Contents

INSTALLATION

The PMCG generator is a compact humidity control system designed for use in museum display cases and other small, sealed enclosures containing cultural heritage materials. The unit supports preventive conservation strategies by maintaining stable relative humidity conditions, thereby reducing the risk of deterioration associated with environmental fluctuations.
When correctly installed and operated, the PMCG microclimate control system is capable of maintaining relative humidity within ±2% (or better) of the user-defined setpoint. Such stability is consistent with preventive conservation principles that prioritize gradual change and environmental control to minimize mechanical and chemical stress on collection materials.
Depending on ambient environmental conditions and the construction, volume, and airtightness of the enclosure, the system can maintain relative humidity levels ranging from below 20% to above 60%. Selection of an appropriate setpoint should be based on the material composition, condition, and conservation requirements of the objects displayed.
The PMCG unit is intended exclusively for use with high-quality museum display cases or sealed enclosures.

2. Documentation Scope

This manual provides guidance for the installation, configuration, and commissioning of the PMCG unit within museum and conservation environments. It is intended for use by conservators, collection managers, exhibition designers, and technical staff responsible for environmental control in display and storage contexts.

3. System Description

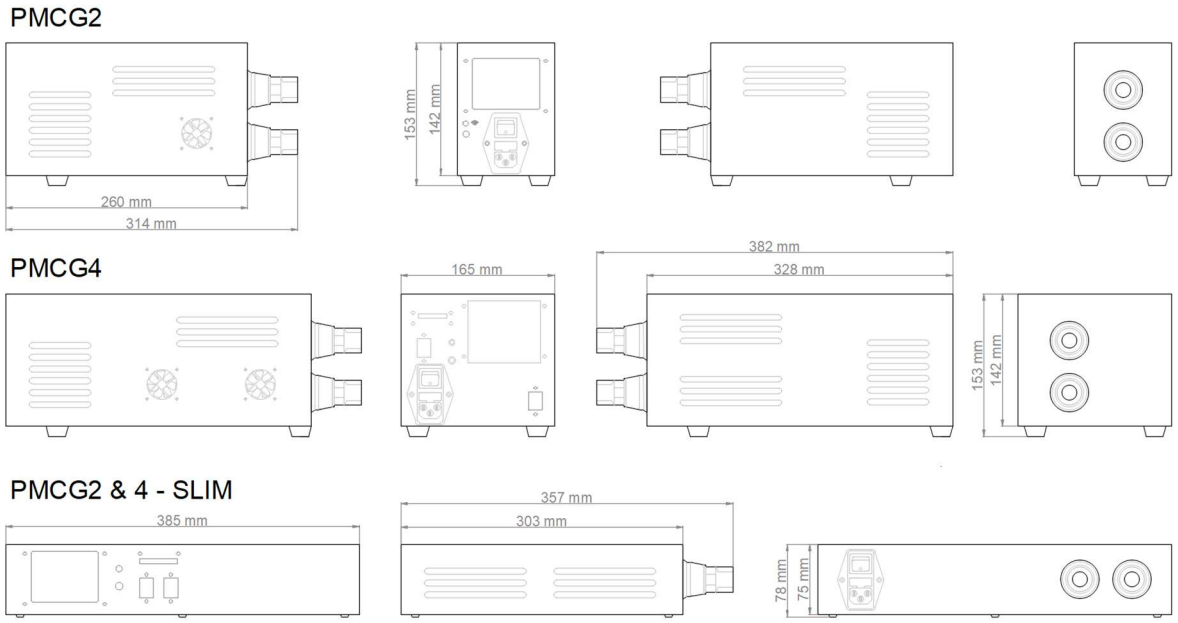
PMCG units are available in three size variants to accommodate different enclosure volumes and environmental loads. All models are equipped with two rear-mounted air connectors (Inlet and Outlet) to facilitate controlled air circulation within the enclosure.
The system offers two humidity control modes:

- **DD (Dehumidification Only)** – Intended for environments requiring moisture reduction without active humidification.
- **DH (Dehumidification and Humidification)** – Intended for environments requiring both moisture reduction and moisture addition to maintain a stable setpoint.

