

USER MANUAL

PZW2

Controller set for heating, smoking and temperature measurement applications

KEY BENEFITS**PRECISION**

Accurate process and measurement control

**SAFETY**

High-level protection

**RELIABILITY**

Stable and dependable operation

**UPDATES**

Continuous improvements and new features

**IN THIS MANUAL**

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

DOCUMENTATION & SUPPORT

www.pamel.pl

pamel@pamel.pl

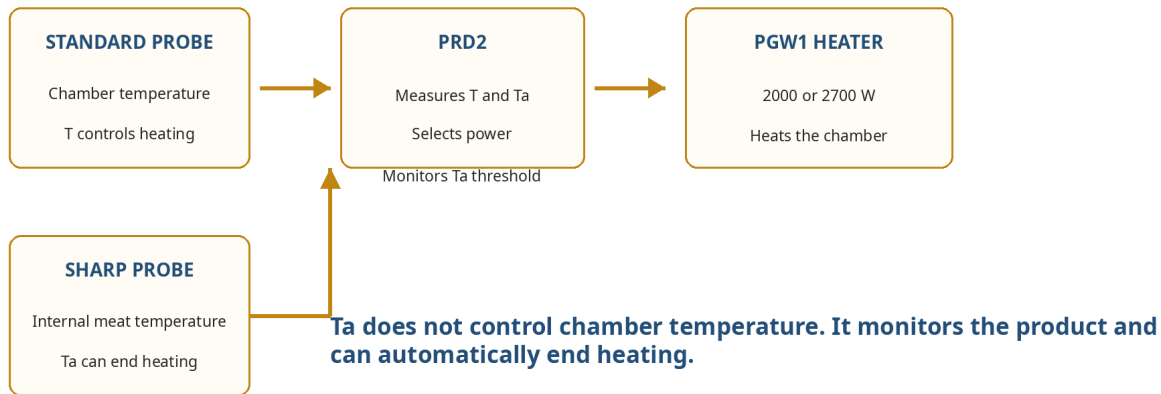
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OPERATING PRINCIPLE

PZW2 is a complete set for electric heating of a smokehouse and monitoring two temperatures: the chamber temperature and the internal temperature of the meat.



MOST IMPORTANT The **STANDARD** probe acts as T and controls the chamber temperature. The **SHARP** probe acts as Ta and can automatically end heating after the set meat temperature is reached.

The PRD2 controller regulates the power of the PGW1 2000 W or 2700 W heater. In automatic mode it increases or decreases the power depending on the difference between the set temperature T and the current chamber temperature.

After the Ta setting is exceeded for about 30 seconds, the controller enters the END state and stops heating. This means that the second probe is not only a thermometer - it can supervise the end of the process.

PZW2 2000 W / PZW2 2700 W

SET CONTENTS

Both PZW2 versions use the same controller and accessories. They differ only in heater power.

Item	PZW2 2000 W	PZW2 2700 W
Controller	PRD2	PRD2
Heater with deflector	PGW1 2000 W	PGW1 2700 W
Chamber probe	STANDARD 2 m / 50 mm	STANDARD 2 m / 50 mm
Meat probe	SHARP 2 m / 50 mm	SHARP 2 m / 50 mm
Controller cables	90 + 90 cm	90 + 90 cm
Heater cable	2 m	2 m
Drip tray	yes	yes
Fan	no	no

Before first installation, check that the set is complete and that no cable, sensor or heating element has been damaged in transport.

NOTE PZW2 is supplied without a circulation fan. Do not apply fan-control recommendations from the standalone PGW1 heater manual - they do not apply to this set.

SAFETY

DANGER The set operates at 230 V. Do not work on it while the power is connected. The smokehouse should be supplied from a circuit with a correctly connected PE protective conductor and a 30 mA residual-current device.

