

# Procon

# MelcoBEMS MINI (A1M+)

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FOR INSTALLERS

## INSTALLATION MANUAL

Manual version 1.0.3

Firmware version 4.1.1

For safe and correct use, please read this installation manual thoroughly before installing the PROCON MelcoBEMS MINI (A1M+).

## Preface

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### Safety warnings

**⚠ Caution:**

Do not expose to rain or moisture.

**⚠ Operating Temperature:**

The product has been designed to operate between -20° C and +60° C

**⚠ Shielded Signal Cables:**

Use only shielded cables for connecting peripherals to any Procon MelcoBEMS MINI (A1M+) device to reduce the possibility of interference with radio communications services. Using shielded cables ensures that you maintain the appropriate EMC classification for the intended environment.

**⚠ CE Notice:**

This product has been determined to be in compliance with 2014/30/EU (EMC Directive), 2014/35/EU (Low Voltage Directive) and 2011/65/EU (RoHS Directive).

UL 61010-1 Electrically Safety Tested.

**⚠ UKCA Notice:**

This product has been determined to be in compliance with SI 2016 No. 1091 (Electromagnetic Compatibility Regulations 2016), SI 2016 No. 1101, (Electrical Equipment (Safety) Regulations 2016) and SI 2012 No. 3032 (The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012).

### Disclaimer

**⚠ Warranty:**

All products manufactured on behalf of Mitsubishi Electric UK are warranted against defective materials for a period of three years from the date of delivery to the original purchaser.

**⚠ Warning:**

Mitsubishi Electric UK assumes no liability for damages consequent to the user of this product. We reserve the right to change this manual at any time without notice. The information furnished by us is believed to be accurate and reliable. However, no responsibility is assumed by us for its use, nor for any infringements of patents or other rights of third parties resulting from its use.

If the equipment is used in a manor not specified by the manufacturer, the protection provided by the equipment may be impaired.

## Amendment Register

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Document Version	Latest Firmware Version	Date	Author	Notes
1.0.0	V4.0.1	01/11/24	SC/IB	Initial version for firmware V1.0.0
1.0.1	V4.0.2	22/11/24	SC	Added current rating for safety approval
1.0.2	V4.1.0	22/05/25	JNF	Release version of A1M+
1.0.3	V4.1.1	18/09/25	JNF	A1M+ feature update

## Firmware revision history

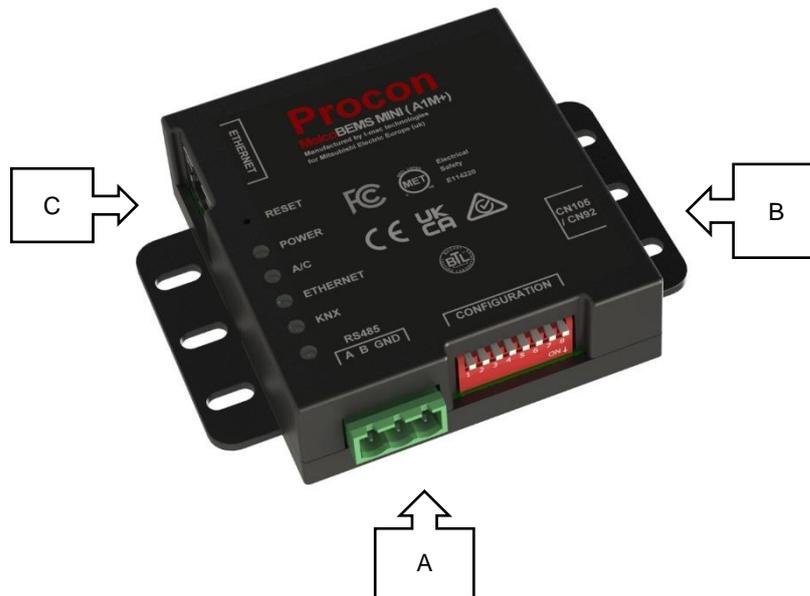
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<b>Firmware Version</b>	<b>Date</b>	<b>Notes</b>
4.0.1	01/04/25	- Initial version of firmware with A1M R5 features
4.0.2	01/04/25	- BACnet IP support
4.0.3	01/04/25	- Modbus TCP support
4.1.0	22/05/25	- Release version of A1M+ with BACnet IP and Modbus TCP support
4.1.1	22/05/25	- BACnet MSTP 76800 baud support - Boot up no network issue fixed - BACnet device name could be set in the setting page

1

[Fig. 1]

MelcoBEMS MINI (A1M+)



- A RS485 connector
- B CN105/CN92 connection lead
- C Ethernet RJ45 connector

2

[Fig. 2]



Air to air unit



Air to water unit

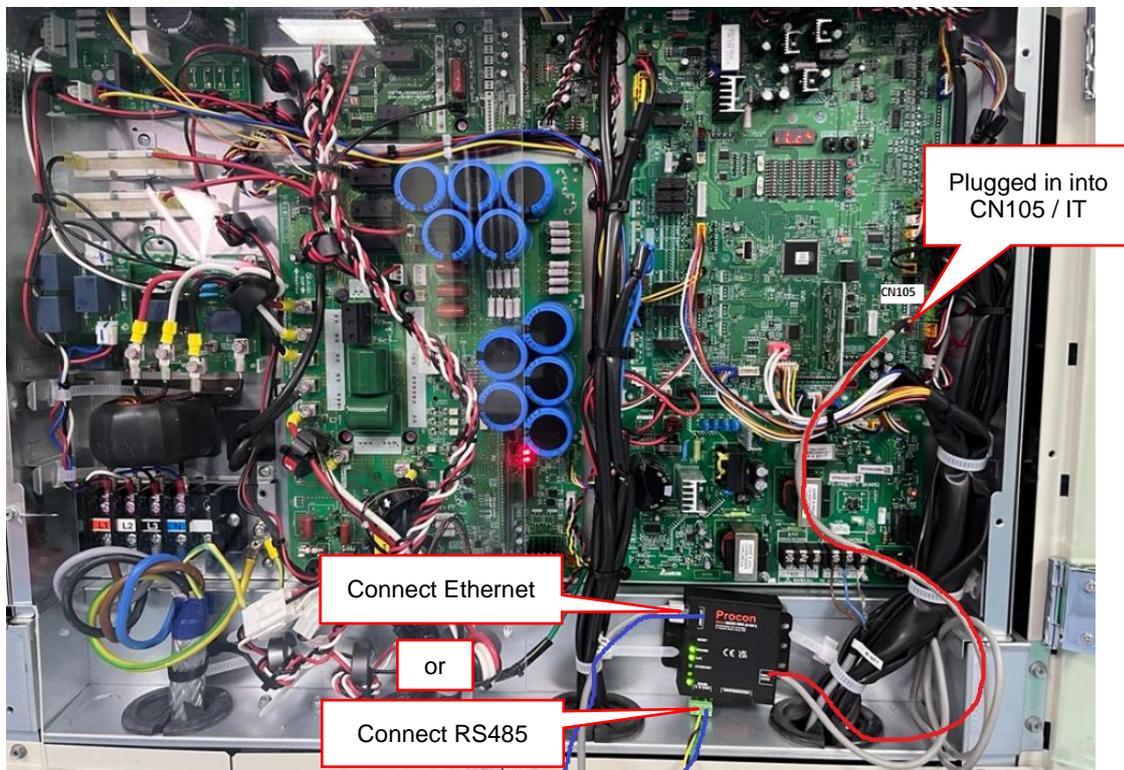


Lossnay unit

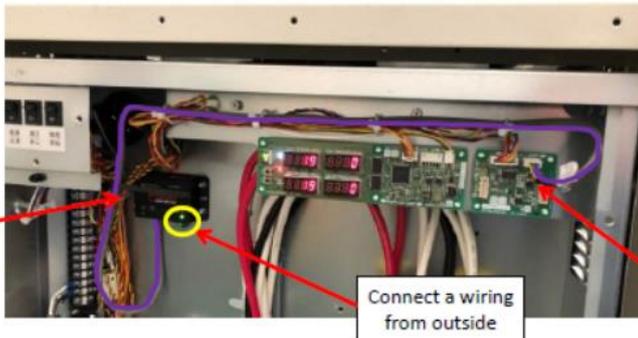
3

[Fig. 3]

**Air To Water Unit  
(CAHV R450YA-HPB)**



4



[Fig. 4]  
Air-Cooled Chilling Unit  
(EAHV/EACV-P1500, 1800YB)

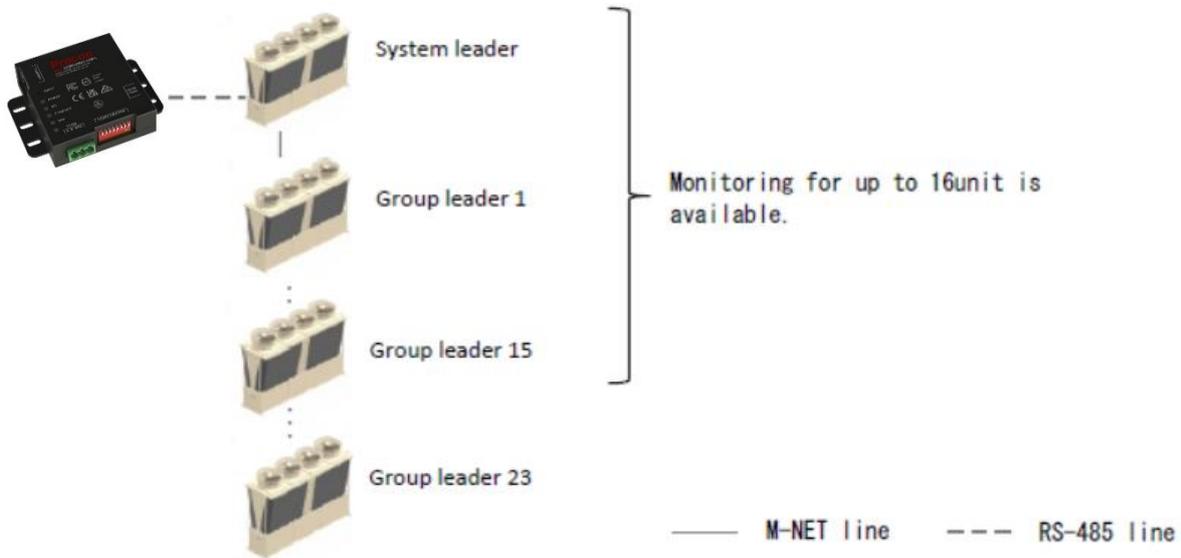
**Compressor information acquisition method(EAHV/EACV-P1500,1800YB)**

Compressor frequency and compressor ON/OFF information can be monitored for up to 16 units. Available information can be switched by Dip switch 2-10(BMS group setting) according to purpose.

① Information acquisition of representative unit in the system simultaneous operation group

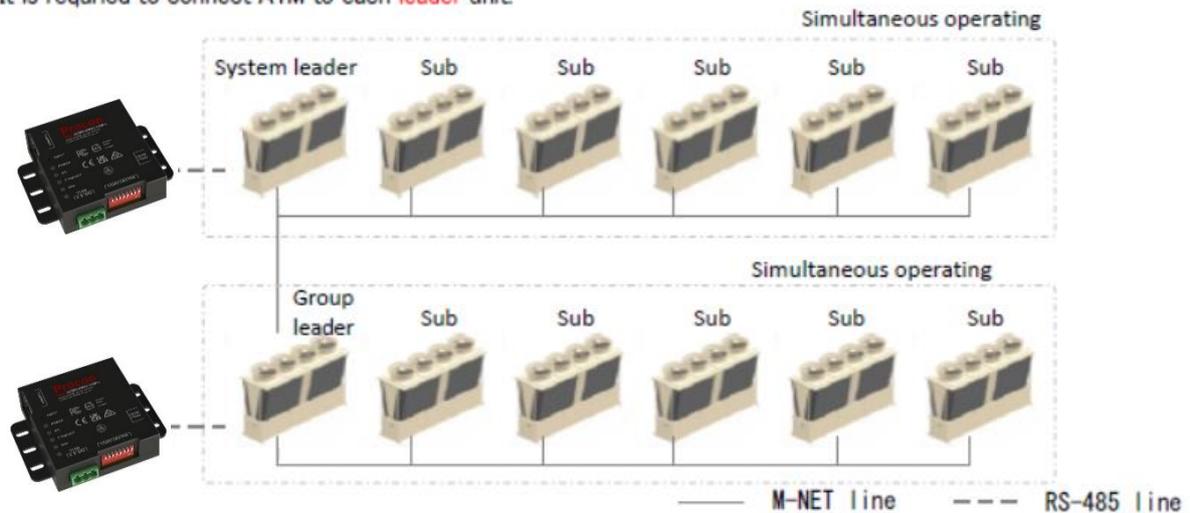
(DIP SW2-10: OFF, only system leader)

The representative unit information in the simultaneous operation group can be acquired by connecting A1M to the representative unit



② Information acquisition for slave unit in the simultaneous operation group(DIP SW2-10:ON, only system leader)

The **sub** unit information of simultaneous operation group can be acquired by connecting A1M to system **leader** unit/**group leader** unit in the simultaneous operation group. It is required to connect A1M to each **leader** unit.



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## Safety precautions

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- **Before installing the unit, make sure you read all the “Safety precautions”**
- **The “Safety precautions” provide very important points regarding safety. Make sure you follow them**

### Symbols used in the text

#### **Warning:**

Describes precautions that should be observed to prevent danger of injury or death to the user.

#### **Caution:**

Describes precautions that should be observed to prevent damage to the unit.

#### **Warning:**

- **Ask the dealer or an authorised technician to install the unit**
  - Improper installation by the user may result in electric shock, or fire
- **Use the specified cables for wiring. Make the connections securely so that any outside forces acting on the cables are not applied to the terminals**
  - Inadequate connection and fastening may generate heat and cause a fire
- **Never repair the unit. If the controller must be repaired, consult the dealer**
  - If the unit is repaired improperly, electric shock, or fire may result
- **Have all electric work done by a licensed electrician according to "Electric Facility Engineering Standard", "Interior Wire Regulations" and the instructions given in this manual and always use a special circuit**
  - If the power source capacity is inadequate or electric work is performed improperly, electric shock and fire may result
- **Keep the electric parts away from any water - washing water etc...**
  - Contact may result in electric shock, fire or smoke
- **To dispose of this product, consult your dealer**

#### **Caution:**

- **Safely dispose of the packing materials**
  - Packing materials, such as nails and other metal or wooden parts, may cause stabs or other injuries
  - Tear apart and throw away plastic packaging bags so that children will not play with them - If children play with a plastic bag which has not been torn apart, they face the risk of suffocation

## Overview

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The Procon MelcoBEMS MINI (A1M+) Protocol Converter is used for remote monitoring and control of both Air-to-Air products (M-, S- and P-series split air conditioning systems) and Air-to-Water products (CAHV, CRHV, PWFY). It acts as a gateway between the system and external third party equipment.

The MelcoBEMS MINI (A1M+) continuously reads data from the system and changes configuration when necessary. Because the reading is continuous, the MelcoBEMS MINI (A1M+) always stores up-to-date data. This data is then available to external devices through the RS-485 port or Ethernet port using the Modbus or BACnet protocol. Values can be read and changed via this connection. Please refer to the Modbus section for further information.

The MelcoBEMS MINI (A1M+) is powered via the CN105/CN92 connector, hence no external power supply is needed.

Compatible model numbers can be found in the appendices of this document.

### **⚠ Caution:**

MAC-397IF and MAC-333IF units cannot be connected when the MelcoBEMS MINI (A1M+) is connected, as the same CN105/CN92 connector is used.

Appendix A lists the compatible Air-To-Air indoor units.  
Appendix B lists the compatible Air-To-Water indoor units.  
Appendix C lists the compatible Lossnay units.

**Figure 1** shows the MelcoBEMS MINI (A1M+) converter.

**Figure 2** shows the CN105/CN92 connector on the indoor unit PCB that the MelcoBEMS MINI (A1M+) connects to, for both Air-to-Air and Air-To-Water type units.

Air Con type	Modbus RTU	BACnet MS/TP	Modbus TCP	BACnet IP over UDP
ATA (Air-to-Air)	✓	✓	✓	✓
ATW (Air-To-Water)	✓	✓	✓	✓
Lossnay	✓	✓	✓	✓

# 1. DIP switch settings

---

There is a bank of 8 DIP switches on the MelcoBEMS MINI (A1M+) labeled 'CONFIGURATION'. These switches are used to configure communication settings and to enable some features.

## 1.1. RS-485 Node address

When BACnet MS/TP protocol has been selected (see section [1.33-3](#)) the node address is used as the Station ID. When Modbus RTU protocol has been selected (see section [1.33-3](#)) The node address is used as the Slave ID.

Any node address in the range 1 – 30 can be chosen using switches 1 – 5. The address is set in binary, where the switch positions have the following values:

Switch number	Value when switch is set to ON
1	1
2	2
3	4
4	8
5	16

To get the node address, add together the value for each switch set ON. For example, to set address 13, set switches 1, 3 and 4 ON (1 + 4 + 8 = address 13).

When all switches 1 – 5 are set to the ON position the node address is set in software by writing to a Modbus register (see Modbus Holding Registers section).

Note: When all switches are set to the OFF position a node address of 1 is assumed.

Note: Each MelcoBEMS MINI (A1M+) connected on the same RS-485 network must be set to a unique node address.

**Node Address Range Table**

DIP switch[5-1]	Node Address or other meaning
0x00	Reserved for Bootloader
0x01	1
0x02	2
	...
0x1D	14
0x1E	15
0x1F	Using Software Address

## 1.2. RS-485 communication settings

The RS-485 settings are set using DIP switch 6.  
When the switch is in the OFF position the Baud Rate and Parity settings are set in software by writing to Modbus registers (see Modbus Holding Register section).

Switch 6	RS-485 communication settings
OFF	Baud Rate and Parity set in software
ON	9600 baud, no parity

The number of data bits is fixed at 8 and the number of stop bits is fixed at 1.

## 1.3. Protocol selection

The RS485 protocol is set using DIP switch 7.  
When the switch is in the ON position the Modbus RTU protocol is selected.

Switch 7	Protocol selection
OFF	BACnet MS/TP and BACnet IP
ON	Modbus RTU

## 1.4. Deadband mode

The Deadband feature can be enabled using DIP switch 8.

When the switch is in the OFF position the Deadband feature is disabled.  
When the switch is in the ON position the Deadband feature is enabled.

Switch 8	Deadband feature
OFF	Disabled
ON	Enabled

## 2. Deadband Mode

---

The deadband mode is enabled by setting DIP switch 8 ON. It is only applicable to Air-To-Air type units.

### 2.1. Settings

There are two settings, the Heating Setpoint (default 19°) and Cooling Setpoint (default 23°C). These values can be changed via Modbus, refer to the Air-To-Air Modbus tables for more information.

The Cooling Setpoint must be at least 2°C greater than the Heating Setpoint, otherwise the default values given above will be assumed.

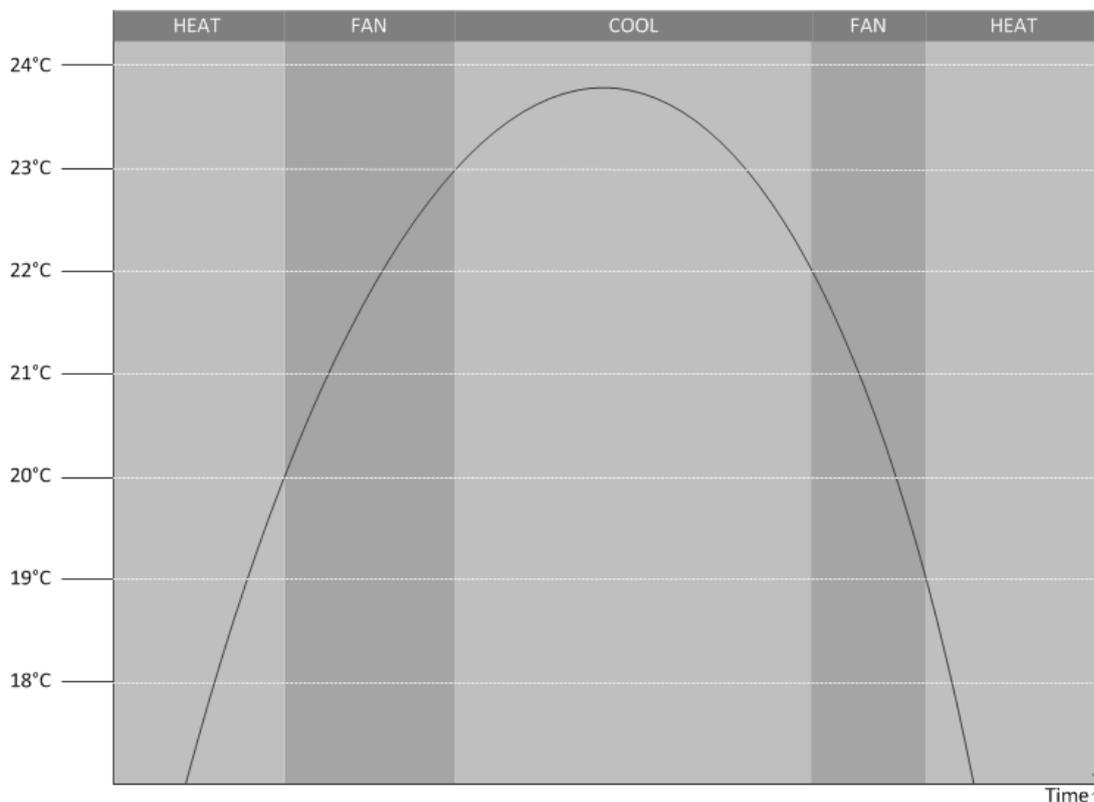
### 2.2. Operation

When enabled, the MelcoBEMS MINI (A1M+) controls the Mode and Temperature Setpoint based on the Room (return air) Temperature.

While the room temperature is less than the *Heating Setpoint* the unit will be set to HEAT mode with a setpoint of 28°C. Whilst in HEAT mode, if the room temperature rises above the *Heating Setpoint* + 1°C the unit will be set to FAN mode. Whilst in FAN mode, if the temperature rises above the *Cooling Setpoint* the unit will be set to COOL mode with a setpoint of 19°C.

Whilst in COOL mode, if the room temperature falls below the *Cooling Setpoint* – 1°C the unit will be set to FAN mode. Whilst in FAN mode, if the room temperature falls below the *Heating Setpoint* the unit will be set to HEAT mode with a setpoint of 28°C.

The following image shows this graphically (assuming a Heating Setpoint of 19°C and a Cooling Setpoint of 23°C):



### **2.3. Initialisation**

When the MelcoBEMS MINI (A1M+) powers up it will set the mode, which will be determined by the room temperature.

If less than the Heating Setpoint the unit will be set to HEAT mode with a setpoint of 28°C.

If greater than or equal to the Cooling Setpoint the unit will be set to COOL mode with a setpoint of 19°C.

If between the Heating and Cooling Setpoints the unit will be set to FAN mode.

### 3. Setpoint Offset

---

The Setpoint Offset feature is only applicable to, and will only be enabled for, Air-To-Air type units.

#### 3.1. Settings

There are two settings which are applicable to the Setpoint Offset feature, *BMS Room Temperature* and *BMS Virtual Setpoint*.

The BMS Virtual Setpoint can be changed using Modbus and is stored in non-volatile memory so the value is retained if the MelcoBEMS MINI (A1M) loses power.

The BMS Room Temperature can be changed using Modbus but is not stored in non-volatile memory, so the value is lost and reset to zero upon the MelcoBEMS MINI (A1M+) losing power.

#### 3.2. Operation

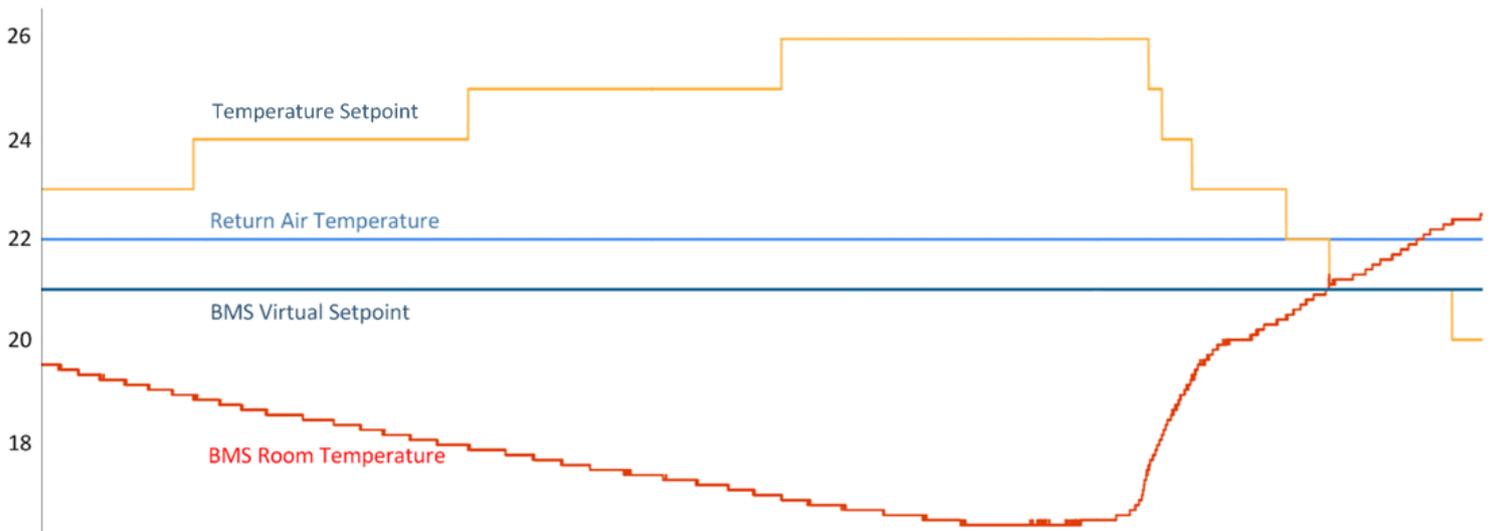
In some situations a 3<sup>rd</sup> party room temperature sensor connected to a BMS or other controller may provide a more accurate temperature reading than the return air temperature of the indoor unit. The A1M+ can calculate the difference between these two temperature readings and compensate by adjusting the indoor unit's temperature setpoint.

The new temperature setpoint is calculated using the following equation:

$$\text{Temperature Setpoint} = \text{Return Air Temperature} - (\text{BMS Room Temperature} - \text{BMS Virtual Temperature})$$

As a hypothetical example, consider the BMS Virtual Setpoint being set to 21°C and the indoor unit return air temperature remaining constant at 22°C. As the BMS Room Temperature decreases the MelcoBEMS MINI (A1M+) increases the indoor unit's temperature setpoint.

When the BMS Room Temperature reaches 18°C the Temperature Setpoint =  $22 - (18 - 21) = 25^\circ\text{C}$ .



Hysteresis has been built in to prevent the temperature setpoint from rapidly changing.

The setpoint offset will only operate correctly if the BMS Room Temperature is periodically updated via Modbus, to ensure the MelcoBEMS MINI (A1M+) always has an up to date reading.

If the BMS Room Temperature is set to 0°C (which it will be on power up) the setpoint offset feature will be disabled. It will only activate when the BMS Room Temperature is not 0°C.

To disable the feature without removing the MelcoBEMS MINI (A1M+) power, simply set the BMS Room Temperature to 0°C.

## 4. RS-485 termination

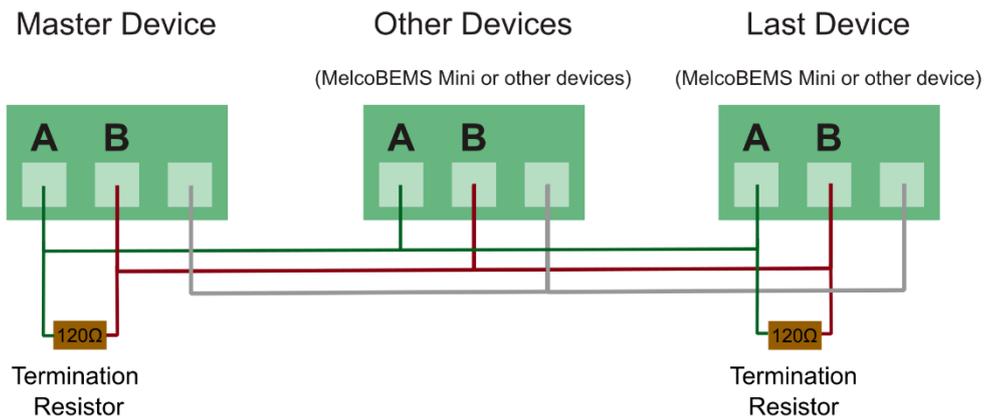
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An RS-485 termination resistor can be enabled on the MelcoBEMS MINI (A1M+) PCB using the single jumper labeled J1.

The jumper setting is summarized below:

Jumper Setting	Description
Not fitted	Termination resistor not enabled
Fitted	Termination resistor enabled

**Note:** The J1 jumper is only available on Revision 3 & 4 variants. For Revision 5 variant, the 120Ω termination resistors for the RS-485 network must be supplied by the installing contractor and fitted across pins A & B on the first & last device.



## 5. Installation

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### **5.1. Physical connection**

The MelcoBEMS MINI (A1M+) has a flying lead to connect directly into the CN105/CN92 connector on the controller PCB. As an example, Figure 2 shows this connection on a Mr Slim indoor unit and a CRHV unit.

### **5.2. Power supply**

The MelcoBEMS MINI (A1M+) is powered from the CN105/CN92 air conditioner host connector at 12V DC / 83mA / 1W (Max) and therefore does not require an external power supply.

### **5.3. Modbus connections**

The MelcoBEMS MINI (A1M+) has a 3-way screw terminal to provide Modbus RTU communication via RS-485. Figure 1 shows the RS-485 terminal (Box A). The Modbus section contains further detail of the Modbus communications.

### **5.4. Ethernet connections**

The MelcoBEMS MINI (A1M+) has RJ45 socket to provide 10/100Mb Ethernet connection. Figure 1 shows the RJ45 socket (Box C). The Ethernet section contains further detail of network setting.

For improved Ethernet EMC emissions it is recommended to fit a Wurth ferrite (part number: 742 711 12) to the Ethernet cable as close as possible to the MelcoBEMS MINI (A1M+) enclosure. This will reduce the electrical noise emitted from the Ethernet cable and reduce the possibility of electrical interference with any other device located in close proximity.

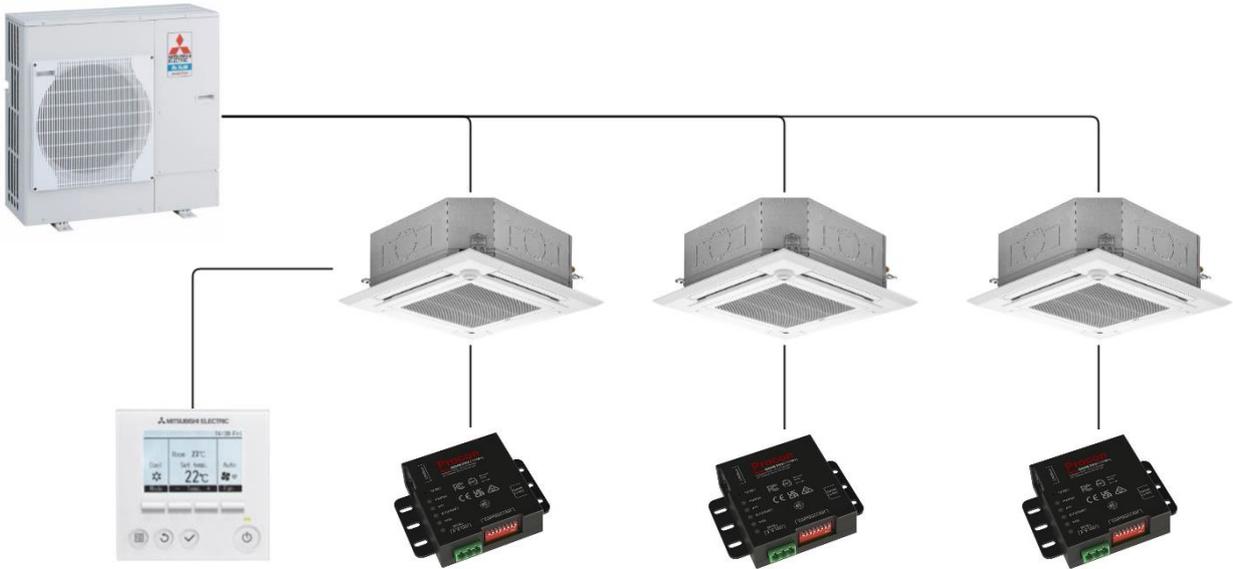
### **5.5. Unit type selection**

The MelcoBEMS MINI (A1M+) software will automatically detect whether an Air-To-Air or Air-To-Water unit is connected. It will then only send commands applicable to that unit type.

