# BACNET PROTOCOL
# FOR FC400

## FC400 from release FW 4.0

Rev 4 of 16/09/26

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## 1. PREFACE

The FC400 controllers support the communication protocol BACNET TCP/IP by CPE100 protocol converter. Using this function it is possible to read the device status and to control the units through the PC's software or through devices supporting Bacnet likes PLCs or BMS Systems.

### 1.1. STANDARD OBJECT TYPES SUPPORTED

| OBJECT TYPE | OPTIONAL PROPERTIES | WRITEABLE PROPERTIES |
|---|---|---|
| Analog Input [AI] | Object Identifier, Object Name, Object Type, Present Value, Units | Present Value |
| Analog Output [AO] | Object Identifier, Object Name, Object Type, Present Value, Units | Present Value |
| Multistate Value [MV] | Object Identifier, Object Name, Object Type, Present Value, Units | Present Value |

## 2. HYSTORY OF DOCUMENT

| DATE | REV. | FW VERS. | CHANGES |
|---|---|---|---|
| 06/09/24 | 00 | 2.1.0 | Emission |
| 17/09/24 | 01 | 2.1.0 | Digital Input Note see paragraph 4.2.2 DIGITAL INPUTS |
| 04/10/24 | 02 | 2.1.0 | Digital Input Note see paragraph 4.1.2 MODBUS SIDE DIAGNOSTICS |
| 03/03/25 | 03 | 2.1.0 | Change data type: From Positive Integer Value to Multistate Value |
| 18/08/26 | 04 | 4.0 | Paragraph's notes update |

## 3. CONTACT ADDRESS OF THE MANUFACTURER AND TECHNICAL SUPPORT

In case of information requests or technical issues the buyer can contact HYTERM at the following address:

HYTERM S.r.l.
Viale del lavoro, 18 – 25045 Castegnato (BS)

**Site**: www.hyterm.com
**E-mail**: info@hyterm.com

Technical Support:
**E-mail**: support@hyterm.com
**Teams**: support@hyterm.com

# 4. DESCRIPTION OF THE REGISTERS OF FC400

List of the registers with detailed address and description.

## 4.1. READ ONLY REGISTERS

### 4.1.1. STATUS PARAMETERS

| OBJECT TYPE [INSTANCE] | VALUES | MIN | MAX | DEF | ACCESS |
|---|---|---|---|---|---|
| MV[0] | **Description**: Operating hours (controller powered) | | | | |
| | h | 0 | 65535 | 0 | R |
| MV[1] | **Description**: Controller operating hours (CU>0) | | | | |
| | h | 0 | 65535 | 0 | R |
| MV[2] | **Description**: Device identification | | | | |
| | 0 = ND<br>3 = FC400 HEADLESS<br>4 = FC400 CIECO ETHERNET<br>5 = FC400 UI<br>6 = FC400 UI ETHERNET<br>7 = SC400<br>8 = RB100 | 0 | 65535 | 0 | R |
| AI[0] | **Description**: Release HW | | | | |
| | 100 = 1.00 | 0.00 | 65535.00 | 0.00 | R |
| MV[3] | **Description**: Release FW (Due byte) → Tripletta | | | | |
| | Byte 1 (least significant) = Build<br>Byte 2 (most significant) = Upper 4 bits: Minor, Latest 4 bits: Major | 0 | 65535 | 0 | R |
| MV[4] | **Description**: Controller status | | | | |
| | 0 = STARTING<br>1 = STOP<br>2 = RUN | 0 | 2 | 0 | R |
| MV[5] | **Description**: Number of working fans | | | | |
| | nr | 0 | 22 | 0 | R |
| MV[6] | **Description**: Total fan power consumption | | | | |
| | Sum of the individual powers in W | 0 | 65535 | 0 | R |
| MV[7] | **Description**: Fan rotation speed (average) | | | | |
| | RPM | 0 | 65535 | 0 | R |

