



# M thermal Power Series Mini size with big energy



**Mono 5~16kW**

## Product lineup



### Mono

Capacity(kW)	5	7	9	12	14	16
220-240-1Ph	•	•	•	•	•	•
380-415-3Ph				•	•	•



Mini size(0.4 m<sup>3</sup>)  
Smaller floor space(0.4M<sup>2</sup>)



Heating, cooling, hot water,  
one-stop solution



Maximum 65°C leaving  
water temperature



Solar hot water, Photovoltaic  
application for green energy-saving



Cascade function for bigger  
system application



USB function for convenient  
data transformation



### External electric heater (Optional)

3-9kW external electric heater enhances low ambient heating capacity

Capacity(kW)	3	4.5	9
220-240-1Ph	•	•	
380-415-3Ph		•	•

## External backup electric heater kit(Optional)

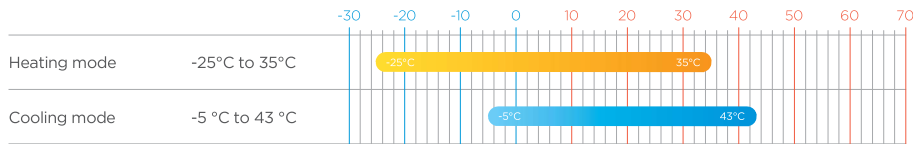
### Features:

- Easy installation;
- Compact structure;
- No fuel tubes and storage;
- Supply additional heating capacity;
- Complete isolation between water and electricity;

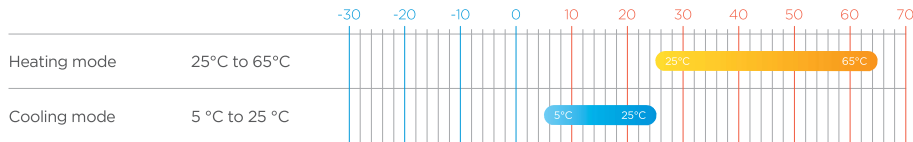


## Wide operation range

### Ambient temperature



### Water temperature



## Mini size

### Compact

Mini size(0.4 m<sup>3</sup>)  
 Container-carrying capacity optimization  
 (For reference: 80 units within one 40HQ container)



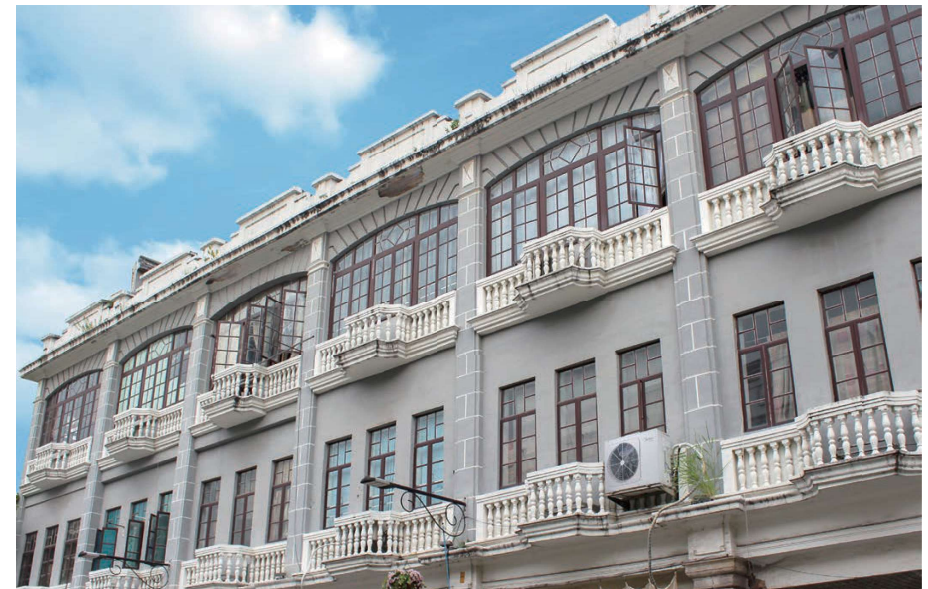
### Lighter

Easier for human transport  
 Transportation cost saving



### Flexible

Smaller floor space(0.4m<sup>2</sup>)  
 Idea for hotels or replacement project.



