Procon
MelcoBEMS MINI (A1M)

FOR INSTALLERS

INSTALLATION MANUAL
Manual version 1.0.20

Firmware version 3.0.18

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

Preface

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.

⚠ **European Union, Class A:**

Class A products are intended for use in non-residential/non-domestic environments. Class A products may also be utilized in residential/domestic environments but may cause interference and require the user to take adequate corrective measures.

This is a Class A product. In a domestic environment this product may cause radio frequency interference in which case the user may be required to take adequate measures.

A "Declaration of Conformity" in accordance with the preceding directives and standards has been made and is available on request.

If this equipment does cause interference with radio communications services, which can be determined by turning the equipment off and on, you are encouraged to try to correct the interference by one or more of the following measures:

> Reorient the receiving antenna.
> Relocate the Procon MelcoBEMS MINI (A1M) with respect to the receiver.
> Move the Procon MelcoBEMS MINI (A1M) away from the receiver.

If necessary, consult a Procon MelcoBEMS MINI (A1M) technical support representative or an experienced radio/television or EMC technician for additional suggestions.

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

Document Version	Latest Firmware Version	Date	Author	Notes
1.0.0	3.0.0	08/05/15	GD	Initial version for firmware V1.0.0
1.0.1	3.0.1	16/06/15	GD	Added 'Applicable Unit Type' columns to Air-To-Water Modbus tables. Other minor modifications.
1.0.2	3.0.1	20/08/15	GD	More FTC5 model types added to 'Appendix B - Compatible Air-To-Water units'.
1.0.3	3.0.1	20/08/15	GD	FTC5 controller type PAC-IF062B-E added to 'Appendix B - Compatible Air-To-Water units'.
1.0.4	3.0.6	19/01/16	GD	Added ATW Modbus registers for measured energy consumed and measured energy produced.
1.0.5	3.0.11	15/06/16	GD	Changes to BACnet section.
1.0.6	3.0.11	23/08/16	GD	Minor changes.
1.0.7	3.0.12	01/08/16	GD	Added Flow Rate Modbus registers for ATW units.
1.0.8	3.0.12	21/10/16	SC / GD	Added warning paragraph on page iii. Added MET lab logo.
1.0.9	3.0.12	14/11/16	GD	Updated MET lab logo.
1.0.10	3.0.12	24/04/17	GD	Updated Appendix A – Compatible Air-To-Air units
1.0.11	3.0.13	19/06/17	GD	Latest firmware version updated to 3.0.13
1.0.12	3.0.13	31/07/17	GD	Added information to Installation section regarding connections to twin/triple/quad and MXZ systems. Correction made to section 2, the name MAC-399IF replaced with MAC-333IF.
1.0.13	3.0.13	25/08/17	GD	Modbus tables updated for QAHV units. QAHV-N560YA-HPB added to the compatible units list.
1.0.14	3.0.13	01/11/17	GD	Modbus tables updated for EAHV units. Numerous changes to Modbus tables due to updated protocol documentation.

1.0.15	3.0.15	08/11/17	GD	Added new Modbus tables for Lossnay units (firmware version must be 3.0.15 or later). Added firmware revision history table. Updated image in Figure 1. Modbus tables now have row headings at the top of every page. Added text to section 2.*Overview*
1.0.16	3.0.15	13/02/18	GD	Updated Modbus tables and Lossnay unit compatibility list. VL series Lossnay unit are not supported.
1.0.17	3.0.15	20/04/18	GD	Fixed errors in Modbus tables so *Applicable Unit Type* columns are correct for '*Defrost*' and '*Brine Temperature*' registers. *EACV* added to *EAHV* column names in Modbus tables. Added Appendix D – Compatible E-Series Chiller units.
1.0.18	3.0.15	22/05/18	GD	Added additional units to *Appendix A – Compatible Air-to-Air Units*
1.0.19	3.0.15	12/07/18	GD	Corrected the scaling of the Wh energy values in Modbus registers 40283 – 40299 and 30157 – 30173.
1.0.20	3.0.18	22/08/18	GD	Latest firmware version now 3.0.18

Any additional notes since printing will be appended to the rear of this document on separate sheets of paper.
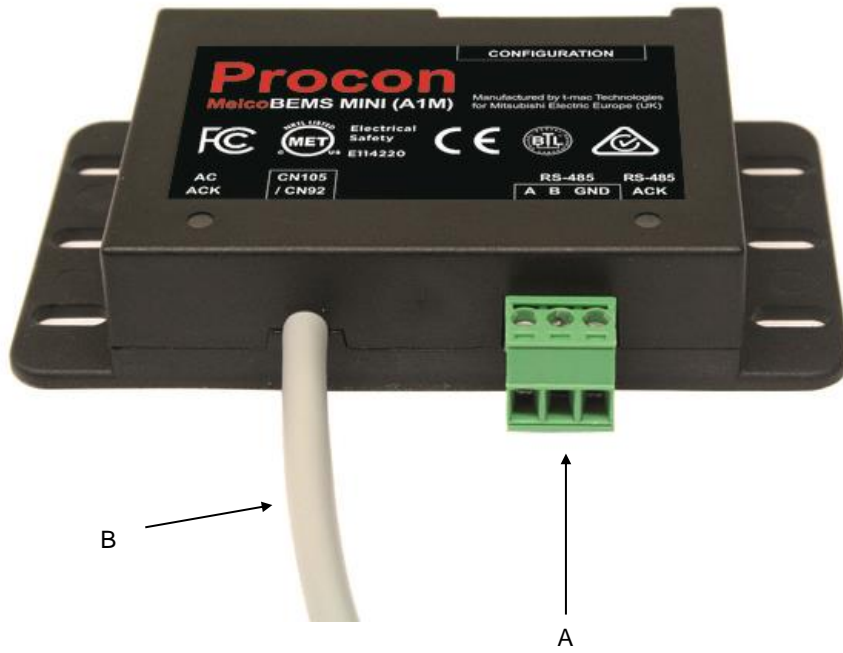
Firmware revision history

