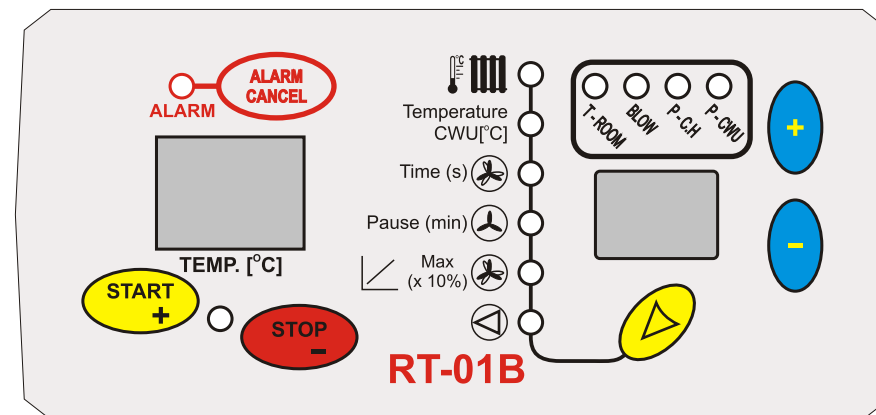


# MANUAL

## C.H CULM BOILER MICROPROCESSOR TEMPERATURE REGULATOR RT-01B



### 1. Basic Parameters

|   |                                       |
|---|---------------------------------------|
| Power                                   | 230V/50Hz                             |
| Power consumption (without load)        | 10VA                                  |
| Max. connection power                   | 800VA                                 |
| Ambient temperature                     | 0÷40°C                                |
| Load capacity of blower                 | 1,5A/230V/50Hz (max 340VA)            |
| Load capacity of rotary pump            | 1A/230V/50Hz (max 230VA)              |
| Load capacity of feeding pump CWU       | 1A/230V/50Hz (max 230VA)              |
| Measurement temperature range           | 0°C÷100°C                             |
| Measurement error                       | 1°C                                   |
| Boiler temperature limit                | 93°C                                  |
| Switch-on temp. of alarm thermostat STB | 94°C                                  |
| Temperature adjustment range            | 40÷90°C                               |
| Scavenge time                           | 1÷30sec                               |
| Scavenge break                          | 2÷40min                               |
| Blower efficiency                       | 10÷100%                               |
| Switch-off temperature of regulator     | 35°C                                  |
| Switch-on regulation of rotary pump     | 30°C÷50°C                             |
| Compatible room thermostat              | equipped with no-voltage relay output |

## C.H CULM BOILER MICROPROCESSOR TEMPERATURE REGULATOR RT-01B

**2. Operation Rules**

The regulator steers the C.H. installation with a culm boiler in which by controlling blower efficiency boiler temperature is changed. Additionally rotary CH and feeding CWU pump operation is controlled.

The regulator recognizes the following emergency situations: damage of temperature sensor, disconnection of temperature sensor, activation of alarm thermostat. Emergency situation is stored into regulator memory (also after power is off), generated a sound and red LED ALARM blinks. Pressing the button ALARM CANCEL turns off the sound and if the cause of breakdown is out, brings back a normal operation (alarm thermostat is off after cooling down to ~70°C). If red LED ALARM still blinks, it means that the cause of breakdown still exists. Exceeding temp. 93°C is signaled by the display flashing. The flashing stops if temperature comes down below 91°C.

C.H boiler operates in the following cycle: Burn-up ; Work ; Extinguish.

**Burn-up phase** starts by button START. Going over to the other phases is automatically done. Regulator kicks off a blower and a rotary pump. By this culm is burnt up and boiler temperature gradually goes up. Reaching 35°C finishes Burn-up phase. Burn-up duration is restricted to up to 2 hours. If temperature doesn't increase, regulator goes to Extinguish phase. At Burn-up phase you can switch off a boiler by STOP button at any moment . Burn-up is signaled by a blinking lamp WORK (***between START and STOP is located***).

The regulator skips the Burn-up phase and automatically switches on a boiler if water temperature exceeds 35°C after turning on the mains.