| OBJECT TYPE [INSTANCE] | VALUES | MIN | MAX | DEF | ACCESS |
|---|---|---|---|---|---|
| AI[1] | **Description**: Setpoint value in use | | | | |
| | °C | -15.0 | 90.0 | 0.0 | R |
| | °F | 5.0 | 194.0 | 0.0 | |
| | Bar | 0.0 | 45.0 | 0.0 | |
| | Psi | 0.0 | 652.6 | 0.0 | |
| AI[2] | **Description**: Analog input 1 value | | | | |
| | Value * | -32768.0 | 32767.0 | 0.0 | R |
| AI[3] | **Description**: Analog input 2 value | | | | |
| | Value * | -32768.0 | 32767.0 | 0.0 | R |
| AI[4] | **Description**: Analog input 3 value | | | | |
| | Value * | -32768.0 | 32767.0 | 0.0 | R |
| AI[5] | **Description**: Analog input 4 value | | | | |
| | Value * | -32768.0 | 32767.0 | 0.0 | R |
| AI[6] | **Description**: Analog input 5 value | | | | |
| | Value * | -32768.0 | 32767.0 | 0.0 | R |
| AI[7] | **Description**: Analog input 6 value | | | | |
| | Value * | -32768.0 | 32767.0 | 0.0 | R |
| MV[8] | **Description**: Digital input status | | | | |
| | Bit 0 = DI1<br>Bit 1 = DI2<br>Bit 2 = DI3<br>Bit 3 = DI4<br>Bit 4 = DI5<br>Bit 5 = DI6<br>Bit 6 = DI7 | 0 | 255 | 0 | R |
| AI[8] | **Description**: Actual DAC value for analog output 1 | | | | |
| | Volt (0-10V) | 0.00 | 1000.00 | 0.00 | R |
| AI[9] | **Description**: Actual DAC value for analog output 2 | | | | |
| | Volt (0-10V) | 0.00 | 1000.00 | 0.00 | R |
| MV[9] | **Description**: Digital output status | | | | |
| | Bit 0 = DO1<br>Bit 1 = DO2<br>Bit 2 = DO3<br>Bit 3 = DO4 | 0 | 15 | 0 | R |

| OBJECT TYPE [INSTANCE] | VALUES | MIN | MAX | DEF | ACCESS |
|---|---|---|---|---|---|
| MV[10] | **Description**: CU value (Fan control percentage) | | | | |
| | % | 0 | 100 | 0 | R |
| MV[11] | **Description**: Warning code 1 | | | | |
| | Bit 0 = DATALOGGER<br>Bit 1 = FAN (General notification)<br>Bit 2 = CIRCUIT BREAKERS WARNING<br>Bit 3 = REPAIR SWITCH WARNING<br>Bit 4 = PANEL HEATER | 0 | 65535 | 0 | R |
| MV[12] | **Description**: Warning code 2 | | | | |
| | Bit 0 = FAN_1<br>Bit 1 = FAN_2<br>Bit 2 = FAN_3<br>Bit 3 = FAN_4<br>Bit 4 = FAN_5<br>Bit 5 = FAN_6<br>Bit 6 = FAN_7<br>Bit 7 = FAN_8<br>Bit 8 = FAN_9<br>Bit 9 = FAN_10<br>Bit 10 = FAN_11<br>Bit 11 = FAN_12<br>Bit 12 = FAN_13<br>Bit 13 = FAN_14<br>Bit 14 = FAN_15<br>Bit 15 = FAN_16 | 0 | 65535 | 0 | R |
| MV[13] | **Description**: Warning code 3 | | | | |
| | Bit 0 = FAN_17<br>Bit 1 = FAN_18<br>Bit 2 = FAN_19<br>Bit 3 = FAN_20<br>Bit 4 = FAN_21<br>Bit 5 = FAN_22 | 0 | 65535 | 0 | R |

| OBJECT TYPE [INSTANCE] | VALUES | MIN | MAX | DEF | ACCESS |
|---|---|---|---|---|---|
| MV[14] | **Description**: Error code 1 | | | | |
| | Bit 0 = TK DIGITAL INPUT (Function ALARM)<br>Bit 1 = ALL FAN<br>Bit 2 = ANALOG Input<br>Bit 3 = SLAVE SAFETY<br>Bit 4 = Reserved<br>Bit 5 = ADIABATIC COMMUNICATION<br>Bit 6 = COMMUNICATION REMOTE CONTROL<br>Bit 7 = OVER HEAT (board)<br>Bit 8 = UNDER HEAT (board)<br>Bit 9 = POWER SUPPLY<br>Bit 8 = UNDER HEAT (board) | 0 | 65535 | 0 | R |
| MV[15] | **Description**: Error code 2 | | | | |
| | Bit 0 = FAN_1<br>Bit 1 = FAN_2<br>Bit 2 = FAN_3<br>Bit 3 = FAN_4<br>Bit 4 = FAN_5<br>Bit 5 = FAN_6<br>Bit 6 = FAN_7<br>Bit 7 = FAN_8<br>Bit 8 = FAN_9<br>Bit 9 = FAN_10<br>Bit 10 = FAN_11<br>Bit 11 = FAN_12<br>Bit 12 = FAN_13<br>Bit 13 = FAN_14<br>Bit 14 = FAN_15<br>Bit 15 = FAN_16 | 0 | 65535 | 0 | R |
| MV[16] | **Description**: Error code 3 | | | | |
| | Bit 0 = FAN_17<br>Bit 1 = FAN_18<br>Bit 2 = FAN_19<br>Bit 3 = FAN_20<br>Bit 4 = FAN_21<br>Bit 5 = FAN_22<br>Bit 6 = FAN_23<br>Bit 7 = FAN_24<br>Bit 10 = Analog input alarm | 0 | 65535 | 0 | R |