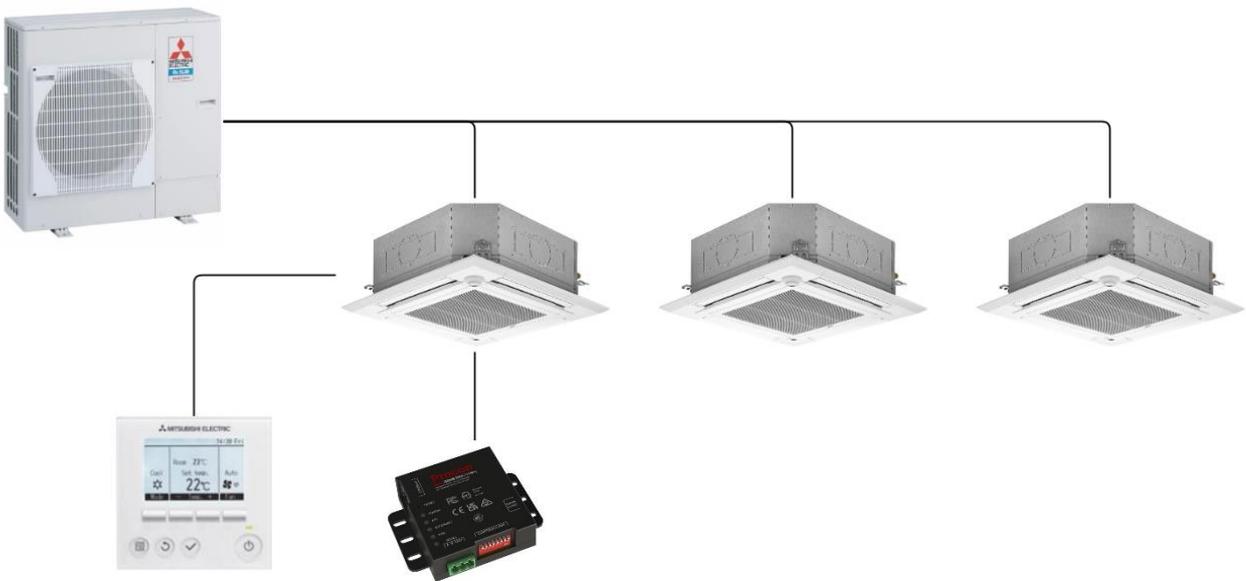
## 5.6. Using Twin/Triple/Quad systems

It is recommended to use one MelcoBEMS MINI (A1M+) for each indoor unit, however, if the fault Modbus register /BACnet object is not used then one MelcoBEMS MINI (A1M+) can be used per twin / triple / quad system.

### 5.6.1. When fault Modbus register is being used



### 5.6.2. When fault Modbus register is not being used



## 5.7. Using single split units in a group

It is recommended to use one MelcoBEMS MINI (A1M+) for each indoor unit, however, if the fault Modbus register is not used then one MelcoBEMS MINI (A1M+) can be used per system.

### 5.7.1. When fault Modbus register is being used

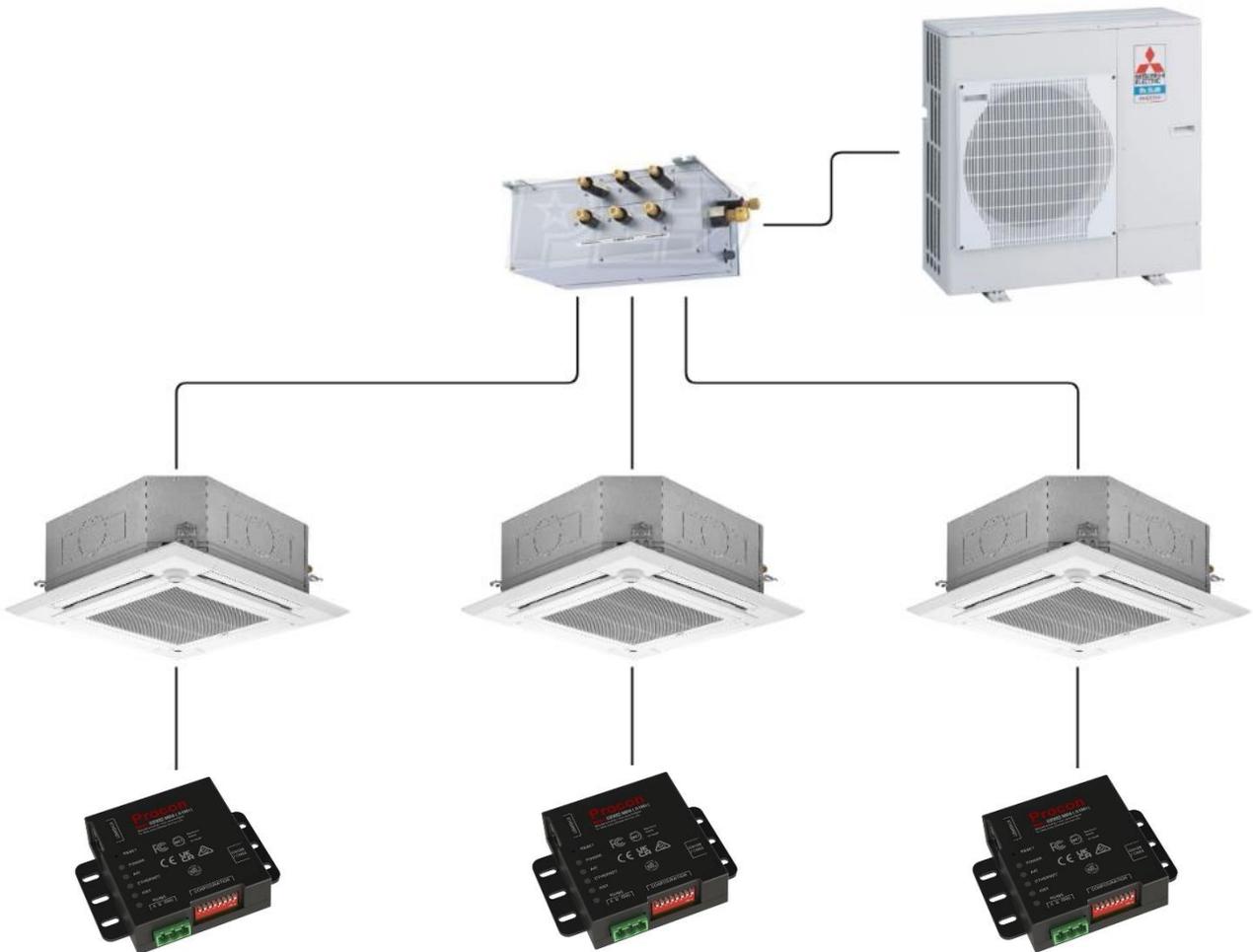


### 5.7.2. When fault Modbus register is not being used



## 5.8. Using MXZ split units

One MelcoBEMS MINI (A1M+) must be installed for each indoor unit when using a MXZ system.



## 6. Status LEDs

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There are two status LEDs on the MelcoBEMS MINI (A1M+). The LED indications are as follows:

LED Name	Colour	Functionality
AC ACK	Green	Lit when A1M+ is powered, flashing indicates valid communication with the indoor unit.
Ethernet ACK	Green	Lit when A1M+ is powered and connecting valid Ethernet connection. Flashing indicates valid Ethernet communication.
RS-485 ACK	Green	Lit when A1M+ is powered, flashing indicates valid Modbus or BACnet communication.

### 6.1. AC ACK

If this LED is permanently lit and does not flash, check the CN105/CN92 connection is secure and the unit type is supported (see appendix).

### 6.2. RS-485 ACK

If this LED is permanently lit and does not flash it could be due to a physical RS-485 connection problem, or incorrect Modbus/BACnet/RS-485 configuration.

### 6.3. Ethernet ACK

If this LED is permanently lit and does not flash it could be due to a physical Ethernet connection problem, or incorrect Network configuration.

## 7. Ethernet

### 7.1. Network Setting Modes

A1M+ has two networking modes.

Mode	Dip switches	Description
Bootloader Mode	All set to zero	<ul style="list-style-type: none"><li>- For Network setting reset or firmware update purpose only.</li><li>- Does NOT have Modbus/BACnet features active.</li><li>- Network setting is <b>ALWAYS</b> the <b>Default Network Settings (see below table)</b>.</li></ul>
Application Mode	Non zero setting	<ul style="list-style-type: none"><li>- Supporting below protocols based on dip switches setting<ul style="list-style-type: none"><li>- Modbus TCP</li><li>- BACnet IP over UDP</li></ul></li><li>- Network Settings can be changed by internal webpage</li></ul>

Default Network Setting	
IP	192.168.92.114
Netmask	255.255.255.0
Gateway	192.168.92.1

### 7.1. Application

#### 7.1.1. Login

To login, type the A1M+ IP address prefixed with http:// into your web browser

e.g. <http://192.168.92.114>

← → ↻ 🏠 ⚠ Not secure 192.168.92.114

## Procon MelcoBEMs Mini

### Login

Please enter your password to access the device configuration

Password

If you do not know the password, [click here](#) to reset

Default password is device serial number.  
E.g. If the A1M+ labeled as **SM123456**, then the password is **SM123456**

### 7.1.2. Settings

After login, the settings page will be shown as below:

← → ↻ 🏠 ⚠ Not secure 192.168.92.114/index.html

## Procon MelcoBEMs Mini

### Network Settings

Use DHCP

IP Address  .  .  .

Subnet Mask  .  .  .

Gateway IP Address  .  .  .

No Network Self Reboot

### BACnet Settings

Device Name

Device Instance

Modbus/BACnet address

Max Info Frames

Max Master

APDU Timeout

APDU Retries

Baud Rate

Parity Type

BACnet IP UDP port

[Reset Password](#) | [Logout](#)

Click “Save” to save the changes, otherwise the changes will lost.

You must reboot the A1M+ before the new settings will take effect.

#### No Network Self Reboot

- This feature means A1M+ will check network continuously
- If the network link is not available after 20~30 seconds, it will reboot itself.
- For the A1M+ using without Ethernet, please untick the “No Network Self Reboot” Otherwise it will keep rebooting for every 30 seconds.

### 7.1.3. Reset Password

If you need to reset the password, click the “Reset password” on the login page.

## Procon MelcoBEMs Mini

### Login

Enter password to login and access the device configuration

Password



[Reset Password](#)

The password reset page will appear as below:

## Procon MelcoBEMs Mini

### Password Reset

Please follow the instructions below to reset the device password

During this process you will be required to toggle the DIP switch on the device within 20 seconds of clicking the reset button. Make sure you have access to the device.

1. Enter the new password below

Passwords must be between 8 and 24 characters, and include at least one uppercase character and one number

2. Click reset

[Login](#)

Passwords must be between 8 and 24 characters, and at least one Capital Letter and one numbers

1. Enter the new password below

Passwords must be between 8 and 24 charaters, and at least one Captial Letter and one number

2. Click reset



Then it will prompt you toggle the DIP switch.

1. Enter the new password below

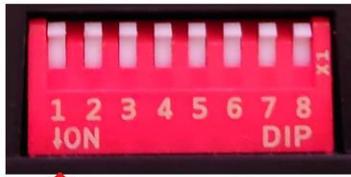
Passwords must be between 8 and 24 charaters, and at least one Captial Letter and one number

2. Click reset

3. Toggle DIP switch 1. If it is ON set it to OFF or vice versa.

Toggle the DIP switch 1

- If it is already ON, then Turn it OFF then turn it ON)
- If it is already OFF, then Turn it ON then turn it OFF)



Then it will prompt you toggle back the DIP switch.

1. Enter the new password below

Passwords must be between 8 and 24 characters, and include at least one uppercase character and one number

2. Click reset

3. Toggle DIP switch 1. If it is ON set it to OFF or vice versa.

4. Toggle DIP switch 1 back to the original position. If it is ON set it to OFF or vice versa.

If successful, the password reset successful message is shown.

1. Enter the new password below

Passwords must be between 8 and 24 characters, and at least one Capital Letter and one number

2. Click reset

Passoword reset successful

If failed (timeout or not toggle the DIP switch), it will show the error message.

1. Enter the new password below

Passwords must be between 8 and 24 characters, and include at least one uppercase character and one number

2. Click reset

Password reset failed, please try again

The password changes will take effect immediately

## 7.2. Bootloader

Option	Description
Reset Setting	Two options available: - Network setting reset only - All setting reset including Login password
Firmware Update	- Update the Firmware by using TFTP tools

### 7.2.1. Reset Setting

To login, type <http://192.168.92.114> into your web browser



## Procon MelcoBEMs Mini

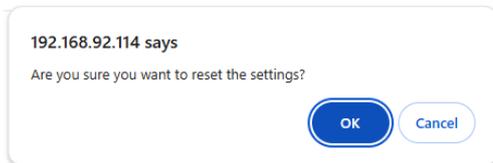
### Device Reset Options

Network Reset

Full Reset

You can choose either Network setting reset or Full reset.

After clicking "Save", a confirmation dialogue will be shown.



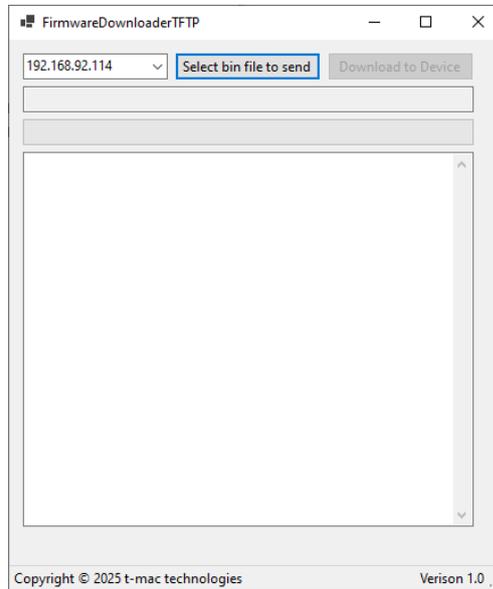
After clicking OK, a config saved message will be shown:

Network Reset	Full Reset
<p><b>Procon MelcoBEMs Mini</b></p> <p><b>Device Reset Options</b></p> <p>Network Reset <input checked="" type="radio"/></p> <p>Full Reset <input type="radio"/></p> <p style="text-align: center;"><input type="button" value="Save"/></p> <p>Config saved</p>	<p><b>Procon MelcoBEMs Mini</b></p> <p><b>Device Reset Options</b></p> <p>Network Reset <input type="radio"/></p> <p>Full Reset <input checked="" type="radio"/></p> <p style="text-align: center;"><input type="button" value="Save"/></p> <p>Config saved</p>

## 7.2.2. Firmware Update

Before you update the firmware, you will need the following:

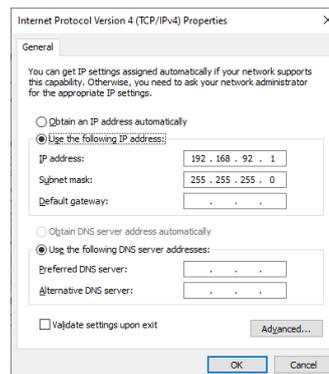
1. New firmware .bin file (E.g. A1M\_Plus\_en.bin)
2. Updating FirmwareDownloaderTFTP application



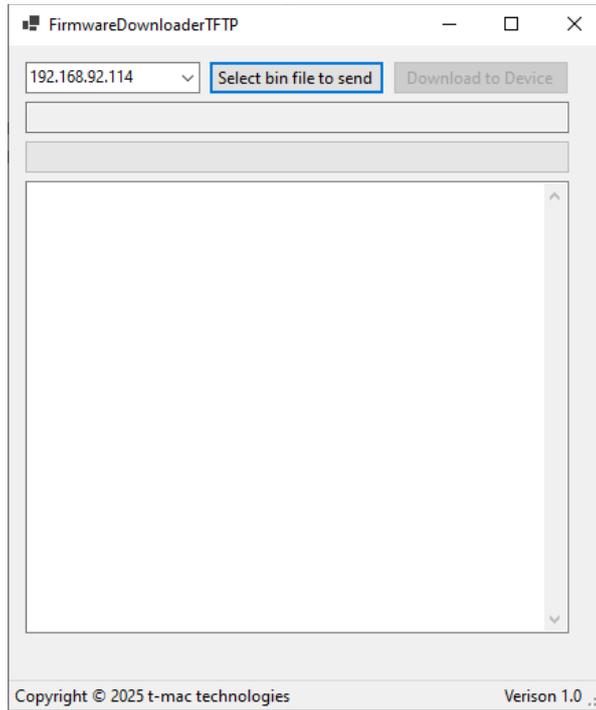
### 3. Connect the A1M+ to PC Ethernet interface

- The A1M+bootloader mode IP address is always 192.168.92.114.
- After direct connecting from PC to A1M+, the PC network interface setting needs to have the same subnet.
- It is recommended to test the connection to the A1M+ by issuing a ping command.

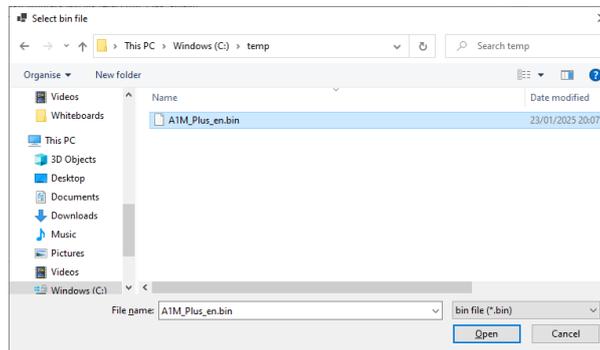
PC network setting example:



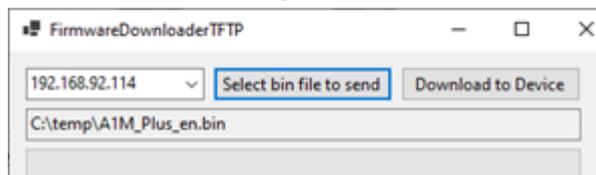
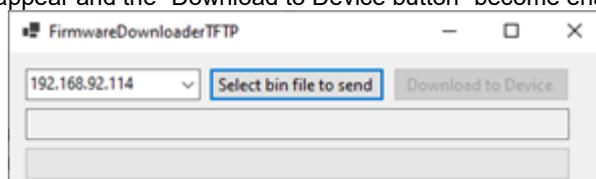
Updating firmware by FirmwareDownloaderTFTP  
- Open the tools



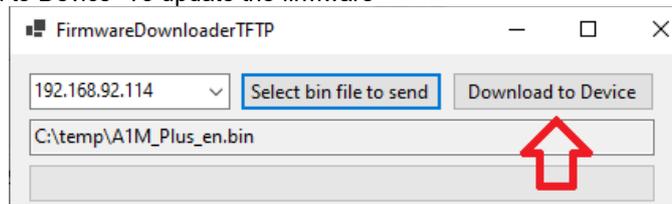
- Click the “Select bin file to send” and select the new firmware file.



- The file path will appear and the “Download to Device button” become enable

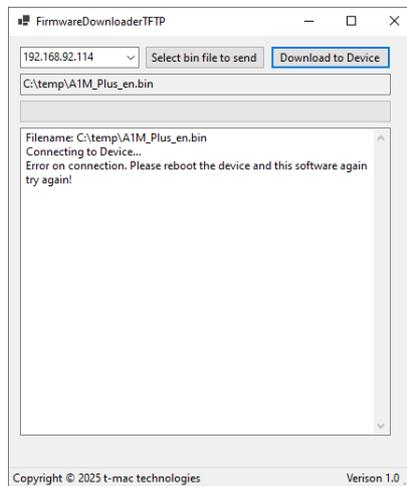


- Press "Download to Device" To update the firmware



A1M+ will erase the flash after receiving 1 <sup>st</sup> packet. (1-3 second delay)	After erasing, it will update the device firmware	After the update is complete, set the DIP switch back before reboot

- If there are any network problem an error message is shown as below:



## 8. BACnet

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### **8.1. BACnet MS/TP**

The MelcoBEMS MINI (A1M+) can be connected to a BACnet MS/TP network using RS-485. BACnet protocol can be selected using DIP switch 7 (see section [1.33-3](#)).

### **8.2. BACnet IP over UDP**

The MelcoBEMS MINI (A1M+) can be connected to a BACnet IP over UDP using Ethernet. BACnet protocol can be selected using DIP switch 7 (see section [1.33-3](#)).

### 8.3. Object types supported

Property	Object Type						
	Device	Analogue Value	Binary Input	Binary Output	Multi State Input	Multi State Output	Analogue Input
Object Identifier	R	R	R	R	R	R	R
Object Name	R/W	R	R	R	R	R	R
Object Type	R	R	R	R	R	R	R
Present Value		R/W	R <sup>1</sup>	R/W	R <sup>1</sup>	R/W	R <sup>1</sup>
Status Flags		R	R	R	R	R	R
Event State		R	R	R	R	R	R
Out Of Service		R	R	R	R	R	R
Number Of States					R	R	
State Text					R	R	
Units		R					R
Polarity			R	R			
Priority Array		R		R		R	
Relinquish Default		R		R	R	R	
System Status	R						
Vendor Name	R						
Vendor Identifier	R						
Model Name	R						
Firmware Revision	R						
Application Software Version	R						
Location	R						
Description	R						
Protocol Version	R						
Protocol Revision	R						
Protocol Services Supported	R						
Protocol Object Types Supported	R						
Object List	R						
Max APDU Length Accepted	R						
Segmentation Supported	R						
APDU Timeout	R						
Number Of ADPU Retries	R						
Max Master	R						
Max Info Frames	R						
Device Address Binding	R						
Database Revision	R						

R = Read accessible only.

R<sup>1</sup> = Read accessible only but writable when the Out Of Service property is TRUE.

R/W = Read and write accessible.

## 8.4. Object list

The MelcoBEMS MINI (A1M+) has objects for certain ATA protocol data points, detailed in the following table.

### 8.4.1. BACnet Object list – Air-To-Air systems

Object type	Object ID	Object name	Notes
Binary Output	BO0	Drive OFF/ON Setup	0 = Drive OFF 1 = Drive ON
Binary Input	BI1	Drive OFF/ON State	0 = Drive OFF 1 = Drive ON
Analog Value	AV2	Setpoint	Value in either °C or °F, depending on the Temperature Units setting
Multi-state Output	MSO3	Mode Setup	1 = Heating 2 = Humidity reduction 3 = Cooling 4 = Ventilation, clean air operation 5 = Auto Operation
Multi-state Input	MSI4	Mode State	1 = Heating 2 = Humidity reduction 3 = Cooling 4 = Ventilation, clean air operation 5 = Auto Operation
Multi-state Output	MSO5	Fan Speed Setup	1 = Auto 2 = Quiet 3 = Weak 4 = Strong 5 = Very strong (SH i)
Multi-state Input	MSI6	Fan Speed State	1 = Auto 2 = Quiet 3 = Weak 4 = Strong 5 = Very strong (SH i)
Multi-state Output	MSO7	Air Direction Setup	1 = Auto 2 = Position 1 3 = Position 2 4 = Position 3 5 = Position 4 6 = Position 5 7 = Swing
Multi-state Input	MSI8	Air Direction State	1 = Auto 2 = Position 1 3 = Position 2 4 = Position 3 5 = Position 4 6 = Position 5 7 = Swing
Multi-state Output	MSO9	Temperature Units	1 = °C 2 = °F
Analog Input	AI10	Inlet Temperature	Value in either °C or °F, depending on the Temperature Units setting
Analog Input	AI11	Fault Code	4-digit fault code
Binary Output	BO12	External Temperature ON/OFF Setup	0 = Feature OFF 1 = Feature ON This feature is feedback the [AV13] value to AC unit which could replace the internal temperature value
Analog Value	AV13	External Temperature Input	Value in either °C or °F, depending on the Temperature Units setting

#### 8.4.2. BACnet Object list – Air-To-Water systems

Object type	Object ID	Object name	Notes
Binary Output	BO0	ATW Drive OFF/ON Setup	0 = System OFF 1 = System ON
Multi-state Output	MSO1	ATW Mode Setup	1 = Stop 2 = Hot Water 3 = Heating 4 = Cooling 5 = No voltage contact input (hot water storage) 6 = Freeze Stat 7 = Legionella 8 = Heating-Eco 9 = Mode 1 10 = Mode 2 11 = Mode 3 12 = No voltage contact input (heating up)
Binary Output	BO2	ATW DHW Mode Setup	0 = Normal 1 = Eco
Multi-state Output	MSO3	ATW Zone 1 Operation Mode AC	1 = Heating Room Temp 2 = Heating Flow Temp 3 = Heating Heat Curve 4 = Cooling Room Temperature (not on 13K model) 5 = Cooling Flow Temp 6 = Floor Dryup
Multi-state Output	MSO4	ATW Zone 2 Operation Mode AC	1 = Heating Room Temp 2 = Heating Flow Temp 3 = Heating Heat Curve 4 = Cooling Room Temperature (not on 13K model) 5 = Cooling Flow Temp 6 = Floor Dryup
Analog Value	AV5	ATW Tank Setpoint Int	Value in either °C or °F, depending on the Temperature Units setting
Analog Value	AV6	ATW Zone1 HC Target Temperature Int	Value in either °C or °F, depending on the Temperature Units setting
Analog Value	AV7	ATW Zone2 HC Target Temperature Int	Value in either °C or °F, depending on the Temperature Units setting
Analog Value	AV8	ATW MRC OperationProhibit	Bit packed value: Bit 0 - System On/Off (0 = ON, 1 = Prohibit) Bit 1 - Running Mode (0 = ON, 1 = Prohibit) Bit 2 - Setting Temperature (0 = ON, 1 = Prohibit) Bit 3 - Undefined (always 0) Bit 4 - Function Setting (0 = Normal, 1 = Function Setting) Bits 5, 6 and 7 - Undefined (always 0) (†† MRC Prohibit command must NOT be written to Shizuoka designed models)
Binary Output	BO9	ATW Forced DHW Setup	0 = Normal 1 = Force DHW
Binary Output	BO10	ATW Holiday Setup	0 = Normal 1 = Holiday
Binary Output	BO11	ATW DHW ON Prohibit Setup	0 = On 1 = Prohibit
Binary Output	BO12	ATW ZONE1 Heating ON Setup	0 = On 1 = Prohibit
Binary Output	BO13	ATW ZONE1 Cooling ON Setup	0 = On 1 = Prohibit
Binary Output	BO14	ATW ZONE2 Heating ON Setup	0 = On 1 = Prohibit
Binary Output	BO15	ATW ZONE2 Cooling ON Setup	0 = On 1 = Prohibit

Object type	Object ID	Object name	Notes
Binary Output	BO16	ATW Capacity Mode Setup	0 = COP priority 1 = Capacity priority
Analog Value	AV17	ATW Capacity Control Ratio	Value in %. 0 = 0% ... 100 = 100%
Binary Output	BO18	ATW Fan Mode Setup	0 = Ordinary 1 = Coercion
Analog Value	AV19	ATW Current Hour	0 ... 23
Analog Value	AV20	ATW Current Minute	0 ... 59
Analog Value	AV21	ATW Outdoor Air Temperature Int	Temperature Value in either °C or °F, depending on the Temperature Units setting multiplied by 10. 0xFE70 = -40°C ... 0x036B = 87.5°C
Analog Value	AV22	ATW Setting Water Temperature Int	Value in either °C or °F, depending on the Temperature Units setting
Analog Value	AV23	ATW Therm Target Temperature Int - Zone 1	Value in either °C or °F, depending on the Temperature Units setting
Analog Value	AV24	ATW Therm Target Temperature Int - Zone 2	Value in either °C or °F, depending on the Temperature Units setting
Multi-state Output	MSO25	ATW HC Control Type	1 = Heating 2 = Cooling
Analog Input	AI26	ATW Own Refrigerant Address	0 ... 32
Analog Input	AI27	ATW Defrost	0 = Normal 1 = Standby 2 = Defrost 3 = Waiting Restart
Analog Input	AI28	ATW Residual Heat Removal	0 = Normal 1 = Prepared 2 = Residual Heat Removal
Analog Input	AI29	ATW Refrigerant Error Info	0 = Normal 1 = Error (System) 2 = Error (Startup) 3 = Maintenance Error
Analog Input	AI30	ATW 7-Segment Display Error Code Digit 1	0 = A 1 = b 2 = E 3 = F 4 = J 5 = L 6 = P 7 = U
Analog Input	AI31	ATW 7-Segment Display Error Code Digit 2	1 - 15 = 1 - F 16 = O 17 = H 18 = J 19 = L 20 = P 21 = U
Analog Input	AI32	ATW Status Of Heating	FTC4 0 = No type 1 = Heating C1 2 = Heating C2 3 = Heating C3 FTC5/6/7 0 = No type 1 = Heating/Cooling A1, Heating/Cooling B1, Heating/Cooling C1 2 = Heating/Cooling A2, Heating/Cooling B2, Heating/Cooling C2 3 = Heating/Cooling A3, Heating/Cooling B3, Heating/Cooling C3
Analog Input	AI33	ATW HeatPumpFreq Master	Frequency value in Hz 0 = 0Hz ... 255 = 255Hz

Object type	Object ID	Object name	Notes
Analog Input	AI34	ATW HeatPumpFreq Slave1	Frequency value in Hz 0 = 0Hz ... 255 = 255Hz
Analog Input	AI35	ATW HeatPumpFreq Slave2	Frequency value in Hz 0 = 0Hz ... 255 = 255Hz
Analog Input	AI36	ATW HeatPumpFreq Slave3	Frequency value in Hz 0 = 0Hz ... 255 = 255Hz
Analog Input	AI37	ATW HeatPumpFreq Slave4	Frequency value in Hz 0 = 0Hz ... 255 = 255Hz
Analog Input	AI38	ATW HeatPumpFreq Slave5	Frequency value in Hz 0 = 0Hz ... 255 = 255Hz
Analog Input	AI39	ATW HeatPumpFreq Slave6	Frequency value in Hz 0 = 0Hz ... 255 = 255Hz
Analog Input	AI40	ATW Heat Source Status	0 = H/P 1 = IH 2 = BH 3 = IH + BH 4 = Boiler
Analog Input	AI41	ATW Zone1 Temperature Setpoint Int	Value in either °C or °F, depending on the Temperature Units setting
Analog Input	AI42	ATW Zone2 Temperature Setpoint Int	Value in either °C or °F, depending on the Temperature Units setting
Analog Input	AI43	ATW Zone1 Flow Temperature Setpoint Int	Value in either °C or °F, depending on the Temperature Units setting
Analog Input	AI44	ATW Zone2 Flow Temperature Setpoint Int	Value in either °C or °F, depending on the Temperature Units setting
Analog Input	AI45	ATW Legionella Temperature Setpoint Int	Value in either °C or °F, depending on the Temperature Units setting
Analog Input	AI46	ATW Dhw Temperature drop Int	Value in either °C or °F, depending on the Temperature Units setting
Analog Input	AI47	ATW Zone1 roomtemperature Int	Value in either °C or °F, depending on the Temperature Units setting
Analog Input	AI48	ATW Zone2 roomtemperature Int	Value in either °C or °F, depending on the Temperature Units setting
Analog Input	AI49	ATW Refrigerant Liquid Temperature Int	Value in either °C or °F, depending on the Temperature Units setting
Analog Input	AI50	ATW Ambient Temperature Int	Value in either °C or °F, depending on the Temperature Units setting
Analog Input	AI51	ATW Flow Temperature Int	Value in either °C or °F, depending on the Temperature Units setting
Analog Input	AI52	ATW Return Temperature Int	Value in either °C or °F, depending on the Temperature Units setting
Analog Input	AI53	ATW Water Temperature Int	Value in either °C or °F, depending on the Temperature Units setting
Analog Input	AI54	ATW Flow Temperature Zone1 Int	Value in either °C or °F, depending on the Temperature Units setting
Analog Input	AI55	ATW Return Temperature Zone1 Int	Value in either °C or °F, depending on the Temperature Units setting
Analog Input	AI56	ATW Flow Temperature Zone2 Int	Value in either °C or °F, depending on the Temperature Units setting
Analog Input	AI57	ATW Return Temperature Zone2 Int	Value in either °C or °F, depending on the Temperature Units setting
Analog Input	AI58	ATW Flow Temperature Boiler Int	Value in either °C or °F, depending on the Temperature Units setting
Analog Input	AI59	ATW Return Temperature Boiler Int	Value in either °C or °F, depending on the Temperature Units setting
Analog Input	AI60	ATW Roomthermo1 IN1	0 = OFF, 1 = ON
Analog Input	AI61	ATW Roomthermo2 IN6	0 = OFF, 1 = ON
Analog Input	AI62	ATW Flow SW1 IN2	0 = OFF, 1 = ON
Analog Input	AI63	ATW Flow SW2 IN3	0 = OFF, 1 = ON
Analog Input	AI64	ATW Flow SW3 IN7	0 = OFF, 1 = ON
Analog Input	AI65	ATW Demand IN4	0 = OFF, 1 = ON

