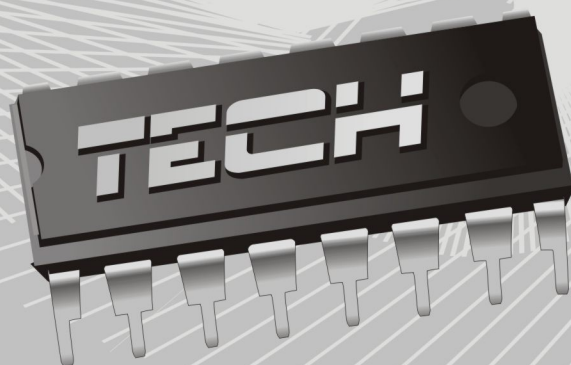


ST-81

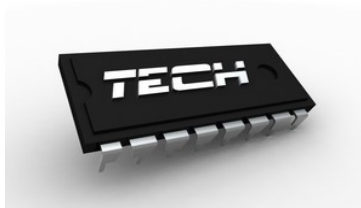
USER'S MANUAL



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TECH



Declaration of Conformity no. 23/2007

TECH, a company with a seated in Andrychów (43-120) at ul. St. Batorego 14, declares with full responsibility that the thermal controller ST-28 (230V, 50Hz) produced by the company complies with the provisions of the Ordinance of the Minister of Economy, Labour and Social Policy (Dz U.03.49.414) of 12 March 2003 introducing the provisions of the Low Voltage Directive (LVD) 2006/95/ECE and the Ordinance of the Minister of Infrastructure (Dz.U.03.90.848) of 02 April 2003 introducing the provisions of the Directive EMC 89/336/EEC.

ST 81 controller Has passed the EMC tests with the maximum loads applied.

The compatibility evaluation has bee based on the harmonized standards

PN-EN 60730-2-1:2002.

The product Has been labelled with CE mark first on:
4 July 2007

Co-owners:
Paweł Jura, Janusz Master

Andrychów, 4 July 2007



WARNING!

Electric device!

Before you take any steps aiming at powering the device (connecting wires, installation of the device etc.), make sure the controller is not connected to the mains.

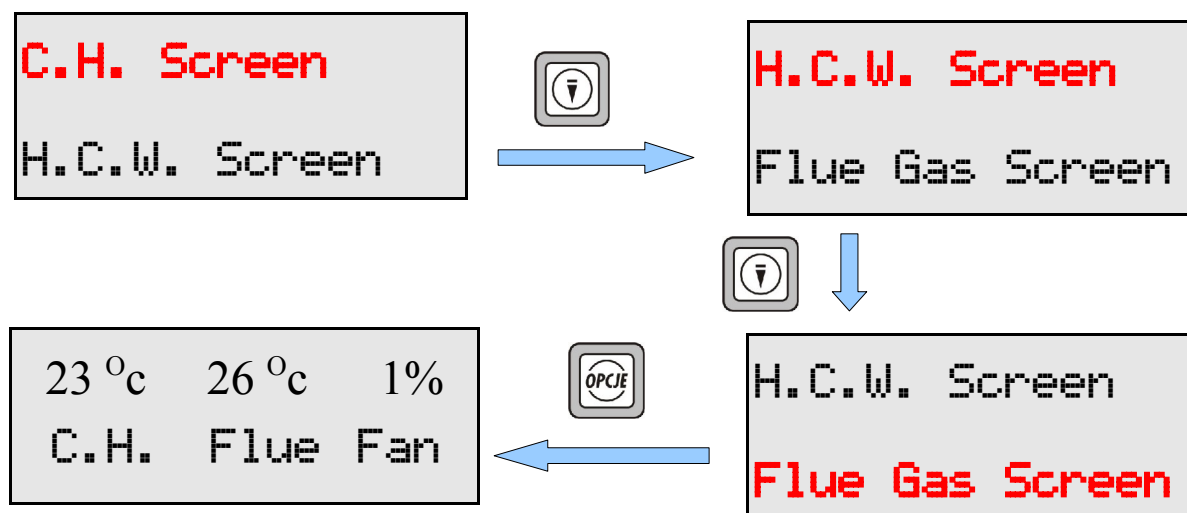
The installation should be conducted by a certified electrician.

Prior to commissioning of the controller, the measurements of the grounding efficiency of the electric motors and a boiler as well as insulation measurements must be taken.