- The PRD2 controller has an IP20 protection rating - protect it from rain, condensation and smoke. Place the controller outside the smokehouse chamber.
- The heater protective PE conductor must be connected correctly. Do not use the heater without protective earthing.
- Route power cables and probe leads so that they do not form loops on the heater and do not touch hot parts.
- Do not use damaged or melted cables. A damaged connection can become very hot.
- Do not pour water onto a hot heater and do not pressure-wash the heating element.

**WARNING!**

Unwind the power cable fully before use.

- ✗ A coiled cable can heat up strongly.
- ✗ Do not place cables on the heater or hot parts.
- ✗ Keep cables straight and away from heat.

BAD - COILED CABLE


GOOD - CABLE UNWOUND


Safe cable routing reduces overheating and damage risk.

Cables should be routed as straight as possible, away from the heater.

INSTALLING THE PGW1 HEATER

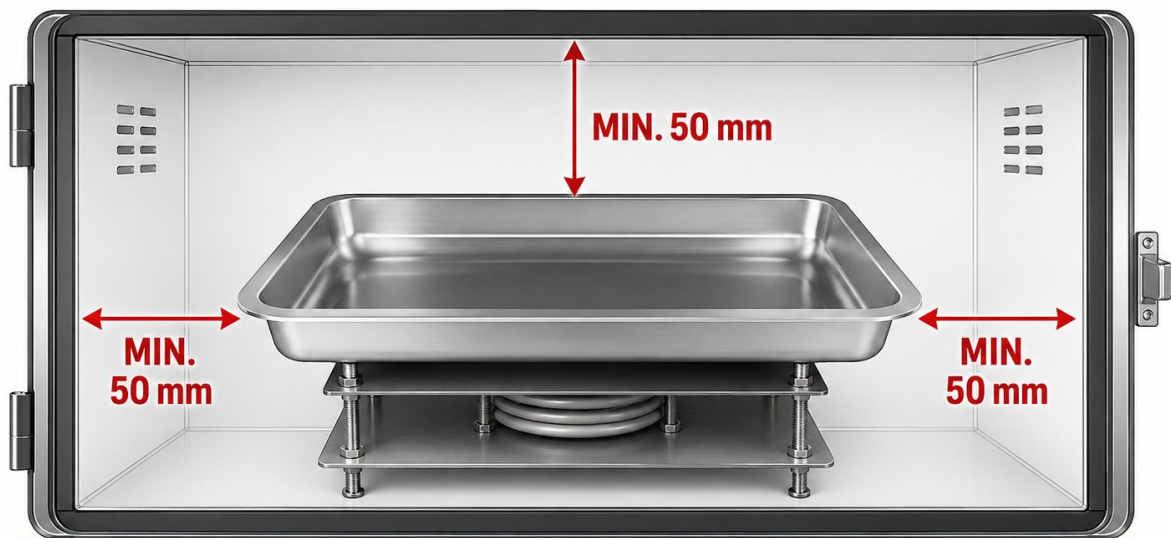
The heater operates inside the smokehouse chamber. The deflector distributes heat, limits grease contamination of the heating element and provides a place for the drip tray.



WARNING!

Keep at least 50 mm between the heater and the chamber walls.

Clearance improves safety and correct operation.



Keep at least 50 mm clearance on all sides of the heater.

Keep at least 50 mm clearance between the heater and the chamber walls or other components.

1. Place the heater assembly stably on the bottom of the chamber.
2. Keep at least 50 mm of free space on all sides.
3. Fit the drip tray so that it does not block the flow of hot air.
4. Make sure that cables and probes cannot fall onto the heater when the door is closed.
5. Before applying power, make sure that the PE conductor is connected.

