

OPERATING MANUAL

PRD3

Power and temperature controller
with probe and process-output support

KEY BENEFITS**PRECISION**

Accurate process
and measurement control

**SAFETY**

Protection at the
highest level

**RELIABILITY**

Stable and dependable
operation

**UPDATES**

Continuous improvement
and new functions

**IN THIS MANUAL**

- Device and safety information
- Installation and connection
- Configuration and operation
- Functions and settings
- Troubleshooting
- Updates and service

DOCUMENTATION AND SUPPORT

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1. Operating principle

PRD3 is a power and temperature controller for resistive loads. The controller measures temperatures from up to five DS18B20 probes, regulates heater power and can control additional OUT1-OUT3 outputs, e.g. cooling-water or process take-off valves.

MOST IMPORTANT The controller has two independent tasks: it regulates the heater power circuit and monitors process temperatures and outputs. OUT outputs are not heater outputs.

How operation proceeds

1. After power-up PRD3 starts the LCD, checks the probe bus and displays the firmware version.
2. If the probe configuration is incomplete, it starts the installation wizard and assigns roles using unique ROM addresses.
3. The user selects the application: DISTILLATION, SMOKING, SCALDING or BREWERY.
4. Depending on the settings, power is set manually or calculated by AUTO P / AUTO PI / AUTO PID.
5. Each probe alarm can indicate an overtemperature condition and trigger a process response.
6. OUT outputs are configured in the VALVES menu. Valve operation is shown in the attached diagram in section 10.

NOTICE Temperature charts and the liquid-level sensor are not described in this manual - they are not part of the currently published PRD3 configuration.

2. Key safety rules

DANGER PRD3 operates with mains voltage. Connecting the 3F version, replacing connectors and any work on the 230/400 V installation should be carried out by a suitably qualified person.

- Control only resistive loads intended for this type of regulation, e.g. heaters.
- Do not bypass thermal cut-outs, fuses or factory protections of the heated device.
- Do not exceed the rated parameters of any component in the circuit: cable, plug, socket, protection device, heater or installation.
- Plugs and sockets must be dry, undamaged and suitable for the actual load.
- Do not coil high-load cables tightly during operation.
- After moving a cold device into a warm room, wait until condensation has completely dried.
- The probe RJ45 is not Ethernet or PoE - do not connect it to a computer network.
- Before START, check that the probe controlling power shows a correct temperature.

WARNING The 3F version can use 1, 2 or 3 power channels, but the control electronics are powered from L1 + N. The N conductor must always be connected.

3. Versions, enclosure and connectors

PRD3 is available in several versions. Connector placement may differ between production series, so device photographs are illustrative only. The labels and connector table are authoritative.

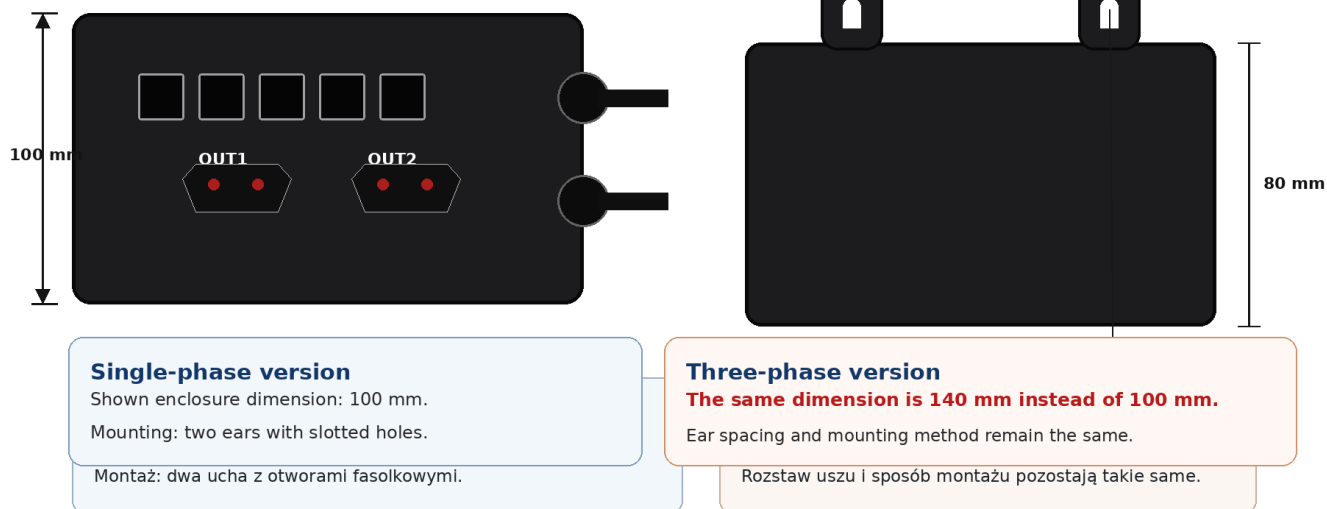
Item	Variant	Notes
Probes	up to 5 x DS18B20	5 RJ45 sockets are electrically connected in parallel
OUT1-OUT3	2 or 3 outputs	each selected at purchase
OUT 12 V	12 V DC / 1 A	5.5/2.1 mm plug, positive centre
OUT 230 V	230 V AC / 1 A	GN11 socket, narrow, without PE
USB	option	USB-B, A-B cable, PAMEL_BUS_AT service communication

4. Dimensions and mounting

Dimensions and mounting - reference sketch

Without front-panel elements. Views show the enclosure, connectors and

BOTTOM VIEW (inputs / outputs)



In the single-phase version the dimension shown in the sketch is 100 mm. In the three-phase version the same dimension is 140 mm. The mounting method and spacing of the mounting lugs remain the same.

DUO VERSION PRD3 can be supplied as a DUO version: the display with keypad is located in a separate small enclosure and connected to the main module by an approx. 2 m cable terminated with D-SUB connectors. The main module then has no display.

5. Probe RJ45 sockets - pinout

6. RJ45 PINOUT FOR DS18B20 PROBES

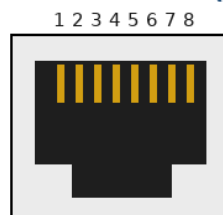
DS18B20 temperature probes with an RJ45 plug can be connected to the device. The diagram below shows the device ports, the RJ45 socket viewed from the front, pin assignment and the recommended 1-Wire bus topology.

IMPORTANT: All 5 RJ45 sockets operate in parallel on one 1-Wire bus. Probe functions are assigned in the installation menu, not by socket

DEVICE VIEW (RJ45 PORTS)



RJ45 SOCKET VIEW (FRONT)



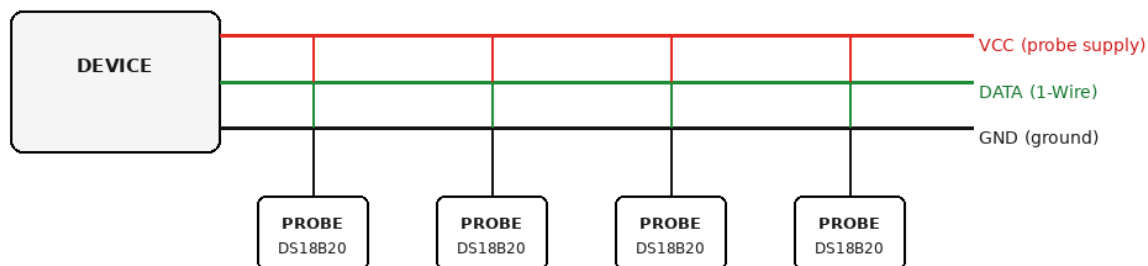
RJ45 PIN ASSIGNMENT (DS18B20)

PIN	SIGNAL	DESCRIPTION
1	—	not connected
2	—	not connected
3	GND	ground (0 V)
4	I/O (DATA)	1-Wire data line
5	—	not connected
6	VCC	probe supply (VCC)
7	—	not connected
8	—	not connected

NOTES:

- Pin 3 = GND, Pin 4 = I/O (DATA), Pin 6 = VCC.
- Other pins are not used for a standard DS18B20 probe.
- Use a common ground (GND) between the device and all probes.
- The maximum 1-Wire length depends on cable quality and number of probes; route

1-WIRE TOPOLOGY (PARALLEL BUS)



Up to 5 probes on one 1-Wire bus

IMPORTANT: Do not connect probe VCC or GND to any other supply source. Connect all probes in parallel to the RJ45 sockets in the device.

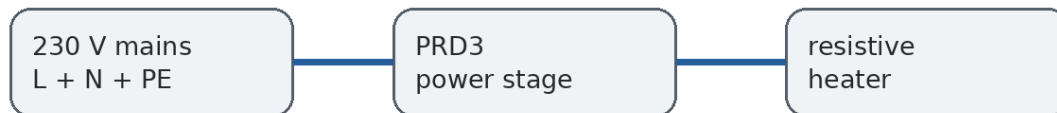
All five RJ45 sockets are connected in parallel. The controller does not identify a probe function by socket number, but by the 64-bit ROM address stored during installation.

IMPORTANT A correctly installed probe can be moved to another of the five RJ45 sockets - its role will remain unchanged.

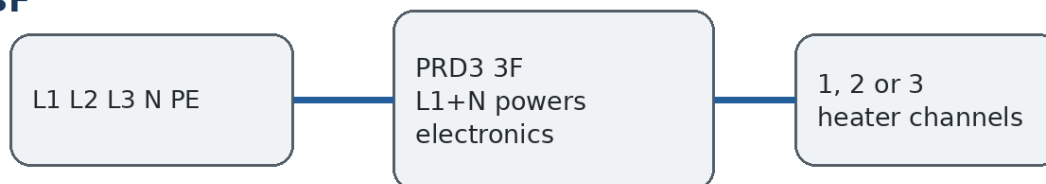
6. Power circuit 1F and 3F

Power circuit - connection principle

1F



3F



In the 3F version the N conductor is always required. L2 and L3 are additional power channels.

Version	Heater circuit
1F	max. 25 A, standard cable 3x2.5 mm ²
3F	max. 3 x 25 A power channels, standard cable 5x2.5 mm ² ; L1+N powers the electronics

WARNING The permissible current of the complete set is also limited by the actual current-carrying capacity of the plugs, sockets, cables, protection devices and installation used. Never exceed the rated value of any component.

The 3F version has three power channels controlled by the same control signal. It can operate with one, two or all three channels loaded. Equal loading is not required, but L1 + N are required to power the electronics.

7. First start-up

1. Mount the controller in a dry, ventilated place.
2. Before switching on, connect the heater and probes. In 3F check L1, N and PE as well as the used L2/L3 phases.
3. Switch on power using the physical power switch.
4. Check the version screen and the number of detected probes.
5. If the probe wizard starts, perform the installation function by function.
6. Check that the probe controlling power shows a plausible temperature.
7. Select the operating mode and set temperatures, power, alarms and valves.
8. Before the real process, perform a test with a safe load and check the OUT response.

TIP After changing from group control to phase control or vice versa, the controller displays a request to switch the power off and on again.

8. Three buttons and navigation

PRD3 uses three buttons below the LCD. Program messages use the pattern <<< OK >>>.

LEFT	CENTRE / OK	RIGHT
previous item / decrease	confirm / next	next item / increase

Holding a button while changing a value speeds up adjustment. Enter settings during start-up by holding the centre button. The service test can be started from the settings menu; the combination of the outer buttons at start-up is intended for the service test.

9. Operating modes

DISTILLATION - full power control, alarms, 5 probes and process valves.

SMOKING - three stages: heating, drying, smoking.

SCALDING - temperature and time of a single scalding process.

BREWERY - sequence of brewing process steps.

NOTICE Select only modes visible in the device menu. In the current version these are: DISTILLATION, SMOKING, SCALDING and BREWERY.

10. OUT valve operation - diagram

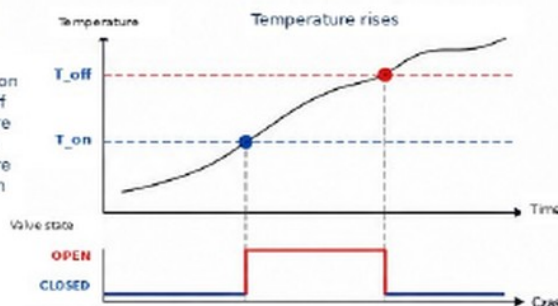
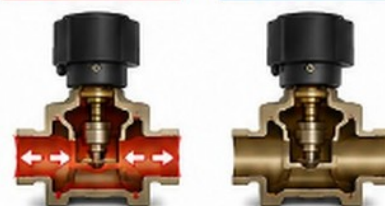
Valve operation is shown in the attached diagram. Valve operating logic is not described in text.

IMPORTANT Valve operation is shown in the attached diagram.

VALVE OPERATION IN DIFFERENT MODES

HYSTERESIS mode

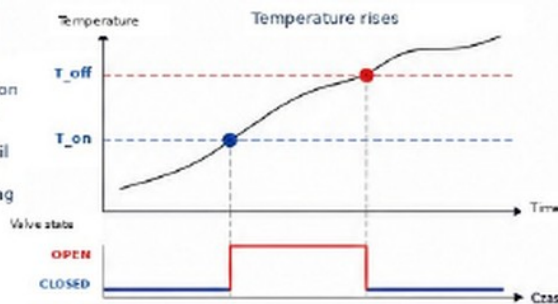
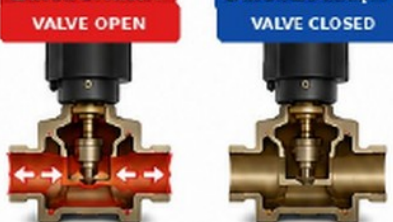
The valve switches on as temperature rises after T_{on} is exceeded. It switches off at T_{off} . When temperature falls, it does not switch on again until the temperature drops below T_{on} and then starts rising.


VALVE OPEN
VALVE CLOSED


- T_{off} - switch-off temperature
- T_{on} - switch-on temperature
- The valve opens only while temperature is rising after T_{on} is exceeded.
- The valve closes after reaching T_{off} .
- When temperature falls, the valve does not switch on again until it drops below T_{on} and starts rising.

WINDOW mode

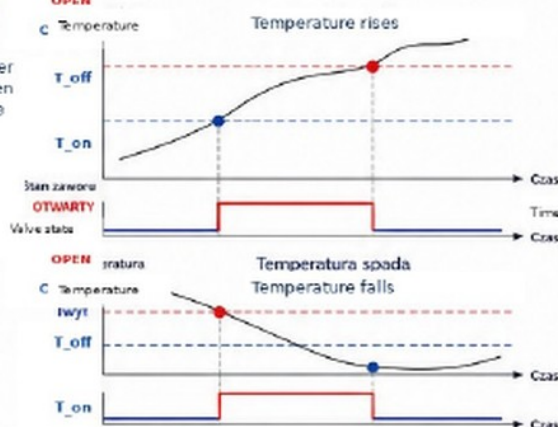
The valve opens as temperature rises after T_{on} is exceeded and closes at T_{off} . When temperature falls, it remains closed until the temperature drops below T_{on} and starts rising again.