| OBJECT TYPE [INSTANCE] | VALUES | MIN | MAX | DEF | ACCESS |
|---|---|---|---|---|---|
| MV[17] | **Description**: Error code 4 | | | | |
| | Bit 0 = ANALOG INPUT 1<br>Bit 1 = ANALOG INPUT 2<br>Bit 2 = ANALOG INPUT 3<br>Bit 3 = ANALOG INPUT 4<br>Bit 4 = ANALOG INPUT 5<br>Bit 5 = ANALOG INPUT 6 | 0 | 65535 | 0 | R |
| MV[18] | **Description**: Temperature unit of measure in use | | | | |
| | Temperature unit<br>0 = °C<br>1 = °F | 0 | 1 | 0 | R |
| MV[19] | **Description**: Pressure unit of measure in use | | | | |
| | Pressure unit<br>0 = Bar<br>1 = Psi | 0 | 1 | 0 | R |

### 4.1.2. MODBUS SIDE DIAGNOSTICS

This BACNET object signals a malfunction in the MODBUS side communication (the regulator doesn't respond to MODBUS queries).



When MV[85] value is greater than 0 wait 60s before triggering an alarm (Communication can automatically re-establish itself within 60s)

| OBJECT TYPE [INSTANCE] | VALUES | MIN | MAX | DEF | ACCESS |
|---|---|---|---|---|---|
| MV[85] | **Description: MODBUS side diagnostics** | | | | |
| | MV[85] = 0 → MODBUS OK → FC400 OK<br>MV[85] > 0 → MODBUS KO→ FC400 KO | 0 | 256 | 0 | R |

## 4.2. READ & WRITE REGISTER



All data in this section (write mode) are saved in memory of the regulator, write the desired value and then the AUTOSAVE function will save it in memory permanently.

### 4.2.1. WORRKING PARAMETERS

| OBJECT TYPE [INSTANCE] | VALUES | MIN | MAX | DEF | ACCESS |
|---|---|---|---|---|---|
| **Description**: Set Point 1 (regulation) | | | | | |
| AI[10] | °C | -15.0 | 90.0 | 35.0 | R |
| | °F | 5.0 | 194.0 | 95.0 | |
| | Bar | 0.0 | 60.0 | 30.0 | |
| | Psi | 0.0 | 870.2 | 435.1 | |
| AO[0] | °C | -15.0 | 90.0 | 35.0 | W |
| | °F | 5.0 | 194.0 | 95.0 | |
| | Bar | 0.0 | 60.0 | 30.0 | |
| | Psi | 0.0 | 870.2 | 435.1 | |
| **Description**: Set Point 2 (regulation) | | | | | |
| AI[11] | °C | -15.0 | 90.0 | 25.0 | R |
| | °F | 5.0 | 194.0 | 95.0 | |
| | Bar | 0.0 | 60.0 | 30.0 | |
| | Psi | 0.0 | 870.2 | 435.1 | |
| AO[1] | °C | -15.0 | 90.0 | 25.0 | W |
| | °F | 5.0 | 194.0 | 95.0 | |
| | Bar | 0.0 | 60.0 | 30.0 | |
| | Psi | 0.0 | 870.2 | 435.1 | |