4. Installation Considerations

Proper installation of the PMCG unit and adequate preparation of the enclosure are critical to achieving stable microclimate conditions. In accordance with preventive conservation best practices, users should ensure that the enclosure is well sealed, that airflow paths are unobstructed, and that materials within the enclosure are acclimatized prior to activation.
Users are strongly advised to review the following sections carefully before installation and operation to minimize risks such as condensation, over-drying, or unintended environmental gradients within the enclosure.

3 MODELS OF PMCG UNIT



PACKING LIST

Standard package consists of:

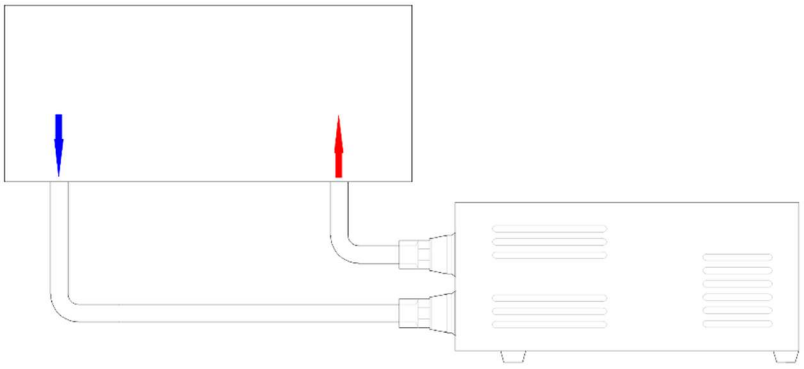
PMCG unit (1 pc)		Power cord (1 pc)	
20 mm Black polypropylene hose, 3 m With 90° angled bracket (2 pcs)		air connector (2 pcs)	
RH/T sensor (1 pc)		WiFi Antenna	

MINIMUM SPACE REQUIREMENTS

- Height
    - Minimal space over the machine is needed. 5-10 mm minimum.
- Width and dept
    - For DD units, minimum 10 mm on each side, on front approximate 100 mm for cabling and on back enough space for hoses and connectors.
    - For DH units, additional space of minimum 30 mm is needed on the side with fans installed.

Although the unit does not require a large amount of surrounding space, the technical compartment in which the machine is installed must be adequately ventilated. Air must be able to circulate freely and exchange with the ambient air outside the display case.

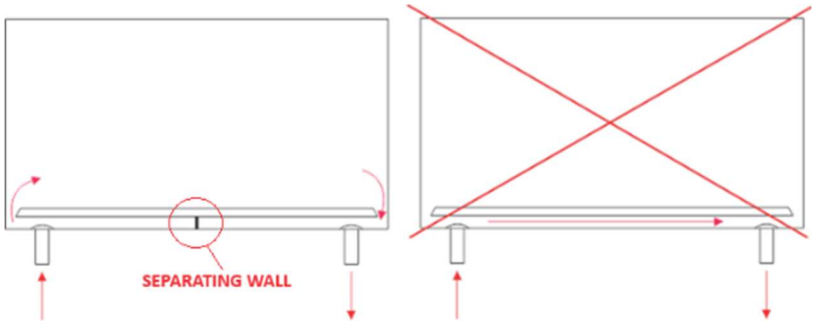
CONNECTION OF AIR HOSES TO THE CASE



SAMPLE CONNECTION

- The Machine output hose should be as short and straight as possible.
- The Machine input hose should be as short as possible, if possible avoid bends in the hose or the use of elbows or fitting.

For optimal performance, air from the PMCG shall be supplied directly into the vitrine. Supplying air into the subfloor may reduce PMCG performance, particularly in large or poorly sealed enclosures.
Ensure that the air supply and air return ports are positioned as far apart as possible. Avoid short-circuiting of the airflow, especially when the ports are located beneath a floor plate.



PMCG – INSTALLATION AND OPERATION MANUAL

The machine is supplied with a 3 m polypropylene hose, which may be cut to the required length. The hose shall be cut using a sharp knife, ensuring a straight cut at 90°. If a tight bend is required, the two supplied brackets shall be used to form a clean 90° bend.