ZAWÓR OTWARTY
ZAWÓR ZAMKNIĘTY


- T_{off} - switch-off temperature
- T_{on} - switch-on temperature
- The valve opens only while temperature is rising after T_{on} is exceeded.
- The valve closes after reaching T_{off} .
- When temperature falls, the valve does not switch on again until it drops below T_{on} and starts rising.

WINDOW 2 mode

The valve is open whenever the temperature is between T_{on} and T_{off} - both while the temperature is rising and while it is falling.


ZAWÓR OTWARTY
ZAWÓR ZAMKNIĘTY

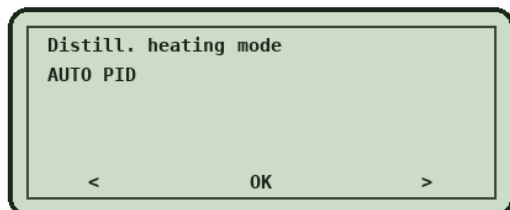

- T_{off} - switch-off temperature (upper window limit)
- T_{on} - switch-on temperature (lower window limit)
- The valve is always open when the temperature is between T_{on} and T_{off} - while rising and while falling.

T_{off} - switch-off temperature (upper window limit)

T_{on} - switch-on temperature (lower window limit)

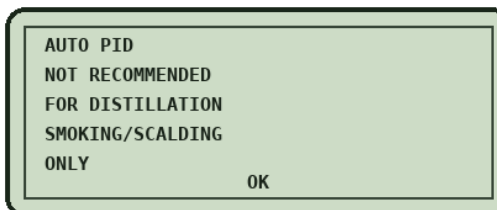
Hysteresis - temperature difference between T_{off} and T_{on}

AUTOMATIC CONTROLLERS AND AUTOTUNING



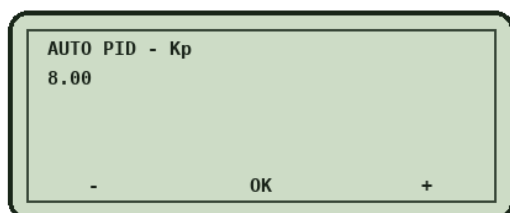
AUTO PID selection

Select the mode with < / OK / >.



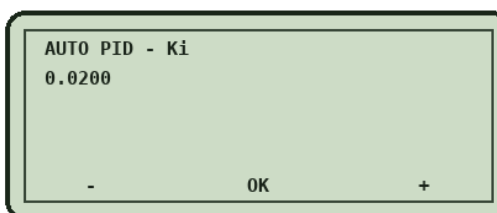
AUTO PID warning

For distillation start with AUTO P or AUTO PI.



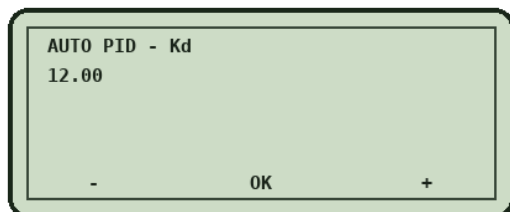
AUTO PID - Kp

Range 0.10-100.00; step 0.10.



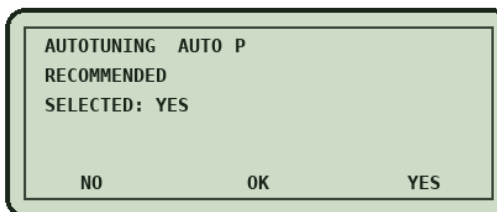
AUTO PID - Ki

Range 0.00001-10.0000; step 0.0001.



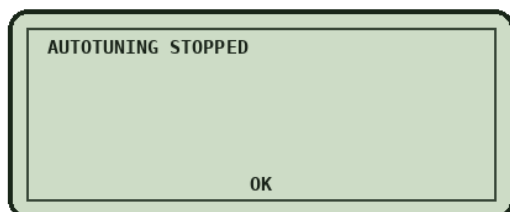
AUTO PID - Kd

Range 0-10000; step 0.10.



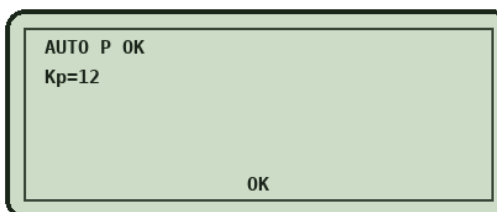
Start autotuning

LEFT=NO, CENTER=OK, RIGHT=YES.



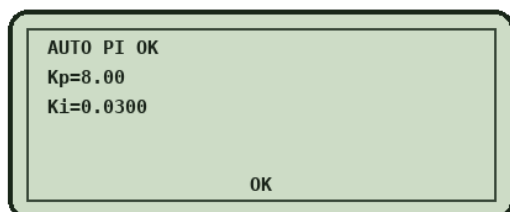
Autotuning interrupted

After interruption the controller returns to operation.



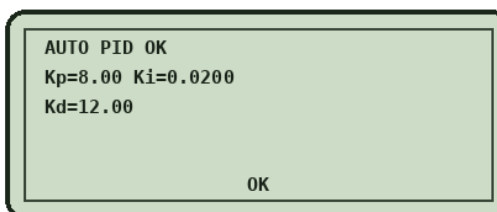
AUTO P result

After success Kp is shown.



AUTO PI result

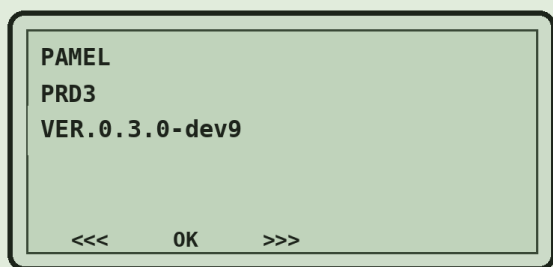
After success Kp and Ki are shown.



AUTO PID result

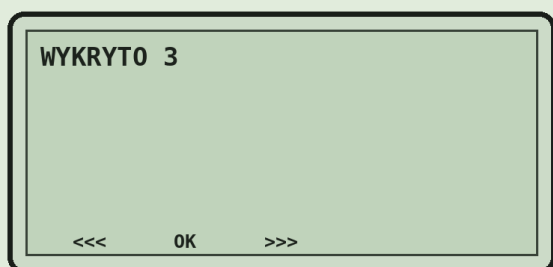
After success Kp, Ki and Kd are shown.

11. Screen atlas - Start and navigation



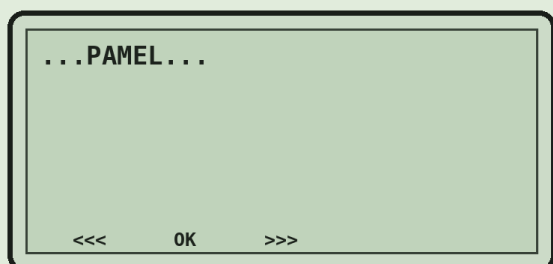
Start screen

Shows the model and firmware version VER.0.3.0-dev9. Provide the version to service.



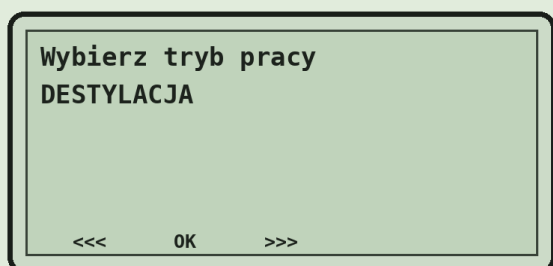
Number of detected probes

Information after start-up about the number of devices found on the 1-Wire bus.



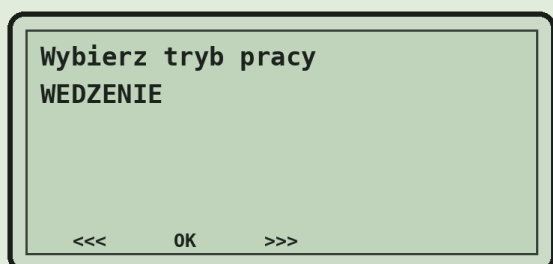
Device name

Displays the stored device name/nickname.



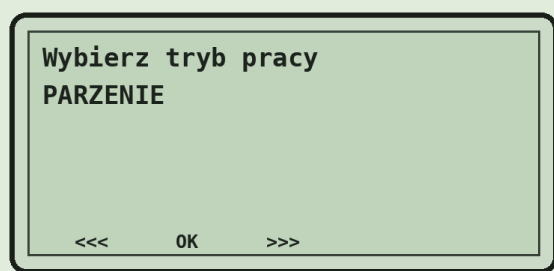
Operating mode selection

Use LEFT/RIGHT to select the application; OK confirms.



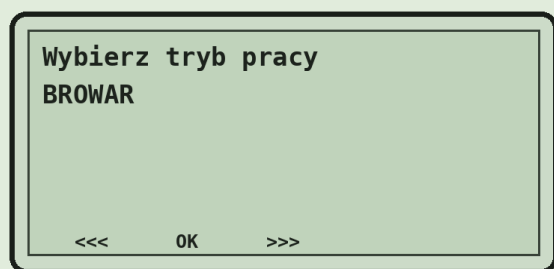
Operating mode selection

Use LEFT/RIGHT to select the application; OK confirms.



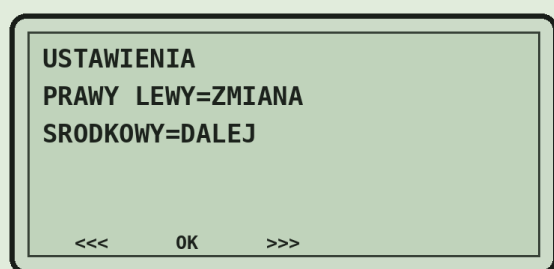
Operating mode selection

Use LEFT/RIGHT to select the application; OK confirms.



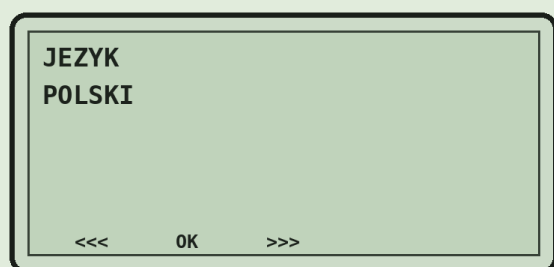
Operating mode selection

Use LEFT/RIGHT to select the application; OK confirms.



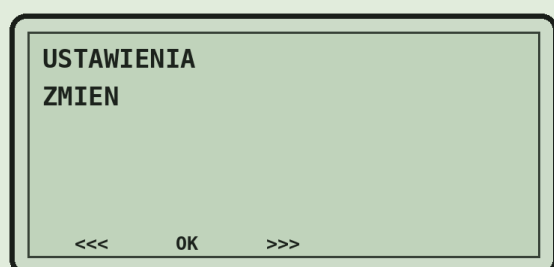
Enter settings

To enter settings during start-up, hold the centre button.



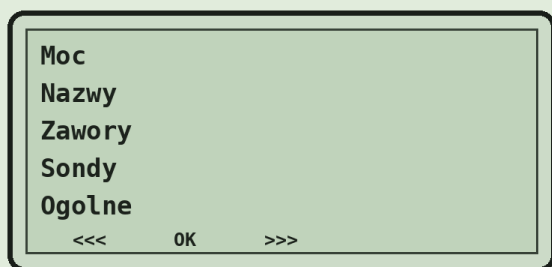
Language selection

Available: PL, EN, CZ, SK. The selection is saved after confirmation.



Settings entry mode

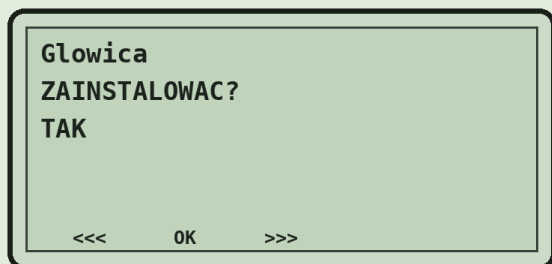
CHANGE opens the settings categories; RESET and TEST are service functions.



Category menu

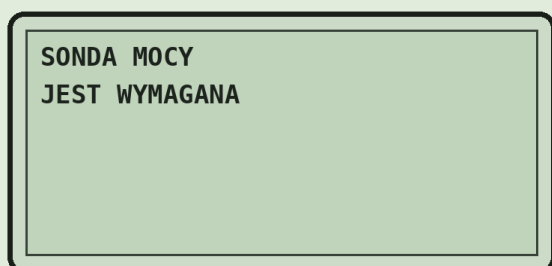
Highlight an item and confirm with OK. NONE is a reserved item with no function.

12. Screen atlas - Probe installation



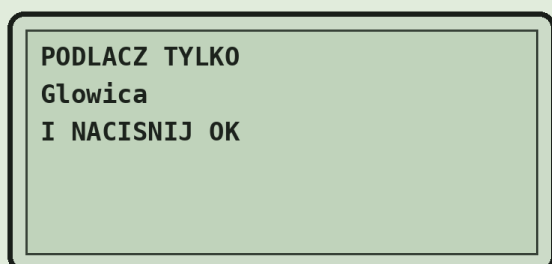
Install probe?

The wizard goes through probe roles one by one. Select YES or NO for each role.



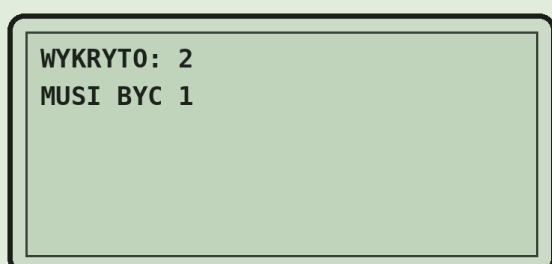
Power probe required

The role currently selected for power control cannot be skipped.



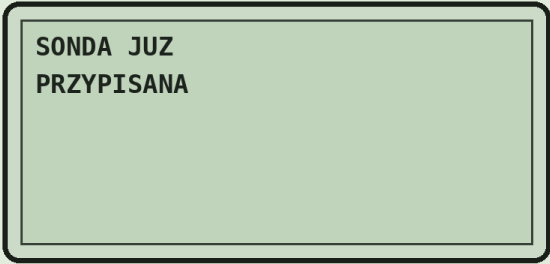
Connect only one probe

During assignment only one probe being installed may be connected to the bus.