| OBJECT TYPE [INSTANCE] | VALUES | MIN | MAX | DEF | ACCESS |
|---|---|---|---|---|---|
| **Description**: Proportional Band | | | | | |
| AI[12] | °C | 2.0 | 60.0 | 7.5 | R |
| | °F | 3.6 | 108.0 | 13.5 | |
| | Bar (PSCALE <= 16) | 0.0 | 45.0 | 2.4 | |
| | Bar (16 < PSCALE < 45) | 0.0 | 45.0 | 3.5 | |
| | Bar (PSCALE >= 45) | 0.0 | 45.0 | 5.2 | |
| | Psi (PSCALE <= 16) | 0.0 | 652.6 | 34.8 | |
| | Psi (16 < PSCALE < 45) | 0.0 | 652.6 | 50.7 | |
| | Psi (PSCALE >= 45) | 0.0 | 652.6 | 75.4 | |
| AO[2] | °C | 2.0 | 60.0 | 7.5 | W |
| | °F | 3.6 | 108.0 | 13.5 | |
| | Bar (PSCALE <= 16) | 0.0 | 45.0 | 2.4 | |
| | Bar (16 < PSCALE < 45) | 0.0 | 45.0 | 3.5 | |
| | Bar (PSCALE >= 45) | 0.0 | 45.0 | 5.2 | |
| | Psi (PSCALE <= 16) | 0.0 | 652.6 | 34.8 | |
| | Psi (16 < PSCALE < 45) | 0.0 | 652.6 | 50.7 | |
| | Psi (PSCALE >= 45) | 0.0 | 652.6 | 75.4 | |
| **Description**: Minimum limit | | | | | |
| MV[20] | % | 0 | 100 | 0 | R |
| MV[86] | % | 0 | 100 | 0 | W |
| **Description**: Maximum limit | | | | | |
| MV[21] | % | 0 | 100 | 100 | R |
| MV[87] | % | 0 | 100 | 100 | W |
| **Description**: MODBUS slave mode speed set | | | | | |
| MV[22] | 0 = 0%<br>65535 = 100% | 0 | 65535 | 0 | R |
| MV[88] | 0 = 0%<br>65535 = 100% | 0 | 65535 | 0 | W |
| **Description**: PID Proportional component weight | | | | | |
| MV[23] | % | 0 | 100 | 5 | R |
| MV[89] | % | 0 | 100 | 5 | W |
| **Description**: PID Integral component weight | | | | | |
| MV[24] | % | 0 | 100 | 5 | R |
| MV[90] | % | 0 | 100 | 5 | W |

| OBJECT TYPE [INSTANCE] | VALUES | MIN | MAX | DEF | ACCESS |
|---|---|---|---|---|---|
| **Description**: PID Peso componente derivativa | | | | | |
| MV[25] | % | 0 | 100 | 5 | R |
| MV[91] | % | 0 | 100 | 5 | W |
| **Description**: PID sampling time | | | | | |
| MV[26] | s | 1 | 10 | 1 | R |
| MV[92] | s | 1 | 10 | 1 | W |
| **Description**: Pressure scale | | | | | |
| MV[27] | 0 = 15,0 Bar<br>1 = 16,0 Bar<br>2 = 25,0 Bar<br>3 = 30,0 Bar<br>4 = 40,0 Bar<br>5 = 45,0 Bar<br>6 = 50,0 Bar<br>7 = 60,0 Bar | 0 | 7 | 3 | R |
| | 0 = 217.5 Psi<br>1 = 232.1 Psi<br>2 = 362.5 Psi<br>3 = 435.1 Psi<br>4 = 580.1 Psi<br>5 = 652.6 Psi<br>6 = 725.2 Psi<br>7 = 870.2 Psi | 0 | 7 | 3 | |
| MV[93] | 0 = 15,0 Bar<br>1 = 16,0 Bar<br>2 = 25,0 Bar<br>3 = 30,0 Bar<br>4 = 40,0 Bar<br>5 = 45,0 Bar<br>6 = 50,0 Bar<br>7 = 60,0 Bar | 0 | 7 | 3 | W |
| | 0 = 217.5 Psi<br>1 = 232.1 Psi<br>2 = 362.5 Psi<br>3 = 435.1 Psi<br>4 = 580.1 Psi<br>5 = 652.6 Psi<br>6 = 725.2 Psi<br>7 = 870.2 Psi | 0 | 7 | 3 | |

### 4.2.2. DIGITAL INPUTS



The command **Enable control functions for single digital input** is saved in memory of the regulator, write the desired value and then the **AUTOSAVE** function will save it in memory permanently.



Digital Input from 1 to 7 are **not saved** in memory: you need to write the desired value continuously over time. If not, if the regulator is turned off the set values will be lost.