At **Work phase** the regulator keeps boiler temperature at the given level. If boiler temperature is lower than the given level, a blower starts (its rotation is automatically set). Temperature increase above the given level stops a blower. There are boiler scavenges at that stage in order to get rid of combustion gas (acc. to given values). Work is signaled by constant light of lamp WORK.

**During boiler operation you can press the button STOP (a longer press is required at 2 sec. ). It causes then a interim blower switch-off e.g. for cleaning up the hearth. The state is signaled by a fast blinking LED WORK. After 30 min. regulator automatically goes over to a normal operation. The pause in blower work can be shortened by pressing once more the button START.**

The temperature fall below 35°C starts **Extinguish phase** of a boiler. If for 45 min temperature doesn't increase then a blower stops and the cycle of boiler work is finished. At **Extinguish phase** you can turn off a boiler by long pressing (~2 sec) the button STOP. **Extinguish phase** is signaled by a blinking lamp WORK (LED between START and STOP) (At the end of this phase the lamp goes off)

| Admission date | Realization date | Signature | Remarks |
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## CE CONFORMITY DECLARATION

Ref. No. 28 RT.09.2002

We

ZAKŁAD ELEKTRONICZNY TATAREK Jerzy Tatarek

75 Swieradowska st, 50-559 Wrocław

declare under our sole responsibility that:

**product:** C.H boiler temperature regulator

**model:** RT-01, RT-02, RT-03

meets the requirements included in the directives EMC 89/336/EEC as well as the order of the Economy, Labor and Social Policy Ministry of 12.03.2003 relating to the basic demands for electronic devices (journal of laws No. 49 of 2003, pos. 414) initiating the directive LVD 73/23/EEC.

The product is in conformity with the following harmonized standards:

- PN-EN 60730-2-1: 2002 - Automatic electric regulators for home use and the like  
Part 2-1: Specific requirements for electric regulators for electric home devices.
- PN-EN 55014-1: 2002 - Electromagnetic Compatibility (EMC).  
Requirements for universal use devices, electric tools and the like.  
Electromagnetic noise emission. Norm for devices group.
- PN-EN 60730-1: 2002 - Automatic electric regulators for home use and the like.  
Part 1: Common requirements

**Complementary information:** Laboratory ZETOM 17 Ks. Bpa H. Bednorza st,  
40-384 Katowice

Research Report No. B/04/156/1 z 23.07.2004  
B/04/156/2 z 23.07.2004

Electronic Engineering Plant TATAREK  
has management system implemented  
and meets

requirements of ISO9001: 2000 Certificate No. 133/2004  
Polish Foreign Commerce Chamber

The last two digits of the year in which the CE marking was affixed: 04

Place of issue:  
Wrocław

Date of issue:  
12.2004

Manufacturer representative:

Jerzy Kopeć

*Jerzy Kopeć*  
Position:  
Designer

### 2.1 Pump operation C.H.

Additional function is to control a rotary pump CH. If boiler temperature exceeds the pre-set value, the pump turns on. Switching off the pump below that value causes a faster heating of boiler above the dew point and in effect the lengthening of boiler life. If the regulator works with a room thermostat, if temperature in room is too high, pump works in cycles (see the description of parameters adjusting the regulator to the features of boiler and C.H installation). Pump C.H. works in cycles also if priority CWU is set (see parameters) while feeding the pod of warm usable water.

### 2.2 Pump operation CWU

The regulator can control the pump of feeding the pod with warm usable water CWU. The pump CWU works if water temperature on the boiler is higher than in the pod, that's why temperature sensor in the pod is required.

If temperature CWU exceeds the pre-set value, pump CWU is off (see description of parameters).

In case of lack of sensor CWU pump will not work.

### 2.3 Cooperation with room thermostat

The regulator has an output to connect a room thermostat of any kind, equipped with a no-voltage relay output. The thermostat clamps need to be connected to the regulator. The clamps are short-circuited if room temperature is higher than the given value. As long as room temperature is lower than the set value in the thermostat (relay clamps are open), the regulator works normally. If room temperature exceeds the in thermostat set value (relay clamps are short-circuited), which is signaled by blinking lamp T-ROOM (fig. 1/4), the regulator modifies its functions: preset boiler temperature gets down.