Incorrect number of probes

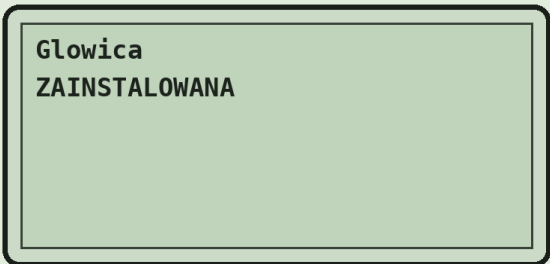
Disconnect the remaining probes and repeat detection.



SONDA JUZ
PRZYPISANA

Probe already assigned

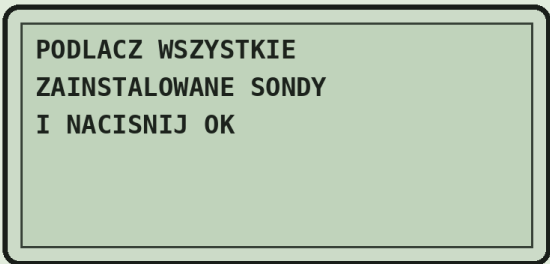
The same ROM address cannot be assigned to two roles.



Głowica
ZAINSTALOWANA

Probe installed

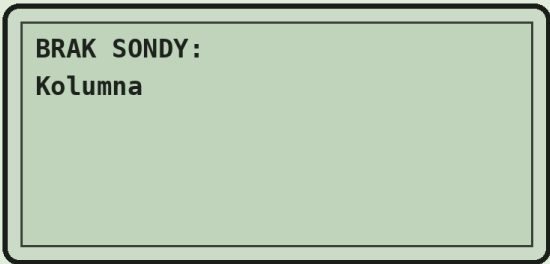
Confirmation that the probe address for the given role has been saved.



PODLACZ WSZYSTKIE
ZAINSTALOWANE SONDY
I NACISNIJ OK

Set check

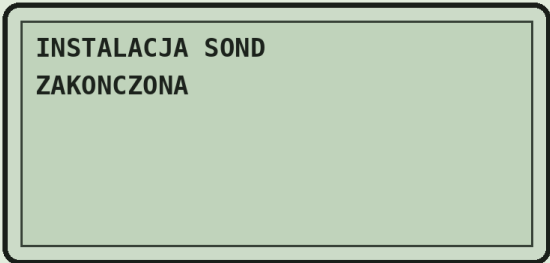
After assigning the roles, connect the full set and perform the check.



BRAK SONDY:
Kolumna

No installed probe

The controller identifies a probe by its ROM address, regardless of the RJ45 socket.



INSTALACJA SOND
ZAKONCZONA

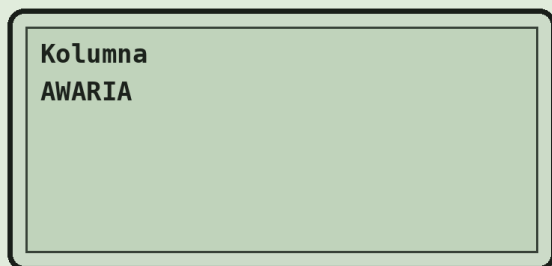
End of installation

After this message you can operate with the full set of probes.



Probe not selected

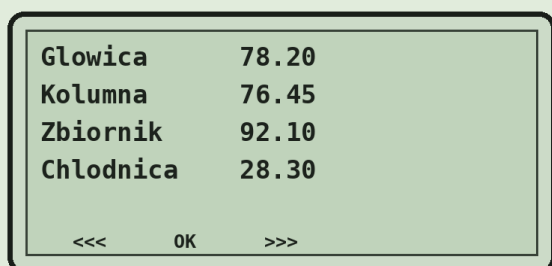
--- indicates a role that has not been installed.



Probe failure

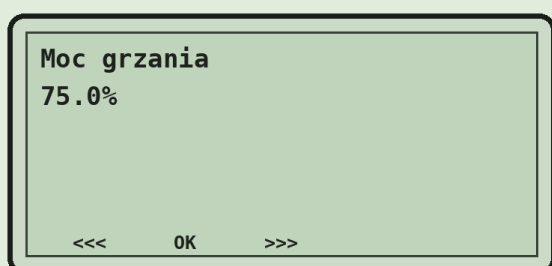
FAILURE means that consecutive valid readings are missing from a probe that was installed.

13. Screen atlas - Distillation



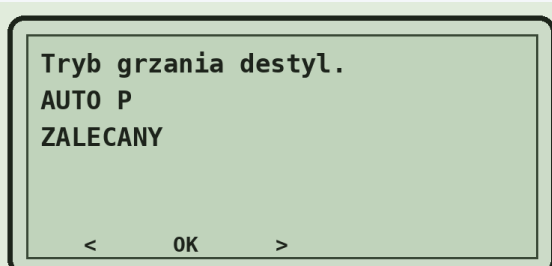
Process temperatures

Measurement screen. Probe names can be changed.



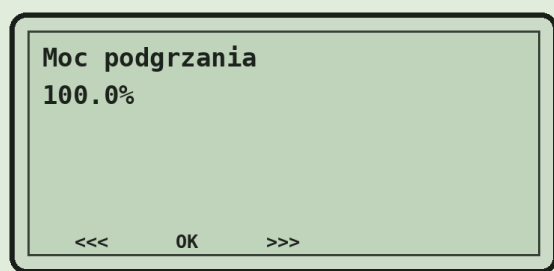
Manual power

In manual mode LEFT/RIGHT changes power by the configured step.



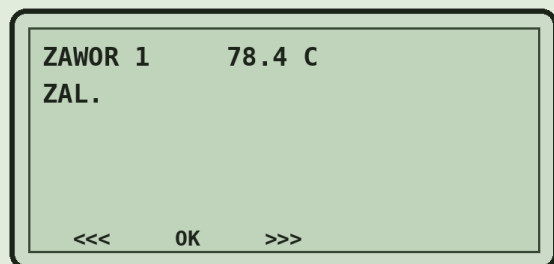
Automatic regulation

The regulator calculates power automatically. Available: AUTO P, AUTO PI and AUTO PID.



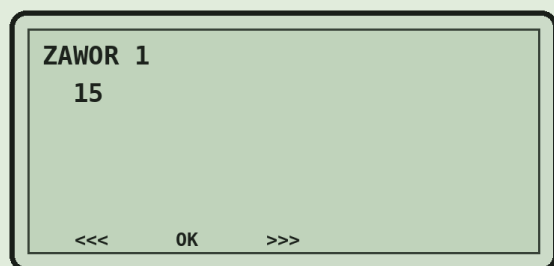
Preheating

Below the set temperature the controller may maintain maximum power.



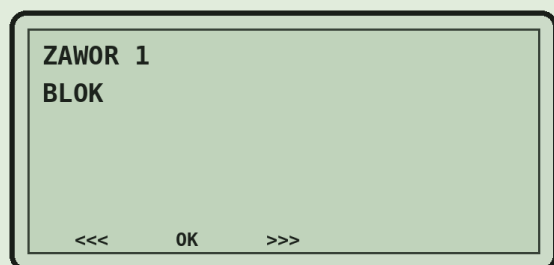
OUT1 status

View of the OUT status and temperature of the assigned probe, if it is operating correctly.



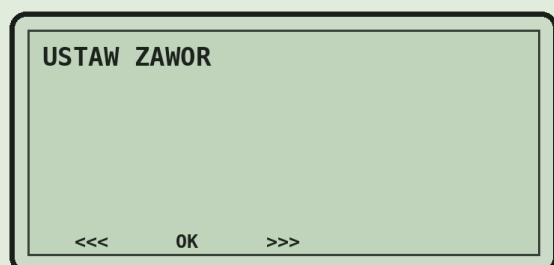
OUT time countdown

View of the time associated with the OUT setting.



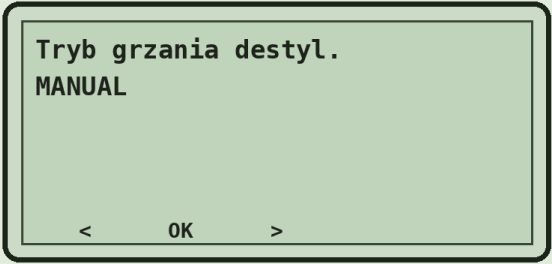
BLOCK message

Message for a timed mode. Valve operation is shown in the attached diagram.



Enter valve settings

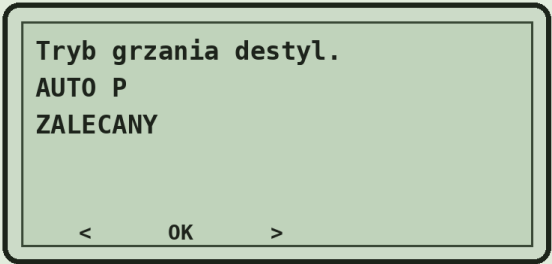
Opens the parameter card for the selected OUT output.



Tryb grzania destyl.
MANUAL

Heating mode - MANUAL

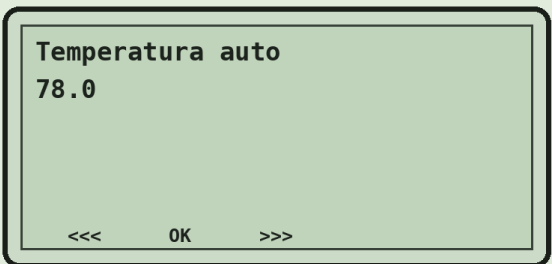
Power is set by the user. A probe is not required; safety interlocks remain active.



Tryb grzania destyl.
AUTO P
ZALECANY

Heating mode - AUTO P

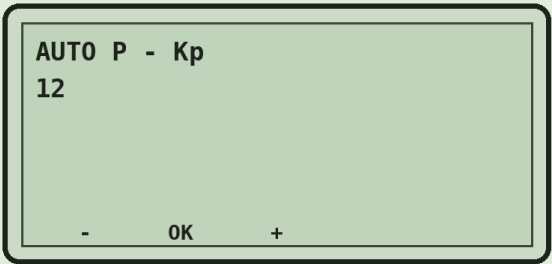
P controller. Recommended and factory-default mode. Selection: < / OK / >.



Temperatura auto
78.0

AUTO temperature

Setpoint of the automatic regulator; the range depends on the process.

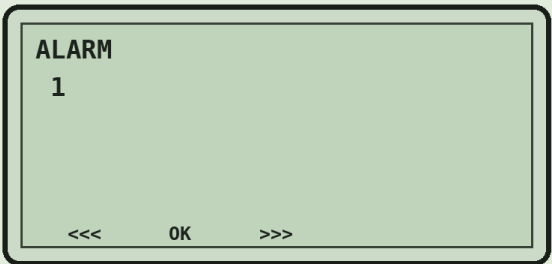


AUTO P - Kp
12

AUTO P - Kp

Kp: range 1-50, step 1. Set manually or by autotuning.

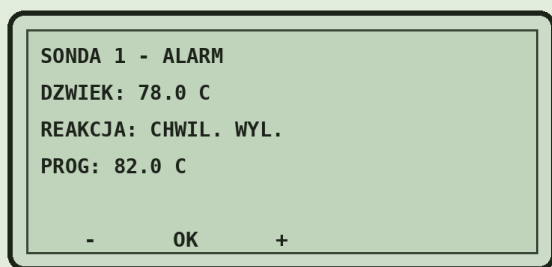
14. Screen atlas - Alarms



ALARM
1

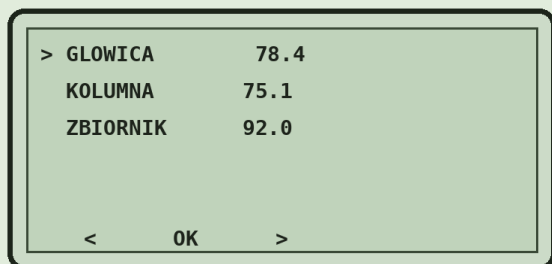
Alarm on screen

The number indicates the probe that triggered the alarm. The cause must clear before the state disappears.



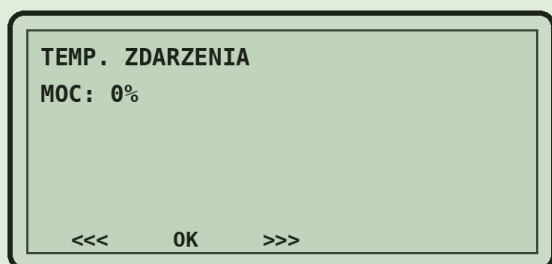
Probe alarm - one screen

The sound threshold, response type and response threshold are on one probe screen.



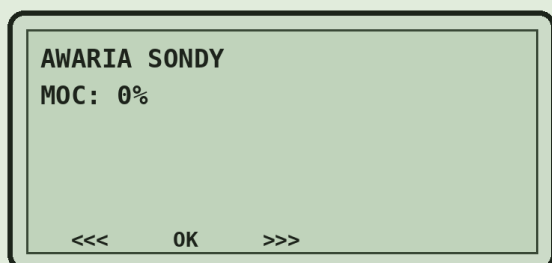
Select probe for alarm

LEFT/RIGHT selects a probe; a short OK opens its alarm.



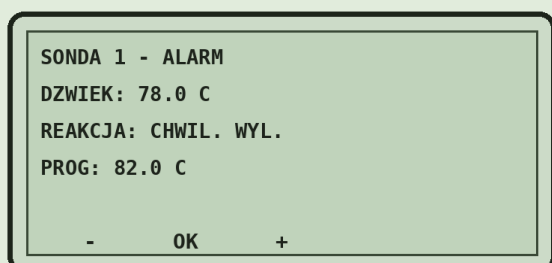
TEMP. EVENT

The top line shows the reason for a power cut-off associated with a temperature event.



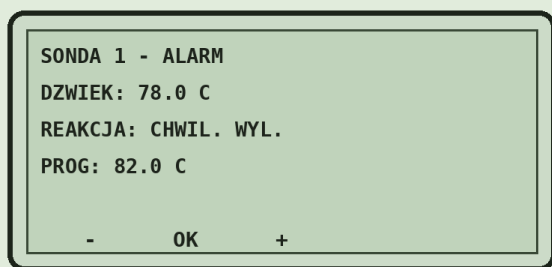
PROBE FAILURE

In AUTO, absence of the required valid probe sets power to 0%.



Alarm response threshold

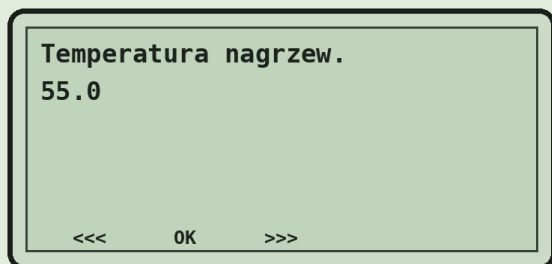
The response threshold is set on the common alarm screen of the given probe.