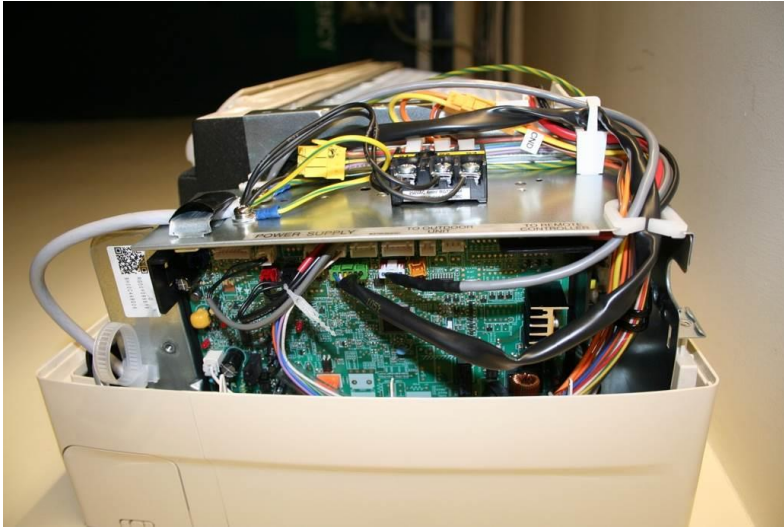| Firmware Version	Date	Notes
3.0.0	23/02/15	- Initial version of firmware with BACnet support for ATA protocol.
3.0.1	12/06/15	- Fixed bug so the 'Outdoor Temperature By BMS' Modbus register reports the correct value.
3.0.2	19/08/15	- DegF to DegC temperature conversions changed to be more accurate. - Removed BACnet objects for Heating and Cooling Setpoints. - BACnet PRESENT_VALUE property now writable for Analog Inputs if they are currently out of service. - Added range checking to BACnet Multi State Output object types when writing to the PRESENT_VALUE property.
3.0.3	06/10/15	- Removed the Min/Max Present Value properties for the Setpoint BACnet object.
3.0.4	29/10/15	- Minor changes to allow support for BACnet protocol revision 12.
3.0.5		- Version not released
3.0.6	15/01/16	- Added support for ATW energy monitoring commands
3.0.7	19/01/16	- Minor changes to aid BTL certification testing.
3.0.8	21/04/16	- Fixed minor bugs reported during BTL testing.
3.0.9	16/05/16	- Fixed more minor bugs reported during BTL testing.
3.0.10	19/05/16	- BACnet Device Object OBJECT_NAME property now writable.
3.0.11	19/05/16	- Fixed minor bug reported during BTL testing.
3.0.12	27/07/16	- Added support to read Flow Rate value for ATW units, value exposed as a Modbus register. - Fixed bug so Modbus writes are always actioned correctly. - This firmware version passed BTL testing.
3.0.13	03/04/17	- Change so writable (not commandable) Analog Value BACnet objects accept and action PRESENT_VALUE write commands for every priority value. The priority array is not updated though and all values remain NULL.
3.0.14	26/09/17	- Communication with connected unit is now reinitialised after if there has been no successful comms for a period of 1 minute.
3.0.15	09/11/17	- Added Modbus support for Lossnay units. - Fixed bug so Modbus comms counter Modbus register increments correctly.
3.0.16	09/03/18	- Fixed bug so writes to Modbus register 40027 are performed correctly for values greater than 7.
3.0.17	22/03/18	- Fixed bug so the fault code Modbus registers do not show value 6999 until there has been a comms error for at least 30 seconds.
3.0.18	10/08/18	- Fixed bug so ATA Setpoint Offset feature works correctly. - Introduced a failsafe reset to the MelcoBEMS MINI resets if there has been a CN105 comms fault for a period of two minutes.

1

[Fig. 1]

A   RS-485 connector

B   CN105/CN92 connection lead

2

[Fig. 2]

Air to air unit

Air to water unit

Contents

1. Safety precautions

> ➢ **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

2. Overview

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 using the Modbus RTU software 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.

ATA – Modbus RTU and BACnet MS/TP Available

ATW Ecodan Heating Products – Only Modbus RTU Available

E Series Chillers – Only Modbus RTU Available

Lossnay – Only Modbus RTU Available

3. 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.

3.1. RS-485 Node address

When BACnet MS/TP protocol has been selected (see section 3.3) the node address is used as the Station ID.
When Modbus RTU protocol has been selected (see section 3.3) 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.

3.2. 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.

3.3. 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
ON	Modbus RTU

3.4. 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

4. Deadband Mode

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

4.1. Settings

There are two settings, the Heating Setpoint (default 19º) and Cooling Setpoint (default 23ºC). 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 2ºC greater than the Heating Setpoint, otherwise the default values given above will be assumed.

4.2. 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 28ºC.
Whilst in HEAT mode, if the room temperature rises above the *Heating Setpoint + 1ºC* 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 19ºC.
Whilst in COOL mode, if the room temperature falls below the *Cooling Setpoint – 1ºC* 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 28ºC.
The following image shows this graphically (assuming a Heating Setpoint of 19ºC and a Cooling Setpoint of 23ºC):
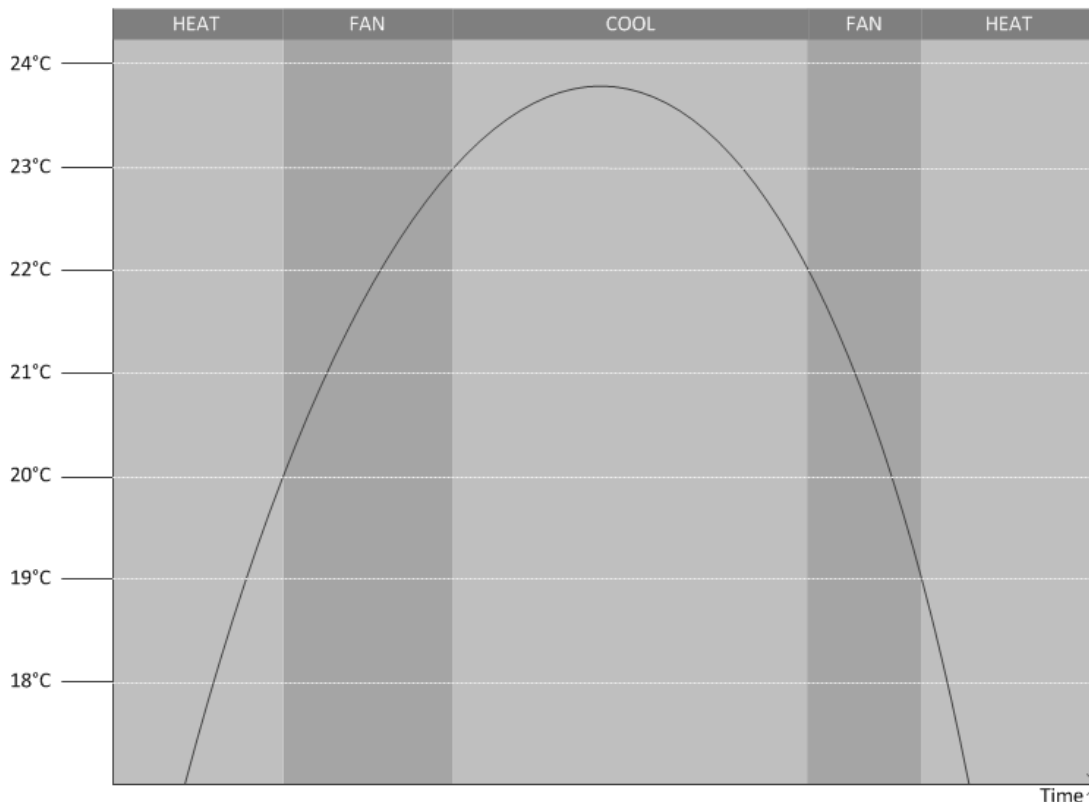
4.3. Initialisation

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 28ºC.
If greater than or equal to the Cooling Setpoint the unit will be set to COOL mode with a setpoint of 19ºC.
If between the Heating and Cooling Setpoints the unit will be set to FAN mode.

5. Setpoint Offset

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

5.1. 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.