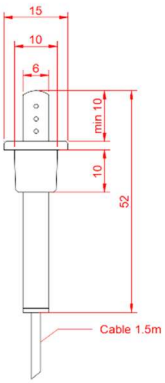
The hoses are connected to both the machine and the enclosure using the same type of connector. To install a hose, simply push it into the connector until it locks in place.

If hose removal is required, use a screwdriver to release the two side locking clips and pull the hose out.

The connector on the display case side may be installed directly in the case floor, provided that the floor thickness does not exceed 7.5 mm. The required installation opening is a circular hole with a diameter of 25 mm.

Alternatively, the connector may be installed using a brass fitting as shown in the drawing. In this configuration, the maximum allowable floor thickness is 27 mm, and the required opening diameter is 21.5–23 mm.

SENSOR CONNECTION



The PMCG is supplied with a sensor enclosed in a Ø6 mm (1/4") stainless steel housing, fitted with a 1.5 m cable. A grommet is included for mounting in a 10 mm hole.

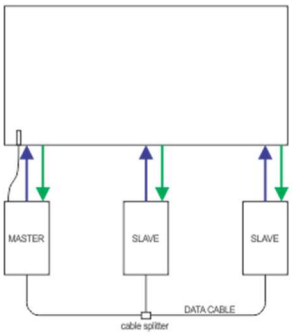
In most applications, locate the sensor near (but not directly in) the air input from the PMCG.

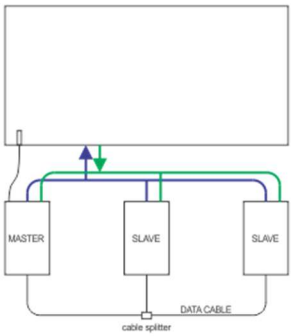
WiFi ANTENNA

Installation of the WiFi antenna is required only when using Preservatech's monitoring service. When the machine is located within a metal enclosure, such as beneath a steel casing, WiFi connectivity may be significantly reduced or unavailable. In these circumstances, the antenna should be installed externally. The antenna is included with the standard supply; a WiFi antenna extension cable is available as an optional accessory.

MASTER – SLAVE CONFIGURATION

When a single machine cannot adequately serve a large or non-airtight case, multiple machines may be configured in a Master/Slave arrangement. Any standard machine can be designated as the Master or a Slave, with one Master capable of controlling up to five Slaves. All Slaves operate in synchronization with the Master.





The Master/Slave group provides performance comparable to a higher-capacity unit. Machines may be connected individually to the case or linked in parallel using tee connectors, with a single hose pair supplying the case. Operation of multiple display cases from one Master/Slave group is not recommended due to potential differences in output between machines.

SETTING MACHINE TO USE AS MASTER/SLAVE SET

Any machine can be set as a Master or Slave. To set a machine to work as a Master/Slave a few parameters in the controller software must be changed.

All the machines need to be connected using a standard Ethernet cable. If more than one slave is in use, cable splitters need to be used. Network port is located on the back or front of the machine (depends on model) and marked with standard Ethernet Logo.

ONLY THE MASTER UNIT NEEDS A SENSOR CONNECTED.

SLAVE MACHINE

The Slave unit will receive all readings from the Master unit and mimic the Master unit operation. Controller on the Slave unit will not work and display will show TrSlave on top of the display.

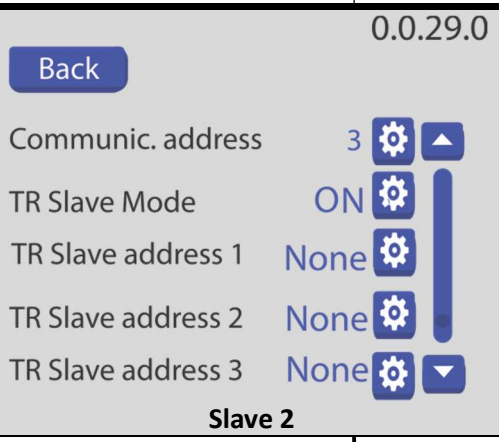
MASTER MACHINE

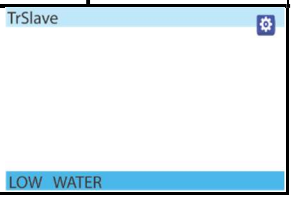
The only parameters to be set, are “TR Slave addresses”. In this mode, all machines are controlled by master unit.