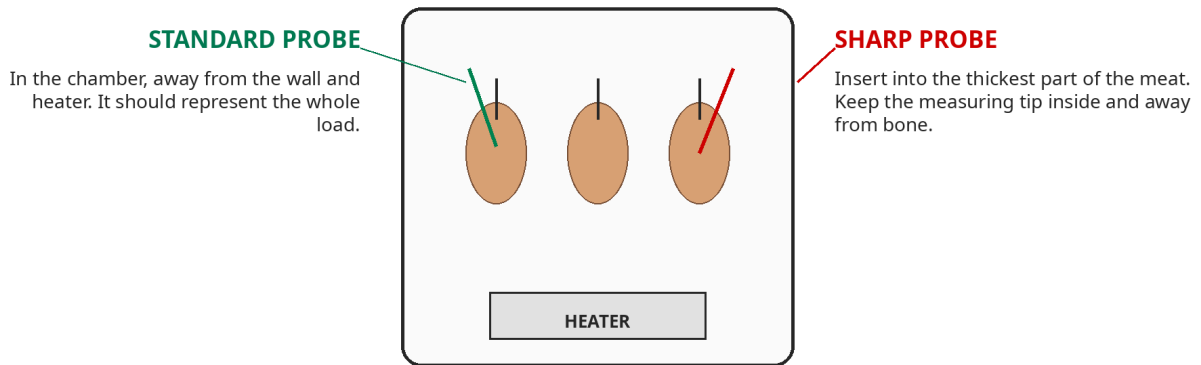
WARNING Grease and carbon deposits are flammable. Clean the tray and deflector regularly, preferably after every smoking cycle.

CONNECTING THE PZW2

PZW2 is supplied with prepared set cables. Connect the components with the power disconnected and do not open the controller if the cables have already been factory-terminated.

- 1. Connect the STANDARD probe to the controller.**
- 2. Connect the SHARP probe to the controller.**
- 3. Connect the PGW1 heater to the controller power output using the heater cable.**
- 4. Check the protective PE connection of the heater and smokehouse.**
- 5. Connect the 230 V supply only at the end.**

PROBE POSITIONING



Probe and power cables must not touch hot parts.

The STANDARD probe should measure the air temperature in a place representative of the load. Do not mount it directly at the wall, above the heater or in a stream of very hot air.

Insert the SHARP probe into the thickest part of the meat. The measuring tip should be inside the product, not near the surface. Avoid contact with bone and metal hooks.

PRACTICAL TIP If the temperatures respond opposite to what you expect, do not swap plugs blindly. First warm one probe with your hand and check whether T or Ta changes. The probe roles can be swapped with the PROBE ORDER parameter.

FIRST START-UP

RECOMMENDATION Perform the first test with an empty smokehouse chamber. Do not start immediately with food.

1. Check the heater, tray, earthing and cable installation.
2. Place the STANDARD probe in the chamber and leave the SHARP probe outside or place it in a test sample.
3. Switch on the power.
4. Warm the STANDARD probe with your hand and check that temperature T changes.
5. Warm the SHARP probe with your hand and check that Ta changes.
6. If the roles are reversed, change the PROBE ORDER parameter.
7. Start with AUTO P mode.
8. Set T to a safe test temperature and set Ta above the expected temperature of the second probe.
9. Observe whether the heater raises the chamber temperature and whether the power decreases as T is approached.

GOOD TEST To check the end function, you can later set Ta a few degrees above the current probe temperature and warm its tip with your hand or in warm water. After the threshold has been exceeded continuously for about 30 s, END should appear.

BASIC SCREENS

POWER

P=65.00%

Heater power / current setting

TEMPERATURE T

T=70.0 C

Chamber temperature / T setting

ALARM Ta

Ta=68.0 C

Second probe / Ta setting

END

END

Heating stopped - Ta condition met

Schematic views - the arrangement of characters may differ slightly depending on the PRD2 software version.

A short touch of the middle field/button switches between the subsequent view and setting screens. The “+” and “-” buttons change the value of the active parameter.

- **P** - heater power in %. In MANUAL mode the user sets it manually; in AUTO mode the controller selects it automatically.
- **T** - chamber temperature. This value controls heating.
- **Ta** - temperature of the second probe, in PZW2 the sharp meat probe. Reaching the setting can end the process.
- **END** - heating has been stopped after the Ta condition has been met. To resume operation, use the middle button as indicated by the controller message.