Alarm acknowledgement

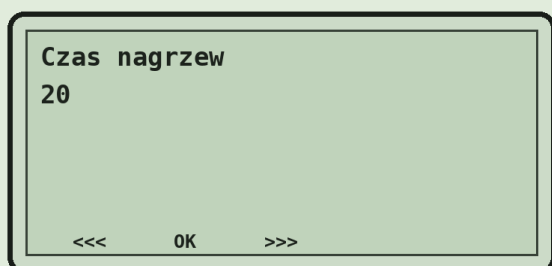
A short OK silences/acknowledges the alarm; the cause must be removed.

15. Screen atlas - Smoking



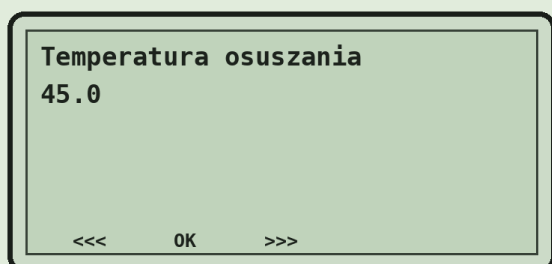
Heating temperature

Temperature of the heating stage.



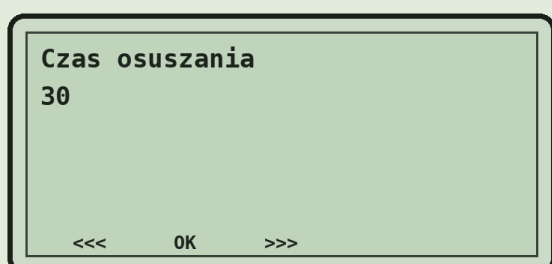
Heating time

Duration of the heating stage.



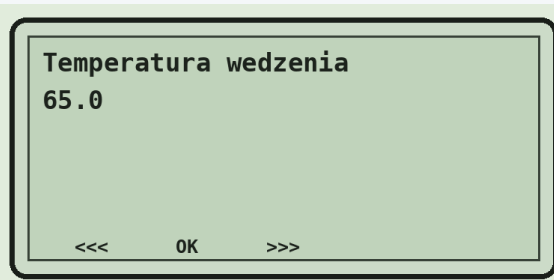
Drying temperature

Temperature of the drying stage.



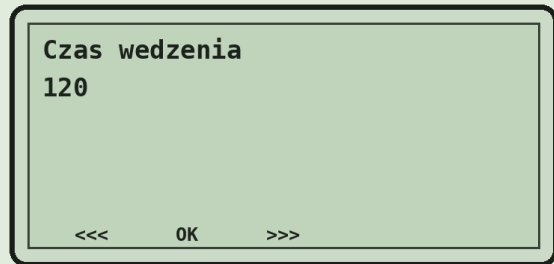
Drying time

Duration of the drying stage.



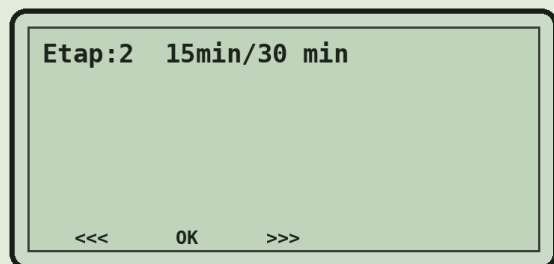
Smoking temperature

Temperature of the smoking stage.



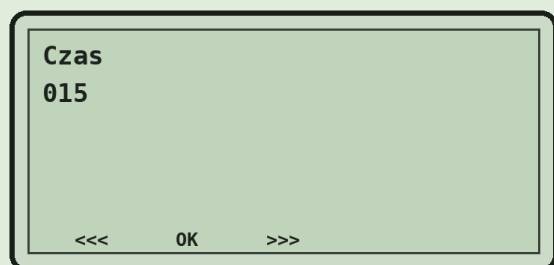
Smoking time

Duration of the smoking stage.



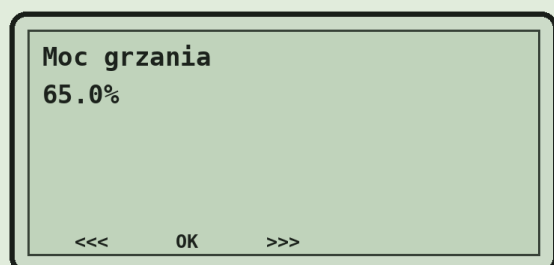
Stage operation screen

Shows the stage number and elapsed/set time.



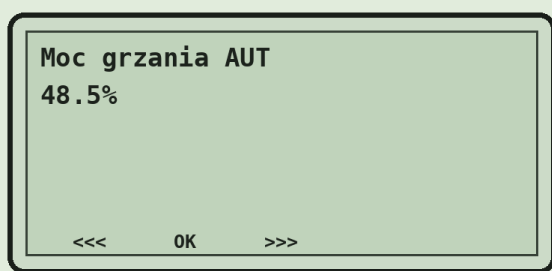
Time

Screen for viewing or correcting time during operation.



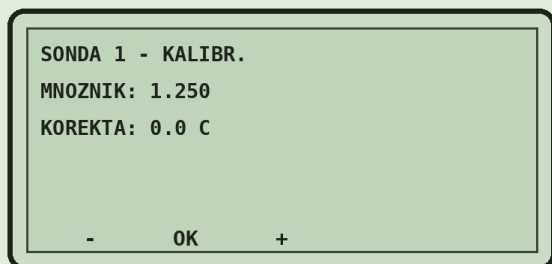
Power

View/change power in manual mode.



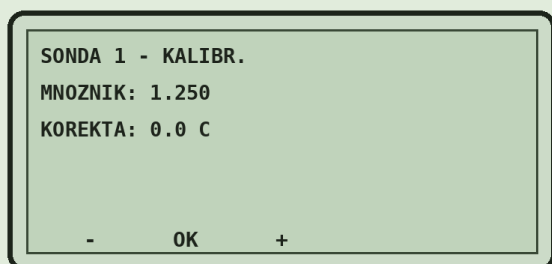
AUTO power

View of automatically calculated power.



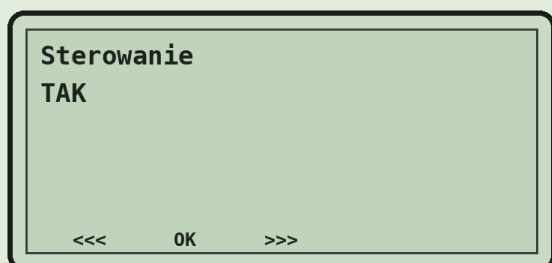
Process probe calibration

The current calibration screen contains two fields: MULTIPLIER and CORRECTION. Change them only after comparison with a reliable reference thermometer.



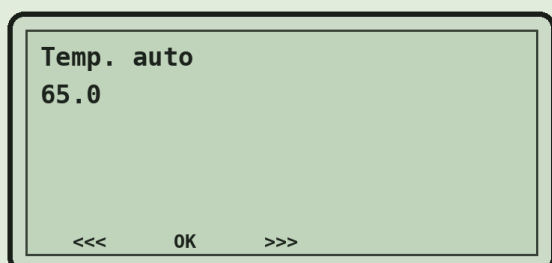
MULTIPLIER and CORRECTION

Typical factory values: MULTIPLIER 1.25 and CORRECTION 0.0. Uninstalled probes are skipped in the calibration menu.



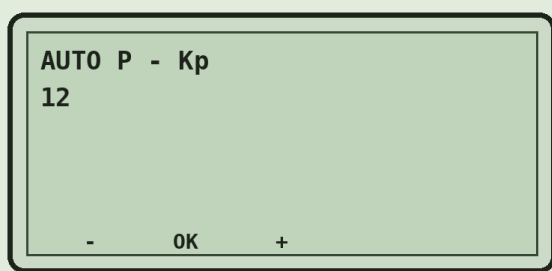
Probe control

Determines whether the probe participates in process temperature control/calculation.



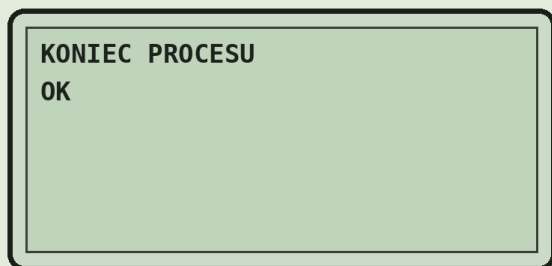
AUTO temperature

Automatic control target temperature for smoking.



AUTO P - Kp (smoking)

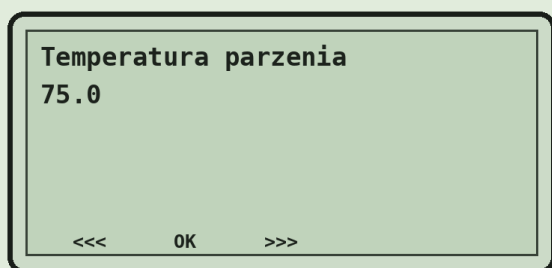
Kp of the P controller for smoking. AUTO P is the recommended starting mode.



End of process

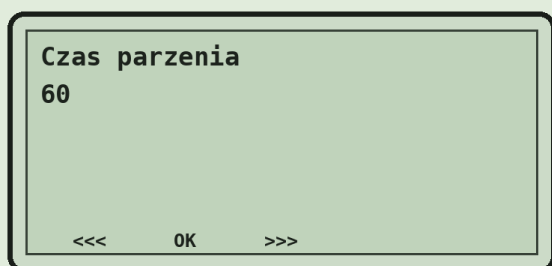
Process completed. OK acknowledges the message.

16. Screen atlas - Scalding



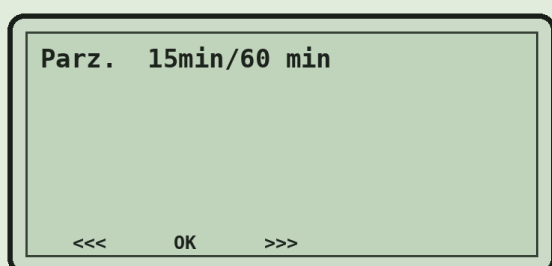
Scalding temperature

Scalding set temperature.



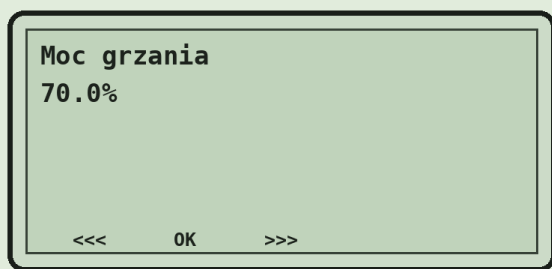
Scalding time

Duration of the scalding stage.

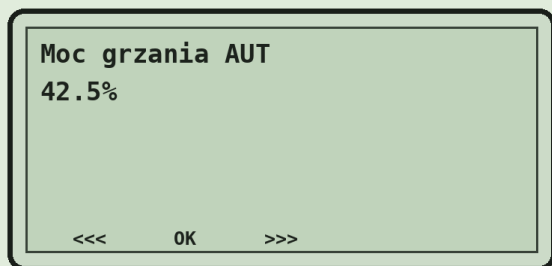


Operation screen

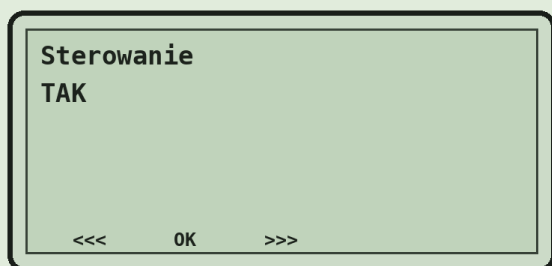
Shows elapsed and set time.

**Power**

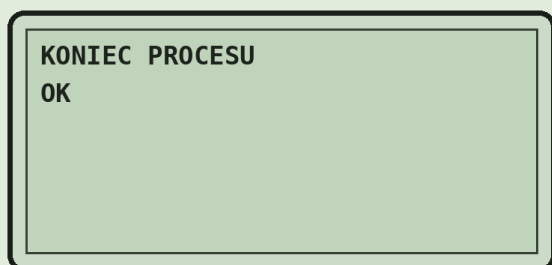
Power in manual mode.

**AUTO power**

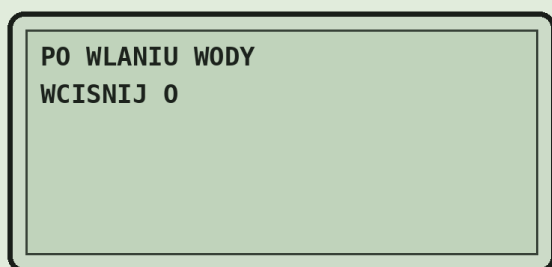
Automatically calculated power.

**Probe control**

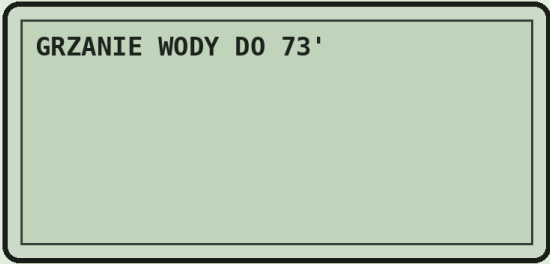
Selects the probes participating in process control.

**End of process**

Process completion acknowledgement.

17. Screen atlas - Brewery**Brewery stage**

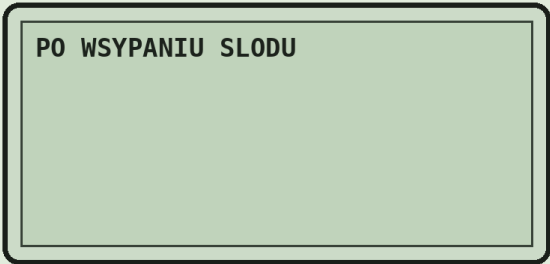
The screen guides the user through the next step of the brewing process.

A screenshot of a screen with a light green background and a black border. The text 'GRZANIE WODY DO 73'' is displayed in the top left corner.

GRZANIE WODY DO 73'

Brewery stage

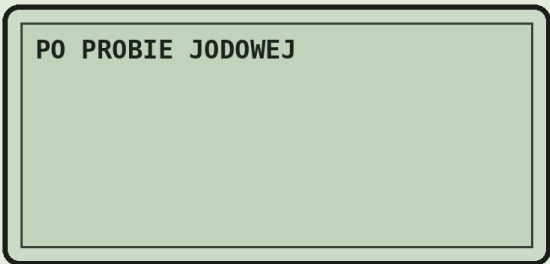
The screen guides the user through the next step of the brewing process.

A screenshot of a screen with a light green background and a black border. The text 'PO WSY PANIU SŁODU' is displayed in the top left corner.

