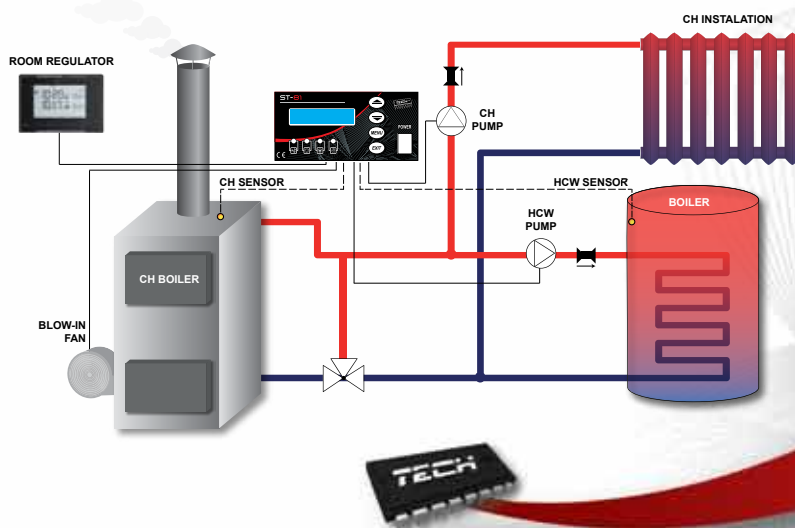
NO.	SPECIFICATION	UNIT	
1.	Power supply	V	230V/50Hz +/-10%
2.	Maximum power consumption of the controller	W	5
3.	Ambient temperature	°C	5÷50
4.	Maximum output load of CH pump	A	0,5
5.	Maximum output load of HUCW pump	A	0,5
6.	Maximum output load of fan	A	0,6
7.	Accuracy of measurement	°C	1
8.	Range of temperature settings	°C	45÷80*
9.	Temperature strength of the sensor	°C	-25÷90
10.	Fuse insert	A	2x 3,15

\* applies to the controller version with standard software

## ► Principle of operation :

ST-81 temperature regulator is intended for charging CH boilers. It controls the water circulation pump, hot usable water pump and the fan. Four optional modes of the pumps' operation: house heating, boiler priority, parallel pumps, summer mode. The controller's casing is adjusted to be assembled in the boiler's installation.

## ► Sample installation (simplified scheme):



# ST-81 zPID



zPID

▶ **Functions performed by the controller**

- \* automatic control of the fan
- \* CH pump control and HCW pump
- \* zPID software

▶ **Controller's equipment**

- \* LCD display
- \* CH temperature sensor, HCW sensor and waste gas sensor
- \* has temperature protection (thermal overload relay)
- \* panel casing for installation of the boiler, made of high quality materials resistant to high and low temperatures
- \* the possibility of installation on the boiler in OM-01 casing

▶ **Technical data**

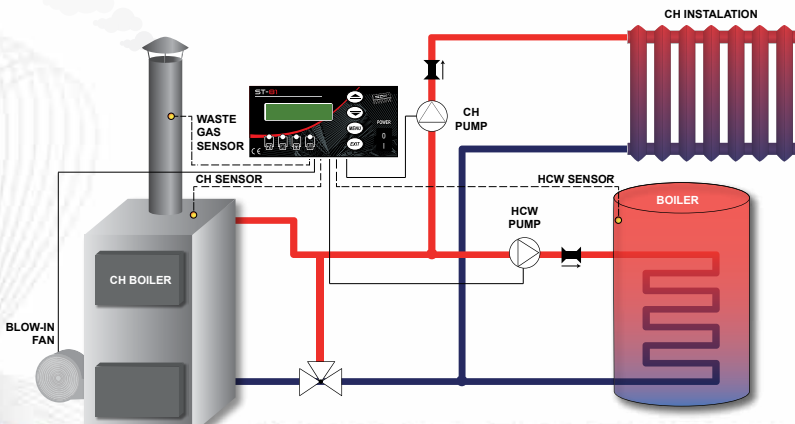
NO.	SPECIFICATION	UNIT	
1.	Power supply	V	230V/50Hz +/-10%
2.	Maximum power consumption of the controller	W	5
3.	Ambient temperature	°C	5÷50
4.	Maximum output load of CH pump	A	0,5
5.	Maximum output load of HUW pump	A	0,5
6.	Maximum output load of fan	A	0,6
7.	Accuracy of measurement	°C	1
8.	Range of temperature settings	°C	45÷80*
9.	Temperature strength of the sensors	°C	-25÷90
10.	Temperature strength of the sensor spalin	°C	30÷480
11.	Fuse insert	A	2x 3,15

\* applies to the controller version with standard software

▶ **Principle of operation :**

ST-81 zPID temperature regulator is intended for charging CH boilers. It controls the water circulation pump, hot usable water pump and the fan. Four optional modes of the pumps' operation: house heating, boiler priority, parallel pumps, summer mode. The controller's casing is adjusted to be assembled in the boiler's installation.

▶ **Sample installation (simplified scheme):**



### ► Functions performed by the controller

- \* control of the fan, CH pump and HCW pump
- \* cooperation with the room regulator with RS or traditional communication
- \* the possibility of connecting ST-65 GSM module (option)
- \* the possibility of connecting ST-500 ETHERNET module (option)



### ► Controller's equipment

- \* LCD display
- \* CH temperature sensor
- \* HUW temperature sensor
- \* has temperature protection (thermal overload relay)
- \* panel casing for installation of the boiler, made of high quality materials resistant to high and low temperatures
- \* the possibility of installation on the boiler in OM-02 casing

### ► Technical data:

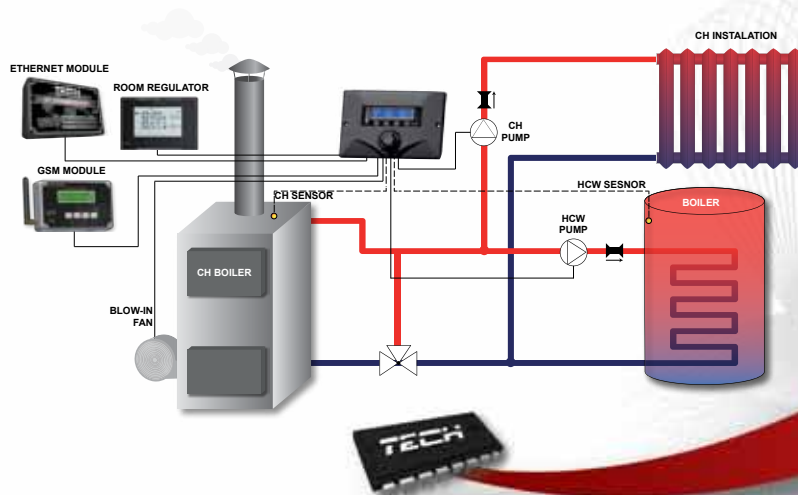
NO.	SPECIFICATION	UNIT	
1.	Power supply	V	230V/50Hz +/-10%
2.	Maximum power consumption of the controller	W	5
3.	Ambient temperature	°C	5÷50
4.	Maximum output load of CH pump	A	0,5
5.	Maximum output load of HUW pump	A	0,5
6.	Maximum output load of fan	A	0,6
7.	Accuracy of measurement	°C	1
8.	Range of temperature settings	°C	45÷80*
9.	Temperature strength of the sensors	°C	-25÷90
10.	Fuse insert	A	2x 3,15

\* applies to the controller version with standard software

### ► Principle of operation :

ST-88 temperature regulator is intended for charging CH boilers. It controls the CH water circulation pump, hot usable water pump and the fan. Four optional modes of the pumps' operation: house heating, boiler priority, parallel pumps, summer mode. The controller's casing is adjusted to be assembled in the boiler's installation.

### ► Sample installation (simplified scheme):



# ST-88 zPID



zPID

▶ **Functions performed by the controller**

- \* automatic control of the fan
- \* control of CH pump , HUW pump, floor pump, and circulation pump
- \* the possibility of connecting ST-65 GSM module (option)
- \* the possibility of connecting ST-500 ETHERNET module (option)
- \* **zPID** software

▶ **Controller's equipment**

- \* LCD display
- \* knob of the pulse generator
- \* CH temperature sensor, HCW sensor and waste gas sensor
- \* has temperature protection (thermal overload relay)
- \* casing made of high quality materials resistant to high and low temperatures
- \* the possibility of installation on the boiler in OM-02 casing

▶ **Technical data**

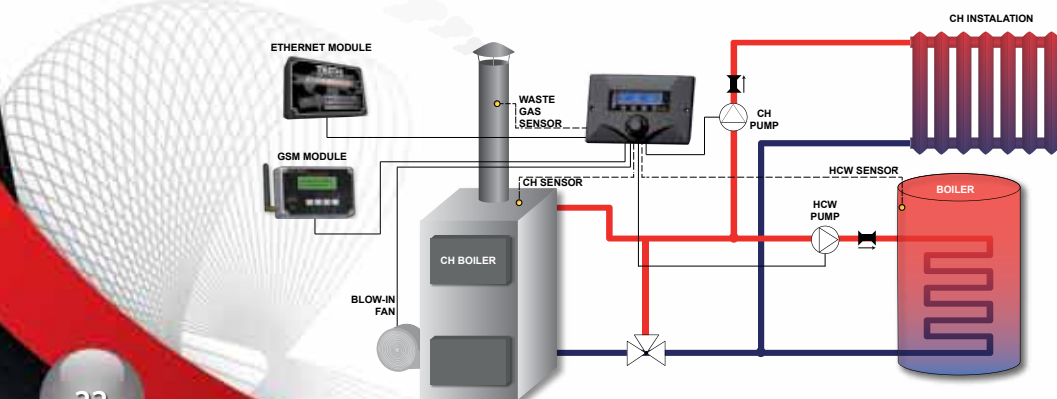
NO.	SPECIFICATION	UNIT	
1.	Power supply	V	230V/50Hz +/-10%
2.	Maximum power consumption of the controller	W	5
3.	Ambient temperature	°C	5÷50
4.	Maximum output load of CH pump	A	0,5
5.	Maximum output load of HUW pump	A	0,5
6.	Maximum output load of fan	A	0,6
7.	Accuracy of measurement	°C	1
8.	Range of temperature settings	°C	45+80*
9.	Temperature strength of the sensors	°C	-25÷90
10.	Temperature strength of the sensor spalin	°C	30+480
11.	Fuse insert	A	2x 3,15

\* applies to the controller version with standard software

▶ **Principle of operation :**

ST-88 zPID temperature regulator is intended for charging CH boilers. It controls the CH water circulation pump, hot usable water pump and the fan. Four optional modes of the pumps' operation: house heating, boiler priority, parallel pumps, summer mode. The controller's casing is adjusted to be assembled in the boiler's installation.