I. Description

In order to check the flue gas outlet temperature, press **EXIT** (hold for several seconds) until the following screen is displayed:



The left of the screen shows the boiler temperature; the middle of the screen shows the flue gas outlet temperature; the right of the screen shows the power of the fan. Press EXIT to return to the main menu.

ST-81 thermal controller is designed for central heating boilers. ST -81 thermoregulator is designed for wood-fired central heating boilers.

It controls water circulating pump and air injection (fan).

However, this type of controller cannot control rotation of the fan.

If the boiler temperature is lower than the set temperature, the controller operates the blower continuously. If the boiler temperature equals or exceeds the set temperature, the controller operates in the temperature maintenance mode. ST-81 controller uses one instructions for different programme versions depending on the type of the boiler. Programme versions are developed for each boiler manufacturer individually. Any comments regarding the programme should be forwarded to a boiler manufacturer. A controller should be set up to meet individual requirements, depending on the type of fuel and a boiler. TECH shall bear no responsibility for the erroneous setup of the controller.

II. Controller functionalities

This section describes controller functions, settings and navigation issues.

II.a) Main screen

During normal operation of the controller, the LCD display presents the main screen with the following information:

- Boiler temperature
- Set temperature



This screen enables quick adjustment of the set temperature by means of **←** and **→**. The **OPTIONS** button takes you to the level 1 submenu. The LCD displays two first lines of the menu. You can navigate around the menus by means of **←** and **→**. The **OPTIONS** button takes you to another submenu or enables an option (applies the changes).

The **EXIT** button takes you to the parent menu.

II.b) Firing-up

The Firing-up functions switches the fan on or off during the continuous operation of the controller. If the boiler temperature exceeds 30 °C but does not reach the set value, the button is used as a START/STOP button and the LCD displays Fan On/Off message. This function allows to enable or disable fan during the boiler operation.

The status is indicated by an asterisk in the right bottom corner of the display (asterisk indicates that the fan is enabled). The function allows safe operation of the boiler. The furnace door must not be opened when the fan is on.

II.c) Manual operation



The controller can operate in manual mode for the convenience of the user.

This function allows independent switching of all elements.



The OPTIONS button enables the blower. The blower is on until the OPTIONS button is pressed again.



The OPTIONS button enables/disables the central heating water pump.



CH PUMP
HOT WATER PUMP

The OPTIONS button enables/disables the hot water pump (of the boiler).



HOT WATER PUMP
ALARM

The OPTIONS button enables/disables the alarm.

II.d) The temperature of activation CH and UHW pumps.



24°C 45°C
SET CH TEMP



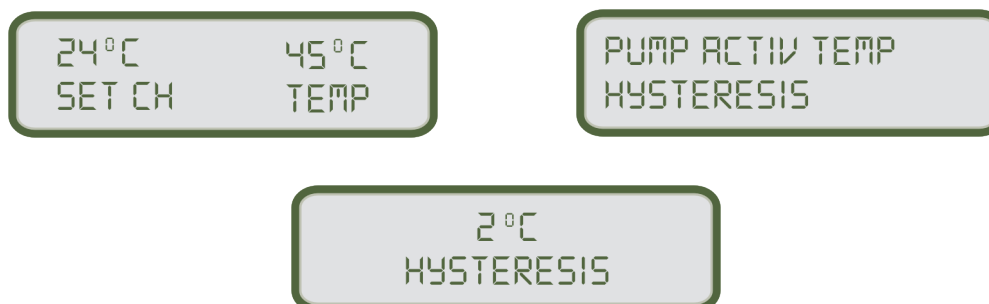
MANUAL MODE
PUMP ACTIV TEMP



30°C
PUMP ACTIV TEMP

The option enables setup of CH pump and UHW pump activation temperatures (this refers to temperatures measured on the boiler). Both pumps do not work below the set temperature. If the set temperature is exceeded, both pumps are activated but they operate depending on the settings i.e. they are activated interchangeably (see pump priority function or continuous CH pump).