| OBJECT TYPE [INSTANCE] | VALUES | MIN | MAX | DEF | ACCESS |
|---|---|---|---|---|---|
| **Description**: Digital Input 1 | | | | | |
| MV[28] | 0 = OFF<br>1 = ON | 0 | 1 | 0 | R |
| MV[94] | 0 = OFF<br>1 = ON | 0 | 1 | 0 | W |
| **Description**: Digital Input 2 | | | | | |
| MV[29] | 0 = OFF<br>1 = ON | 0 | 1 | 0 | R |
| MV[95] | 0 = OFF<br>1 = ON | 0 | 1 | 0 | W |
| **Description**: Digital Input 3 | | | | | |
| MV[30] | 0 = OFF<br>1 = ON | 0 | 1 | 0 | R |
| MV[96] | 0 = OFF<br>1 = ON | 0 | 1 | 0 | W |
| **Description**: Digital Input 4 | | | | | |
| MV[31] | 0 = OFF<br>1 = ON | 0 | 1 | 0 | R |
| MV[97] | 0 = OFF<br>1 = ON | 0 | 1 | 0 | W |
| **Description**: Digital Input 5 | | | | | |
| MV[32] | 0 = OFF<br>1 = ON | 0 | 1 | 0 | R |
| MV[98] | 0 = OFF<br>1 = ON | 0 | 1 | 0 | W |

| OBJECT TYPE [INSTANCE] | VALUES | MIN | MAX | DEF | ACCESS |
|---|---|---|---|---|---|
| **Description**: Digital Input 6 | | | | | |
| MV[33] | 0 = OFF<br>1 = ON | 0 | 1 | 0 | R |
| MV[99] | 0 = OFF<br>1 = ON | 0 | 1 | 0 | W |
| **Description**: Digital Input 7 | | | | | |
| MV[34] | 0 = OFF<br>1 = ON | 0 | 1 | 0 | R |
| MV[100] | 0 = OFF<br>1 = ON | 0 | 1 | 0 | W |
| **Description**: Enabling control functions for single digital input | | | | | |
| MV[35] | Bit 0 = digital input 1 –> 0 = OFF / 1 = ON<br>Bit 1 = digital input 2 –> 0 = OFF / 1 = ON<br>Bit 2 = digital input 3 –> 0 = OFF / 1 = ON<br>Bit 3 = digital input 4 –> 0 = OFF / 1 = ON<br>Bit 4 = digital input 5 –> 0 = OFF / 1 = ON<br>Bit 5 = digital input 6 –> 0 = OFF / 1 = ON<br>Bit 6 = digital input 7 –> 0 = OFF / 1 = ON | 0 | 127 | 0 | R |
| MV[101] | Bit 0 = digital input 1 –> 0 = OFF / 1 = ON<br>Bit 1 = digital input 2 –> 0 = OFF / 1 = ON<br>Bit 2 = digital input 3 –> 0 = OFF / 1 = ON<br>Bit 3 = digital input 4 –> 0 = OFF / 1 = ON<br>Bit 4 = digital input 5 –> 0 = OFF / 1 = ON<br>Bit 5 = digital input 6 –> 0 = OFF / 1 = ON<br>Bit 6 = digital input 7 –> 0 = OFF / 1 = ON | 0 | 127 | 0 | W |

### 4.2.3. SPECIAL FUNCTIONS



All data in this section (write mode) are saved in memory of the regulator, write the desired value and then the AUTOSAVE function will save it in memory permanently.

#### 4.2.3.1. EMERGENCY SPEED

| OBJECT TYPE [INSTANCE] | VALUES | MIN | MAX | DEF | ACCESS |
|---|---|---|---|---|---|
| **Description**: Enabling the Fan Emergency function | | | | | |
| MV[36] | 0 = Function disabled<br>1 = Function enabled | 0 | 1 | 0 | R |
| MV[102] | 0 = Function disabled<br>1 = Function enabled | 0 | 1 | 0 | W |
| **Description**: Rotation speed in EMERGENCY mode | | | | | |
| MV[37] | % | 10 | 100 | 100 | R |
| MV[103] | % | 10 | 100 | 100 | W |
| **Description**: Fan start delay | | | | | |
| MV[38] | sec | 1 | 60 | 5 | R |
| MV[104] | sec | 1 | 60 | 5 | W |

#### 4.2.3.2. SHEDDING

| OBJECT TYPE [INSTANCE] | VALUES | MIN | MAX | DEF | ACCESS |
|---|---|---|---|---|---|
| **Description**: Enabling the Shedding function | | | | | |
| MV[39] | 0 = Function disabled<br>1 = Function enabled | 0 | 1 | 0 | R |
| MV[105] | 0 = Function disabled<br>1 = Function enabled | 0 | 1 | 0 | W |
| **Description**: Number of start attempts | | | | | |
| MV[40] | nr | 1 | 200 | 20 | R |
| MV[106] | nr | 1 | 200 | 20 | W |

