



# TMEC3E Wi-Fi THERMOSTAT

*The **ultimate technology of thermostats**, equipped with **embedded 5 GHz Wi-Fi 6** advanced tech, specifically designed for **residential hot water** electric heaters*



***One Thermostat Endless Possibilities***



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# 1 Introduction

## 1.1 General overview

The TMEC3E Wi-Fi is the ultimate evolution of Mechatronic Thermostats that integrates electronic temperature control, mechanical high-limit safety mechanism on the stem (water immersed), and advanced technology for remote operation thanks to built-in dual-band (2.4 / 5 GHz) Wi-Fi 6 (802.11ax) module with 802.11a/b/g/n/ac/ax backward compatibility. Designed specifically for residential electric water heaters, the TMEC3E Wi-Fi marks the third generation of THERMOWATT's patented Smart Thermostat line.

Building on its expertise with mechanical thermostats, THERMOWATT has incorporated innovations from previous generations of the TMEC line. Earlier models introduced a self-learning ECO mode that records user habits and adjusts the water heater's temperature based on time and energy content; this ensures consistent comfort and improved energy efficiency. In addition, features such as remote control via Wi-Fi, Holiday and Programming modes, malfunction diagnostics, Antifreeze and Antibacterial safety functions were included.

The TMEC3E Wi-Fi further enhances and reinforces these capabilities in a compact, technologically advanced solution. This new generation also introduces extra functionalities for the user including Consumer-Led Flexibility (CLF) / Demand Side Response (DSR) management, a temporary Boost function, the reset of non-volatile errors and factory default settings. Furthermore, the device stays constantly up to date thanks to Over-The-Air (OTA) remote software updates.

**The user can interact with the TMEC3E Wi-Fi through the APP only; therefore, it's strictly recommended that the TMEC3E Wi-Fi is always powered on and stable connected to the user's Wi-Fi network.**

## 1.2 Certifications

The TMEC3E Wi-Fi meets safety standards EN 60730-1 and EN60730-2-9, and as part of the water heater, complies with EN60335-1 and EN60335-2-21. Furthermore, the TMEC3E Wi-Fi meets cybersecurity standard EN 18031-1 for internet connected radio equipment and complies with ETSI EN 303 645.



### 1.3 Safety information

The TMEC3E Wi-Fi must be installed by a competent person or qualified engineer in a controlled environment, such as a technical or domestic room. Please read these instructions carefully. Failure to follow these instructions can damage the TMEC3E Wi-Fi or cause hazardous conditions.

The qualified installer must ensure that the TMEC3E Wi-Fi is plugged into a heating element fully immersed in water and only subjected to normal operating conditions in a domestic hot water system such as vented, unvented or solar thermal water system. No warranty is hereby given or implied for other uses except domestic.

The qualified installer and the user must also ensure that there is water in the system before the TMEC3E Wi-Fi is switched on. If the TMEC3E Wi-Fi is allowed to run when the water level is not fully covering the heating element there may be serious damage incurred to the heater, property or persons.

The TMEC3E Wi-Fi must be fitted in accordance with the latest IEE wiring regulations and must be wired through a double pole isolator or suitable controller which must have a contact separation of at least 3 mm in all poles.

It is essential that the TMEC3E Wi-Fi cap is never covered as this will potentially cause major problems with the working of the unit and can be very dangerous.

- **Always isolate the mains supply before installing the TMEC3E Wi-Fi or performing maintenance activities on it.**
- **The TMEC3E Wi-Fi must not be modified in any way.**
- **The TMEC3E Wi-Fi must be earthed.**
- **To reduce the risk of scalding, it is recommended that the temperature set point is set no higher than 65°C.**

The TMEC3E Wi-Fi can be used by children aged 8 years and above, and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the TMEC3E Wi-Fi in a safe way and understand the hazards involved. Children should not play with the TMEC3E Wi-Fi. Cleaning and user maintenance shall not be done by children without supervision.

This publication is based on information available when approved. Ongoing design refinements may lead to changes not included in this publication.

### 1.4 Warranty

The Manufacturer warrants that as from the date of purchase of the TMEC3E Wi-Fi for a period of **2 (two) years** the TMEC3E Wi-Fi is free from any defects in design, workmanship, construction or materials ("Defect").

In the event of Defect, the Manufacturer will only offer a replacement of the faulty item. The Manufacturer will not be held responsible for any replacement or re-installation costs, travelling expenses, etc.

This warranty does not cover defects or damages due to improper installation, alteration, accident or any other event beyond the control of the Manufacturer. Defect or damage resulting from misuse, abuse or negligence will void this warranty. This warranty does not cover wear and tear under normal operating conditions.

All warranty claims must be made in written form through the retailer where the TMEC3E Wi-Fi was originally purchased within 10 (ten) days from the Defect discovery. A purchase receipt or other proof of date of purchase of the TMEC3E Wi-Fi will be required to process all warranty claims. The model number and the part number found on the TMEC3E Wi-Fi label will be required when submitting any warranty claims.

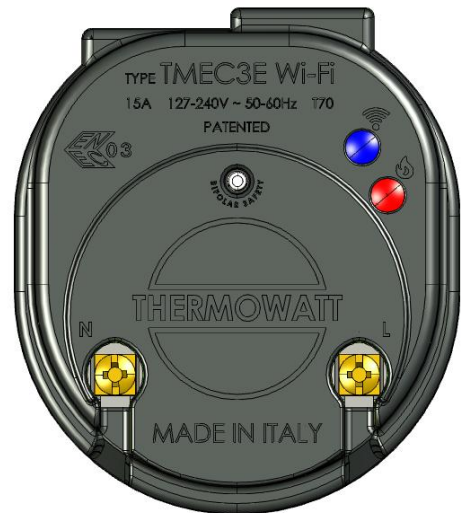
This express warranty is in lieu of any warranty of merchantability, fitness for a particular purpose, or other warranty. In no event shall Manufacturer be liable for general or consequential damages, whether resulting from delay in delivery, loss of use, parts failure, or other cause.



## 1.5 Product overview

The TMEC3E Wi-Fi is a plug-in stem mechatronic thermostat featuring a dual-band Wi-Fi 6 radio module. The front panel of the TMEC3E Wi-Fi contains two LEDs:

- The blue LED indicates the Wi-Fi status:
  - Steady on when connected to a Wi-Fi network.
  - Off when not connected.
  - Blinking during configuration or pairing.
- The red LED indicates the heating element status:
  - Steady on when the heating element is active.
  - Off when the heating element is inactive.
  - Blinking when an error is detected.



## 1.6 Product installation

**Always isolate the mains supply before installing the TMEC3E Wi-Fi.**

The TMEC3E Wi-Fi must be wired with a heat-resistant flexible cord with a minimum T rating of “T-80” and with a minimum cross-section area of 1.5 mm<sup>2</sup>.

The qualified installer must:

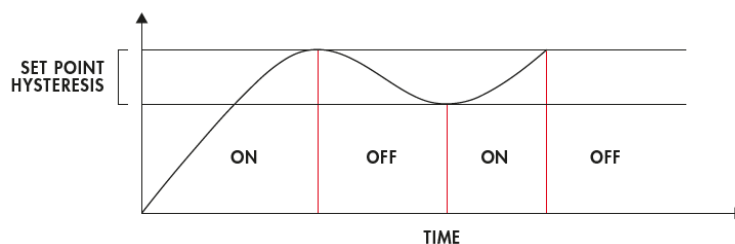
- Connect the Live and Neutral wires to the TMEC3E Wi-Fi terminal slots and ensure that the terminal screws (respectively marked “L” and “N”) are properly tightened (from 1 Nm to 2 Nm) to avoid poor electrical connections and prevent the terminations being broken off.
- Ensure that all the electric connections are good and solid.
- Insert the TMEC3E Wi-Fi stem into the heating element pocket and ensure that the TMEC3E Wi-Fi faston terminals fit within the heating element spade connectors; improper or poor electric contact between faston terminals and spade connectors could generate serious damage to the heater, property or persons.
- Ensure that there is water in the system before the TMEC3E Wi-Fi is switched on.
- Turn on the mains supply circuit breaker to enable power to the TMEC3E Wi-Fi; the blue LED starts blinking.



## 2 Working modes

### 2.1 General overview

The TMEC3E Wi-Fi controls the heating element to maintain the desired temperature. When the measured temperature falls below the set point minus the factory default hysteresis value, the device activates the heating element. If the measured temperature exceeds the set point, the heating element is deactivated. The set point is determined by the selected working mode or any function in use.



The TMEC3E Wi-Fi operates in a hierarchy: first, automatic safety errors, followed by automatic safety features like Antibacterial and Antifreeze, then temporary manual functions such as CLF / DSR and Boost (if activated by the user), and finally the user-selected working mode.

After resolving an error or after a power outage, the TMEC3E Wi-Fi resumes operation in the same working mode and states immediately prior to the interruption (see exceptions in following paragraphs).

### 2.2 Factory settings

The TMEC3E Wi-Fi factory default and user-adjustable settings are detailed in paragraph 6 (*example*).

### 2.3 Wi-Fi remote connection via APP

The TMEC3E Wi-Fi setup is carried out via APP using Bluetooth: connect the device to the mains supply via the external circuit breaker to activate Bluetooth and start the initial Wi-Fi configuration; there is a 5-minute window to complete the process. When the Wi-Fi configuration is successfully completed, the TMEC3E Wi-Fi is ready to interact with the user via APP.

To update Wi-Fi parameters, disconnect and reconnect the device to the mains supply via the external circuit breaker to re-enable Bluetooth, again allowing 5 minutes for configuration before previous parameters are automatically restored. The TMEC3E Wi-Fi remote control via APP is unavailable during Bluetooth activation, becoming available once setup is finished or time runs out.



## 2.4 MANUAL

The TMEC3E Wi-Fi works as a mechanical thermostat, switching on the heating element to reach the desired set point defined by the user.

## 2.5 ECO

The TMEC3E Wi-Fi automatically adapts to a 7-day usage cycle.

### First week

The TMEC3E Wi-Fi switches on the heating element to reach a factory default set point while learns the user's habits, recording time and temperature drop ( $\Delta T$ ) during each withdrawal.

### Following weeks

The set point is automatically calculated by the TMEC3E Wi-Fi in accordance with the previous week learning, providing the exact amount of hot water at the right time to satisfy the user's habitual needs; the comfort is always ensured by a minimum set point.

During each week the TMEC3E Wi-Fi continues to learn the user's habits for the next week.

The self-learning mode starts (or is reset) each time ECO mode is selected by the user, or after a volatile or non-volatile error, a CLF / DSR event, a power outage.

## 2.6 PROGRAMMING (AUTO)

The TMEC3E Wi-Fi follows a user-defined weekly schedule.

This mode is designed for users who want to get maximum control of the device and seek to manage the balance between savings and comfort.

The user sets the period in which the heating element can switch on to reach the temperature set point, ensuring always a minimum level of comfort defined through the COMFORT temperature setting.

By enabling the PRE-HEATING setting, the user allows the TMEC3E Wi-Fi to switch on the heating element in advance to reach the temperature set point at the beginning of the time slots selected.

In case of Wi-Fi connectivity absence after a power outage, the TMEC3E Wi-Fi cannot synchronize the week schedule until the connection is restored.

## 2.7 HOLIDAY

The TMEC3E Wi-Fi switches off the heating element until the date set by the user.

In case of a prolonged loss of Wi-Fi connectivity after a power outage, the holiday period is automatically ended to ensure comfort.

## 2.8 OFF

The TMEC3E Wi-Fi switches off the heating element.



## 3 Functions

### 3.1 Boost temporary function

The function could be activated by the user only if the working mode is MANUAL or PROGRAMMING (AUTO). If activated by the user, the TMEC3E Wi-Fi switches on the heating to reach a temperature set point that should be higher than the one defined in the currently selected working mode. In the settings menu the user defines both the new temperature set point and the duration for which this temporary feature should remain active before returning to the currently selected working mode. The temporary function is immediately terminated after a volatile or non-volatile error, a CLF / DSR event, a power outage.

### 3.2 Consumer-Led Flexibility (CLF) / Demand Side Response (DSR) temporary function

In case of the user has entered a CLF / DSR agreement with one of THERMOWATT's partners, the TMEC3E Wi-Fi shall switch on or switch off the heating element in accordance with the instructions received via cloud API from the third party authorised by the user, to achieve the objectives defined in the contract. In case of a prolonged loss of Wi-Fi connectivity after a power outage during a CLF / DSR event, the instruction execution is automatically terminated to resumes operation in the same working mode and states immediately prior to the event activation.

### 3.3 Antibacterial function

The TMEC3E Wi-Fi performs a thermal treatment against the proliferation of bacteria switching on the heating element when required, to maintain the measured temperature above a predefined threshold for a set period. The cycle starts after the device is first connected to the mains supply via the external circuit breaker, and subsequently at regular intervals to meet the criteria above mentioned. In case of a prolonged loss of Wi-Fi connectivity after a power outage, the antibacterial cycle is immediately triggered to ensure enhanced protection.

### 3.4 Antifreeze function

The TMEC3E Wi-Fi switches on the heating element to protect the water heater against the ice.





## 4 Errors and warnings

The TMEC3E Wi-Fi continuously checks the measured temperatures to detect immediately any situations of danger for the user or the system. If an error is detected, the TMEC3E Wi-Fi switches off the heating element. If a warning is detected, the TMEC3E Wi-Fi works in accordance with the selected working mode.

### 4.1 Volatile Errors

When a volatile fault is solved, the TMEC3E Wi-Fi error status automatically disappears, enabling the selected working mode (automatic reset).

- PROBES DIFFERENTIAL ERROR  
The TMEC3E Wi-Fi error status appears if the difference between the temperatures measured by the two probes is higher than 50°C. The TMEC3E Wi-Fi error status automatically disappears if the difference between the temperatures measured by the two probes is lower than 42°C.
- NTC1 OPEN/SHORT CIRCUIT  
The TMEC3E Wi-Fi error status appears if the NTC1 (high probe) reads a value out of the range. The TMEC3E Wi-Fi error status automatically disappears if the NTC1 reads a value included in the range.
- NTC2 OPEN/SHORT CIRCUIT  
The TMEC3E Wi-Fi error status appears if the NTC2 (low probe) reads a value out of the range. The TMEC3E Wi-Fi error status automatically disappears if the NTC2 reads a value included in the range.
- HIGH OPERATING TEMPERATURE  
The TMEC3E Wi-Fi error status appears if the device, through its internal sensors, detects an operating temperature that exceeds the maximum permitted value. The TMEC3E Wi-Fi error status automatically disappears if the operating temperature returns within the allowed range.

### 4.2 Non-volatile Errors

The intervention of a qualified technician is required to assess the potential damages and solve the root causes. The TMEC3E Wi-Fi error status disappears only after a manual reset done by the user via APP.

- DRY HEATING  
The TMEC3E Wi-Fi error status appears if the measured temperature increases more than 15°C in 32 seconds.

### 4.3 Warning

The TMEC3E Wi-Fi warning status disappears if the warning conditions end or after a power outage.

- HEATING ELEMENT WARNING (Low Heating Rate)  
The TMEC3E Wi-Fi detects the warning if the heating element is on for more than 2 consecutive hours and the measured temperature does not increase more than 2°C. The TMEC3E Wi-Fi warning status disappears if the measured temperature changes by over 2°C.



#### 4.4 OVERHEATING

If the temperature measured by the mechanical safety device is above the safety threshold, the TMEC3E Wi-Fi disconnects from the mains supply. The intervention of a qualified technician is required to assess the potential damages and solve the severe malfunction's root causes. The water heater could be reconnected to the mains supply via the external circuit breaker only after a manual reset done by a qualified technician. For the manual reset, disconnect the TMEC3E Wi-Fi from the mains supply via the external circuit breaker and press the bipolar safety pin on the TMEC3E Wi-Fi.



## 5 Technical Data

Thermostat type	Patented Wi-Fi SMART mechatronic thermostat with electronic temperature control and mechanical safety
Rated current / voltage	15 A / 127-240 V~
Max ambient temperature	70°C
Functional cut-off	Unipolar
Safety cut-out	Bipolar
Safety reset	Manual
Standard stem length	280 mm
Electrical connection	Screw terminals
External regulation	MyThermowatt APP
Wi-Fi protocol	IEEE 802.11a/b/g/n/ac/ax (dual-band 2.4 / 5 GHz)
Maximum radio frequency power transmitted	20 dBm
EC Declaration of Conformity	Hereby, Thermowatt S.p.A. (via S. Giovanni Battista 21, 60011 Arcevia (AN), ITALY) declares that all the TMEC3E Wi-Fi are in compliance with the essential requirements and other relevant provisions of Directive RED 2014/53/EU. The complete Declaration of Conformity is available at the following address: <a href="https://www.thermowatt.com/en/products/mechatronic-thermostat/tmec3e-wifi.html">https://www.thermowatt.com/en/products/mechatronic-thermostat/tmec3e-wifi.html</a>
Approvals	CE, UKCA

The Manufacturer reserves the right to make product improvements which may deviate from the specifications and descriptions stated herein, without obligation to change previously manufactured products or to note the change.



## 6 Factory default and user-adjustable settings (*example*)

Working mode	MANUAL (user-adjustable via APP)
Set point	60°C (user-adjustable via APP)
Maximum set point	70°C
Minimum set point	20°C
Hysteresis	8°C
Mechanical safety threshold	85°C +8°C/-5°C
ECO first week set point	70°C
ECO following weeks maximum set point	62.5°C
ECO following weeks minimum set point	40°C
PROGRAMMING (AUTO) set point	65°C (user-adjustable via APP)
PROGRAMMING (AUTO) COMFORT set point	20°C (user-adjustable via APP)
PROGRAMMING (AUTO) period	24/7 @ set point (user-adjustable via APP)
PROGRAMMING (AUTO) PRE-HEATING	Disabled (user-adjustable via APP)
HOLIDAY maximum period	49 days
Boost set point	70°C (user-adjustable via APP)
Boost maximum set point	Maximum set point
Boost minimum set point	20°C
Boost duration	180 minutes (user-adjustable via APP)
Boost maximum duration	300 minutes
Boost minimum duration	30 minutes
Antibacterial set point	70°C
Antibacterial threshold	62°C
Antibacterial period	30 minutes
Antibacterial intervals	2 hours (first connection)   7 days
Antifreeze set point	5°C + Hysteresis
Water heater power	- Watt (user-adjustable via APP)
Electricity average price per kWh	- (user-adjustable via APP)