5.2. Operation

In some situations a 3rd 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:

Temperature Setpoint = Return Air Temperature – (BMS Room Temperature – BMS Virtual Temperature)

As a hypothetical example, consider the BMS Virtual Setpoint being set to 21ºC and the indoor unit return air temperature remaining constant at 22ºC. As the BMS Room Temperature decreases the MelcoBEMS MINI (A1M) increases the indoor unit's temperature setpoint.
When the BMS Room Temperature reaches 18ºC the Temperature Setpoint = 22 – (18 – 21) = 25ºC.
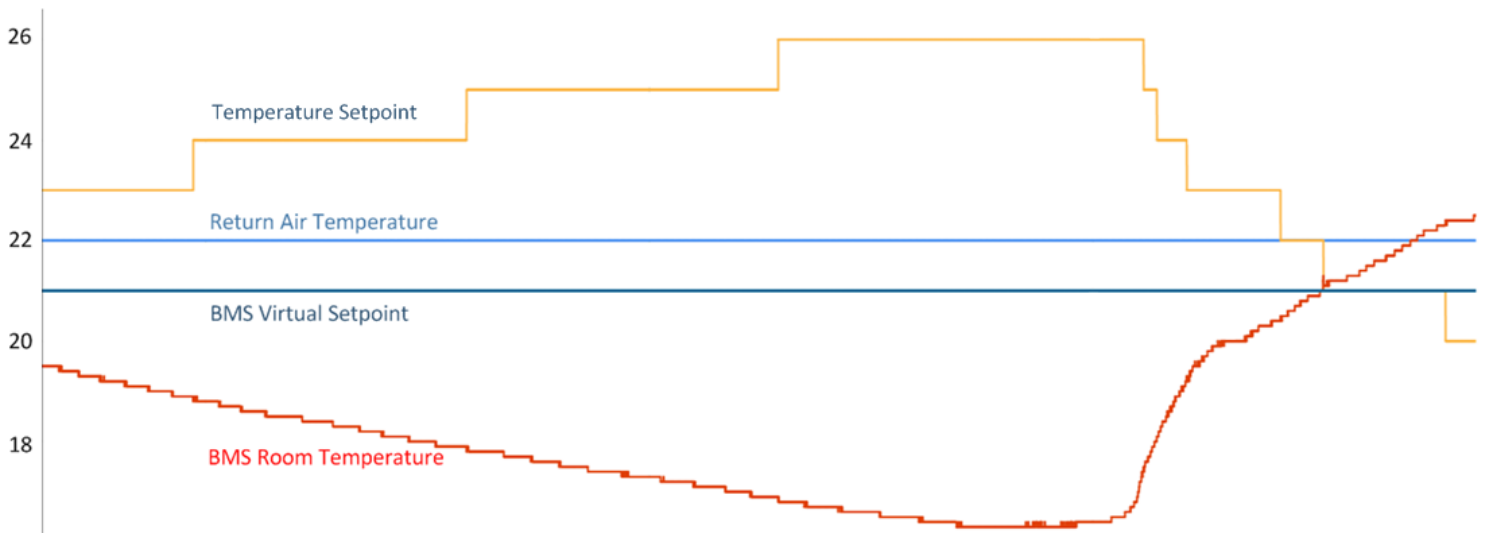
Hysteresis has been built in to prevent the temperature setpoint from rapidly changing.

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

6. RS-485 termination

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

The jumper setting is summarised below:

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

7. Installation

7.1. Physical connection

The MelcoBEMS MINI (A1M) has a 1 metre 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.

7.2. Power supply

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

7.3. 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 connections. The Modbus section contains further detail of the Modbus communications.

7.4. 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.

7.5. Using Twin/Triple/Quad systems

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

7.5.1. When fault Modbus register is being used

7.5.2. When fault Modbus register is not being used

7.6. Using single split units in a group

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

7.6.1. When fault Modbus register is being used

7.6.2. When fault Modbus register is not being used

7.7. Using MXZ split units

One MelcoBEMS MINI must be installed for each indoor unit when using a MXZ system.
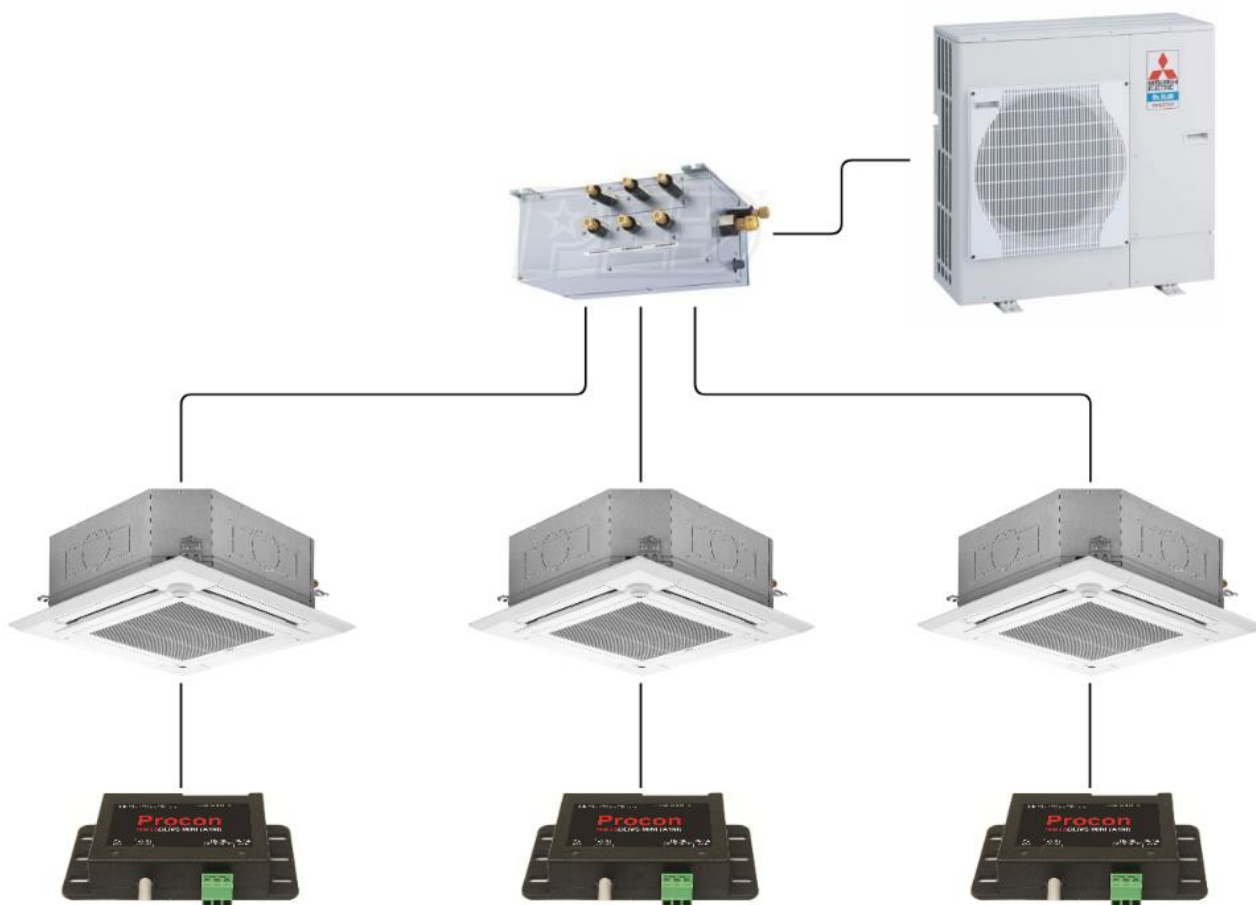
8. Status LEDs

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.
RS-485 ACK	Green	Lit when A1M is powered, flashing indicates valid Modbus or BACnet communication.