### 4.2.3.3. NIGHT LIMIT

| OBJECT TYPE [INSTANCE] | VALUES | MIN | MAX | DEF | ACCESS |
|---|---|---|---|---|---|
| **Description**: Enabling the NIGHT function | | | | | |
| MV[41] | 0 = Function disabled<br>1 = Function enabled with digital input<br>2 = Automatic function | 0 | 2 | 1 | R |
| MV[107] | 0 = Function disabled<br>1 = Function enabled with digital input<br>2 = Automatic function | 0 | 2 | 1 | W |
| **Description**: Function activation time (Enable = 2) | | | | | |
| MV[42] | hh:mm | 100 | 2359 | 2300 | R |
| MV[108] | hh:mm | 100 | 2359 | 2300 | W |
| **Description**: Function deactivation time (Enable = 2) | | | | | |
| MV[43] | hh:mm | 100 | 2359 | 600 | R |
| MV[109] | hh:mm | 100 | 2359 | 600 | W |
| **Description**: Rotation speed in NIGHT mode | | | | | |
| MV[44] | % | 1 | 100 | 70 | R |
| MV[110] | % | 1 | 100 | 70 | W |

### 4.2.3.4. SPEED JUMP

| OBJECT TYPE [INSTANCE] | VALUES | MIN | MAX | DEF | ACCESS |
|---|---|---|---|---|---|
| **Description**: Enabling the JUMP function | | | | | |
| MV[45] | 0 = Function disabled<br>1 = Function enabled | 0 | 1 | 0 | R |
| MV[111] | 0 = Function disabled<br>1 = Function enabled | 0 | 1 | 0 | W |
| **Description**: Jump lower limit 1 | | | | | |
| MV[46] | % | 0 | 100 | 0 | R |
| MV[112] | % | 0 | 100 | 0 | W |
| **Description**: Jump upper limit 1 | | | | | |
| MV[47] | % | 0 | 100 | 0 | R |
| MV[113] | % | 0 | 100 | 0 | W |

| OBJECT TYPE [INSTANCE] | VALUES | MIN | MAX | DEF | ACCESS |
|---|---|---|---|---|---|
| **Description**: Jump lower limit 2 | | | | | |
| MV[48] | % | 0 | 100 | 0 | R |
| MV[114] | % | 0 | 100 | 0 | W |
| **Description**: Jump upper limit 2 | | | | | |
| MV[49] | % | 0 | 100 | 0 | R |
| MV[115] | % | 0 | 100 | 0 | W |

### 4.2.3.5. UNLOCK

| OBJECT TYPE [INSTANCE] | VALUES | MIN | MAX | DEF | ACCESS |
|---|---|---|---|---|---|
| **Description**: Enabling the UnLock function | | | | | |
| MV[50] | 0 = Function disabled<br>1 = Function enabled with digital input<br>2 = Automatic function | 0 | 2 | 0 | R |
| MV[116] | 0 = Function disabled<br>1 = Function enabled with digital input<br>2 = Automatic function | 0 | 2 | 0 | W |
| **Description**: Fan rotation time | | | | | |
| MV[51] | min | 1 | 120 | 15 | R |
| MV[117] | min | 1 | 120 | 15 | W |
| **Description**: Fan rest time | | | | | |
| MV[52] | min | 1 | 43000 | 10080 | R |
| MV[118] | min | 1 | 43000 | 10080 | W |
| **Description**: Rotation speed in UNLOCK mode | | | | | |
| MV[53] | % | 10 | 100 | 100 | R |
| MV[119] | % | 10 | 100 | 100 | W |

### 4.2.3.6. CLEAN

| OBJECT TYPE [INSTANCE] | VALUES | MIN | MAX | DEF | ACCESS |
|---|---|---|---|---|---|
| **Description**: Enabling the Clean function | | | | | |
| MV[54] | 0 = Function disabled<br>1 = Function enabled with digital input<br>2 = Automatic function | 0 | 2 | 0 | R |
| MV[120] | 0 = Function disabled<br>1 = Function enabled with digital input<br>2 = Automatic function | 0 | 2 | 0 | W |
| **Description**: Trigger Frequency (Enable = 2) | | | | | |
| MV[55] | day | 1 | 30 | 10 | R |
| MV[121] | day | 1 | 30 | 10 | W |
| **Description**: Cleaning start time (Enable = 2) | | | | | |
| MV[56] | hh:mm | 100 | 2359 | 2300 | R |
| MV[122] | hh:mm | 100 | 2359 | 2300 | W |
| **Description**: Cleaning cycle duration (Enable = 2) | | | | | |
| MV[57] | min | 1 | 60 | 15 | R |
| MV[123] | min | 1 | 60 | 15 | W |
| **Description**: Speed during the cleaning cycle | | | | | |
| MV[58] | % | 1 | 100 | 100 | R |
| MV[124] | % | 1 | 100 | 100 | W |