PRD2 OPERATING MODES

The mode is selected in the settings menu. For typical smoking, it is best to start with AUTO P.

Mode	How it works	When to use
MANUAL	You set power P manually. T can act as a temperature limit.	Tests, manual heating, selecting holding power.
AUTO P	The controller selects power proportionally to the difference between the set and actual T.	Recommended mode for most PZW2 applications.
AUTO PID	The controller regulates power using the PID algorithm.	Advanced mode when AUTO P does not provide the required stability.

AUTO P - START The WSP parameter determines how strongly the controller reacts to a temperature difference. For PZW2, WSP = 12 is a good starting point. If the chamber clearly underheats - increase it carefully; if it overshoots - reduce it.

In AUTO P the power is determined from the temperature difference. In the source PRD2 manual the relationship is described as $P[\%] = WSP \times (T_{\text{set}} - T_{\text{actual}}) / 4$, taking the Pmin and Pmax limits into account.

SETTINGS MENU - POWER AND START

Enter the menu by holding the middle button/field for about 5 seconds.
Subsequent short presses move to the next parameters.

Pmin - minimum power

The minimum power that the controller may retain when the temperature is close to the setpoint. A value that is too high can cause overheating.

Range / values: from 0% to a value not greater than Pmax; step according to the controller resolution

Initial setting: leave the factory value; it is typically selected experimentally

Example: if at 0% the temperature drops quickly and the system repeatedly compensates in cycles, a small Pmin may smooth the control.

Pmax - maximum power

Limits the highest heater power. It can be used for gentler heating or to limit the electrical load.

Range / values: 0-100%

Initial setting: 100%

Example: Pmax=80% limits a 2700 W heater to a controlled average power below its full rated power.

START WITH LAST POWER / FROM 0

Determines whether, after power-up in manual mode, the controller returns to the stored power or starts from 0%.

Range / values: two options

Initial setting: starting from 0% is convenient for safety

Example: if you always begin by checking the settings, choose start from 0%.

SETTINGS MENU - PROBES AND CONTROL

PROBE ORDER

Swaps the roles of the two detected probes without reconnecting the cables. In PZW2 set it so that STANDARD is T and SHARP is Ta.

Range / values: two orders (depending on the version, displayed for example as 0/1)

Initial setting: verify with the hand-warming test

Example: if you warm the meat probe and T changes, change PROBE ORDER.

WSP - AUTO P coefficient

Determines the strength of the controller response to the difference between the set and actual temperature. A higher WSP gives higher power for the same temperature difference.

Range / values: adjustable in the menu; do not increase it unnecessarily

Initial setting: start from 12

Example: a chamber with high thermal inertia may require correction after observing several cycles.

B - calibration multiplier

Changes the slope of the measurement characteristic. Use only when the error increases with temperature.

Range / values: adjustable in the calibration menu

Initial setting: 1.25 according to the PRD2 manual

Example: if the error at 20°C is small but clearly greater at 80°C, correction of B may be appropriate.

A - calibration offset

Adds a constant correction to the temperature indication. Use when the error is similar across the whole range.

Range / values: adjustable in the calibration menu

Initial setting: 0

Example: if the probe reads about 2°C too low over the entire range, correction A is used - after confirmation with a reliable reference.

FORMULA Displayed temperature = $B \times \text{temperature read from the sensor} + A$. Do not change A and B unless you have a reliable reference point.

PROBE CALIBRATION

IMPORTANT Calibration is usually not required. Differences in readings often result from a different measurement location rather than a probe error.

**WARNING!**

Probe calibration is usually not necessary.

100.00°C ?
Boiling water is not a precise 100.00°C reference.


Use a reliable reference thermometer and compare at least two temperatures.

Calibrate only after confirming a systematic measurement error.

Do not use boiling water as a "100.00°C" reference - the boiling temperature depends, among other things, on pressure and measurement conditions.

1. Place the PZW2 probe and a reliable reference thermometer as close to each other as possible.
2. Wait for both readings to stabilise.
3. Check the difference at at least two temperatures relevant to smoking.
4. If the error is constant - correct A. If the error changes with temperature - only then consider correcting B.
5. After the change, check both points again.

NOTE Do not calibrate the probe "by eye" against the temperature of the chamber wall, lid or another sensor installed in a different location.

PZW2 IN A SMOKEHOUSE - PREPARATION

PZW2 is intended for an electric smokehouse. The controller maintains the chamber temperature, while the second probe allows you to monitor the product temperature.

1. **Clean the drip tray and deflector of grease left from the previous process.**
2. **Check that the heater has at least 50 mm clearance from walls and the load.**
3. **Place the STANDARD probe in the chamber in a position representative of the entire load.**
4. **Insert the SHARP probe into the thickest piece of meat that you want to monitor.**
5. **Set AUTO P mode and check WSP and Pmax.**
6. **Set chamber temperature T according to your own recipe.**
7. **Set Ta as the target product temperature if you want heating to end automatically.**

FOOD TECHNOLOGY The PZW2 manual describes the operation of the device, not a recipe. Correct smoking temperatures and safe internal temperatures depend on the type of product and the technology used.

If you do not want to use automatic ending, set Ta above the temperature you expect in the product - within the permitted setting range. During tests, for example, 110°C may be used only as a technical threshold that meat will not reach, not as a food temperature.

PZW2 IN A SMOKEHOUSE - PROCESS FLOW

The following arrangement shows how to use PZW2 during the subsequent stages. Set the actual temperatures and times according to your recipe.

Stage	What PZW2 does	T probe	Ta probe
Heating up	Raises the chamber temperature to T.	STANDARD in the chamber	May only monitor the product
Drying	Maintains the set temperature.	Do not move unnecessarily	Monitor the increase in meat temperature
Smoking	AUTO P corrects heater power.	T determines the power	Ta shows the core temperature
Finishing / cooking	Maintains the chamber temperature until the end.	T continues to control	After Ta is reached it can trigger END

DO NOT MOVE THE T PROBE DURING OPERATION Changing the position of the chamber probe can suddenly change the reading and cause an unnecessary power change. If you must move it, observe operation after the change.

During the first few uses, record temperature T, WSP, Pmin and the behaviour of the chamber. This will make it easier to find repeatable settings for your smokehouse.

ENDING BY MEAT TEMPERATURE

The Ta function is particularly useful in PZW2 because the SHARP probe can monitor the internal temperature of the product.

1. Set the **STANDARD** probe as T and the **SHARP** probe as Ta.
2. Insert the **SHARP** probe correctly into the meat.
3. Set T for the chamber temperature.
4. Set Ta to the final value required by your recipe and food-safety rules.
5. After Ta has been reached for about 30 seconds, the controller stops heating and displays **END**.
6. Check the product. If you deliberately want to continue, resume operation with the middle button and set a new threshold.

WHY 30 SECONDS? A brief threshold exceedance, for example when the probe is touched or due to a momentary disturbance, should not immediately end the whole process.

NOTE Ta does not replace correct food-preparation technology. If the probe is inserted too shallowly, near a bone or somewhere other than the centre of the thickest piece, the reading may not represent the temperature of the entire product.

2000 W OR 2700 W?

Both sets operate in the same way. The difference is the heater power and how quickly it can compensate for chamber heat losses.

Feature	PZW2 2000 W	PZW2 2700 W
Rated power	2000 W	2700 W
Typical application	smaller / well-insulated chamber	larger chamber, higher losses, operation in cold conditions
Current at approx. 230 V	approx. 8.7 A	approx. 11.7 A
Control	PRD2	PRD2

The power of a resistive heater depends on the supply voltage. At about 210 V the available power falls to approx. 83% of the rated value. At 250 V it rises to approx. 118%.

- **In winter the chamber loses more heat and voltage drops may additionally reduce heater power.**
- **Avoid long and thin extension leads - they cause voltage drop and cable heating.**
- **If the chamber does not reach T even at P=100%, check the voltage under load, chamber insulation, leaks and whether the heater power is correctly selected.**

MAINTENANCE AND CLEANING

BEFORE CLEANING Disconnect the set from 230 V and wait until the heater and metal parts have cooled completely.

After each cycle:

- remove grease and deposits from the drip tray,
- remove heavy deposits from the deflector,
- check that nothing touches the heating element,
- wipe the probes with a soft damp cloth; do not pull on the cable,
- check that the cables are not melted or crushed.

Every few uses:

- inspect the condition of the cables, including the PE conductor,
- check that the heating element has no cracks, local bulges or signs of short circuit,
- remove carbon deposits from places where they could ignite.

DO NOT PRESSURE-WASH Do not flood the heating element, controller or cables. If the heater has become damp, do not switch it on until it has dried and the insulation condition has been checked.

TECHNICAL PARAMETERS

Parameter	Value
Set power supply	230 V AC, 50 Hz
Heater power	2000 W or 2700 W
Controller	PAMEL PRD2
Max. PRD2 load capacity	5.5 kW
PRD2 self-consumption	max. 1.5 W
Power control resolution	0.25%
PRD2 temperature setting range	10 to 130°C
Temperature measurement resolution	0.05°C
Controller operating temperature	-10 to +60°C
Controller protection rating	IP20
PRD2 dimensions	approx. 150 × 155 × 60 mm
Heater assembly dimensions	approx. 250 × 250 × 140 mm
Minimum heater clearance	50 mm from walls and other components
STANDARD probe	2 m cable, 50 mm measuring section
SHARP probe	2 m cable, 50 mm measuring section
Heater cable	2 m
Controller cables	90 + 90 cm
Drip tray	included
Circulation fan	not included in PZW2

NOTE Controller parameters are given for the PRD2 used in the PZW2 set. The specific version designation and permitted power are also shown on the device.

BEFORE CALLING SERVICE - 1

Disconnect the power first if the problem involves a burning smell, melted cables, RCD tripping or unusual heating of cables.

SYMPTOM	POSSIBLE CAUSE	WHAT TO DO
Controller does not switch on	No 230 V, circuit switched off, damaged cable.	Check the socket and protection devices. Do not open the controller while energised.
Heater does not heat	P=0%, Pmax=0%, T/Ta reached, END state or no power at the output.	Check the P, T, Ta and Pmax screens and the END message. Perform a test with an empty chamber.
Chamber does not reach T	Insufficient power, high heat losses, low voltage, Pmax too low.	Check P=100%, voltage under load, insulation, door sealing and Pmax.
Temperature overshoots significantly	Probe is above the heater / near the wall, WSP or Pmin are too high.	Move the probe to a representative position; reduce WSP or Pmin in steps.
Lights dim during heating	Large voltage drop in the installation or extension lead.	Do not use a thin/long extension lead. Check the electrical installation.

BEFORE CALLING SERVICE - 2

SYMPTOM	POSSIBLE CAUSE	WHAT TO DO
Probe error / 0°C	Probe disconnected, damaged cable or poor contact.	Switch off the power, check the plug and cable. Swap the probes temporarily only for diagnostic purposes.
T and Ta are swapped	The detected sensor order is reversed.	Use PROBE ORDER. Confirm by warming one probe with your hand.
END appears	Ta was exceeded for approx. 30 s.	Check the meat temperature and Ta setting. Resume operation deliberately.
I cannot set 0% or 100%	Pmin/Pmax limit the available range.	Check Pmin and Pmax in the menu.
Controller is warm	Power-control components may become warm during operation.	Provide ventilation around the controller. If the enclosure is very hot, disconnect the set and contact service.
RCD trips the circuit	Possible leakage current through moisture, the heater or a cable.	Disconnect the set immediately. Do not bypass the RCD. The inspection should be carried out by a suitably qualified person.
Heater does not switch off even at 0%	Possible failure of the output element or incorrect interpretation of voltage measured with a meter.	Disconnect the heater and contact service. Do not continue the process without temperature control.

PREPARE FOR SERVICE PZW2 model, 2000/2700 W power, photo of the PRD2 screen, P/T/Ta values, description of Pmin/Pmax/WSP settings, information whether the heater was cold or hot, and a photo of the connection.

DOCUMENTATION, SERVICE AND MANUAL VERSION

The main entry point for PAMEL documentation and support is:

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



Main QR code - serwer.pamel.pl

Additional materials:

[PAMEL Knowledge Base](#)

[YouTube PAMEL CONTROLLERS](#)

[Facebook PAMEL](#)

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BEFORE PUBLICATION After every significant change to the device or manual, update the version date and recheck compliance with the current PRD2 software.

WARRANTY TERMS

PAMEL, 42-300 Myszków, ul. Urodzajna 5E

1. PAMEL provides a warranty for the controller (without additional accessories) within the territory of the Republic of Poland: 24 months basic warranty, 6 months extended manufacturer's warranty, and the option to purchase an extension of up to 40 or 50 months. The total warranty period cannot exceed 80 months from the device's production date. The purchased extension is confirmed by a hologram sticker on the warranty card.

2. Additional accessories and consumables, including probes, heaters, antennas, sensors, holders, cables, and batteries, are not covered by the device's extended warranty; they are subject to the rules of law and the terms and conditions of sale.

3. During the warranty period, the manufacturer undertakes to repair any physical defects free of charge. If at least four repairs have been performed under the basic warranty and the device remains defective, the Buyer may request a replacement with a device of equivalent parameters or a refund. The warranty period is extended by the duration of the repair.

4. Complaints should be submitted by email to pamel@pamel.pl or by phone. The manufacturer will first attempt to resolve the problem remotely and recommend further steps. At the manufacturer's request, the Buyer will complete a complaint report.

5. The warranty covers only defects resulting from causes inherent in the device. It does not cover damage resulting from, among other things, improper installation, operation, or maintenance, poor storage conditions, inappropriate consumables, unauthorized repairs or modifications, mechanical damage, flooding, condensation, contamination, atmospheric phenomena, fortuitous events, or exceeding the rated parameters.

6. The warranty does not cover claims regarding the technical parameters of the device if they are consistent with the manufacturer's specifications.

7. The warranty is valid only if the device is delivered complete, in packaging that protects it from damage, along with documentation, cables, and additional components, without broken seals or identification marks, and with the original warranty card signed by both parties and a sticker with the production date.

8. The warranty does not cover services and materials related to normal operation, such as assembly, programming, cleaning, maintenance, replacement of fuses, light bulbs, and consumables. Such services are subject to a fee.

WARRANTY TERMS

9. The service center may refuse warranty repairs if the data in the documentation does not match the condition of the device, unauthorized changes to the documents have been made, or identification marks have been removed.
10. Warranty repairs are completed within 21 days of the device's delivery to the service center. If it is necessary to import parts from abroad, the deadline may be extended, of which the Buyer will be informed by email.
11. The device must be installed in accordance with standards and the operating instructions; if required by regulations, by a qualified person.
12. The rights and obligations of the parties are governed by this document. Equipment not collected from the service center within 3 months of the repair becoming the property of the service center. Parts replaced during the repair remain the property of the manufacturer.
13. The manufacturer is not responsible for the loss of user data stored on the device. The device can be returned with factory settings after repair.
14. Your signature on the warranty card confirms that you have read and accepted the terms and conditions. A warranty card without a signature and the original production date sticker is invalid.
15. The number of repairs does not include maintenance, cleaning, replacing light bulbs, fuses, consumables, or repairs resulting from normal wear and tear.

DATE	SELLER	CUSTOMER