Object type	Object ID	Object name	Notes
Analog Input	AI66	ATW Outdoorthermo IN5	0 = OFF, 1 = ON
Analog Input	AI67	ATW DipSwitch SW2	Bit 0 = Switch 2-1 (0 = OFF, 1 = ON) ... Bit 9 = Switch 2-10 (0 = OFF, 1 = ON)
Analog Input	AI68	ATW Heatpump Master ONOFF	0 = Stop, 1 = Run
Analog Input	AI69	ATW Heatpump Slave ONOFF 0	0 = Stop, 1 = Run
Analog Input	AI70	ATW Heatpump Slave ONOFF 1	0 = Stop, 1 = Run
Analog Input	AI71	ATW Heatpump Slave ONOFF 2	0 = Stop, 1 = Run
Analog Input	AI72	ATW Heatpump Slave ONOFF 3	0 = Stop, 1 = Run
Analog Input	AI73	ATW Heatpump Slave ONOFF 4	0 = Stop, 1 = Run
Analog Input	AI74	ATW Heatpump Slave ONOFF 5	0 = Stop, 1 = Run
Analog Input	AI75	ATW Heatpump Slave ONOFF 6	0 = Stop, 1 = Run
Analog Input	AI76	ATW Heatpump Slave ONOFF 7	0 = Stop, 1 = Run
Analog Input	AI77	ATW Heatpump Runtime Hours	Value in hours 0 = 0 Hours ... 99 = 99 Hours
Analog Input	AI78	ATW Heatpump Runtime Hours x100	Value in hours multiplied by 100 0 = 0 hours ... 65535 = 6553500 hours
Analog Input	AI79	ATW Heatpump Refaddr1 Runtime Hours x100	Value in hours multiplied by 100 0 = 0 hours ... 65535 = 6553500 hours
Analog Input	AI80	ATW Heatpump Refaddr2 Runtime Hours x100	Value in hours multiplied by 100 0 = 0 hours ... 65535 = 6553500 hours
Analog Input	AI81	ATW Heatpump Refaddr3 Runtime Hours x100	Value in hours multiplied by 100 0 = 0 hours ... 65535 = 6553500 hours
Analog Input	AI82	ATW Heatpump Refaddr4 Runtime Hours x100	Value in hours multiplied by 100 0 = 0 hours ... 65535 = 6553500 hours
Analog Input	AI83	ATW Heatpump Refaddr5 Runtime Hours x100	Value in hours multiplied by 100 0 = 0 hours ... 65535 = 6553500 hours
Analog Input	AI84	ATW Heatpump Refaddr6 Runtime Hours x100	Value in hours multiplied by 100 0 = 0 hours ... 65535 = 6553500 hours
Analog Input	AI85	ATW Boiler ONOFF	0 = Stop, 1 = Run
Analog Input	AI86	ATW Boosterheater1 ONOFF	0 = Stop, 1 = Run
Analog Input	AI87	ATW Boosterheater2 ONOFF	0 = Stop, 1 = Run
Analog Input	AI88	ATW Boosterheater2plus ONOFF	0 = Stop, 1 = Run
Analog Input	AI89	ATW Immersionheater ONOFF	0 = Stop, 1 = Run
Analog Input	AI90	ATW Waterpump1 ONOFF	0 = Stop, 1 = Run
Analog Input	AI91	ATW Waterpump2 ONOFF	0 = Stop, 1 = Run
Analog Input	AI92	ATW Waterpump3 ONOFF	0 = Stop, 1 = Run

Object type	Object ID	Object name	Notes
Analog Input	AI93	ATW 3wayvalve ONOFF	0 = Stop, 1 = Run
Analog Input	AI94	ATW 2wayvalve2 ONOFF	0 = Stop, 1 = Run
Analog Input	AI95	ATW Mixingvalvestep	0 = Step 0 ... 10 = Step 10
Analog Input	AI96	ATW Ref1 Errcode Upper Digit	7-Segment Display Error Code
Analog Input	AI97	ATW Ref1 Errcode Lower Digit	Digit (Upper)                      Digit (Lower)
Analog Input	AI98	ATW Ref2 Errcode Upper Digit	0 = A                                      1 - 15 = 1 - F
Analog Input	AI99	ATW Ref2 Errcode Lower Digit	1 = b                                      16 = O
Analog Input	AI100	ATW Ref3 Errcode Upper Digit	2 = E                                      17 = H
Analog Input	AI101	ATW Ref3 Errcode Lower Digit	3 = F                                      18 = J
Analog Input	AI102	ATW Ref4 Errcode Upper Digit	4 = J                                      19 = L
Analog Input	AI103	ATW Ref4 Errcode Lower Digit	5 = L                                      20 = P
Analog Input	AI104	ATW Ref5 Errcode Upper Digit	6 = P                                      21 = U
Analog Input	AI105	ATW Ref5 Errcode Lower Digit	7 = U
Analog Input	AI106	ATW Ref6 Errcode Upper Digit	
Analog Input	AI107	ATW Ref6 Errcode Lower Digit	
Analog Input	AI108	ATW Heatpump Freq 0	Frequency value in Hz 0 = 0Hz ... 255 = 255Hz
Analog Input	AI109	ATW Heatpump Freq 1	Frequency value in Hz 0 = 0Hz ... 255 = 255Hz
Analog Input	AI110	ATW Heatpump Freq 2	Frequency value in Hz 0 = 0Hz ... 255 = 255Hz
Analog Input	AI111	ATW Heatpump Freq 3	Frequency value in Hz 0 = 0Hz ... 255 = 255Hz
Analog Input	AI112	ATW Heatpump Freq 4	Frequency value in Hz 0 = 0Hz ... 255 = 255Hz
Analog Input	AI113	ATW Heatpump Freq 5	Frequency value in Hz 0 = 0Hz ... 255 = 255Hz
Analog Input	AI114	ATW Heatpump Freq 6	Frequency value in Hz 0 = 0Hz ... 255 = 255Hz
Analog Input	AI115	ATW Heatpump Freq 7	Frequency value in Hz 0 = 0Hz ... 255 = 255Hz
Analog Input	AI116	ATW Heatpump Freq 8	Frequency value in Hz 0 = 0Hz ... 255 = 255Hz
Analog Input	AI117	ATW Heatpump Operation 0	0 = Stop, 1 = Run
Analog Input	AI118	ATW Heatpump Operation 1	0 = Stop, 1 = Run
Analog Input	AI119	ATW Heatpump Operation 2	0 = Stop, 1 = Run
Analog Input	AI120	ATW Heatpump Operation 3	0 = Stop, 1 = Run
Analog Input	AI121	ATW Heatpump Operation 4	0 = Stop, 1 = Run
Analog Input	AI122	ATW Heatpump Operation 5	0 = Stop, 1 = Run
Analog Input	AI123	ATW Heatpump Operation 6	0 = Stop, 1 = Run
Analog Input	AI124	ATW Heatpump Operation 7	0 = Stop, 1 = Run
Analog Input	AI125	ATW Heatpump Operation 8	0 = Stop, 1 = Run
Analog Input	AI126	ATW Heatpump Operation 9	0 = Stop, 1 = Run
Analog Input	AI127	ATW Heatpump Operation 10	0 = Stop, 1 = Run
Analog Input	AI128	ATW Heatpump Operation 11	0 = Stop, 1 = Run
Analog Input	AI129	ATW Heatpump Operation 12	0 = Stop, 1 = Run
Analog Input	AI130	ATW Heatpump Operation 13	0 = Stop, 1 = Run
Analog Input	AI131	ATW Heatpump Operation 14	0 = Stop, 1 = Run
Analog Input	AI132	ATW Heatpump Operation 15	0 = Stop, 1 = Run
Analog Input	AI133	ATW Heatpump Operation 16	0 = Stop, 1 = Run
Analog Input	AI134	ATW Heatpump Operation 17	0 = Stop, 1 = Run
Analog Input	AI135	ATW Heatpump Operation 18	0 = Stop, 1 = Run

Object type	Object ID	Object name	Notes
Analog Input	AI136	ATW Heatpump Operation 19	0 = Stop, 1 = Run
Analog Input	AI137	ATW Heatpump Operation 20	0 = Stop, 1 = Run
Analog Input	AI138	ATW Heatpump Operation 21	0 = Stop, 1 = Run
Analog Input	AI139	ATW Heatpump Operation 22	0 = Stop, 1 = Run
Analog Input	AI140	ATW Externalheater Operation	0 = Stop, 1 = Run
Analog Input	AI141	ATW Waterpump Operation 0	0 = Stop, 1 = Run
Analog Input	AI142	ATW Waterpump Operation 1	0 = Stop, 1 = Run
Analog Input	AI143	ATW Waterpump Operation 2	0 = Stop, 1 = Run
Analog Input	AI144	ATW Waterpump Operation 3	0 = Stop, 1 = Run
Analog Input	AI145	ATW Waterpump Operation 4	0 = Stop, 1 = Run
Analog Input	AI146	ATW Waterpump Operation 5	0 = Stop, 1 = Run
Analog Input	AI147	ATW Waterpump Operation 6	0 = Stop, 1 = Run
Analog Input	AI148	ATW Waterpump Operation 7	0 = Stop, 1 = Run
Analog Input	AI149	ATW Waterpump Operation 8	0 = Stop, 1 = Run
Analog Input	AI150	ATW Waterpump Operation 9	0 = Stop, 1 = Run
Analog Input	AI151	ATW Waterpump Operation 10	0 = Stop, 1 = Run
Analog Input	AI152	ATW Waterpump Operation 11	0 = Stop, 1 = Run
Analog Input	AI153	ATW Waterpump Operation 12	0 = Stop, 1 = Run
Analog Input	AI154	ATW Drainpan Operation or Antifreeze piping heater operation ON/OFF	0 = Stop, 1 = Run
Analog Input	AI155	ATW Evaporating Temperature Int	Value in either °C or °F, depending on the Temperature Units setting
Analog Input	AI156	ATW Condensing Temperature Int	Value in either °C or °F, depending on the Temperature Units setting
Analog Input	AI157	ATW Electric Energy 1	Electric Energy
Analog Input	AI158	ATW Electric Energy 2	0x0000 = 0.00 kWh
Analog Input	AI159	ATW Electric Energy 3	0x0001 = 0.01 kWh
Analog Input	AI160	ATW Electric Energy 4	...
Analog Input	AI161	ATW Electric Energy 5	0xFFFFE = 655.34 kWh
Analog Input	AI162	ATW Electric Energy 6	0xFFFFF = 655.35 kWh
Analog Input	AI163	ATW Electric Energy 7	
Analog Input	AI164	ATW Electric Energy 8	
Analog Input	AI165	ATW Electric Energy 9	
Analog Input	AI166	ATW Electric Energy 10	
Analog Input	AI167	ATW Electric Energy 11	
Analog Input	AI168	ATW Electric Energy 12	
Analog Input	AI169	ATW Electric Energy 13	
Analog Input	AI170	ATW Electric Energy 14	
Analog Input	AI171	ATW Electric Energy 15	
Analog Input	AI172	ATW Electric Energy 16	
Analog Input	AI173	ATW Brine Inlet Temperature Int	Value in either °C or °F, depending on the Temperature Units setting
Analog Input	AI174	ATW Brine Outlet Temp1 Int	Value in either °C or °F, depending on the Temperature Units setting
Analog Input	AI175	ATW Brine Outlet Temp2 Int	Value in either °C or °F, depending on the Temperature Units setting
Analog Input	AI176	ATW Condensing Temp2 Int	Value in either °C or °F, depending on the Temperature Units setting
Analog Input	AI177	ATW Water Outlet Temp2 Int	Value in either °C or °F, depending on the Temperature Units setting
Analog Input	AI178	ATW Evaporating Temp2 Int	Value in either °C or °F, depending on the Temperature Units setting

Object type	Object ID	Object name	Notes
Analog Input	AI179	ATW PWM Duty Of Waterpump1	Duty value in % 0 = 0% ... 100 = 100%
Analog Input	AI180	ATW PWM Duty Feedback Waterpump1	Duty value in % 0 = 0% ... 100 = 100%
Analog Input	AI181	ATW 3way Valve 1	0 = OFF (stop) 1 = ON (run)
Analog Input	AI182	ATW Protocol Version Upper	Version of Protocol is a value in BCD e.g. V3.01 = 3 (upper) and 1 (lower)
Analog Input	AI183	ATW Protocol Version Lower	Version of Protocol is a value in BCD e.g. V3.01 = 3 (upper) and 1 (lower)
Analog Input	AI184	ATW Model Version Upper	Version of Model is a value in BCD e.g. V2.00 = 2 (upper) and 0 (lower)
Analog Input	AI185	ATW Model Version Lower	Version of Model is a value in BCD e.g. V2.00 = 2 (upper) and 0 (lower)
Analog Input	AI186	ATW Capacity Of Supply Electricity	Value in Watts 0 = 0.0 W ... 255 = 25.5 W
Analog Input	AI187	ATW Model Profile 1	0 = FTC2B 1 = FTC4 2 = FTC5 3 = FTC6 128 = CAHV1A 129 = CAHV1B 130 = CRHV1A 131 = CRHV1B 132 = EAHV1A 133 = EAHV1B 134 = QAHV1A 135 = QAHV1B 144 = PWFY1
Analog Input	AI188	ATW Model Profile 2	0 = Address 0 ... 255 = Address 255 (addresses 7 - 255 not used for FTC)
Analog Input	AI189	ATW EnergyConsumptionYear	Date of last energy consumption measurement – Year
Analog Input	AI190	ATW EnergyConsumptionMonth	Date of last energy consumption measurement – Month
Analog Input	AI191	ATW EnergyConsumptionDay	Date of last energy consumption measurement – Day
Analog Input	AI192	ATW EnergyConsumptionHeatingKwh	Last measured heating energy consumption - kWh part of the value. 0 = 0kWh ... 65535 = 65535kWh
Analog Input	AI193	ATW EnergyConsumptionHeatingWh	Last measured heating energy consumption - Wh part of the value multiplied by 10. 0 = 0Wh ... 99 = 990Wh
Analog Input	AI194	ATW EnergyConsumptionCoolingKwh	Last measured cooling energy consumption - kWh part of the value. 0 = 0kWh ... 65535 = 65535kWh
Analog Input	AI195	ATW EnergyConsumptionCoolingWh	Last measured cooling energy consumption - Wh part of the value multiplied by 10. 0 = 0Wh ... 99 = 990Wh
Analog Input	AI196	ATW EnergyConsumptionDHWKwh	Last measured DHW energy consumption - kWh part of the value. 0 = 0kWh ... 65535 = 65535kWh
Analog Input	AI197	ATW EnergyConsumptionDHWWh	Last measured DHW energy consumption - Wh part of the value multiplied by 10. 0 = 0Wh ... 99 = 990Wh
Analog Input	AI198	ATW EnergyConsumptionTotalKwh	Last measured DHW energy consumption - Wh part of the value multiplied by 10. 0 = 0Wh ... 99 = 990Wh

Object type	Object ID	Object name	Notes
Analog Input	AI199	ATW EnergyProducedYear	Date of last energy produced measurement – Year
Analog Input	AI200	ATW EnergyProducedMonth	Date of last energy produced measurement – Month
Analog Input	AI201	ATW EnergyProducedDay	Date of last energy produced measurement – Day
Analog Input	AI202	ATW EnergyProducedHeatingKwh	Last measured heating energy produced - kWh part of the value. 0 = 0kWh ... 65535 = 65535kWh
Analog Input	AI203	ATW EnergyProducedHeatingWh	Last measured heating energy produced - Wh part of the value multiplied by 10. 0 = 0Wh ... 99 = 990Wh
Analog Input	AI204	ATW EnergyProducedCoolingKwh	Last measured cooling energy produced - kWh part of the value. 0 = 0kWh ... 65535 = 65535kWh
Analog Input	AI205	ATW EnergyProducedCoolingWh	Last measured cooling energy produced - Wh part of the value multiplied by 10. 0 = 0Wh ... 99 = 990Wh
Analog Input	AI206	ATW EnergyProducedDHWKwh	Last measured DHW energy produced - kWh part of the value. 0 = 0kWh ... 65535 = 65535kWh
Analog Input	AI207	ATW EnergyProducedDHWWh	Last measured DHW energy produced - Wh part of the value multiplied by 10. 0 = 0Wh ... 99 = 990Wh
Analog Input	AI208	ATW EnergyProducedTotalKwh	Last measured total energy produced in Kwh. 0 = 0kWh ... 65535 = 65535kWh
Analog Input	AI209	ATW FlowRate 1	Litres per minute 0 = 0 l/min ... 255 = 255 l/min
Analog Input	AI210	ATW Date Year	Date(year): 0 = 2000 ... 99 = 2099
Analog Input	AI211	ATW Date Month	Date(month): 1 = January ... 12 = December
Analog Input	AI212	ATW Date Day	Date(day): 1 ... 31
Analog Input	AI213	ATW Time Hour	Time(hour): 0 ... 255
Analog Input	AI214	ATW Time Min	Time(minute): 0 ... 59
Analog Input	AI215	ATW Time Sec	Time(sec): 0 ... 59
Analog Input	AI216	ATW Version Main SW	Version of Software: e.g. version 01.23 is entered as 0123
Analog Input	AI217	ATW Version Subcode	Sub-code Version of Software: e.g. "r01" = 0001, "t02" = 0102, "c03" = 0203
Analog Input	AI218	ATW Demand Leg Prevention	Demand of Legionella Prevention; 0 = Normal, 1 = Legionella Prevention
Analog Input	AI219	ATW Type Emergency Op	Type of Emergency Prevention: 0 = Normal, 1 = Standby, 2 = Backup
Analog Input	AI220	ATW Zone1 Sensor Setting	Zone 1 sensor setting: 0 = Main RC, 1-8 = RoomRC1-8, 15 = TH1
Analog Input	AI221	ATW Zone2 Sensor Setting	Zone 2 sensor setting: 0 = Main RC, 1-8 = RoomRC1-8, 15 = TH1
Analog Input	AI222	ATW Freeze Stat Func Outdoor Unit	Freeze stat function for outdoor unit: 0 = Normal, 1 = Freeze stat
Analog Input	AI223	ATW Boiler Protection	Boiler Protection: 0 = Normal, 1 = Prepared, 2 = Protected
Analog Input	AI224	ATW Auto Restart PWR Failure	Auto restart at power failure: 0 = Normal, 1 = Standby, 2 = IT initial setting standby
Analog Input	AI225	ATW Demand of Heater	Demand of heater operation: 0 = No demand, 1 = Run, 2 = Prohibit
Analog Input	AI226	ATW Type Heating Cooling	Type Heating / Cooling: 0 = Type A, 1 = Type B, 2 = Type C

Object type	Object ID	Object name	Notes
Analog Input	AI227	ATW Zone1 HP Thermo Diff Adj Control	Zone1 H/P thermos diff. adjustment control: 0 = Normal, 1 = discriminating, 2 = adjustment <sup>α</sup> 3 = β, 4 = γ
Analog Input	AI228	ATW Zone2 HP Thermo Diff Adj Control	Zone2 H/P thermos diff. adjustment control: 0 = Normal, 1 = discriminating, 2 = adjustment <sup>α</sup> 3 = β, 4 = γ
Analog Input	AI229	ATW Slave Unit Connecting	Slave Unit Connection Status: Bit 0 = address 1..... Bit 5 = address 5 Value: 0 = unconnected, 1 = connected
Analog Input	AI230	ATW Slave Unit Operating Status	Slave Unit Operation Status: Bit 0 = address 1..... Bit 5 = address 5 Value: 0 = Stop, 1 = Running
Analog Input	AI231	ATW HPFREQ4 Status	Status of H/P frequency 4: 0 = 0 Hz ... 255 = 255 Hz
Analog Input	AI232	ATW Heatsource Phase DHW	Heat Source Phase of DHW: 0 = Normal, 1 = H/P Phase, 2 = Heater Phase
Analog Input	AI233	ATW Heatsource Type	Type of Heat Source: 0 = Fixed, 1 = Auto
Analog Input	AI234	ATW Heatsource Judgement condition	1 = Boiler - Emergency operation 2 = Heater - Emergency operation 3 = Boiler - External input (IN5) 4 = Boiler - Heat source setting [Boiler] 5 = Heater - Heat source setting [Heater] 6 = Standard - Heatsource setting [Standard] 7 = Heater - External input (IN5) 8 = Heater - Backup operation 9 = Heater - Demand from outdoor unit 10 = Boiler - External input (IN4) 11 = Boiler - Backup operation 12 = Boiler - Heat source setting [Hybrid] 13 = Heater - Low outdoor temp. operation 14 = Standard - Pumpdown operation 15 = Standard - Floor dry up operation 16 = Boiler - Indoor unit only operation 17 = Heater - Indoor unit only operation
Analog Input	AI235	ATW Boiler Operation Hybrid Settings	Boiler operation hybrid settings - Priority mode 0 = Ambient, 1 = Cost, 2 = CO2
Analog Input	AI236	ATW CP Boiler	CP boiler: 00h 00h 00h = 0.000 */kW 00h 00h 01h = 0.001 */kW ... FFh FFh FFh = 16777.215 */kW * unit of user's currency
Analog Input	AI237	ATW CO2 Boiler	CO2 boiler: 00h 00h 00h = 0.000 kg-CO2 00h 00h 01h = 0.001 kg-CO2 ... FFh FFh FFh = 16777.215 kg-CO2
Analog Input	AI238	ATW Energyprice Electricity	Energy Price Electricity: 00h 00h 00h = 0.000 */kW 00h 00h 01h = 0.001 */kW ... FFh FFh FFh = 16777.215 */kW * unit of user's currency
Analog Input	AI239	ATW OC Connection Error	OC Connection Error:
Analog Input	AI240	ATW RC Connection Error	RC Connection Error:
Analog Input	AI241	ATW Consumed Electric Power	Consumed electric power/energy: 0 = 0 kW or Wh ..... 65535 = 65535 kW or Wh

Object type	Object ID	Object name	Notes
Analog Input	AI242	ATW Produced Power	Produced heat power/energy: 0 = 0 kW or Wh ..... 65535 = 65535 kW or Wh
Analog Input	AI243	ATW Calc Func Consumed Electrical Energy	Calculation function of consumed electrical energy: 0 = no function, 1 = with function
Analog Input	AI244	ATW Calcfunc Produced Energy	Calculation function of produced energy: 0 = no function, 1 = with function
Analog Input	AI245	ATW Heatingfunction OnOff	Heating Function: 0 = OFF (inactive), 1 = ON (active)
Analog Input	AI246	ATW Ext Outdoor AmbTemp	Extended Outdoor Ambient Temperature: 0 = OFF, 1 = ON
Analog Input	AI247	ATW Mixtank Water Tempint	Value in either °C or °F, depending on the Temperature Units setting
Analog Input	AI248	ATW Condensing Tempint	Value in either °C or °F, depending on the Temperature Units setting
Analog Input	AI249	ATW Dipswitch SW1	DipSW setting (SW1) lower byte: bit 0 = SW1-1..... bit 7 = SW1-8 upper byte: bit 0 = SW1-9 ... bit 1 = SW1-10
Analog Input	AI250	ATW Dipswitch SW3	DipSW setting (SW3) lower byte: bit 0 = SW3-1..... bit 7 = SW3-8 upper byte: bit 0 = SW3-9 ... bit 1 = SW3-10
Analog Input	AI251	ATW Dipswitch SW4	DipSW setting (SW4) lower byte: bit 0 = SW4-1..... bit 5 = SW4-6
Analog Input	AI252	ATW Dipswitch SW5	DipSW setting (SW5) lower byte: bit 0 = SW5-1..... bit 7 = SW5-8
Analog Input	AI253	ATW Dipswitch SW6	DipSW setting (SW6) lower byte: bit 0 = SW6-1..... bit 4 = SW6-5
Analog Input	AI254	ATW Flow Rate 2	Flow rate 2: 0 = 0.0 L/min, 1 = 1.0 L/min ..... 255 = 255 L/min
Analog Input	AI255	ATW Waterpump4 OnOff	Water Pump 4 On/Off: 0 = Stop, 1 = Run
Analog Input	AI256	ATW 2WayValve 2a OnOff	2-way Valve 2a On/Off: 0 = Stop, 1 = Run
Analog Input	AI257	ATW 2WayValve 2b OnOff	2-way Valve 2b On/Off: 0 = Stop, 1 = Run
Multi-state Output	MSO258	Temperature Units	1 = °C 2 = °F

### 8.4.3. BACnet Object list – Lossnay systems

Object type	Object ID	Object name	Notes
Binary Output	BO0	Lossnay Drive OFF/ON Setup	0 = Power OFF 1 = Power ON
Multi-state Output	MSO1	Lossnay Mode Setup	1 = Heat 2 = Cool 3 = Fan 4 = Auto
Multi-state Output	MSO2	Lossnay Vent Mode Setup	1 = Lossnay mode 2 = Bypass mode 3 = Auto mode
Multi-state Output	MSO3	Lossnay Fan Speed A Setup	1 = Auto 2 = Speed 1 3 = Speed 2 4 = Speed 3 5 = Speed 4
Analog Value	AV4	Lossnay Temperature Setpoint A	Value in either °C or °F, depending on the Temperature Units setting
Analog Input	AI5	Lossnay Supply Air Temperature A	Value in either °C or °F, depending on the Temperature Units setting
Analog Input	AI6	Lossnay Outdoor Temperature Int	Value in either °C or °F, depending on the Temperature Units setting
Analog Input	AI7	Lossnay Room Temperature A	Value in either °C or °F, depending on the Temperature Units setting
Analog Input	AI8	Lossnay Room Co2 Level	CO2 level divided by 10. 0 = 0ppm ... 240 = 2400 and above. [Value 254 = Under detecting] [Value 255 = No sensor] Note: Only available when 'CO2 Level Sensor' value = 1 (Equipped).
Analog Input	AI9	Lossnay Thermo Onoff	0 = Thermo OFF 1 = Thermo ON
Analog Input	AI10	Lossnay Energy Consumption	"Value in kWh multiplied by 10. 0 = 0kWh ... 65535 = 6553.5kWh"
Analog Input	AI11	Lossnay Actual Operation Mode	1 = Not auto mode 2 = Determining 3 = Heating 4 = Cooling
Analog Input	AI12	Lossnay Auto Fan Speed Control Availability	0 = Not available 1 = Available
Analog Input	AI13	Lossnay Night Purge	0 = Normal operation 1 = In night purge operation
Analog Input	AI14	Lossnay Maintenance Sign	0 = Inactive 1 = Active
Analog Input	AI15	Lossnay Filter Sign	0 = Inactive 1 = Active
Analog Input	AI16	Lossnay Actual Ventilation Mode	0 = Lossnay ventilation 1 = Bypass ventilation
Analog Input	AI17	Lossnay Actual Supply Fan Speed	1 = Stop 2 = Speed 1 3 = Speed 2 4 = Speed 3 5 = Speed 4
Analog Input	AI18	Lossnay Actual Extract Fan Speed	1 = Stop 2 = Speed 1 3 = Speed 2 4 = Speed 3 5 = Speed 4
Analog Input	AI19	Lossnay Setpoint 0.5°C Increments Availability	0 = Not available 1 = Available

Object type	Object ID	Object name	Notes
Analog Input	AI20	Lossnay Heat/Cool or Cool-Only	0 = Heat and Cool 1 = Cool only
Analog Input	AI21	Lossnay Auto Operation Mode Availability	0 = Not available 1 = Available
Analog Input	AI22	Lossnay Heat/Cool or Heat-Only	0 = Heat and Cool 1 = Heat only
Analog Input	AI23	Lossnay Minimum Cooling Setpoint	Value in either °C or °F, depending on the Temperature Units setting
Analog Input	AI24	Lossnay Maximum Cooling Setpoint	Value in either °C or °F, depending on the Temperature Units setting
Analog Input	AI25	Lossnay Minimum Heating Setpoint	Value in either °C or °F, depending on the Temperature Units setting
Analog Input	AI26	Lossnay Maximum Heating Setpoint	Value in either °C or °F, depending on the Temperature Units setting
Analog Input	AI27	Lossnay Minimum Auto Setpoint	Value in either °C or °F, depending on the Temperature Units setting
Analog Input	AI28	Lossnay Maximum Auto Setpoint	Value in either °C or °F, depending on the Temperature Units setting
Analog Input	AI29	Lossnay Energy Consumption Data Available	0 = Not available 1 = Available
Analog Input	AI30	Lossnay Number Of Fan Speeds	Values 1 – 4 valid
Analog Input	AI31	Lossnay Bypass Damper Function	0 = Not available 1 = Available
Analog Input	AI32	Lossnay Auto Ventilation Mode Available	0 = Not available 1 = Available
Analog Input	AI33	Lossnay Operation Mode off Temperature Control Unit	0 = Not available (not connected) 1 = Available (connected)
Analog Input	AI34	Lossnay Set Temperature on Temperature Control Unit	0 = No set temperature display 1 = RA (Return Air) temperature 2 = SA (Supply Air) temperature
Analog Input	AI35	Lossnay Outdoor Temperature Sensor	0 = Not equipped 1 = Equipped
Analog Input	AI36	Lossnay Return Air Temperature Sensor	0 = Not equipped 1 = Equipped
Analog Input	AI37	Lossnay Supply Air Temperature Sensor	0 = Not equipped 1 = Equipped
Analog Input	AI38	Lossnay CO2 Sensor	0 = Not equipped 1 = Equipped
Multi-state Output	MSO39	Temperature Units	1 = °C 2 = °F

## 9. Modbus connection

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### 9.1. Modbus background

Modbus is a master-slave protocol, which means there are two types of Modbus device, Modbus *Masters* and Modbus *Slaves*.

Slave devices simply wait until they receive a command from a Master, act upon that command and send a reply to the Master. Slaves do not have the ability to send commands to other devices on the bus. Master devices are responsible for sending commands to slave devices and receiving data. Modbus only permits there to be one Master device on the bus at any one time, but up to 247 slaves can be connected at a time.

Modbus is most commonly used over RS-485, which is a hardware standard allowing multiple devices to be connected on the same bus.

Each Slave device must have a unique ID on the bus, which is referred to as a *Slave ID*. Each Modbus command the Master sends will contain this Slave ID and only the Slave with that Slave ID will reply.

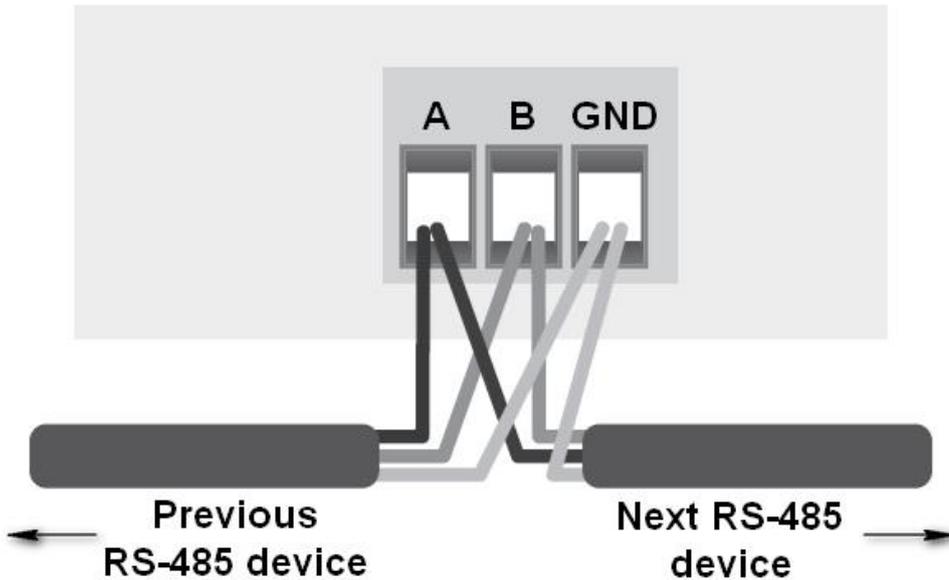
### 9.2. Modbus registers

Modbus Slave devices store data in registers. There are four register types and each type has its own register bank. The register types are summarised below:

Register Name	Register Type	Description
Discrete Input	Digital Input	Read only register used for holding status information which holds a value of 0 or 1.
Coil	Digital Output	Read and write accessible register which holds a value of 0 or 1.
Input Register	Analogue Input	Read only register used for status information which holds a 16-bit value (0-65535)
Holding Register	Analogue Output	Read and write accessible register used for status information which holds a 16-bit value (0-65535)

### 9.3. Modbus RS485 connections

For communication over RS-485 all 3 connections are needed. These are labeled A, B and GND. Please refer to the connection diagrams below.