II.e) Hysteresis of the boiler



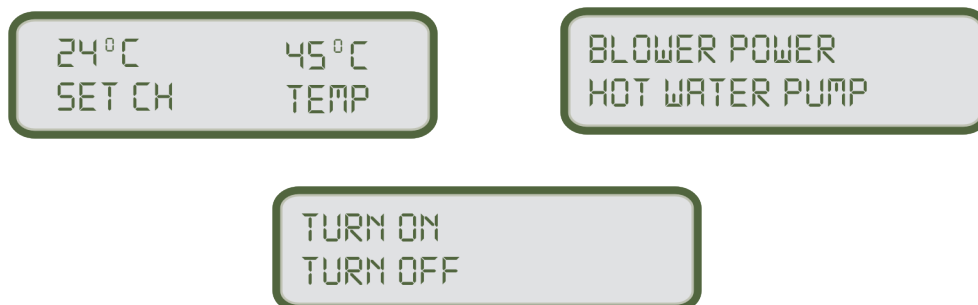
This option allows setup of the set temperature hysteresis. This value represents a difference between the temperature of the temperature maintenance mode activation and the operation mode restoration temperature (e.g. if the set temperature is 60°C and the hysteresis value is 2°C, the temperature maintenance mode will be activated at 60°C, whereas the operation mode will be restored upon drop to 58°C. The hysteresis value may range from 2°C to 6°C.

II.f) Hysteresis of UHW



This option allows setup of the set temperature hysteresis. This value represents a difference between the set temperature (required boiler temperature) and the boiler temperature (e.g. if the set temperature is 55°C and the hysteresis value is 5°C, upon reaching the set temperature i.e. 55°C, UHW pump is turned off and CH pump is activated. The UHW pump will be activated upon temperature drop to 50°C).

II.g) UHW pump



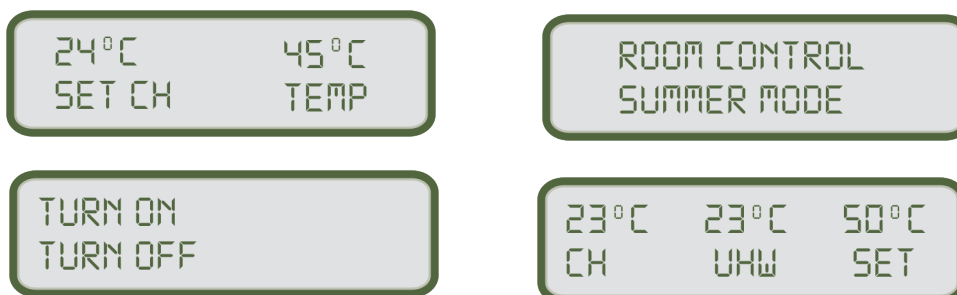
Activation of UHW pump (by selecting TURN ON) makes the controller switch to boiler priority mode. In this mode, the boiler pump (UHW) is activated until the set temperature is reached. Then, the pump is turned off and the CH circulating pump is activated.

The temperature of the UHW pump is adjusted by pressing (for a few seconds) the EXIT button. The LCD will display the set temperature and the boiler temperature. To activate the UHW pump, the set temperature must be above the pump activation threshold (see page 6 II d). The range of the set temperature is adjusted by means of and . After a few seconds, the display is restored. Upon reaching the set temperature, the UHW pump is deactivated and the CH pump starts.

In this mode, the operation of the fan is limited to 62°C at the boiler to prevent boiler overheating. This condition continuous until the boiler set temperature is reached. Upon reaching the temperature, the UHW pump is deactivated and the CH pump starts. The CH pump continuous to operate until the boiler temperature drops below the set value. Then, the CH pump is turned off and the UHW pump is started. UHW priority means that the utility hot water is heated first and the water in radiators is heated afterwards.

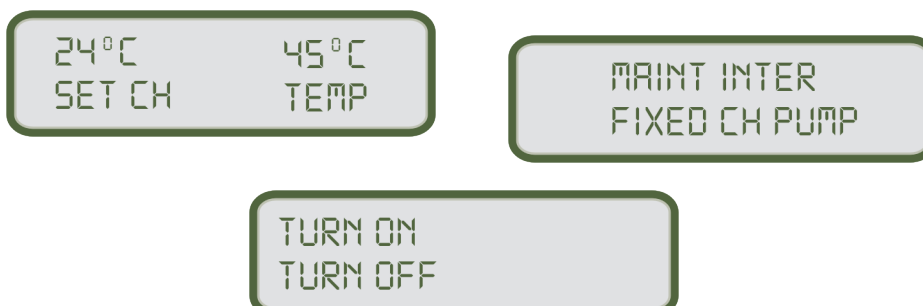
WARNING: The boiler should be fitted with non-return valves in the CH and UHW circulation systems. The valve on the UHW pump prevents discharge of hot water from the boiler. The valve on CH pump prevents hot water from entering the house.