8.1. 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).

8.2. 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.

9. BACnet

9.1. 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 3.3).

9.2. BTL Listing

The MelcoBEMs MINI (A1M) is a BTL listed device.

9.3. 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[1]	R/W	R[1]	R/W	R[1]
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[1] = Read accessible only but writable when the Out Of Service property is TRUE.
R/W = Read and write accessible.

9.4. Object list

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

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 ºC or ºF, 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 = ºC 2 = ºF
Analog Input	AI10	Inlet Temperature	Value in either ºC or ºF, depending on the Temperature Units setting
Analog Input	AI11	Fault Code	4-digit fault code

* Please power cycle the MelcoBEMS MINI after changing the Present Value property of this object.

10.   Modbus connection

10.1.   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.

10.2.   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)

10.3.   Modbus 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.

Previous RS-485 device — Next RS-485 device
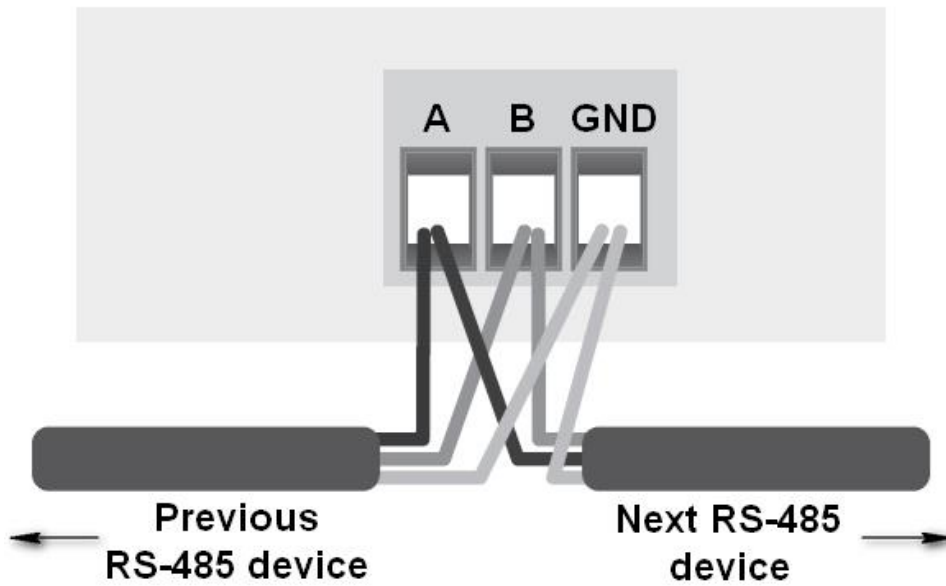
⚠ **Caution:**

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).

11.   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).

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 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 = 115200
BACnet RS-485 Baud Rate			0 = 9600 4 = 9600 6 = 19200 8 = 38400 10 = 57600
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 ºC multiplied by 10. 0xFF9C = -10ºC … 0x01F4 = 50ºC
BMS Room Temperature	16	40017	Temperature value in ºC multiplied by 10. 0 = 0ºC … 500 = 50ºC
BMS Virtual Setpoint	17	40018	Temperature value in ºC multiplied by 10. 100 = 10ºC … 400 = 40ºC
Deadband Heating Setpoint	18	40019	Temperature in ºC (default 19ºC). Value must be at least 2ºC lower than the Deadband Cooling Setpoint.
Deadband Cooling Setpoint	19	40020	Temperature in ºC (default 23ºC). Value must be at least 2ºC higher than the Deadband Heating Setpoint.

Holding Registers (Analogue Outputs)			
Register Name	Address	Modicon Address	Details
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

11.2.   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)

11.3. Discrete Inputs

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

11.4. 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 *(Note: Holding register address 7 can also be used to change the Drive)*	0	00001	0 = Drive OFF 1 = Drive ON

12. 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 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	FTC4	FTC5	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	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	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 ºC multiplied by 100. (see note *)	✓#6	✓								
Thermo-off Temperature (signed)			Temperature value in ºC multiplied by 100. (see note *)							✓			
Set Tank Water Temperature	31	40032	Temperature value in ºC multiplied by 100. (see note **)	✓#6	✓								
Thermo-off Temperature			Temperature value in ºC multiplied by 100. (see note **)							✓			
H/C Thermostat Target Temperature – Zone 1 (signed)	32	40033	Temperature value in ºC multiplied by 100. (see note *)	✓	✓								
H/C Thermostat Target Temperature – Zone 1	33	40034	Temperature value in ºC multiplied by 100. (see note **)	✓	✓								
H/C Thermostat Target Temperature – Zone 2 (signed)	34	40035	Temperature value in ºC multiplied by 100. (see note *)	✓	✓								
H/C Thermostat Target Temperature – Zone 2	35	40036	Temperature value in ºC multiplied by 100. (see note **)	✓	✓								