**⚠ Caution:**

The RS-485 cable must be a shielded data cable. Mains flex or other unshielded cable should not be used. The cable shield should be connected to GND at one end only.

**⚠ Caution:**

RS-485 has polarised data connections. It is crucial that all 'A's are connected together, all 'B's are connected together and all 'GND's are connected together.

**⚠ Caution:**

The RS-485 cable must be daisy-chained in a bus network. T-junctions (e.g. star network wiring) are not permitted.

**⚠ Caution:**

RS-485 biasing jumpers must be fitted on the Procon MelcoRETAIL/MelcoREMOTE (if used).

### 9.4. Modbus TCP connections

For communication over Ethernet, RJ45 port must be connected to the network.

Modbus TCP setting for Modbus TCP client	
IP	The IP address of A1M+. For example, the default IP address is 192.168.92.114
TCP Port	502

## 10. Modbus tables – Air-To-Air systems

Some BMS controllers can only read Modbus Holding Registers, so the MelcoBEMS MINI (A1M+) also exposes all Discrete, Coil and Input Registers as Holding Registers. The Discrete Input registers and Input registers are not writable so their equivalent Holding Register is read only and marked [READ ONLY].

Some BMS controllers may not be able to read signed register values (i.e. values which can be negative in value), so the MelcoBEMS MINI (A1M+) also exposes an unsigned version of those registers (these registers will not return a negative value).

### 10.1. Holding registers

Holding Registers are read using function code 03 and written to using either function code 06 or 16. Function code 06 is used when writing to a single holding register, function code 16 is used for writing to multiple holding registers in the same command.

Holding Registers (Analogue Outputs)			
Register Name	Address	Modicon Address	Details
Drive Mode	0	40001	1 = Heating 2 = Humidity reduction 3 = Cooling 7 = Ventilation, clean air operation 8 = Auto Operation 9 = i-see heating operation* 10 = i-see humidity reduction* 11 = i-see cooling *  * indicates a read only value, writing this value will have no effect
Temperature Setpoint	1	40002	Temperature value in °C multiplied by 10. e.g. value 200 = 20°C
Fan Speed	2	40003	0 = Auto 2 = Quiet 3 = Weak 5 = Strong 6 = Very strong (SH i)
Air Direction	3	40004	0 = Auto 1 = Position 1 2 = Position 2 3 = Position 3 4 = Position 4 5 = Position 5 7 = Swing
Modbus Slave ID	4	40005	Values 1 – 247 valid
BACnet Station ID			Values 1 -127 valid

Holding Registers (Analogue Outputs)			
Register Name	Address	Modicon Address	Details
Modbus RS-485 Baud Rate	5	40006	0 = 9600 1 = 1200 2 = 2400 3 = 4800 4 = 9600 5 = 14400 6 = 19200 7 = 28800 8 = 38400 9 = 56000 10 = 57600 11 = 76800 12 = 115200
BACnet RS-485 Baud Rate			0 = 9600 4 = 9600 6 = 19200 8 = 38400 11 = 76800
RS-485 Parity Type	6	40007	0 = None 1 = Even 2 = Odd
Drive On/Off	7	40008	0 = Drive OFF 1 = Drive ON
Room Temperature [READ ONLY]	8	40009	Temperature value in °C multiplied by 10. e.g. value 200 = 20°C
Fault Code (hex) [READ ONLY]	9	40010	0x8000 = No error 0x6999 = Bad communication with indoor unit (Refer to indoor unit documentation for description of other fault code values)
MelcoBEMS MINI (A1M+) Firmware Version [READ ONLY]	10	40011	MelcoBEMS MINI (A1M+) firmware version
Modbus Comms Counter [READ ONLY]	11	40012	Value of a counter which increments upon every valid Modbus command received. Value is automatically reset to zero when value exceeds 65535.
Fault Code (decimal) [READ ONLY]	12	40013	8000 = No error 6999 = Bad communication with indoor unit (Refer to indoor unit documentation for description of other fault code values)
System Type Detected [READ ONLY]	13	40014	0 = ATA 1 = ATW 2 = Lossnay 255 = Undetermined (no unit detected yet)
Deadband Enabled State [READ ONLY]	14	40015	0 = Deadband disabled (DIP switch 8 OFF) 1 = Deadband enabled (DIP switch 8 ON)
BMS Room Temperature (signed)	15	40016	Signed temperature value in °C multiplied by 10. 0xFF9C = -10°C ... 0x01F4 = 50°C
BMS Room Temperature	16	40017	Temperature value in °C multiplied by 10. 0 = 0°C ... 500 = 50°C
BMS Virtual Setpoint	17	40018	Temperature value in °C multiplied by 10. 100 = 10°C ... 400 = 40°C
Deadband Heating Setpoint	18	40019	Temperature in °C (default 19°C). Value must be at least 2°C lower than the Deadband Cooling Setpoint.

<b>Holding Registers (Analogue Outputs)</b>			
Register Name	Address	Modicon Address	Details
Deadband Cooling Setpoint	19	40020	Temperature in °C (default 23°C). Value must be at least 2°C higher than the Deadband Heating Setpoint.
BACnet Device Instance (most significant 16 bits)	272	40273	Most significant 16 bits of the 32-bit Device Instance
BACnet Device Instance (least significant 16 bits)	273	40274	Least significant 16 bits of the 32-bit Device Instance
BACnet Max Master	274	40275	Maximum number of masters to search for
BACnet Max Info Frames	275	40276	
BACnet APDU Timeout	276	40277	Timeout value in ms for client requests
BACnet APDU Retries	277	40278	Number of times to retry after timeout

## 10.2. Input registers

Input Registers are read using function code 04.

Note the values of all Input registers have corresponding Holding registers which can be used instead.

Input Registers (Analogue Inputs)			
Register Name	Address	Modicon Address	Details
Room Temperature	0	30001	Temperature value in °C multiplied by 10. e.g. value 200 = 20°C
Fault Code (hex)	1	30002	0x8000 = No error 0x6999 = Bad communication with indoor unit (Refer to indoor unit documentation for description of other fault code values)
MelcoBEMS MINI (A1M+) Firmware Version	3	30004	MelcoBEMS MINI (A1M+) firmware version
Modbus Comms Counter	5	30006	Value of a counter which increments upon every valid Modbus command received. Counter is reset to zero when value exceeds 65535.
Fault Code (decimal)	8	30009	8000 = No error 6999 = Bad communication with indoor unit (Refer to indoor unit documentation for description of other fault code values)
System Type Detected	9	30010	0 = ATA 1 = ATW 2 = Lossnay 255 = Undetermined (no unit detected yet)
Deadband Enabled State	10	30011	0 = Deadband disabled (DIP switch 8 OFF) 1 = Deadband enabled (DIP switch 8 ON)

## 10.3. Discrete Inputs

There are no Discrete Inputs for Air-To-Air systems.

## 10.4. Coils

Coils are read using function code 01 and written to using either function code 05 or 15. Function code 05 is used when writing to a single coil register, function code 15 is used for writing to multiple coil registers in the same command. Note the values of all Coil registers have corresponding Holding registers which can be used instead.

Coils (Digital Outputs)			
Register Name	Address	Modicon Address	Details
Drive On/Off <i>(Note: Holding register address 7 can also be used to change the Drive)</i>	0	00001	0 = Drive OFF 1 = Drive ON

## 11. Modbus tables – Air-To-Water systems

Some BMS controllers can only read Modbus Holding Registers, so the MelcoBEMS MINI (A1M) also exposes all Discrete, Coil and Input Registers as Holding Registers. The Discrete Input registers and Input registers are not writable so their equivalent Holding Register is read only and marked [READ ONLY].

Some BMS controllers may not be able to read signed register values (i.e. values that can be negative in value), so the A1M also exposes an unsigned version of those registers (these registers will not return a negative value).

### 11.1. Holding registers

Holding Registers are read using function code 03 and written to using either function code 06 or 16. Function code 06 is used when writing to a single holding register, function code 16 is used for writing to multiple holding registers in the same command.

Holding Register (Analogue Output)				Applicable Unit Type										
Register Name	Addr	Modicon Address	Details	FTC4	FTC5	FTC6	CAHV master	CAHV slave	CRHV master	CRHV slave	QAHV master	EAHV/EACV master	EAHV/EACV slave	
Modbus Slave ID	4	40005	Values 1 – 247 valid	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Modbus RS-485 Baud Rate	5	40006	0 = 9600 1 = 1200 2 = 2400 3 = 4800 4 = 9600 5 = 14400 6 = 19200 7 = 28800 8 = 38400 9 = 56000 10 = 57600 11 = 115200	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
RS-485 Parity Type	6	40007	0 = None 1 = Even 2 = Odd	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	

Holding Register (Analogue Output)				Applicable Unit Type										
Register Name	Addr	Modicon Address	Details	FTC4	FTC5	FTC6	CAHV master	CAHV slave	CRHV master	CRHV slave	QAHV master	EAHV / EACV master	EAHV / EACV slave	
Fault/Error Code (hex) [READ ONLY]	9	40010	0x8000 = No error 0x6999 = Bad communication with unit (Refer to indoor unit documentation for description of other fault code values)	✓	✓	✓	✓		✓		✓	✓		
MelcoBEMS MINI (A1M) Firmware Version [READ ONLY]	10	40011	MelcoBEMS MINI (A1M) Firmware Version	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Modbus Comms Counter [READ ONLY]	11	40012	Value of a counter which increments upon every valid Modbus command received. Counter is reset to zero when value exceeds 65535.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Fault Code (decimal) [READ ONLY]	12	40013	8000 = No error 6999 = Bad communication between A1M and unit (Refer to unit documentation for description of other fault code values)	✓	✓	✓	✓		✓		✓	✓		
System Type Detected [READ ONLY]	13	40014	0 = ATA unit connected 1 = ATW system connected 2 = Lossnay system connected 255 = Undetermined (no unit detected yet)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
System On/Off	25	40026	0 = System OFF 1 = System ON 2 = Emergency Run (read only value) 3 = Test Run (read only value)	✓	✓	✓	✓ #14	(✓) #18	✓ #14	(✓) #18	✓	✓ #14	(✓) #18	
Operating Mode	26	40027	0 = Stop 1 = Hot Water 2 = Heating 3 = Cooling 4 = No voltage contact input (hot water storage) 5 = Freeze Stat 6 = Legionella 7 = Heating-Eco 8 = Mode 1 9 = Mode 2 10 = Mode 3 11 = No voltage contact input (heating up)				✓#4	(✓) #18	✓#5	(✓) #18	✓	✓ #13	(✓) #18	
Operating Mode (DHW)	27	40028	0 = Normal 1 = Eco		✓	✓								

Holding Register (Analogue Output)				Applicable Unit Type										
Register Name	Addr	Modicon Address	Details	FTC4	FTC5	FTC6	CAHV master	CAHV slave	CRHV master	CRHV slave	QAHV master	EAHV / EACV master	EAHV / EACV slave	
A/C Mode – Zone 1	28	40029	0 = Heating Room Temp 1 = Heating Flow Temp 2 = Heating Heat Curve 3 = Cooling Room Temp (not on 13K model) 4 = Cooling Flow Temp 5 = Floor Dryup	✓	✓	✓								
A/C Mode – Zone 2	29	40030	0 = Heating Room Temp 1 = Heating Flow Temp 2 = Heating Heat Curve 3 = Cooling Room Temp (not on 13K model) 4 = Cooling Flow Temp 5 = Floor Dryup	✓	✓	✓								
Set Tank Water Temperature (signed)	30	40031	Temperature value in °C multiplied by 100. (see note *)	✓#6	✓	✓								
Thermo-off Temperature (signed)			Temperature value in °C multiplied by 100. (see note *)							✓				
Set Tank Water Temperature	31	40032	Temperature value in °C multiplied by 100. (see note **)	✓#6	✓	✓								
Thermo-off Temperature			Temperature value in °C multiplied by 100. (see note **)							✓				
H/C Thermostat Target Temperature – Zone 1 (signed)	32	40033	Temperature value in °C multiplied by 100. (see note *)	✓	✓	✓								
H/C Thermostat Target Temperature – Zone 1	33	40034	Temperature value in °C multiplied by 100. (see note **)	✓	✓	✓								
H/C Thermostat Target Temperature – Zone 2 (signed)	34	40035	Temperature value in °C multiplied by 100. (see note *)	✓	✓	✓								
H/C Thermostat Target Temperature – Zone 2	35	40036	Temperature value in °C multiplied by 100. (see note **)	✓	✓	✓								

Holding Register (Analogue Output)				Applicable Unit Type										
Register Name	Addr	Modicon Address	Details	FTC4	FTC5	FTC6	CAHV master	CAHV slave	CRHV master	CRHV slave	QAHV master	EAHV / EACV master	EAHV / EACV slave	
MRC Prohibit	36	40037	Bit packed value: Bit 0 – System On/Off (0 = ON, 1 = Prohibit) Bit 1 – Running Mode (0 = ON, 1 = Prohibit) Bit 2 – Setting Temp (0 = ON, 1 = Prohibit) Bit 3 – Undefined (always 0) Bit 4 – Function Setting (0 = Normal, 1 = Function Setting) Bits 5, 6 and 7 – Undefined (always 0)  (Before using this register see note <sup>††</sup> )	✓	✓	✓	✓#7		✓#7		✓	✓#7		
Force DHW	37	40038	0 = Normal 1 = Force DHW	✓	✓	✓								
Holiday	38	40039	0 = Normal 1 = Holiday	✓	✓	✓								
DHW On Prohibit [READ ONLY]	39	40040	0 = On 1 = Prohibit	✓	✓	✓								
Heating On Prohibit – Zone 1 [READ ONLY]	40	40041	0 = On 1 = Prohibit	✓	✓	✓								
Cooling On Prohibit – Zone 1	41	40042	0 = On 1 = Prohibit	✓#6	✓	✓								
Heating On Prohibit – Zone 2 [READ ONLY]	42	40043	0 = On 1 = Prohibit	✓	✓	✓								
Cooling On Prohibit – Zone 2	43	40044	0 = On 1 = Prohibit		✓	✓								
Unused	44	40045	Value 0 always returned											
Capacity Mode	45	40046	0 = COP priority 1 = Capacity priority				✓		✓#8		✓	✓		
Capacity Control Ratio	46	40047	Value in %. 0 = 0% ... 100 = 100%				✓		✓		✓	✓		
Fan Mode	47	40048	0 = Ordinary 1 = Coercion						✓		✓	✓		

Holding Register (Analogue Output)				Applicable Unit Type										
Register Name	Addr	Modicon Address	Details	FTC4	FTC5	FTC6	CAHV master	CAHV slave	CRHV master	CRHV slave	QAHV master	EAHV / EACV master	EAHV / EACV slave	
Current Hour	48	40049	0 ... 23				✓	(✓) #18	✓	(✓) #18	✓	✓	(✓) #18	
Current Minute	49	40050	0 ... 59				✓	(✓) #18	✓	(✓) #18	✓	✓	(✓) #18	
Outdoor Temperature By BMS (signed)	50	40051	Temperature value in °C multiplied by 10. 0xFE70 = -40°C ... 0x036B = 87.5°C				✓ #9		✓ #9			✓ #9		
Outdoor Temperature By BMS	51	40052	Temperature value in °C multiplied by 10. 0x0000 = 0.0°C ... 0x036B = 87.5°C.				✓ #10		✓ #10			✓ #10		
Setting Water Temperature (signed)	52	40053	Temperature value in °C multiplied by 100. (see note *)				✓ #11		✓ #12		✓ #15	✓ #16	✓ #16	
Setting Water Temperature	53	40054	Temperature value in °C multiplied by 100. (see note **)				✓ #11		✓ #12		✓ #15	✓ #16	✓ #16	
Thermostat Target Temperature – Zone 1 (signed)	54	40055	Temperature value in °C multiplied by 100. (see note *)	✓	✓	✓								
Thermostat Target Temperature – Zone 1	55	40056	Temperature value in °C multiplied by 100. (see note **)	✓	✓	✓								
Thermostat Target Temperature – Zone 2 (signed)	56	40057	Temperature value in °C multiplied by 100. (see note *)	✓	✓	✓								
Thermostat Target Temperature – Zone 2	57	40058	Temperature value in °C multiplied by 100. (see note **)	✓	✓	✓								
HC Control Type	58	40059	0 = Heating 1 = Cooling	✓	✓	✓								
Own Refrigerant Address [READ ONLY]	66	40067	0 ... 32	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Defrost [READ ONLY]	67	40068	0 = Normal 1 = Standby 2 = Defrost 3 = Waiting Restart	✓	✓	✓	✓	✓			✓	✓	✓	
Residual Heat Removal [READ ONLY]	68	40069	0 = Normal 1 = Prepared 2 = Residual Heat Removal	✓	✓	✓								

Holding Register (Analogue Output)				Applicable Unit Type										
Register Name	Addr	Modicon Address	Details	FTC4	FTC5	FTC6	CAHV master	CAHV slave	CRHV master	CRHV slave	QAHV master	EAHV / EACV master	EAHV / EACV slave	
Refrigerant Error Info [READ ONLY]	69	40070	0 = Normal 1 = Error (System) 2 = Error (Startup) 3 = Maintenance Error	✓	✓	✓	✓ #17		✓ #17		✓ #17	✓		
7-Segment Display Error Code Digit 1 [READ ONLY]	70	40071	(see note ^)	✓	✓	✓								
7-Segment Display Error Code Digit 2 [READ ONLY]	71	40072	(see note ^^)	✓	✓	✓								
Status Of Heating [READ ONLY]	72	40073	0 = No type 1 = Heating C1 2 = Heating C2 3 = Heating C3	✓										
			0 = No type 1 = Heating/Cooling A1, Heating/Cooling B1, Heating/Cooling C1 2 = Heating/Cooling A2, Heating/Cooling B2, Heating/Cooling C2 3 = Heating/Cooling A3, Heating/Cooling B3, Heating/Cooling C3		✓	✓								
Heat Pump Frequency – Master [READ ONLY]	73	40074	Frequency value in Hz 0 = 0Hz ... 255 = 255Hz	✓	✓	✓	✓		✓		✓	✓		
Heat Pump Frequency – Slave 1 [READ ONLY]	74	40075	Frequency value in Hz 0 = 0Hz ... 255 = 255Hz	✓	✓	✓	✓		✓		✓	✓		
Heat Pump Frequency – Slave 2 [READ ONLY]	75	40076	Frequency value in Hz 0 = 0Hz ... 255 = 255Hz	✓	✓	✓	✓		✓		✓	✓		
Heat Pump Frequency – Slave 3 [READ ONLY]	76	40077	Frequency value in Hz 0 = 0Hz ... 255 = 255Hz	✓	✓	✓	✓		✓		✓	✓		
Heat Pump Frequency – Slave 4 [READ ONLY]	77	40078	Frequency value in Hz 0 = 0Hz ... 255 = 255Hz	✓	✓	✓	✓		✓		✓	✓		
Heat Pump Frequency – Slave 5 [READ ONLY]	78	40079	Frequency value in Hz 0 = 0Hz ... 255 = 255Hz	✓	✓	✓	✓		✓		✓	✓		
Heat Pump Frequency – Slave 6 [READ ONLY]	79	40080	Frequency value in Hz 0 = 0Hz ... 255 = 255Hz	✓	✓	✓	✓		✓		✓			

Holding Register (Analogue Output)				Applicable Unit Type										
Register Name	Addr	Modicon Address	Details	FTC4	FTC5	FTC6	CAHV master	CAHV slave	CRHV master	CRHV slave	QAHV master	EAHV / EACV master	EAHV / EACV slave	
Heat Source Status [READ ONLY]	80	40081	0 = H/P 1 = IH 2 = BH 3 = IH + BH 4 = Boiler	✓	✓	✓								
Temperature Setpoint – Zone 1 (signed) [READ ONLY]	81	40082	Temperature value in °C multiplied by 100. (see note *)	✓	✓	✓								
Temperature Setpoint – Zone 1 [READ ONLY]	82	40083	Temperature value in °C multiplied by 100. (see note **)	✓	✓	✓								
Temperature Setpoint – Zone 2 (signed) [READ ONLY]	83	40084	Temperature value in °C multiplied by 100. (see note *)	✓	✓	✓								
Temperature Setpoint – Zone 2 [READ ONLY]	84	40085	Temperature value in °C multiplied by 100. (see note **)	✓	✓	✓								
Flow Temperature Setpoint – Zone 1 (signed) [READ ONLY]	85	40086	Temperature value in °C multiplied by 100. (see note *)	✓	✓	✓	✓	✓	✓	✓		✓	✓	
Flow Temperature Setpoint – Zone 1 [READ ONLY]	86	40087	Temperature value in °C multiplied by 100. (see note **)	✓	✓	✓	✓	✓	✓	✓		✓	✓	
Flow Temperature Setpoint – Zone 2 (signed) [READ ONLY]	87	40088	Temperature value in °C multiplied by 100. (see note *)	✓	✓	✓								
Flow Temperature Setpoint – Zone 2 [READ ONLY]	88	40089	Temperature value in °C multiplied by 100. (see note **)	✓	✓	✓								
Legionella Temperature Setpoint (signed) [READ ONLY]	89	40090	Temperature value in °C multiplied by 100. (see note *)	✓	✓	✓								
Legionella Temperature Setpoint [READ ONLY]	90	40091	Temperature value in °C multiplied by 100. (see note **)	✓	✓	✓								
DHW Temperature Drop (signed) [READ ONLY]	91	40092	Temperature value in °C multiplied by 10. 0xFF38 = -20.0°C ... 0x0433 = 107.5°C	✓	✓	✓								
DHW Temperature Drop [READ ONLY]	92	40093	Temperature value in °C multiplied by 10. 0x0000 = 0°C ... 0x0433 = 107.5°C 0 = 0.0°C ... 1075 = 107.5°C	✓	✓	✓								

Holding Register (Analogue Output)				Applicable Unit Type										
Register Name	Addr	Modicon Address	Details	FTC4	FTC5	FTC6	CAHV master	CAHV slave	CRHV master	CRHV slave	QAHV master	EAHV / EACV master	EAHV / EACV slave	
Room Temperature – Zone 1 (signed) [READ ONLY]	93	40094	Temperature value in °C multiplied by 100. (see note *)	✓	✓	✓								
Room Temperature – Zone 1 [READ ONLY]	94	40095	Temperature value in °C multiplied by 100. (see note **)	✓	✓	✓								
Room Temperature – Zone 2 (signed) [READ ONLY]	95	40096	Temperature value in °C multiplied by 100. (see note *)	✓	✓	✓								
Room Temperature – Zone 2 [READ ONLY]	96	40097	Temperature value in °C multiplied by 100. (see note **)	✓	✓	✓								
Refrigerant Liquid Temperature (signed) [READ ONLY]	97	40098	Temperature value in °C multiplied by 100. (see note *)	✓	✓	✓								
Refrigerant Liquid Temperature [READ ONLY]	98	40099	Temperature value in °C multiplied by 100. (see note **)	✓	✓	✓								
Outdoor Ambient Temperature (signed) [READ ONLY]	99	40100	Temperature value in °C multiplied by 10. 0xFE70 = -40.0°C ... 0x036B = 87.5°C	✓	✓	✓	✓		✓	✓	✓	✓	✓	
Outdoor Ambient Temperature [READ ONLY]	100	40101	Temperature value in °C multiplied by 10. 0x0000 = 0.0°C ... 0x036B = 87.5°C.	✓	✓	✓	✓		✓	✓	✓	✓	✓	
Flow Temperature (signed) [READ ONLY]	101	40102	Temperature value in °C multiplied by 100. (see note *)	✓	✓	✓								
Water Outlet Temperature (signed) [READ ONLY]						✓	✓	✓	✓	✓	✓	✓	✓	
Flow Temperature [READ ONLY]	102	40103	Temperature value in °C multiplied by 100. (see note **)	✓	✓	✓								
Water Outlet Temperature [READ ONLY]								✓	✓	✓	✓	✓	✓	✓
Return Temperature (signed) [READ ONLY]	103	40104	Temperature value in °C multiplied by 100. (see note *)	✓	✓	✓								
Water Inlet Temperature (signed) [READ ONLY]								✓	✓	✓	✓	✓	✓	✓

Holding Register (Analogue Output)				Applicable Unit Type										
Register Name	Addr	Modicon Address	Details	FTC4	FTC5	FTC6	CAHV master	CAHV slave	CRHV master	CRHV slave	QAHV master	EAHV / EACV master	EAHV / EACV slave	
Return Temperature [READ ONLY]	104	40105	Temperature value in °C multiplied by 100. (see note **)	✓	✓	✓								
Water Inlet Temperature [READ ONLY]			Temperature value in °C multiplied by 100. (see note **)				✓	✓	✓	✓	✓	✓	✓	
Tank Water Temperature (signed) [READ ONLY]	105	40106	Temperature value in °C multiplied by 100. (see note *)	✓	✓	✓								
Tank Water Temperature [READ ONLY]	106	40107	Temperature value in °C multiplied by 100. (see note **)	✓	✓	✓								
Flow Temperature – Zone 1 (signed) [READ ONLY]	107	40108	Temperature value in °C multiplied by 100. (see note *)	✓	✓	✓								
External Water Temperature 1 (signed) [READ ONLY]			Temperature value in °C multiplied by 100. (see note *)				✓		✓		✓	✓		
Flow Temperature – Zone 1 [READ ONLY]	108	40109	Temperature value in °C multiplied by 100. (see note **)	✓	✓	✓								
External Water Temperature 1 [READ ONLY]			Temperature value in °C multiplied by 100. (see note **)				✓		✓		✓	✓		
Return Temperature – Zone 1 (signed) [READ ONLY]	109	40110	Temperature value in °C multiplied by 100. (see note *)	✓	✓	✓								
External Water Temperature 3 (signed) [READ ONLY]			Temperature value in °C multiplied by 100. (see note *)								✓			
Return Temperature – Zone 1 [READ ONLY]	110	40111	Temperature value in °C multiplied by 100. (see note **)	✓	✓	✓								
External Water Temperature 3 [READ ONLY]			Temperature value in °C multiplied by 100. (see note **)								✓			
Flow Temperature – Zone 2 (signed) [READ ONLY]	111	40112	Temperature value in °C multiplied by 100. (see note *)	✓	✓	✓								
External Water Temperature 2 (signed) [READ ONLY]			Temperature value in °C multiplied by 100. (see note *)				✓		✓					

Holding Register (Analogue Output)				Applicable Unit Type										
Register Name	Addr	Modicon Address	Details	FTC4	FTC5	FTC6	CAHV master	CAHV slave	CRHV master	CRHV slave	QAHV master	EAHV / EACV master	EAHV / EACV slave	
External Water Temperature 4 (signed) [READ ONLY]			Temperature value in °C multiplied by 100. (see note *)								✓			
Flow Temperature – Zone 2 [READ ONLY]	112	40113	Temperature value in °C multiplied by 100. (see note **)	✓	✓	✓								
External Water Temperature 2 [READ ONLY]			Temperature value in °C multiplied by 100. (see note **)				✓		✓					
External Water Temperature 4 [READ ONLY]			Temperature value in °C multiplied by 100. (see note **)								✓			
Return Temperature – Zone 2 (signed) [READ ONLY]	113	40114	Temperature value in °C multiplied by 100. (see note *)	✓	✓	✓								
External Water Temperature 6 (signed) [READ ONLY]			Temperature value in °C multiplied by 100. (see note **)							✓				
Return Temperature – Zone 2 [READ ONLY]	114	40115	Temperature value in °C multiplied by 100. (see note **)	✓	✓	✓								
External Water Temperature 6 [READ ONLY]			Temperature value in °C multiplied by 100. (see note **)							✓				
Boiler Flow Temperature (signed) [READ ONLY]	115	40116	Temperature value in °C multiplied by 100. (see note *)	✓	✓	✓								
Boiler Flow Temperature [READ ONLY]	116	40117	Temperature value in °C multiplied by 100. (see note **)	✓	✓	✓								
Boiler Return Temperature (signed) [READ ONLY]	117	40118	Temperature value in °C multiplied by 100. (see note *)	✓	✓	✓								
Boiler Return Temperature [READ ONLY]	118	40119	Temperature value in °C multiplied by 100. (see note **)	✓	✓	✓								
Room Thermo 1 (IN1) [READ ONLY]	119	40120	0 = OFF, 1 = ON	✓	✓	✓								
Room Thermo 2 (IN6) [READ ONLY]	120	40121	0 = OFF, 1 = ON	✓	✓	✓								

Holding Register (Analogue Output)				Applicable Unit Type										
Register Name	Addr	Modicon Address	Details	FTC4	FTC5	FTC6	CAHV master	CAHV slave	CRHV master	CRHV slave	QAHV master	EAHV / EACV master	EAHV / EACV slave	
Flow SW1 (IN2) [READ ONLY]	121	40122	0 = OFF, 1 = ON	✓	✓	✓								
Flow SW2 (IN3) [READ ONLY]	122	40123	0 = OFF, 1 = ON	✓	✓	✓								
Flow SW3 (IN7) [READ ONLY]	123	40124	0 = OFF, 1 = ON	✓	✓	✓								
Demand (IN4) [READ ONLY]	124	40125	0 = OFF, 1 = ON	✓	✓	✓								
Outdoor Thermo (IN5) [READ ONLY]	125	40126	0 = OFF, 1 = ON	✓	✓	✓								
DIP Switch SW2 [READ ONLY]	126	40127	Bit 0 = Switch 2-1 (0 = OFF, 1 = ON) ... Bit 9 = Switch 2-10 (0 = OFF, 1 = ON)	✓	✓	✓								
Heat Pump Master ON/OFF [READ ONLY]	127	40128	0 = Stop, 1 = Run	✓	✓	✓	✓		✓		✓	✓		
Heat Pump Slave 1 ON/OFF (address 2 for CAHV/CRHV) [READ ONLY]	128	40129	0 = Stop, 1 = Run	✓	✓	✓	✓		✓		✓	✓		
Heat Pump Slave 2 ON/OFF (address 3 for CAHV/CRHV) [READ ONLY]	129	40130	0 = Stop, 1 = Run	✓	✓	✓	✓		✓					
Heat Pump Slave 3 ON/OFF (address 4 for CAHV/CRHV) [READ ONLY]	130	40131	0 = Stop, 1 = Run	✓	✓	✓	✓		✓					
Heat Pump Slave 4 ON/OFF (address 5 for CAHV/CRHV) [READ ONLY]	131	40132	0 = Stop, 1 = Run	✓	✓	✓	✓		✓					
Heat Pump Slave 5 ON/OFF (address 6 for CAHV/CRHV) [READ ONLY]	132	40133	0 = Stop, 1 = Run	✓	✓	✓	✓		✓					
Heat Pump Slave 6 ON/OFF (address 7 for CAHV/CRHV) [READ ONLY]	133	40134	0 = Stop, 1 = Run	✓	✓	✓	✓		✓					
Heat Pump Slave 7 ON/OFF (address 8 for CAHV/CRHV) [READ ONLY]	134	40135	0 = Stop, 1 = Run				✓		✓					