### 4.2.3.7. WASH

| OBJECT TYPE [INSTANCE] | VALUES | MIN | MAX | DEF | ACCESS |
|---|---|---|---|---|---|
| **Description**: Enabling the WASH function | | | | | |
| MV[59] | 0 = OFF<br>1 = ON | 0 | 1 | 0 | R |
| MV[125] | 0 = OFF<br>1 = ON | 0 | 1 | 0 | W |
| **Description**: Trigger Frequency | | | | | |
| MV[60] | day | 1 | 30 | 10 | R |
| MV[126] | day | 1 | 30 | 10 | W |

| OBJECT TYPE [INSTANCE] | VALUES | MIN | MAX | DEF | ACCESS |
|---|---|---|---|---|---|
| **Description**: Cleaning start time | | | | | |
| MV[61] | hh:mm | 100 | 2359 | 2300 | R |
| MV[127] | hh:mm | 100 | 2359 | 2300 | W |
| **Description**: Battery cooling duration | | | | | |
| MV[62] | min | 1 | 60 | 5 | R |
| MV[128] | min | 1 | 60 | 5 | W |
| **Description**: Battery wash duration | | | | | |
| MV[63] | min | 1 | 60 | 15 | R |
| MV[129] | min | 1 | 60 | 15 | W |
| **Description**: Speed during the wash cycle | | | | | |
| MV[64] | % | 1 | 100 | 100 | R |
| MV[130] | % | 1 | 100 | 100 | W |

### 4.2.3.8. ECO

| OBJECT TYPE [INSTANCE] | VALUES | MIN | MAX | DEF | ACCESS |
|---|---|---|---|---|---|
| **Description**: Enabling the ECO function | | | | | |
| MV[65] | 0 = OFF<br>1 = ON | 0 | 1 | 0 | R |
| MV[131] | 0 = OFF<br>1 = ON | 0 | 1 | 0 | W |
| **Description**: Minimum waiting time before the next activation/deactivation | | | | | |
| MV[66] | sec | 3 | 90 | 10 | R |
| MV[132] | sec | 3 | 90 | 10 | W |
| **Description**: Group activation speed | | | | | |
| MV[67] | % | 10 | 50 | 25 | R |
| MV[133] | % | 10 | 50 | 25 | W |
| **Description**: Group deactivation speed | | | | | |
| MV[68] | % | 10 | 50 | 15 | R |
| MV[134] | % | 10 | 50 | 15 | W |

| OBJECT TYPE [INSTANCE] | VALUES | MIN | MAX | DEF | ACCESS |
|---|---|---|---|---|---|
| **Description**: Speed KICK | | | | | |
| MV[69] | % | 1 | 100 | 80 | R |
| MV[135] | % | 1 | 100 | 80 | W |

### 4.2.3.9. SETPOINT SWITCH

| OBJECT TYPE [INSTANCE] | VALUES | MIN | MAX | DEF | ACCESS |
|---|---|---|---|---|---|
| **Description**: Enabling the SP change function with Tamb | | | | | |
| MV[70] | 0 = Function disabled<br>1 = Function enabled | 0 | 1 | 0 | R |
| MV[136] | 0 = Function disabled<br>1 = Function enabled | 0 | 1 | 0 | W |
| **Description**: Temperature change Set point | | | | | |
| AI[13] | °C | -10.0 | 60.0 | 30.0 | R |
| | °F | 14.0 | 140.0 | 86.0 | |
| AO[3] | °C | -10.0 | 60.0 | 30.0 | W |
| | °F | 14.0 | 140.0 | 86.0 | |
| **Description**: hysteresis | | | | | |
| AI[14] | °C | 3.0 | 20.0 | 5.0 | R |
| | °F | 14.0 | 140.0 | 86.0 | |
| AO[4] | °C | 3.0 | 20.0 | 5.0 | W |
| | °F | 14.0 | 140.0 | 86.0 | |

