

## INSTALLATION MANUAL

# AIR-TO-WATER HEAT PUMP

Please read this installation manual completely before installing the product.

Installation work must be performed in accordance with the national wiring standards by authorized personnel only.

Please retain this installation manual for future reference after reading it thoroughly.

**THERMA V™**  
Original instruction



MFL68026607  
Rev.00\_021819

[www.lg.com](http://www.lg.com)

Copyright © 2018 - 2019 LG Electronics Inc. All Rights Reserved.

# TABLE OF CONTENTS

## 4 PREFACE

---

## 5 IMPORTANT SAFETY INSTRUCTIONS

---

## 12 INSTALLATION PART

---

## 13 GENERAL INFORMATION

---

- 13 Model Information
- 14 Model name and related information
- 15 Parts and Dimensions
- 18 Control Parts
- 19 Remote Controller
- 20 Wiring Diagram
- 23 Typical Installation Example
- 29 Cycle Diagram
- 30 Water cycle

## 32 INSTALLATION

---

- 32 Transporting the Unit
- 33 Installation places
- 34 Seasonal Wind and Cautions in Winter
- 35 Foundation for Installation
- 36 Electrical Wiring
- 42 Wiring of main power supply and equipment capacity
- 43 Water Piping and Water Circuit Connection
- 45 Water Charging
- 45 Pipe Insulation
- 46 Water pump Capacity
- 46 Pressure Drop
- 47 Performance curve
- 48 Water Quality
- 48 Frost protection
- 49 Water Volume and Expansion Vessel Pressure

## 50 ACCESSORIES INSTALLATION

---

- 50 Accessories supported by LG Electronics
- 51 Accessories supported by 3rd party Companies
- 52 Before Installation
- 52 Thermostat
- 55 2nd Circuit
- 58 3rd Party Boiler
- 59 3rd Party Controller
- 60 Meter Interface
- 61 Central Controller
- 62 Remote Controller
- 65 DHW Tank
- 68 DHW Tank Kit
- 69 Solar Thermal Kit
- 70 Dry Contact
- 72 External Controller - Setting up programmable digital input operation
- 73 Remote Temperature Sensor
- 75 Solar pump
- 76 External pump
- 77 Wi-fi Modem
- 78 Smart Grid
- 79 2Way Valve
- 80 3Way Valve(A)
- 81 3Way Valve(B)
- 82 Electric Heater
- 85 Final check

## 86 CONFIGURATION

---

- 86 DIP Switch Setting

---

## 92 SERVICE SETTING

---

- 92 How to enter service setting
- 92 Service setting
- 93 Service Contact
- 94 Model Information
- 95 RMC Version Information
- 96 Open Source License

## 97 INSTALLER SETTING

---

- 97 How to enter installer setting
- 98 Installer setting
- 100 3 Minutes Delay
- 101 Select Temperature Sensor
- 102 Dry Contact Mode
- 103 Central Control Address
- 104 Pump test run
- 105 Air cooling set temp
- 106 Water cooling set temp
- 107 Air heating set temp
- 108 Water heating set temp
- 109 DHW set temp
- 110 Screed drying
- 112 Heater on temperature
- 114 Water supply off temp. during cooling
- 116 Tank disinfection setting 1, 2
- 117 Tank setting 1
- 118 Tank setting 2
- 120 Heater priority
- 121 DHW time setting
- 122 TH on/off Variable, heating air
- 123 TH on/off Variable, heating water
- 124 TH on/off Variable, cooling air
- 125 TH on/off Variable, cooling water
- 126 Heating temp. setting
- 127 Cooling temp. setting
- 128 Pump setting in heating
- 129 Pump setting. in cooling
- 130 Forced operation
- 131 CN\_CC
- 132 Pump Capacity
- 133 Smart Grid(SG)
- 134 Seasonal auto temp
- 136 Modbus Address
- 137 CN\_EXT
- 138 Anti-freezing Temperature
- 139 Add Zone
- 140 Use External Pump
- 141 3rd Party Boiler
- 142 Meter Interface
- 143 Pump Prerun/Overrun
- 144 Solar Thermal System
- 146 Data logging
- 147 Password Initialization
- 148 Power Supply Blockage (SG Ready)
- 149 Overview settings

## 151 COMMISSIONING

---

- 151 Check List before Starting Operation
- 152 Starting Operation
- 153 Airborne Noise Emission
- 153 Starting Operation flow chart
- 154 Vacuum & Charge of Refrigerant
- 157 Troubleshooting





# PREFACE

This installation manual is to present information and guide about understanding, installing, and checking **THERMAV™**.