PO WSY PANIU SŁODU

Brewery stage

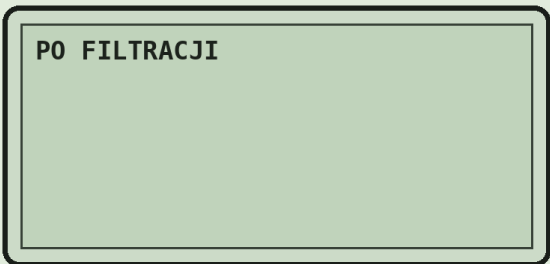
The screen guides the user through the next step of the brewing process.

A screenshot of a screen with a light green background and a black border. The text 'PO PROBIE JODOWEJ' is displayed in the top left corner.

PO PROBIE JODOWEJ

Brewery stage

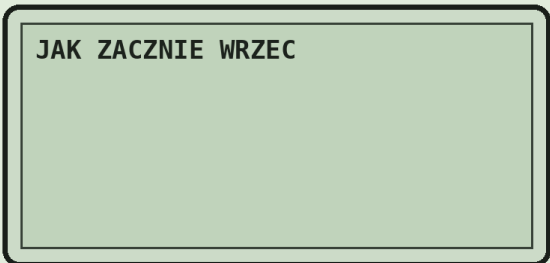
The screen guides the user through the next step of the brewing process.

A screenshot of a screen with a light green background and a black border. The text 'PO FILTRACJI' is displayed in the top left corner.

PO FILTRACJI

Brewery stage

The screen guides the user through the next step of the brewing process.

A screenshot of a screen with a light green background and a black border. The text 'JAK ZACZNIE WRZEC' is displayed in the top left corner.

JAK ZACZNIE WRZEC

Brewery stage

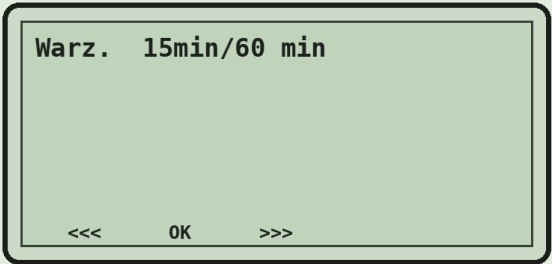
The screen guides the user through the next step of the brewing process.

A rectangular screen with a light green background and a black border. The word "KONIEC" is displayed in the top left corner in a black, sans-serif font.

KONIEC

Brewery stage

The screen guides the user through the next step of the brewing process.

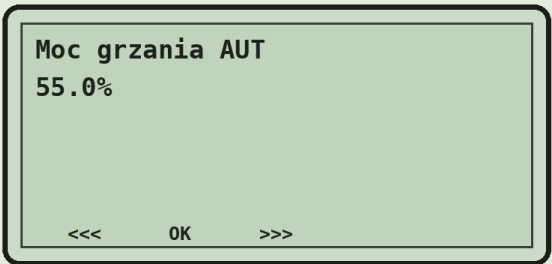
A rectangular screen with a light green background and a black border. The text "Warz. 15min/60 min" is displayed in the top left corner. At the bottom, there are three navigation options: "<<<", "OK", and ">>>".

Warz. 15min/60 min

<<< OK >>>

Brewing time

View of the time for the current stage.

A rectangular screen with a light green background and a black border. The text "Moc grzania AUT" and "55.0%" is displayed in the top left corner. At the bottom, there are three navigation options: "<<<", "OK", and ">>>".

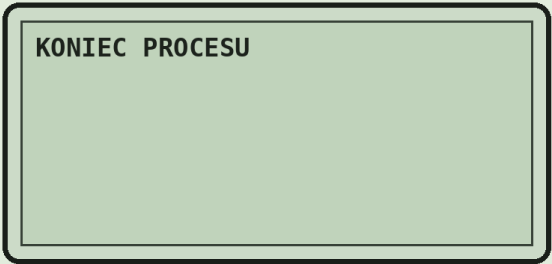
Moc grzania AUT
55.0%

<<< OK >>>

AUTO power

View of automatically regulated power.

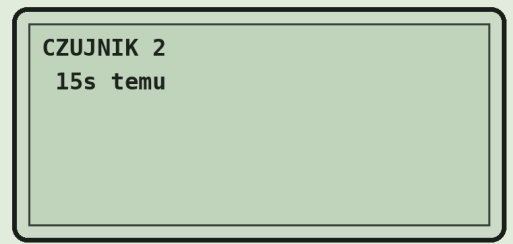
18. Screen atlas - Process messages

A rectangular screen with a light green background and a black border. The text "KONIEC PROCESU" is displayed in the top left corner.

KONIEC PROCESU

End of process

The controller stopped the cycle according to the program logic.

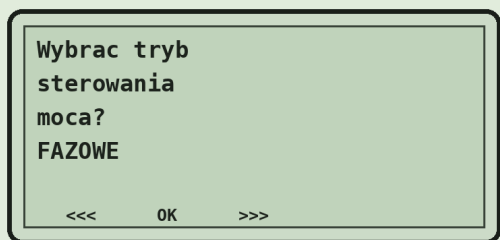
A rectangular screen with a light green background and a black border. The text "CZUJNIK 2" and "15s temu" is displayed in the top left corner.

CZUJNIK 2
15s temu

Sensor causing the stop

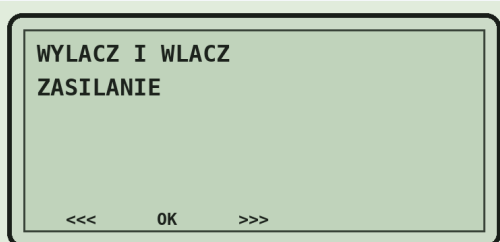
Shows the sensor number and the time since the event.

19. Screen atlas - Settings - Power



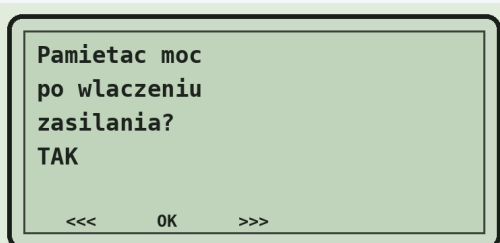
Power control mode

The user selects PHASE or GROUP. A restart is required after a change.



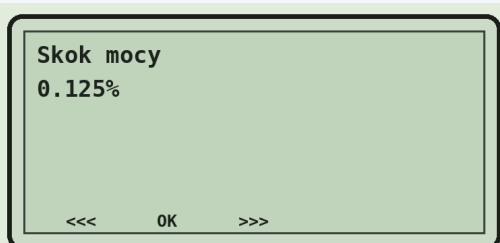
Restart after change

The message forces a restart after changing phase/group control.



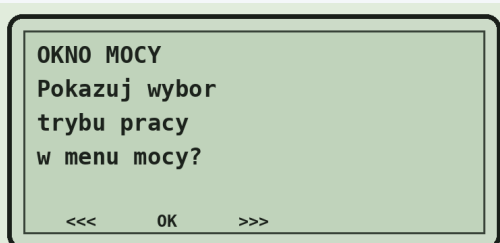
Power memory

Determines whether manual power is restored after power-up.



Power step

Power change step. Firmware range: 0.125-10.000%.



Power window

Enables an additional operating-mode selection in the power menu.

Dodatkowa grzałka
wersja z 3 wyjściem
TAK

<<< OK >>>

Additional heater

Additional-heater function in the version with a third output.

Temp. odłączenia
dodatkowej grzałki
50.0

<<< OK >>>

Additional heater cut-off temp.

Temperature threshold that switches off the additional heater.

Nr sondy
sterującej dodatk.
grzałka: 3

<<< OK >>>

Additional heater probe

Selection of probe 1-5 controlling the additional heater.

Moc grzałki
jesli wpiszesz '0'
moc bedzie w %
5500W

<<< OK >>>

Heater power in W

The entered power allows the value to be displayed in W; 0 means operation in percent.

Tryb grzania destyl.
AUTO P
ZALECANY

< OK >

Distillation heating mode

MANUAL / AUTO P / AUTO PI / AUTO PID. For distillation start with AUTO P or AUTO PI.

Moc
w czasie destylacji
75.000%

<<< OK >>>

Distillation power

Starting/manual power for distillation.

Temperatura
ponizej ktorej
zawsze moc=Pmax
50.0

<<< OK >>>

Pmax threshold

Below this temperature the regulator may maintain maximum power.

Minimalna moc
w czasie destylacji
10%

<<< OK >>>

Minimum distillation power

Lower power limit of the automatic regulator.

Maksymalna moc
w czasie destylacji
100%

<<< OK >>>

Maximum distillation power

Upper power limit of the automatic regulator.

Temperatura do
ktorej ma dazyc
automatyczna regulacja
78.0

<<< OK >>>

Automatic temperature

Automatic control target.

AUTO PI - Kp
8.00

- OK +

AUTO PI - Kp

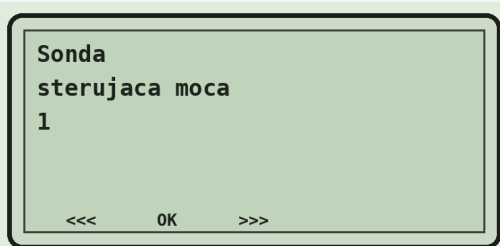
Range 0.10-100.00; step 0.10; factory default 8.00.

Minimalna moc
w czasie wedzenia
0%

<<< OK >>>

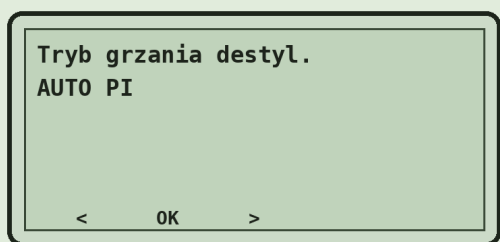
Minimum smoking power

Lower power limit for smoking.



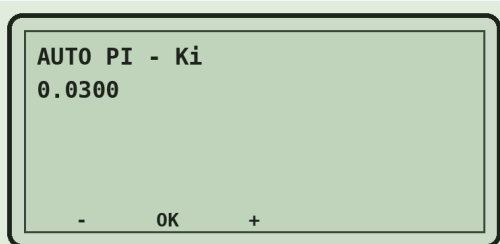
Power probe

Probe 1-5 used by the power regulator. It must be installed.



Smoking heating mode

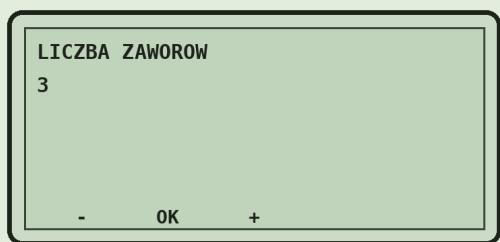
MANUAL / AUTO P / AUTO PI / AUTO PID. AUTO PID is an advanced mode.



AUTO PI - Ki

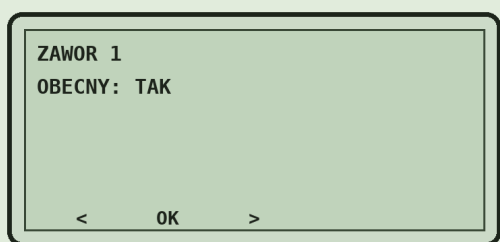
Range 0.00001-10.0000; step 0.0001; factory default 0.0300.

20. Screen atlas - Settings - Valves



Number of valves

Number of physically available OUT outputs: 1-3.



Output present

Whether the given OUT output is used.

ZAWOR 1
 RODZAJ: N. ZAM.
 TRYB: HISTERESIS
 STEROW.: AUTO
 < OK >

Valve type

NORMALLY OPEN / NORMALLY CLOSED - according to the valve used.

ZAWOR 1
 RODZAJ: N. OTW.
 TRYB: HISTERESIS
 STEROW.: AUTO
 < OK >

Valve mode - HYSTERESIS

Mode-selection item. Operation is shown in the attached diagram.

ZAWOR 1
 RODZAJ: N. OTW.
 TRYB: OKNO
 STEROW.: AUTO
 < OK >

Valve mode - WINDOW

Mode-selection item. Operation is shown in the attached diagram.

ZAWOR 1
 RODZAJ: N. OTW.
 TRYB: OKNO 2
 STEROW.: AUTO
 < OK >

Valve mode - WINDOW 2

Mode-selection item. Operation is shown in the attached diagram.

ZAWOR 1
 RODZAJ: N. OTW.
 TRYB: PRZEDGON
 STEROW.: AUTO
 < OK >

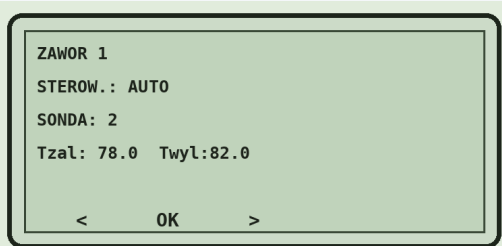
Valve mode - HEADS

Mode-selection item in the valve card.

ZAWOR 1
 RODZAJ: N. OTW.
 TRYB: POGON
 STEROW.: AUTO
 < OK >

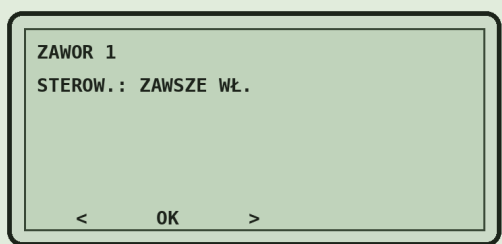
Valve mode - TAILS

Mode-selection item in the valve card.



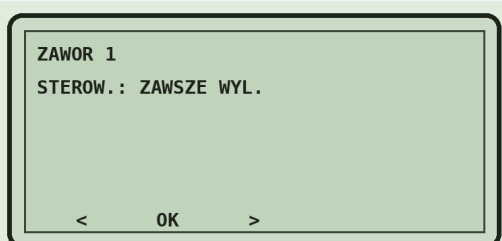
AUTO mode

Automatic control according to the saved configuration.



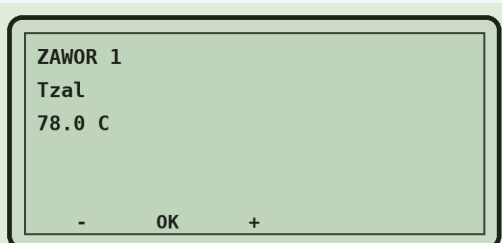
Always ON

Manual forcing of a permanently ON state.



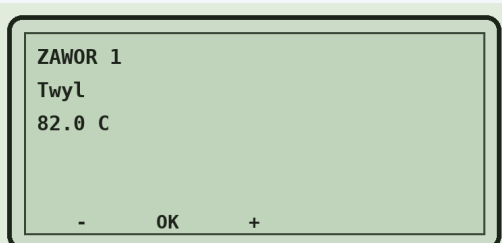
Always OFF

Manual forcing of a permanently OFF state.