If thermostat is not mounted, then the proper input of the regulator needs to be left loose (unconnected).

The thermostat ought to be located in the largest room. Installing by-heater thermostatic valves are not allowed to be installed in the room. The thermostat should be fixed at 1,5m off ground, far away from windows and heaters. In the other rooms by-heater valves can be installed.

### 3. Signaling of regulator operation

| Phase             | Blower  | C.H. pump  |   | Lamp WORK |
|-------------------|---|--|---|-----------|
|                   |   | switch-off temp. of C.H. pump (Parameter P1)=30  | switch-off temp. of C.H. pump (Parameter P1)=31...50                                      |           |
| <b>Burn-up</b>    | works   | works  | works if temp. is higher than $P1+2^{\circ}\text{C}$<br>no work if temp. is lower than P1 | blinks    |
| <b>Work</b>       | works only if temp. lower than that given.<br>No work if temp. higher than that given | works  | works if temp. is higher than $P1+2^{\circ}\text{C}$<br>no work if temp. is lower than P1 | lights    |
| <b>Extinguish</b> | works   | works  | works if temp. is higher than $P1+2^{\circ}\text{C}$<br>no work if temp. is lower than P1 | blinks    |
| <b>End</b>        | no work   | works only if temp. higher than $32^{\circ}\text{C}$ .<br>No work if temp. lower than $30^{\circ}\text{C}$ | works if temp. is higher than $P1+2^{\circ}\text{C}$<br>no work if temp. is lower than P1 | off       |

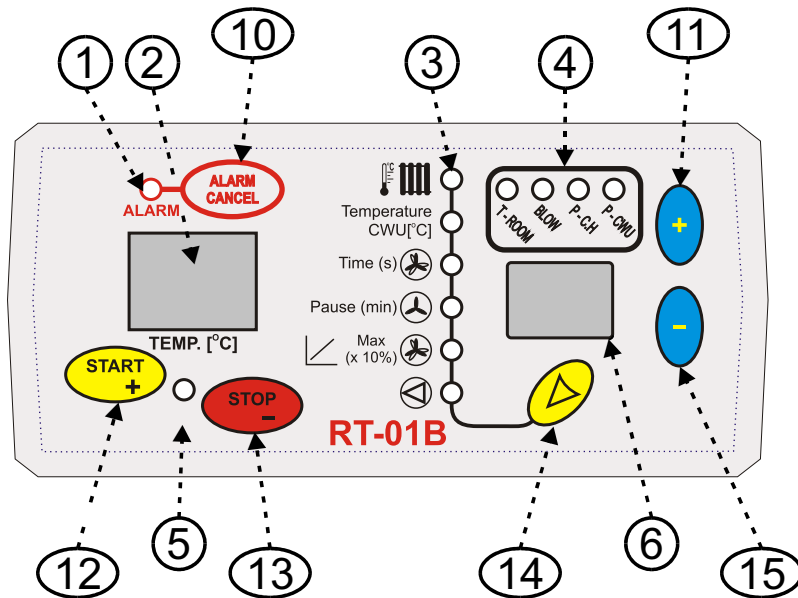


Fig.1 Control panel view

### WARRANTY

1. Warranty is valid [12] [24] months from the date of sale.
2. Producer does not take responsibility for any mechanical damages made by user.
3. MAKING REPAIRS OR MODIFYING THE DEVICE BY USER IS FORBIDDEN AND CAUSES WARRANTY CANCELLATION
4. Warranty card is valid only with seller's signature and stamp
5. Warranty and after-warranty repairs should be done only by producer, damaged regulators should be sent to producer in order to make all repairs needed.

### WARNING!

Connection cable of regulator may be replaced only by producer or his authorized service locations

ANY MODIFICATION OF THE REGULATOR MADE BY USER CAN BE THE CAUSE OF SAFETY CONDITIONS DETERIORATION AND CAN EXPOSE THE USER TO ELECTRIC SHOCK OR DAMAGE DEVICES SUPPLIED.

