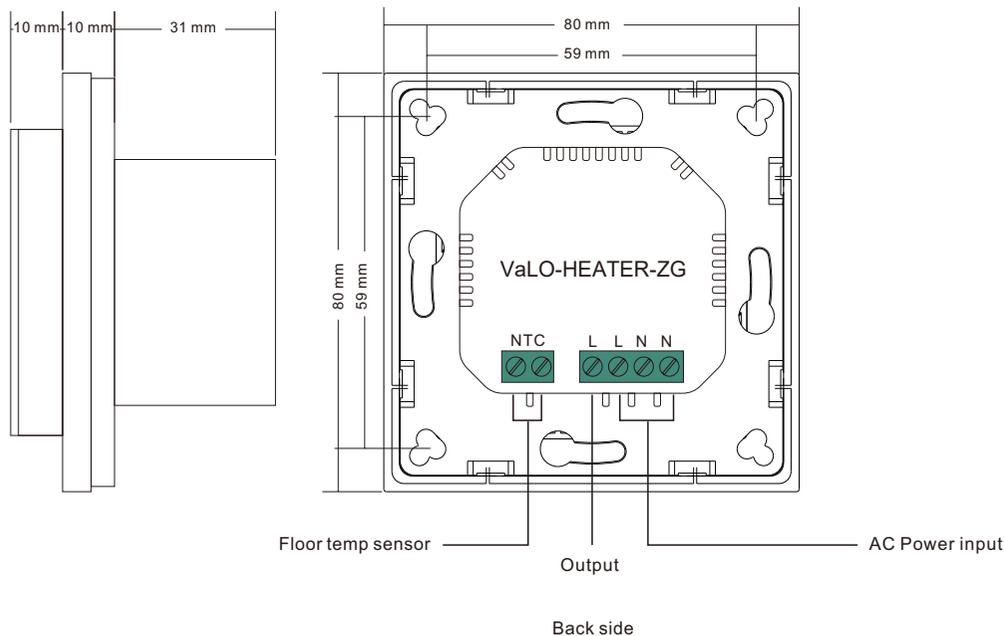
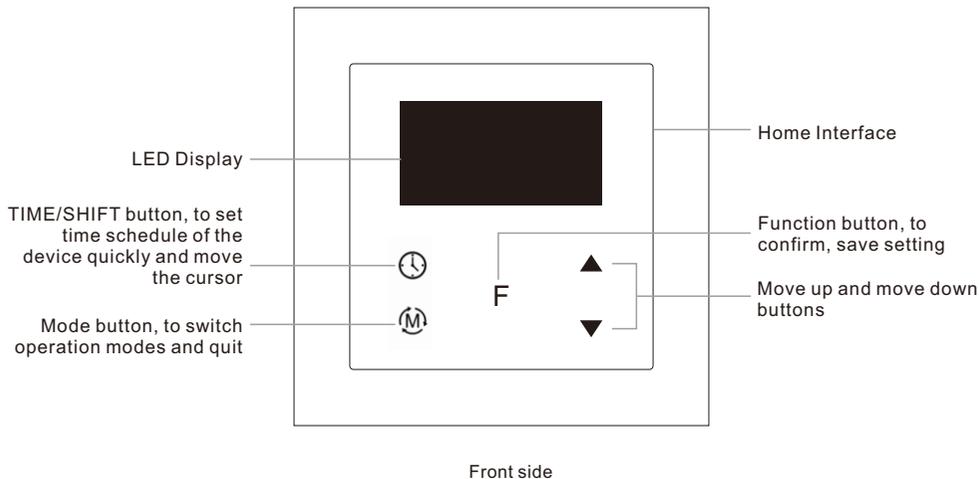


# VaLO Zigbee 3.0 Heating Thermostat



**Important:** Read All Instructions Prior to Installation

## Function introduction



## 1. Product Data

Radio Frequency	2.4GHz
Input Voltage	EU: AC200-240V, 50/60Hz
Output Voltage	EU: AC200-240V
Max Load	3680W @ 230V (resistive load)
Max Current	16A
Power Consumption	<2W
Ambient Temperature	0°C to 40°C (during operation)
Set Temperature Range	0°C to 40°C
Hysteresis	0.5°C to 2°C (default 0.5°C)
Floor sensor type	<ol style="list-style-type: none"> <li>1. NTC/10K B(25/50°C)=3950 (default)</li> <li>2. NTC/15K B(25/50°C)=3950</li> <li>3. NTC/50K B(25/50°C)=3950</li> <li>4. NTC/100K B(25/50°C)=3950</li> <li>5. NTC/12K B(25/50°C)=3950</li> </ol>
Control Mode	OFF, HEAT, ENERGY HEAT, AWAY, DRY
Control Type	<p>Control type means which temperature sensor the device refers to when it adjust temperature.</p> <p><b>Room sensor:</b> adjust temperature refers to room temperature (factory default type).</p> <p><b>Floor sensor:</b> adjust temperature refers to floor temperature.</p> <p><b>Room+Floor sensor:</b> adjust temperature refers to both room temperature and floor temperature.</p>
Wiring Requirement	<p>Current ≤ 13A - 1.5mm<sup>2</sup> wire</p> <p>Current &gt; 13A to 16A - 2.5mm<sup>2</sup> wire</p>
IP Rating	IP21
Control Pollution Degree (Method D)	pollution degree 2
Rated Impulse Voltage (Method D)	4kV
Relative Humidity	8% to 80%
Dimensions	80x80x52mm
Approvals	<p><b>CE,</b></p> <p><b>LVD:</b> EN 60730-1:2016;A1, EN IEC 60730-2-9:2019;A1</p> <p><b>EMC &amp; RF:</b> EN IEC 61000-3-2:2019, EN 61000-3-3:2013+A1:2019, EN 60730-1:2016+A1:2019, EN 60730-2-19:2019+A1:2019+A2:2020, EN 50663:2017;ETSI EN 301 489-1V2.2.3, ETSI EN301 489-3V2.1.1</p> <p>ETSI EN300 220-1 v3.1.1., ETSI EN300 220-2 V3.2.1</p> <p><b>RED certificate:</b> 2014/53/EU</p>