# High reliability

## Manual defrost

During heating/DHW mode, frost is generated and attached to the fins, which affects the heating performance. In order to recover heating capacity, heat pump enters defrost mode automatically in time. Manual defrost is also suitable for quickly defrosting according to user's demand.

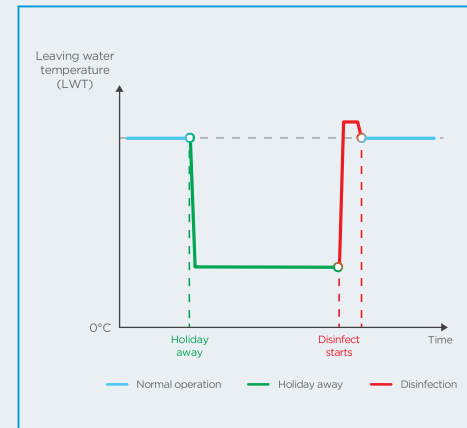
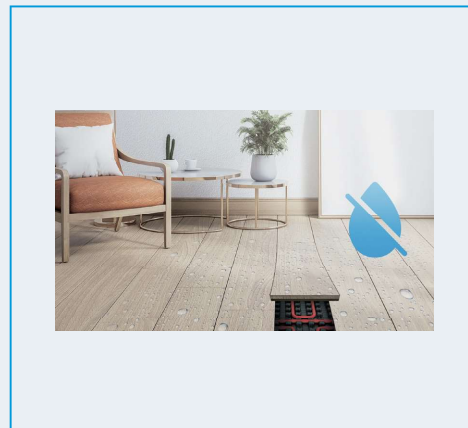


## Power limitation function

Power limitation function allows heat pump to suit a variety of current supplies. 8 configurations can be defined according to the maximum allowable access current. Only simple setting on the wired controller is needed, heat pump can easily fit into more electric applications.

## Preheating and drying

Drying up mode is used to dry the floor after installation. Preheating mode is designed for the first heating during seasonal heating. The water temperature of floor heating loops would be increased gradually in order to protect the floor from warped or even rupture.



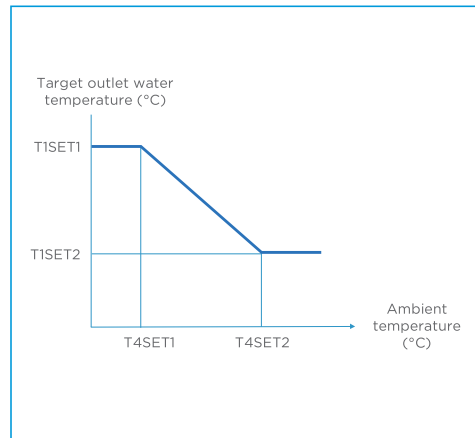
## Holiday away

If user leaves, heat pump runs in heating mode and/or DHW mode with lower water temperature to prevent water system from freezing. Disinfection is available before user returns home to ensure the water security.

# Smart control

## Climate curve

Water temperature automatically changes as ambient temperature changes. It is convenient and energy-saving for end users. 32 fixed climate curves and 1 customized curve are available, which meets the diversified requirement.



## DHW pump function

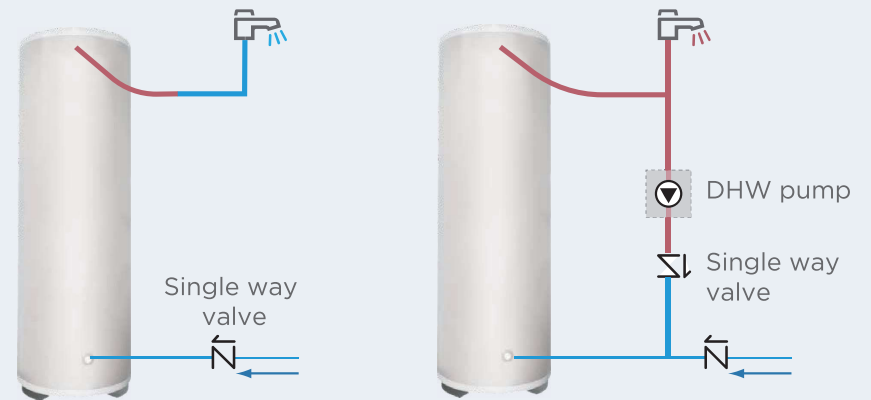
The DHW pump function is used to return water in the water pipe net to the tank. Total 12 timers for one day can be set, which allows users to set the DHW pump operation schedule according to using habit to guarantee using hot water without waiting for a long time.