Holding Register (Analogue Output)				Applicable Unit Type										
Register Name	Addr	Modicon Address	Details	FTC4	FTC5	FTC6	CAHV master	CAHV slave	CRHV master	CRHV slave	QAHV master	EAHV / EACV master	EAHV / EACV slave	
Heat Pump Slave 8 ON/OFF (address 9 for CAHV/CRHV) [READ ONLY]	135	40136	0 = Stop, 1 = Run				✓		✓					
Heat Pump Run Time (hours) [READ ONLY]	136	40137	Value in hours 0 = 0 Hours ... 99 = 99 Hours	✓	✓	✓	✓		✓					
Heat Pump Run Time (hours x100) [READ ONLY]	137	40138	Value in hours multiplied by 100 0 = 0 hours ... 65535 = 6553500 hours	✓	✓	✓	✓		✓					
Heat Pump Refrigerant Address 1 Run Time (hours x100) [READ ONLY]	138	40139	Value in hours multiplied by 100 0 = 0 hours ... 65535 = 6553500 hours	✓	✓	✓								
Heat Pump Refrigerant Address 2 Run Time (hours x100) [READ ONLY]	139	40140	Value in hours multiplied by 100 0 = 0 hours ... 65535 = 6553500 hours	✓	✓	✓								
Heat Pump Refrigerant Address 3 Run Time (hours x100) [READ ONLY]	140	40141	Value in hours multiplied by 100 0 = 0 hours ... 65535 = 6553500 hours	✓	✓	✓								
Heat Pump Refrigerant Address 4 Run Time (hours x100) [READ ONLY]	141	40142	Value in hours multiplied by 100 0 = 0 hours ... 65535 = 6553500 hours	✓	✓	✓								
Heat Pump Refrigerant Address 5 Run Time (hours x100) [READ ONLY]	142	40143	Value in hours multiplied by 100 0 = 0 hours ... 65535 = 6553500 hours	✓	✓	✓								
Heat Pump Refrigerant Address 6 Run Time (hours x100) [READ ONLY]	143	40144	Value in hours multiplied by 100 0 = 0 hours ... 65535 = 6553500 hours	✓	✓	✓								
Boiler ON/OFF [READ ONLY]	144	40145	0 = Stop, 1 = Run	✓	✓	✓						✓	✓	
External Heater Operation 1 [READ ONLY]							✓		✓					

Holding Register (Analogue Output)				Applicable Unit Type										
Register Name	Addr	Modicon Address	Details	FTC4	FTC5	FTC6	CAHV master	CAHV slave	CRHV master	CRHV slave	QAHV master	EAHV / EACV master	EAHV / EACV slave	
Booster Heater 1 ON/OFF [READ ONLY]	145	40146	0 = Stop, 1 = Run	✓	✓	✓								
Booster Heater 2 ON/OFF [READ ONLY]	146	40147	0 = Stop, 1 = Run	✓	✓	✓								
Booster Heater 2+ ON/OFF [READ ONLY]	147	40148	0 = Stop, 1 = Run	✓	✓	✓								
Immersion Heater ON/OFF [READ ONLY]	148	40149	0 = Stop, 1 = Run	✓	✓	✓								
Water Pump 1 ON/OFF [READ ONLY]	149	40150	0 = Stop, 1 = Run	✓	✓	✓	✓		✓	✓	✓	✓	✓	
Water Pump 2 ON/OFF [READ ONLY]	150	40151	0 = Stop, 1 = Run	✓	✓	✓	✓							
Water Pump 3 ON/OFF [READ ONLY]	151	40152	0 = Stop, 1 = Run	✓	✓	✓	✓							
3-Way Valve ON/OFF [READ ONLY]	152	40153	0 = Stop, 1 = Run	✓	✓	✓								
2-Way Valve 2 ON/OFF [READ ONLY]	153	40154	0 = Stop, 1 = Run	✓	✓	✓								
Mixing Valve Step [READ ONLY]	154	40155	0 = Step 0 ... 10 = Step 10	✓	✓	✓								
Refrigerant 1 Error Code Digit 1 [READ ONLY]	155	40156	(see note ^)	✓	✓	✓								
Refrigerant 1 Error Code Digit 2 [READ ONLY]	156	40157	(see note ^^)	✓	✓	✓								
Refrigerant 2 Error Code Digit 1 [READ ONLY]	157	40158	(see note ^)	✓	✓	✓								
Refrigerant 2 Error Code Digit 2 [READ ONLY]	158	40159	(see note ^^)	✓	✓	✓								

Holding Register (Analogue Output)				Applicable Unit Type										
Register Name	Addr	Modicon Address	Details	FTC4	FTC5	FTC6	CAHV master	CAHV slave	CRHV master	CRHV slave	QAHV master	EAHV / EACV master	EAHV / EACV slave	
Refrigerant 3 Error Code Digit 1 [READ ONLY]	159	40160	(see note ^)	✓	✓	✓								
Refrigerant 3 Error Code Digit 2 [READ ONLY]	160	40161	(see note ^)	✓	✓	✓								
Refrigerant 4 Error Code Digit 1 [READ ONLY]	161	40162	(see note ^)	✓	✓	✓								
Refrigerant 4 Error Code Digit 2 [READ ONLY]	162	40163	(see note ^)	✓	✓	✓								
Refrigerant 5 Error Code Digit 1 [READ ONLY]	163	40164	(see note ^)	✓	✓	✓								
Refrigerant 5 Error Code Digit 2 [READ ONLY]	164	40165	(see note ^)	✓	✓	✓								
Refrigerant 6 Error Code Digit 1 [READ ONLY]	165	40166	(see note ^)	✓	✓	✓								
Refrigerant 6 Error Code Digit 2 [READ ONLY]	166	40167	(see note ^)	✓	✓	✓								
Heat Pump Frequency – Slave 7 [READ ONLY]	167	40168	Frequency value in Hz 0 = 0Hz ... 255 = 255Hz				✓		✓		✓			
Heat Pump Frequency – Slave 8 [READ ONLY]	168	40169	Frequency value in Hz 0 = 0Hz ... 255 = 255Hz				✓		✓		✓			
Heat Pump Frequency – Slave 9 [READ ONLY]	169	40170	Frequency value in Hz 0 = 0Hz ... 255 = 255Hz				✓		✓		✓			
Heat Pump Frequency – Slave 10 [READ ONLY]	170	40171	Frequency value in Hz 0 = 0Hz ... 255 = 255Hz				✓		✓		✓			
Heat Pump Frequency – Slave 11 [READ ONLY]	171	40172	Frequency value in Hz 0 = 0Hz ... 255 = 255Hz				✓		✓		✓			
Heat Pump Frequency – Slave 12 [READ ONLY]	172	40173	Frequency value in Hz 0 = 0Hz ... 255 = 255Hz				✓		✓		✓			

Holding Register (Analogue Output)				Applicable Unit Type										
Register Name	Addr	Modicon Address	Details	FTC4	FTC5	FTC6	CAHV master	CAHV slave	CRHV master	CRHV slave	QAHV master	EAHV / EACV master	EAHV / EACV slave	
Heat Pump Frequency – Slave 13 [READ ONLY]	173	40174	Frequency value in Hz 0 = 0Hz ... 255 = 255Hz				✓		✓		✓			
Heat Pump Frequency – Slave 14 [READ ONLY]	174	40175	Frequency value in Hz 0 = 0Hz ... 255 = 255Hz				✓		✓		✓			
Heat Pump Frequency – Slave 15 [READ ONLY]	175	40176	Frequency value in Hz 0 = 0Hz ... 255 = 255Hz				✓		✓		✓			
Heat Pump 10 ON/OFF [READ ONLY]	176	40177	0 = Stop, 1 = Run				✓		✓		✓			
Heat Pump 11 ON/OFF [READ ONLY]	177	40178	0 = Stop, 1 = Run				✓		✓		✓			
Heat Pump 12 ON/OFF [READ ONLY]	178	40179	0 = Stop, 1 = Run				✓		✓		✓			
Heat Pump 13 ON/OFF [READ ONLY]	179	40180	0 = Stop, 1 = Run				✓		✓		✓			
Heat Pump 14 ON/OFF [READ ONLY]	180	40181	0 = Stop, 1 = Run				✓		✓		✓			
Heat Pump 15 ON/OFF [READ ONLY]	181	40182	0 = Stop, 1 = Run				✓		✓		✓			
Heat Pump 16 ON/OFF [READ ONLY]	182	40183	0 = Stop, 1 = Run				✓		✓		✓			
Heat Pump 17 ON/OFF [READ ONLY]	183	40184	0 = Stop, 1 = Run				✓		✓		✓			
Heat Pump 18 ON/OFF [READ ONLY]	184	40185	0 = Stop, 1 = Run				✓#1		✓#1					
Heat Pump 19 ON/OFF [READ ONLY]	185	40186	0 = Stop, 1 = Run				✓#1		✓#1					
Heat Pump 20 ON/OFF [READ ONLY]	186	40187	0 = Stop, 1 = Run				✓#1		✓#1					

Holding Register (Analogue Output)				Applicable Unit Type										
Register Name	Addr	Modicon Address	Details	FTC4	FTC5	FTC6	CAHV master	CAHV slave	CRHV master	CRHV slave	QAHV master	EAHV / EACV master	EAHV / EACV slave	
Heat Pump 21 ON/OFF [READ ONLY]	187	40188	0 = Stop, 1 = Run				✓#1		✓#1					
Heat Pump 22 ON/OFF [READ ONLY]	188	40189	0 = Stop, 1 = Run				✓#1		✓#1					
Heat Pump 23 ON/OFF [READ ONLY]	189	40190	0 = Stop, 1 = Run				✓#1		✓#1					
Heat Pump 24 ON/OFF [READ ONLY]	190	40191	0 = Stop, 1 = Run				✓#1		✓#1					
Heat Pump 25 ON/OFF [READ ONLY]	191	40192	0 = Stop, 1 = Run				✓#1		✓#1					
Heat Pump 26 ON/OFF [READ ONLY]	192	40193	0 = Stop, 1 = Run				✓#1		✓#1					
Heat Pump 27 ON/OFF [READ ONLY]	193	40194	0 = Stop, 1 = Run				✓#1		✓#1					
Heat Pump 28 ON/OFF [READ ONLY]	194	40195	0 = Stop, 1 = Run				✓#1		✓#1					
Heat Pump 29 ON/OFF [READ ONLY]	195	40196	0 = Stop, 1 = Run				✓#1		✓#1					
Heat Pump 30 ON/OFF [READ ONLY]	196	40197	0 = Stop, 1 = Run				✓#1		✓#1					
Heat Pump 31 ON/OFF [READ ONLY]	197	40198	0 = Stop, 1 = Run				✓#1		✓#1					
Heat Pump 32 ON/OFF [READ ONLY]	198	40199	0 = Stop, 1 = Run				✓#1		✓#1					
	199 - 214	40200 - 40215	Reserved											
External Heater ON/OFF [READ ONLY]	215	40216	0 = Stop, 1 = Run						✓#1					
Water Pump 4 ON/OFF [READ ONLY]	216	40217	0 = Stop, 1 = Run				✓							

Holding Register (Analogue Output)				Applicable Unit Type										
Register Name	Addr	Modicon Address	Details	FTC4	FTC5	FTC6	CAHV master	CAHV slave	CRHV master	CRHV slave	QAHV master	EAHV / EACV master	EAHV / EACV slave	
Water Pump 5 ON/OFF [READ ONLY]	217	40218	0 = Stop, 1 = Run				✓							
Water Pump 6 ON/OFF [READ ONLY]	218	40219	0 = Stop, 1 = Run				✓							
Water Pump 7 ON/OFF [READ ONLY]	219	40220	0 = Stop, 1 = Run				✓							
Water Pump 8 ON/OFF [READ ONLY]	220	40221	0 = Stop, 1 = Run				✓							
Water Pump 9 ON/OFF [READ ONLY]	221	40222	0 = Stop, 1 = Run				✓							
Water Pump 10 ON/OFF [READ ONLY]	222	40223	0 = Stop, 1 = Run				✓							
Water Pump 11 ON/OFF [READ ONLY]	223	40224	0 = Stop, 1 = Run				✓							
Water Pump 12 ON/OFF [READ ONLY]	224	40225	0 = Stop, 1 = Run				✓							
Water Pump 13 ON/OFF [READ ONLY]	225	40226	0 = Stop, 1 = Run				✓							
Water Pump 14 ON/OFF [READ ONLY]	226	40227	0 = Stop, 1 = Run				✓							
Water Pump 15 ON/OFF [READ ONLY]	227	40228	0 = Stop, 1 = Run				✓							
Water Pump 16 ON/OFF [READ ONLY]	228	40229	0 = Stop, 1 = Run				✓							
Drain Pan Heater ON/OFF [READ ONLY]	229	40230	0 = Stop, 1 = Run						✓	✓		✓	✓	
Antifreeze piping heater operation ON/OFF [READ ONLY]			0 = Stop, 1 = Run								✓			

Holding Register (Analogue Output)				Applicable Unit Type										
Register Name	Addr	Modicon Address	Details	FTC4	FTC5	FTC6	CAHV master	CAHV slave	CRHV master	CRHV slave	QAHV master	EAHV / EACV master	EAHV / EACV slave	
Evaporating Temperature (signed) [READ ONLY]	230	40231	Temperature value in °C multiplied by 100. (see note *)				✓	✓	✓	✓	✓	✓	✓	
Evaporating Temperature [READ ONLY]	231	40232	Temperature value in °C multiplied by 100. (see note **)				✓	✓	✓	✓	✓	✓	✓	
Condensing Temperature (signed) [READ ONLY]	232	40233	Temperature value in °C multiplied by 100. (see note *)				✓	✓	✓	✓	✓	✓	✓	
Condensing Temperature [READ ONLY]	233	40234	Temperature value in °C multiplied by 100. (see note **)				✓	✓	✓	✓	✓	✓	✓	
Electric Energy 1 [READ ONLY]	234	40235	Electric Energy in kWh multiplied by 100 (see note †)				✓#1	✓#1	✓#1	✓#1		✓#1	✓#1	
Electric Energy 2 [READ ONLY]	235	40236	Electric Energy in kWh multiplied by 100 (see note †)				✓#1	✓#1	✓#1	✓#1		✓#1	✓#1	
Electric Energy 3 [READ ONLY]	236	40237	Electric Energy in kWh multiplied by 100 (see note †)				✓#1	✓#1	✓#1	✓#1		✓#1	✓#1	
Electric Energy 4 [READ ONLY]	237	40238	Electric Energy in kWh multiplied by 100 (see note †)				✓#1	✓#1	✓#1	✓#1		✓#1	✓#1	
Electric Energy 5 [READ ONLY]	238	40239	Electric Energy in kWh multiplied by 100 (see note †)				✓#1	✓#1	✓#1	✓#1		✓#1	✓#1	
Electric Energy 6 [READ ONLY]	239	40240	Electric Energy in kWh multiplied by 100 (see note †)				✓#1	✓#1	✓#1	✓#1		✓#1	✓#1	
Electric Energy 7 [READ ONLY]	240	40241	Electric Energy in kWh multiplied by 100 (see note †)				✓#1	✓#1	✓#1	✓#1		✓#1	✓#1	
Electric Energy 8 [READ ONLY]	241	40242	Electric Energy in kWh multiplied by 100 (see note †)				✓#1	✓#1	✓#1	✓#1		✓#1	✓#1	
Electric Energy 9 [READ ONLY]	242	40243	Electric Energy in kWh multiplied by 100 (see note †)				✓#1	✓#1	✓#1	✓#1		✓#1	✓#1	
Electric Energy 10 [READ ONLY]	243	40244	Electric Energy in kWh multiplied by 100 (see note †)				✓#1	✓#1	✓#1	✓#1		✓#1	✓#1	

Holding Register (Analogue Output)				Applicable Unit Type										
Register Name	Addr	Modicon Address	Details	FTC4	FTC5	FTC6	CAHV master	CAHV slave	CRHV master	CRHV slave	QAHV master	EAHV / EACV master	EAHV / EACV slave	
Electric Energy 11 [READ ONLY]	244	40245	Electric Energy in kWh multiplied by 100 (see note †)				✓#1	✓#1	✓#1	✓#1		✓#1	✓#1	
Electric Energy 12 [READ ONLY]	245	40246	Electric Energy in kWh multiplied by 100 (see note †)				✓#1	✓#1	✓#1	✓#1		✓#1	✓#1	
Electric Energy 13 [READ ONLY]	246	40247	Electric Energy in kWh multiplied by 100 (see note †)				✓#1	✓#1	✓#1	✓#1		✓#1	✓#1	
Electric Energy 14 [READ ONLY]	247	40248	Electric Energy in kWh multiplied by 100 (see note †)				✓#1	✓#1	✓#1	✓#1		✓#1	✓#1	
Electric Energy 15 [READ ONLY]	248	40249	Electric Energy in kWh multiplied by 100 (see note †)				✓#1	✓#1	✓#1	✓#1		✓#1	✓#1	
Electric Energy 16 [READ ONLY]	249	40250	Electric Energy in kWh multiplied by 100 (see note †)				✓#1	✓#1	✓#1	✓#1		✓#1	✓#1	
Brine Inlet Temperature (signed) [READ ONLY]	250	40251	Temperature value in °C multiplied by 100. (see note *)						✓	✓				
Brine Inlet Temperature [READ ONLY]	251	40252	Temperature value in °C multiplied by 100. (see note **)						✓	✓				
Brine Outlet Temperature 1 (signed) [READ ONLY]	252	40253	Temperature value in °C multiplied by 100. (see note *)						✓	✓				
Brine Outlet Temperature 1 [READ ONLY]	253	40254	Temperature value in °C multiplied by 100. (see note **)						✓	✓				
Brine Outlet Temperature 2 (signed) [READ ONLY]	254	40255	Temperature value in °C multiplied by 100. (see note *)						✓	✓				
Brine Outlet Temperature 2 [READ ONLY]	255	40256	Temperature value in °C multiplied by 100. (see note **)						✓	✓				
Condensing Temperature 2 (signed) [READ ONLY]	256	40257	Temperature value in °C multiplied by 100. (see note *)				✓	✓	✓	✓		✓	✓	
Condensing Temperature 2 [READ ONLY]	257	40258	Temperature value in °C multiplied by 100. (see note **)				✓	✓	✓	✓		✓	✓	

Holding Register (Analogue Output)				Applicable Unit Type										
Register Name	Addr	Modicon Address	Details	FTC4	FTC5	FTC6	CAHV master	CAHV slave	CRHV master	CRHV slave	QAHV master	EAHV / EACV master	EAHV / EACV slave	
Water Outlet Temperature 2 (signed) [READ ONLY]	258	40259	Temperature value in °C multiplied by 100. (see note *)				✓	✓	✓	✓		✓	✓	
Water Outlet Temperature 2 [READ ONLY]	259	40260	Temperature value in °C multiplied by 100. (see note **)				✓	✓	✓	✓		✓	✓	
Evaporating Temperature 2 (signed) [READ ONLY]	260	40261	Temperature value in °C multiplied by 100. (see note *)				✓	✓	✓	✓		✓	✓	
Evaporating Temperature 2 [READ ONLY]	261	40262	Temperature value in °C multiplied by 100. (see note **)				✓	✓	✓	✓		✓	✓	
Water Pump 1 – PWM Duty [READ ONLY]	262	40263	Duty value in % 0 = 0% ... 100 = 100%								✓			
Water Pump 1 – PWM Duty Feedback [READ ONLY]	263	40264	Duty value in % 0 = 0% ... 100 = 100%											
3-Way Valve 1 [READ ONLY]	264	40265	0 = OFF (stop) 1 = ON (run)				✓				✓			
Version of Protocol (upper) [READ ONLY]	265	40266	Version of Protocol is a value in BCD e.g. V3.01 = 3 (upper) and 1 (lower)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Version of Protocol (lower) [READ ONLY]	266	40267	Version of Protocol is a value in BCD e.g. V3.01 = 3 (upper) and 1 (lower)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Version of Model (upper) [READ ONLY]	267	40268	Version of Model is a value in BCD e.g. V2.00 = 2 (upper) and 0 (lower)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Version of Model (lower) [READ ONLY]	268	40269	Version of Model is a value in BCD e.g. V2.00 = 2 (upper) and 0 (lower)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Capacity of Supplying Electricity [READ ONLY]	269	40270	Value in Watts 0 = 0,0 W ... 255 = 25,5 W	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	

Holding Register (Analogue Output)				Applicable Unit Type										
Register Name	Addr	Modicon Address	Details	FTC4	FTC5	FTC6	CAHV master	CAHV slave	CRHV master	CRHV slave	QAHV master	EAHV / EACV master	EAHV / EACV slave	
Model Profile 1 [READ ONLY]	270	40271	0 = FTC2B 1 = FTC4 2 = FTC5 3 = FTC6 128 = CAHV1A 129 = CAHV1B 130 = CRHV1A 131 = CRHV1B 132 = EAHV1A 133 = EAHV1B 134 = QAHV1A 135 = QAHV1B 144 = PWFY1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Model Profile 2 (refrigerant address) [READ ONLY]	271	40272	0 = Address 0 ... 255 = Address 255  (addresses 7 – 255 not used for FTC)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Energy Consumption Measured Date – Year [READ ONLY]	279	40280	Date of last energy consumption measurement – Year		✓	✓								
Energy Consumption Measured Date – Month [READ ONLY]	280	40281	Date of last energy consumption measurement – Month		✓	✓								
Energy Consumption Measured Date – Day [READ ONLY]	281	40282	Date of last energy consumption measurement – Day		✓	✓								
Last Measured Heating Energy Consumption – kWh part [READ ONLY]	282	40283	Last measured heating energy consumption – kWh part of the value. 0 = 0kWh ... 65535 = 65535kWh		✓	✓								
Last Measured Heating Energy Consumption – Wh part [READ ONLY]	283	40284	Last measured heating energy consumption – Wh part of the value multiplied by 10. 0 = 0Wh ... 99 = 990Wh		✓	✓								
Last Measured Cooling Energy Consumption – kWh part [READ ONLY]	284	40285	Last measured cooling energy consumption – kWh part of the value. 0 = 0kWh ... 65535 = 65535kWh		✓	✓								
Last Measured Cooling Energy Consumption – Wh part [READ ONLY]	285	40286	Last measured cooling energy consumption – Wh part of the value multiplied by 10. 0 = 0Wh ... 99 = 990Wh		✓	✓								

Holding Register (Analogue Output)				Applicable Unit Type										
Register Name	Addr	Modicon Address	Details	FTC4	FTC5	FTC6	CAHV master	CAHV slave	CRHV master	CRHV slave	QAHV master	EAHV / EACV master	EAHV / EACV slave	
Last Measured DHW Energy Consumption – kWh part <b>[READ ONLY]</b>	286	40287	Last measured DHW energy consumption – kWh part of the value. 0 = 0kWh ... 65535 = 65535kWh		✓	✓								
Last Measured DHW Energy Consumption – Wh part <b>[READ ONLY]</b>	287	40288	Last measured DHW energy consumption – Wh part of the value multiplied by 10. 0 = 0Wh ... 99 = 990Wh		✓	✓								
Last Measured Total Energy Consumption – kWh <b>[READ ONLY]</b>	288	40289	Last measured total energy consumption in Kwh. 0 = 0kWh ... 65535 = 65535kWh		✓	✓								
Energy Produced Measured Date – Year <b>[READ ONLY]</b>	289	40290	Date of last energy produced measurement – Year		✓	✓								
Energy Produced Measured Date – Month <b>[READ ONLY]</b>	290	40291	Date of last energy produced measurement – Month		✓	✓								
Energy Produced Measured Date – Day <b>[READ ONLY]</b>	291	40292	Date of last energy produced measurement – Day		✓	✓								
Last Measured Heating Energy Produced – kWh part <b>[READ ONLY]</b>	292	40293	Last measured heating energy produced – kWh part of the value. 0 = 0kWh ... 65535 = 65535kWh		✓	✓								
Last Measured Heating Energy Produced – Wh part <b>[READ ONLY]</b>	293	40294	Last measured heating energy produced – Wh part of the value multiplied by 10. 0 = 0Wh ... 99 = 990Wh		✓	✓								
Last Measured Cooling Energy Produced – kWh part <b>[READ ONLY]</b>	294	40295	Last measured cooling energy produced – kWh part of the value. 0 = 0kWh ... 65535 = 65535kWh		✓	✓								
Last Measured Cooling Energy Produced – Wh part <b>[READ ONLY]</b>	295	40296	Last measured cooling energy produced – Wh part of the value multiplied by 10. 0 = 0Wh ... 99 = 990Wh		✓	✓								
Last Measured DHW Energy Produced – kWh part <b>[READ ONLY]</b>	296	40297	Last measured DHW energy produced – kWh part of the value. 0 = 0kWh ... 65535 = 65535kWh		✓	✓								
Last Measured DHW Energy Produced – Wh part <b>[READ ONLY]</b>	297	40298	Last measured DHW energy produced – Wh part of the value multiplied by 10. 0 = 0Wh ... 99 = 990Wh		✓	✓								
Last Measured Total Energy Produced – kWh <b>[READ ONLY]</b>	298	40299	Last measured total energy produced in Kwh. 0 = 0kWh ... 65535 = 65535kWh		✓	✓								

Holding Register (Analogue Output)				Applicable Unit Type										
Register Name	Addr	Modicon Address	Details	FTC4	FTC5	FTC6	CAHV master	CAHV slave	CRHV master	CRHV slave	QAHV master	EAHV / EACV master	EAHV / EACV slave	
Flow Rate [READ ONLY]	299	40300	Litres per minute 0 = 0 l/min ... 255 = 255 l/min		✓	✓								

Holding Register (Analogue Output)				Applicable Unit Type										
Register Name	Addr	Modicon Address	Details	FTC4	FTC5	FTC6	CAHV master	CAHV slave	CRHV master	CRHV slave	QAHV master	EAHV / EACV master	EAHV / EACV slave	
Date – Year [READ ONLY]	342	40343	Date(year): 0 = 2000 ... 99 = 2099			✓								
Date – Month [READ ONLY]	343	40344	Date(month): 1 = January ... 12 = December			✓								
Date – Day [READ ONLY]	344	40345	Date(day): 1 ... 31			✓								
Time – Hour [READ ONLY]	345	40346	Time(hour): 0 ... 255			✓								
Time – Minute [READ ONLY]	346	40347	Time(minute): 0 ... 59			✓								
Time - Sec [READ ONLY]	347	40348	Time(sec): 0 ... 59			✓								
Version of main software [READ ONLY]	348	40349	Version of Software: e.g. version 01.23 is entered as 0123			✓								
Sub-version of software [READ ONLY]	349	40350	Sub-code Version of Software: e.g. "r01" = 0001, "t02" = 0102, "c03" = 0203			✓								
Legionella Prevention [READ ONLY]	350	40351	Demand of Legionella Prevention; 0 = Normal, 1 = Legionella Prevention			✓								
Emergency Operation Type [READ ONLY]	351	40352	Type of Emergency Prevention: 0 = Normal, 1 = Standby, 2 = Backup			✓								

Sensor Setting – Zone 1 [READ ONLY]	352	40353	Zone 1 sensor setting: 0 = Main RC, 1-8 = RoomRC1-8, 15 = TH1			✓							
Sensor Setting – Zone 2 [READ ONLY]	353	40354	Zone 2 sensor setting: 0 = Main RC, 1-8 = RoomRC1-8, 15 = TH1			✓							
Outdoor Unit – Freeze Stat Func [READ ONLY]	354	40355	Freeze stat function for outdoor unit: 0 = Normal, 1 = Freeze stat			✓							
Boiler Protection [READ ONLY]	355	40356	Boiler Protection: 0 = Normal, 1 = Prepared, 2 = Protected			✓							

Holding Register (Analogue Output)				Applicable Unit Type									
Register Name	Addr	Modicon Address	Details	FTC4	FTC5	FTC6	CAHV master	CAHV slave	CRHV master	CRHV slave	QAHV master	EAHV / EACV master	EAHV / EACV slave
Auto Restart at Pwr Failure [READ ONLY]	356	40357	Auto restart at power failure: 0 = Normal, 1 = Standby, 2 = IT initial setting standby			✓							
Demand of Heater [READ ONLY]	357	40358	Demand of heater operation: 0 = No demand, 1 = Run, 2 = Prohibit			✓							
Type Heating / Cooling [READ ONLY]	358	40359	Type Heating / Cooling: 0 = Type A, 1 = Type B, 2 = Type C			✓							
HP Thermo diff adj control – Zone 1 [READ ONLY]	359	40360	Zone1 H/P thermos diff. adjustment control: 0 = Normal, 1 = discriminating, 2 = adjustment ° 3 = β, 4 = γ			✓							
HP Thermo diff adj control – Zone 2 [READ ONLY]	360	40361	Zone2 H/P thermos diff. adjustment control: 0 = Normal, 1 = discriminating, 2 = adjustment ° 3 = β, 4 = γ			✓							
Slave Unit Connection Status [READ ONLY]	361	40362	Slave Unit Connection Status: Bit 0 = address 1..... Bit 5 = address 5 Value: 0 = unconnected, 1 = connected			✓							
Slave Unit Operating status [READ ONLY]	362	40363	Slave Unit Operation Status: Bit 0 = address 1..... Bit 5 = address 5 Value: 0 = Stop, 1 = Running			✓							
H/P Freq 4 Status [READ ONLY]	363	40364	Status of H/P frequency 4: 0 = 0 Hz ... 255 = 255 Hz			✓							
Heat Source Phase – DHW [READ ONLY]	364	40365	Heat Source Phase of DHW: 0 = Normal, 1 = H/P Phase, 2 = Heater Phase			✓							
Heat Source Type [READ ONLY]	365	40366	Type of Heat Source: 0 = Fixed, 1 = Auto			✓							

Holding Register (Analogue Output)				Applicable Unit Type									
Register Name	Addr	Modicon Address	Details	FTC4	FTC5	FTC6	CAHV master	CAHV slave	CRHV master	CRHV slave	QAHV master	EAHV / EACV master	EAHV / EACV slave
Heat Source – judgement condition [READ ONLY]	366	40367	1 = Boiler - Emergency operation 2 = Heater - Emergency operation 3 = Boiler - External input (IN5) 4 = Boiler - Heat source setting [Boiler] 5 = Heater - Heat source setting [Heater] 6 = Standard - Heatsource setting [Standard] 7 = Heater - External input (IN5) 8 = Heater - Backup operation 9 = Heater - Demand from outdoor unit 10 = Boiler - External input (IN4) 11 = Boiler - Backup operation 12 = Boiler - Heat source setting [Hybrid] 13 = Heater - Low outdoor temp. operation 14 = Standard - Pumpdown operation 15 = Standard - Floor dry up operation 16 = Boiler - Indoor unit only operation 17 = Heater - Indoor unit only operation			✓							
Boiler Operation Hybrid Settings [READ ONLY]	367	40368	Boiler operation hybrid settings – Priority mode 0 = Ambient, 1 = Cost, 2 = CO2			✓							
CP Boiler (Upper) [READ ONLY]	368	40369	CP boiler: (upper)(middle)(lower) 00h 00h 00h = 0.000 */kW			✓							
CP Boiler (Middle) [READ ONLY]	369	40370	. 00h 00h 01h = 0.001 */kW			✓							
CP Boiler (Lower) [READ ONLY]	370	40371	FFh FFh FFh = 16777.215 */kW • - unit of user's currency			✓							

Holding Register (Analogue Output)				Applicable Unit Type									
Register Name	Addr	Modicon Address	Details	FTC4	FTC5	FTC6	CAHV master	CAHV slave	CRHV master	CRHV slave	QAHV master	EAHV / EACV master	EAHV / EACV slave
CO2 Boiler (Upper) [READ ONLY]	371	40372	CO2 boiler: (upper)(middle)(lower) 00h 00h 00h = 0.000 kg-CO2			✓							
CO2 Boiler (Middle) [READ ONLY]	372	40373	00h 00h 01h = 0.001 kg-CO2 .			✓							
CO2 Boiler (Lower) [READ ONLY]	373	40374	FFh FFh FFh = 16777.215 kg-CO2			✓							
Energy Price – Electricity(Upper) [READ ONLY]	374	40375	Energy Price Electricity: (upper)(middle)(lower) 00h 00h 00h = 0.000 */kW			✓							
Energy Price – Electricity(Middle) [READ ONLY]	375	40376	00h 00h 01h = 0.001 */kW .			✓							
Energy Price – Electricity(Lower) [READ ONLY]	376	40377	FFh FFh FFh = 16777.215 */kW • - unit of user' s currency			✓							
OC Connection Error [READ ONLY]	377	40378	OC Connection Error:			✓							
RC Connection Error [READ ONLY]	378	40379	RC Connection Error:			✓							
Consumed Electric Power [READ ONLY]	379	40380	Consumed electric power/energy: 0 = 0 kW or Wh ..... 65535 = 65535 kW or Wh			✓							
Produced Power [READ ONLY]	380	40381	Produced heat power/energy: 0 = 0 kW or Wh ..... 65535 = 65535 kW or Wh			✓							
Calc Func Consumed Elec Energy [READ ONLY]	381	40382	Calculation function of consumed electrical energy: 0 = no function, 1 = with function			✓							
Calc Func Produced Energy [READ ONLY]	382	40383	Calculation function of produced energy: 0 = no function, 1 = with function			✓							
Heating Func On/Off [READ ONLY]	383	40384	Heating Function: 0 = OFF (inactive) 1 = ON (active)			✓							
Ext Outdoor Ambient [READ ONLY]	384	40385	Extended Outdoor Ambient Temperature: 0 = OFF 1 = ON			✓							

Holding Register (Analogue Output)				Applicable Unit Type									
Register Name	Addr	Modicon Address	Details	FTC4	FTC5	FTC6	CAHV master	CAHV slave	CRHV master	CRHV slave	QAHV master	EAHV / EACV master	EAHV / EACV slave
Mix Tank Water Temp (signed) [READ ONLY]	385	40386	Mixing tank water temperature: see note *			✓							
Mix Tank Water Temp [READ ONLY]	386	40387	Mixing tank water temperature: see note *			✓							
Condensing Temp (signed) [READ ONLY]	387	40388	Condensing temperature: see note *			✓							
Condensing Temp [READ ONLY]	388	40389	Condensing temperature: see note *			✓							
DipSwitch SW1 [READ ONLY]	389	40390	DipSW setting (SW1) lower byte: bit 0 = SW1-1..... bit 7 = SW1-8 upper byte: bit 0 = SW1-9 ... bit 1 = SW1-10			✓							
DipSwitch SW3 [READ ONLY]	390	40391	DipSW setting (SW3) lower byte: bit 0 = SW3-1..... bit 7 = SW3-8 upper byte: bit 0 = SW3-9 ... bit 1 = SW3-10			✓							
DipSwitch SW4 [READ ONLY]	391	40392	DipSW setting (SW4) lower byte: bit 0 = SW4-1..... bit 5 = SW4-6			✓							
DipSwitch SW5 [READ ONLY]	392	40393	DipSW setting (SW5) lower byte: bit 0 = SW5-1..... bit 7 = SW5-8			✓							
DipSwitch SW6 [READ ONLY]	393	40394	DipSW setting (SW6) lower byte: bit 0 = SW6-1..... bit 4 = SW6-5			✓							
Flow Rate 2 [READ ONLY]	394	40395	Flow rate 2: 0 = 0.0 L/min, 1 = 1.0 L/min ..... 255 = 255 L/min			✓							
Water Pump 4 On/Off [READ ONLY]	395	40396	Water Pump 4 On/Off: 0 = Stop, 1 = Run			✓							
2way Valve 2a On/Off [READ ONLY]	396	40397	2-way Valve 2a On/Off: 0 = Stop, 1 = Run			✓							
2way Valve 2b On/Off [READ ONLY]	397	40398	2-way Valve 2b On/Off: 0 = Stop, 1 = Run			✓							

Holding Register (Analogue Output)				Applicable Unit Type									
Register Name	Addr	Modicon Address	Details	FTC4	FTC5	FTC6	CAHV master	CAHV slave	CRHV master	CRHV slave	QAHV master	EAHV / EACV master	EAHV / EACV slave
Error Status 1 [READ ONLY]	398	40399	Error Status 1: 0 = Normal, 1 = Error Standby, 2 = Error			✓							
Error Status 2 [READ ONLY]	399	40400	Error Status 2 0 = Normal, 1 = Error Standby, 2 = Error			✓							
Error Status 3 [READ ONLY]	400	40401	Error Status 3 0 = Normal, 1 = Error Standby, 2 = Error			✓							
Error Status 4 [READ ONLY]	401	40402	Error Status 4 0 = Normal, 1 = Error Standby, 2 = Error			✓							
Error Status 5 [READ ONLY]	402	40403	Error Status 5 0 = Normal, 1 = Error Standby, 2 = Error			✓							
Error Status 6 [READ ONLY]	403	40404	Error Status 6 0 = Normal, 1 = Error Standby, 2 = Error			✓							
Error Status 7 [READ ONLY]	404	40405	Error Status 7 0 = Normal, 1 = Error Standby, 2 = Error			✓							
Error Status 8 [READ ONLY]	405	40406	Error Status 8 0 = Normal, 1 = Error Standby, 2 = Error			✓							
Error Status 9 [READ ONLY]	406	40407	Error Status 9 0 = Normal, 1 = Error Standby, 2 = Error			✓							
Error Status 10 [READ ONLY]	407	40408	Error Status 10 0 = Normal, 1 = Error Standby, 2 = Error			✓							
Error Status 34 [READ ONLY]	408	40409	Error Status 34 0 = Normal, 1 = Error Standby, 2 = Error			✓							
Error Status 11 [READ ONLY]	409	40410	Error Status 11: 0 = Normal, 1 = Error Standby, 2 = Error			✓							
Error Status 12 [READ ONLY]	410	40411	Error Status 12 0 = Normal, 1 = Error Standby, 2 = Error			✓							
Error Status 13 [READ ONLY]	411	40412	Error Status 13 0 = Normal, 1 = Error Standby, 2 = Error			✓							

Holding Register (Analogue Output)				Applicable Unit Type									
Register Name	Addr	Modicon Address	Details	FTC4	FTC5	FTC6	CAHV master	CAHV slave	CRHV master	CRHV slave	QAHV master	EAHV / EACV master	EAHV / EACV slave
Error Status 14 [READ ONLY]	412	40413	Error Status 14 0 = Normal, 1 = Error Standby, 2 = Error			✓							
Error Status 15 [READ ONLY]	413	40414	Error Status 15 0 = Normal, 1 = Error Standby, 2 = Error			✓							
Error Status 16 [READ ONLY]	414	40415	Error Status 16 0 = Normal, 1 = Error Standby, 2 = Error			✓							
Error Status 17 [READ ONLY]	415	40416	Error Status 17 0 = Normal, 1 = Error Standby, 2 = Error			✓							
Error Status 18 [READ ONLY]	416	40417	Error Status 18 0 = Normal, 1 = Error Standby, 2 = Error			✓							
Error Status 19 [READ ONLY]	417	40418	Error Status 19 0 = Normal, 1 = Error Standby, 2 = Error			✓							
Error Status 20 [READ ONLY]	418	40419	Error Status 20 0 = Normal, 1 = Error Standby, 2 = Error			✓							
Error Status 21 [READ ONLY]	419	40420	Error Status 21 0 = Normal, 1 = Error Standby, 2 = Error			✓							
Error Status 22 [READ ONLY]	420	40421	Error Status 22 0 = Normal, 1 = Error Standby, 2 = Error			✓							
Error Status 23 [READ ONLY]	421	40422	Error Status 11: 0 = Normal, 1 = Error Standby, 2 = Error			✓							
Error Status 24 [READ ONLY]	422	40423	Error Status 12 0 = Normal, 1 = Error Standby, 2 = Error			✓							
Error Status 25 [READ ONLY]	423	40424	Error Status 13 0 = Normal, 1 = Error Standby, 2 = Error			✓							
Error Status 26 [READ ONLY]	424	40425	Error Status 14 0 = Normal, 1 = Error Standby, 2 = Error			✓							
Error Status J* [READ ONLY]	425	40426	Error Status 15 0 = Normal, 1 = Error Standby, 2 = Error			✓							
Error Status 27 [READ ONLY]	426	40427	Error Status 16 0 = Normal, 1 = Error Standby, 2 = Error			✓							

Holding Register (Analogue Output)				Applicable Unit Type									
Register Name	Addr	Modicon Address	Details	FTC4	FTC5	FTC6	CAHV master	CAHV slave	CRHV master	CRHV slave	QAHV master	EAHV/EACV master	EAHV/EACV slave
Error Status 28 [READ ONLY]	427	40428	Error Status 17 0 = Normal, 1 = Error Standby, 2 = Error			✓							
Error Status 29 [READ ONLY]	428	40429	Error Status 18 0 = Normal, 1 = Error Standby, 2 = Error			✓							
Error Status 39 [READ ONLY]	429	40430	Error Status 39 0 = Normal, 1 = Error Standby, 2 = Error			✓							

\* Temperature in °C multiplied by 100.

0x8000 = -327.68°C

0x8001 = -327.67°C

...

0xFFFF = -0.01°C

0x0000 = 0.00°C

...

0x7FFE = 327.66°C

0x7FFF = 327.67°C

\*\* Temperature in °C multiplied by 100.

0x0000 = 0.00°C

0x0001 = 0.01°C

...

0x7FFE = 327.66°C

0x7FFF = 327.67°C

^ 7-Segment Display Error Code Digit 1

0 = A

1 = b

2 = E

3 = F

4 = J

5 = L  
6 = P  
7 = U

^^ 7-Segment Display Error Code Digit 2

1 – 15 = 1 - F

16 = O

17 = H

18 = J

19 = L

20 = P

21 = U

† Electric Energy

0x0000 = 0.00 kWh

0x0001 = 0.01 kWh

...

0xFFFFE = 655.34 kWh

0xFFFFF = 655.35 kWh

†† MRC Prohibit command must NOT be written to Shizuoka designed models

#1 Value always read as 0 on CAHV/CRHV 2013 models

#2 Value always read as 0 on CAHV/CRHV 2013 models

#3 Value always read as 0 on CAHV/CRHV 2013 models

#4 Stop and Cooling modes not supported on CAHV 2013 models

#5 Stop, Cooling and Legionella modes not supported on CRHV 2013 models

#6 This value is read only on FTC4 models

#7 Bit 4 not supported on CAHV/CRHV 2013 models and EAHV 2015 models

#8 This setting is not supported on CAHV 2013 models

#9 Range is -30..+50°C for CRHV/CAHV/EAHV models

#10 Range is 0..+50°C for CRHV/CAHV/EAHV models

#11 Range is +30..+65°C for CAHV models

#12 Range is +25..+65°C for CRHV models

#13 For EAHV 2015 models the modes Stop, Hot Water, No-Voltage Contact and Legionella are unsupported

#14 For CAHV/CRHV 2013 models and EAHV 2015 models settings Emergency Run and Test Run are unsupported

#15 Range is +40..+90°C for QAHV models

#16 Range is +30..+55°C for EAHV models (Heating)

Range is +5..+25°C for EAHV models (Cooling)

#17 "Error information of refrigerant system" for CAHV/CRHV/QAHV models

#18 Read only value

## 11.2. Input registers

Input Registers are read using function code 04.

Input Register (Analogue Input)				Applicable Unit Type										
Register Name	Addr	Modicon Address	Details	FTC4	FTC5	FTC6	CAHV master	CAHV slave	CRHV master	CRHV slave	QAHV master	EAHV/EACV master	EAHV/EACV slave	
Fault/Error Code (hex)	1	30002	0x8000 = No error 0x6999 = Bad communication with unit (Refer to indoor unit documentation for description of other fault code values)	✓	✓	✓	✓		✓		✓	✓		
MelcoBEMS MINI (A1M) Firmware Version	3	30004	MelcoBEMS MINI (A1M) Firmware Version	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Modbus Comms Counter	5	30006	Value of a counter which increments upon every valid Modbus command received. Value will automatically reset to zero when value exceeds 65535.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Fault Code (decimal)	8	30009	8000 = No error 6999 = Bad communication between A1M and unit (Refer to unit documentation for description of other fault code values)	✓	✓	✓	✓		✓		✓	✓		
System Type Detected	9	30010	0 = ATA unit connected 1 = ATW system connected 2 = Lossnay system connected 255 = Undetermined (no unit detected yet)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Own Refrigerant Address	25	30026	0 ... 32	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Defrost	26	30027	0 = Normal 1 = Standby 2 = Defrost 3 = Waiting Restart	✓	✓	✓	✓	✓			✓	✓	✓	
Residual Heat Removal	27	30028	0 = Normal 1 = Prepared 2 = Residual Heat Removal	✓	✓	✓								
Refrigerant Error Info	28	30029	0 = Normal 1 = Error (System) 2 = Error (Startup) 3 = Maintenance Error	✓	✓	✓	✓#2		✓#2		✓#2	✓		

Input Register (Analogue Input)				Applicable Unit Type										
Register Name	Addr	Modicon Address	Details	FTC4	FTC5	FTC6	CAHV master	CAHV slave	CRHV master	CRHV slave	QAHV master	EAHV / EACV master	EAHV / EACV slave	
7-Segment Display Error Code Digit 1	29	30030	(see note ^)	✓	✓	✓								
7-Segment Display Error Code Digit 2	30	30031	(see note ^^)	✓	✓	✓								
Status Of Heating	31	30032	0 = No type 1 = Heating C1 2 = Heating C2 3 = Heating C3	✓										
			0 = No type 1 = Heating/Cooling A1, Heating/Cooling B1, Heating/Cooling C1 2 = Heating/Cooling A2, Heating/Cooling B2, Heating/Cooling C2 3 = Heating/Cooling A3, Heating/Cooling B3, Heating/Cooling C3		✓	✓								
Heat Pump Frequency – Master	32	30033	Frequency value in Hz 0 = 0Hz ... 255 = 255Hz	✓	✓	✓	✓		✓		✓	✓		
Heat Pump Frequency – Slave 1	33	30034	Frequency value in Hz 0 = 0Hz ... 255 = 255Hz	✓	✓	✓	✓		✓		✓	✓		
Heat Pump Frequency – Slave 2	34	30035	Frequency value in Hz 0 = 0Hz ... 255 = 255Hz	✓	✓	✓	✓		✓		✓	✓		
Heat Pump Frequency – Slave 3	35	30036	Frequency value in Hz 0 = 0Hz ... 255 = 255Hz	✓	✓	✓	✓		✓		✓	✓		
Heat Pump Frequency – Slave 4	36	30037	Frequency value in Hz 0 = 0Hz ... 255 = 255Hz	✓	✓	✓	✓		✓		✓	✓		
Heat Pump Frequency – Slave 5	37	30038	Frequency value in Hz 0 = 0Hz ... 255 = 255Hz	✓	✓	✓	✓		✓		✓	✓		
Heat Pump Frequency – Slave 6	38	30039	Frequency value in Hz 0 = 0Hz ... 255 = 255Hz	✓	✓	✓	✓		✓		✓			
Heat Source Status	39	30040	0 = H/P 1 = IH 2 = BH 3 = IH + BH 4 = Boiler	✓	✓	✓								

Input Register (Analogue Input)				Applicable Unit Type											
Register Name	Addr	Modicon Address	Details	FTC4	FTC5	FTC6	CAHV master	CAHV slave	CRHV master	CRHV slave	QAHV master	EAHV / EACV master	EAHV / EACV slave		
Temperature Setpoint – Zone 1 (signed)	40	30041	Temperature value in °C multiplied by 100. (see note *)	✓	✓	✓									
Temperature Setpoint – Zone 1	41	30042	Temperature value in °C multiplied by 100. (see note **)	✓	✓	✓									
Temperature Setpoint – Zone 2 (signed)	42	30043	Temperature value in °C multiplied by 100. (see note *)	✓	✓	✓									
Temperature Setpoint – Zone 2	43	30044	Temperature value in °C multiplied by 100. (see note **)	✓	✓	✓									
Flow Temperature Setpoint – Zone 1 (signed)	44	30045	Temperature value in °C multiplied by 100. (see note *)	✓	✓	✓	✓	✓	✓	✓		✓	✓		
Flow Temperature Setpoint – Zone 1	45	30046	Temperature value in °C multiplied by 100. (see note **)	✓	✓	✓	✓	✓	✓	✓		✓	✓		
Flow Temperature Setpoint – Zone 2 (signed)	46	30047	Temperature value in °C multiplied by 100. (see note *)	✓	✓	✓									
Flow Temperature Setpoint – Zone 2	47	30048	Temperature value in °C multiplied by 100. (see note **)	✓	✓	✓									
Legionella Temperature Setpoint (signed)	48	30049	Temperature value in °C multiplied by 100. (see note *)	✓	✓	✓									
Legionella Temperature Setpoint	49	30050	Temperature value in °C multiplied by 100. (see note **)	✓	✓	✓									
DHW Temperature Drop (signed)	50	30051	Temperature value in °C multiplied by 10. 0xFF38 = -20.0°C ... 0x0433 = 107.5°C	✓	✓	✓									
DHW Temperature Drop	51	30052	Temperature value in °C multiplied by 10. 0x0000 = 0°C ... 0x0433 = 107.5°C 0 = 0.0°C ... 1075 = 107.5°C	✓	✓	✓									
Room Temperature – Zone 1 (signed)	52	30053	Temperature value in °C multiplied by 100. (see note *)	✓	✓	✓									
Room Temperature – Zone 1	53	30054	Temperature value in °C multiplied by 100. (see note **)	✓	✓	✓									

Input Register (Analogue Input)				Applicable Unit Type										
Register Name	Addr	Modicon Address	Details	FTC4	FTC5	FTC6	CAHV master	CAHV slave	CRHV master	CRHV slave	QAHV master	EAHV / EACV master	EAHV / EACV slave	
Room Temperature – Zone 2 (signed)	54	30055	Temperature value in °C multiplied by 100. (see note *)	✓	✓	✓								
Room Temperature – Zone 2	55	30056	Temperature value in °C multiplied by 100. (see note **)	✓	✓	✓								
Refrigerant Liquid Temperature (signed)	56	30057	Temperature value in °C multiplied by 100. (see note *)	✓	✓	✓								
Refrigerant Liquid Temperature	57	30058	Temperature value in °C multiplied by 100. (see note **)	✓	✓	✓								
Outdoor Ambient Temperature (signed)	58	30059	Temperature value in °C multiplied by 10. 0xFE70 = -40.0°C ... 0x036B = 87.5°C	✓	✓	✓	✓		✓	✓	✓	✓	✓	
Outdoor Ambient Temperature	59	30060	Temperature value in °C multiplied by 10. 0x0000 = 0.0°C ... 0x036B = 87.5°C.	✓	✓	✓	✓		✓	✓	✓	✓	✓	
Flow Temperature (signed)	60	30061	Temperature value in °C multiplied by 100. (see note *)	✓	✓	✓								
Water Outlet Temperature (signed)							✓	✓	✓	✓	✓	✓	✓	
Flow Temperature	61	30062	Temperature value in °C multiplied by 100. (see note **)	✓	✓	✓								
Water Outlet Temperature								✓	✓	✓	✓	✓	✓	✓
Return Temperature (signed)	62	30063	Temperature value in °C multiplied by 100. (see note *)	✓	✓	✓								
Water Inlet Temperature (signed)								✓	✓	✓	✓	✓	✓	✓
Return Temperature	63	30064	Temperature value in °C multiplied by 100. (see note **)	✓	✓	✓								
Water Inlet Temperature								✓	✓	✓	✓	✓	✓	✓
Tank Water Temperature (signed)	64	30065	Temperature value in °C multiplied by 100. (see note *)	✓	✓	✓								

Input Register (Analogue Input)				Applicable Unit Type										
Register Name	Addr	Modicon Address	Details	FTC4	FTC5	FTC6	CAHV master	CAHV slave	CRHV master	CRHV slave	QAHV master	EAHV / EACV master	EAHV / EACV slave	
Tank Water Temperature	65	30066	Temperature value in °C multiplied by 100. (see note **)	✓	✓	✓								
Flow Temperature – Zone 1 (signed)	66	30067	Temperature value in °C multiplied by 100. (see note *)	✓	✓	✓								
External Water Temperature 1 (signed)			Temperature value in °C multiplied by 100. (see note *)				✓		✓		✓	✓		
Flow Temperature – Zone 1	67	30068	Temperature value in °C multiplied by 100. (see note **)	✓	✓	✓								
External Water Temperature 1			Temperature value in °C multiplied by 100. (see note **)				✓		✓		✓	✓		
Return Temperature – Zone 1 (signed)	68	30069	Temperature value in °C multiplied by 100. (see note *)	✓	✓	✓								
External Water Temperature 3 (signed)			Temperature value in °C multiplied by 100. (see note *)								✓			
Return Temperature – Zone 1	69	30070	Temperature value in °C multiplied by 100. (see note **)	✓	✓	✓								
External Water Temperature 3			Temperature value in °C multiplied by 100. (see note **)								✓			
Flow Temperature – Zone 2 (signed)	70	30071	Temperature value in °C multiplied by 100. (see note *)	✓	✓	✓								
External Water Temperature 2 (signed)			Temperature value in °C multiplied by 100. (see note *)				✓		✓					
External Water Temperature 4 (signed)			Temperature value in °C multiplied by 100. (see note *)								✓			
Flow Temperature – Zone 2	71	30072	Temperature value in °C multiplied by 100. (see note **)	✓	✓	✓								
External Water Temperature 2			Temperature value in °C multiplied by 100. (see note **)				✓		✓					
External Water Temperature 4			Temperature value in °C multiplied by 100. (see note **)								✓			

Input Register (Analogue Input)				Applicable Unit Type										
Register Name	Addr	Modicon Address	Details	FTC4	FTC5	FTC6	CAHV master	CAHV slave	CRHV master	CRHV slave	QAHV master	EAHV / EACV master	EAHV / EACV slave	
Return Temperature – Zone 2 (signed)	72	30073	Temperature value in °C multiplied by 100. (see note *)	✓	✓	✓								
External Water Temperature 6 (signed)			Temperature value in °C multiplied by 100. (see note **)								✓			
Return Temperature – Zone 2	73	30074	Temperature value in °C multiplied by 100. (see note **)	✓	✓	✓								
External Water Temperature 6			Temperature value in °C multiplied by 100. (see note **)							✓				
Boiler Flow Temperature (signed)	74	30075	Temperature value in °C multiplied by 100. (see note *)	✓	✓	✓								
Boiler Flow Temperature	75	30076	Temperature value in °C multiplied by 100. (see note **)	✓	✓	✓								
Boiler Return Temperature (signed)	76	30077	Temperature value in °C multiplied by 100. (see note *)	✓	✓	✓								
Boiler Return Temperature	77	30078	Temperature value in °C multiplied by 100. (see note **)	✓	✓	✓								
DIP Switch SW2	78	30079	Bit 0 = Switch 2-1 (0 = OFF, 1 = ON) ... Bit 9 = Switch 2-10 (0 = OFF, 1 = ON)	✓	✓	✓								
Heat Pump Run Time (hours)	79	30080	Value in hours 0 = 0 Hours ... 99 = 99 Hours	✓	✓	✓	✓		✓					
Heat Pump Run Time (hours x100)	80	30081	Value in hours multiplied by 100 0 = 0 hours ... 65535 = 6553500 hours	✓	✓	✓	✓		✓					
Heat Pump Refrigerant Address 1 Run Time (hours x100)	81	30082	Value in hours multiplied by 100 0 = 0 hours ... 65535 = 6553500 hours	✓	✓	✓								
Heat Pump Refrigerant Address 2 Run Time (hours x100)	82	30083	Value in hours multiplied by 100 0 = 0 hours ... 65535 = 6553500 hours	✓	✓	✓								

Input Register (Analogue Input)				Applicable Unit Type										
Register Name	Addr	Modicon Address	Details	FTC4	FTC5	FTC6	CAHV master	CAHV slave	CRHV master	CRHV slave	QAHV master	EAHV / EACV master	EAHV / EACV slave	
Heat Pump Refrigerant Address 3 Run Time (hours x100)	83	30084	Value in hours multiplied by 100 0 = 0 hours ... 65535 = 6553500 hours	✓	✓	✓								
Heat Pump Refrigerant Address 4 Run Time (hours x100)	84	30085	Value in hours multiplied by 100 0 = 0 hours ... 65535 = 6553500 hours	✓	✓	✓								
Heat Pump Refrigerant Address 5 Run Time (hours x100)	85	30086	Value in hours multiplied by 100 0 = 0 hours ... 65535 = 6553500 hours	✓	✓	✓								
Heat Pump Refrigerant Address 6 Run Time (hours x100)	86	30087	Value in hours multiplied by 100 0 = 0 hours ... 65535 = 6553500 hours	✓	✓	✓								
Mixing Valve Step	87	30088	0 = Step 0 ... 10 = Step 10	✓	✓	✓								
Refrigerant 1 Error Code Digit 1	88	30089	(see note ^)	✓	✓	✓								
Refrigerant 1 Error Code Digit 2	89	30090	(see note ^^)	✓	✓	✓								
Refrigerant 2 Error Code Digit 1	90	30091	(see note ^)	✓	✓	✓								
Refrigerant 2 Error Code Digit 2	91	30092	(see note ^^)	✓	✓	✓								
Refrigerant 3 Error Code Digit 1	92	30093	(see note ^)	✓	✓	✓								
Refrigerant 3 Error Code Digit 2	93	30094	(see note ^^)	✓	✓	✓								
Refrigerant 4 Error Code Digit 1	94	30095	(see note ^)	✓	✓	✓								
Refrigerant 4 Error Code Digit 2	95	30096	(see note ^^)	✓	✓	✓								

Input Register (Analogue Input)				Applicable Unit Type										
Register Name	Addr	Modicon Address	Details	FTC4	FTC5	FTC6	CAHV master	CAHV slave	CRHV master	CRHV slave	QAHV master	EAHV / EACV master	EAHV / EACV slave	
Refrigerant 5 Error Code Digit 1	96	30097	(see note ^)	✓	✓	✓								
Refrigerant 5 Error Code Digit 2	97	30098	(see note ^^)	✓	✓	✓								
Refrigerant 6 Error Code Digit 1	98	30099	(see note ^)	✓	✓	✓								
Refrigerant 6 Error Code Digit 2	99	30100	(see note ^^)	✓	✓	✓								
Heat Pump Frequency – Slave 7	100	30101	Frequency value in Hz 0 = 0Hz ... 255 = 255Hz				✓		✓		✓			
Heat Pump Frequency – Slave 8	101	30102	Frequency value in Hz 0 = 0Hz ... 255 = 255Hz				✓		✓		✓			
Heat Pump Frequency – Slave 9	102	30103	Frequency value in Hz 0 = 0Hz ... 255 = 255Hz				✓		✓		✓			
Heat Pump Frequency – Slave 10	103	30104	Frequency value in Hz 0 = 0Hz ... 255 = 255Hz				✓		✓		✓			
Heat Pump Frequency – Slave 11	104	30105	Frequency value in Hz 0 = 0Hz ... 255 = 255Hz				✓		✓		✓			
Heat Pump Frequency – Slave 12	105	30106	Frequency value in Hz 0 = 0Hz ... 255 = 255Hz				✓		✓		✓			
Heat Pump Frequency – Slave 13	106	30107	Frequency value in Hz 0 = 0Hz ... 255 = 255Hz				✓		✓		✓			
Heat Pump Frequency – Slave 14	107	30108	Frequency value in Hz 0 = 0Hz ... 255 = 255Hz				✓		✓		✓			
Heat Pump Frequency – Slave 15	108	30109	Frequency value in Hz 0 = 0Hz ... 255 = 255Hz				✓		✓		✓			
Evaporating Temperature (signed)	109	30110	Temperature value in °C multiplied by 100. (see note *)				✓	✓	✓	✓	✓	✓	✓	
Evaporating Temperature	110	30111	Temperature value in °C multiplied by 100. (see note **)				✓	✓	✓	✓	✓	✓	✓	

Input Register (Analogue Input)				Applicable Unit Type											
Register Name	Addr	Modicon Address	Details	FTC4	FTC5	FTC6	CAHV master	CAHV slave	CRHV master	CRHV slave	QAHV master	EAHV / EACV master	EAHV / EACV slave		
Condensing Temperature (signed)	111	30112	Temperature value in °C multiplied by 100. (see note *)				✓	✓	✓	✓	✓	✓	✓		
Condensing Temperature	112	30113	Temperature value in °C multiplied by 100. (see note **)				✓	✓	✓	✓	✓	✓	✓		
Electric Energy 1	113	30114	Electric Energy in kWh multiplied by 100 (see note 1)				✓#1	✓#1	✓#1	✓#1		✓#1	✓#1		
Electric Energy 2	114	30115	Electric Energy in kWh multiplied by 100 (see note 1)				✓#1	✓#1	✓#1	✓#1		✓#1	✓#1		
Electric Energy 3	115	30116	Electric Energy in kWh multiplied by 100 (see note 1)				✓#1	✓#1	✓#1	✓#1		✓#1	✓#1		
Electric Energy 4	116	30117	Electric Energy in kWh multiplied by 100 (see note 1)				✓#1	✓#1	✓#1	✓#1		✓#1	✓#1		
Electric Energy 5	117	30118	Electric Energy in kWh multiplied by 100 (see note 1)				✓#1	✓#1	✓#1	✓#1		✓#1	✓#1		
Electric Energy 6	118	30119	Electric Energy in kWh multiplied by 100 (see note 1)				✓#1	✓#1	✓#1	✓#1		✓#1	✓#1		
Electric Energy 7	119	30120	Electric Energy in kWh multiplied by 100 (see note 1)				✓#1	✓#1	✓#1	✓#1		✓#1	✓#1		
Electric Energy 8	120	30121	Electric Energy in kWh multiplied by 100 (see note 1)				✓#1	✓#1	✓#1	✓#1		✓#1	✓#1		
Electric Energy 9	121	30122	Electric Energy in kWh multiplied by 100 (see note 1)				✓#1	✓#1	✓#1	✓#1		✓#1	✓#1		
Electric Energy 10	122	30123	Electric Energy in kWh multiplied by 100 (see note 1)				✓#1	✓#1	✓#1	✓#1		✓#1	✓#1		
Electric Energy 11	123	30124	Electric Energy in kWh multiplied by 100 (see note 1)				✓#1	✓#1	✓#1	✓#1		✓#1	✓#1		
Electric Energy 12	124	30125	Electric Energy in kWh multiplied by 100 (see note 1)				✓#1	✓#1	✓#1	✓#1		✓#1	✓#1		
Electric Energy 13	125	30126	Electric Energy in kWh multiplied by 100 (see note 1)				✓#1	✓#1	✓#1	✓#1		✓#1	✓#1		

Input Register (Analogue Input)				Applicable Unit Type											
Register Name	Addr	Modicon Address	Details	FTC4	FTC5	FTC6	CAHV master	CAHV slave	CRHV master	CRHV slave	QAHV master	EAHV / EACV master	EAHV / EACV slave		
Electric Energy 14	126	30127	Electric Energy in kWh multiplied by 100 (see note <sup>1</sup> )				✓#1	✓#1	✓#1	✓#1		✓#1	✓#1		
Electric Energy 15	127	30128	Electric Energy in kWh multiplied by 100 (see note <sup>1</sup> )				✓#1	✓#1	✓#1	✓#1		✓#1	✓#1		
Electric Energy 16	128	30129	Electric Energy in kWh multiplied by 100 (see note <sup>1</sup> )				✓#1	✓#1	✓#1	✓#1		✓#1	✓#1		
Brine Inlet Temperature (signed)	129	30130	Temperature value in °C multiplied by 100. (see note *)						✓	✓					
Brine Inlet Temperature	130	30131	Temperature value in °C multiplied by 100. (see note **)						✓	✓					
Brine Outlet Temperature 1 (signed)	131	30132	Temperature value in °C multiplied by 100. (see note *)						✓	✓					
Brine Outlet Temperature 1	132	30133	Temperature value in °C multiplied by 100. (see note **)						✓	✓					
Brine Outlet Temperature 2 (signed)	133	30134	Temperature value in °C multiplied by 100. (see note *)						✓	✓					
Brine Outlet Temperature 2	134	30135	Temperature value in °C multiplied by 100. (see note **)						✓	✓					
Condensing Temperature 2 (signed)	135	30136	Temperature value in °C multiplied by 100. (see note *)				✓	✓	✓	✓		✓	✓		
Condensing Temperature 2	136	30137	Temperature value in °C multiplied by 100. (see note **)				✓	✓	✓	✓		✓	✓		
Water Outlet Temperature 2 (signed)	137	30138	Temperature value in °C multiplied by 100. (see note *)				✓	✓	✓	✓		✓	✓		
Water Outlet Temperature 2	138	30139	Temperature value in °C multiplied by 100. (see note **)				✓	✓	✓	✓		✓	✓		
Evaporating Temperature 2 (signed)	139	30140	Temperature value in °C multiplied by 100. (see note *)				✓	✓	✓	✓		✓	✓		
Evaporating Temperature 2	140	30141	Temperature value in °C multiplied by 100. (see note **)				✓	✓	✓	✓		✓	✓		

Input Register (Analogue Input)				Applicable Unit Type											
Register Name	Addr	Modicon Address	Details	FTC4	FTC5	FTC6	CAHV master	CAHV slave	CRHV master	CRHV slave	QAHV master	EAHV / EACV master	EAHV / EACV slave		
Water Pump 1 – PWM Duty	141	30142	Duty value in % 0 = 0% ... 100 = 100%								✓				
Water Pump 1 – PWM Duty Feedback	142	30143	Duty value in % 0 = 0% ... 100 = 100%												
3-Way Valve 1	143	30144	0 = OFF (stop) 1 = ON (run)				✓				✓				
H/C Control Type	144	30145	0 = Heating 1 = Cooling	✓	✓	✓									
MRC Prohibit	145	30146	Bit packed value: Bit 0 – System On/Off (0 = ON, 1 = Prohibit) Bit 1 – Running Mode (0 = ON, 1 = Prohibit) Bit 2 – Setting Temp (0 = ON, 1 = Prohibit) Bit 3 – Undefined (always 0) Bit 4 – Function Setting (0 = Normal, 1 = Function Setting) Bits 5, 6 and 7 – Undefined (always 0)	✓	✓	✓	✓		✓						
Version of Protocol (upper)	146	30147	Version of Protocol is a value in BCD e.g. V3.01 = 3 (upper) and 1 (lower)	✓	✓	✓	✓	✓	✓	✓	✓				
Version of Protocol (lower)	147	30148	Version of Protocol is a value in BCD e.g. V3.01 = 3 (upper) and 1 (lower)	✓	✓	✓	✓	✓	✓	✓	✓				
Version of Model (upper)	148	30149	Version of Model is a value in BCD e.g. V2.00 = 2 (upper) and 0 (lower)	✓	✓	✓	✓	✓	✓	✓	✓				
Version of Model (lower)	149	30150	Version of Model is a value in BCD e.g. V2.00 = 2 (upper) and 0 (lower)	✓	✓	✓	✓	✓	✓	✓	✓				
Capacity of Supplying Electricity	150	30151	Value in Watts 0 = 0,0 W ... 255 = 25,5 W	✓	✓	✓	✓	✓	✓	✓	✓				

Input Register (Analogue Input)				Applicable Unit Type										
Register Name	Addr	Modicon Address	Details	FTC4	FTC5	FTC6	CAHV master	CAHV slave	CRHV master	CRHV slave	QAHV master	EAHV / EACV master	EAHV / EACV slave	
Model Profile 1	151	30152	0 = FTC2B 1 = FTC4 2 = FTC5 128 = CAHV1A 129 = CAHV1B 130 = CRHV1A 131 = CRHV1B 132 = EAHV1A 133 = EAHV1B 134 = QAHV1A 135 = QAHV1B 144 = PWFY1	✓	✓	✓	✓	✓	✓	✓				
Model Profile 2 (refrigerant address)	152	30153	0 = Address 0 ... 255 = Address 255  (addresses 7 – 255 not used for FTC)	✓	✓	✓	✓	✓	✓	✓				
Energy Consumption Measured Date – Year	153	30154	Date of last energy consumption measurement – Year		✓	✓								
Energy Consumption Measured Date – Month	154	30155	Date of last energy consumption measurement – Month		✓	✓								
Energy Consumption Measured Date – Day	155	30156	Date of last energy consumption measurement – Day		✓	✓								
Last Measured Heating Energy Consumption – kWh part	156	30157	Last measured heating energy consumption – kWh part of the value. 0 = 0kWh ... 65535 = 65535kWh		✓	✓								
Last Measured Heating Energy Consumption – Wh part	157	30158	Last measured heating energy consumption – Wh part of the value multiplied by 10. 0 = 0Wh ... 99 = 990Wh		✓	✓								
Last Measured Cooling Energy Consumption – kWh part	158	30159	Last measured cooling energy consumption – kWh part of the value. 0 = 0kWh ... 65535 = 65535kWh		✓	✓								
Last Measured Cooling Energy Consumption – Wh part	159	30160	Last measured cooling energy consumption – Wh part of the value multiplied by 10. 0 = 0Wh ... 99 = 990Wh		✓	✓								
Last Measured DHW Energy Consumption – kWh part	160	30161	Last measured DHW energy consumption – kWh part of the value. 0 = 0kWh ... 65535 = 65535kWh		✓	✓								

Input Register (Analogue Input)				Applicable Unit Type											
Register Name	Addr	Modicon Address	Details	FTC4	FTC5	FTC6	CAHV master	CAHV slave	CRHV master	CRHV slave	QAHV master	EAHV / EACV master	EAHV / EACV slave		
Last Measured DHW Energy Consumption – Wh part	161	30162	Last measured DHW energy consumption – Wh part of the value multiplied by 10. 0 = 0Wh ... 99 = 990Wh		✓	✓									
Last Measured Total Energy Consumption – kWh	162	30163	Last measured total energy consumption in Kwh. 0 = 0kWh ... 65535 = 65535kWh		✓	✓									
Energy Produced Measured Date – Year	163	30164	Date of last energy produced measurement – Year		✓	✓									
Energy Produced Measured Date – Month	164	30165	Date of last energy produced measurement – Month		✓	✓									
Energy Produced Measured Date – Day	165	30166	Date of last energy produced measurement – Day		✓	✓									
Last Measured Heating Energy Produced – kWh part	166	30167	Last measured heating energy produced – kWh part of the value. 0 = 0kWh ... 65535 = 65535kWh		✓	✓									
Last Measured Heating Energy Produced – Wh part	167	30168	Last measured heating energy produced – Wh part of the value multiplied by 10. 0 = 0Wh ... 99 = 990Wh		✓	✓									
Last Measured Cooling Energy Produced – kWh part	168	30169	Last measured cooling energy produced – kWh part of the value. 0 = 0kWh ... 65535 = 65535kWh		✓	✓									
Last Measured Cooling Energy Produced – Wh part	169	30170	Last measured cooling energy produced – Wh part of the value multiplied by 10. 0 = 0Wh ... 99 = 990Wh		✓	✓									
Last Measured DHW Energy Produced – kWh part	170	30171	Last measured DHW energy produced – kWh part of the value. 0 = 0kWh ... 65535 = 65535kWh		✓	✓									
Last Measured DHW Energy Produced – Wh part	171	30172	Last measured DHW energy produced – Wh part of the value multiplied by 10. 0 = 0Wh ... 99 = 990Wh		✓	✓									
Last Measured Total Energy Produced – kWh	172	30173	Last measured total energy produced in Kwh. 0 = 0kWh ... 65535 = 65535kWh		✓	✓									
Flow Rate	173	30174	Litres per minute 0 = 0 l/min ... 255 = 255 l/min		✓	✓									

Input Register (Analogue Input)				Applicable Unit Type											
Register Name	Addr	Modicon Address	Details	FTC4	FTC5	FTC6	CAHV master	CAHV slave	CRHV master	CRHV slave	QAHV master	EAHV / EACV master	EAHV / EACV slave		
Date – Year	193	30194	Date(year): 0 = 2000 ... 99 = 2099			✓									
Date – Month	194	30195	Date(month): 1 = January ... 12 = December			✓									
Date – Day	195	30196	Date(day): 1 ... 31			✓									
Time – Hour	196	30197	Time(hour): 0 ... 255			✓									
Time – Minute	197	30198	Time(minute): 0 ... 59			✓									
Time_Sec	198	30199	Time(sec): 0 ... 59			✓									
Version of main software	199	30200	Version of Software: e.g. version 01.23 is entered as 0123			✓									
Sub-version of software	200	30201	Sub-code Version of Software: e.g. "r01" = 0001, "t02" = 0102, "c03" = 0203			✓									
Emergency Operation Type	201	30202	Type of Emergency Prevention: 0 = Normal, 1 = Standby, 2 = Backup			✓									
Sensor Setting – Zone 1	202	30203	Zone 1 sensor setting: 0 = Main RC, 1-8 = RoomRC1-8, 15 = TH1			✓									
Sensor Setting – Zone 2	203	30204	Zone 2 sensor setting: 0 = Main RC, 1-8 = RoomRC1-8, 15 = TH1			✓									
Boiler Protection	204	30205	Boiler Protection: 0 = Normal, 1 = Prepared, 2 = Protected			✓									
Auto Restart at Pwr Failure	205	30206	Auto restart at power failure: 0 = Normal, 1 = Standby, 2 = IT initial setting standby			✓									
Demand of Heater	206	30207	Demand of heater operation: 0 = No demand, 1 = Run, 2 = Prohibit			✓									

Input Register (Analogue Input)				Applicable Unit Type											
Register Name	Addr	Modicon Address	Details	FTC4	FTC5	FTC6	CAHV master	CAHV slave	CRHV master	CRHV slave	QAHV master	EAHV / EACV master	EAHV / EACV slave		
Type Heating / Cooling	207	30208	Type Heating / Cooling: 0 = Type A, 1 = Type B, 2 = Type C			✓									
HP Thermo diff adj control – Zone 1	208	30209	Zone1 H/P thermos diff. adjustment control: 0 = Normal, 1 = discriminating, 2 = adjustment ° 3 = β, 4 = γ			✓									
HP Thermo diff adj control – Zone 2	209	30210	Zone2 H/P thermos diff. adjustment control: 0 = Normal, 1 = discriminating, 2 = adjustment ° 3 = β, 4 = γ			✓									
Slave Unit Connection Status	210	30211	Slave Unit Connection Status: Bit 0 = address 1..... Bit 5 = address 5 Value: 0 = unconnected, 1 = connected			✓									
Slave Unit Operating status	211	30212	Slave Unit Operation Status: Bit 0 = address 1..... Bit 5 = address 5 Value: 0 = Stop, 1 = Running			✓									
H/P Freq 4 Status	212	30213	Status of H/P frequency 4: 0 = 0 Hz ... 255 = 255 Hz			✓									
Heat Source Phase – DHW	213	30214	Heat Source Phase of DHW: 0 = Normal, 1 = H/P Phase, 2 = Heater Phase			✓									
Heat Source – judgement condition	214	30215	1 = Boiler - Emergency operation 2 = Heater - Emergency operation 3 = Boiler - External input (IN5) 4 = Boiler - Heat source setting [Boiler] 5 = Heater - Heat source setting [Heater] 6 = Standard - Heatsource setting [Standard] 7 = Heater - External input (IN5) 8 = Heater - Backup operation 9 = Heater - Demand from outdoor unit 10 = Boiler - External input (IN4) 11 = Boiler - Backup operation 12 = Boiler - Heat source setting [Hybrid] 13 = Heater - Low outdoor temp. operation 14 = Standard - Pumpdown operation 15 = Standard - Floor dry up operation 16 = Boiler - Indoor unit only operation 17 = Heater - Indoor unit only operation			✓									

Input Register (Analogue Input)				Applicable Unit Type										
Register Name	Addr	Modicon Address	Details	FTC4	FTC5	FTC6	CAHV master	CAHV slave	CRHV master	CRHV slave	QAHV master	EAHV / EACV master	EAHV / EACV slave	
Boiler Operation Hybrid Settings	215	30216	Boiler operation hybrid settings – Priority mode 0 = Ambient, 1 = Cost, 2 = CO2			✓								
CP Boiler (Upper)	216	30217	CP boiler: (upper)(middle)(lower) 00h 00h 00h = 0.000 */kW			✓								
CP Boiler (Middle)	217	30218	00h 00h 01h = 0.001 */kW .			✓								
CP Boiler (Lower)	218	30219	FFh FFh FFh = 16777.215 */kW • - unit of user's currency			✓								
CO2 Boiler (Upper)	219	30220	CO2 boiler: (upper)(middle)(lower) 00h 00h 00h = 0.000 kg-CO2			✓								
CO2 Boiler (Middle)	220	30221	00h 00h 01h = 0.001 kg-CO2 .			✓								
CO2 Boiler (Lower)	221	30222	FFh FFh FFh = 16777.215 kg-CO2			✓								
Energy Price – Electricity(Upper)	222	30223	Energy Price Electricity: (upper)(middle)(lower) 00h 00h 00h = 0.000 */kW			✓								
Energy Price – Electricity(Middle)	223	30224	00h 00h 01h = 0.001 */kW .			✓								
Energy Price – Electricity(Lower)	224	30225	FFh FFh FFh = 16777.215 */kW • - unit of user's currency			✓								
CO2 Boiler (Upper)	219	30220	CO2 boiler: (upper)(middle)(lower) 00h 00h 00h = 0.000 kg-CO2			✓								
CO2 Boiler (Middle)	220	30221	00h 00h 01h = 0.001 kg-CO2 .			✓								
CO2 Boiler (Lower)	221	30222	FFh FFh FFh = 16777.215 kg-CO2			✓								

Input Register (Analogue Input)				Applicable Unit Type											
Register Name	Addr	Modicon Address	Details	FTC4	FTC5	FTC6	CAHV master	CAHV slave	CRHV master	CRHV slave	QAHV master	EAHV / EACV master	EAHV / EACV slave		
Energy Price – Electricity(Upper)	222	30223	Energy Price Electricity: (upper)(middle)(lower) 00h 00h 00h = 0.000 */kW			✓									
Energy Price – Electricity(Middle)	223	30224	00h 00h 01h = 0.001 */kW .			✓									
Energy Price – Electricity(Lower)	224	30225	FFh FFh FFh = 16777.215 */kW • - unit of user' s currency			✓									
OC Connection Error	225	30226	OC Connection Error:			✓									
RC Connection Error	226	30227	RC Connection Error:			✓									
Consumed Electric Power	227	30228	Consumed electric power/energy: 0 = 0 kW or Wh ..... 65535 = 65535 kW or Wh			✓									
Produced Power	228	30229	Produced heat power/energy: 0 = 0 kW or Wh ..... 65535 = 65535 kW or Wh			✓									
Mix Tank Water Temp (signed)	229	30230	Mixing tank water temperature: see note *			✓									
Mix Tank Water Temp	230	30231	Mixing tank water temperature: see note *			✓									
Condensing Temp (signed)	231	30232	Condensing temperature: see note *			✓									
Condensing Temp	232	30233	Condensing temperature: see note *			✓									
DipSwitch SW1	233	30234	DipSW setting (SW1) lower byte: bit 0 = SW1-1..... bit 7 = SW1-8 upper byte: bit 0 = SW1-9 ... bit 1 = SW1-10			✓									
DipSwitch SW3	234	30235	DipSW setting (SW3) lower byte: bit 0 = SW3-1..... bit 7 = SW3-8 upper byte: bit 0 = SW3-9 ... bit 1 = SW3-10			✓									
DipSwitch SW4	235	30236	DipSW setting (SW4) lower byte: bit 0 = SW4-1..... bit 5 = SW4-6			✓									

Input Register (Analogue Input)				Applicable Unit Type										
Register Name	Addr	Modicon Address	Details	FTC4	FTC5	FTC6	CAHV master	CAHV slave	CRHV master	CRHV slave	QAHV master	EAHV / EACV master	EAHV / EACV slave	
DipSwitch SW5	236	30237	DipSW setting (SW5) lower byte: bit 0 = SW5-1..... bit 7 = SW5-8			✓								
DipSwitch SW6	237	30238	DipSW setting (SW6) lower byte: bit 0 = SW6-1..... bit 4 = SW6-5			✓								
Flow Rate 2	238	30239	Flow rate 2: 0 = 0.0 L/min, 1 = 1.0 L/min ..... 255 = 255 L/min			✓								
Error Status 1	239	30240	Error Status 1: 0 = Normal, 1 = Error Standby, 2 = Error			✓								
Error Status 2	240	30241	Error Status 2 0 = Normal, 1 = Error Standby, 2 = Error			✓								
Error Status 3	241	30242	Error Status 3 0 = Normal, 1 = Error Standby, 2 = Error			✓								
Error Status 4	242	30243	Error Status 4 0 = Normal, 1 = Error Standby, 2 = Error			✓								
Error Status 5	243	30244	Error Status 5 0 = Normal, 1 = Error Standby, 2 = Error			✓								
Error Status 6	244	30245	Error Status 6 0 = Normal, 1 = Error Standby, 2 = Error			✓								
Error Status 7	245	30246	Error Status 7 0 = Normal, 1 = Error Standby, 2 = Error			✓								
Error Status 8	246	30247	Error Status 8 0 = Normal, 1 = Error Standby, 2 = Error			✓								
Error Status 9	247	30248	Error Status 9 0 = Normal, 1 = Error Standby, 2 = Error			✓								
Error Status 10	248	30249	Error Status 10 0 = Normal, 1 = Error Standby, 2 = Error			✓								
Error Status 34	249	30250	Error Status 34 0 = Normal, 1 = Error Standby, 2 = Error			✓								
Error Status 11	250	30251	Error Status 11: 0 = Normal, 1 = Error Standby, 2 = Error			✓								

Input Register (Analogue Input)				Applicable Unit Type											
Register Name	Addr	Modicon Address	Details	FTC4	FTC5	FTC6	CAHV master	CAHV slave	CRHV master	CRHV slave	QAHV master	EAHV / EACV master	EAHV / EACV slave		
Error Status 12	251	30252	Error Status 12 0 = Normal, 1 = Error Standby, 2 = Error			✓									
Error Status 13	252	30253	Error Status 13 0 = Normal, 1 = Error Standby, 2 = Error			✓									
Error Status 14	253	30254	Error Status 14 0 = Normal, 1 = Error Standby, 2 = Error			✓									
Error Status 15	254	30255	Error Status 15 0 = Normal, 1 = Error Standby, 2 = Error			✓									
Error Status 16	255	30256	Error Status 16 0 = Normal, 1 = Error Standby, 2 = Error			✓									
Error Status 17	256	30257	Error Status 17 0 = Normal, 1 = Error Standby, 2 = Error			✓									
Error Status 18	257	30258	Error Status 18 0 = Normal, 1 = Error Standby, 2 = Error			✓									
Error Status 19	258	30259	Error Status 19 0 = Normal, 1 = Error Standby, 2 = Error			✓									
Error Status 20	259	30260	Error Status 20 0 = Normal, 1 = Error Standby, 2 = Error			✓									
Error Status 21	260	30261	Error Status 21 0 = Normal, 1 = Error Standby, 2 = Error			✓									
Error Status 22	261	30262	Error Status 22 0 = Normal, 1 = Error Standby, 2 = Error			✓									
Error Status 23	262	30263	Error Status 11: 0 = Normal, 1 = Error Standby, 2 = Error			✓									
Error Status 24	263	30264	Error Status 12 0 = Normal, 1 = Error Standby, 2 = Error			✓									
Error Status 25	264	30265	Error Status 13 0 = Normal, 1 = Error Standby, 2 = Error			✓									
Error Status 26	265	30266	Error Status 14 0 = Normal, 1 = Error Standby, 2 = Error			✓									

Input Register (Analogue Input)				Applicable Unit Type										
Register Name	Addr	Modicon Address	Details	FTC4	FTC5	FTC6	CAHV master	CAHV slave	CRHV master	CRHV slave	QAHV master	EAHV / EACV master	EAHV / EACV slave	
Error Status J*	266	30267	Error Status 15 0 = Normal, 1 = Error Standby, 2 = Error			✓								
Error Status 27	267	30268	Error Status 16 0 = Normal, 1 = Error Standby, 2 = Error			✓								
Error Status 28	268	30269	Error Status 17 0 = Normal, 1 = Error Standby, 2 = Error			✓								
Error Status 29	269	30270	Error Status 18 0 = Normal, 1 = Error Standby, 2 = Error			✓								
Error Status 39	270	30271	Error Status 39 0 = Normal, 1 = Error Standby, 2 = Error			✓								

\* Temperature in °C multiplied by 100.

0x8000 = -327.68°C

0x8001 = -327.67°C

...

0xFFFF = -0.01°C

0x0000 = 0.00°C

...

0x7FFE = 327.66°C

0x7FFF = 327.67°C

\*\* Temperature in °C multiplied by 100.

0x0000 = 0.00°C

0x0001 = 0.01°C

...

0x7FFE = 327.66°C

0x7FFF = 327.67°C

^ 7-Segment Display Error Code Digit 1

0 = A  
1 = b  
2 = E  
3 = F  
4 = J  
5 = L  
6 = P  
7 = U

^^ 7-Segment Display Error Code Digit 2

1 – 15 = 1 - F  
16 = O  
17 = H  
18 = J  
19 = L  
20 = P  
21 = U

† Electric Energy

0x0000 = 0.00 kWh  
0x0001 = 0.01 kWh  
...  
0xFFFFE = 655.34 kWh  
0xFFFFF = 655.35 kWh

#1 Value always read as 0 on CAHV/CRHV 2013 models

#2 “Error information of refrigerant system” for CAHV/CRHV/QAHV models

### 11.3. Coils

Coils are read using function code 01 and written to using either function code 05 or 15. Function code 05 is used when writing to a single coil register, function code 15 is used for writing to multiple coil registers in the same command.

Coil (Digital Output)				Applicable Unit Type										
Register Name	Addr	Modicon Address	Details	FTC4	FTC5	FTC6	CAHV master	CAHV slave	CRHV master	CRHV slave	QAHV master	EAHV/EACV master	EAHV/EACV slave	
System ON/OFF	1	00002	0 = System OFF 1 = System ON (Note: Reading back value 1 could indicate the unit is in Emergency Run or Test Run mode)	✓	✓	✓	✓	(✓) #1	✓	(✓) #1	✓	✓	(✓) #1	

#1 Read only value

## 11.4. Discrete Inputs

Discrete Inputs are read using function code 02.

Discrete Input (Digital Input)				Applicable Unit Type										
Register Name	Addr	Modicon Address	Details	FTC4	FTC5	FTC6	CAHV master	CAHV slave	CRHV master	CRHV slave	QAHV master	EAHV / EACV master	EAHV / EACV slave	
Room Thermo 1 (IN1)	0	10001	0 = OFF, 1 = ON	✓	✓	✓								
Room Thermo 2 (IN6)	1	10002	0 = OFF, 1 = ON	✓	✓	✓								
Flow SW1 (IN2)	2	10003	0 = OFF, 1 = ON	✓	✓	✓								
Flow SW2 (IN3)	3	10004	0 = OFF, 1 = ON	✓	✓	✓								
Flow SW3 (IN7)	4	10005	0 = OFF, 1 = ON	✓	✓	✓								
Demand (IN4)	5	10006	0 = OFF, 1 = ON	✓	✓	✓								
Outdoor Thermo (IN5)	6	10007	0 = OFF, 1 = ON	✓	✓	✓								
Heat Pump Master ON/OFF	7	10008	0 = Stop, 1 = Run	✓	✓	✓	✓		✓		✓	✓		
Heat Pump Slave 1 ON/OFF (address 2 for CAHV/CRHV)	8	10009	0 = Stop, 1 = Run	✓	✓	✓	✓		✓		✓	✓		
Heat Pump Slave 2 ON/OFF (address 3 for CAHV/CRHV)	9	10010	0 = Stop, 1 = Run	✓	✓	✓	✓		✓					
Heat Pump Slave 3 ON/OFF (address 4 for CAHV/CRHV)	10	10011	0 = Stop, 1 = Run	✓	✓	✓	✓		✓					
Heat Pump Slave 4 ON/OFF (address 5 for CAHV/CRHV)	11	10012	0 = Stop, 1 = Run	✓	✓	✓	✓		✓					
Heat Pump Slave 5 ON/OFF (address 6 for CAHV/CRHV)	12	10013	0 = Stop, 1 = Run	✓	✓	✓	✓		✓					

Discrete Input (Digital Input)				Applicable Unit Type											
Register Name	Addr	Modicon Address	Details	FTC4	FTC5	FTC6	CAHV master	CAHV slave	CRHV master	CRHV slave	QAHV master	EAHV / EACV master	EAHV / EACV slave		
Heat Pump Slave 6 ON/OFF (address 7 for CAHV/CRHV)	13	10014	0 = Stop, 1 = Run	✓	✓	✓	✓		✓						
Heat Pump Slave 7 ON/OFF (address 8 for CAHV/CRHV)	14	10015	0 = Stop, 1 = Run				✓		✓						
Heat Pump Slave 8 ON/OFF (address 9 for CAHV/CRHV)	15	10016	0 = Stop, 1 = Run				✓		✓						
Boiler ON/OFF	16	10017	0 = Stop, 1 = Run	✓	✓	✓						✓	✓		
External Heater Operation 1			0 = Stop, 1 = Run				✓		✓						
Booster Heater 1 ON/OFF	17	10018	0 = Stop, 1 = Run	✓	✓	✓									
Booster Heater 2 ON/OFF	18	10019	0 = Stop, 1 = Run	✓	✓	✓									
Booster Heater 2+ ON/OFF	19	10020	0 = Stop, 1 = Run	✓	✓	✓									
Immersion Heater ON/OFF	20	10021	0 = Stop, 1 = Run	✓	✓	✓									
Water Pump 1 ON/OFF	21	10022	0 = Stop, 1 = Run	✓	✓	✓	✓		✓	✓	✓	✓	✓		
Water Pump 2 ON/OFF	22	10023	0 = Stop, 1 = Run	✓	✓	✓	✓								
Water Pump 3 ON/OFF	23	10024	0 = Stop, 1 = Run	✓	✓	✓	✓								
3-Way Valve ON/OFF	24	10025	0 = Stop, 1 = Run	✓	✓	✓									
2-Way Valve 2 ON/OFF	25	10026	0 = Stop, 1 = Run	✓	✓	✓									
Heat Pump 10 ON/OFF	26	10027	0 = Stop, 1 = Run				✓		✓		✓				

Discrete Input (Digital Input)				Applicable Unit Type										
Register Name	Addr	Modicon Address	Details	FTC4	FTC5	FTC6	CAHV master	CAHV slave	CRHV master	CRHV slave	QAHV master	EAHV / EACV master	EAHV / EACV slave	
Heat Pump 11 ON/OFF	27	10028	0 = Stop, 1 = Run				✓		✓		✓			
Heat Pump 12 ON/OFF	28	10029	0 = Stop, 1 = Run				✓		✓		✓			
Heat Pump 13 ON/OFF	29	10030	0 = Stop, 1 = Run				✓		✓		✓			
Heat Pump 14 ON/OFF	30	10031	0 = Stop, 1 = Run				✓		✓		✓			
Heat Pump 15 ON/OFF	31	10032	0 = Stop, 1 = Run				✓		✓		✓			
Heat Pump 16 ON/OFF	32	10033	0 = Stop, 1 = Run				✓		✓		✓			
Heat Pump 17 ON/OFF	33	10034	0 = Stop, 1 = Run				✓		✓		✓			
Heat Pump 18 ON/OFF	34	10035	0 = Stop, 1 = Run				✓#1		✓#1					
Heat Pump 19 ON/OFF	35	10036	0 = Stop, 1 = Run				✓#1		✓#1					
Heat Pump 20 ON/OFF	36	10037	0 = Stop, 1 = Run				✓#1		✓#1					
Heat Pump 21 ON/OFF	37	10038	0 = Stop, 1 = Run				✓#1		✓#1					
Heat Pump 22 ON/OFF	38	10039	0 = Stop, 1 = Run				✓#1		✓#1					
Heat Pump 23 ON/OFF	39	10040	0 = Stop, 1 = Run				✓#1		✓#1					
Heat Pump 24 ON/OFF	40	10041	0 = Stop, 1 = Run				✓#1		✓#1					
Heat Pump 25 ON/OFF	41	10042	0 = Stop, 1 = Run				✓#1		✓#1					

Discrete Input (Digital Input)				Applicable Unit Type										
Register Name	Addr	Modicon Address	Details	FTC4	FTC5	FTC6	CAHV master	CAHV slave	CRHV master	CRHV slave	QAHV master	EAHV / EACV master	EAHV / EACV slave	
Heat Pump 26 ON/OFF	42	10043	0 = Stop, 1 = Run				✓#1		✓#1					
Heat Pump 27 ON/OFF	43	10044	0 = Stop, 1 = Run				✓#1		✓#1					
Heat Pump 28 ON/OFF	44	10045	0 = Stop, 1 = Run				✓#1		✓#1					
Heat Pump 29 ON/OFF	45	10046	0 = Stop, 1 = Run				✓#1		✓#1					
Heat Pump 30 ON/OFF	46	10047	0 = Stop, 1 = Run				✓#1		✓#1					
Heat Pump 31 ON/OFF	47	10048	0 = Stop, 1 = Run				✓#1		✓#1					
Heat Pump 32 ON/OFF	48	10049	0 = Stop, 1 = Run				✓#1		✓#1					
	49 - 64	10050 - 10065	Reserved											
External Heater ON/OFF	65	10066	0 = Stop, 1 = Run						✓#1					
Water Pump 4 ON/OFF	66	10067	0 = Stop, 1 = Run				✓							
Water Pump 5 ON/OFF	67	10068	0 = Stop, 1 = Run				✓							
Water Pump 6 ON/OFF	68	10069	0 = Stop, 1 = Run				✓							
Water Pump 7 ON/OFF	69	10070	0 = Stop, 1 = Run				✓							
Water Pump 8 ON/OFF	70	10071	0 = Stop, 1 = Run				✓							
Water Pump 9 ON/OFF	71	10072	0 = Stop, 1 = Run				✓							

Discrete Input (Digital Input)				Applicable Unit Type										
Register Name	Addr	Modicon Address	Details	FTC4	FTC5	FTC6	CAHV master	CAHV slave	CRHV master	CRHV slave	QAHV master	EAHV / EACV master	EAHV / EACV slave	
Water Pump 10 ON/OFF	72	10073	0 = Stop, 1 = Run				✓							
Water Pump 11 ON/OFF	73	10074	0 = Stop, 1 = Run				✓							
Water Pump 12 ON/OFF	74	10075	0 = Stop, 1 = Run				✓							
Water Pump 13 ON/OFF	75	10076	0 = Stop, 1 = Run				✓							
Water Pump 14 ON/OFF	76	10077	0 = Stop, 1 = Run				✓							
Water Pump 15 ON/OFF	77	10078	0 = Stop, 1 = Run				✓							
Water Pump 16 ON/OFF	78	10079	0 = Stop, 1 = Run				✓							
Drain Pan Heater ON/OFF	79	10080	0 = Stop, 1 = Run						✓	✓		✓	✓	
Antifreeze piping heater operation ON/OFF			0 = Stop, 1 = Run								✓			

Discrete Input (Digital Input)				Applicable Unit Type											
Register Name	Addr	Modicon Address	Details	FTC4	FTC5	FTC6	CAHV master	CAHV slave	CRHV master	CRHV slave	QAHV master	EAHV / EACV master	EAHV / EACV slave		
Legionella Prevention	98	10099	Demand of Legionella Prevention; 0 = Normal, 1 = Legionella Prevention			✓									
Outdoor Unit – Freeze Stat Func	99	10100	Freeze stat function for outdoor unit: 0 = Normal, 1 = Freeze stat			✓									
Heat Source Type	100	10101	Type of Heat Source: 0 = Fixed, 1 = Auto			✓									
Calc Func Consumed Elec Energy	101	10102	Calculation function of consumed electrical energy: 0 = no function, 1 = with function			✓									
Calc Func Produced Energy	102	10103	Calculation function of produced energy: 0 = no function, 1 = with function			✓									
Heating Func On/Off	103	10104	Heating Function: 0 = OFF (inactive) 1 = ON (active)			✓									
Ext Outdoor Ambient	104	10105	Extended Outdoor Ambient Temperature: 0 = OFF 1 = ON			✓									
Water Pump 4 On/Off	105	10106	Water Pump 4 On/Off: 0 = Stop, 1 = Run			✓									
2way Valve 2a On/Off	106	10107	2-way Valve 2a On/Off: 0 = Stop, 1 = Run			✓									
2way Valve 2b On/Off	107	10108	2-way Valve 2b On/Off: 0 = Stop, 1 = Run			✓									

#1 Value always read as 0 on CAHV/CRHV 2013 models

## 12. Modbus tables – Lossnay systems

Some BMS controllers can only read Modbus Holding Registers, so the MelcoBEMS MINI (A1M+) also exposes all Discrete, Coil and Input Registers as Holding Registers. The Discrete Input registers and Input registers are not writable so their equivalent Holding Register is read only and marked [**READ ONLY**].

Some BMS controllers may not be able to read signed register values (i.e. values which can be negative in value), so the A1M+ also exposes an unsigned version of those registers (these registers will not return a negative value).

### 12.1. Holding registers

Holding Registers are read using function code 03 and written to using either function code 06 or 16. Function code 06 is used when writing to a single holding register, function code 16 is used for writing to multiple holding registers in the same command.

Holding Register (Analogue Output)				Applicable Unit Type		
Register Name	Addr	Modicon Address	Details	Lossnay LGH Series	Lossnay VL Series	
Modbus Slave ID	4	40005	Values 1 – 247 valid	✓	✓	
Modbus RS-485 Baud Rate	5	40006	0 = 9600 1 = 1200 2 = 2400 3 = 4800 4 = 9600 5 = 14400 6 = 19200 7 = 28800 8 = 38400 9 = 56000 10 = 57600 11 = 115200	✓	✓	

Holding Register (Analogue Output)				Applicable Unit Type		
Register Name	Addr	Modicon Address	Details	Lossnay LGH Series	Lossnay VL Series	
RS-485 Parity Type	6	40007	0 = None 1 = Even 2 = Odd	✓	✓	
Fault/Error Code (hex) [READ ONLY]	9	40010	0x8000 = No error 0x6999 = Bad communication with unit (Refer to indoor unit documentation for description of other fault code values)	✓	✓	
MelcoBEMS MINI (A1M+) Firmware Version [READ ONLY]	10	40011	MelcoBEMS MINI (A1M+) Firmware Version	✓	✓	
Modbus Comms Counter [READ ONLY]	11	40012	Value of a counter which increments upon every valid Modbus command received. Counter is reset to zero when value exceeds 65535.	✓	✓	
System Type Detected [READ ONLY]	13	40014	0 = ATA unit connected 1 = ATW system connected 2 = Lossnay system connected 255 = Undetermined (no unit detected yet)	✓	✓	
Power On/Off	300	40301	0 = Power OFF 1 = Power ON	✓	✓	
Operating Mode	301	40302	1 = Heat 3 = Cool 7 = Fan 8 = Auto			
Ventilation Mode	302	40303	0 = Lossnay mode 1 = Bypass mode 2 = Auto mode	✓	✓	
Fan Speed A	303	40304	0 = Auto 1 = Speed 1 2 = Speed 2 3 = Speed 3 4 = Speed 4	✓#2	✓#2	
Temperature Setpoint A	304	40305	Temperature value in °C multiplied by 10. 0 = 0°C ... 400 = 40°C  Note: Only available when 'Set Temperature on Temperature Control Unit' value = 1 or 2.			

Holding Register (Analogue Output)				Applicable Unit Type		
Register Name	Addr	Modicon Address	Details	Lossnay LGH Series	Lossnay VL Series	
Supply Air Temperature [READ ONLY]	305	40306	Temperature value in °C multiplied by 10. 0 = 0°C ... 400 = 40°C  Note: Only available when 'Supply Air Temperature Sensor' value = 1 (Equipped).			
Outdoor Temperature (signed) [READ ONLY]	306	40307	Temperature value in °C multiplied by 10. (see note *)  Note: Only available when 'Outdoor Temperature Sensor' value = 1 (Equipped).	✓	✓	
Outdoor Temperature [READ ONLY]	307	40308	Temperature value in °C multiplied by 10. (see note **)  Note: Only available when 'Outdoor Temperature Sensor' value = 1 (Equipped).	✓	✓	
Room Temperature A [READ ONLY]	308	40309	Temperature value in °C multiplied by 10. 0 = 0°C ... 400 = 40°C  Note: Only available when 'Return Air Temperature Sensor' value = 1 (Equipped).	✓	✓	
Room CO2 Level [READ ONLY]	309	40310	CO2 level divided by 10. 0 = 0ppm ... 240 = 2400 and above. [Value 254 = Under detecting] [Value 255 = No sensor]  Note: Only available when 'CO2 Level Sensor' value = 1 (Equipped).			
Fault/Error Code (hex) [READ ONLY]	310	40311	0x8000 = No error 0x6999 = Bad communication with unit (Refer to Lossnay unit documentation for description of other fault code values)	✓	✓	
Fault/Error Code (decimal) [READ ONLY]	311	40312	8000 = No error 6999 = Bad communication with unit (Refer to Lossnay unit documentation for description of other fault code values)	✓	✓	
Thermo On/Off [READ ONLY]	312	40313	0 = Thermo OFF 1 = Thermo ON			

Holding Register (Analogue Output)				Applicable Unit Type		
Register Name	Addr	Modicon Address	Details	Lossnay LGH Series	Lossnay VL Series	
Energy Consumption [READ ONLY]	313	40314	Value in kWh multiplied by 10. 0 = 0kWh ... 65535 = 6553.5kWh	✓	✓	
Actual Operation Mode [READ ONLY]	314	40315	0 = Not auto mode 1 = Determining 2 = Heating 3 = Cooling			
Auto Fan Speed Control Availability [READ ONLY]	315	40316	0 = Not available 1 = Available			
Night Purge [READ ONLY]	316	40317	0 = Normal operation 1 = In night purge operation  During night-purge operation: - Pressing ON/OFF button starts normal operation. - When pressing the Ventilation button the Lossnay remains in bypass mode	✓	✓	
Maintenance Sign [READ ONLY]	317	40318	0 = Inactive 1 = Active	✓	✓	
Filter Sign [READ ONLY]	318	40319	0 = Inactive 1 = Active	✓	✓	
Actual Ventilation Mode [READ ONLY]	319	40320	0 = Lossnay ventilation 1 = Bypass ventilation	✓	✓	
Actual Supply Fan Speed [READ ONLY]	320	40321	0 = Stop 1 = Speed 1 2 = Speed 2 3 = Speed 3 4 = Speed 4	✓	✓	
Actual Extract Fan Speed [READ ONLY]	321	40322	0 = Stop 1 = Speed 1 2 = Speed 2 3 = Speed 3 4 = Speed 4	✓	✓	
Setpoint 0.5°C Increments Availability [READ ONLY]	322	40323	0 = Not available 1 = Available			

Holding Register (Analogue Output)				Applicable Unit Type		
Register Name	Addr	Modicon Address	Details	Lossnay LGH Series	Lossnay VL Series	
Heat/Cool or Cool-Only [READ ONLY]	323	40324	0 = Heat and Cool 1 = Cool only			
Auto Operation Mode Availability [READ ONLY]	324	40325	0 = Not available 1 = Available			
Heat/Cool or Heat-Only [READ ONLY]	325	40324	0 = Heat and Cool 1 = Heat only			
Minimum Cooling Setpoint [READ ONLY]	326	40327	Temperature value in °C multiplied by 10. 0 = 0°C ... 400 = 40°C  Note: Only available when 'Set Temperature on Temperature Control Unit' value = 1 or 2.			
Maximum Cooling Setpoint [READ ONLY]	327	40328	Temperature value in °C multiplied by 10. 0 = 0°C ... 400 = 40°C  Note: Only available when 'Set Temperature on Temperature Control Unit' value = 1 or 2.			
Minimum Heating Setpoint [READ ONLY]	328	40329	Temperature value in °C multiplied by 10. 0 = 0°C ... 400 = 40°C  Note: Only available when 'Set Temperature on Temperature Control Unit' value = 1 or 2.			
Maximum Heating Setpoint [READ ONLY]	329	40330	Temperature value in °C multiplied by 10. 0 = 0°C ... 400 = 40°C  Note: Only available when 'Set Temperature on Temperature Control Unit' value = 1 or 2.			
Minimum Auto Setpoint [READ ONLY]	330	40331	Temperature value in °C multiplied by 10. 0 = 0°C ... 400 = 40°C  Note: Only available when 'Set Temperature on Temperature Control Unit' value = 1 or 2.			
Maximum Auto Setpoint [READ ONLY]	331	40332	Temperature value in °C multiplied by 10. 0 = 0°C ... 400 = 40°C  Note: Only available when 'Set Temperature on Temperature Control Unit' value = 1 or 2.			

Holding Register (Analogue Output)				Applicable Unit Type		
Register Name	Addr	Modicon Address	Details	Lossnay LGH Series	Lossnay VL Series	
Energy Consumption Data Available [READ ONLY]	332	40333	0 = Not available 1 = Available	✓	✓	
Number of Fan Speeds [READ ONLY]	333	40334	Values 1 – 4 valid.	✓	✓	
Bypass Damper Available [READ ONLY]	334	40335	0 = Not available 1 = Available	✓	✓	
Auto Ventilation Mode Available [READ ONLY]	335	40336	0 = Not available 1 = Available	✓	✓	
Operation Mode of Temperature Control Unit [READ ONLY]	336	40337	0 = Not available (not connected) 1 = Available (connected)			
Set Temperature on Temperature Control Unit [READ ONLY]	337	40338	0 = No set temperature display 1 = RA (Return Air) temperature 2 = SA (Supply Air) temperature			
Outdoor Temperature Sensor [READ ONLY]	338	40339	0 = Not equipped 1 = Equipped	✓	✓	
Return Air Temperature Sensor [READ ONLY]	339	40340	0 = Not equipped 1 = Equipped	✓	✓	
Supply Air Temperature Sensor [READ ONLY]	340	40341	0 = Not equipped 1 = Equipped			
CO2 Level Sensor [READ ONLY]	341	40342	0 = Not equipped 1 = Equipped			

\* Temperature in °C multiplied by 10.

0xFDD0 = -56.0°C  
0xFDD5 = -55.5 °C

...

0xFFFFB = -0.5°C  
0x0000 = 0.0°C  
0x0005 = 0.5 °C

...

0x0271 = 62.5°C  
0x0276 = 63.0°C

[0x7FFE = Under detecting]

[0x7FFF = No thermistor connected]

\*\* Temperature in °C multiplied by 10.

0x0000 = 0.0°C  
0x0005 = 5.0°C

...

0x0271 = 62.5°C  
0x0276 = 63.0°C

[0x7FFE = Under detecting]

[0x7FFF = No thermistor connected]

#1 Lossnay ventilation mode supported only, Bypass and Auto modes not supported.

#2 Auto fan speed (value 0) not supported.

## 12.2. Input registers

Input Registers are read using function code 04.

Input Register (Analogue Input)				Applicable Unit Type		
Register Name	Addr	Modicon Address	Details	Lossnay LGH Series	Lossnay VL Series	
MelcoBEMS MINI (A1M+) Firmware Version	3	30004	MelcoBEMS MINI (A1M+) Firmware Version	✓	✓	
Modbus Comms Counter	5	30006	Value of a counter which increments upon every valid Modbus command received. Value will automatically reset to zero when value exceeds 65535.	✓	✓	
System Type Detected	9	30010	0 = ATA unit connected 1 = ATW system connected 2 = Lossnay system connected 255 = Undetermined (no unit detected yet)	✓	✓	
Supply Air Temperature	174	30175	Temperature value in °C multiplied by 10. 0 = 0°C ... 400 = 40°C  Note: Only available when 'Supply Air Temperature Sensor' value = 1 (Equipped).			
Outdoor Temperature (signed)	175	30176	Temperature value in °C multiplied by 10. (see note *)  Note: Only available when 'Outdoor Temperature Sensor' value = 1 (Equipped).	✓	✓	
Outdoor Temperature	176	30177	Temperature value in °C multiplied by 10. (see note **)  Note: Only available when 'Outdoor Temperature Sensor' value = 1 (Equipped).	✓	✓	
Room Temperature A	177	30178	Temperature value in °C multiplied by 10. 0 = 0°C ... 400 = 40°C  Note: Only available when 'Return Air Temperature Sensor' value = 1 (Equipped).	✓	✓	

Input Register (Analogue Input)				Applicable Unit Type		
Register Name	Addr	Modicon Address	Details	Lossnay LGH Series	Lossnay VL Series	
Room CO2 Level	178	30179	CO2 level divided by 10. 0 = 0ppm ... 240 = 2400 and above. [Value 254 = Under detecting] [Value 255 = No sensor]  Note: Only available when 'CO2 Level Sensor' value = 1 (Equipped).			
Fault/Error Code (hex)	179	30180	0x8000 = No error 0x6999 = Bad communication with unit (Refer to Lossnay unit documentation for description of other fault code values)	✓	✓	
Fault/Error Code (decimal)	180	30181	8000 = No error 6999 = Bad communication with unit (Refer to Lossnay unit documentation for description of other fault code values)	✓	✓	
Energy Consumption	181	30182	Value in kWh multiplied by 10. 0 = 0kWh ... 65535 = 6553.5kWh	✓	✓	
Actual Operation Mode	182	30183	0 = Not auto mode 1 = Determining 2 = Heating 3 = Cooling			
Actual Supply Fan Speed	183	30184	0 = Stop 1 = Speed 1 2 = Speed 2 3 = Speed 3 4 = Speed 4	✓	✓	
Actual Extract Fan Speed	184	30185	0 = Stop 1 = Speed 1 2 = Speed 2 3 = Speed 3 4 = Speed 4	✓	✓	
Minimum Cooling Setpoint	185	30186	Temperature value in °C multiplied by 10. 0 = 0°C ... 400 = 40°C  Note: Only available when 'Set Temperature on Temperature Control Unit' value = 1 or 2.			

Input Register (Analogue Input)				Applicable Unit Type		
Register Name	Addr	Modicon Address	Details	Lossnay LGH Series	Lossnay VL Series	
Maximum Cooling Setpoint	186	30187	Temperature value in °C multiplied by 10. 0 = 0°C ... 400 = 40°C  Note: Only available when 'Set Temperature on Temperature Control Unit' value = 1 or 2.			
Minimum Heating Setpoint	187	30188	Temperature value in °C multiplied by 10. 0 = 0°C ... 400 = 40°C  Note: Only available when 'Set Temperature on Temperature Control Unit' value = 1 or 2.			
Maximum Heating Setpoint	188	30189	Temperature value in °C multiplied by 10. 0 = 0°C ... 400 = 40°C  Note: Only available when 'Set Temperature on Temperature Control Unit' value = 1 or 2.			
Minimum Auto Setpoint	189	30190	Temperature value in °C multiplied by 10. 0 = 0°C ... 400 = 40°C  Note: Only available when 'Set Temperature on Temperature Control Unit' value = 1 or 2.			
Maximum Auto Setpoint	190	30191	Temperature value in °C multiplied by 10. 0 = 0°C ... 400 = 40°C  Note: Only available when 'Set Temperature on Temperature Control Unit' value = 1 or 2.			
Number of Fan Speeds	191	30192	Values 1 – 4 valid.	✓	✓	
Set Temperature on Temperature Control Unit	192	30193	0 = No set temperature display 1 = RA (Return Air) temperature 2 = SA (Supply Air) temperature			

### 12.3. Coils

Coils are read using function code 01 and written to using either function code 05 or 15. Function code 05 is used when writing to a single coil register, function code 15 is used for writing to multiple coil registers in the same command.

Coil (Digital Output)				Applicable Unit Type		
Register Name	Addr	Modicon Address	Details	Lossnay LGH Series	Lossnay VL Series	
Power On/Off	3	00004	0 = Power OFF 1 = Power ON	✓	✓	

### 12.4. Discrete Inputs

Discrete Inputs are read using function code 02.

Discrete Input (Digital Input)				Applicable Unit Type		
Register Name	Addr	Modicon Address	Details	Lossnay LGH Series	Lossnay VL Series	
Thermo On/Off	80	10081	0 = Thermo OFF 1 = Thermo ON			
Auto Fan Speed Control Availability	81	10082	0 = Not available 1 = Available			
Night Purge	82	10083	0 = Normal operation 1 = In night purge operation During night-purge operation:	✓	✓	

Discrete Input (Digital Input)				Applicable Unit Type		
Register Name	Addr	Modicon Address	Details	Lossnay LGH Series	Lossnay VL Series	
			- Pressing ON/OFF button starts normal operation. - When pressing the Ventilation button the Lossnay remains in bypass mode			
Maintenance Sign	83	10084	0 = Inactive 1 = Active	✓	✓	
Filter Sign	84	10085	0 = Inactive 1 = Active	✓	✓	
Actual Ventilation Mode	85	10086	0 = Lossnay ventilation 1 = Bypass ventilation	✓	✓	
Setpoint 0.5°C Increments Availability	86	10087	0 = Not available 1 = Available			
Heat/Cool or Cool-Only	87	10088	0 = Heat and Cool 1 = Cool only			
Auto Operation Mode Availability	88	10089	0 = Not available 1 = Available			
Heat/Cool or Heat-Only	89	10090	0 = Heat and Cool 1 = Heat only			
Energy Consumption Data Available	90	10091	0 = Not available 1 = Available	✓	✓	
Bypass Damper Available	91	10092	0 = Not available 1 = Available	✓	✓	
Auto Ventilation Mode Available	92	10093	0 = Not available 1 = Available	✓	✓	
Operation Mode of Temperature Control Unit	93	10094	0 = Not available (not connected) 1 = Available (connected)			
Outdoor Temperature Sensor	94	10095	0 = Not equipped 1 = Equipped	✓	✓	
Return Air Temperature Sensor	95	10096	0 = Not equipped 1 = Equipped	✓	✓	

Discrete Input (Digital Input)				Applicable Unit Type		
Register Name	Addr	Modicon Address	Details	Lossnay LGH Series	Lossnay VL Series	
Supply Air Temperature Sensor	96	10097	0 = Not equipped 1 = Equipped			
CO2 Level Sensor	97	10098	0 = Not equipped 1 = Equipped			

### 13. Technical specification

Parameter	Min.	Typ.	Max.	Comments
<b>Environmental</b>				
Operating temperature	-20°C		60°C	
Indoor or outdoor use				Indoor
Altitude		< 2000m		
Relative humidity				90% non-condensing
Pollution degree		2		

## Appendix A – Compatible Air-To-Air units

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### Indoor Unit Models

#### M Series

MSZ-AP15/20VF	(from Feb 2018)
MSZ-AP25/35/42/50VG(K)	(from Jan 2018)
MSZ-LN18/25/35/50/60VGW/V/R/B	
MSZ-WN25/35VA	
MSZ-DM25/35VA	
MSZ-EF18/22/25/35/42/50VE3W/S/B	
MSZ-EF18/22/25/35/42/50VE2W/S/B	
MSZ-EF18/22VEW/S/B	
MSZ-EF25/35/42/50VEB/W/S-E1	
MSZ-FD25/35/50VA	
MSZ-FH25/35/50VE2	
MSZ-FH25/35/50VE	
MSZ-GA60/71VA	
MSZ-GB50VA	
MSZ-GC22/25/35VA	
MSZ-GE22/25/35/42/50/60/71VA	
MSZ-GF60/71VE2	
MSZ-GF60/71VE	
MSZ-SF15/20VA	
MSZ-SF25/35/42/50VE3	
MSZ-SF25/35/42/50VE2	
MSZ-SF25/35/42/50VE	
MFZ-KJ25/35/50VE2	
MFZ-KJ25/35/50VE	
MFZ-KA25/35/50VA	
MLZ-KP25/35/50VA	(from Feb 2018)
MLZ-KA25/35/50VA	

#### S Series

SEZ-KA35/50/60/71VA	
SEZ-KD25/35/50/60/71VAL	
SEZ-KD25/35/50/60/71VAQ	
SEZ-M25/35/50/60/71DA	(from Mar 2018)
SEZ-M25/35/50/60/71DAL	(from Mar 2018)
SLZ-KF25/35/50/60VA2	
SLZ-KF25/35/50/60VA	
SLZ-M15/25/35/50/60FA	(from Mar 2018)
SLZ-KA25VAL2	
SLZ-KA25/35/50VAL3	
SLZ-KA25/35/50VAQ	
SLZ-KA25/35/50VAQR1	
SLZ-KA25VAQ2	
SLZ-KA25/35/50VAQ3	
SLZ-KA35/50VAL	
SLZ-KA35/50VALR2	
SLZ-KA35/50VALR3	
SLZ-KA35/50VAQR2	

## P Series

PCA-M71HA  
PCA-M50/60/71/100/125/140KA  
PCA-RP35/50/60/71/100/125/140KAQ  
PCA-RP35/50/60/71/100/125/140KAQR2  
PCA-RP50/60/71KAQR1  
PEAD-M35/50/60/71/100/125/140JA  
PEAD-RP50/60/71/125/140EA  
PEAD-RP35/100EA2  
PEAD-RP35/50/60/71/100/125/140JA(L)Q  
PEA-RP200/250GAQR2  
PEA-RP200/250WKA (from Nov 2017)  
PEA-ZM200/250WKA  
PKA-RP35/50HAL  
PKA-RP35/50HALR1  
PKA-RP60/71/100KAL  
PKA-RP60/71/100KALR1  
PLA-SM71/100/125/140EA (from Dec 2017)  
PEAD-SM71/100/125/140JA(L) (from Dec 2017)  
PEAD-SP (all variants from Dec 2017)  
PLA-RP35/50/60/71/EA  
PLA-RP100/125/140EA (from Oct 2017)  
PLA-ZP35/50/60/71/100/125/140EA  
PLA-RP100/125/140AA2  
PLA-RP100/125/140BA  
PLA-RP100/125/140BAR2  
PLA-RP125/140BA2  
PLA-RP100BA3  
PLA-RP140BA2R4  
PLA-RP35/50/60/71AA  
PLA-RP35/50/60/71BA  
PLA-RP35/50/60/71BAR1  
PLA-RP35/50/60/71BAR2  
PLA-RP71BA2  
PLA-ZRP100/125/140BA  
PLA-ZRP100/125/140BAR1  
PLA-ZRP35/50/60/71BA  
PLA-ZRP35/50/60/71BAR1  
PSA-RP71/100/125GA  
PSA-RP71KA  
PSA-RP100/125/140KA (from Oct 2017)  
PLA-SM71/100/125/140EA  
PLA-ZM35/50/60/71/100/125/140EA  
PLA-M35/50/60/71/100/125/140EA  
PKA-M35/50HA  
PKA-M60/71KA  
PKA-M100KA (from Oct 2017)  
PKA-M35/50HAL  
PKA-M60/71KAL  
PKA-M100KAL (from Oct 2017)  
PCA-M35/50/60/71KA  
PCA-M100/125/140KA (from Oct 2017)  
PEAD-M35/50/60/71JA  
PEAD-M100/125/140JA (from Oct 2017)  
PEAD-M35/50/60/71JAL  
PEAD-M100/125/140JAL (from Oct 2017)

## Models Not Supported:

MSZ-HJ25/35VA  
MSZ-HC25/35VA/VAB  
PCA-RP71/125HA/HAQ  
PEA-RP400/500GAQ

## City Multi

Name	From Production	Firmware Version	Serial Number
PLFY-P**VLMD-E	Oct-14	Ver. 10.23 →	4XW***** →
PFFY-P**VLEM-E	Jan-15	Ver. 10.23 →	41W***** →
PFFY-P**VLRM-E	Jan-15	Ver. 10.23 →	41W***** →
PFFY-P**VLRM M-E	Nov-14	Ver. 10.23 →	4YW***** →
PEFY-P**VMH-E	Jan-15	Ver. 10.23 →	41W***** →
PEFY-P**VMH-E-F	Jan-15	Ver. 10.23 →	41W***** →
PEFY-P**VMR-E-L	Jan-15	Ver. 10.23 →	41W***** →
PEFY-P**VMR-E-R	Jan-15	Ver. 10.23 →	41W***** →
PEFY-P**VMHS-E	Jan-15	Ver. 11.17 →	31W***** →
PEFY-P**VMA-ER3.UK	Mar-15	Ver. 10.23 →	5C***** →
PEFY-P**VMAL-ER3.UK	Mar-15	Ver. 10.23 →	5C***** →
PEFY-P**VMS1-ER2.TH	Dec-14	Ver. 10.23 →	4ZM***** →
PEFY-P**VMS1L-ER1.TH	Dec-14	Ver. 10.23 →	4ZM***** →
PLFY-P**VBM-ER3.UK	Jan-15	Ver. 10.29 →	5A***** →
PLFY-P**VBM-E.UK	From first product		
PLFY-P**VCM-E2R1.TH	Jan-15	Ver. 10.29 →	51M***** →
PLFY-P**VCM-E3.TH	From first product		
PLFY-P**VFM-E.TH	From first product		
PMFY-P**VBM-ER4	Jan-15	Ver. 10.29 →	41A***** →
PKFY-P**VKM-ER1.TH	Jan-15	Ver. 10.29 →	51M***** →
PKFY-P**VHM-ER2	Jan-15	Ver. 10.29 →	41A***** →
PKFY-P**VBM-ER3	Jan-15	Ver. 10.29 →	41A***** →
PCFY-P**VKM-ER1	Jan-15	Ver. 10.29 →	41A***** →
PFFY-P**VKM-E2	Jan-15	Ver. 10.29 →	41A***** →

## Hybrid City Multi

### Name

PEFY-WP15-50VMS1-E  
PEFY-WP10VMS1-E  
PEFY-WP20-50VMA-E  
PEFY-WP63-125VMA-E  
PFFY-WP20-50VLRMM-E  
PLFY-WP32-50VBM-E  
PKFY-WP10-25(PKFY chassis basis)  
PKFY-WP10-32(MSZ-AP chassis basis)  
PLFY-WP10-32VFM

## Appendix B – Compatible Air-To-Water units

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### Ecodan FTC4:

#### Cylinder

EHST20C-VM6HB  
 EHST20C-YM9HB  
 EHST20C-VM6B  
 EHST20C-YM9B  
 EHST20C-VM6EB  
 EHST20C-YM9EB  
 EHST20C-VM6SB  
 EHPT20X-VM2HB  
 EHPT20X-VM6HB  
 EHPT20X-YM9HB  
 EHPT20X-VM6B  
 EHPT20X-YM9B  
 EHST-20CVM2B  
 EHST20C-TM9HB  
 EHPT20X-TM9HB

#### Hydrobox

EHSC-VM6B  
 EHSC-YM9B  
 EHSC-VM6EB  
 EHSC-YM9EB  
 EHPX-VM2B  
 EHPX-VM6B  
 EHPX-YM9B  
 ERSC-VM2B  
 EHSC-VM2B  
 EHSC-TM9B

#### Controller

PAC-IF052B-E  
 PAC-IF051B-E

### Ecodan FTC5:

#### Cylinder

EHST20C-VM2C  
 EHST20C-VM6C  
 EHST20C-YM9C  
 EHST20C-TM9C  
 EHST20C-VM2EC  
 EHST20C-VM6EC  
 EHST20C-YM9EC  
 EHST20C-MEC  
 EHST20C-MHCW  
 EHST20D-VM2C  
 EHST20D-MEC  
 EHST20D-MHC  
 EHST20D-MHCW  
 EHPT20X-VM2C  
 EHPT20X-VM6C  
 EHPT20X-YM9C  
 EHPT20X-TM9C  
 EHPT20X-MHCW

#### Hydrobox

EHSC-VM2C  
 EHSC-VM2EC  
 EHSC-VM6C  
 EHSC-VM6EC  
 EHSC-YM9C  
 EHSC-YM9EC  
 EHSC-TM9C  
 EHSC-MEC  
 EHSD-VM2C  
 EHSD-MEC  
 ERSC-VM2C  
 ERSC-MEC  
 ERSD-VM2C  
 EHPX-VM2C  
 EHPX-YM9C

#### Controller

PAC-IF062B-E

EHPT15X-UKHCW\*  
 EHPT17X-UKHCW\*  
 EHPT21X-UKHCW\*  
 EHPT25X-UKHCW\*  
 EHPT30X-UKHCW\*  
 EHPT21X-UKHSCW\*  
 EHPT25X-UKHSCW\*  
 EHPT30X-UKHSCW\*  
 EHPT15X-UKHLCW\*  
 EHPT17X-UKHLCW\*

\*UK Models

### Ecodan FTC6:

#### Cylinder

EHST17D-VM2D  
 EHST17D-YM9D  
 EHST20D-MED  
 EHST20D-VM2D  
 EHST20D-VM6D  
 EHST20D-YM9D

#### Hydrobox

EHSD-MED  
 EHSD-VM2D  
 EHSD-VM6D  
 EHSD-YM9D  
 EHSD-YM9ED  
 EHSD-TM9D

#### Controller

PAC-IF071B-E  
 PAC-IF072B-E  
 PAC-IF073B-E

EHST20D-YM9ED	EHSC-MED
EHST20D-TM9D	EHSC-VM2D
EHST30D-MED	EHSC-VM6D
EHST30D-VM6ED	EHSC-YM9D
EHST30D-YM9ED	EHSC-YM9ED
EHST30D-TM9ED	EHSC-TM9D
EHST20C-MED	EHSE-YM9ED
EHST20C-VM2D	EHSE-MED
EHST20C-VM6D	ERSD-MED
EHST20C-YM9D	ERSD-VM2D
EHST20C-YM9ED	ERSC-MED
EHST20C-TM9D	ERSC-VM2D
EHST30C-MED	ERSD-VM6D
EHST30C-VM6ED	ERSD-YM9D
EHST30C-YM9ED	ERSC-VM6D
EHST30C-TM9ED	ERSC-YM9D
	ERSE-YM9ED
	ERSE-MED
ERST17D-VM2D	EHPX-MED
ERST17D-VM6D	EHPX-VM2D
ERST20D-VM2D	EHPX-VM6D
ERST20D-VM6D	EHPX-YM9D
ERST20D-YM9D	EHPX-YM9ED
ERST30D-VM2ED	
ERST20C-VM2D	ERPX-MD
ERST20C-VM6D	ERPX-VM2D
ERST20C-YM9D	ERPX-VM6D
ERST30C-VM2ED	ERPX-YM9D
ERST30D-VM6ED	
ERST30D-YM9ED	
EHPT17X-VM2D	
EHPT17X-VM6D	
EHPT17X-YM9D	
ERPT17X-VM2D	
EHPT20X-MED	
EHPT20X-VM6D	
EHPT20X-YM9D	
EHPT20X-YM9ED	
EHPT20X-TM9D	
EHPT20X-MHEDW	
ERPT20X-MD	
ERPT20X-VM2D	
ERPT20X-VM6D	
EHPT30X-MED	
EHPT30X-YM9ED	
ERPT30X-VM2ED	
ERPT30X-VM6ED	
Packaged Cylinder	
EHPT20X-MHEDW	
Pre-Plumbed Cylinder - Slimline	
EHPT15X-UKHLDW*	
EHPT17X-UKHLDW*	
Pre-Plumbed Cylinder - Standard	
EHPT15X-UKHDW*	
EHPT17X-UKHDW*	
EHPT21X-UKHDW*	

EHPT25X-UKHDW\*  
EHPT30X-UKHDW\*

Pre-Plumbed Cylinder - Solar  
EHPT21X-UKHSDW\*  
EHPT25X-UKHSDW\*  
EHPT30X-UKHSDW\*

\*UK Models

**Ecodan Ground Source Heat Pump:**  
CRHV-P600YA-HPB

**Ecodan Air Source Heat Pump:**  
CAHV-P500YB-HPB  
CAHV-R450YA-HPB

**Hot Water Heat Pump**  
QAHV-N560YA-HPB

## Appendix C – Compatible Lossnay units

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### LGH Series

LGH-15-200RVX-E1  
 LGH-150-250RVXT-E1

### VL Vertical Series

VL-250-500CZPVU-R-E  
 VL-250-500CZPVU-L-E

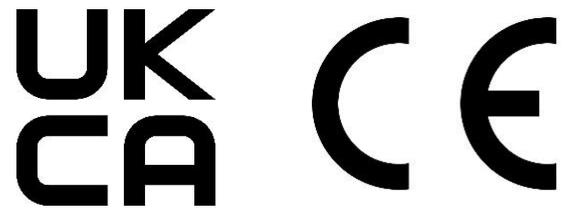
## Appendix D – Compatible E-Series Chiller units

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Type	Model	Capacities
Cooling Only	EACV-P900YA(L)(-H)(-N)(-BS)	90kW, 180kW, 270kW, 360kW, 450kW, 540kW
	EACV-P1500YB(L)(-N)(-BS)	150kW, 300kW, 450kW, 600kW 750kW, 900kW
	EACV-M1500YCL(-N)(-BS)	150kW, 300kW, 450kW, 600kW 750kW, 900kW
	EACV-P1800YB(L)(-N)(-BS)	180kW, 360kW, 540kW, 720kW, 900kW, 1080kW
	EACV-M1800YCL(-N)(-BS)	180kW, 360kW, 540kW, 720kW, 900kW, 1080kW
Heating/Cooling	EAHV-P900YA(L)(-H)(-N)(-BS)	90kW, 180kW, 270kW, 360kW, 450kW, 540kW
	EAHV-P1500YB(L)(-H)(-N)(-BS)	150kW, 300kW, 450kW, 600kW 750kW, 900kW
	EAHV-M1500YCL(-N)(-BS)	150kW, 300kW, 450kW, 600kW 750kW, 900kW
	EAHV-P1800YB(L)(-H)(-N)(-BS)	180kW, 360kW, 540kW, 720kW, 900kW, 1080kW
	EAHV-M1800YCL(-N)(-BS)	180kW, 360kW, 540kW, 720kW, 900kW, 1080kW
Heating Only	EAHV-P900YA-H	90kW, 180kW, 270kW, 360kW, 450kW, 540kW







Please be sure to put the contact address/telephone number on this manual before handing it to the customer.

**MITSUBISHI ELECTRIC UK**

MITSUBISHI ELECTRIC UK, TRAVELLERS LANE, HATFIELD, HERTFORDSHIRE, AL10 8XB