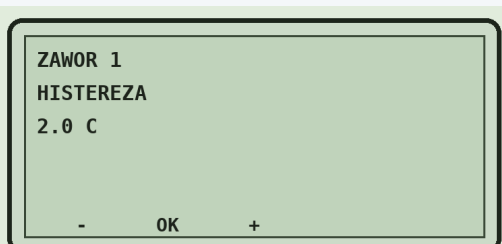
T-on

T-on temperature parameter in the valve card.



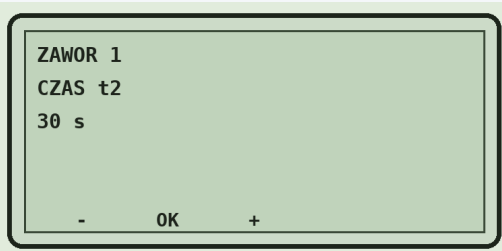
T-off

T-off parameter; the field is visible only when used.



Hysteresis

Range 0-10 C; the field is visible only when used.



Time / delay

Time parameter; availability depends on the selected mode.



Time t2

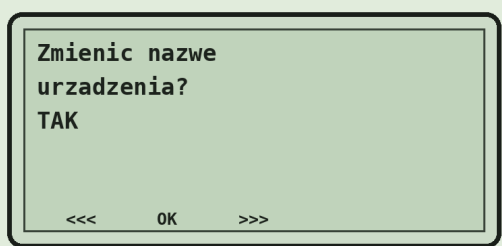
Additional time parameter; only for modes that use it.



Valve probe

Selection of probe 1-5 assigned to the output.

21. Screen atlas - Settings - Names



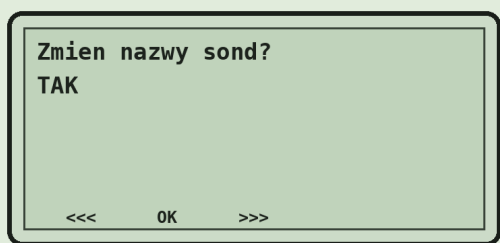
Device name

A custom nickname/name displayed at start-up can be set.



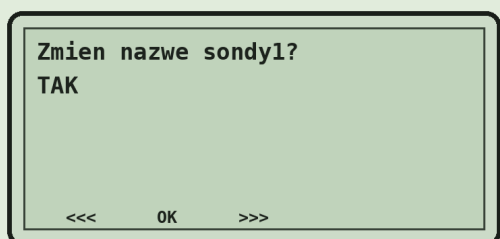
Edit name

Change successive characters with the buttons; OK moves to the next character.



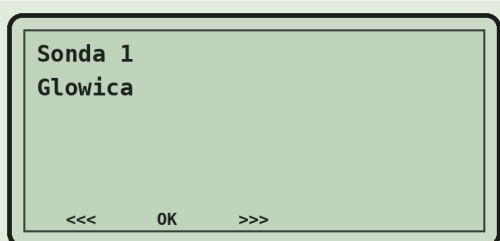
Change probe names

Opens successive probe-name screens.



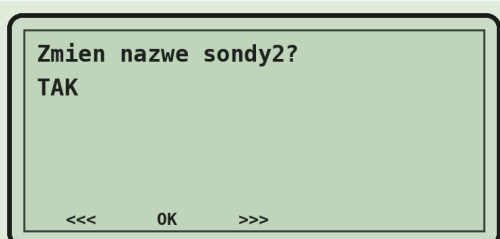
Probe 1 name

Allows changing the name of probe 1 in basic/distillation mode.



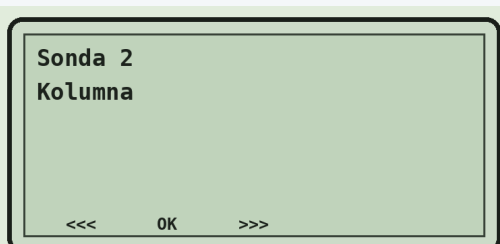
Edit probe 1

Character-by-character editing; the name is displayed with the temperature.



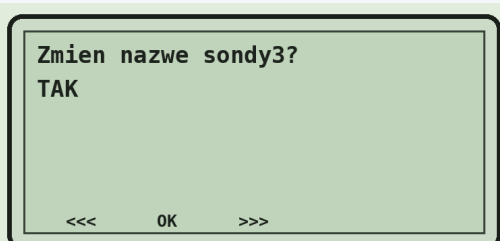
Probe 2 name

Allows changing the name of probe 2 in basic/distillation mode.



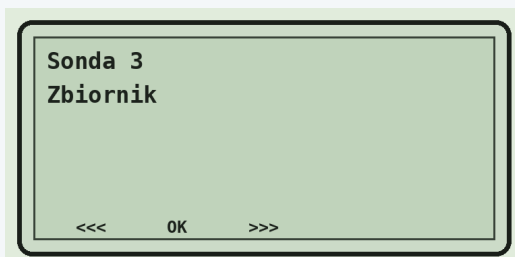
Edit probe 2

Character-by-character editing; the name is displayed with the temperature.



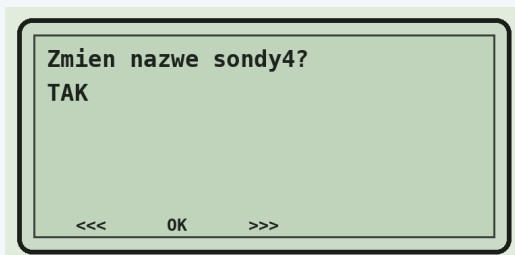
Probe 3 name

Allows changing the name of probe 3 in basic/distillation mode.



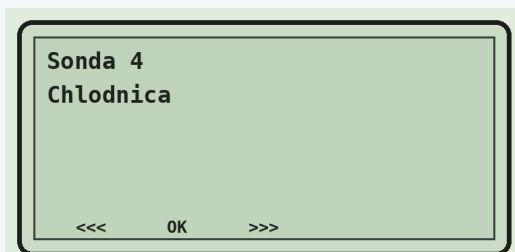
Edit probe 3

Character-by-character editing; the name is displayed with the temperature.



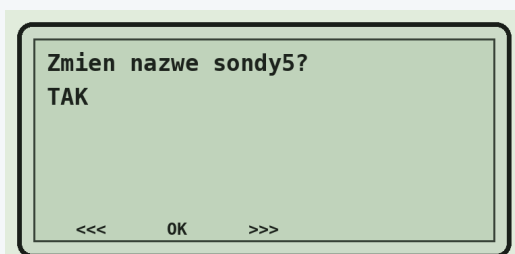
Probe 4 name

Allows changing the name of probe 4 in basic/distillation mode.



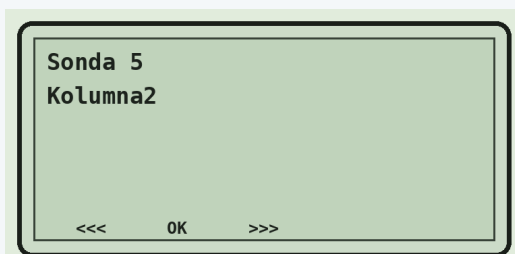
Edit probe 4

Character-by-character editing; the name is displayed with the temperature.



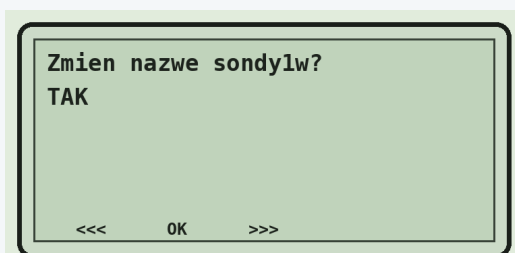
Probe 5 name

Allows changing the name of probe 5 in basic/distillation mode.



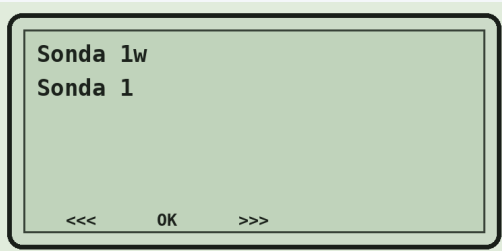
Edit probe 5

Character-by-character editing; the name is displayed with the temperature.



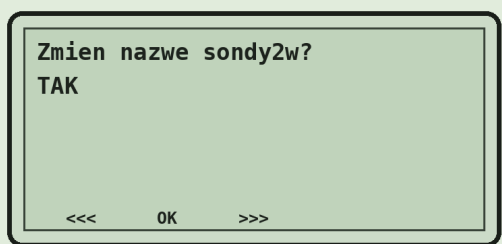
Probe 1w name

Separate name of probe 1 for smoking/scalding mode, as implemented in the firmware.



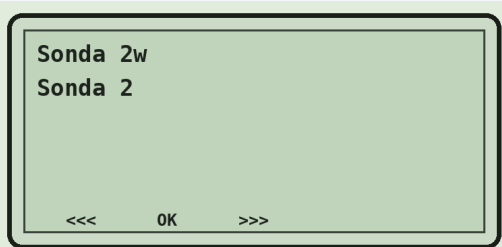
Edit probe 1w

Edits the name used in process modes.



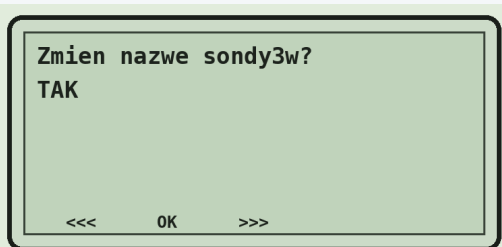
Probe 2w name

Separate name of probe 2 for smoking/scalding mode, as implemented in the firmware.



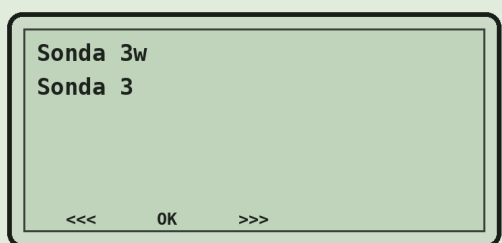
Edit probe 2w

Edits the name used in process modes.



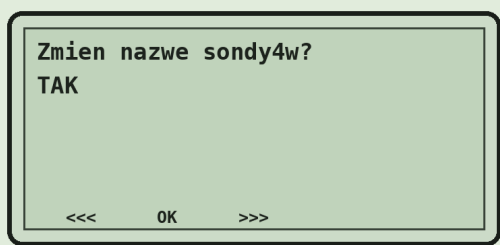
Probe 3w name

Separate name of probe 3 for smoking/scalding mode, as implemented in the firmware.



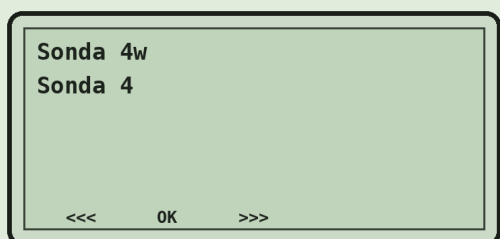
Edit probe 3w

Edits the name used in process modes.



Probe 4w name

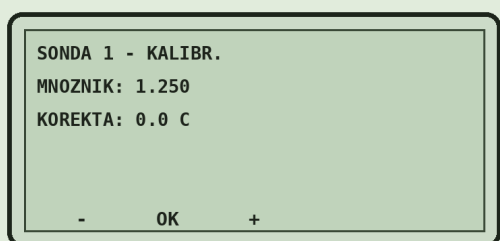
Separate name of probe 4 for smoking/scalding mode, as implemented in the firmware.



Edit probe 4w

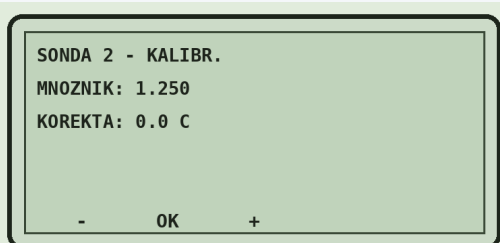
Edits the name used in process modes.

22. Screen atlas - Settings - Probes



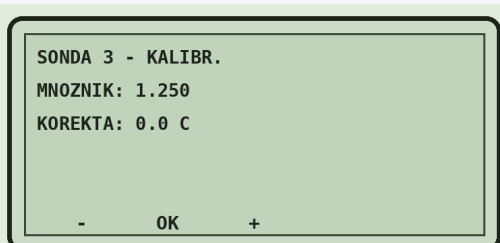
Probe 1 calibration

One screen: MULTIPLIER and CORRECTION. Factory defaults 1.25 and 0.0; a missing probe is skipped.



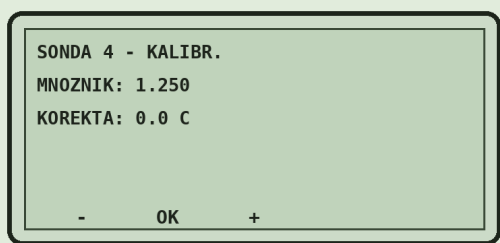
Probe 2 calibration

One screen: MULTIPLIER and CORRECTION. Factory defaults 1.25 and 0.0; a missing probe is skipped.



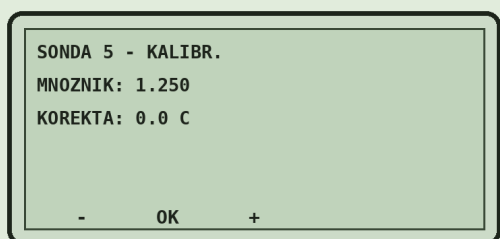
Probe 3 calibration

One screen: MULTIPLIER and CORRECTION. Factory defaults 1.25 and 0.0; a missing probe is skipped.



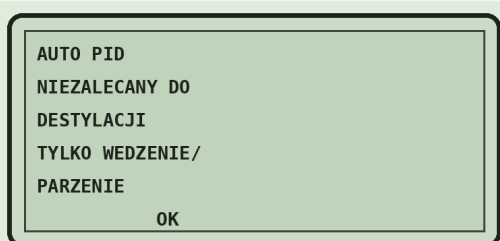
Probe 4 calibration

One screen: MULTIPLIER and CORRECTION. Factory defaults 1.25 and 0.0; a missing probe is skipped.



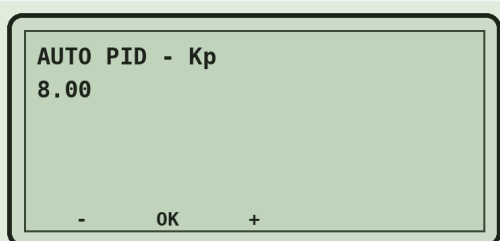
Probe 5 calibration

One screen: MULTIPLIER and CORRECTION. Factory defaults 1.25 and 0.0; a missing probe is skipped.