MASTER/SLAVE CONFIGURATION SAMPLE

Below is a sample of setting up one master and two slaves machines.

<table>
<tr><th colspan="2">MASTER</th><th colspan="2">SLAVE</th></tr>
<tr><td colspan="2"> 
</td><td colspan="2"> 

Slave 1</td></tr>
<tr><td>Communication address</td><td>1</td><td>Communication address</td><td>2</td></tr>
<tr><td>TR Slave Mode</td><td>Off</td><td>TR Slave Mode</td><td>ON</td></tr>
<tr><td>TR Slave address 1</td><td>2</td><td colspan="2" rowspan="4"> 

Slave 2</td></tr>
<tr><td>TR Slave address 2</td><td>3</td></tr>
<tr><td rowspan="2">TR Slave address 3,4,5</td><td rowspan="2">None</td></tr>
<tr><td colspan="2">Communication address 3
TR Slave Mode ON</td></tr>
<tr><td></td><td colspan="3">Display of the slave machines will change.
To go back to stand alone mode, press configuration button and change “TR Slave Mode to “OFF”.
 
</td></tr>
</table>

If more then 2 slaves are set, the master machine TR Slave address 3, 4, 5 must be set. The slave machines must be set accordingly to correspond with the master unit.

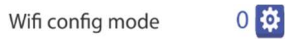
NETWORK CONFIGURATION

Use of the rhmonitoring.com service requires the machine to be configured for operation on a local Wi-Fi network. Prior to configuration, the Wi-Fi SSID (network name) and network password must be available. Setup may be completed using any Wi-Fi-enabled smartphone.

The system does not operate on open networks and requires a secured, password-protected connection.

<table>
<tr>
<td>Wifi config mode

Back

Hub_11291479
Wifi SSID:“PRESERVATECH _EUROPE”
Wifi Pass:“12345678”
Server 1 IP: 0.0.0.0
Server 2 Name:“pws.iq.direct”
Server 3 Name:“”</td>
<td>
1. To enter Wi-Fi configuration mode, in normal display mode push configuration button.
2. Using slider, find “Wifi config mode” and push configuration button located on the right.
 

3. After entering this mode, display shows among others Hub id, WiFi SSID (network name) and WiFi Pass. For proper operation SSID and Pass must be set to access local WiFi network.
4. Using your smartphone choose connection with Hubxxxxx . (Machine must be in Wifi config mode)
 

5. Within a few seconds after login a new page with the machine data will pop up.
 

6. Enter proper SSID (Name of local WiFi network) and a password.
7. Save data by pressing “Save to Hub” button.
 

8. Display should show actual parameters with the new data.
9. Shut down the machine and after 30 sec. turn it on again.
10. Assuming rhmonitoring.com account is ordered and setup, machine will be visible in the monitoring service.
</td>
</tr>
</table>

FireWall

If firewall is blocking connection to the server, use:

Protocol: TCP, Port (outbound): 5630, Server: pws.iq.direct

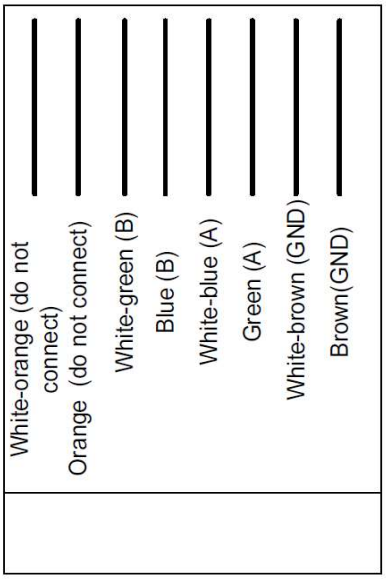
CONNECTING PMCG MACHINES TO THE BMS

1. In addition to Wi-Fi cloud connectivity, each machine can integrate with a Building Management System (BMS) using the Modbus/RTU protocol via an RJ45 connector.
2. Cable can be connected to RJ45 marked with Modbus logo connector on machine (See pinout below).
3. It's up to museum IT staff to implement this System and use data sent from Preservatech's controller.
4. Modbus/RTU parameters: Baud 9600, Data bits: 8, Stop bits: 1, Parity: none.
5. Device address set by parameter: "**RS485 addr external**" See Programming chapter.