Your careful reading before installation is highly appreciated to make no mistake and to prevent potential risks. The manual is divided into nine chapters. These chapters are classified according to installation procedure. See the table below to get summarized information.

Chapters	Contents
Chapter 1	<ul style="list-style-type: none"> <li>• Warning and Caution concerned with safety.</li> <li>• This chapter is directly related with human safety. We strongly recommend reading this chapter carefully.</li> </ul>
Chapter 2	<ul style="list-style-type: none"> <li>• Items Inside product Box</li> <li>• Before starting installation, please make it sure that all parts are found inside the product box.</li> </ul>
Chapter 3	<ul style="list-style-type: none"> <li>• Fundamental knowledge about <b>THERMAV™</b></li> <li>• Model identification, accessories information, refrigerant and water cycle diagram, parts and dimensions, electrical wiring diagrams, etc.</li> <li>• This chapter is important to understand <b>THERMAV™</b></li> </ul>
Chapter 4	<ul style="list-style-type: none"> <li>• Installation about the unit.</li> <li>• Installation location, constraints on installation site, etc</li> <li>• Electrical wiring at the unit.</li> <li>• System set-up and configuration.</li> <li>• Information about water pump</li> </ul>
Chapter 5	<ul style="list-style-type: none"> <li>• Information about supported accessories</li> <li>• Specification, Constraints, and wiring are described.</li> <li>• Before purchasing accessories, please find supported specification to buy proper one.</li> </ul>
Chapter 6	<ul style="list-style-type: none"> <li>• Information about DIP switch setting</li> </ul>
Chapter 7	<ul style="list-style-type: none"> <li>• check and input service contact</li> <li>• information about model and open source license</li> </ul>
Chapter 8	<ul style="list-style-type: none"> <li>• Information on the installer setup mode that sets the detailed functions of the remote control</li> <li>• Incorrectly setting the installer setup mode may result in product failure, personal injury, or property loss, so this chapter requires a deeper understanding</li> </ul>
Chapter 9	<ul style="list-style-type: none"> <li>• Check points before starting operation are explained.</li> <li>• Troubleshooting, maintenance, and error code list are presented to correct problems</li> </ul>

# IMPORTANT SAFETY INSTRUCTIONS

	<p>Read the precautions in this manual carefully before operating the unit.</p>		<p>This appliance is filled with flammable refrigerant (R32)</p>
	<p>This symbol indicates that the Operation Manual should be read carefully.</p>		<p>This symbol indicates that a service personnel should be handling this equipment with reference to the Installation Manual.</p>

## ***READ ALL INSTRUCTIONS BEFORE USING THE APPLIANCE.***

Always comply with the following precautions to avoid dangerous situations and ensure peak performance of your product

### **⚠ WARNING**

It can result in serious injury or death when the directions are ignored

### **⚠ CAUTION**

It can result in minor injury or product damage when the directions are ignored

### **⚠ WARNING**

#### **Installation**

- Do not use a defective or underrated circuit breaker. Use this appliance on a dedicated circuit.
  - There is risk of fire or electric shock.
- For electrical work, contact the dealer, seller, a qualified electrician, or an Authorized Service Center.
  - There is risk of fire or electric shock.
- Always ground the unit.
  - There is risk of fire or electric shock.
- Install the panel and the cover of control box securely.
  - There is risk of fire or electric shock.