## Smart Grid

Heat pump adjusts the operation mode according to different grid signals to realize energy saving. When the electric price is low or even free, heat pump takes DHW priority. When the electric price is high, DHW-related functions are limited. When the electric price is normal, heat pump operates according to users' requirement.



— Hot Water — Cold Water

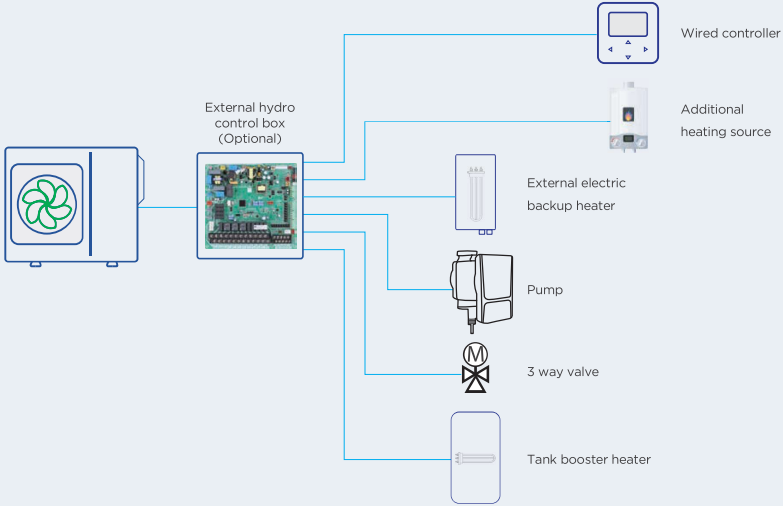




# High reliability

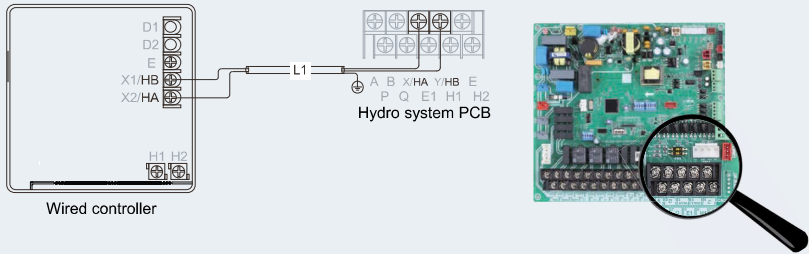
## External control box

Shorten the field connection cable length between hydro system PCB and wired controller, external electric heater, tank booster heater, etc., make the installation more flexible.



## Wired controller

- Homebus connection ports
- 2 core shielded twisted pair cable with nonpolar installation
- Easy installation



# Convenient

## USB function

- Convenient program upgrade  
No need to carry any other heavy equipments but only USB can realize program upgrade.
- Parameter transmission  
Installer can quickly copy the setting from one ontroller to another via USB, which save the time of on-site installation.



## Holiday home

Flexible setting allow user to set a new schedule during the time at home but without changing the multiple daily or weekly setting.



## APP control

- Touch-key design
- Liquid Crystal Display
- Error code display
- Operation parameter checking
- Point check function
- Multiple languages
- Child lock function
- Buzzer alarm,
- Built-in temperature sensor and wifi module
- Modbus protocol and network flexibility.





Easy setting



Double zones control



Monitor system status



Power consumption



Schedule function



Remote control



Energy saving suggestion



**MSmartHome APP**

Zone name setting  
Electric consumption setting

On/Off control

Terminal icon

Mode setting

Temperature curve setting

Day timer  
Weekly timer

ECO mode

Silent mode  
Super silent mode

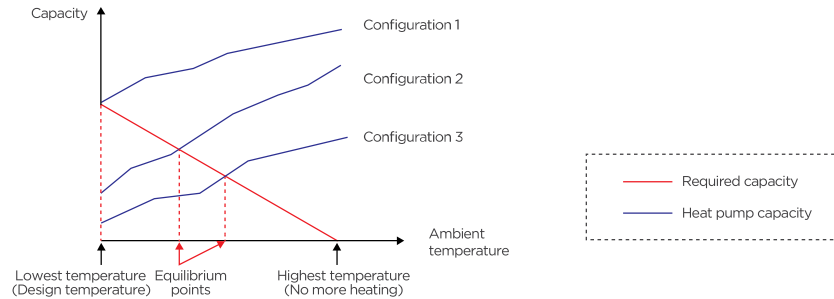
Holiday away mode  
Holiday home mode

Note:  
APP interface changes from time to time as APP is updated and may change slightly vary from those in this document.