Holding Register (Analogue Output)				Applicable Unit Type									
Register Name	Addr	Modicon Address	Details	FTC4	FTC5	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 ††)	✓	✓	✓[#7]		✓[#7]		✓	✓[#7]		
Force DHW	37	40038	0 = Normal 1 = Force DHW	✓	✓								
Holiday	38	40039	0 = Normal 1 = Holiday	✓	✓								
DHW On Prohibit	39	40040	0 = On 1 = Prohibit	✓[#6]	✓								
Heating On Prohibit – Zone 1	40	40041	0 = On 1 = Prohibit	✓[#6]	✓								
Cooling On Prohibit – Zone 1	41	40042	0 = On 1 = Prohibit	✓[#6]	✓								
Heating On Prohibit – Zone 2	42	40043	0 = On 1 = Prohibit	✓[#6]	✓								
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	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 ºC multiplied by 10. 0xFE70 = -40ºC … 0x036B = 87.5ºC			✓ #9		✓ #9			✓#9	
Outdoor Temperature By BMS	51	40052	Temperature value in ºC multiplied by 10. 0x0000 = 0.0ºC ... 0x036B = 87.5ºC.			✓ #10		✓ #10			✓ #10	
Setting Water Temperature (signed)	52	40053	Temperature value in ºC multiplied by 100. (see note *)			✓ #11		✓ #12		✓ #15	✓ #16	
Setting Water Temperature	53	40054	Temperature value in ºC multiplied by 100. (see note **)			✓ #11		✓ #12		✓ #15	✓ #16	
Thermostat Target Temperature – Zone 1 (signed)	54	40055	Temperature value in ºC multiplied by 100. (see note *)	✓	✓							
Thermostat Target Temperature – Zone 1	55	40056	Temperature value in ºC multiplied by 100. (see note **)	✓	✓							
Thermostat Target Temperature – Zone 2 (signed)	56	40057	Temperature value in ºC multiplied by 100. (see note *)	✓	✓							
Thermostat Target Temperature – Zone 2	57	40058	Temperature value in ºC 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	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	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 ºC multiplied by 100. (see note *)	✓	✓								
Temperature Setpoint – Zone 1 **[READ ONLY]**	82	40083	Temperature value in ºC multiplied by 100. (see note **)	✓	✓								
Temperature Setpoint – Zone 2 (signed) **[READ ONLY]**	83	40084	Temperature value in ºC multiplied by 100. (see note *)	✓	✓								
Temperature Setpoint – Zone 2 **[READ ONLY]**	84	40085	Temperature value in ºC multiplied by 100. (see note **)	✓	✓								
Flow Temperature Setpoint – Zone 1 (signed) **[READ ONLY]**	85	40086	Temperature value in ºC multiplied by 100. (see note *)	✓	✓	✓	✓	✓	✓		✓	✓	
Flow Temperature Setpoint – Zone 1 **[READ ONLY]**	86	40087	Temperature value in ºC multiplied by 100. (see note **)	✓	✓	✓	✓	✓	✓		✓	✓	
Flow Temperature Setpoint – Zone 2 (signed) **[READ ONLY]**	87	40088	Temperature value in ºC multiplied by 100. (see note *)	✓	✓								
Flow Temperature Setpoint – Zone 2 **[READ ONLY]**	88	40089	Temperature value in ºC multiplied by 100. (see note **)	✓	✓								
Legionella Temperature Setpoint (signed) **[READ ONLY]**	89	40090	Temperature value in ºC multiplied by 100. (see note *)	✓	✓								
Legionella Temperature Setpoint **[READ ONLY]**	90	40091	Temperature value in ºC multiplied by 100. (see note **)	✓	✓								
DHW Temperature Drop (signed) **[READ ONLY]**	91	40092	Temperature value in ºC multiplied by 10. 0xFF38 = -20.0ºC … 0x0433 = 107.5ºC	✓	✓								
DHW Temperature Drop **[READ ONLY]**	92	40093	Temperature value in ºC multiplied by 10. 0x0000 = 0ºC … 0x0433 = 107.5ºC 0 = 0.0ºC … 1075 = 107.5ºC	✓	✓								

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

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

Holding Register (Analogue Output)				Applicable Unit Type									
Register Name	Addr	Modicon Address	Details	FTC4	FTC5	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 ºC multiplied by 100. (see note *)							✓			
Flow Temperature – Zone 2 **[READ ONLY]**			Temperature value in ºC multiplied by 100. (see note **)	✓	✓								
External Water Temperature 2 **[READ ONLY]**	112	40113	Temperature value in ºC multiplied by 100. (see note **)			✓		✓					
External Water Temperature 4 **[READ ONLY]**			Temperature value in ºC multiplied by 100. (see note **)							✓			
Return Temperature – Zone 2 (signed) **[READ ONLY]**	113	40114	Temperature value in ºC multiplied by 100. (see note *)	✓	✓								
External Water Temperature 6 (signed) **[READ ONLY]**			Temperature value in ºC multiplied by 100. (see note **)							✓			
Return Temperature – Zone 2 **[READ ONLY]**	114	40115	Temperature value in ºC multiplied by 100. (see note **)	✓	✓								
External Water Temperature 6 **[READ ONLY]**			Temperature value in ºC multiplied by 100. (see note **)							✓			
Boiler Flow Temperature (signed) **[READ ONLY]**	115	40116	Temperature value in ºC multiplied by 100. (see note *)	✓	✓								
Boiler Flow Temperature **[READ ONLY]**	116	40117	Temperature value in ºC multiplied by 100. (see note **)	✓	✓								
Boiler Return Temperature (signed) **[READ ONLY]**	117	40118	Temperature value in ºC multiplied by 100. (see note *)	✓	✓								
Boiler Return Temperature **[READ ONLY]**	118	40119	Temperature value in ºC 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	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	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]**			0 = Stop, 1 = Run			✓		✓					

Holding Register (Analogue Output)				Applicable Unit Type									
Register Name	Addr	Modicon Address	Details	FTC4	FTC5	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	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	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	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			✓							

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Holding Register (Analogue Output)				Applicable Unit Type									
Register Name	Addr	Modicon Address	Details	FTC4	FTC5	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	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 ºC multiplied by 100. (see note *)			✓	✓	✓	✓	✓	✓	✓	
Evaporating Temperature **[READ ONLY]**	231	40232	Temperature value in ºC multiplied by 100. (see note **)			✓	✓	✓	✓	✓	✓	✓	
Condensing Temperature (signed) **[READ ONLY]**	232	40233	Temperature value in ºC multiplied by 100. (see note *)			✓	✓	✓	✓	✓	✓	✓	
Condensing Temperature **[READ ONLY]**	233	40234	Temperature value in ºC 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	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 ºC multiplied by 100. (see note *)					✓	✓				
Brine Inlet Temperature **[READ ONLY]**	251	40252	Temperature value in ºC multiplied by 100. (see note **)					✓	✓				
Brine Outlet Temperature 1 (signed) **[READ ONLY]**	252	40253	Temperature value in ºC multiplied by 100. (see note *)					✓	✓				
Brine Outlet Temperature 1 **[READ ONLY]**	253	40254	Temperature value in ºC multiplied by 100. (see note **)					✓	✓				
Brine Outlet Temperature 2 (signed) **[READ ONLY]**	254	40255	Temperature value in ºC multiplied by 100. (see note *)					✓	✓				
Brine Outlet Temperature 2 **[READ ONLY]**	255	40256	Temperature value in ºC multiplied by 100. (see note **)					✓	✓				
Condensing Temperature 2 (signed) **[READ ONLY]**	256	40257	Temperature value in ºC multiplied by 100. (see note *)			✓	✓	✓	✓		✓	✓	
Condensing Temperature 2 **[READ ONLY]**	257	40258	Temperature value in ºC multiplied by 100. (see note **)			✓	✓	✓	✓		✓	✓	

Holding Register (Analogue Output)				Applicable Unit Type									
Register Name	Addr	Modicon Address	Details	FTC4	FTC5	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 ºC multiplied by 100. (see note *)			✓	✓	✓	✓		✓	✓	
Water Outlet Temperature 2 **[READ ONLY]**	259	40260	Temperature value in ºC multiplied by 100. (see note **)			✓	✓	✓	✓		✓	✓	
Evaporating Temperature 2 (signed) **[READ ONLY]**	260	40261	Temperature value in ºC multiplied by 100. (see note *)			✓	✓	✓	✓		✓	✓	
Evaporating Temperature 2 **[READ ONLY]**	261	40262	Temperature value in ºC 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	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 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		✓								
Last Measured DHW Energy Consumption – kWh part **[READ ONLY]**	286	40287	Last measured DHW energy consumption – kWh part of the value. 0 = 0kWh … 65535 = 65535kWh		✓								

Holding Register (Analogue Output)				Applicable Unit Type									
Register Name	Addr	Modicon Address	Details	FTC4	FTC5	CAHV master	CAHV slave	CRHV master	CRHV slave	QAHV master	EAHV / EACV master	EAHV / EACV slave	
Last Measured DHW Energy Consumption – Wh part **[READ ONLY]**	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 **[READ ONLY]**	288	40289	Last measured total energy consumption in Kwh. 0 = 0kWh … 65535 = 65535kWh		✓								
Energy Produced Measured Date – Year **[READ ONLY]**	289	40290	Date of last energy produced measurement – Year		✓								
Energy Produced Measured Date – Month **[READ ONLY]**	290	40291	Date of last energy produced measurement – Month		✓								
Energy Produced Measured Date – Day **[READ ONLY]**	291	40292	Date of last energy produced measurement – Day		✓								
Last Measured Heating Energy Produced – kWh part **[READ ONLY]**	292	40293	Last measured heating energy produced – kWh part of the value. 0 = 0kWh … 65535 = 65535kWh		✓								
Last Measured Heating Energy Produced – Wh part **[READ ONLY]**	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 **[READ ONLY]**	294	40295	Last measured cooling energy produced – kWh part of the value. 0 = 0kWh … 65535 = 65535kWh		✓								
Last Measured Cooling Energy Produced – Wh part **[READ ONLY]**	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 **[READ ONLY]**	296	40297	Last measured DHW energy produced – kWh part of the value. 0 = 0kWh … 65535 = 65535kWh		✓								
Last Measured DHW Energy Produced – Wh part **[READ ONLY]**	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 **[READ ONLY]**	298	40299	Last measured total energy produced in Kwh. 0 = 0kWh … 65535 = 65535kWh		✓								
Flow Rate **[READ ONLY]**	299	40300	Litres per minute 0 = 0 l/min … 255 = 255 l/min		✓								

* Temperature in ºC multiplied by 100.
  0x8000 = -327.68ºC
  0x8001 = -327.67ºC

  …
  0xFFFF = -0.01ºC
  0x0000 = 0.00ºC

  …
  0x7FFE = 327.66ºC
  0x7FFF = 327.67ºC

** Temperature in ºC multiplied by 100.
  0x0000 = 0.00ºC
  0x0001 = 0.01ºC

  …
  0x7FFE = 327.66ºC
  0x7FFF = 327.67ºC

^ 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

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† Electric Energy
  0x0000 = 0.00 kWh
  0x0001 = 0.01 kWh
  …
  0xFFFE = 655.34 kWh
  0xFFFF = 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..+50ºC for CRHV/CAHV/EAHV models
[#10] Range is 0..+50ºC for CRHV/CAHV/EAHV models
[#11] Range is +30..+65ºC for CAHV models
[#12] Range is +25..+65ºC 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..+90ºC for QAHV models
[#16] Range is +30..+55ºC for EAHV models (Heating)
    Range is +5..+25ºC for EAHV models (Cooling)
[#17] "Error information of refrigerant system" for CAHV/CRHV/QAHV models
[#18] Read only value

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	FTC4	FTC5	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	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	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 ºC multiplied by 100. (see note *)	✓	✓								
Temperature Setpoint – Zone 1	41	30042	Temperature value in ºC multiplied by 100. (see note **)	✓	✓								
Temperature Setpoint – Zone 2 (signed)	42	30043	Temperature value in ºC multiplied by 100. (see note *)	✓	✓								
Temperature Setpoint – Zone 2	43	30044	Temperature value in ºC multiplied by 100. (see note **)	✓	✓								
Flow Temperature Setpoint – Zone 1 (signed)	44	30045	Temperature value in ºC multiplied by 100. (see note *)	✓	✓	✓	✓	✓	✓		✓	✓	
Flow Temperature Setpoint – Zone 1	45	30046	Temperature value in ºC multiplied by 100. (see note **)	✓	✓	✓	✓	✓	✓		✓	✓	
Flow Temperature Setpoint – Zone 2 (signed)	46	30047	Temperature value in ºC multiplied by 100. (see note *)	✓	✓								
Flow Temperature Setpoint – Zone 2	47	30048	Temperature value in ºC multiplied by 100. (see note **)	✓	✓								
Legionella Temperature Setpoint (signed)	48	30049	Temperature value in ºC multiplied by 100. (see note *)	✓	✓								
Legionella Temperature Setpoint	49	30050	Temperature value in ºC multiplied by 100. (see note **)	✓	✓								
DHW Temperature Drop (signed)	50	30051	Temperature value in ºC multiplied by 10. 0xFF38 = -20.0ºC … 0x0433 = 107.5ºC	✓	✓								
DHW Temperature Drop	51	30052	Temperature value in ºC multiplied by 10. 0x0000 = 0ºC … 0x0433 = 107.5ºC 0 = 0.0ºC … 1075 = 107.5ºC	✓	✓								
Room Temperature – Zone 1 (signed)	52	30053	Temperature value in ºC multiplied by 100. (see note *)	✓	✓								
Room Temperature – Zone 1	53	30054	Temperature value in ºC multiplied by 100. (see note **)	✓	✓								

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

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

Input Register (Analogue Input)				Applicable Unit Type									
Register Name	Addr	Modicon Address	Details	FTC4	FTC5	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 ºC multiplied by 100. (see note *)	✓	✓								
External Water Temperature 6 (signed)			Temperature value in ºC multiplied by 100. (see note **)							✓			
Return Temperature – Zone 2	73	30074	Temperature value in ºC multiplied by 100. (see note **)	✓	✓								
External Water Temperature 6			Temperature value in ºC multiplied by 100. (see note **)							✓			
Boiler Flow Temperature (signed)	74	30075	Temperature value in ºC multiplied by 100. (see note *)	✓	✓								
Boiler Flow Temperature	75	30076	Temperature value in ºC multiplied by 100. (see note **)	✓	✓								
Boiler Return Temperature (signed)	76	30077	Temperature value in ºC multiplied by 100. (see note *)	✓	✓								
Boiler Return Temperature	77	30078	Temperature value in ºC 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	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	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 ºC multiplied by 100. (see note *)			✓	✓	✓	✓	✓	✓	✓	
Evaporating Temperature	110	30111	Temperature value in ºC multiplied by 100. (see note **)			✓	✓	✓	✓	✓	✓	✓	

Input Register (Analogue Input)				Applicable Unit Type									
Register Name	Addr	Modicon Address	Details	FTC4	FTC5	CAHV master	CAHV slave	CRHV master	CRHV slave	QAHV master	EAHV / EACV master	EAHV / EACV slave	
Condensing Temperature (signed)	111	30112	Temperature value in ºC multiplied by 100. (see note *)			✓	✓	✓	✓	✓	✓	✓	
Condensing Temperature	112	30113	Temperature value in ºC 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	
Electric Energy 2	114	30115	Electric Energy in kWh multiplied by 100 (see note †)			✓#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	
Electric Energy 4	116	30117	Electric Energy in kWh multiplied by 100 (see note †)			✓#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	
Electric Energy 6	118	30119	Electric Energy in kWh multiplied by 100 (see note †)			✓#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	
Electric Energy 8	120	30121	Electric Energy in kWh multiplied by 100 (see note †)			✓#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	
Electric Energy 10	122	30123	Electric Energy in kWh multiplied by 100 (see note †)			✓#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	
Electric Energy 12	124	30125	Electric Energy in kWh multiplied by 100 (see note †)			✓#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	

Input Register (Analogue Input)				Applicable Unit Type									
Register Name	Addr	Modicon Address	Details	FTC4	FTC5	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 †)			✓#1	✓#1	✓#1	✓#1		✓#1	✓#1	
Electric Energy 15	127	30128	Electric Energy in kWh multiplied by 100 (see note †)			✓#1	✓#1	✓#1	✓#1		✓#1	✓#1	
Electric Energy 16	128	30129	Electric Energy in kWh multiplied by 100 (see note †)			✓#1	✓#1	✓#1	✓#1		✓#1	✓#1	
Brine Inlet Temperature (signed)	129	30130	Temperature value in ºC multiplied by 100. (see note *)					✓	✓				
Brine Inlet Temperature	130	30131	Temperature value in ºC multiplied by 100. (see note **)					✓	✓				
Brine Outlet Temperature 1 (signed)	131	30132	Temperature value in ºC multiplied by 100. (see note *)					✓	✓				
Brine Outlet Temperature 1	132	30133	Temperature value in ºC multiplied by 100. (see note **)					✓	✓				
Brine Outlet Temperature 2 (signed)	133	30134	Temperature value in ºC multiplied by 100. (see note *)					✓	✓				
Brine Outlet Temperature 2	134	30135	Temperature value in ºC multiplied by 100. (see note **)					✓	✓				
Condensing Temperature 2 (signed)	135	30136	Temperature value in ºC multiplied by 100. (see note *)			✓	✓	✓	✓		✓	✓	
Condensing Temperature 2	136	30137	Temperature value in ºC multiplied by 100. (see note **)			✓	✓	✓	✓		✓	✓	
Water Outlet Temperature 2 (signed)	137	30138	Temperature value in ºC multiplied by 100. (see note *)			✓	✓	✓	✓		✓	✓	
Water Outlet Temperature 2	138	30139	Temperature value in ºC multiplied by 100. (see note **)			✓	✓	✓	✓		✓	✓	
Evaporating Temperature 2 (signed)	139	30140	Temperature value in ºC multiplied by 100. (see note *)			✓	✓	✓	✓		✓	✓	
Evaporating Temperature 2	140	30141	Temperature value in ºC multiplied by 100. (see note **)			✓	✓	✓	✓		✓	✓	

Input Register (Analogue Input)				Applicable Unit Type								
Register Name	**Addr**	**Modicon Address**	**Details**	**FTC4**	**FTC5**	**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	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	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		✓								

* Temperature in ºC multiplied by 100.
   0x8000 = -327.68ºC
   0x8001 = -327.67ºC
   …
   0xFFFF = -0.01ºC
   0x0000 = 0.00ºC
   …
   0x7FFE = 327.66ºC
   0x7FFF = 327.67ºC

** Temperature in ºC multiplied by 100.
   0x0000 = 0.00ºC
   0x0001 = 0.01ºC
   …
   0x7FFE = 327.66ºC
   0x7FFF = 327.67ºC

^ 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
  …
  0xFFFE = 655.34 kWh
  0xFFFF = 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

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	FTC4	FTC5	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

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	FTC4	FTC5	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	✔	✔	✔		✔				

Discrete Input (Digital Input)				Applicable Unit Type									
Register Name	Addr	Modicon Address	Details	FTC4	FTC5	CAHV master	CAHV slave	CRHV master	CRHV slave	QAHV master	EAHV / EACV master	EAHV / EACV slave	
Heat Pump Slave 5 ON/OFF (address 6 for CAHV/CRHV)	12	10013	0 = Stop, 1 = Run	✓	✓	✓		✓					
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	✓	✓								

Discrete Input (Digital Input)				Applicable Unit Type								
Register Name	Addr	Modicon Address	Details	FTC4	FTC5	CAHV master	CAHV slave	CRHV master	CRHV slave	QAHV master	EAHV / EACV master	EAHV / EACV slave
Heat Pump 10 ON/OFF	26	10027	0 = Stop, 1 = Run			✓		✓		✓		
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]				

Discrete Input (Digital Input)				Applicable Unit Type									
Register Name	Addr	Modicon Address	Details	FTC4	FTC5	CAHV master	CAHV slave	CRHV master	CRHV slave	QAHV master	EAHV / EACV master	EAHV / EACV slave	
Heat Pump 25 ON/OFF	41	10042	0 = Stop, 1 = Run			✓[#1]		✓[#1]					
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			✓							

Discrete Input (Digital Input)				Applicable Unit Type									
Register Name	Addr	Modicon Address	Details	FTC4	FTC5	CAHV master	CAHV slave	CRHV master	CRHV slave	QAHV master	EAHV / EACV master	EAHV / EACV slave	
Water Pump 9 ON/OFF	71	10072	0 = Stop, 1 = Run			✓							
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							✓			

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

13. 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).

13.1. 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**		
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	Lossnay LGH Series		
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		
Temperature Setpoint A	304	40305	Temperature value in ºC multiplied by 10. 0 = 0ºC … 400 = 40ºC Note: Only available when 'Set Temperature on Temperature Control Unit' value = 1 or 2.			
Supply Air Temperature [**READ ONLY**]	305	40306	Temperature value in ºC multiplied by 10. 0 = 0ºC … 400 = 40ºC Note: Only available when 'Supply Air Temperature Sensor' value = 1 (Equipped).			

Holding Register (Analogue Output)				Applicable Unit Type		
Register Name	Addr	Modicon Address	Details	Lossnay LGH Series		
Outdoor Temperature (signed) [**READ ONLY**]	306	40307	Temperature value in ºC multiplied by 10. (see note *) Note: Only available when 'Outdoor Temperature Sensor' value = 1 (Equipped).	✓		
Outdoor Temperature [**READ ONLY**]	307	40308	Temperature value in ºC 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 ºC multiplied by 10. 0 = 0ºC … 400 = 40ºC 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			
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			

Holding Register (Analogue Output)				Applicable Unit Type		
Register Name	Addr	Modicon Address	Details	Lossnay LGH Series		
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 0.5ºC Increments Availability [**READ ONLY**]	322	40323	0 = Not available 1 = Available			
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			

Holding Register (Analogue Output)				Applicable Unit Type		
Register Name	**Addr**	**Modicon Address**	**Details**	**Lossnay LGH Series**		
Minimum Cooling Setpoint [**READ ONLY**]	326	40327	Temperature value in ºC multiplied by 10. 0 = 0ºC … 400 = 40ºC Note: Only available when 'Set Temperature on Temperature Control Unit' value = 1 or 2.			
Maximum Cooling Setpoint [**READ ONLY**]	327	40328	Temperature value in ºC multiplied by 10. 0 = 0ºC … 400 = 40ºC Note: Only available when 'Set Temperature on Temperature Control Unit' value = 1 or 2.			
Minimum Heating Setpoint [**READ ONLY**]	328	40329	Temperature value in ºC multiplied by 10. 0 = 0ºC … 400 = 40ºC Note: Only available when 'Set Temperature on Temperature Control Unit' value = 1 or 2.			
Maximum Heating Setpoint [**READ ONLY**]	329	40330	Temperature value in ºC multiplied by 10. 0 = 0ºC … 400 = 40ºC Note: Only available when 'Set Temperature on Temperature Control Unit' value = 1 or 2.			
Minimum Auto Setpoint [**READ ONLY**]	330	40331	Temperature value in ºC multiplied by 10. 0 = 0ºC … 400 = 40ºC Note: Only available when 'Set Temperature on Temperature Control Unit' value = 1 or 2.			
Maximum Auto Setpoint [**READ ONLY**]	331	40332	Temperature value in ºC multiplied by 10. 0 = 0ºC … 400 = 40ºC Note: Only available when 'Set Temperature on Temperature Control Unit' value = 1 or 2.			
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	✓		