Modbus Addressing

Address	Meaning	
0x2000	Device Mode 0-PID, 1-HUM	r
0x2001	Humidity * 10	r
0x2002	Temperature * 10	r
0x2100	Humidity Preset * 10	rw
0x2101	Humidity Alarm Error Offset * 10	rw
0x2200	Tempearture Error * 10 (used for air pump)	rw
0x2201	Termperature Alarm Error Delay (used for air pump)	rw
0x2300	PID kP	rw
0x2301	PID kI	rw
0x2302	PID kD	rw
0x2500	WiFi Send Interval (sec)	rw
0x2501	External SD Log Interval (sec)	rw

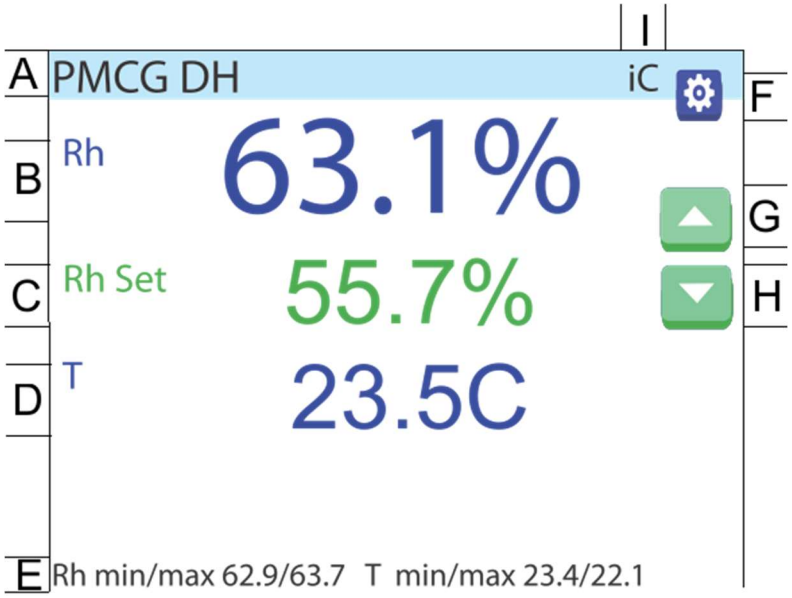
RJ45 Pinout



RJ-45. RS485. View from contacts side

OPERATION MANUAL

TOUCH SCREEN DISPLAY

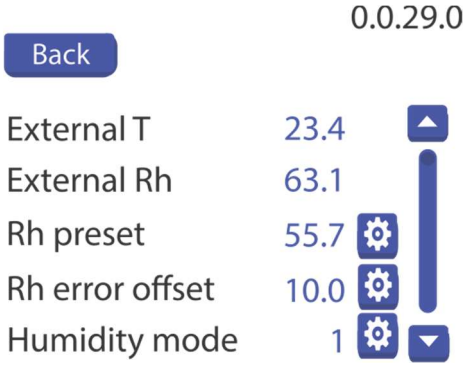


The touch screen is divided into a few areas with different functions. Below is an explanation of all the display areas.

The display will turn off after 10 minutes of being idle. Lightly tap the display to turn it back on.

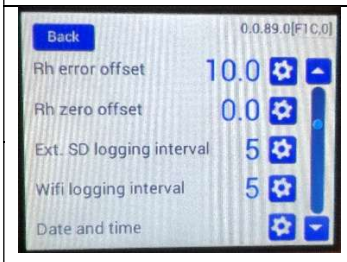
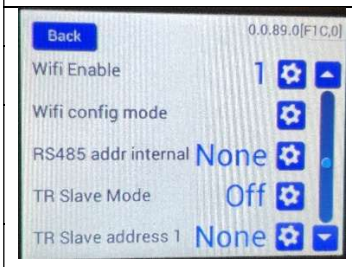
A	Humidity generator model (PMCG DH or DD)
B	Relative humidity measured by the machine's sensor (inside the display case) Under normal conditions, the digits are blue, when measured RH is out of range, digits change to RED and start BLINKING. OUT OF RANGE STATUS IS DETERMINED BY PARAMETER "RH error offset" (see "Programming Chapter")
C	Target RH. Can be adjusted by arrows on the right (G and H)
D	Temperature measured by the machine's sensor (inside the display case)
E	Displays the minimum and maximum values for RH and T in the last 24 hours.
F	Button for programming mode. See chapter: Programming.
G & H	Arrows to change target RH value. Use G to raise target RH, H to lower target RH.
I	Shows status of WiFi connection. i = Wi-Fi initialized C = Connected to server

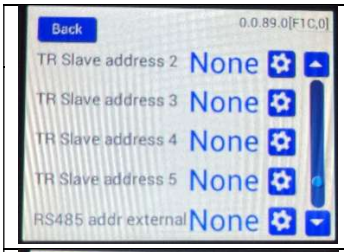
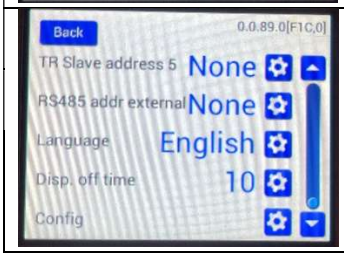
PROGRAMMING



After pushing the "Programming Button" (F) display will change to programming mode.

The display will show a list of parameters with some that can be changed by the user. Use the slider on the right side of the display to go to the next parameter. Parameters which can be changed have a small button on the right side of the value. After pressing it, the display allows to change this parameter.

	External T	The temperature measured by sensor. Read only.
	External RH	The relative humidity measured by sensor. Read only.
	Rh preset	The target value of RH.
	Rh delta	Value of RH offset where machine is switching to opposite mode DD to DH or DH to DD. Machine is shipped with value: 0.3
	RH delay	Delay in seconds when machine is reacted to "Rh delta" parameter. Machine is shipped with value: 5
	Rh error offset	The value, expressed as a percentage, defines the allowable deviation from the set humidity. When this limit is exceeded, the monitoring system sends an error message.
	Rh zero offset	This parameter allows the measured relative humidity (RH) value to be offset. It may be used when the reading shown on the machine display differs from that of an external reference instrument. For example, if the discrepancy is 2%, setting this parameter to 2 will adjust the displayed value accordingly.
	EXT. SD logging interval	Time span between logging data. In minutes.
	Wifi logging interval	Time span between sending data to monitoring server. Can be set from rhmonitoring.com
	Date and time	Setting proper time and date.
	Wifi Enable	1-WiFi enable, 0- Wifi disable
	Wifi config mode	Configures Wi-Fi network. See chapter Network Configuration.
	RS485 addr internal	Factory default:0 . It can be changed to allow communication between machines in master-slave mode. See chapter Master-Slave Configuration for more detailed information.
	TR Slave Mode	For setting a machine as a Slave. See chapter Master-Slave Configuration for more datailed explanation.
	TR Slave address 1	If a machine is set as a master, this parameter must correspond with the slave machine(s). Must be different then master machine communication address. See chapter Master-Slave Configuration for a more in depth explanation.

	TR Slave address 2, 3, 4, 5	Setting addresses for up to 5 slaves.
	RS485 addr external	Device address for Modbus connectivity.
	Language	Choice of English and Chinese language
	Disp. Off time	Time in minutes after display is turned off.
	Config	Configuration page. Access only of authorised personel.

USING DATA LOGGER

The PMCG includes an integrated data logger that records RH levels inside the controlled display case. The Micro SD card slot is located on either the front or rear panel, depending on the model. Logging intervals are adjustable from 1 to 60 minutes in 1-minute steps (see the Programming chapter). Logged data is stored in CSV format and can be opened with standard spreadsheet software such as Microsoft Excel.