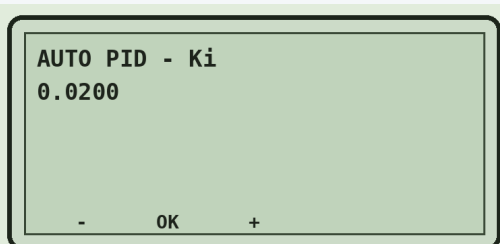
AUTO PID - warning

AUTO PID is not the recommended first choice for distillation. Use AUTO P or AUTO PI first.



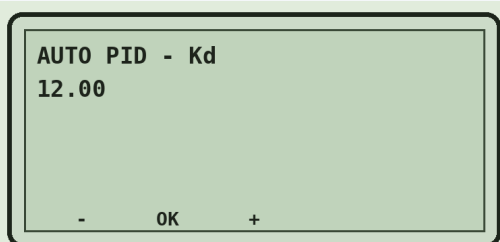
AUTO PID - Kp

Range 0.10-100.00; step 0.10; factory default 8.00.



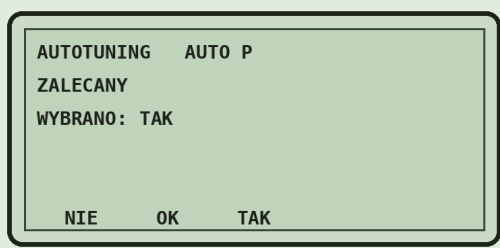
AUTO PID - Ki

Range 0.00001-10.0000; step 0.0001; factory default 0.0200.



AUTO PID - Kd

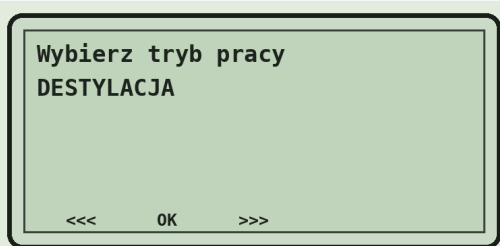
Range 0-10000; step 0.10; factory default 12.00.



AUTOTUNING

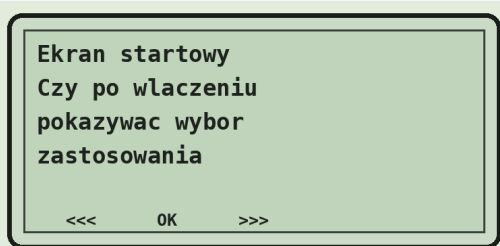
AUTO P tunes Kp, AUTO PI - Kp and Ki, AUTO PID - Kp, Ki and Kd. LEFT=NO, CENTRE=OK, RIGHT=YES. After interruption the message AUTOTUNING ABORTED appears.

23. Screen atlas - Settings - General



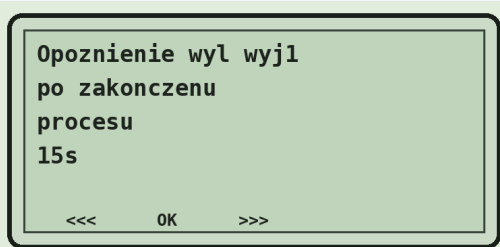
Operating mode

Select DISTILLATION, SMOKING, SCALDING or BREWERY.



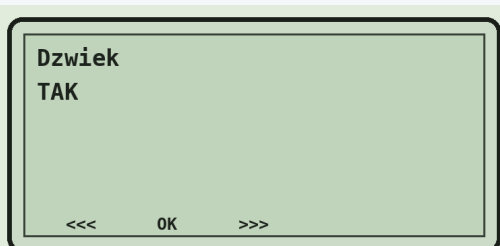
Start screen

SHOW SELECTION allows the mode to be selected after every power-up; SKIP SELECTION goes directly to the saved mode.



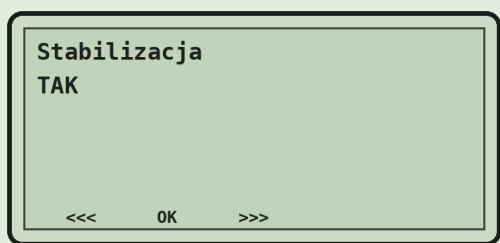
OUT delay

Separate switch-off delay for each used OUT; the firmware allows up to 300 s.



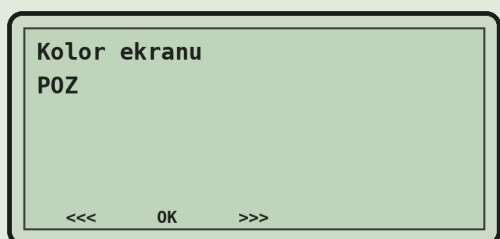
Sound

Buzzer on/off.



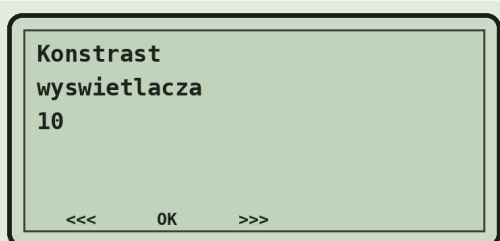
Stabilisation

Optional stabilisation stage before normal distillation operation.



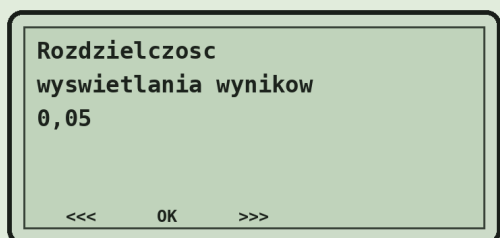
Screen colour

POS/NEG selects positive or negative display mode.



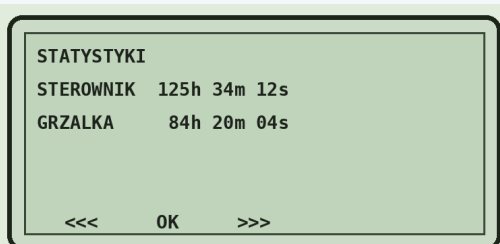
Contrast

LCD contrast adjustment within the firmware range.



Resolution

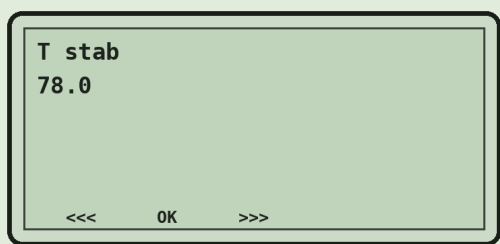
Select 0.1 or 0.05 degree.



STATISTICS

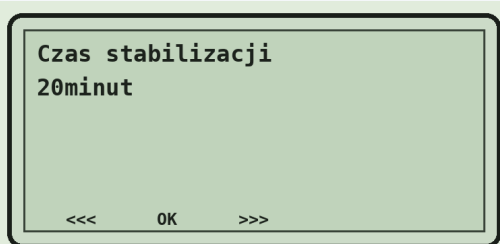
CONTROLLER = total device operating time. HEATER = time with power >0%, counted 1:1 regardless of the % level. Counters are saved periodically (about every 15 min) and a normal RESET does not clear them.

24. Screen atlas - Stabilisation



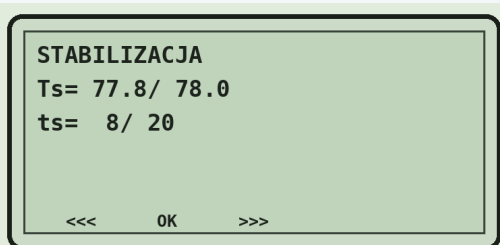
Stabilisation temperature

Target temperature of the stabilisation stage.



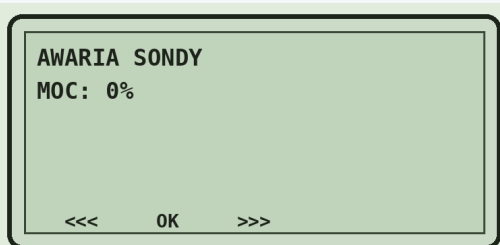
Stabilisation time

Time for maintaining the stabilisation condition.



Stabilisation operation

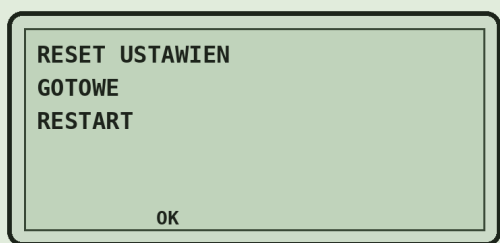
Shows current/set temperature and elapsed time.



PROBE FAILURE - power lockout

In AUTO, absence of the required valid probe gives 0%. MANUAL does not require a probe.

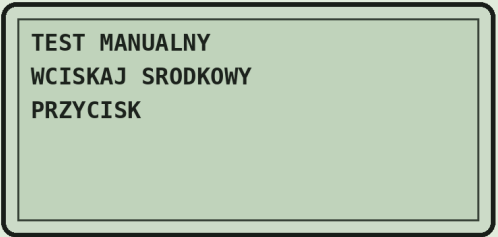
25. Screen atlas - Reset and service



RESET - DONE / RESTART

Restores settings and clears the probe configuration. Statistics remain.

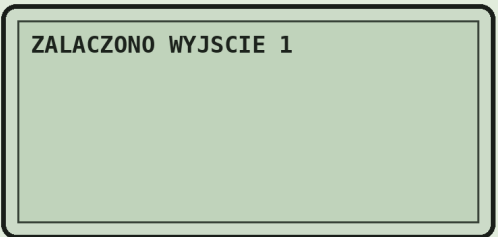
26. Screen atlas - Service test



TEST MANUALNY
WCISKAJ SRODKOWY
PRZYCIISK

Start test

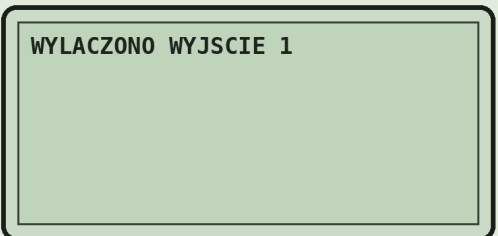
The test proceeds through successive items after pressing the centre button.



ZALACZONO WYJSCIE 1

Output 1 ON

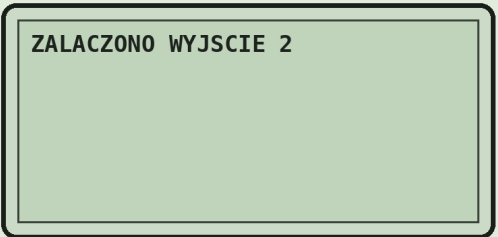
Physical output in the current PRD3 hardware.



WYLACZONO WYJSCIE 1

Output 1 OFF

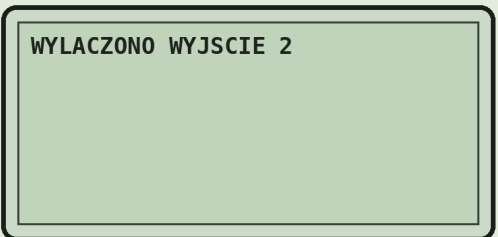
Physical output in the current PRD3 hardware.



ZALACZONO WYJSCIE 2

Output 2 ON

Physical output in the current PRD3 hardware.



WYLACZONO WYJSCIE 2

Output 2 OFF

Physical output in the current PRD3 hardware.

A rectangular screen with a light green background and a black border. The text 'ZALACZONO WYJSCIE 3' is displayed in the top left corner.

Output 3 ON

Physical output in the current PRD3 hardware.

A rectangular screen with a light green background and a black border. The text 'WYLACZONO WYJSCIE 3' is displayed in the top left corner.

Output 3 OFF

Physical output in the current PRD3 hardware.

A rectangular screen with a light green background and a black border. The text 'ZALACZONO WYJSCIE 4' is displayed in the top left corner.

Output 4 ON

Legacy screen: the current PRD3 hardware has no physical OUT4; do not treat it as an available connector.

A rectangular screen with a light green background and a black border. The text 'WYLACZONO WYJSCIE 4' is displayed in the top left corner.

Output 4 OFF

Legacy screen: the current PRD3 hardware has no physical OUT4; do not treat it as an available connector.

A rectangular screen with a light green background and a black border. The text 'ZALACZONO WYJSCIE 5' is displayed in the top left corner.

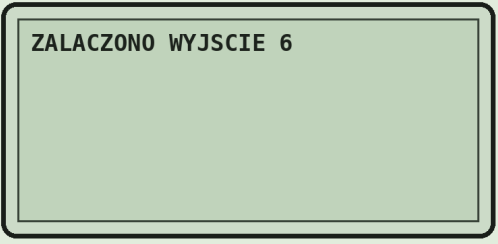
Output 5 ON

Legacy screen: the current PRD3 hardware has no physical OUT5; do not treat it as an available connector.

A rectangular screen with a light green background and a black border. The text 'WYLACZONO WYJSCIE 5' is displayed in the top left corner.

Output 5 OFF

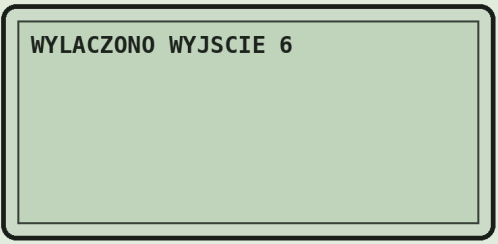
Legacy screen: the current PRD3 hardware has no physical OUT5; do not treat it as an available connector.



ZALACZONO WYJSCIE 6

Output 6 ON

Legacy screen: the current PRD3 hardware has no physical OUT6; do not treat it as an available connector.



WYLACZONO WYJSCIE 6

Output 6 OFF

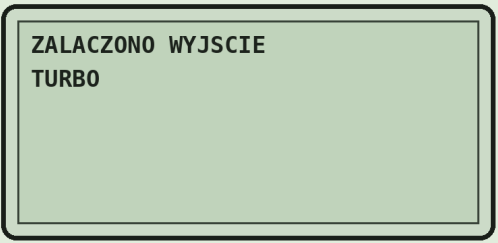
Legacy screen: the current PRD3 hardware has no physical OUT6; do not treat it as an available connector.



Transmisja

Transmission

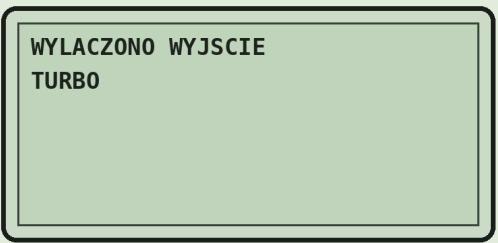
Communication/interface test step.



ZALACZONO WYJSCIE
TURBO

Turbo ON

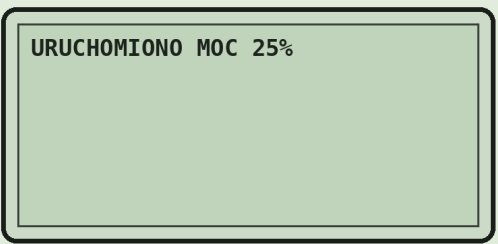
Internal/service output test screen.