II.i) Summer mode



Upon activation of this function, this pump is deactivated and the UHW pump starts above the set temperature (see the pump activation temperature function), whereas the UHW pump operates continuously. The summer function allows to adjust only the boiler set temperature for heating the water in the vessel. Upon activation of this function, the LCD displays three items: Boiler temperature (CH), vessel temperature (UHW) and set temperature.

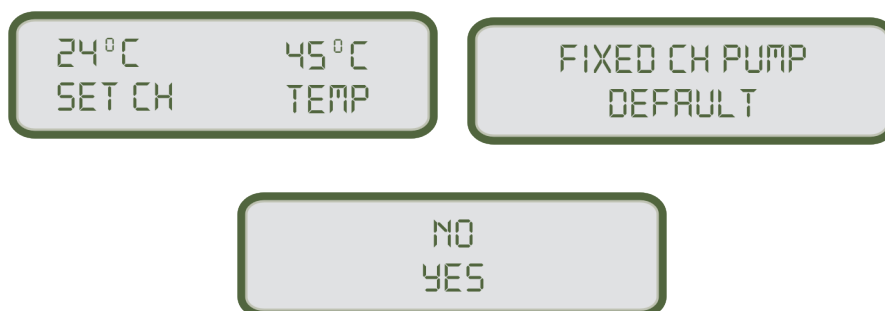
II. j) Fixed CH Pump



In this mode, pumps are activated concurrently above the set temperature. (see pump activation temperature function) CH pump operates continuously, whereas the UHW pump is deactivated upon reaching temperature set on the boiler.

Warning: For operation in this mode, there should be a three-way valve or other mixing valve installed to ensure different environment and boiler temperatures.

II. k) Default settings



The controller comes with a default setup for operation. However, it should be customized to meet the individual needs. Default settings may be restored at any time. By selecting the default settings, all customized settings of boiler are deleted. This allows for setting new parameters of the boiler.

III. Safety measures

To ensure maximum safety and failure-free operation, the controller has been equipped with a range of safety measures. The alarm status is indicated by a sound and a special message is displayed on the LCD.

To restore operation of the boiler, press the OPTIONS button.

III.a) Thermal protection

This is an auxiliary bimetal mini-sensor (next to the furnace sensor) which cuts off the fan output upon exceeding the limit value of 85°C. This prevents boiling of the water in the system in the case of boiler overheating or controller failure. This type of safety temperature limiter restores the starting position: automatic

III.b) Automatic sensor control

In the case of failure of the CH temperature sensor, an alarm is activated and the LCD displays a message:



The blower is activated. The pump starts irrespective of the current temperature. The controller awaits for pressing the OPTIONS button. Next, the alarm is deactivated and the normal operation of the controller is restored.

III.c) Temperature protection

The controller has an auxiliary protection in case of damage to a bimetal sensor: upon exceeding the temperature of 85°C, the alarm is activated and the LCD displays:



III. d) Boiling protection

This function prevents excessive temperature of the boiler (only when the boiler priority function is on) i.e. when the boiler set temperature is e.g. 55°C and the current boiler temperature is 62°C, the controller activates the fan. When the temperature reaches as much as 80°C, the CH pump is activated. If the temperature continuously increasing, the alarm turns on at 85°C. This may happen, when the boiler is damaged, the sensor is installed improperly and the pump is damaged. However, if the temperature decreases, at the threshold value of 60 °C, the blower will be started and it will continue operation until the boiler set temperature is reached.

III.e) Fuse

The controller is equipped with a WT **2.5A** fuse to protect the means.

WARNING: No fuse of the higher value should be used. Installation of the fuse of a higher ampere value may result in a damage to the controller.

IV. Maintenance

The technical conditions of the wires of the ST-28 controller should be inspected prior to the heating season as well as during its duration. The mounting of the controller should be checked and the dust and other contamination should be removed. Furthermore, the measurements of the grounding efficiency of the electric motors (of CH pump, UHW pump and fan) must be taken.

No.	Item	Unit	
1	Power supply	V	230V/50Hz +/-10%
2	Power input	W	2
3	Environment temperature	°C	10÷50
4	Circulation pump output load	A	1
5	Fan output load	A	1
6	Temperature measurement range	°C	0÷85
7	Measurement accuracy	°C	1
8	Temperature setting range	°C	30÷80
9	Temp. Sensor durability	°C	-25 ÷ 100
10	Fuse	A	2,5



V. Technical support

Any defects should be forwarded to the following address:

TECH Sp.j.
34-120 Andrychów ul. St. Batorego 14
tel. 33 8705105 , 33 8759380

VI. Instllation

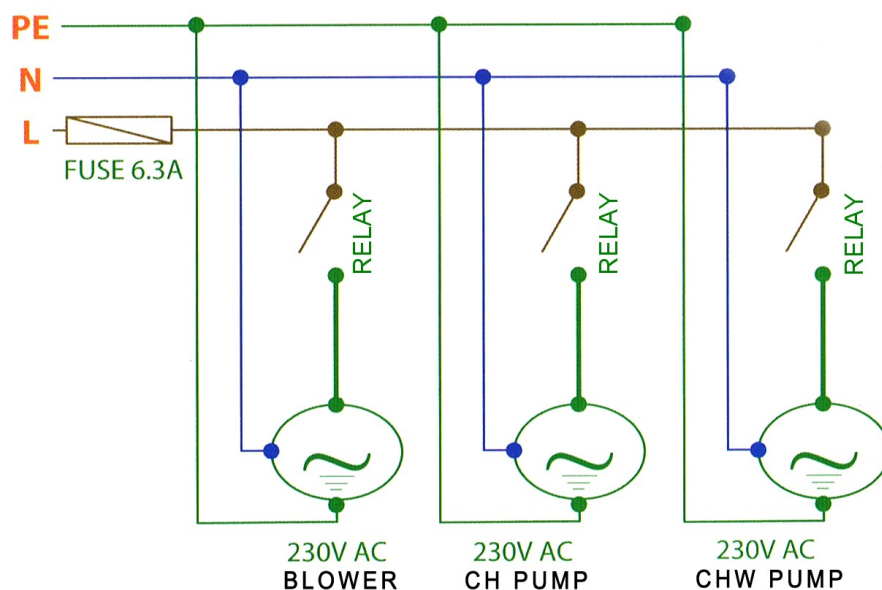
WARNING: The installation should be conducted by a certified electrician! The device cannot be powered during the installation (make sure the plug is not connected to the means).

WARNING: Incorrect installation of the wires may result in a damage to the controller. The controller cannot operate in a closed central heating circulation system. The system must incorporate safety valves, pressure valves, and a surge tank to prevent boiling of water in the central heating system.

VI.a) Controller wiring diagram

Please, pay special attention during installation of the controller wiring.

Make sure that the ground conductor is connected properly.



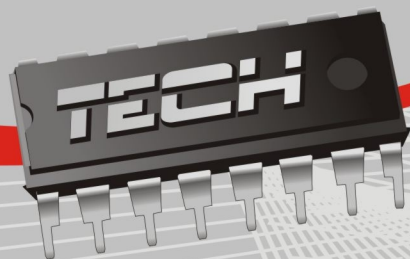
PE - GROUNDING (YELLOW-GREEN)
N - NEUTRAL (BLUE)
L - PHASE (BROWN)

Contents

I. Description.....	4
II. Controller functionalities.....	5
II. a) Main screen.....	5
II. b) Firing-up.....	5
II. c) Manual operation.....	6
II. d) The temperature of activation of CH and UHW pumps	6
II. e) Hysteresis of the boiler.....	7
II. f) Hysteresis of UHW.....	8
II. g) UHV pump	8
II. i) Summer mode.....	10
II. j) Fixed CH Pump	11
II. k) .Default settings.....	11
III. Safety measures.....	12
III. a) Thermal protection.....	12
III. b) Automatic sensor control.....	12
III. c) Temperature protection.....	13
III. d) Boiling protection.....	13
III. e) Fuse.....	13
IV. Maintenance.....	14
V. Technical support.....	15
VI. Installation.....	16

ST-81

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Service notices are accepted

Monday to Friday

7.00-16.00

Saturday from

9.00-12.00

TECH