Holding Register (Analogue Output)				Applicable Unit Type		
Register Name	Addr	Modicon Address	Details	Lossnay LGH Series		
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 ºC multiplied by 10.
  0xFDD0 = -56.0ºC
  0xFDD5 = -55.5 ºC
  …
  0xFFFB = -0.5ºC
  0x0000 = 0.0ºC
  0x0005 = 0.5 ºC
  …
  0x0271 = 62.5ºC
  0x0276 = 63.0ºC

  [0x7FFE = Under detecting]
  [0x7FFF = No thermistor connected]

** Temperature in ºC multiplied by 10.
  0x0000 = 0.0ºC
  0x0005 = 5.0ºC
  …
  0x0271 = 62.5ºC
  0x0276 = 63.0ºC

  [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.

13.1. 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**		
MelcoBEMS MINI Firmware Version	3	30004	MelcoBEMS MINI 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 ºC multiplied by 10. 0 = 0ºC … 400 = 40ºC Note: Only available when 'Supply Air Temperature Sensor' value = 1 (Equipped).			
Outdoor Temperature (signed)	175	30176	Temperature value in ºC multiplied by 10. (see note *) Note: Only available when 'Outdoor Temperature Sensor' value = 1 (Equipped).	✓		
Outdoor Temperature	176	30177	Temperature value in ºC multiplied by 10. (see note **) Note: Only available when 'Outdoor Temperature Sensor' value = 1 (Equipped).	✓		
Room Temperature A	177	30178	Temperature value in ºC multiplied by 10. 0 = 0ºC … 400 = 40ºC 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		
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 ºC multiplied by 10. 0 = 0ºC … 400 = 40ºC 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		
Maximum Cooling Setpoint	186	30187	Temperature value in ºC multiplied by 10. 0 = 0ºC … 400 = 40ºC Note: Only available when 'Set Temperature on Temperature Control Unit' value = 1 or 2.			
Minimum Heating Setpoint	187	30188	Temperature value in ºC multiplied by 10. 0 = 0ºC … 400 = 40ºC Note: Only available when 'Set Temperature on Temperature Control Unit' value = 1 or 2.			
Maximum Heating Setpoint	188	30189	Temperature value in ºC multiplied by 10. 0 = 0ºC … 400 = 40ºC Note: Only available when 'Set Temperature on Temperature Control Unit' value = 1 or 2.			
Minimum Auto Setpoint	189	30190	Temperature value in ºC multiplied by 10. 0 = 0ºC … 400 = 40ºC Note: Only available when 'Set Temperature on Temperature Control Unit' value = 1 or 2.			
Maximum Auto Setpoint	190	30191	Temperature value in ºC multiplied by 10. 0 = 0ºC … 400 = 40ºC 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			

13.1. 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**		
Power On/Off	3	00004	0 = Power OFF 1 = Power ON	✓		

13.1. 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**		
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		
			- 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 0.5ºC 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		
Supply Air Temperature Sensor	96	10097	0 = Not equipped 1 = Equipped			
CO2 Level Sensor	97	10098	0 = Not equipped 1 = Equipped			

Appendix A – Compatible Air-To-Air units

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-RP35/50/60/71/100/125/140KAQ
PCA-RP35/50/60/71/100/125/140KAQR2
PCA-RP50/60/71KAQR1
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)
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-ZM35/50/60/71/100/125/140EA
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

Ecodan FTC4:

Cylinder	Hydrobox	Controller
EHST20C-VM6HB	EHSC-VM6B	PAC-IF052B-E
EHST20C-YM9HB	EHSC-YM9B	PAC-IF051B-E
EHST20C-VM6B	EHSC-VM6EB	
EHST20C-YM9B	EHSC-YM9EB	
EHST20C-VM6EB	EHPX-VM2B	
EHST20C-YM9EB	EHPX-VM6B	
EHST20C-VM6SB	EHPX-YM9B	
EHPT20X-VM2HB	ERSC-VM2B	
EHPT20X-VM6HB	EHSC-VM2B	
EHPT20X-YM9HB	EHSC-TM9B	
EHPT20X-VM6B		
EHPT20X-YM9B		
EHST-20CVM2B		
EHST20C-TM9HB		
EHPT20X-TM9HB		

Ecodan FTC5:

Cylinder	Hydrobox	Controller
EHST20C-VM2C	EHSC-VM2C	PAC-IF062B-E
EHST20C-VM6C	EHSC-VM2EC	
EHST20C-YM9C	EHSC-VM6C	
EHST20C-TM9C	EHSC-VM6EC	
EHST20C-VM2EC	EHSC-YM9C	
EHST20C-VM6EC	EHSC-YM9EC	
EHST20C-YM9EC	EHSC-TM9C	
EHST20C-MEC	EHSC-MEC	
EHST20C-MHCW	EHSD-VM2C	
EHST20D-VM2C	EHSD-MEC	
EHST20D-MEC	ERSC-VM2C	
EHST20D-MHC	ERSC-MEC	
EHST20D-MHCW	ERSD-VM2C	
EHPT20X-VM2C	EHPX-VM2C	
EHPT20X-VM6C	EHPX-YM9C	
EHPT20X-YM9C		
EHPT20X-TM9C		
EHPT20X-MHCW		
EHPT15X-UKHCW*		
EHPT17X-UKHCW*		
EHPT21X-UKHCW*		
EHPT25X-UKHCW*		
EHPT30X-UKHCW*		
EHPT21X-UKHSCW*		
EHPT25X-UKHSCW*		
EHPT30X-UKHSCW*		
EHPT15X-UKHLCW*		
EHPT17X-UKHLCW*	*UK Models	

Ecodan Ground Source Heat Pump:
CRHV-P600YA-HPB

Ecodan Air Source Heat Pump:	**Hot Water Heat Pump**
CAHV-P500YB-HPB	QAHV-N560YA-HPB

Appendix C – Compatible Lossnay units

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

Appendix D – Compatible E-Series Chiller units

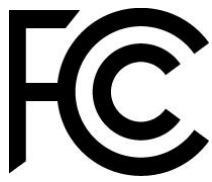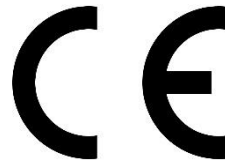| Type	Model	Capacities
Cooling Only	EACV-P900YA	90kW, 180kW, 270kW, 360kW, 450kW, 540kW
Heating/Cooling	EAHV-P900YA	90kW, 180kW, 270kW, 360kW, 450kW, 540kW
Heating Only	EAHV-P900YA-H	90kW, 180kW, 270kW, 360kW, 450kW, 540kW

MITSUBISHI ELECTRIC UK

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