WYLACZONO WYJSCIE
TURBO

Turbo OFF

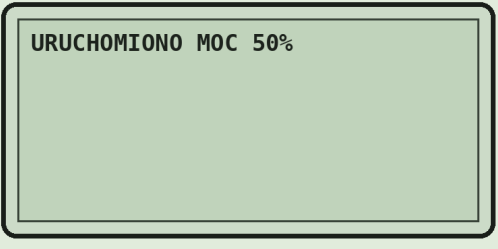
Internal/service output test screen.



URUCHOMIONO MOC 25%

Power test 25%

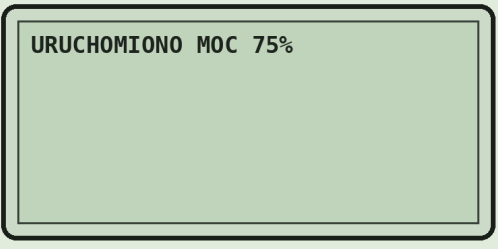
Short power-circuit test; perform safely with a suitable load.

A screenshot of a green rectangular display area with a black border. The text 'URUCHOMIONO MOC 50%' is displayed in the top left corner in a black, sans-serif font.

URUCHOMIONO MOC 50%

Power test 50%

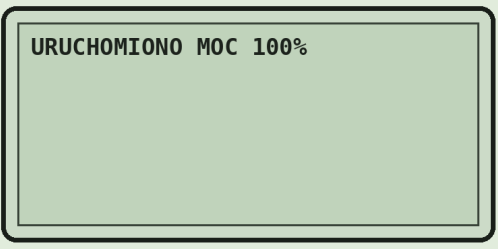
Short power-circuit test; perform safely with a suitable load.

A screenshot of a green rectangular display area with a black border. The text 'URUCHOMIONO MOC 75%' is displayed in the top left corner in a black, sans-serif font.

URUCHOMIONO MOC 75%

Power test 75%

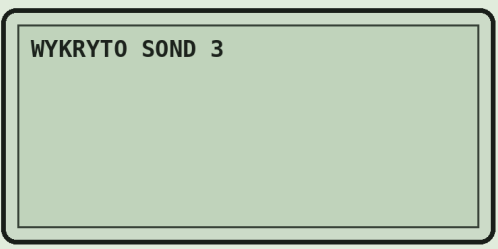
Short power-circuit test; perform safely with a suitable load.

A screenshot of a green rectangular display area with a black border. The text 'URUCHOMIONO MOC 100%' is displayed in the top left corner in a black, sans-serif font.

URUCHOMIONO MOC 100%

Power test 100%

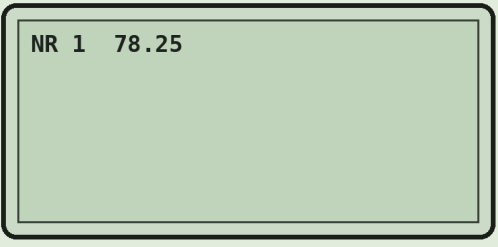
Short power-circuit test; perform safely with a suitable load.

A screenshot of a green rectangular display area with a black border. The text 'WYKRYTO SOND 3' is displayed in the top left corner in a black, sans-serif font.

WYKRYTO SOND 3

Detected probes

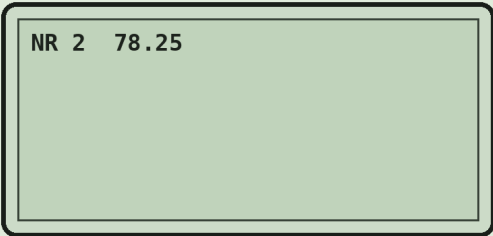
Check of the number of probes detected on the bus.

A screenshot of a green rectangular display area with a black border. The text 'NR 1 78.25' is displayed in the top left corner in a black, sans-serif font.

NR 1 78.25

Probe 1 reading

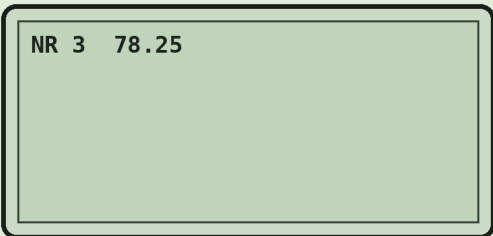
Temperature view during the test.

A rectangular display with a black border and a light green background. The text "NR 2 78.25" is displayed in the top left corner.

NR 2 78.25

Probe 2 reading

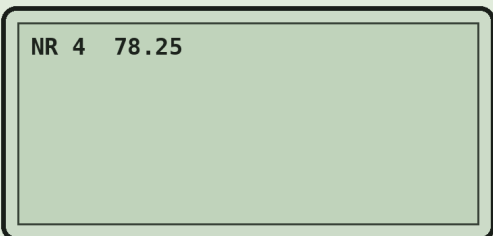
Temperature view during the test.

A rectangular display with a black border and a light green background. The text "NR 3 78.25" is displayed in the top left corner.

NR 3 78.25

Probe 3 reading

Temperature view during the test.

A rectangular display with a black border and a light green background. The text "NR 4 78.25" is displayed in the top left corner.

NR 4 78.25

Probe 4 reading

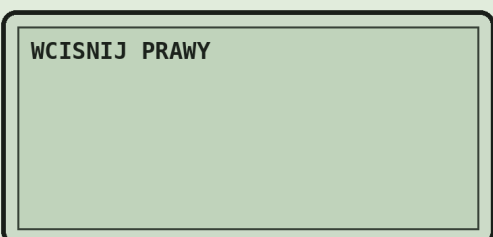
Temperature view during the test.

A rectangular display with a black border and a light green background. The text "BRAK" is displayed in the top left corner.

BRAK

No probe

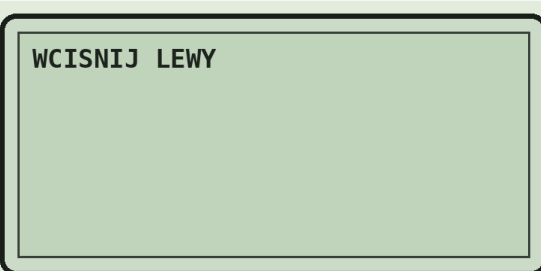
No reading in this test step.

A rectangular display with a black border and a light green background. The text "WCISNIJ PRAWY" is displayed in the top left corner.

WCISNIJ PRAWY

Press right

Physical button test.

A rectangular display with a black border and a light green background. The text "WCISNIJ LEWY" is displayed in the top left corner.

WCISNIJ LEWY

Press left

Physical button test.



BLAD

Error

Information that a test step was not passed.

27. Probe calibration - MULTIPLIER and CORRECTION

For each of the five probes PRD3 stores two calibration parameters: MULTIPLIER and CORRECTION. MULTIPLIER corrects the change in indication with temperature, while CORRECTION shifts the indication by a constant value.

Parameter	When to correct	Example
MULTIPLIER	error changes with temperature	at room temperature +0.1 C, at 80 C +0.4 C
CORRECTION	error is almost constant	reference consistently shows 1.0 C more

TIP Typical starting settings: MULTIPLIER = 1.25; CORRECTION = 0.0. Change them only after comparison with a reliable reference.

28. PAMEL Smoke and PAMEL_BUS

Selected PRD3 units may have a USB-B interface. Communication with PAMEL Smoke and service software uses PAMEL_BUS_AT. There is no local MONITOR/BLACKBOX selection on the controller; the PC application selects the LOCAL/MONITOR session and PRD3 continues to run the process independently.

NOTE USB-B is optional equipment. Interface availability depends on the device version.

TIP PAMEL Smoke can read 5 temperatures and probe names and identify SMOKING/SCALDING modes. Remote process control is not advertised in this version.

29. Technical data and variants

Parameter	PRD3
Device name	PRD3
Firmware covered by this manual	0.3.0-dev9
Electronics supply	230 V AC; in 3F from L1 + N
Probes	1-5 x DS18B20, 5 parallel RJ45 sockets
RJ45 pinout	3=GND, 4=DATA/I/O, 6=VCC
Heater circuit 1F	max. 25 A, standard cable 3x2.5 mm ²
Heater circuit 3F	max. 3x25 A power stage; standard cable 5x2.5 mm ²
3F operation	1, 2 or 3 channels may be used; L1+N always required
Additional outputs	2 or 3: OUT1/OUT2/OUT3
OUT 12 V	12 V DC / 1 A, 5.5/2.1 mm, positive centre
OUT 230 V	230 V AC / 1 A, GN11, without PE
Power regulation types	phase or group, selected by the user
Controllers	MANUAL, AUTO P, AUTO PI, AUTO PID
USB	optional USB-B / PAMEL_BUS_AT service interface
3F enclosure dimension	the dimension corresponding to 100 mm in 1F is 140 mm
DUO	optional remote display on an approx. 2 m D-SUB cable

WARNING Power-circuit ratings do not remove the need to size the installation and connectors correctly. The lowest permissible rating of the components used always applies.

30. Before you call service

SYMPTOM	POSSIBLE CAUSE	WHAT TO DO
--- on the screen	the probe role was not installed	run probe installation if this role is to be used
Probe FAILURE	no consecutive valid readings from an installed probe	check the RJ45 plug and cable and move the probe to another parallel socket
AUTO power = 0%	PROBE FAILURE, TEMP. EVENT, TEMPORARY POWER OFF or SAFETY LOCKOUT	read the message in the top line and remove its cause
Heater does not reach temperature	maximum power too low, external thermostat limitation, heater power too low	check Pmax, the heated device setting and the installation
Heater heats continuously	controller bypass or a second heater connected outside the controller	all heaters in the given circuit must be included in the control

30. Before you call service - continued

SYMPTOM	POSSIBLE CAUSE	WHAT TO DO
Lights dim	phase control and high load on the same installation	check the installation; compare group mode if necessary
OUT does not work	output absent/forced or configuration does not match the installation	check OUT presence, mode, valve type and probe; operation - see diagram
Nothing changes after switching phase/group	restart required	switch the power off and on again
PRD3 3F does not start from L2/L3	the electronics are powered from L1+N	check that L1 and N are present
Alarm beeps	alarm threshold has been exceeded	silence the signal, check the probe number and remove the cause; the alarm screen disappears when the condition clears

30. Before you call service - information to prepare

- model: PRD3
- firmware version from the start screen
- operating mode: distillation / smoking / scalding / brewery
- number of installed probes and which one shows FAILURE
- set power, Pmin/Pmax and AUTO temperature
- for an OUT problem: OUT number, HYSTERESIS/WINDOW/WINDOW2/HEADS/TAILS, probe and thresholds
- 1F/3F version and heater connection method

TIP If possible, before contacting service take a photo of the screen with the message and note the conditions under which the problem occurs.

31. PAMEL Product Center

Current manuals, FAQ, materials and software for PRD3 are available in the Product Center:

Main address:

<https://serwer.pamel.pl/>

Technical support: pamel@pamel.pl

[PAMEL Facebook](#)

NOTICE The configuration data of the specific unit (number of OUT outputs, 12/230 V, USB, 1F/3F) takes precedence over the general description of variants.

PAMEL Product Center

Scan the QR code to open current PRD3 materials, manuals and support.



<https://serwer.pamel.pl/>

Manual version: 24.08.2026

Interface described: PRD3 DUZY 0.3.0-dev9

Dear User,

First of all, thank you for choosing a PAMEL product. We are confident that you will be satisfied with your choice. We design our devices to meet your requirements and provide trouble-free use in the future.

1. PAMEL provides a warranty for the controller (excluding optional equipment) within the Republic of Poland for a maximum period of 60 months:

- 24 months of basic warranty,
- 6 months of extended manufacturer warranty,
- additionally, a warranty extension up to 40 or 50 months may be purchased.

The total warranty period may not exceed 80 months from the device production date.

Optional equipment (e.g. probes, heaters) is covered by the standard warranty resulting from the Polish Civil Code.

A purchased warranty extension is confirmed by a holographic sticker on the warranty card.

2. The warranty does not cover consumable parts and accessories intended for self-installation (e.g. antennas, sensors, brackets, heaters, cables, batteries).

3. During the warranty period, the manufacturer undertakes to remove physical defects free of charge. If at least four repairs have been carried out under the basic warranty and the device is still defective, the Buyer is entitled to replacement with a new unit of equivalent parameters or a refund.

4. The warranty period is extended by the duration of the repair.

5. Claims should be reported by e-mail (pamel@pamel.pl) or by telephone. The manufacturer will first attempt to resolve the problem remotely and will indicate the next steps in the claim procedure.

6. At the manufacturer's request, the Buyer is required to complete a claim report.

7. The warranty covers only defects resulting from causes inherent in the device.

8. The warranty does not cover damage caused by:

- incorrect installation, operation or maintenance,
- storage under unsuitable conditions,
- use of incorrect consumables,
- unauthorized repairs or modifications,
- mechanical damage, flooding, water-vapour condensation, contamination, atmospheric phenomena or accidental events,
- exceeding rated parameters.

9. The warranty does not cover claims concerning the technical parameters of the device if they comply with the manufacturer's specifications.

10. Warranty rights are retained provided that the device is delivered:

- complete,
- in packaging protecting it against damage,
- together with documentation, cables and additional components,
- with seals and labels intact and not removed,
- with the original warranty card signed by both parties and the production-date sticker.

11. The warranty does not cover services and materials related to normal operating maintenance (e.g. installation, programming, cleaning, maintenance, replacement of fuses and bulbs). These services are chargeable.

12. The service centre may refuse a warranty repair in the event of:

- discrepancies between documentation data and the actual condition of the device,
- unauthorized corrections in documents,
- removal of device identification marks (e.g. a label).

13. Warranty repairs are performed within 21 days from delivery of the device to the service centre. If parts must be imported from abroad, this period may be extended - the Buyer will be informed by e-mail.

14. The device must be installed in accordance with applicable standards and this operating manual. Where required by law, installation must be carried out by a suitably authorized person.

15. The scope of rights and obligations of the parties is governed exclusively by this document.

16. Equipment not collected from the service centre within 3 months after repair completion becomes the property of the service centre.

17. Parts replaced during repair remain the property of the manufacturer.

18. The manufacturer is not responsible for loss of user data stored in the device. After repair, the device is returned with factory settings restored.

19. By signing the warranty card, the Buyer confirms that they have read and accept the warranty terms.

A card without a signature and without the original production-date label is invalid.

Note: Maintenance, cleaning, replacement of bulbs, fuses, consumable parts or repairs resulting from normal wear (e.g. potentiometers) are not counted as warranty repairs.

WARRANTY PERIOD START DATE:

SELLER'S STAMP:

CUSTOMER'S SIGNATURE: