

ThermoB.3WHC432 / 3WHC412V

ELECTRONIC CONTROLLER

for a 3-way mixing valve and circulation pump

SETUP GUIDE



Models:

Model	R1 – pump	R2 / R3 – close / open	0–10V output	Sensors	Power supply
ThermoB.3WHC432	yes	yes	x	2 pcs. external	230V AC or 24V AC
ThermoB.3WHC412V	yes	x	yes	2 pcs. external	230V AC or 24V AC

Table 1 – Operating modes (parameter P09)

P09	Mode	Water temperature setpoint	Adjustment with [▲] / [▼]	Input S2
0	Heating by curve	curve P11...P15 + P16	P16	outdoor sensor
1	Cooling by curve	curve P17...P21 + P16	P16	outdoor sensor
2	Heating, fixed temperature	P01 + P16	P16	not used
3	Cooling, fixed temperature	P02 + P16	P16	start / stop
4	Heating, fixed temperature	P01	P01	start / stop
5	Cooling, fixed temperature	P02	P02	start / stop
6	Manual control	–	manual open / close	not used
7	Automatic Heating / Cooling	P01 or P02 + P16	P16	Heating / Cooling selection
8	Automatic Heating / Cooling	P01 or P02	–	Heating / Cooling selection

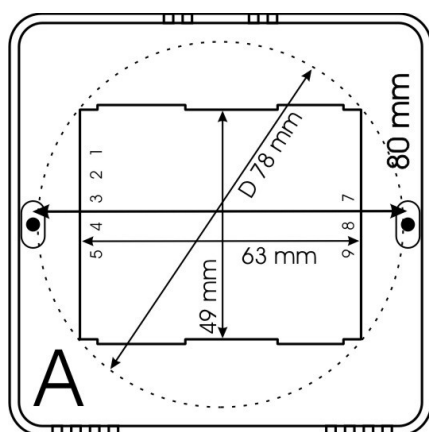
Input S2 – start / stop: closed contact = run, open contact = stop. Heating / Cooling selection: sensor S2 ≥ P31 or closed contact = Heating; sensor S2 ≤ P30 or open contact = Cooling.

Features:

ThermoB.3WHC432 / 3WHC412V	
LCD display with backlight and 4 buttons	Control of a 3-way mixing valve and circulation pump
2 inputs for external NTC 10 kΩ sensors – S1 and S2	Input S2: outdoor sensor or voltage-free contact
Power supply 230V / AC / 50Hz or 24V / AC	Consumption ≤ 2VA
Relay outputs: 3WHC432 – 3 pcs., 3WHC412V – 1 pc.; max 4A in total; supply “live” control potential	0–10V output (3WHC412V); RL > 3 kΩ
Front panel dimensions 90x90 mm	Mounting in a D80 wall box

ThermoB.3WHC432 / 3WHC412V	
Degree of protection IP20	Operating conditions -5...+40°C, RH80%
Measured temperature -25...+100°C / 1°C; accuracy ±1°C	Water temperature setpoint +6...+90°C / 1°C
Transport and storage -20...+60°C	Sensors NTC 10 kΩ, 1 m cable, not for immersion; the outdoor sensor is a separate item
Pulse control with fine and coarse zone and integral correction	Temperature curves for heating and cooling
Frost protection; periodic pump exercise	Manual control of the valve and pump

INSTALLATION:



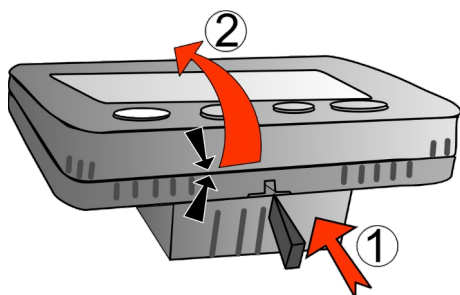
sketch 1

The device is designed for mounting in a D80mm wall box. The mounting dimensions are given on sketch 1.

Use fasteners with a stem diameter of up to 3.5mm.

The orientation for fastening and mounting (correct view) is marked with "A".

To access the mounting holes, open the device by separating the front panel from its rear part.



sketch 2

- Press lightly with the tip of a flat screwdriver in the indicated slot and direction (1) on the underside of the front panel, sketch 2.
- At the same time separate the upper side of the panel in the indicated direction (2).
- The two parts are connected by a cable; if necessary, disconnect the terminal from the front side.