# Typical Applications

## System configurations

M thermal system can be configured to run with the electric heater either enabled or disabled and can also be used in conjunction with an auxiliary heat source such as a boiler. The chosen configuration affects the size of heat pump that is required. Three typical configurations are described below.



### Configuration 1: Heat pump only

- The heat pump covers the required capacity and no extra heating capacity is necessary.
- Requires selection of larger capacity heat pump and implies higher initial investment.
- Ideal for new construction in projects where energy efficiency is paramount.

### Configuration 2: Heat pump and backup electric heater

- Heat pump covers the required capacity until the ambient temperature drops below the point at which the heat pump is able to provide sufficient capacity. When the ambient temperature is below this equilibrium point, the backup electric heater supplies the required additional heating capacity.
- Best balance between initial investment and running costs, results in lowest lifecycle cost.
- Ideal for new construction.

### Configuration 3: Heat pump with auxiliary heat source

- Heat pump covers the required capacity until the ambient temperature drops below the point at which the heat pump is able to provide sufficient capacity. When the ambient temperature is below this equilibrium point, depending on the system settings, either the auxiliary heat source supplies the required additional heating capacity or the heat pump does not run and the auxiliary heat source covers the required capacity.
- Enables selection of lower capacity heat pump.
- Ideal for refurbishments and upgrades.

## Selection Procedure

### Step 1 Total heat load calculation

Calculate conditioned surface area and select the heat emitters (type, quantity, water temperature and heat load)

### Step 2 System configuration

Decide whether to include AHS and set AHS' s switching temperature  
Decide whether backup electric heater is enabled or disabled.

### Step 3 Selection

Determine required total heat load on outdoor units  
Set capacity safety factor  
Select power supply

Provisionally select M thermal unit capacity based on nominal capacity

Correct capacity of the outdoor units for the following items:  
Outdoor air temperature / Outdoor humidity / Water outlet temperature/ Altitude

Is corrected M thermal unit capacity  $\geq$  Required total heat load on outdoor units

**YES** M thermal system selection is complete

**NO** Select a larger model or enable backup electric heater operation

## Leaving Water Temperature (LWT)

The recommended design LWT ranges for different types of heat emitter are:

For floor heating: 30°C to 35°C

For fan coil units: 40°C to 45°C

For low temperature radiators: 40°C to 55°C

## One-stop solution Heating, cooling and domestic hot water in one system

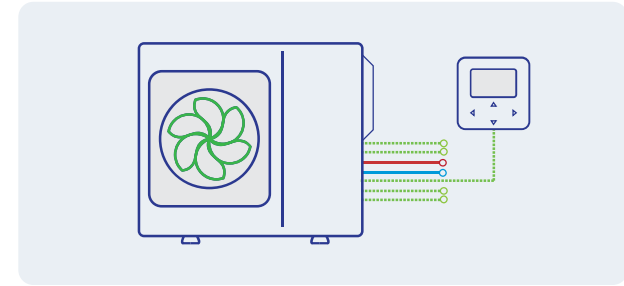
M thermal is an integrated system that provides space heating and cooling as well as domestic hot water, offering a complete, all-year-round solution which can remove the need for traditional gas or oil boilers, or work together with them.

M thermal can be combined with floor heating loops, fan coil units, radiators and domestic water tank. It can also be connected to solar collectors, gas furnace, boiler and other heat sources.

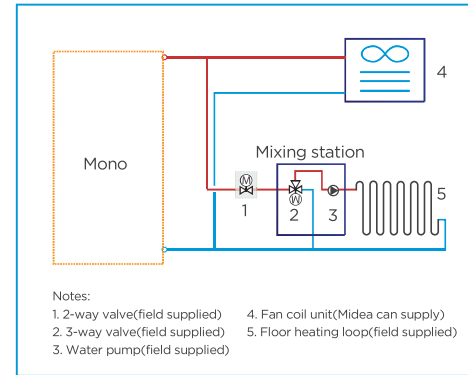


## Typical application

Practical applications are various, including but not limited to the following applications. The application examples given below are for illustration only.