Note: Only FAT32-formatted SD cards are supported. Correct date, time, and logging interval settings are required for proper data logging.

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SHIPPING AND STORAGE

The PMCG should be stored in a clean area with temperature between 5°C – 30°C and relative humidity below 80%. All cables, hoses and attachments must be disconnected and machine should be placed within a clear plastic bag once properly dried.

If shipping is necessary, original packing is the best solution. Otherwise, machine must be shipped in a box properly cushioned with bubble foil, Styrofoam chips or other packing material preventing physical damage to the machine case.

LIMITED WARRANTY - EU

Preservatech warrants that this product is free from defects in materials and workmanship under normal use and operating conditions, when installed and operated in accordance with this Installation and Operating Manual.

This warranty is valid for **two (2) years** from the original date of purchase and applies exclusively to the **original purchaser** who acquired the product from an authorized distributor of Preservatech Inc. or Preservatech Europe sp. z o.o. The warranty is non-transferable.

Warranty Coverage:

- **First year:** Full warranty coverage, including parts, labor, and shipping.
- **Second year:** Coverage for parts and labor only. Shipping and transportation costs shall be borne by the purchaser.

At Preservatech's discretion, defective components will be repaired or replaced, provided service is carried out by an authorized service provider or with prior authorization from Preservatech.

This warranty does not cover damage resulting from misuse, improper installation, improper power supply, unauthorized modification or repair, accidental damage, transportation damage, environmental conditions, or force majeure events.

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Proof of purchase is required for all warranty claims.

info@preservatech.com

LIMITED WARRANTY-UNITED STATES

Preservatech warrants that this product will be free from defects in materials and workmanship under normal use and service, when installed and operated in accordance with this Installation and Operating Manual.

This **Limited Warranty** is valid for **two (2) years** from the original date of purchase and applies only to the **original end-user purchaser** who purchased the product from an authorized Preservatech distributor. This warranty is non-transferable.

Warranty Coverage:

- **Year One:** Full warranty coverage, including parts, labor, and shipping.
- **Year Two:** Coverage for parts and labor only. The purchaser is responsible for all shipping and transportation costs.

Preservatech, at its sole option, will repair or replace defective parts, provided that service is performed by an authorized service provider or with Preservatech's prior written approval.

This warranty does not cover damage caused by misuse, abuse, improper installation, improper power supply, unauthorized service or modification, accident, transportation damage, environmental exposure, or acts of God.

EXCEPT AS EXPRESSLY PROVIDED HEREIN, PRESERVATECH DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, TO THE EXTENT PERMITTED BY LAW.
IN NO EVENT SHALL PRESERVATECH BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES.

Some states do not allow limitations on implied warranties or the exclusion of incidental or consequential damages; therefore, these limitations may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Proof of purchase is required for all warranty claims.

DECLARATION OF CONFORMITY

CE DECLARATION OF CONFORMITY

Manufacturer: Preservatech Europe sp. z o.o.
Józefa Brandta 4
85-306 Bydgoszcz
Poland

Product identification: Product: PMCG Humidity Generator

Description: Constant humidity generator designed for controlling relative humidity inside museum display cases, equipped with Wi-Fi connectivity.
This declaration of conformity is issued under the sole responsibility of the manufacturer.

The object of the declaration described above is in conformity with the relevant Union harmonisation legislation:

- **Directive 2014/53/EU – Radio Equipment Directive (RED)**
- **Directive 2011/65/EU – RoHS**

Harmonised standards applied

The following harmonised standards and technical specifications have been applied:

- **EN 300 328**
- **EN 301 489-1**
- **EN 301 489-17**
- **EN IEC 62368-1**
- **EN 62479**

Additional RED information

- **Frequency band: 2.4 GHz ISM band**
- **Maximum RF output power: < 20 dBm (EIRP)**

Conformity assessment

The conformity assessment procedure has been carried out in accordance with Directive 2014/53/EU.

The technical documentation is compiled and maintained by the manufacturer.

Place and date of issue
Bydgoszcz, Augusr 15, 2024
Authorized signatory
Name: Jan Maternicki
Position: CEO