▶ **Sample installation (simplified scheme):**





# ST-37



► **Functions performed by the controller**

- \* automatic control of the fan and feeding screw or piston feeder
- \* CH pump control and HCW pump
- \* the possibility of connecting room regulator with traditional communication with RS communication
- \* the possibility of connecting ST-65 GSM module
- \* weekly control (option)

► **Controller's equipment**

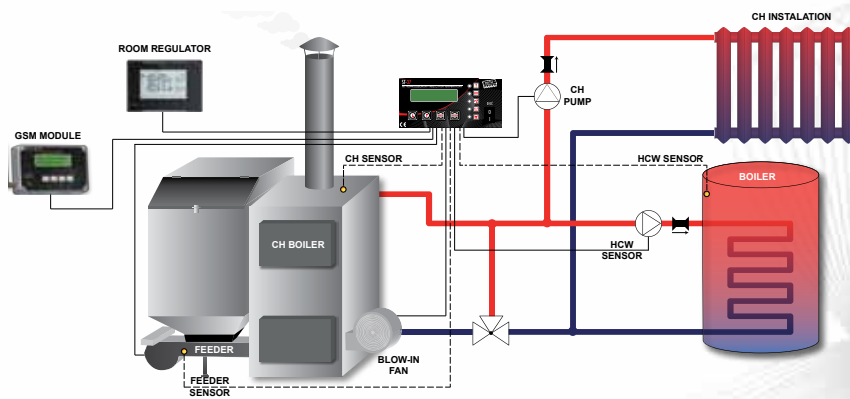
- \* LCD display
- \* CH temperature sensor, HCW sensor, floor sensor, feeder sensor (protection)
- \* has temperature protection (thermal overload relay)
- \* panel casing for installation of the boiler, made of high quality materials resistant to high and low temperatures
- \* the possibility of installation on the boiler in OM-01 casing

► **Technical data**

NO.	SPECIFICATION	UNIT	
1.	Power supply	V	230V/50Hz +/-10%
2.	Maximum power consumption of the controller	W	7
3.	Ambient temperature	°C	5÷50
4.	Maximum output load of CH pump	A	0,5
5.	Maximum output load of HUW pump	A	0,5
6.	Maximum output load of fan	A	0,6
7.	Accuracy of measurement	°C	1
8.	Range of temperature settings	°C	45÷80*
9.	Temperature strength of the sensor	°C	-25÷90
10.	Fuse insert	A	6,3

\* applies to the controller version with standard software

► **Sample installation (simplified scheme):**



# ST-37 i



▶ **Functions performed by the controller**

- \* control of the fan and feeding screw or piston feeder
- \* CH pump control and HCW pump
- \* the possibility of connecting room regulator
- \* weekly control (option)

▶ **Controller's equipment**

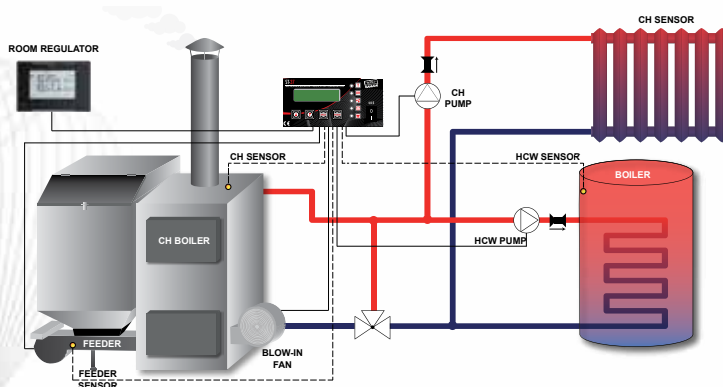
- \* LCD display
- \* knob of the pulse generator
- \* CH temperature sensor, HCW sensor, floor sensor, feeder sensor (protection)
- \* has temperature protection (thermal overload relay)
- \* casing made of high quality materials resistant to high and low temperatures
- \* panel casing for installation of the boiler
- \* the possibility of installation on the boiler in OM-01 casing

▶ **Technical data**

NO.	SPECIFICATION	UNIT	
1.	Power supply	V	230V/50Hz +/-10%
2.	Maximum power consumption of the controller	W	7
3.	Ambient temperature	°C	5÷50
4.	Maximum output load of CH pump	A	0,5
5.	Maximum output load of HUW pump	A	0,5
6.	Maximum output load of fan	A	0,6
7.	Accuracy of measurement	°C	1
8.	Range of temperature settings	°C	45÷80*
9.	Temperature strength of the sensor	°C	-25÷90
10.	Fuse insert	A	6,3

\* applies to the controller version with standard software

▶ **Sample installation (simplified scheme):**



## ► Functions performed by the controller

- \* automatic control of the fan and feeding screw or piston feeder
- \* control of CH pump, HUW pump, floor pump, and circulation pump
- \* the possibility of connecting room regulator



## ► Controller's equipment

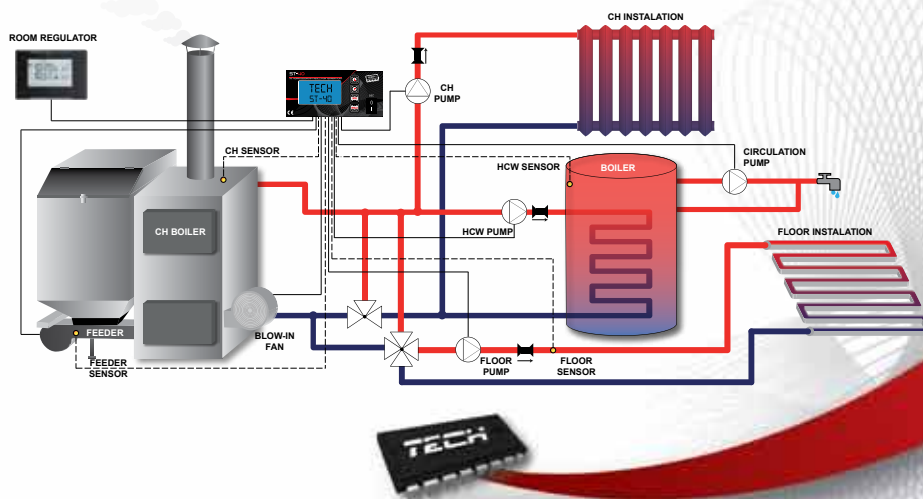
- \* large graphic display facilitating the controller's operation
- \* CH temperature sensor, HCW sensor, floor sensor, feeder sensor (protection)
- \* has temperature protection (thermal overload relay)
- \* panel casing for installation of the boiler, made of high quality materials resistant to high and low temperatures
- \* the possibility of installation on the boiler in OM-01 casing

## ► Technical data

NO.	SPECIFICATION	UNIT	
1.	Power supply	V	230V/50Hz +/-10%
2.	Maximum power consumption of the controller	W	10
3.	Ambient temperature	°C	5÷50
4.	Maximum output load of CH pump	A	0,5
5.	Maximum output load of HUW pump	A	0,5
6.	Maximum output load of floor pump	A	0,5
7.	Maximum output load of the circulation pump	A	0,5
8.	Maximum output load of fan	A	0,6
9.	Maximum output load of feeder	A	2
10.	Range of temperature settings	°C	45÷80*
11.	Temperature strength of the sensor	°C	-25÷90
12.	Accuracy of measurement	°C	1
13.	Fuse insert	A	6,3

\* applies to the controller version with standard software

## ► Sample installation (simplified scheme):



# ST-40 i



► **Functions performed by the controller**

- \* automatic control of the fan and feeding screw or piston feeder
- \* control of CH pump , HUW pump, floor pump, and circulation pump
- \* the possibility of connecting room regulator

► **Controller's equipment**

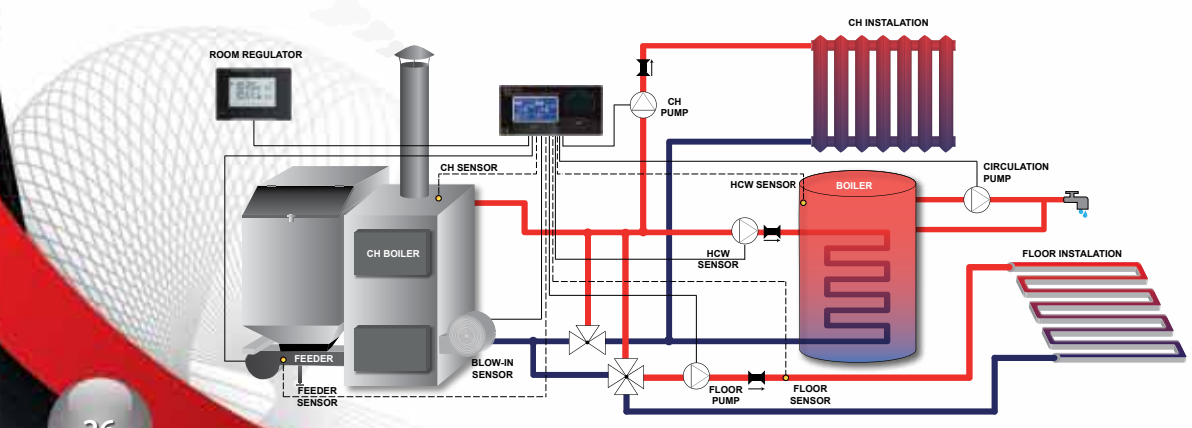
- \* large graphic display facilitating the controller's operation
- \* knob of the pulse generator
- \* CH temperature sensor, HCW sensor, floor sensor, feeder sensor (protection)
- \* has temperature protection (thermal overload relay)
- \* single-module panel casing for installation of the boiler, made of high quality materials resistant to high and low temperatures
- \* the possibility of installation on the boiler in OM-01 casing

► **Technical data**

NO.	SPECIFICATION	UNIT	
1.	Power supply	V	230V/50Hz +/-10%
2.	Maximum power consumption of the controller	W	10
3.	Ambient temperature	°C	5+50
4.	Maximum output load of CH pump	A	0,5
5.	Maximum output load of HUW pump	A	0,5
6.	Maximum output load of floor pump	A	0,5
7.	Maximum output load of the circulation pump	A	0,5
8.	Maximum output load of fan	A	0,6
9.	Maximum output load of feeder	A	2
10.	Range of temperature settings	°C	45+80*
11.	Temperature strength of the sensor	°C	-25+90
12.	Accuracy of measurement	°C	1
13.	Fuse insert	A	6,3