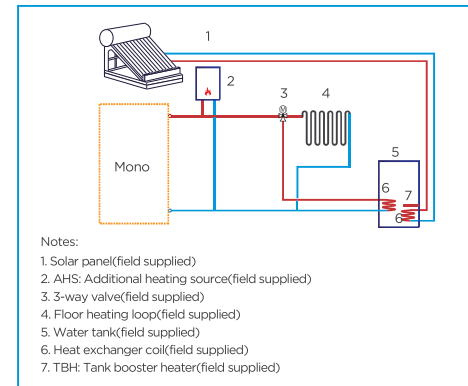


Mono



### Heating and cooling

Floor heating loops is used for space heating and fan coil unit is used for both space heating and cooling. For heating mode, floor heating loops and fan coil unit require different operating water temperature. Mixing station is used to adjust appropriate water temperature for floor heating loops using 2-way valve is used to prevent water from entering floor heating loops then result in condensation during cooling.



### Heating, DHW and hybrid heat source

Backup electric heater(optional) and AHS provide additional heating to raise the leaving water temperature. TBH and solar system provide additional heating to raise the domestic hot water temperature. 3-way valve is used to switch between heating mode and DHW mode.



## Double zones control

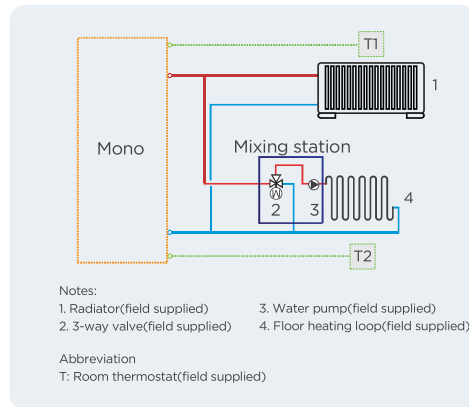
Double zones control is only available for heating mode. It can control different areas to reach different temperature to meet various needs.

### 1. Using wired controller only

Wired controller sets the mode, temperature and on/off. Zone 1 is controlled based on the leaving water temperature. Zone 2 is controlled based on the leaving water temperature or built-in sensor integrated in the wired controller.

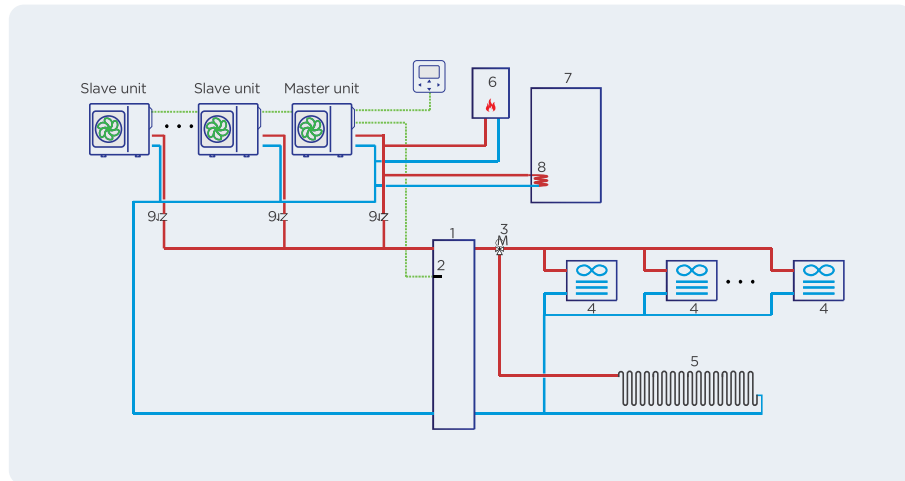
### 2. Using wired controller and thermostat

Wired controller sets the mode and water temperature. Both Zone 1 and Zone 2 are controlled by thermostat.



## Cascade system

Cascade system design is perfect when an extension of capacity becomes required as the building demand evolves. Maximum 6 units can be controlled in group with one controller. Balance tank temperature control makes water temperature more accurate.



