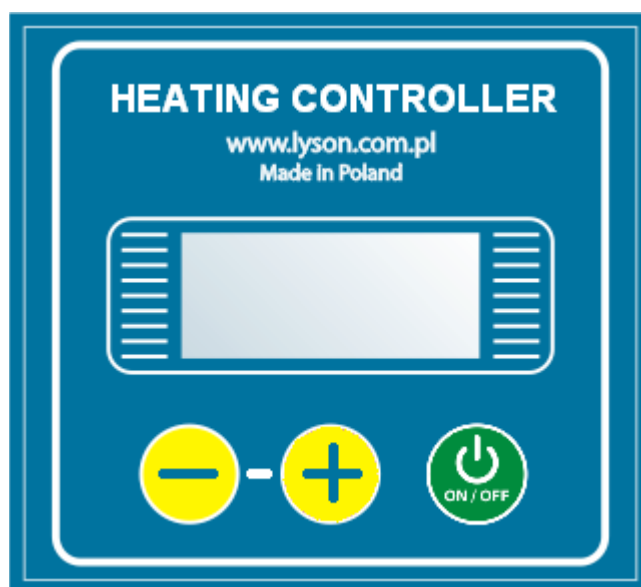


# AHC-01A / AHC-01B

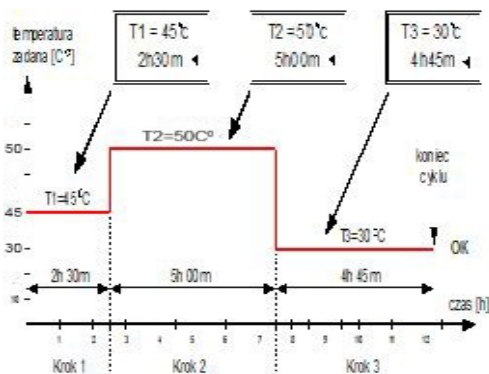


## Heating Controller User's Manual & Configuration

Read this user's manual carefully before use.  
 Heating controller implemented in our devices allows to set the required temperature and maintain it over the required period of time.

### • General Information

Heating controller executing the programmed heating cycle. Each cycle consists of 3 steps. For each cycle its duration and the value of stabilised temperature can be defined. Once the cycle is completed ( having executed the total time defined for the cycle) the controller enters the stand-by mode.



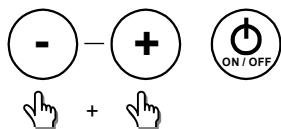
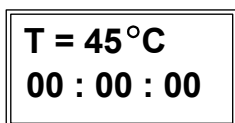
**Graph.1** Heating cycle example: T1=45°C, 2h30m -> T2=70°C, 5h00m -> T3=30°C, 4h45m.

Graph 1 shows the sample of heating cycle. After powering up the controller begins its task and maintain the required temperature at 45°C. That temperature is maintained over the period of 2h30m. Once the required time is over, the controller raises the temperature up to 50°C and maintains it over the next 5 hours. In the last step the controller lowers the temperature down to 30°C and after 12h15m since the beginning of the cycle the controller shuts down and turns the heating circuit off. The correct completion of the heating cycle is signalled by **OK** message displayed on the LCD panel. The **OK** message disappears if any key is pressed ( controller reboot) or in the case of lack of power supply.

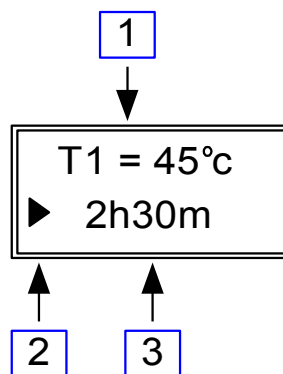
### • Heating cycle programming mode

Enter the cycle programming mode to set (programme) a heating cycle. This can only be done if the heating cycle execution is off and by simultaneously pressing two buttons „+” and „-”.

Programming ( entering heating cycle parameters ) can be performed from the screen menu level (Graph 3.)



**Graph.2.** Entering the cycle programming mode



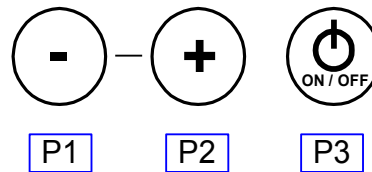
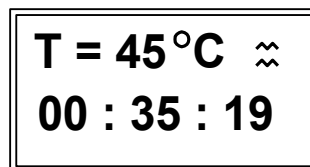
**Rys.3.** Cycle programming mode screen menu

To program the cycle, one needs to set for each step the required temperature [1] and its duration [3]. The value of current chosen parameter can be modified by pressing „+” or „-”. To choose the parameter to be modified press the „ON/OFF” button sequentially. The current modified parameter is indicated by an indicator [2]. After inputting into controller's memory the parameters of each 3 steps, a message will be displayed on the LCD panel showing the range of regulated temperature – example from **Graph.1**, it states as follows: (30-50 °C ) and the total cycle duration.

After a while the controller will reboot and will enter into stand-by mode.

### • Work mode

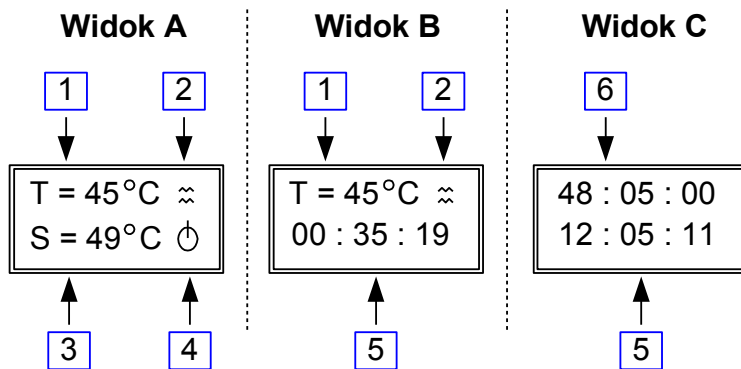
Work mode is the default mode the controller will launch after powering up. The controller's manning comes down to switching the heating cycles' execution ( button P3) and choosing one out of 3 available work modes' screen views.



**Rys.4.** Temperature regulator manning elements

ELEMENT DESCRIPTION	FUNCTION
P1	Change of currently displayed screen view. After rebooting the controller will launch the last chosen view.
P2	Change of currently displayed screen view. After rebooting the controller will launch the last chosen view.
P3	Heating cycle ON/OFF. <b>The ON/OFF state is stored even in the event of power cut.</b>

Pressing the button for some time whilst turning the cycle off will cause the counter of the cycle duration to reset. Switching it on again will start the new full cycle – executed from the beginning: counting the time from zero and re-controlling the minimum temperature.



Rys 5. Work mode screen views

SCREEN VIEW	VIEW'S DESCRIPTION
A	Current temperature and set temperature.
B	Current temperature and heating cycle's time elapsed.
C	Set and elapsed heating cycle's time.

ELEMENT DESCRIPTION	FUNCTION
1	Real temperature – measured.
2	Graphics indicating working heater. Heaters on – graphics displayed. Heaters off – no graphics displayed.
3	Temperature set – adjusted during cycle's programming
4	Graphics indicating working controller. Cycle execution- graphics on ; cycle off – no graphics displayed.
5	Heating cycle elapsed time.
6	Heating cycle set time.

### Diagnosis – safeguards and error codes

AHC-01... controller has been equipped with advanced diagnostic procedures – increasing the safety and comfort of use.

#### Error indicators

- errors are indicated by displaying „E-xxx” message on the LCD panel, where xxx relates to the error number as per the table below
- error detection results in an immediate stop of the heating circuit
- Restarting the controller can only be performed after switching it off, repairing the fault and re-powering
- switching the controller off will erase errors' memory module

ERROR	ERROR DESCRIPTION
-------	-------------------

CODE	
E-100	Programme's memory error
E-101	Configuration memory error
E-102	Operating memory error
E-200	Pressed / locked „-” button
E-201	Pressed/ locked „+” button
E-202	Pressed/ locked „ON/OFF” button
E-301	Temperature sensor faulty
E-302	Sensor's temperature too high (value exceeds the range)
E-303	Sensor's temperature too low (value exceeds the range)
E-304	Heating cycle's temperature too high
E-305	Heating cycle's temperature too low

**E-304** – error displayed when on powering the device up, the measured temperature exceeds the highest set temperature by 10°C.

**E-304** – error displayed when despite 2 cycle steps' lapse (step 1 and step 2), the measured temperature has not reached the threshold ( the lowest set temperature less 5°C). The moment of reaching the minimal described temperature is signalled by a short beep.

#### • Technical data

Each AHC-01 temperature controller is made of microprocessor motherboard (identical for each type of controller) and a powering-executing module, connected with a controller by special tape. A dedicated, digital temperature sensor complements the whole.

MICROPROCESSOR CONTROLLER	
Range of measured temperature:	from 0°C to +55°C
Settings' range of stabilised temperature:	from +30°C to +55°C
Regulation type:	Bistable (ON / OFF)
Reading resolution / temperature setting:	1°C
Temperature's regulation hysteresis:	±1°C
Guaranteed temperature accuracy:	±0.5°C within the range: 0°C to 55°C
Number of heating cycle steps:	3
Step's minimal duration:	1 minute
Step's maximal duration:	32 hours 59 minutes
Maximum total cycle duration:	≈ 99 hours (4 days 3 hours)
Default cycle parameters for step 1	+45°C / 6h
Default cycle parameters for step 2	+45°C / 21h
Default cycle parameters for step 3	+45°C / 21h

POWERING-EXECUTING MODULE AHC-01A	
Beeper:	Yes
Acoustic signalling of the loss of connection with microprocessor controller's module:	Yes

Additional anti over-heating sensor interface:	Yes
Output type:	relay, 1Z
Output load capacity	AC1 - 10A 230V
Maximum heaters' wattage:	<b>2000W 230VAC</b>
Output electrical endurance:	> 3 x 10 <sup>4</sup> for 10A 230VAC
Maximum switching frequency AC1	600 cycles/h
Controller's supply voltage:	230VAC ±10%
Controller's power consumption:	Max 2VA for 230VAC
Type of integrated delay fuse:	TR5 1A 250VAC
<b>Powering-executing module AHC-01B</b>	
Beeper:	No
Output type:	relay, 1Z
Output load capacity:	AC1 – 2,5A 230V
Maximum heaters' wattage:	<b>550W 230VAC</b>
Output electrical endurance:	> 0.7 x 10 <sup>5</sup> for 2,5A 230VAC
Maximum switching frequency AC1	600 cycles/h
Controller's supply voltage:Controller's power consumption:	230VAC ±10%
Controller's power consumption:	Max 1,5VA for 230VAC
Type of integrated delay fuse:	TR5 1A 250VAC
<b>ENVIRONMENTAL CONDITIONS</b>	
Ambient temperature of controller in use:	0°C...40°C
Ambient temperature of stored controller:	0°C...50°C
Air humidity of controller in use:	Max 75% for 25°C
Air humidity of stored controller:	NA