\* applies to the controller version with standard software

► **Sample installation (simplified scheme):**





moduł ST-60

## ► Functions performed by the controller

- \* automatic control of the fan and feeding screw or piston feeder
- \* control of CH pump, HUW pump, floor pump, and circulation pump
- \* the possibility of connecting room regulator
- \* possible control of two valves by means of additional ST-61 modules

## ► Controller's equipment

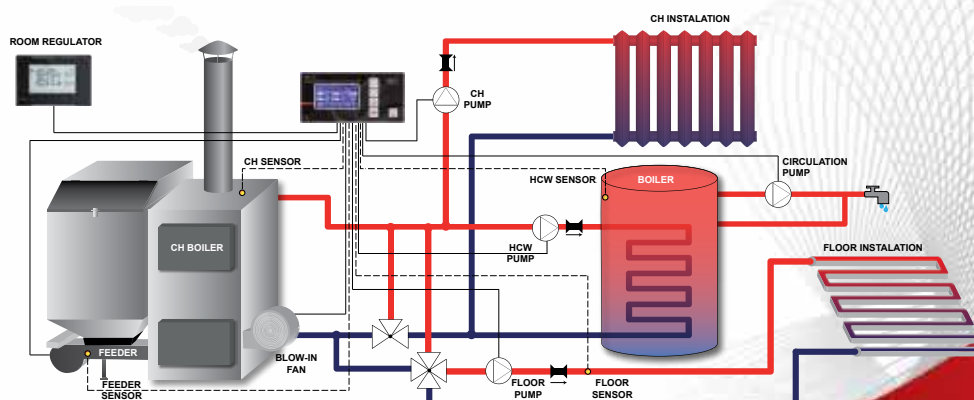
- \* large graphic display facilitating the controller's operation
- \* CH temperature sensor, HCW sensor, floor sensor, feeder sensor (protection)
- \* has temperature protection (thermal overload relay)
- \* control panel for installation of the boiler with the possibility of installation in OM-01
- \* executive module ST-60 for assembly on any part of the boiler

## ► Technical data

NO.	SPECIFICATION	UNIT	
1.	Power supply	V	230V/50Hz +/-10%
2.	Maximum power consumption of the controller	W	10
3.	Ambient temperature	°C	5÷50
4.	Maximum output load of CH pump	A	0,5
5.	Maximum output load of HUW pump	A	0,5
6.	Maximum output load of floor pump	A	0,5
7.	Maximum output load of mixing pump	A	0,5
8.	Maximum output load of fan	A	0,6
9.	Maximum output load of feeder	A	2
10.	Range of temperature settings	°C	45÷80*
11.	Temperature strength of the sensor	°C	-25÷90
12.	Accuracy of measurement	°C	1
13.	Fuse insert	A	6,3

\* applies to the controller version with standard software

## ► Sample installation (simplified scheme):



# ST-48

► **Functions performed by the controller**

- \* automatic control of the fan and feeding screw or piston feeder
- \* control of CH pump , HUW pump, floor pump, and circulation pump
- \* cooperation with the room regulator with RS or traditional communication
- \* the possibility of connecting ST-65 GSM module
- \* the possibility of connecting ST-500 ETHERNET module
- \* possible control of two valves by means of additional ST-61 modules



► **Controller's equipment**

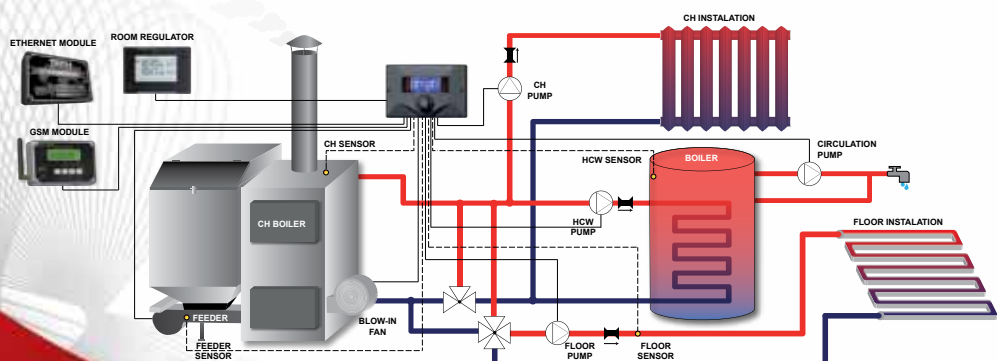
- \* large graphic display facilitating the controller's operation
- \* knob of the pulse generator
- \* CH temperature sensor, HCW sensor, floor sensor, feeder sensor (protection)
- \* has temperature protection (thermal overload relay)
- \* single-module panel casing for installation of the boiler, made of high quality materials resistant to high and low temperatures
- \* the possibility of installation on the boiler in OM-02 casing

► **Technical data**

NO.	SPECIFICATION	UNIT	
1.	Power supply	V	230V/50Hz +/-10%
2.	Maximum power consumption of the controller	W	11
3.	Ambient temperature	°C	5+50
4.	Maximum output load of CH pump	A	0,5
5.	Maximum output load of HUW pump	A	0,5
6.	Maximum output load of floor pump	A	0,5
7.	Maximum output load of the circulation pump	A	0,5
8.	Maximum output load of fan	A	0,6
9.	Maximum output load of feeder	A	2
10.	Range of temperature settings	°C	45+80*
11.	Temperature strength of the sensor	°C	-25+90
12.	Accuracy of measurement	°C	1
13.	Fuse insert	A	6,3

\* applies to the controller version with standard software

► **Sample installation (simplified scheme):**



## ROTATIONS CONTROL



**zPID**

### ► Functions performed by the controller

- \* automatic control of the fan and feeding screw or piston feeder
- \* control of CH pump, HUW pump, floor pump, and circulation pump
- \* control of the mixing valve
- \* cooperation with the room regulator with RS or traditional communication
- \* the possibility of connecting ST-65 GSM module
- \* the possibility of connecting ST-500 ETHERNET module
- \* possible control of two valves by means of additional ST-61 modules
- \* **zPID** software

### ► Controller's equipment

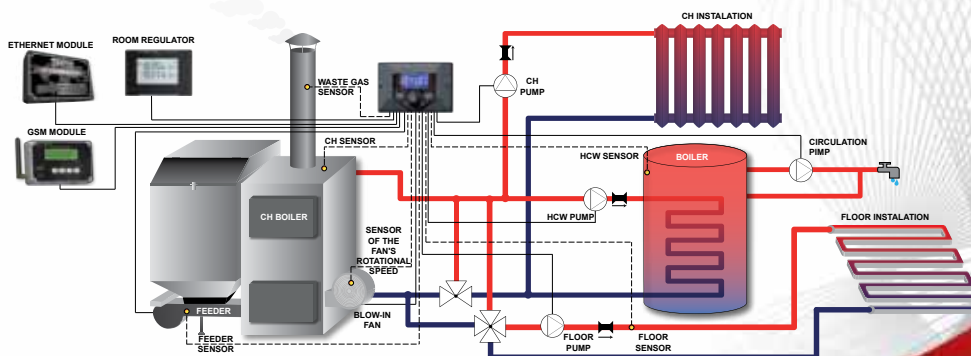
- \* large graphic display facilitating the controller's operation
- \* knob of the pulse generator
- \* CH temperature sensor, HCW sensor, floor sensor, feeder sensor (protection), waste gas sensor
- \* sensor of the fan's rotational speed
- \* has temperature protection (thermal overload relay)
- \* single-module panel casing for installation of the boiler, made of high quality materials resistant to high and low temperatures
- \* the possibility of installation on the boiler in OM-02 casing

### ► Technical data

NO.	SPECIFICATION	UNIT	
1.	Power supply	V	230V/50Hz +/-10%
2.	Maximum power consumption of the controller	W	11
3.	Ambient temperature	°C	5+50
4.	Maximum output load of CH pump	A	0,5
5.	Maximum output load of HUW pump	A	0,5
6.	Maximum output load of floor pump	A	0,5
7.	Maximum output load of the circulation pump	A	0,5
8.	Maximum output load of fan	A	0,6
9.	Maximum output load of feeder	A	2
10.	Range of temperature settings	°C	45+80*
11.	Temperature strength of the sensor	°C	-25+90
12.	Accuracy of measurement	°C	1
13.	Fuse insert	A	6,3

\* applies to the controller version with standard software

### ► Sample installation (simplified scheme):



# ST-709



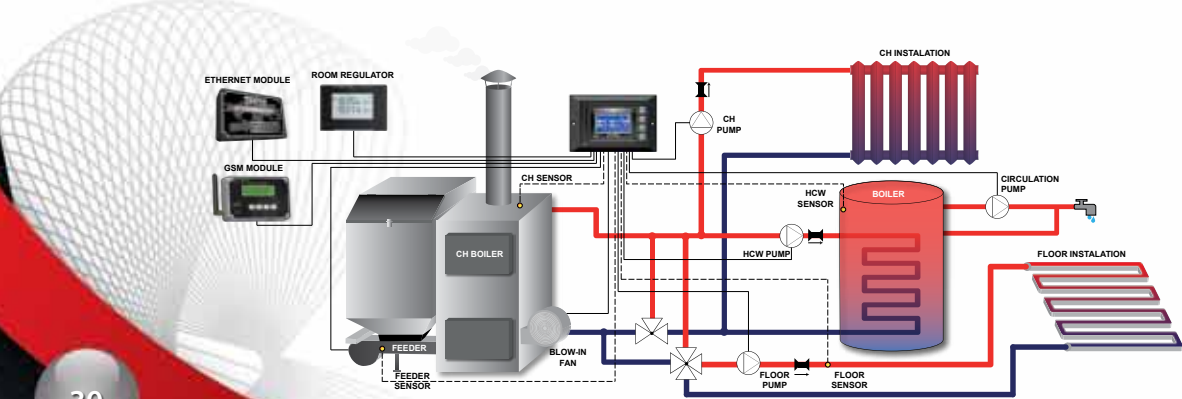
- ▶ **Functions performed by the controller**
  - \* automatic control of the fan and feeding screw or piston feeder
  - \* control of CH pump , HUW pump, floor pump, and circulation pump
  - \* cooperation with the room regulator with RS or traditional communication
  - \* the possibility of connecting ST-65 GSM module
  - \* the possibility of connecting ST-500 ETHERNET module
  