- Always install a dedicated circuit and breaker.
  - Improper wiring or installation may cause fire or electric shock
- Use the correctly rated breaker or fuse.
  - There is risk of fire or electric
- Do not modify or extend the power cable.
  - There is risk of fire or electric shock.
- Do not install, remove, or reinstall the unit by yourself (customer).
  - There is risk of fire, electric shock, explosion, or injury
- For antifreeze, always contact the dealer or an authorized service center.
  - Almost the antifreeze is a toxic product.
- For installation, always contact the dealer or an authorized Service Center.
  - There is risk of fire, electric shock, explosion, or injury.
- Do not install the unit on a defective installation stand.
  - It may cause injury, accident, or damage to the unit.
- Be sure the installation area does not deteriorate with age.
  - If the base collapses, the unit could fall with it, causing property damage, unit failure, and personal injury.
- Do not install the water pipe system as Open loop type.
  - It may cause failure of unit.
- Use a vacuum pump or inert (nitrogen) gas when doing leakage test or purging air. Do not compress air or oxygen and do not use flammable gases.
  - There is the risk of death, injury, fire or explosion.
- Make sure the connected condition of connector in product after maintenance.
  - Otherwise, it may cause product damage
- Do not touch leaked refrigerant directly.
  - There is risk of frostbite.
- Compliance with national gas regulations shall be observed.
- Refrigerant tubing shall be protected or enclosed to avoid damage.
- The installation of pipe-work shall be kept to a minimum.

- A brazed, welded, or mechanical connection shall be made before opening the valves to permit refrigerant to flow between the refrigerating system parts. A vacuum valve shall be provided to evacuate the interconnecting pipe and/or any uncharged refrigerating system part.
- Any person who is involved with working on or breaking into a refrigerant circuit should hold a current valid certificate from an industry-accredited assessment authority, which authorises their competence to handle refrigerants safely in accordance with an industry recognised assessment specification.
- Pipe-work shall be protected from physical damage and shall not be installed in an unventilated space, if that space is smaller than
  - 1) The minimum floor area : 49.4 m<sup>2</sup>
  - 2) The maximum refrigerant charge amount : 2.4 kg
- Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.
- Do not pierce or burn.
- Be aware that refrigerants may not contain an odour.
- Dismantling the unit, treatment of the refrigerant oil and eventual parts should be done in accordance with local and national standards.
- Ducts connected to an appliance shall not contain an ignition source.
- Copper in contact with refrigerants shall be oxygen-free or deoxidized, for example Cu-DHP as specified in EN 12735-1 and EN 12735-2.

## Operation

- Take care to ensure that power cable could not be pulled out or damaged during operation.
  - There is risk of fire or electric shock.
- Do not place anything on the power cable.
  - There is risk of fire or electric shock.
- Do not plug or unplug the power supply plug during operation.
  - There is risk of fire or electric shock.

- Do not touch (operate) the unit with wet hands.
  - There is risk of fire or electric shock.
- Do not place a heater or other appliances near the power cable.
  - There is risk of fire or electric shock.
- Do not allow water to run into electric parts.
  - There is risk of fire, failure of the unit, or electric shock.
- Do not store or use flammable gas or combustibles near the unit.
  - There is risk of fire or failure of unit.
- Do not use the unit in a tightly closed space for a long time.
  - It may cause damage to the unit. When flammable gas
- leaks, turn off the gas and open a window for ventilation before turning the unit on.
  - There is risk of explosion or fire.
- If strange sounds or smell or smoke comes from unit, turn the breaker off or disconnect the power supply cable.
  - There is risk of electric shock or fire.
- Stop operation and close the window in storm or hurricane. If possible, remove the unit from the window before the hurricane arrives.
  - There is risk of property damage, failure of unit, or electric shock.
- Do not open the front cover of the unit while operation. (Do not touch the electrostatic filter, if the unit is so equipped.)
  - There is risk of physical injury, electric shock, or unit failure.
- Do not touch any electric part with wet hands. you should be power off before touching electric part.
  - There is risk of electric shock or fire.
- Do not touch refrigerant pipe and water pipe or any internal parts while the unit is operating or immediately after operation.
  - There is risk of burns or frostbite, personal injury.
- If you touch the pipe or internal parts, you should be wear protection or wait time to return to normal temperature.
  - Otherwise , it may cause burns or frostbite, personal injury.



- Turn the main power on 6 hours ago before the product starting operation.
  - Otherwise, it may cause compressor damage.
- Do not touch electric parts for 10 minutes after main power off.
  - There is risk of physical injury, electric shock.
- The inside heater of product may operate during stop mode. It is intended to protect the product.
- Be careful that some part of the control box are hot.
  - There is risk of physical injury or burns.
- When the unit is soaked (flooded or submerged), contact an Authorized Service Center.
  - There is risk of fire or electric shock.
- Be cautious that water could not be poured to the unit directly.
  - There is risk of fire, electric shock, or unit damage.
- Ventilate the unit from time to time when operating it together with a stove, etc.
  - There is risk of fire or electric shock.
- Turn the main power off when cleaning or maintaining the unit.
  - There is risk of electric shock.
- Take care to ensure that nobody could step on or fall onto the unit.
  - This could result in personal injury and unit damage.
- For installation, always contact the dealer or an Authorized Service Center.
  - There is risk of fire, electric shock, explosion, or injury.
- If the unit is not used for long time, we strongly recommend not to switch off the power supply to the unit.
  - There is risk of water freezing.
- The appliance shall be stored in a well-ventilated area where the room size corresponds to the room area as specified for operation.
- The appliance shall be stored in a room without continuously operating open flames (for example an operating gas appliance) and ignition sources (for example an operating electric heater).

- The appliance shall be stored so as to prevent mechanical damage from occurring.
- Servicing shall only be performed as recommended by the equipment manufacturer. Maintenance and repair requiring the assistance of other skilled personnel shall be carried out under the supervision of the person competent in the use of flammable refrigerants.
- When mechanical connectors are reused indoors, sealing parts shall be renewed. When flared joints are reused indoors, the flare part shall be re-fabricated.
- Be aware that refrigerants may not contain an odor.
- Periodic (more than once/year) cleaning of the dust or salt particles stuck on the heat exchangers by using water.
- Keep any required ventilation openings clear of obstruction.

## CAUTION

### Installation

- Always check for gas (refrigerant) leakage after installation or repair of unit.
  - Low refrigerant levels may cause failure of unit.
- Keep level even when installing the unit.
  - To avoid vibration or water leakage.
- Use two or more people to lift and transport the unit.
  - Avoid personal injury.

### Operation

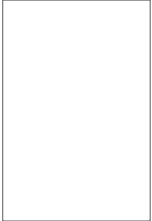
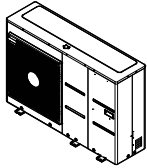
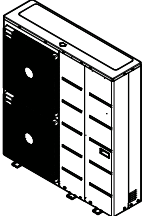
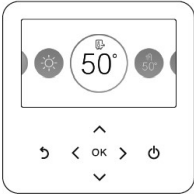
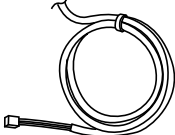
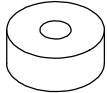

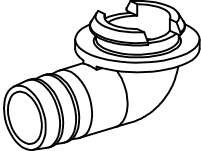
- Do not use the unit for special purposes, such as preserving foods, works of art, etc.
  - There is risk of damage or loss of property.
- Use a soft cloth to clean. Do not use harsh detergents, solvents, etc.
  - There is risk of fire, electric shock, or damage to the plastic parts of the unit.
- Do not step on or put anything on the unit.
  - There is risk of personal injury and failure of unit.

- Use a firm stool or ladder when cleaning or maintaining the unit.
  - Be careful and avoid personal injury.
- Do not turn on the breaker or power under condition that front panel cabinet, top cover, control box cover are removed or opened.
  - Otherwise it may cause fire, electric shock, explosion or death.
- The appliance shall be disconnected from its power source during service and when replacing parts.
- Means for disconnection must be incorporated in the fixed wiring in accordance with the wiring rules.
- The Installation kit supplied with the appliance are to be used and that old Installation kit should not be reused.
- If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard. Installation work must be performed in accordance with the national wiring standards by authorized personnel only.
- This equipment shall be provided with a supply conductor complying with the national regulation.
- The instructions for service to be done by specialized personnel, mandated by the manufacturer or the authorized representative may be supplied in only one Community language which the specialized personnel understand.
- This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance.

# INSTALLATION PART

Thank you for choosing LG Electronics Air-to-Water Heat Pump **THERMAV™**.

Before starting installation, please make it sure that all parts are found inside the product box.

Item	Image	Quantity
Installation Manual		1
Outdoor Unit UN4 Chassis (Product heating capacity : 5 kW, 7 kW, 9 kW)		1
Outdoor Unit UN3 Chassis (Product heating capacity : 12 kW, 14 kW, 16 kW)		1
Remote Controller		1
Remote Controller Cable		1
Damper		6
Drain Cap		2
Drain Nipple		1