Date of Sale

Seller's signature and stamp

-----

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## 6. Solution of problems

| Problem  | Possible cause   | Solution   |
|--|--|--|
| Regulator turns off                                  | 1. Wrong connection of mains cable<br>2. Damaged fuse<br><br>3. Switch MAINS is off                  | 1. Check the supply connection<br>2. Check the fuses, swap them for new ones acc. to the documentation<br>3. Set the switch to I                                     |
| Wrong boiler temp. displayed by regulator            | 1. Temp. sensor disconnected<br>2. Temp. sensor damaged  | 1. Check sensor connection<br>2. Get in touch with the service   |
| Regulator does not control boiler, lamp ALARM blinks | 1. Not deleted the memory of alarms<br>2. The cause of alarm still exists<br>3. Temp. sensor damaged | 1. Press ALARM CANCEL to delete the memory of alarms<br>2. Wait till the end of alarm (e.g. a security device sensor cools down)<br>3. Get in touch with the service |
| Boiler temperature strongly higher than that preset. | 1. Too fast burning  | 1. Change the scavenge parameters  |

## 7. Instalowanie regulatora

! The regulator is supplied by 230V/50Hz .

Any moves regarding installation should be made at the disconnected mains.

! The regulator has to be connected to the mains with the zero-pin.

! The regulator should not be exposed to water affecting. Its environs ought to be clean.

! The producer doesn't take any responsibility for damages caused by wrong usage of the regulator.

The Regulator is designed to mount on the C.H. boiler. The control should be connected to the proper sockets on the back wall. An integrated temperature sensor /alarm thermostat has to be located in the special hole of the boiler housing. In order to guarantee a proper thermal conductance, that hole should be filled with machine oil or silicon paste. The cables should be directed in such way so they cannot be exposed to overheating.

1. Lamp signaling ALARM

2. Display of measured temperature

3. Lamps indicating the kind of parameter displayed on "6"

4. Lamps signaling the operation of devices:

T-ROOM - activation of room thermostat

BLOW- activation of blower

P-C.H - activation of rotary pump

P-CWU - activation of pump feeding the pod with warm usable water

5. Lamp WORK signaling boiler operation

6. Auxiliary display

10. Button to cancel alarm

11. Button to increase value

12. Button to start boiler operation

13. Button to stop boiler operation

14. Button to choose parameter

15. Button to decrease value

## 4. Handling of regulator

Power switch is located on the back wall (Fig. 2). Turning off the regulator by switch "6" (Fig. 2) disconnects the power supply of a blower and a rotary pump as well. Control Panel (Fig. 1) is designed to put in regulator adjustments. The left display "2" shows boiler temperature. Buttons "12" and "13" serve to initiate **Burn-up** and **Extinguish phase** of a boiler. (**Extinguish** is possible only if temperature is lower than 35°C). Boiler state is indicated by lamp "5". The right display "6" shows the value of a parameter chosen by button "14" signaled by one of lamps "3". The value of the parameter can be changed by buttons "11/15". If the buttons are not used for longer than 10sec and the regulator indicates the given temperature.

| Parameter               | Range of changes        | Factory adjustment |
|-------------------------|-------------------------|--------------------|
| Given temperature       | 40÷90°C                 | 70°C               |
| Scavenge time           | 1÷30 sec                | 10sec              |
| Scavenge break          | 2÷40 min                | 3 min              |
| Blower efficiency x 10% | 3÷10 (it means 30÷100%) | 10 (it means 100%) |

## 5. Additional parameters

Apart from the parameters of 4th chapter being mentioned, the regulator can be fitted to C.H. installation and user's wishes by additional parameters. Their value has a significant meaning for a proper operation of the regulator and casual changes are not allowed.

The additional parameters access is possible for a first minute since switching on the regulator. The parameters are located under the position "OTHER PARAMETERS" (going over acc. to 4-th chapter).

The value shows up on the right display "6" and can be changed by buttons +/- ("11/15").