- ▶ **Controller's equipment**
  - \* large graphic display facilitating the controller's operation
  - \* CH temperature sensor, HCW sensor, floor sensor, feeder sensor (protection)
  - \* has temperature protection (thermal overload relay)
  - \* single-module panel casing for installation of the boiler, made of high quality materials resistant to high and low temperatures
  - \* the possibility of installation on the boiler in OM-02 casing

▶ **Technical data**

NO.	SPECIFICATION	UNIT	
1.	Power supply	V	230V/50Hz +/-10%
2.	Maximum power consumption of the controller	W	11
3.	Ambient temperature	°C	5+50
4.	Maximum output load of CH pump	A	0,5
5.	Maximum output load of HUW pump	A	0,5
6.	Maximum output load of floor pump	A	0,5
7.	Maximum output load of the circulation pump	A	0,5
8.	Maximum output load of fan	A	0,6
9.	Maximum output load of feeder	A	2
10.	Range of temperature settings	°C	45+80*
11.	Temperature strength of the sensor	°C	-25+90
12.	Accuracy of measurement	°C	1
13.	Fuse insert	A	6,3

\* applies to the controller version with standard software

▶ **Sample installation (simplified scheme):**







executive modules

## ► Functions performed by the controller

- \* control of the fan and feeder
- \* CH pump control and HCW pump
- \* control of two additional pumps
- \* weekly control
- \* cooperation with the room regulator with RS or traditional communication
- \* the possibility of connecting ST-65 GSM module
- \* the possibility of connecting ST-500 ETHERNET module
- \* ignition by means of a heater
- \* control of the poker
- \* possible control of two mixing valves

## ► Controller's equipment

- \* large graphic display facilitating the controller's operation
- \* CH temperature sensor, HCW sensor
- \* two additional sensors of pumps
- \* sensor of the accumulator's flap
- \* feeder sensor (protection)
- \* return temperature sensor
- \* photocell (flame sensor)
- \* has temperature protection (thermal overload relay)
- \* control panel for installation of the boiler
- \* two executive modules ST-60 (M1 and M2) for installation at any place

## ► Technical data

NO.	SPECIFICATION	UNIT	
1.	Power supply	V	230V/50Hz +/-10%
2.	Maximum power consumption of the controller	W	16
3.	Ambient temperature	°C	5÷50
4.	Maximum output load pump CH, HCW	A	0,5
6.	Maximum output load of additional pumps	A	0,5
7.	Maximum output load of fan	A	0,6
8.	Maximum output load of feeder	A	2
9.	Range of temperature settings	°C	45÷80*
10.	Temperature strength of the sensor	°C	-25÷90
11.	Accuracy of measurement	°C	1
12.	Fuse insert	A	6,3

\* applies to the controller version with standard software





► **Functions performed by the controller**

- \* control of the fan and feeder
- \* CH pump control and HCW pump
- \* control of two additional pumps
- \* weekly control
- \* cooperation with the room regulator with RS or traditional communication
- \* the possibility of connecting ST-65 GSM module
- \* the possibility of connecting ST-500 ETHERNET module
- \* ignition by means of a heater
- \* control of the poker
- \* possible control of two mixing valves

► **Controller's equipment**

- \* large colour graphic display facilitating the controller's operation
- \* CH temperature sensor, HCW sensor
- \* two additional sensors of pumps
- \* sensor of the accumulator's flap
- \* feeder sensor (protection)
- \* return temperature sensor
- \* photocell (flame sensor)
- \* has temperature protection (thermal overload relay)
- \* control panel for installation of the boiler with the possibility of installation in OM-60a or OM-60b metal shield
- \* two executive modules ST-60 (M1 and M2) for installation at any place

► **Why pellet?**

Granulated product, as opposed to dry biomass, burns perfectly and, at the same time, is completely resistant to self-ignition. Furthermore, pellets effectively resist natural putrefaction - their smooth surface protects against assimilation of moisture from the environment, therefore, they are easy to store. Granulated product storage is also facilitated by its fragmented mass occupying from ten to thirty times less space than the primary raw material.

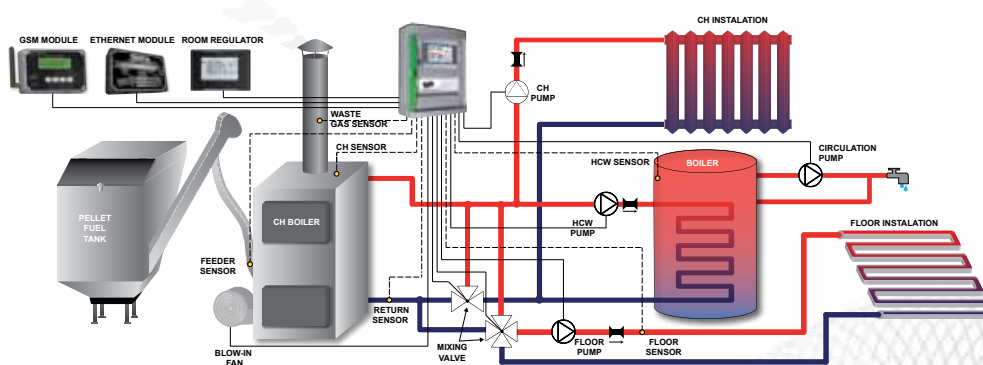
For instance 1 ton of pellet from Barlinek has the cubature of 0.7 m<sup>3</sup>. The form of granulated product enables also its easy and automatic supply to the boiler. Modern boilers fired with pellets can therefore mainly work unattended.

► **Technical data**

NO.	SPECIFICATION	UNIT	
1.	Power supply	V	230V/50Hz +/-10%
2.	Maximum power consumption of the controller	W	16
3.	Ambient temperature	°C	5÷50
4.	Maximum output load pump CH, HCW	A	0,5
6.	Maximum output load of additional pumps	A	0,5
7.	Maximum output load of fan	A	0,6
8.	Maximum output load of feeder	A	2
9.	Range of temperature settings	°C	45÷80*
10.	Temperature strength of the sensor	°C	-25÷90
11.	Accuracy of measurement	°C	1
12.	Fuse insert	A	6,3

\* applies to the controller version with standard software

► **Sample installation (simplified scheme):**



# ST-81 i zPID



zPID

► **Functions performed by the controller**

- \* automatic control of the fan
- \* CH pump control and HCW pump
- \* **zPID** software

► **Controller's equipment**

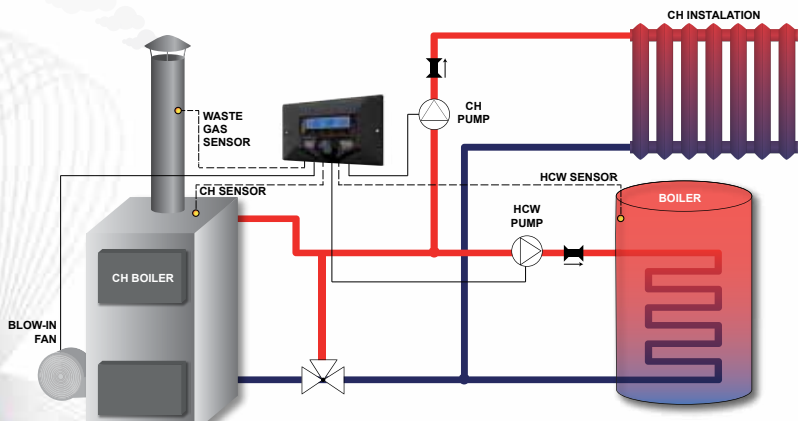
- \* LCD display
- \* CH temperature sensor, HCW sensor and waste gas sensor
- \* has temperature protection (thermal overload relay)
- \* panel casing for installation of the boiler, made of high quality materials resistant to high and low temperatures
- \* the possibility of installation on the boiler in OM-02 casing

► **Technical data**

NO.	SPECIFICATION	UNIT	
1.	Power supply	V	230V/50Hz +/-10%
2.	Maximum power consumption of the controller	W	5
3.	Ambient temperature	°C	5+50
4.	Maximum output load of CH pump	A	0,5
5.	Maximum output load of HUW pump	A	0,5
6.	Maximum output load of fan	A	0,6
8.	Accuracy of measurement	°C	1
9.	Range of temperature settings	°C	45+80*
10.	Temperature strength of the sensors	°C	-25+90
11.	Temperature strength of the sensor spalin	°C	30+480
12.	Fuse insert	A	2x 3,15

\* applies to the controller version with standard software

► **Sample installation (simplified scheme):**



## ► Functions performed by the controller

- \* automatic control of the fan
- \* CH pump control, HCW pump,
- \* control of the mixing valve
- \* cooperation with the room regulator with RS or traditional communication
- \* the possibility of connecting ST-65 GSM module
- \* the possibility of connecting ST-500 ETHERNET module
- \* **zPID** software



**zPID**

## ► Controller's equipment

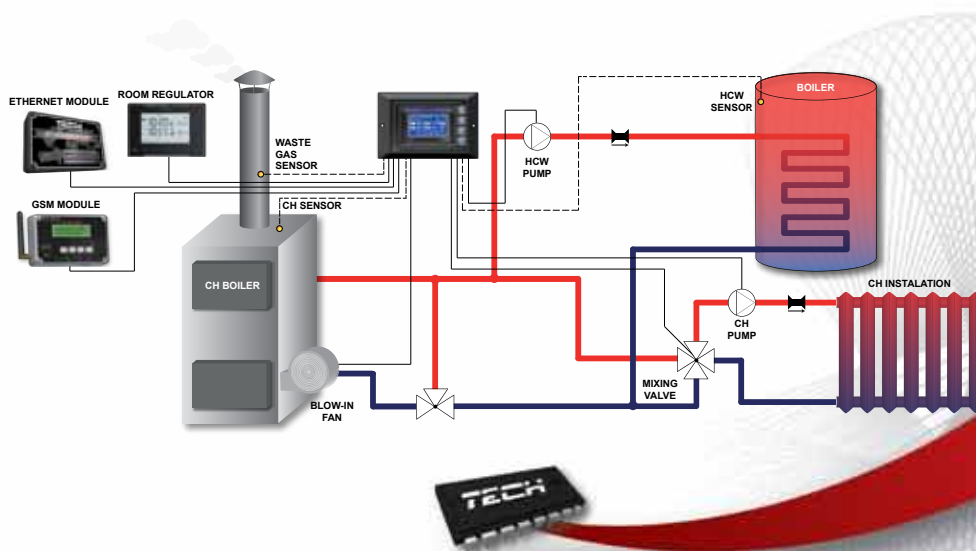
- \* large graphic display facilitating the controller's operation
- \* CH temperature sensor, HCW sensor and waste gas sensor
- \* has temperature protection (thermal overload relay)
- \* single-module panel casing for installation of the boiler, made of high quality materials resistant to high and low temperatures
- \* the possibility of installation on the boiler in OM-02 casing

## ► Technical data

NO.	SPECIFICATION	UNIT	
1.	Power supply	V	230V/50Hz +/-10%
2.	Maximum power consumption of the controller	W	11
3.	Ambient temperature	°C	5+50
4.	Maximum output load of CH pump	A	0,5
5.	Maximum output load of HUW pump	A	0,5
6.	Maximum output load of floor pump	A	0,5
7.	Maximum output load of mixing pump	A	0,5
8.	Maximum output load of fan	A	0,6
9.	Maximum output load of feeder	A	2
10.	Range of temperature settings	°C	45+80*
11.	Temperature strength of the sensor	°C	-25+90
12.	Accuracy of measurement	°C	1
13.	Fuse insert	A	6,3

\* applies to the controller version with standard software

## ► Sample installation (simplified scheme):



ST-401



► **Functions performed by the controller**

- \* control of the operation of pumps
- \* supervision and handling of the solar system operation
- \* protection against overheating and freezing of the collector

► **Controller's equipment**

- \* large clear LCD display
- \* collector's temperature sensor
- \* heat accumulator's temperature sensor
- \* casing made of high quality materials resistant to high and low temperatures

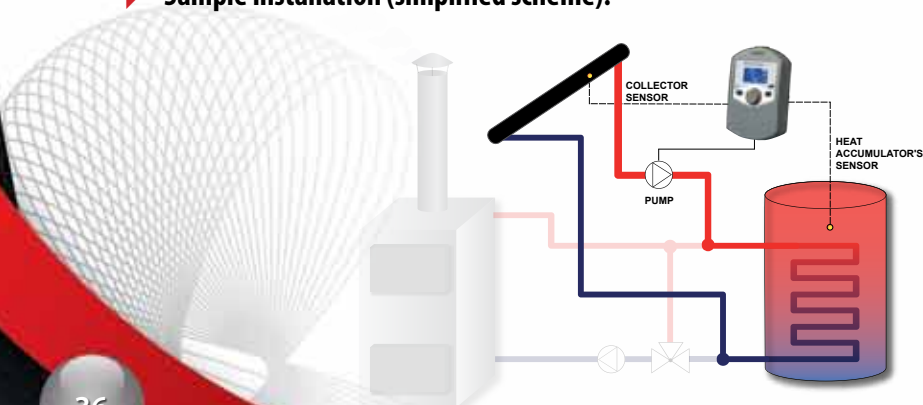
► **Technical data**

NO.	SPECIFICATION	UNIT	
1.	Power supply	V	230V/50Hz +/-10%
2.	Maximum power consumption of the controller	W	4
3.	Ambient temperature	°C	5+50
4.	Maximum load on each output	A	1
5.	Accuracy of measurement	°C	1
6.	Range of temperature settings	°C	8+90
7.	Temperature strength of the sensor KTY/PT1000	°C	-25+90 / -30+180 (temporarily 200)
8.	Fuse insert	A	3,15

► **Principle of operation**

ST-401 type thermoregulator is intended for operation of solar collector systems. This device controls the main (collector) pump on the basis of temperature measurement on the collector and in the accumulation tank. There is an optional possibility to connect additional devices such as a mixing pump or an electric heater as well as to send a signal to the CH boiler to fire it up. Control of the circulation pump and sending the firing-up signal to the CH boiler is possible directly from the controller and in the case of the heater's control an additional signal relay is necessary.

► **Sample installation (simplified scheme):**





### ► Functions performed by the controller

- \* control of the operation of pumps (or a pump and a valve)
- \* supervision and handling of the solar system operation for nine configurations of the system
- \* protection against overheating and freezing of the collector
- \* the possibility of connecting an additional device: circulating pump, electric heater or sending a signal to the CH boiler to fire it up

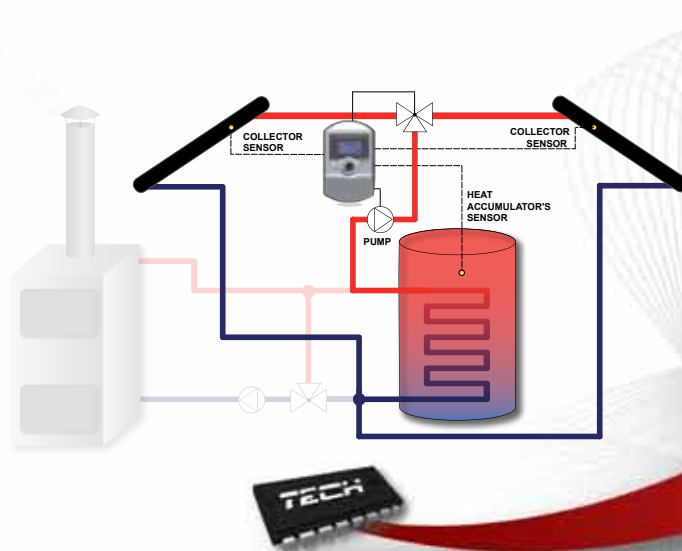
### ► Controller's equipment

- \* large clear LCD display
- \* collector's temperature sensor
- \* heat accumulator's temperature sensor
- \* casing made of high quality materials resistant to high and low temperatures

### ► Technical data

NO.	SPECIFICATION	UNIT	
1.	Power supply	V	230V/50Hz +/-10%
2.	Maximum power consumption of the controller	W	4
3.	Ambient temperature	°C	5÷50
4.	Maximum load on each output	A	1
5.	Accuracy of measurement	°C	1
6.	Range of temperature settings	°C	8÷90
7.	Temperature strength of the sensors	°C	-30÷180 (temporarily 200)
8.	Fuse insert	A	3,15

### ► Sample installation (simplified scheme):



# ST-448



▶ **Functions performed by the controller**

- \* control of the operation of pumps (or a pump and a valve)
- \* supervision and handling of the solar system operation for nine configurations of the system
- \* protection against overheating and freezing of the collector
- \* the possibility of connecting ST-65 GSM module
- \* the possibility of connecting ST-500 ETHERNET module
- \* the possibility of connecting an additional device: circulating pump, electric heater or sending a signal to the CH boiler to fire it up

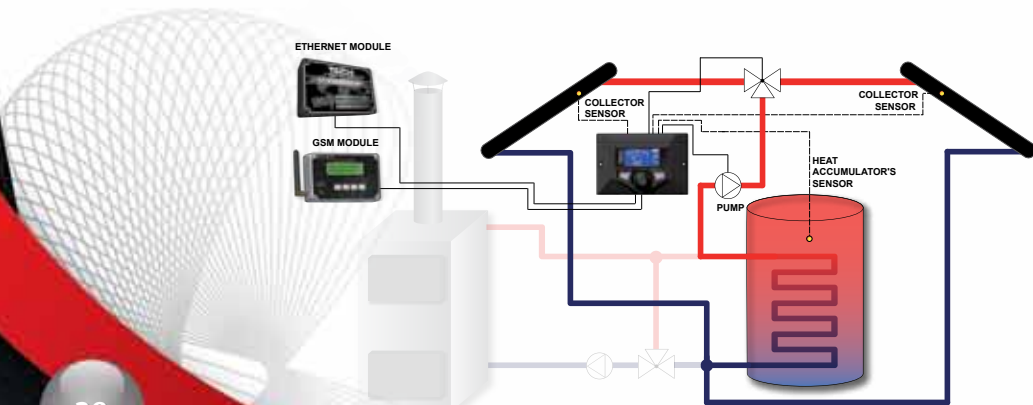
▶ **Controller's equipment**

- \* large clear LCD display
- \* collector's temperature sensor
- \* heat accumulator's temperature sensor
- \* panel casing for installation of the boiler, made of high quality materials resistant to high and low temperatures
- \* the possibility of installation on the boiler in OM-02 casing

▶ **Technical data**

NO.	SPECIFICATION	UNIT	
1.	Power supply	V	230V/50Hz +/-10%
2.	Maximum power consumption of the controller	W	4
3.	Ambient temperature	°C	5+50
4.	Maximum load on each output	A	1
5.	Accuracy of measurement	°C	1
6.	Range of temperature settings	°C	8+90
7.	Temperature strength of the sensors	°C	-30+180 (temporarily 200)
8.	Fuse insert	A	3,15

▶ **Sample installation (simplified scheme):**







**COLOUR  
TOUCH  
SCREEN**



#### ► Functions performed by the controller

- \* control of the room temperature
- \* control of the central heating boiler's temperature
- \* HUW temperature control
- \* control of the temperature of mixing valves
- \* monitoring of external temperature
- \* 1-week heating program
- \* alarm clock
- \* calendar
- \* parental lock
- \* display of current courses of the boiler's temperatures and room temperatures

#### ► Controller's equipment

- \* large, clear, colour touch screen
- \* embedded room sensor
- \* RS communication cable for the boiler's controller

#### ► Technical data

NO.	SPECIFICATION	UNIT	
1.	Range of temperature settings pokojowej	°C	10÷30
2.	Power supply	V	12 / DC
3.	Maximum power consumption	W	1,3
4.	Accuracy of measurement	°C	0,1
5.	Ambient temperature	°C	5÷50

#### ► Principle of operation :

Application of a room regulator provides convenient control of the temperature in the room, boiler and valves directly from home without the need to go down to the boiler room.

Clear, large, colour touch screen enables very convenient handling of the regulator and modulation of its parameters. Easy installation on the wall, aesthetic appearance of the device and its reasonable price are other advantages of the regulator.



### ST-290 v1

#### ► Functions performed by the controller

- \* control of the room temperature
- \* 1-week heating program
- \* manual program
- \* day/night program

#### ► Controller's equipment

- \* temporarily highlighted display
- \* embedded room sensor
- \* wireless external sensor (option)
- \* battery



### ST-290 v2

#### ► Functions performed by the controller

- \* wireless communication
- \* control of the room temperature
- \* 1-week heating program
- \* manual program
- \* day/night program

#### ► Controller's equipment

- \* temporarily highlighted display
- \* embedded room sensor
- \* wireless external sensor (option)
- \* battery

### ST-290 v3

#### ► Functions performed by the controller

- \* control of the room temperature
- \* 1-week heating program
- \* manual program
- \* day/night program

#### ► Controller's equipment

- \* constantly highlighted display
- \* embedded room sensor
- \* power supply unit

\* OPTIONAL  
ADDITIONAL  
WIRELESS  
MODULE



### ► Functions performed by the controller

- \* control of the room temperature
- \* control of the central heating boiler's temperature
- \* HUW temperature control
- \* external temperature monitoring (in cooperation with ST-61 module)
- \* control of the mixing valve (available only with ST-61 module)
- \* 1-week heating program
- \* parental lock

### ► Controller's equipment

- \* embedded room sensor
- \* RS communication cable for the boiler's controller
- \* wireless module installed at the boiler (option)

### ► Technical data

NO.	SPECIFICATION	UNIT	
1.	Power supply	V	12V/DC
2.	Maximum power consumption of the controller	W	1,3
3.	Range of temperature settings pokojowej	°C	10+30
4.	Ambient temperature	°C	5+50
5.	Accuracy of measurement	°C	+/- 0,1

### ► Principle of operation :

ST-298 type room regulator is intended to control the temperature of central heating, hot usable water and room temperature, and it can perform a weekly heating program. Application of the regulator provides convenient control at home and the temperature of hot usable water directly from home without the need to go down to the boiler room.

Clear large graphic display with highlighted screen facilitates the reading and modulation of parameters on the regulator. Easy installation on the wall, aesthetic appearance of the device and its reasonable price are other advantages of the regulator.

ST-298 regulator cooperates with the controllers for boilers with RS communication . In an additional option - wireless communication.

ST-430



► **Functions performed by the controller**

- \* smooth control of the three- and four-way valve
- \* pump operation control
- \* return temperature protection
- \* weather-related control
- \* cooperation with the room regulator

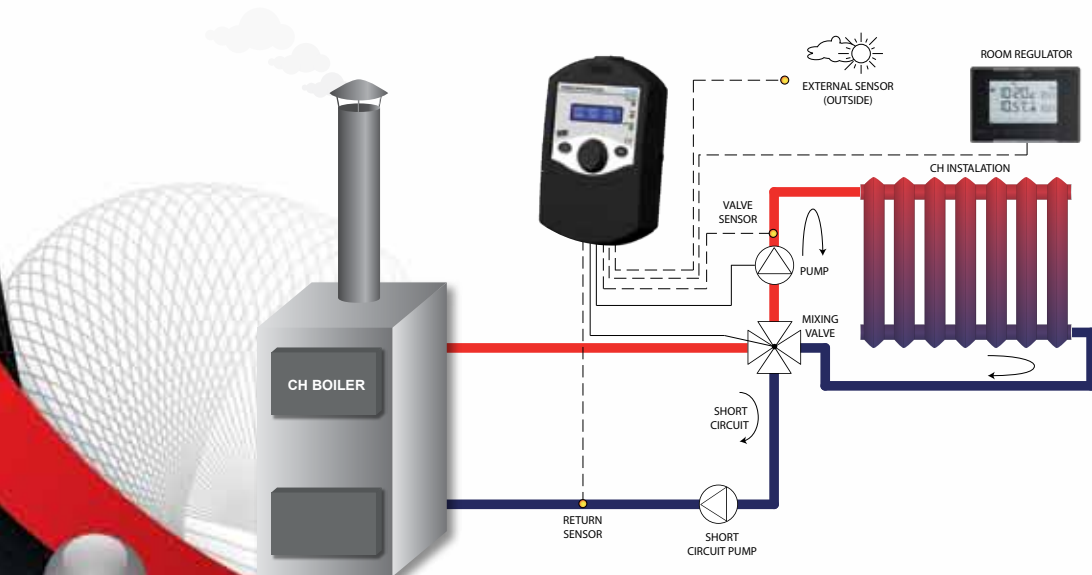
► **Controller's equipment**

- \* LCD display
- \* valve's temperature sensor
- \* return temperature sensor
- \* weather sensor
- \* casing made of high quality materials resistant to high and low temperatures

► **Technical data**

NO.	SPECIFICATION	UNIT	
1.	Power supply	V	230V/50Hz +/-10%
2.	Maximum power consumption of the controller	W	4
3.	Maximum load on each output	A	0,5
4.	Ambient temperature	°C	5+50
4.	Range of temperature settings	°C	8+90
5.	Temperature strength of the sensor	°C	-25+90
6.	Fuse insert	A	1,6

► **Sample installation (simplified scheme):**





## ► Functions performed by the controller

- \* smooth control of the three- and four-way valve
- \* pump operation control
- \* possible control of two valves by means of additional ST-61 modules
- \* return temperature protection
- \* weather-related control
- \* weekly control
- \* cooperation with the room regulator with RS or traditional communication

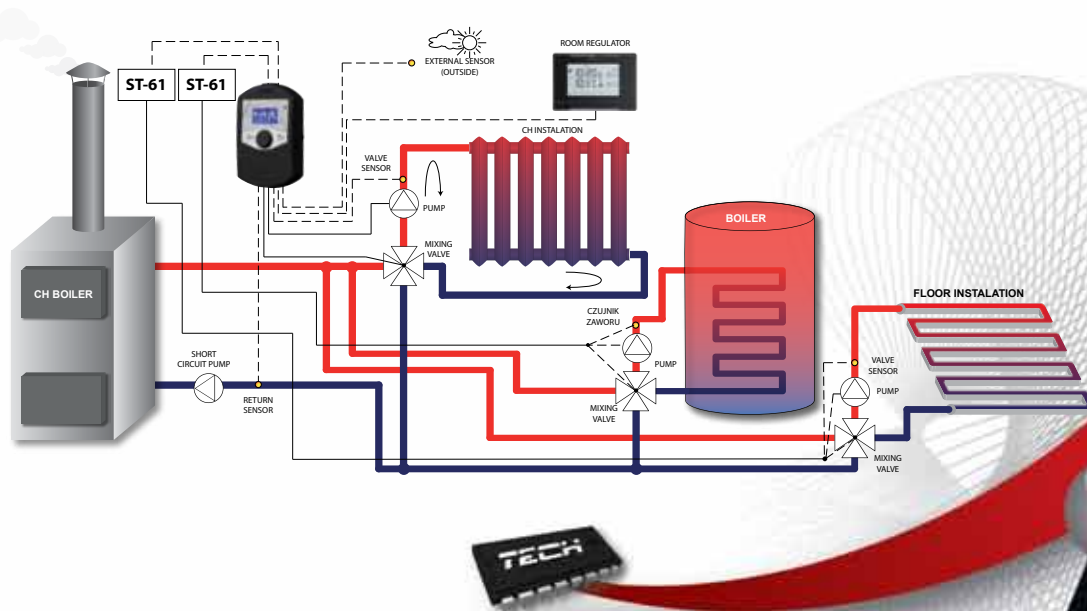
## ► Controller's equipment

- \* LCD display
- \* valve's temperature sensor
- \* return temperature sensor
- \* weather sensor
- \* casing made of high quality materials resistant to high and low temperatures

## ► Technical data

NO.	SPECIFICATION	UNIT	
1.	Power supply	V	230V/50Hz +/-10%
2.	Maximum power consumption of the controller	W	4
3.	Maximum load on each output	A	0,5
4.	Ambient temperature	°C	5÷50
4.	Range of temperature settings	°C	8÷90
5.	Temperature strength of the sensor	°C	-25÷90
6.	Fuse insert	A	1,6

## ► Sample installation (simplified scheme):



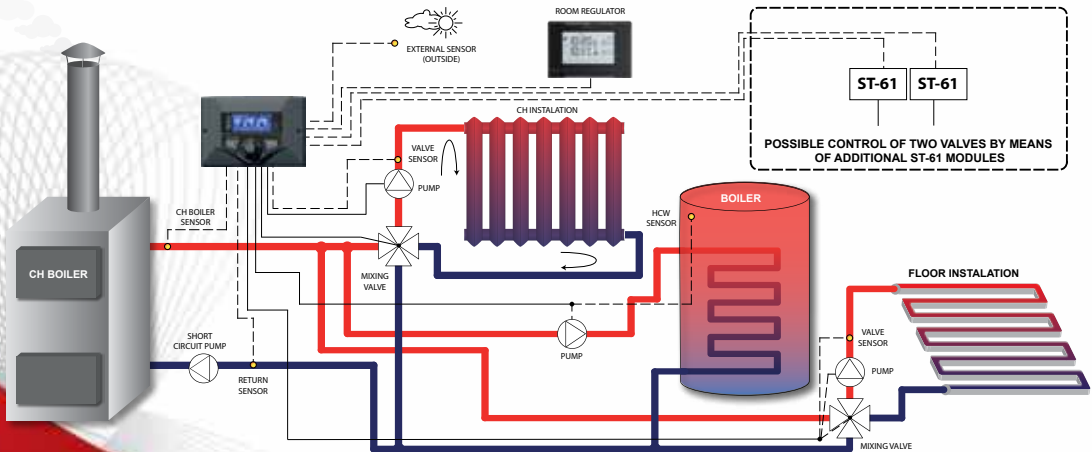
# ST-408



- ▶ **Functions performed by the controller**
  - \* smooth control of two mixing valves
  - \* pump operation control HUW
  - \* possible control of two valves by means of additional ST-61 modules
  - \* return temperature protection
  - \* weather-related control
  - \* weekly control
  - \* cooperation with two room regulators with traditional communication
  - \* cooperation with the room regulator with RS
- ▶ **Controller's equipment**
  - \* LCD display
  - \* HUW temperature sensor and weather sensor
  - \* valves' temperature sensors
  - \* return and boiler's temperature sensors
  - \* casing made of high quality materials resistant to high and low temperatures
- ▶ **Technical data**

NO.	SPECIFICATION	UNIT	
1.	Power supply	V	230V/50Hz +/-10%
2.	Maximum power consumption of the controller	W	4
3.	Maximum load on each output	A	0,5
4.	Ambient temperature	°C	5÷50
4.	Range of temperature settings	°C	8÷90
5.	Temperature strength of the sensor	°C	-25÷90
6.	Fuse insert	A	1,6

▶ **Sample installation (simplified scheme):**





### ► Functions performed by the controller

- \* control of the burner's (heater's) operation in the heating device
- \* CH pump control, , HUW, additional pump and valve
- \* optional possibility of connecting room regulator
- \* weekly control
- \* return protection function

### ► Controller's equipment

- \* large graphic display facilitating the controller's operation.
- \* CH temperature sensor
- \* HUW temperature sensor
- \* return temperature sensor
- \* valve's temperature sensor
- \* casing made of high quality materials resistant to high and low temperatures
- \* single-module panel casing for installation of the boiler
- \* the possibility of installation on the boiler in OM-01 casing

### ► Technical data

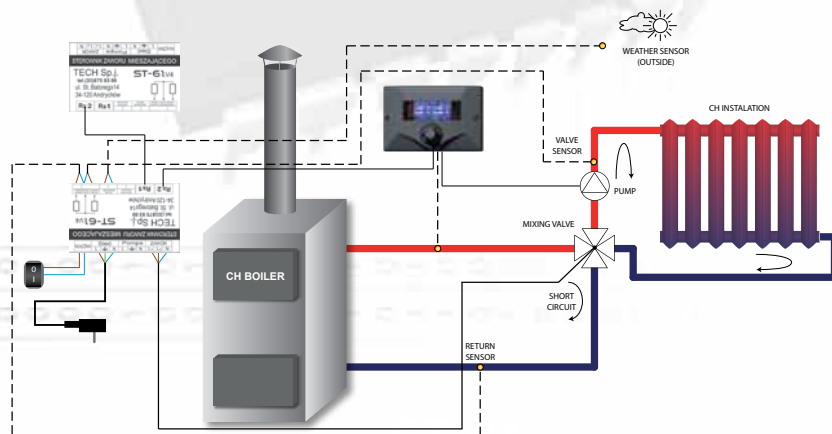
NO.	SPECIFICATION	UNIT	
1.	Power supply	V	230V/50Hz +/-10%
2.	Maximum power consumption of the controller	W	10
3.	Ambient temperature	°C	5÷50
4.	Maximum output load grzałki	A	2
4.	Maximum output load of CH pump	A	0,5
5.	Maximum output load of HCW pump	A	0,5
6.	Maximum output load of additional pumps	A	0,5
7.	Maximum output load of valve	A	0,5
9.	Accuracy of measurement	°C	1
10.	Range of temperature settings	°C	40÷80*
11.	Temperature strength of the sensor	°C	-25÷90
12.	Fuse insert	A	6,3

\* applies to the controller version with standard software

# ST-61

## MIXING VALVE'S MODULE

- ▶ **Functions performed by the controller**
  - \* handling of the three- or four-way mixing valve
  - \* return protection function
  - \* weather-related control
  - \* the possibility of connecting room regulator
  
- ▶ **Controller's equipment**
  - \* power supply cable for the module,
  - power supply cable for the pump
  - \* RS communication cable for the boiler's controller
  - \* valve's temperature sensor
  - \* return temperature sensor
  - \* external sensor
  
- ▶ **Sample installation (simplified scheme):**



# ST-69

## LAMBDA PROBE

- ▶ **ST-69 module is equipped with a lambda probe installed on the waste gas outlet. This device is used to control the operation of the servomotor, in order to adjust proper secondary air supply to the furnace. Primary air supply is adjusted with the use of a blow-in fan.**
  
- ▶ **Advantages of lambda module application:**
  - significant improvement in power efficiency of the boiler within the full range of power,
  - extended life of the boiler,
  - feasible savings thanks to lower fuel consumption, limited emission of carbon monoxide to the atmosphere.



## FIREPLACE CONTROLLER



zPID

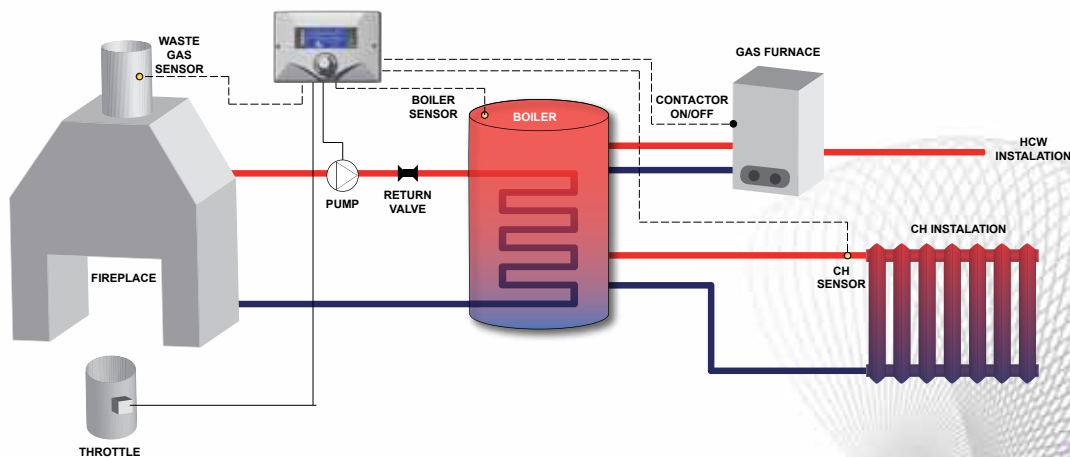
### ► Functions performed by the controller

- \* handling of one pump (type of pump: optional)
- \* throttle handling
- \* contactor switching the operation of gas furnace off or on, depending on the required temperature of water in the circulation, taking account of hysteresis
- \* zPID software

### ► Controller's equipment

- \* waste gas sensor
- \* CH temperature sensor
- \* HUW temperature sensor
- \* throttle

### ► Sample installation (simplified scheme):



# ST-65 GSM



► **Functions performed by the controller**

- \* cooperation with the controllers with RS communication
- \* control of the sensors' temperatures through SMS messages
- \* SMS and phone notifications (incoming call) about boiler alerts
- \* the possibility of changing the set temperatures with the use of a mobile phone
- \* module protection with an authentication code

► **Controller's equipment**

- \* power supply unit
- \* RS communication cable for the boiler's controller
- \* GSM antenna

► **Technical data**

NO.	SPECIFICATION	UNIT	
1	Power supply	V	9V / DC
2	Maximum power consumption	W	2
3	Ambient temperature	°C	5 ÷ 50
4	Range of alert temperature settings	°C	-10 ÷ 85
5	Measurement error	°C	1
6	Temperature strength of additional sensors (KTY)	°C	-25 ÷ 90
7	Length of RS232 communication wire	m	5
8	Maximum output load of transmitter	mA	100

► **Principle of operation :**

GSM module cooperates with TECH controllers with RS communication and enables remote control of the boiler with the use of a mobile phone. The user is informed with an SMS about each alert of the boiler controller, in addition, by sending an appropriate SMS at any time, the user receives information about the current temperature of all active sensors. After entering an authentication code it is also possible to remotely change the set temperatures.

ST-65 module has 4 additional sensor connectors operating independently from the boiler's controller, with universal application:

- 1) Two temperature sensor inputs (KTY)
- 2) One input detecting short circuit/opening of contacts (e.g. as an anti-burglar sensor with a limiting switch in the set).
- 3) One controlled 9V DC voltage output (e.g. a possibility of connecting an additional transmitter to control any electric circuit)



### ► Functions performed by the controller

- \* remote control of the boiler's operation through the Internet or local network
- \* graphic interface with animation on the home computer screen
- \* the possibility of introducing changes of the set temperatures for both the pumps and the mixing valves
- \* monitoring of the temperatures on sensors
- \* monitoring of the history of temperatures
- \* monitoring of the history and type of alarm

### ► Controller's equipment

- \* power supply unit 9V DC
- \* RS T-connection
- \* RS communication cable for the boiler's controller

### ► Technical data

NO.	SPECIFICATION	UNIT	
1	Power supply	V	9V DC
2	Maximum current intake	mA	100
3	Transmission	Mb/s	IEEE 802.3 10 Mb/s
4	Connection with the network	-	Złącze RJ 45
5	Connection with the controller	-	Złącze RJ12

### ► Principle of operation :

Internet module is a device enabling remote control of the boiler over the Internet or local network . On the home computer screen the user controls the condition of all boiler system devices and the operation of each device is presented in the form of animation.

Apart from the possibility to view the temperature of every sensor the user has the possibility of changing the set temperatures for both the pumps and the mixing valves. Possible monitoring of the history of temperatures in the form of clear charts and the history of the controller's alerts.



ST-67



▶ **Principle of operation :**

ST-67 sensor is designed to control the level of solid biofuels (pellet, oats, corn, etc.) both in the bunkers of heating boilers as well as in any type of grain silos where the maximum spacing of measurement sensors does not exceed 3.5m.

If the control is to proceed correctly, it is necessary to supply only dry fuel to the bunker. The principle of operation of the device is based on determination of the level of solid biofuel by means of accordingly spaced volume sensors. At the time when the level of biofuel in the bunker decreases below the lower sensor, the device sends a voltage signal (230V) to the motor of the external feeder, until the moment when the bunker is filled up to the level of the upper sensor. Such operation results in continuous cyclical refilling of the lacking fuel in the tank with no additional human interference.

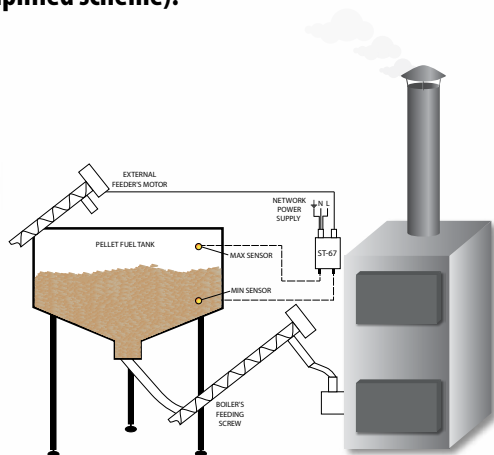
▶ **Controller's equipment**

- \* network cable with a plug, factory-installed, length 2.5m
- \* power supply cable for the external feeder's motor, length 2m
- \* two sensors (capacity-type), factory-installed, each with the length of 2m
- \* controlling device

▶ **Technical data**

NO.	SPECIFICATION	UNIT	
1	Power supply	V	230V/50Hz +/-10%
2	Maximum power consumption of the controller	W	2
3	Ambient temperature	°C	0 ÷ 60
4	Maximum output power	W	690
5	Output voltage	V	230V/50Hz
6	Maximum output load	A	3
7	Fuse insert	A	3.15

▶ **Sample installation (simplified scheme):**



▶ **Semiconductor temperature sensor of KTY type**

(plastified PVC cable insulation)  
Resistance at 25°C: 2kΩ  
Coefficient: 0.79 %/K  
Accuracy : 1%  
Range of operation: -25÷90°C



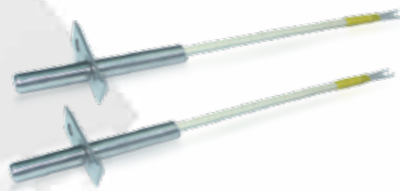
▶ **Bimetallic sensor – (thermal overload relay)**

Activation temperature 85°C  
Accuracy : +/-3°C  
Application: temperature protection



▶ **Semiconducting temperature sensor of PT1000 type**

(cable insulation made of glass fiber)  
Resistance at 0°C: 1kΩ  
Accuracy : +/-0.3°C  
Range of operation: -25÷480°C



▶ **Semiconducting temperature sensor of PT1000 type**

(silicone cable insulation)  
Resistance at 0°C: 1kΩ  
Accuracy : +/-0.3°C  
Range of operation: -25÷180°C



▶ **Photocell – fire sensor**

Application: pellet-fired boilers



▶ **Hall generator (Hall's sensor)**

Application: boilers with piston feeder



▶ **Safety thermostat – (STB)**

Activation temperature: 90÷110°C  
Accuracy : +/-3÷5°C  
Maximum current: 16A  
Application: temperature protection



▶ **P type quick release coupling**

Application: for installation of sensors on a strip



ADDITIONAL CASINGS



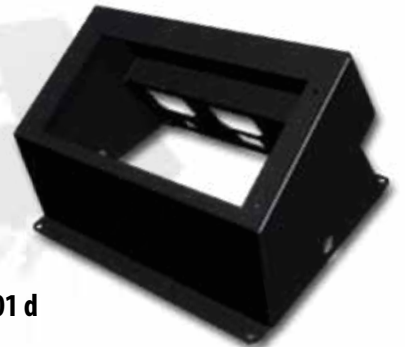
▶ OM - 01 a



▶ OM - 01 b



▶ OM - 01 c



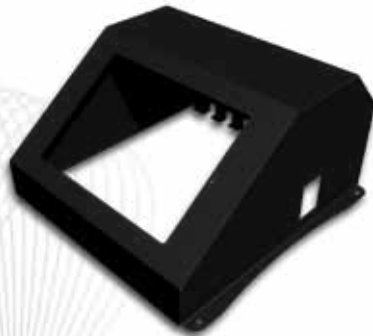
▶ OM - 01 d



▶ OM - 01 e



▶ OM - 02 a



▶ OM - 02 a



▶ OM - 02 b

## ADDITIONAL CASINGS



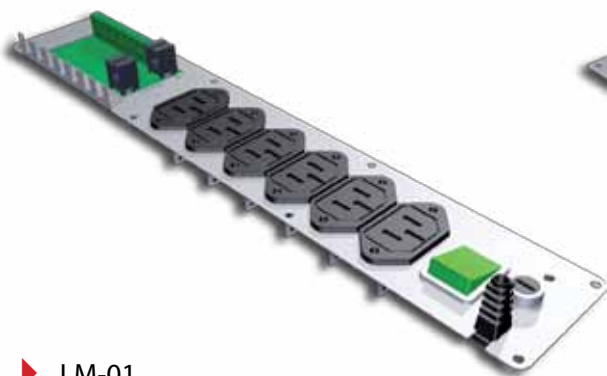
▶ **OM - 02 c**



▶ **OM - 02 d**

Metal cover for a controller with an external output for a fuse, intended for installation on the boiler:

CASING	CONTROLLERS
OM-01 a	ST-37 ; ST-37 i ; ST-40 ; ST-40 i ; ST-41 ; ST-43 ; ST-81 ; ST-81 zPID
OM-01 b	
OM-01 c	
OM-01 d	
OM-01 e	
OM-02 a	ST-48 ; ST-48 zPID ; ST-49 ; ST-49 zPID;ST-49 P ; ST-81i zPID ; ST-88 ; ST-88 zPID
OM-02 b	
OM-02 c	
OM-02 d	
OM-02 e	



▶ **LM-01**



▶ **LM-02**

Metal strip is used for installation of power supply and sensors for installation of the boiler

# RV-12

► **Parameters**

NO.	SPECIFICATION	UNIT
1.	Driving motor type	Inductive type, with the working condenser, external rotor
2.	Nominal voltage	230 V
3.	Rated frequency	50 Hz
4.	Consumed power	70 W
5.	Rated current	0,35 A
6.	Max. efficiency	240 m3/h
7.	Max. compression	310 Pa
8.	Revolutions at max. efficiency	2450 rpm
9.	Revolutions at max. pile-up	2850 rpm
10.	Type of work	S1
11.	Operation position	any
12.	Degree of protection	IP20
13.	Basic insulation	B class
14.	Protection against non-standard use	thermal fuse of the motor
15.	Acoustic power level	<60 dB(A)
16.	Weight	2,0 kg
17.	Minimum power supply voltage	80 V

► **Fan application**

coal boilers, boilers with a retort feeder 25 -50 kW



# RV-14R-G

► **Parameters**

L.P	SPECIFICATION	UNIT
1.	Driving motor type	Inductive type
2.	Nominal voltage	230 V
3.	Rated frequency	50 Hz
4.	Consumed power	60 W
5.	Rated current	0,4 A
6.	Max. efficiency	200 m3/h
7.	Max. compression	240 Pa
8.	Revolutions at max. efficiency	1800 rpm
9.	Revolutions at max. pile-up	2800 rpm
10.	Type of work	S1
11.	Operation position	any
12.	Degree of protection	IP20
13.	Basic insulation	H class
14.	Protection against non-standard use	thermal fuse of the motor
15.	Acoustic power level	62 dB(A)
16.	Weight	2 kg
17.	Minimum power supply voltage	100 V

► **Fan application**

fine boilers of up to 35 kW, coal furnaces

\* Also available in a version without a revolution control sensor (Hall generator)



**WITH HALL GENERATOR**



## WPA-117



### ► Fan application

The fan is intended for air blow-in to CH boiler furnaces.

### ► Parameters

NO.	SPECIFICATION	UNIT
1.	Engine type	R2E 120-AR87-37
2.	Maximum compression	280 Pa
3.	Maximum efficiency	180 m3/h
4.	Rotational speed	1650 rpm
5.	Consumed power	34 W

## WPA-140



### ► Fan application

The fan is intended for air blow-in to CH boiler furnaces.

### ► Parameters

NO.	SPECIFICATION	UNIT
1.	Engine type	RF2C-140/059 K172
2.	Maximum compression	355 Pa
3.	Maximum efficiency	295 m3/h
4.	Rotational speed	1350 rpm
5.	Consumed power	100 W

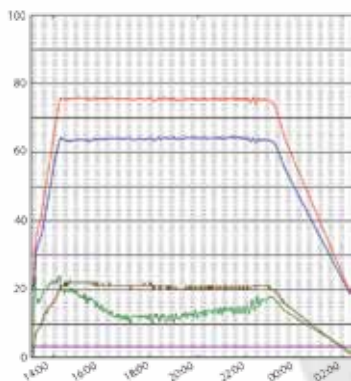
Our offer also includes a number of other fans with various parameters.

In the controller with zPID control system the blow-in power is calculated on the basis of measurement of the boiler's temperature and the temperature of waste gas measured on the boiler's outlet. The fan's operation is continuous and the blow-in power depends directly on the measured boiler temperature, temperatures of waste gas and the difference between these parameters and their preset values. Stable maintenance of the set temperature without any unnecessary readjustments and oscillations are the advantages of zPID regulator.

When using this type of controller with a flue gas outlet sensor, savings in fuel combustion may reach up to more than ten percent; the outlet water temperature is very stable, which affects the longer life span of the exchanger (boiler).

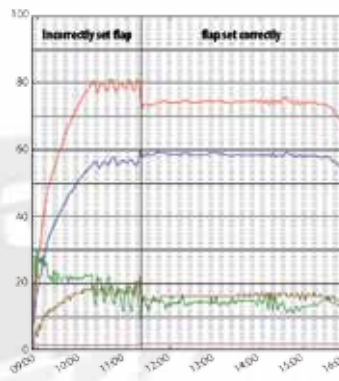
Below we present the results of tests conducted with the use of **TECH** controllers with zPID control system.

**Charging boiler - rated power 25 kW**



The chart presents control of the fan's operation in the charging boiler with zPID algorithm. Stable maintenance of the set CH temperature by means of precise supply of an appropriate quantity of air of the combustion chamber.

**Charging boiler - rated power 25 kW**



Position of the fan's flap is very significant for proper operation of zPID algorithm. The chart presents the boiler's operation with correctly and incorrectly positioned flap of the fan. Incorrectly set flap (first part of the chart) causes unstable operation of the boiler and several-degree over-adjustment above the set temperature (excess air in the combustion chamber).

The second part of the chart (flap set correctly) presents the boiler's operation when the air is properly supplied to the combustion chamber by the fan controlled with zPID algorithm.

**Boiler with feeder - rated power 25 kW**

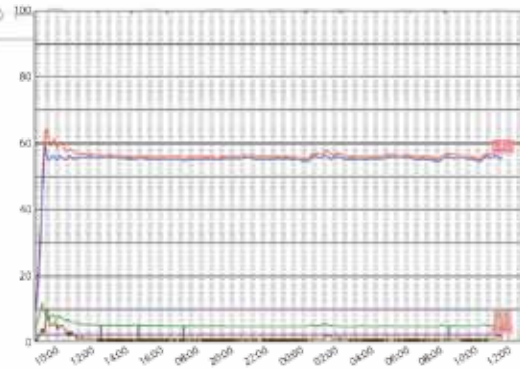


Chart showing the boiler's operation for minimum power consumption (ca 1kW). Stable maintenance of the set CH temperature is a result of proper functioning of zPID algorithm.

**Boiler with feeder - rated power 25 kW**



The controller selects an appropriate dose of fuel and air to reach the required thermal power. The chart presents the courses of three sample powers, depending on energy reception.

- **POWER SUPPLY**  
TEMPERATURE [°C]
- **RETURN**  
TEMPERATURE [°C]
- **WASTE GAS**  
TEMPERATURE [°C x10]
- **FLOW**  
[m³/h]
- **BOILER'S POWER**  
[kW]

To ensure maximally safe and failure-free operation, our regulators have a number of protections. In the event of an alert a sound signal is activated and a relevant message is shown on the display.

The controllers have double protection of the boiler against too high temperature of the circulation. The regulator has software and equipment protection in the form of an additional bimetallic sensor which, after activation, turns off the fan, thus preventing further growth in the boiler's temperature.



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