Reassemble in reverse order: first bring the two parts together at their top sides, then press from the bottom until the two parts lock. Don't forget to reconnect the terminal!

CONNECTION:

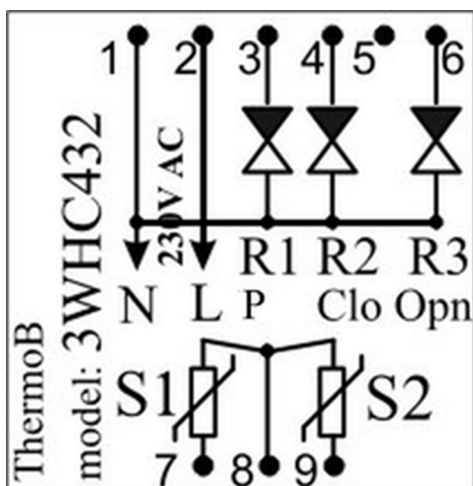


diagram 1 – ThermoB.3WHC432

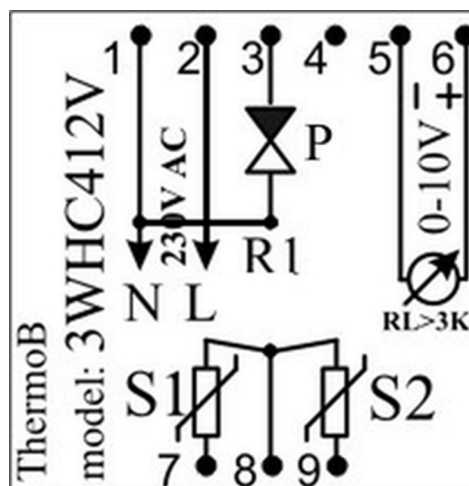


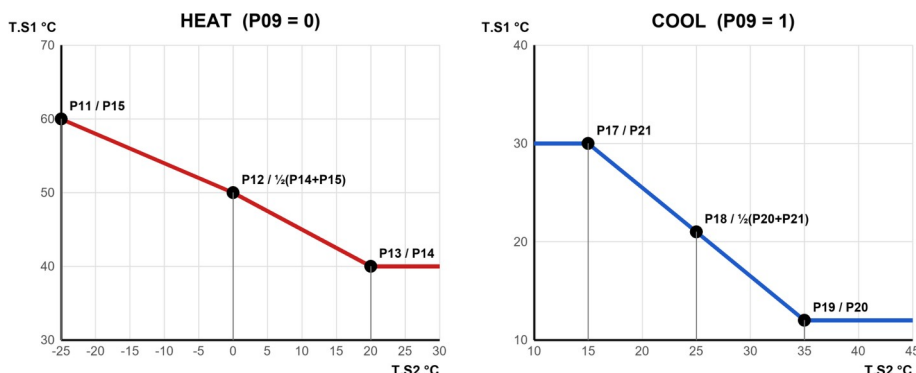
diagram 2 – ThermoB.3WHC412V

Term.	ThermoB.3WHC432	ThermoB.3WHC412V
1	N – power supply; common wire of the loads	N – power supply; common wire of the pump
2	L – power supply	L – power supply
3	R1 – pump (P)	R1 – pump (P)
4	R2 – actuator, close (Clo)	free
5	free	0–10V „–“
6	R3 – actuator, open (Opn)	0–10V „+” – control signal to the actuator
7	S1 – water temperature sensor after the mixing valve	
8	common ground of sensors S1 and S2	
9	S2 – outdoor sensor or contact start / stop / Heating–Cooling (according to P09)	

- power supply 230V / AC / 50Hz or 24V / AC – according to the version, terminals 1 and 2
- on outputs R1, R2 and R3 the controller supplies the control “L phase” (24V in the 24V version); connect the other terminals of the pump and actuator to “N” – terminal 1
- total current of the relay outputs – max 4A
- ThermoB.3WHC412V: the 0–10V actuator is powered separately; the controller supplies only the control signal 0V = valve closed, 10V = valve open
- wire cross-section: power supply and outputs 0.5 – 1.5mm²; sensors – not less than 0.25mm²
- the contact to input S2 must be voltage-free
- do not connect the free terminals

OPERATING PRINCIPLE:

The controller keeps the water temperature after the mixing valve (sensor S1) at the set value. The setpoint is fixed (P01 / P02) or calculated from a temperature curve based on the outdoor temperature (sensor S2), see Table 1 and the chart.



Heating curve: at outdoor temperature $\leq P11$ the setpoint is $P15$, at $P12$ – the midpoint between $P14$ and $P15$, at $\geq P13$ – $P14$. Cooling curve: at $\leq P17$ – $P21$, at $P18$ – the midpoint between $P20$ and $P21$, at $\geq P19$ – $P20$. The correction $P16$ is added to the result.

Pulse control of the valve (in heating: above the setpoint – close, below the setpoint – open; in cooling – the opposite):

- deviation $\geq P04$ (coarse zone) – pulse $1.5 \times P05$ every $P07/2$ (above the setpoint) or $P08/2$ (below the setpoint)
- deviation $\geq P03$ (fine zone) – pulse $P05$ every $P07$ or $P08$
- deviation $< P03$ – if the deviation stays above 1°C , a pulse $P05/2$ is given every 6 double periods
- alarm zone – outside the $P10$ threshold the valve is corrected without pause until it returns to the zone
- movement in one direction stops after $1.5 \times P06$ without a change of direction

The valve position (0–100 %) is calculated from the running time relative to $P06$ and is shown after the first full closing. When switched off (OFF) the valve closes for $1.25 \times P06$ and the pump stops.

ThermoB.3WHC412V – 0–10V output

The open / close pulses change the calculated valve position (0–100 %), which is sent to the 0–10V output:

$$U = 10V \times [P27 + (P28 - P27) \times \text{position} / 100] / 100$$

- P06 is fixed at 100 s – a pulse P05 = 1.5 s changes the position by 1.5 %
- the position is shown immediately and is kept during a power failure
- at OFF: P29 = 0 – the output stays at P27; P29 = 1 – the output goes to 0V

Pump

- runs while the controller is on (AUTO); stops at OFF and during the first 10 s after power-up
- frost protection: at S1 temperature $\leq$ P23 the pump runs and the valve opens fully (in cooling – closes)
- exercise: if the pump has not run for P25 hours, it is switched on for P26 minutes (the first time not earlier than 1 hour after power-up)
- at P09 = 6 the pump is controlled manually only

PARAMETERS:

Number	Description	step	Default
P01	Fixed water setpoint – Heating [6...90°C]; limited to P14...P15	1°	40°
P02	Fixed water setpoint – Cooling [6...35°C]; limited to P20...P21	1°	15°
P03	Fine control zone [1...10°C]	1°	3°
P04	Coarse control zone [3...25°C]; kept within P03+2 ... P03+15	1°	5°
P05	Pulse duration to the actuator [0.5...10.0 s]	0.1 s	1.5 s
P06	Actuator full travel time [15...250 s]; for 3WHC412V – fixed 100 s	1 s	60 s
P07	Pulse period at temperature above the setpoint [10...120 s]	1 s	15 s
P08	Pulse period at temperature below the setpoint [10...120 s]	1 s	18 s
P09	Operating mode [0...8] – see Table 1	1	2
P10	Alarm zone [5...75]. Threshold: Heating – setpoint + (P10 – 25)°C; Cooling – setpoint + (P10 – 40)°C	1	50
P11	Heating curve – low outdoor temperature [-25...0°C]	1°	-25°
P12	Heating curve – medium outdoor temperature [-15...+15°C]	1°	0°
P13	Heating curve – high outdoor temperature [-10...+30°C]	1°	20°
P14	Minimum water temperature – Heating [10...70°C]	1°	40°
P15	Maximum water temperature – Heating [15...90°C]	1°	60°
P16	Setpoint correction "Cor" [-5...+5°C]	1°	0°
P17	Cooling curve – low outdoor temperature [-5...+20°C]	1°	15°
P18	Cooling curve – medium outdoor temperature [5...30°C]	1°	25°
P19	Cooling curve – high outdoor temperature [15...50°C]	1°	35°
P20	Minimum water temperature – Cooling [-10...+25°C]	1°	12°
P21	Maximum water temperature – Cooling [-5...+35°C]	1°	30°
P22	Heating / Cooling change from the buttons: 0 – allowed; 1 – locked	1	1
P23	Frost protection [-10...+10°C]; -10 = off	1°	6°
P24	Password for parameter access [0...255]; 0 = no password	1	0
P25	Pump exercise – idle time [0...240 h]; 0 = off	1 h	24 h
P26	Pump exercise – run time [1...3 min]	1 min	1 min
P27	0–10V output – signal at position 0 % [0...60 %] *	1 %	0 %
P28	0–10V output – signal at position 100 % [40...100 %]; P28 $\geq$ P27 + 40 *	1 %	100 %
P29	0–10V output at OFF: 0 – P27; 1 – 0V *	1	0
P30	Sensor S2 $\leq$ P30 → Cooling (P09 = 7, 8) [6...35°C]	1°	22°
P31	Sensor S2 $\geq$ P31 → Heating (P09 = 7, 8) [25...70°C]	1°	30°
P32	System type and version: R3 (3WHC432) / Pu (3WHC412V) and version	–	1.9

* P27 – P29 apply only to ThermoB.3WHC412V.

QUICK OPERATING GUIDE

Buttons: [▼] [mode] [On/Off] [▲]

ON / OFF

- On the main screen press [On/Off].
- (AUTO) – the controller is running; (OFF) – off: the valve closes, the pump stops, frost protection stays active.
- The state is kept during a power failure.

SCREENS

- Each press of [mode] changes the screen: main → outdoor temperature / valve position → correction “Cor” → (MAN – only at OFF) → main.
- At P09 = 4, 5 only the first two screens are shown.

TEMPERATURE ADJUSTMENT

- On the main screen with [▲] / [▼]:
- P09 = 4, 5 – the setpoint P01 / P02 is changed;
- P09 = 0, 1, 2, 3, 7 – the correction P16 is changed (also shown on the “Cor” screen).

HEATING / COOLING CHANGEOVER

- Allowed at P22 = 0 and P09 = 0...5:
- hold [mode] + [▲] for 3 s → Heating; [mode] + [▼] for 3 s → Cooling.
- At P09 = 7, 8 the mode is selected automatically by input S2.

MANUAL CONTROL (MAN)

- Available at OFF or at P09 = 6, from the last screen:
- hold [▲] – the valve opens; hold [▼] – the valve closes;
- [On/Off] changes the pump mode: permanently on → 2 min → 5 min cycle (5 s on / 5 s off) → off.

PARAMETER ACCESS

- Hold [mode] + [On/Off] for 5 s.
- With a password set (P24 ≠ 0): enter it with [▲] / [▼] and confirm with [On/Off]; a wrong password is followed by a 60 s wait.
- [▲] / [▼] – next / previous parameter; [On/Off] – start / end of editing (the value flashes);
- hold [mode] for 3 s – exit and save.

SCREENS AND SYMBOLS

1 – main: S1 temperature, setpoint, mode



2 – outdoor temperature and valve position



3 – correction “Cor” (P16)



4 – manual control (MAN)

Symbol	Meaning
	Heating mode
	Cooling mode
AUTO / OFF / MAN	controller running / off / manual control
T1 / T2	valve closing / opening
T3	the pump is running
T6	frost protection – active
thermometer	water temperature setpoint (main screen)
tree	the setpoint is calculated from a curve (screen 2)
START	P09 = 7: the Heating / Cooling mode is selected by S2 (screen 2)
%	valve position; “---” until the first full closing

Symbol	Meaning
COMF	“Cor” screen – setpoint correction
padlock	parameter password set
HI	sensor missing or open circuit
--	temperature below -24°C

ALARMS AND PROTECTIONS

Event	Controller response	Reset
Sensor S1 fault	automatic valve control stops (manual control remains); the backlight flashes; shows “HI”	automatic
Missing sensor S2 at P09 = 0, 1	the setpoint becomes the midpoint between the minimum and maximum water temperature; screen 2 shows “HI”	automatic
Alarm zone (P10)	the valve is corrected without pause	return to the zone
Frost protection (P23)	the pump runs; the valve opens fully (in cooling – closes); symbol T6	S1 > P23
Travel limit	after 1.5 × P06 in one direction the output stops	change of direction
Power-up	10 s without control and without pump operation in AUTO	automatic

Warranty card

Please fill out the card for the warranty to be valid!

Manufacturer: Proxel Engineering Ltd., Plovdiv, office@proxel-bg.com

Type: ThermoB ☐ 3WHC432 ☐ 3WHC412V ☐ 230V AC ☐ 24V AC

Serial number: Date of manufacture:

Seller / Installer:

Address:

Date of sale (installation) / Stamp:

Sale / installation carried out by:

(name and signature)

Installation is carried out by: ☐ INSTALLER ☐ CUSTOMER