Notes:

1. Balance tank (field supplied)
2. Balance tank temperature sensor (Midea can supply)
3. 3-way valve (field supplied)
4. Fan coil unit (Midea can supply)
5. Floor heating loop (field supplied)

6. AHS: Additional heating source (field supplied)
7. Water tank (field supplied)
8. Heat exchanger coil (field supplied)
9. Single way valve (field supplied)

# Specifications



## Power Series Mono

Outdoor unit model		MHC-V5W D2N8-C	MHC-V7W D2N8-C	MHC-V9W D2N8-C	MHC-V12W D2N8-C	MHC-V14W D2N8-C	MHC-V16W D2N8-C	MHC-V12W D2RN8-C	MHC-V14W D2RN8-C	MHC-V16W D2RN8-C		
Heating <sup>1</sup>	Capacity	W	6500	8400	10000	12000	14100	16000	12200	14100	16000	
	Rated input	W	1226	1663	2128	2490	3000	3556	2490	3000	3556	
	COP	/	5.30	5.05	4.70	4.90	4.70	4.50	4.90	4.70	4.50	
Heating <sup>2</sup>	Capacity	W	6600	8500	10200	12500	14500	16200	12500	14500	16200	
	Rated input	W	1650	2237	2795	3378	4085	4696	3378	4085	4696	
	COP	/	4.00	3.80	3.65	3.70	3.55	3.45	3.70	3.55	3.45	
Heating <sup>3</sup>	Capacity	W	6300	8200	9400	12000	14000	16000	12000	14000	16000	
	Rated input	W	1969	2603	3032	4000	4746	5614	4000	4746	5614	
	COP	/	3.20	3.15	3.10	3.00	2.95	2.85	3.00	2.95	2.85	
Cooling <sup>4</sup>	Capacity	W	6500	8300	10000	12200	13900	15400	12200	13900	15400	
	Rated input	W	1275	1711	2326	2652	3159	3667	2652	3159	3667	
	EER	/	5.10	4.85	4.30	4.60	4.40	4.20	4.60	4.40	4.20	
Cooling <sup>5</sup>	Capacity	W	5500	7400	9000	11600	13400	14000	11600	13400	14000	
	Rated input	W	1692	2349	3103	3742	4573	4828	3742	4573	4828	
	EER	/	3.25	3.15	2.90	3.10	2.93	2.90	3.10	2.93	2.90	
Seasonal space heating energy efficiency class <sup>6</sup>	Water outlet at 35°C	class	A+++									
	Water outlet at 55°C	class	A++									
Refrigerant	Type(GWP)	/	R32(675)									
	Charged weight	kg	125			1.8						
Sound power Level <sup>7</sup>	dB	60	63	65	70	72	72	70	72	72		
Net dimension (W×H×D)	mm	865 x 1040 x 410										
Packing dimension (W×H×D)	mm	970 x 1190 x 560										
Net/Gross weight	kg	87/103			106/122			120/136				
Water pump	Max.pump head	m	9									
Water piping connection	mm	G1" BSP				G5/4" BSP						
Ambient temperature range	Cooling	°C	-5-43									
	Heating	°C	-25-35									
	DHW	°C	-25-43									
LWT setting range	Cooling	°C	5-25									
	Heating	°C	25-65									
	DHW	°C	20-60									
Backup E-heater <sup>8</sup> (Optional)	Standard mounted	kW	/									
	Optional	kW	3/4.5/6/9									
	Capacity steps	/	1/1/2/3									
	Power supply	3	V/Ph/Hz	220-240/1/50								
		4.5		220-240/1/50								
4.5		380-415/3/50										
6		380-415/3/50										
9	380-415/3/50											

Notes:

1. Outdoor air temperature 7°C DB, 6°C WB; Water inlet 30°C, Water outlet 35°C.
2. Outdoor air temperature 7°C DB, 6°C WB; Water inlet 40°C, Water outlet 45°C.
3. Outdoor air temperature 7°C DB, 6°C WB; Water inlet 47°C, Water outlet 55°C.
4. Outdoor air temperature 35°C DB; Water inlet 23°C, Water outlet 18°C.
5. Outdoor air temperature 35°C DB; Water inlet 12°C, Water outlet 7°C.
6. Seasonal space heating energy efficiency class testes in average climate general conditions.
7. Testing standard: EN12102-1.
8. Backup electric heater is external installation.
9. Relevant EU standards and legislation: EN14511; EN14825; EN50564; EN12102; (EU) No 811/2013; (EU) No 813/2013; OJ 2014/C 207/02:2014.