• The Zigbee HVAC controller is a wireless thermostat for heating system, which complies to Zigbee 3.0 wireless protocol standards. The thermostat has 4 operation modes which can be controlled manually and locally or through remote controlled through Zigbee gateway controller.

• All setup is performed via supported IEEE 802.15.4-based control platforms and other Zigbee3.0 compatible control systems. Appropriate gateway control software allows for adjustment of control mode, control type, schedule etc.

- Sensors: Air temperature
- THERMOSTAT MODE: OFF, HEAT, ENERGY HEAT, AWAY, DRY
- Measurement range: -10°C to +60°C
- Accuracy: ±0.1°C
- **WARNING:** Electrical power must be switched off during installation

## 2.Home Interface

### 2.1 Home Interface



Already added to a Zigbee network:

Child Lock enabled:

Week display: MON, TUE, WED, THU, FRI, SAT, SUN

The set temperature: Set 28.5°C

Room temperature: 25.5°C

Floor temperature:

Operation modes: (AWAY), (Automatic), (Manual), (Drying), (OFF)

Heating status: (Heating), (Locked: heating forbidden), (Door is opened, heating forbidden)

### 2.2 Button Description

- : TIME/SHIFT button, to set time schedule of the device quickly and move down the cursor
- F** : Function button, to confirm, save setting
- : Mode button, to switch operation modes and quit
- : Move up and move down buttons

### 2.3 Standby Interface



If there is no operation within 2 minutes, the device will go to this standby interface. Once the device goes to standby interface, if there is no operation within 1 minute, the display will go off automatically.

## 3.Safety & Warnings

- DO NOT install with power applied to device.
- DO NOT expose the device to moisture.

## 4. Basic Function Introduction

### 4.1 Switch Operation modes

Short press button on Home interface to switch operation modes: the icons of Away, Manual (Comfort), Automatic (Energy Save), Drying, OFF modes will be displayed alternatively for 3 seconds and last displayed mode will be selected, or just short press **F** button to select a desired mode when the modes' icon displayed alternatively. Press and hold button on Home interface for over 3 seconds to select Away mode directly, then press and hold button for 3 seconds to quit Away mode.

**OFF Mode:** this mode means that the device is under idle status.

**Manual (Comfort Mode):** the device will control the heating system according to current set temperature. The temperature can be set by move up and move down button on the Home interface, or the mode and temperature can be configured by Zigbee gateway.

**Automatic (Energy Save Mode):** the device will control the heating system according to the configured time schedule, or the mode can be configured by Zigbee gateway but the temperature can not be modified and sent

by the gateway alone.

**Away (Away Mode):** this mode means there is no person at home, to keep a certain indoor temperature, the user can set the deadline of away, it also can be considered as anti-freezing function, the recommended setting temperature is 4-10 degrees. The mode and temperature can be configured by Zigbee gateway.

**Drying (Drying Mode):** The device will judge the set temperature for heating within a short period of time, or the mode and temperature can be configured by Zigbee gateway.

### 4.2 System Setting Interface

Under Home interface, meanwhile the device is at OFF mode , press and hold move up and move down buttons at the same time for over 5 seconds to enter into System Setting Interface as follows:



Quit: on System Setting Interface short press button to go back to Home interface.

Enter into set interface of each setting item: short press move up or move down button to select a setting item, then short press button **F** to enter into set interface of the selected item.

### 4.3 Preview of Device Information

On System Setting Interface, user can enter into **PREVIEW** interface, the interface will display some basic configurations, energy consumption, date, floor temperature etc.

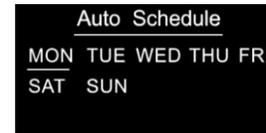
### 4.4 Auto Mode Schedule

When Auto Mode Schedule is valid, the device will control according to the set temperature of the schedule. For instance, if user would like to keep room temperature at 18 degree Celsius during 18:00-23:00 on every Monday, and keep room temperature at 20 degree Celsius after 22:30 on every Monday, then user can set schedule by himself.