The kind of parameter ( the code of which shows on the left display "2") is changed by buttons START/STOP ("8/9"). If the buttons are not used for the time longer than 15sec , the regulator automatically goes over to the standby state (actual boiler temperature on the left display, preset temperature on the right)

| Parameter   | Code | Value | factory sets | Remarks   |
|---|------|-------|--------------|---|
| Recovering factory sets (initial setting)                                     | UP   | 0÷3   | 0            | This is not a parameter but the way for setting parameters to factory values (except for operation mode of blower motor SL, which will not change - its value is set by boiler producer acc. to a blower). In order to make initial setting, UP should be "2" and press the choice button "14". |
| Switch-off temperature of rotary pump (change of operation mode of pump) [°C] | P1   | 30÷50 | 35           | 30 Pump works always during Burn-up, Work, Extinguish<br>If boiler doesn't work, pump is on if temp. is higher than 32°C. Pump is off if temp. is lower than 30°C<br>31-50 Pump is on if temp. is higher than P1+2 °C, and is off if temp. is lower than P1                                     |
| Switch-off time of pump C.H. [min]  | P2   | 1÷30  | 4            | Pause time of pump C.H. if a room thermostat decides about turning off heating or the priority of pump CWU is activated. After ending that time, pump is on for 30 sec.   |
| Switch-on temperature of pump CWU [°C]  | U1   | 20÷85 | 45           | Minimal boiler temp. at which pump CWU is on.   |

| Parameter                                     | Code | Value          | Factory sets | Remarks  |
|---|------|----------------|--------------|--|
| Switch-off temp. of pump CWU [°C]             | U2   | 30÷99          | 80           | Maximum temp. of the pod CWU. Switch-off temp. of pump CWU   |
| Delta CWU [°C]                                | U3   | 1÷10           | 5            | Minimal difference between boiler and pod CWU temp. required for pump operation CWU  |
| Priority CWU [0-off 1-on]                     | U4   | 0÷1            | 0            | Switch-on of this function causes taht while feeding the pod CWU, thermal reception by C.H. installation is restricted by cyclic pump operation C.H. (the same as in room thermostat)  |
| Temperature of room thermostat [°C]           | F1   | 40÷60          | 40           | Preset boiler temperature in cooperation with room thermostat. It means temperature to which the regulator sets boiler in case of room thermostat deciding about turning off heating.  |
| Blower efficiency during scavenges x10[%]     | F2   | 1÷10 (10÷100%) | 10 (100%)    |  |
| hysteresis of blower at operation on/off [°c] | F3   | 0÷5            | 2            | Insensitivity zone, the difference between switch-on and switch-off temperature.   |
| Operation mode of blower motor                | SL   | 0÷2            | 1            | 0 Lack of variable rotations, operation on/off. The mode is designed for any kind of motor, impervious to floating rotation regulation<br>1 Floating rotation regulation<br>2 Floating rotation regulation, it relates to the motors class RV-14 |

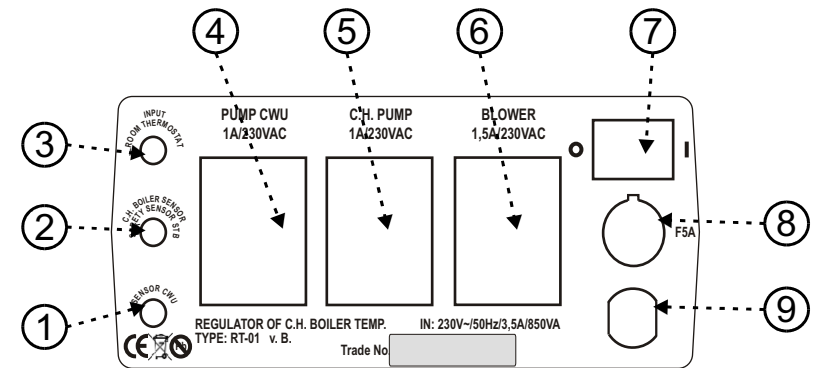


Fig.2 Back wall view

1. Connection socket of temperature sensor of the pod CWU
2. Connection socket of temperature sensor and alarm thermostat STB
3. Connection socket of room thermostat
4. Connection socket of pump feeding the pod CWU
5. Connection socket of rotary pump
6. Connection socket of blower
7. Power switch of regulator, blower and pump
8. Fuse socket 5A
9. Mains cable 230V/50Hz