**Schedule setting method 1:** user can enters into schedule on System Setting Interface, the schedule interface is as follows:



Short press button to select "Auto Schedule", then short press button **F** to enter into Auto Mode Schedule weekly setting interface.



**Schedule setting method 2:** on System Setting Interface, meanwhile the device is under Auto Mode , short press button to enter into Auto Mode Schedule weekly setting interface quickly:

On Auto Mode Schedule weekly setting interface, use buttons and **F** to enter into schedule setting of a certain week as follows:



On Auto Day Schedule interface, short press button to select the time or temperature that you would like to modify, then short press move up and move down buttons to modify value, then short press button **F** to save and quit, short pressing button only quits without saving.

For each schedule, the latter time should be later than the former time, otherwise saving will fail with the error remind "Time setting error!!!". The default time schedules are as follows:

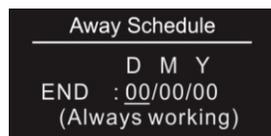
Monday ~ Friday

7:30,24°C ~ 12:00,20°C  
 18:00,16°C ~ 22:30,18°C  
 Saturday~Sunday  
 7:30,24°C ~ 12:00,20°C  
 18:00,18°C ~ 22:30,18°C

#### 4.5 Away Mode Schedule

User can set time to leave home and time to go home according to the requirements of themselves, and set how the device will control the temperature during this period.

- 1.If away mode has already been activated, the end time for away mode is valid, the device will execute Away Mode Temperature Schedule before the end time.
- 2.If away mode has already been activated, the values of end time for away mode are set as 0, the device will always execute current set temperature with no time limitation. The device will consider the mode as anti-freeze mode, the recommended temperature setting is 4-10°C, and factory default setting is 6°C.



D means date, M means month, Y means year (2019-2099).  
 Start and end mean away time.  
 To enter into the setting interface and setting method, please refer to the 1.4 Auto Mode (Energy Save Mode) Schedule.

#### 4.6 Dry Mode Schedule

For example, in order to quickly dry the water on the floor of the bathroom, the device can be set to quickly heat in a short time to dry the floor. Enter the configuration interface as follows:

Duration: set how long the dry mode lasts, can be configured through the proprietary attribute DryTime (0x1006) of Thermostat Cluster (0x0201), the configurable range is 5-100 minutes.

After Mode: set the mode after the drying mode ends, can be configured through the proprietary attribute ModeAfterDry (0x1007) of Thermostat Cluster (0x0201).

Remain: shows the remaining time of the drying mode



For configuration method and modification, please refer to Automatic Mode (Energy Save Mode) Schedule:

#### 4.7 MONITOR SET

The function of monitor set is real time monitor of over current, over heat and freezing, on Home interface, short press MONITOR SET to enter into monitor set interface as follows:



Short press button to select the item would like to modify, then short press move up and move down buttons to modify value of selected item, then short press button **F** to save and quit, short pressing button only quits without saving.

#### Max Current (16A by default)

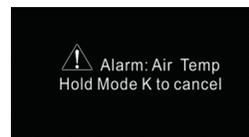
If current is over the set value, the relay will be forced to off by the device, and the state will be reported to the gateway. The over current alarm function can be disabled, which can be set directly through the device. Or can be configured through the ACAlarmsMask and ACCurrentOverload of Electrical Measurement (0X0B04), for details please refer to the configuration value .

#### RoomTemp alarm (45°C by default)

If room temperature is over the set value, the relay will be forced to off by the device, and over heat alarm will be

reported to the associated devices, meanwhile the buzzer or vibrator will beep 3 times every 10 seconds. The over heat alarm function can be disabled, which can be set directly through the device. Or can be configured through the attribute AlarmAirTempOverValue (0x2001) of Thermostat Cluster (0x0201), when this value is set as 0, this function is disabled.

Over heat alarm interface is as follow:



**Note: to cancel over current alarm or over heat alarm, just press and hold button for over 3 seconds or reset power of the device. After cancel manually, the relay will show heating forbidden icon within 120 seconds, but other operations are allowed.**

#### Hysterersis (0.5°C by default)

To prevent the undulation of sensor temperature when the sensor temperature is approaching the set temperature, which will cause that the controller may keep switching on/off the relay. Here hysteresis enables the controller to control the relay only when the sensor temperature is a little bit lower than the set temperature, this value can be set.

For instance, when hysteresis is set as 0.5 degree, then only when current sensor temperature is 0.5 degree lower than the set temperature, will the controller heat, if the sensor temperature >= set temperature, the controller will not heat.

This value can also be configured through the proprietary attribute Hysteresis (0x100A) of Thermostat Cluster (0x0201).

Note: This hysteresis only valid when the control type is single sensor, please refer to the part Control Type.

#### Window Open Detect (disabled by default)

Once the device is powered on and stable, referring to the room temperature sensor, if the temperature decreases to the threshold of this setting, the window open mark will be enabled, the relay will be forced to turn off to save energy, then the icon will appear.

After window open mark is enabled, if the temperature increases to the threshold of this setting in 3 minutes, the window open mark will be disabled.

Once the window open mark is enabled, it will be disabled after 10 minutes, and the device will keep current working mode.

This value can also be configured through the proprietary attribute WindowOpenCheck (0x1009) of Thermostat Cluster (0x0201), 0 means this function is disabled.

Note: this function will work better when the device is installed beside the window or door.

#### 4.8 TIME/DATE SET

Select TIME/DATE on Home Interface to enter into TIME/DATE SET interface as follow:

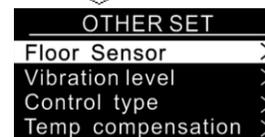


Short press button to select the item would like to modify, then short press move up and move down buttons to modify value of selected item, then short press button **F** to save and quit, short pressing button only quits without saving.

The device Time Cluster is client, if the bound device supports local time of Time Cluster, the device will acquire local time from the bound device spontaneously under 3 situations: acquire after this device is added to a network, acquire when the device already added to a network and power is reset, acquire every 24 hours .

#### 4.9 OTHER SET

Select OTHER SET on Home Interface to enter into OTHER SET interface as follow:



Short press button to select the item would like to modify, then short press move up and move down buttons to modify value of selected item, then short press button **F** to save and quit, short pressing button only quits without saving.

#### Floor Sensor (NTC 10K by default)

If external sensor is broken, the user can buy NTC sensor by themselves, the available sensor types are as follows:

NTC 100K/25 (3m,NTC,R25=100KΩ±1%@25°C, B25/50=3950K±1%)

NTC 50K/25 (3m,NTC,R25=50KΩ±1%@25°C, B25/50=3950K±1%)

NTC 15K/25 (3m,NTC,R25=15KΩ±1%@25°C, B25/50=3950K±1%)

NTC 10K/25 (3m,NTC,R25=10KΩ±1%@25°C, B25/50=3950K±1%)

NTC 12K/25 (3m,NTC,R25=12KΩ±1%@25°C, B25/50=3950K±1%)

This sensor type can also be configured through the proprietary attribute FloorSensorType (0x1002) of Thermostat Cluster (0x0201).

#### Key vibration level (OFF by default)

Set the level of vibration sensor under the buttons or buzzer level.

OFF: vibration or buzzer off

Low Level, High Level: low vibration or buzzer level, high vibration or buzzer level

This level can also be configured through the proprietary attribute ButtonVibrationLevel (0x1001) of Thermostat Cluster (0x0201).

#### Control type (Room sensor by default)

Control type means which temperature sensor the device refers to when it adjust temperature.

**Room sensor:** adjust temperature refers to room temperature (factory default type)

**Floor sensor:** adjust temperature refers to floor temperature

**Room+Floor sensor:** adjust temperature refers to both room temperature and floor temperature. Turn on heat valve under other circumstances. This mode is to prevent the device from continuous heating that caused by malfunction of either sensor. When the floor sensor temperature is  $\geq$  the set temperature minus 1 or when the room sensor is  $\geq$  the set temperature, either of the conditions is achieved, the controller will stop heat, otherwise the controller will heat.

This control type can also be configured through the proprietary attribute ControlType (0x1003) of Thermostat Cluster (0x0201).

#### Temp compensation (0 by default)

The displayed temperature may has big tolerance caused by the sensor or other factors, so it is necessary to do temp compensation to room sensor and floor sensor.

Compensation range is -5 ~ +5°C, stepping is 0.5°C.

This value can also be configured through the attribute LocalTemperatureCalibration (0x0010) of Thermostat Cluster (0x0201), and through the proprietary attribute FloorSensorCalibration (0x1005) of Thermostat Cluster (0x0201).

#### RePower status(last status by default)

Device state after reset power of the device.

If set as "last status", device will go to the status before power failure after power on again.

If set as "default", device will go to default mode after power on again.

This status can also be configured through the proprietary attribute PowerUpStatus (0x1004) of Thermostat Cluster (0x0201).

#### Display Temp type (Home Temp by default)

This parameter defines which sensor temperature will be displayed on Home page.

Floor Temp: floor temperature (external sensor).

Home Temp: indoor air temperature.

This status can also be configured through the proprietary attribute TemperatureDisplay (0x1008) of Thermostat Cluster (0x0201).

#### Operate Brightness (Mid Level by default)

The OLED display brightness when operate the device.

High Level, Mid Level, Low Level.

This brightness can also be configured through the proprietary attribute OperateDisplayLcdBrightness (0x1000) of Thermostat Cluster (0x0201).

#### Display Auto Off (60S by factory setting)

By factory setting, once the device goes to standby interface, if there is no operation within 1 minute, the display will go off automatically.

#### Child Lock

On the Home Interface, press and hold both **F** and **▼** buttons for over 10S, the Child Lock can be enabled or disabled, when the Child Lock is enabled, the icon  will appear at the upper right corner, otherwise the icon will not appear.

#### Internal Over Heat Protection

To ensure the safety of the device, if the internal temperature of the device (not displayed on the interface) is over a certain value during heating process, the device will execute a short temporary action to turn off the relay, and the icon  will appear on the interface, after the temperature decreases to a certain value, the device will recover to work.

### 4.10 Zigbee Configuration Introduction

Select  Network Set on Home Interface to enter into Zigbee network management interface as follow:



#### Adding to a Zigbee Network

Operate your Zigbee gateway to add device, select "Add", then short press button **F**, the device will search network and try to join, "Status" will show "Inclusion...". If there is no response from a gateway, or adding failed, "Status" will show "Fail". If added successfully, "Status" will show "Inclusion OK" and device ID.

#### Removing from a Zigbee Network

Operate your Zigbee gateway to remove device, Select "Remove", then short press button **F**, the device will send out removing request, "Status" will show "Exclusion...". If there is no response from a gateway, or removing failed, "Status" will show "Fail". If removed successfully, "Status" will show "Exclusion OK" and device ID will be showed as 0.

The device will be removed from the network and all parameters will be restored to factory default setting, all bindings will be cleared.

#### Factory Reset (Reset)

Factory resetting will remove the device from Zigbee network and all parameters will be restored to factory default setting, all bindings will be cleared.

Select "Reset", then short press button **F**, the device will start reset, "Status" will show "Reset...". If exclusion failed, "Status" will show "Fail". If reset successfully, "Status" will show "Reset OK".

#### Configure Device Operation Mode through Zigbee

Since Zigbee does not have away mode, the attribute Occupancy (occupied or unoccupied) of Thermostat (0x0201) and attribute Occupancy of received OccupancySensing (0x0406) are required to judge whether it is away mode.

1) if the device receives other devices' or the gateway's report: the Bit 0 of the value of attribute Occupancy (0x0000) of OccupancySensing Cluster (0x0406) is 1, which means occupied, then the operation mode of the thermostat, the attribute SystemMode(0x001c)=0x04(heat) of Thermostat (0x0201),

meanwhile the value of attribute Occupancy (0x0002) of Thermostat (0x0201) is 0. It means the Away Mode is activated, and the thermostat UI will display .

2) If the gateway send command to modify the attribute SystemMode(0x001c) of Thermostat (0x0201), the thermostat will quit Away Mode. Meanwhile the value of attribute Occupancy (0x0002) of Thermostat (0x0201) is 1.

3) The proprietary attribute 0x2002(Manufacturer Code=0x1224) of the cluster 0x0201 can be modified to configure whether it is away mode or at home.

Note: Away Mode uses attribute UnOccupiedHeatingSetpoint to set temperature.

Other modes uses attribute OccupiedHeatingSetpoint to set temperature.

## 5. Zigbee Interface

The thermostat provides 3 zigbee application endpoints:

Endpoint	Profile	Application
0(0x00)	0x0000(ZDP)	ZigBee Device Object (ZDO) – standard management features
1(0x01)	0x0104(HA)	Device ID is 0x0301(Thermostat).
2(0x02)	0x0104(HA)	Device ID is 0x0007(OTA).
242(0xF2)	0xA1E0(GP)	Device ID is 0x0021(GreenPower).

### 5.1 Application Endpoint #0 –ZigBee Device Object

- Application profile Id 0x0000
- Application device Id 0x0000
- Supports all mandatory clusters

### 5.2 Application Endpoint #1 –Thermostat

Cluster	supported	Description
0x0000	server	<b>Basic</b> Provides basic information about the device, such as the manufacturer ID, vendor and model name, stack profile, ZCL version, production date, hardware revision etc. Allows a factory reset of attributes, without the device leaving the network.
0x0003	server	<b>Identify</b> Allows to put the endpoint into identify mode. Useful for identifying/locating devices and required for Finding & Binding.
0x0004	server	<b>Groups</b> Allows adding this endpoint to one or more groups. Afterwards the endpoint can be addressed using the group address. This is also a prerequisite for scenes. You may also query group membership and delete group associations.
0x0005	server	<b>Scenes</b> Allows storing one or more scenes per group, where each scene consists of a pre-set on/off state value. You may either store the current values as a scene, or provide scene settings when adding a scene, or delete scenes.
0x0201	server	<b>Thermostat</b>
0x0702	server	Simple Meter
0x0b04	server	Electrical Measurement Measuring power, voltage, current
0x0009	server	<b>Alarm</b> Device related alarm
0x0406	client	Occupancy Sensing
0x000a	client	Time

#### 5.2.1 Basic -0x0000 (Server)

Attributes supported:

Attribute	Type	Description
0x0000	INT8U, read-only	<b>ZCLVersion</b> 0x03
0x0001	INT8U, read-only	<b>ApplicationVersion</b> This is the firmware version number of the application
0x0002	INT8U, read-only	<b>StackVersion</b>
0x0003	INT8U, read-only	<b>HWVersion</b> Hardware version 1
0x0004	string, read-only	<b>ManufacturerName</b> “Sunricher”
0x0005	string, read-only	<b>ModelIdentifier</b> “Zg9092”
0x0006	string, read-only	<b>DateCode</b> NULL
0x0007	ENUM8, read-only	<b>PowerSource</b> Device power supply, fixed value 0x01 Mains (single phase)
0x0008	ENUM8, read-only	<b>GenericDevice-Class</b> 0xFF
0x0009	ENUM8, read-only	GenericDevice-Type 0xFF
0x000A	octstr read-only	ProductCode 00
0x000B	string, read-only	ProductURL NULL
0x4000	string, read-only	Sw build id 6.9.1.0_r4

Command supported:

Command	Description
0x00	Reset to Factory Defaults Command On receipt of this command, the device resets all the attributes of all its clusters to their factory defaults. Note that networking functionality, bindings, groups, or other persistent data are not affected by this command.

#### 5.2.2 Scenes 0x0005 (Server)

Attributes supported:

Attribute	Type	Description
0x0000	int8u, read-only	<b>SceneCount</b> Holds the total number of scenes (across all groups) currently stored on the device.
0x0001	int8u, read-only	<b>CurrentScene</b> If the SceneValid attribute is true, this attribute, together with the CurrentGroup attribute, indicates the currently active scene.
0x0002	int16u, read-only	<b>CurrentGroup</b> If the SceneValid attribute is true, this attribute, together with the CurrentScene attribute, indicates the currently active scene.

0x0003	bool, read-only	<b>SceneValid</b> If true, the scene identified by CurrentGroup and CurrentScene is currently active, i.e. all device attribute values match the values in the scene field set.
0x0004	bitmap8, read-only	<b>NameSupport</b>

Command supported:

Command	Description
0x00	<b>Add Scene</b> Adds a scene with or without a scene field set
0x01	<b>View Scene</b> Returns the scene field set, name and transition times for a scene.
0x02	<b>Remove Scene</b> Removes a scene from the scene table.
0x03	<b>Remove All Scenes</b> Removes all scenes that belong to a particular group.
0x04	<b>Store Scene</b> Stores the device's current state as a scene or updates a previously stored scene accordingly
0x05	<b>Recall Scene</b> Reverts the device's current state using the values from the previously stored field set.

### 5.2.3 Groups-0x0004 (Server)

Attributes supported:

Attribute	Type	Description
0x0000	bitmap8, read-only	<b>NameSupport</b> 0, not supported

Command supported:

Command	Description
0x00	<b>Add Group</b> Adds the endpoint to a group.
0x01	<b>View Group</b> Determines whether the device belongs to a group and returns the group name, if supported
0x03	<b>Remove Group</b> Removes this endpoint from the specified group. Also removes all scenes that refer to this group.
0x04	<b>Remove All Groups</b> Removes this endpoint from all groups. Also removes all scenes that refer to any of the existing groups.
0x05	<b>Add Group if Identifying</b> Adds this endpoint to the group, if the endpoint is identifying.

### 5.2.4 Thermostat-0x0201(Server)

Attributes supported:

Attribute	Type	Description
0x0000	int16S, read-only	<b>reportable LocalTemperature Attribute</b> This is room temperature, the maximum resolution this format allows is 0.01 °C.

0x0001	int16S, read-only	<b>reportable OutdoorTemperature</b> This is floor temperature, the maximum resolution this format allows is 0.01 °C.
0x0002	bitmap8, read-only	<b>Occupancy</b> When this flag is set as 1, it means occupied, OccupiedHeatingSetpoint will be used, otherwise UnoccupiedHeatingSetpoint will be used.
0x0010	Int8S, reportable	<b>LocalTemperatureCalibration</b> Room temperature calibration, range is -30-30, the maximum resolution this format allows 0.1°C. Default value: 0
0x0011	int16S, reportable	<b>OccupiedCoolingSetpoint</b> This system is not invalid.
0x0012	int16S, reportable	<b>OccupiedHeatingSetpoint</b> Range is 0-4000,the maximum resolution this format allows is 0.01 °C. Default is 0xbb8(30.00°C)
0x0014	int16S, reportable	<b>UnoccupiedHeatingSetpoint</b> Range is 0-4000,the maximum resolution this format allows is 0.01 °C. Default is 0x258(6.00°C)
0x001B	Enum8, reportable	<b>ControlSequenceOfOperation</b> Set device supported operation type, here only supports Heating Only(0x02)
0x0029	Map16, read-only, reportable	<b>HVAC relay state/ ThermostatRunningState</b> Indicates the relay on/off status, here only supports bit0( Heat State)

Proprietary Attributes:

Attribute	Type	Manufacturer code	Description
0x1000	ENUM8, reportable	0x1224	<b>OperateDisplayLcdBrightness</b> OLED brightness when operate the buttons: Value=0 : Low Level Value=1 : Mid Level(default) Value=2 : High Level
0x1001	ENUM8 reportable	0x1224	<b>ButtonVibrationLevel</b> Key beep volume & vibration level: Value=0 : off(default) Value=1 : Low Level Value=2 : High Level
0x1002	ENUM8 reportable	0x1224	<b>FloorSenserType</b> Select external (Floor) sensor type: Value=5 : NTC 12K/25 Value=4 : NTC 100K/25 Value=3 : NTC 50K/25 Value=2 : NTC 15K/25 Value=1 : NTC 10K/25 (Default)
0x1003	ENUM8 reportable	0x1224	<b>ControlType</b> The referring sensor for heat control: Value=0 : Room sensor(Default) Value=1 : floor sensor Value=2 : Room+floor sensor
0x1004	ENUM8 reportable	0x1224	<b>PowerUpStatus</b> The mode after reset power of the device: Value=0 : default mode Value=1 : last status before power off (Default)

0x1005	INT8S, reportable	0x1224	<b>FloorSenserCalibration</b> The temp compensation for the external (floor) sensor, range is -30-30, unit is 0.1°C. default value 0
0x1006	INT8U reportable	0x1224	<b>DryTime</b> The duration of Dry Mode, range is 5-100, unit is min. Default value is 5.
0x1007	ENUM8 reportable	0x1224	<b>ModeAfterDry</b> The mode after Dry Mode: Value=0 : OFF Value=1 : Manual mode Value=2 : Auto mode –schedule (default) Value=3 : Away mode
0x1008	ENUM8 reportable	0x1224	<b>TemperatureDisplay :</b> Value=0 : Room Temp (Default) Value=1 : Floor Temp
0x1009	INT8U reportable	0x1224	<b>WindowOpenCheck</b> The threshold to detect open window, range is 0.3-8, unit is 0.5°C, 0 means disabled, default is 0
0x100A	INT8U reportable	0x1224	<b>Hysterersis</b> Hysterersis setting, range is 5-20, unit is 0.1°C, default value is 5
0x2001	INT8U, reportable	0x1224	<b>AlarmAirTempOverValue</b> Room temp alarm threshold, range is 0.20-60, unit is 1°C, 0 means disabled, default is 45
0x2002	ENUM8 reportable	0x1224	<b>Away Mode Set:</b> Value=0: not away (default) Value=1: away

Command supported:

Command	Description
0x0000	<b>Setpoint Raise/Lower</b> Increase or decrease the set temperature according to current mode, unit is 0.1°C

### 5.2.5 Simple Meter-0x0702 (Server)

Attributes supported:

Attribute	Type	Description
0x0000	unsigned48, read-only, reportable	<b>CurrentSummationDelivered</b> Indicates the current amount of electrical energy delivered to the load.
0x0200	bitmap8, read-only	<b>Status</b> Flags indicating current device status, always is 0x00
0x0300	enum8, read-only	<b>UnitOfMeasure</b> The unit of metering data, this is always kWh(0x00)
0x0303	map8, read-only	<b>SummationFormatting</b> The decimal point on the left and right sides of the data, this is always 0x00
0x0306	bitmap8, read-only	<b>MeteringDeviceType</b> Metering data type, this is always Electric Metering (0x00)

### 5.2.6 Electrical Measurement-0x0b04(Server)

Attributes supported:

Attribute	Type	Description

0x0000	bitmap32, read-only	<b>MeasurementType</b> Indicates the physical entities that this devices is able to measure. Supports only bit0: Active measurement (AC)
0x0505	int16U, read-only, reportable	<b>RMSVoltage</b> Single phase valid voltage, unit is V
0x0508	int16U, reportable, read-only	<b>RMSCurrent</b> Single phase valid current, unit is A
0x050B	int16S, reportable read-only	<b>ActivePower</b> Single phase valid power, unit is W
0x0600	int16U, read-only	<b>ACVoltageMultiplier</b>
0x0601	int16U, read-only	<b>ACVoltageDivisor</b> Used together with above attributes, the real displayed voltage = RMSVoltage* ACVoltageMultiplier / ACVoltageDivisor
0x0602	int16U, read-only	<b>ACCurrentMultiplier</b>
0x0603	int16U, read-only	<b>ACCurrentDivisor</b> Used together with above attributes, the real displayed current = RMSCurrent * ACCurrentMultiplier / ACCurrentDivisor
0x0800	int16U,	<b>ACAAlarmsMask</b> Specifies which configurable alarms may be generated, only Bit1: Current Overload is set, if set=0, then ACCurrentOverload=0, over current will not be detected
0x0802	int16S, reportable read-only	<b>ACCurrentOverload</b> Alarms when the current is over a certain value, 0, 10-16, unit is A

Proprietary Attributes:

Attribute	Type	Manufacturer code	Description
0x0000	Int8u, reportable	0x1224	<b>OverCurrent</b> Over current value set by the user, range is 0, 10-16, ACCurrentOverload will change spontaneously if this value is modified.

### 5.2.7 Alarm-0x0009(Server)

Please set a valid value for ACAAlarmsMask of Electrical Measurement.

The Alarm Server cluster can generate the following commands

CmdID	Description
0x00	Alarm:

The alarm code of Electrical Measurement is 0,

Proprietary command, **Manufacturer code=0x1224**

CmdID	Description
0x00	Room air temperature over heat, not alarm code

### 5.2.8 Time-0x000A(client)

The Time cluster is a general cluster for time it is based on a UTC time in seconds since 0 hrs 0 mins 0 sec on 1st January 2000. Refer to [Z2] for ZigBee specification of the time cluster.

The metering device will use this clusters as a client – provided that a suitable Time Server is available on the network (most likely on the Gateway/concentrator)

If the device has bound TIME cluster, then the device will acquire the value of Local Time (0x0007) spontaneously.

### 5.2.9 OccupancySensing-0x0406(client)

The attributes that can be received:

Attribute	Type	Description
0x0000	bitmap8 ,	<b>Occupancy</b> Bit 0 specifies the sensed occupancy as follows: 1 = occupied, 0 = unoccupied. This flag bit will affect the Occupancy attribute of HVAC cluster, and the operation mode.

### 5.3 Application Endpoint #2-OTA

Cluster	supported	Description
0x0000	server	<b>Basic</b>
0x0003	server	<b>Identify</b>
0x0019	Client	<b>OTA Upgrade</b> Pull-oriented firmware upgrade. Searches the network for mating servers and allows the server to control all stages of the upgrade process, including which image to download, when to download, at what rate and when to install the downloaded image.

Ota complies to standard Zigbee protocol.

### 5.4 Application Endpoint #242 –GreenPower

#### Troubleshooting:

- External (floor) sensor temperature tolerance is too high  
Possible reason: the selected sensor type is not correct
- The gateway can not set temperature when energy save mode is selected  
The temperature schedule of auto mode (energy save mode) is not configured correctly
- Current temperature is not executed when away mode is selected  
Check whether away mode time is set as 0 or within valid time range
- Over heat alarm when power on the device  
Possible reason: the set sensor type is not correct or sensor type after factory reset is not correct
- Device time is not the same as the gateway controller after added to the network  
Set the device time and time zone manually after added to the gateway network
- The tolerance of the indoor temperature sensor is high after powered on  
Possible reason: due to temperature effect, we need to wait for a while



### 6.Wiring diagram

This device should be installed by a licensed electrician in a manner that conforms to local regulations and building codes. Provide these instructions to the licensed electrician who is installing the device.

**WARNING: Electrical power must be switched off during installation.**

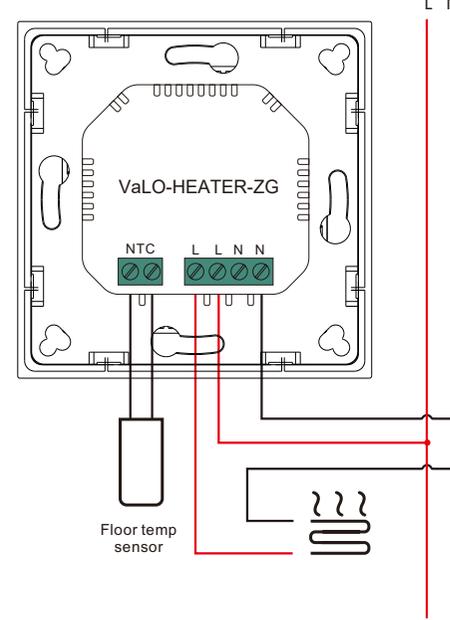
- Placement of the device is of utmost importance for proper operation and must be away from sunlight and sources of direct heat. We recommend installing the device approximately 1.5 meters above the floor.
- Remove the display unit and backplate of the device from the packaging.
- FIRST ENSURE THE POWER IS OFF at the main circuit breaker, and then test the wires with a probe or multimeter to verify.

Insert the power and heater wires to the correct device terminals by inserting a small Phillips-head screwdriver in the slot beneath each terminal to open. Follow the connection diagram and instructions below:

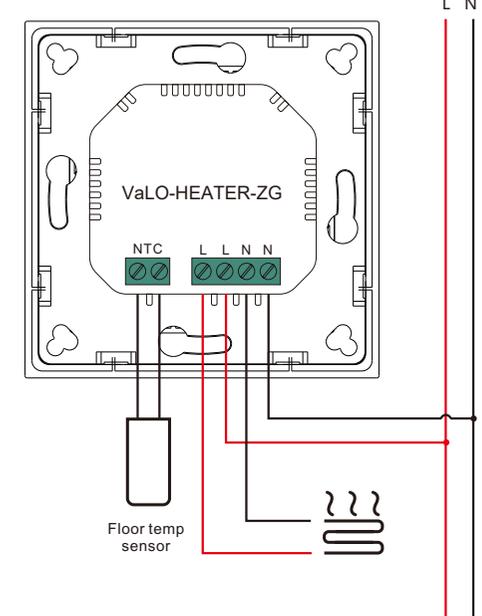
- **Power wires:** connect Line & Neutral wires to L & N terminals labeled "IN"
- **Heater wires:** connect Line & Neutral wires to L & N terminals labeled with "heating element" graphic

**WARNING: The wire size shall be in compliance with regulations, using wire with insufficient size for big load will cause severe temperature rising.**

Connection diagram 1



Connection diagram 2



### 7. Installation