### 4.2.3.10. SETPOINT ADJUST

| OBJECT TYPE [INSTANCE] | VALUES | MIN | MAX | DEF | ACCESS |
|---|---|---|---|---|---|
| **Description**: Enabling the SP adjustment function with Tamb | | | | | |
| MV[71] | 0 = Function disabled<br>1 = Function enabled | 0 | 1 | 0 | R |
| MV[137] | 0 = Function disabled<br>1 = Function enabled | 0 | 1 | 0 | W |

| OBJECT TYPE [INSTANCE] | VALUES | MIN | MAX | DEF | ACCESS |
|---|---|---|---|---|---|
| **Description**: Minimum acceptable SP | | | | | |
| AI[15] | °C | 0.0 | 90.0 | 20.0 | R |
| | °F | 32.0 | 194.0 | 68.0 | |
| AO[5] | °C | 0.0 | 90.0 | 20.0 | W |
| | °F | 32.0 | 194.0 | 68.0 | |
| **Description**: Maximum acceptable SP | | | | | |
| AI[16] | °C | 0.0 | 90.0 | 40.0 | R |
| | °F | 32.0 | 194.0 | 104.0 | |
| AO[6] | °C | 0.0 | 90.0 | 40.0 | W |
| | °F | 32.0 | 194.0 | 104.0 | |
| **Description**: Offset | | | | | |
| AI[17] | °C | 1.0 | 20.0 | 5.0 | R |
| | °F | 33.8 | 68.0 | 41.0 | |
| AO[7] | °C | 1.0 | 20.0 | 5.0 | W |
| | °F | 33.8 | 68.0 | 41.0 | |
| **Description**: Refrigerant selection for BAR → °C conversion in pressure control<br>Refrigerant used in the condenser | | | | | |
| MV[72] | 18 = R404A | 0 | 33 | 18 | R |
| MV[138] | 18 = R404A | 0 | 33 | 18 | W |

### 4.2.3.11. FLOATING SETPOINT

| OBJECT TYPE [INSTANCE] | VALUES | MIN | MAX | DEF | ACCESS |
|---|---|---|---|---|---|
| **Description**: Enabling of the Sp regulation function with external signal | | | | | |
| MV[73] | 0 = Function disabled<br>1 = Function enabled | 0 | 1 | 0 | R |
| MV[139] | 0 = Function disabled<br>1 = Function enabled | 0 | 1 | 0 | W |
| **Description**: SP control signal | | | | | |
| MV[74] | 0 = 1-10V<br>1 = 4-20mA | 0 | 1 | 0 | R |
| MV[140] | 0 = 1-10V<br>1 = 4-20mA | 0 | 1 | 0 | W |

| OBJECT TYPE [INSTANCE] | VALUES | MIN | MAX | DEF | ACCESS |
|---|---|---|---|---|---|
| **Description**: Minimum value that can be set for SP | | | | | |
| AI[18] | °C | -15.0 | 90.0 | 20.0 | R |
| | °F | 5.0 | 194.0 | 68.0 | |
| | Bar | 0.0 | 60.0 | 20.0 | |
| | Psi | 0.0 | 870.2 | 290.0 | |
| AO[8] | °C | -15.0 | 90.0 | 20.0 | W |
| | °F | 5.0 | 194.0 | 68.0 | |
| | Bar | 0.0 | 60.0 | 20.0 | |
| | Psi | 0.0 | 870.2 | 290.0 | |
| **Description**: Maximum value that can be set for SP | | | | | |
| AI[19] | °C | -15.0 | 90.0 | 40.0 | R |
| | °F | 5.0 | 194.0 | 104.0 | |
| | Bar | 0.0 | 60.0 | 40.0 | |
| | Psi | 0.0 | 870.2 | 580.0 | |
| AO[9] | °C | -15.0 | 90.0 | 40.0 | W |
| | °F | 5.0 | 194.0 | 104.0 | |
| | Bar | 0.0 | 60.0 | 40.0 | |
| | Psi | 0.0 | 870.2 | 580.0 | |

### 4.2.3.12. SLAVE SAFETY

| OBJECT TYPE [INSTANCE] | VALUES | MIN | MAX | DEF | ACCESS |
|---|---|---|---|---|---|
| **Description**: Enabling the SLAVE SAFETY function | | | | | |
| MV[75] | 0 = Function disabled<br>1 = Function enabled | 0 | 1 | 0 | R |
| MV[141] | 0 = Function disabled<br>1 = Function enabled | 0 | 1 | 0 | W |
| **Description**: Control signal | | | | | |
| MV[76] | 0 = MODBUS<br>1 = 1-10V<br>2 = 4-20mA | 0 | 2 | 2 | R |
| MV[142] | 0 = MODBUS<br>1 = 1-10V<br>2 = 4-20mA | 0 | 2 | 2 | W |

### 4.2.3.13. FEEDBACK

| OBJECT TYPE [INSTANCE] | VALUES | MIN | MAX | DEF | ACCESS |
|---|---|---|---|---|---|
| **Description**: Function enable | | | | | |
| MV[77] | 0 = Function disabled<br>1 = Function enabled | 0 | 1 | 0 | R |
| MV[143] | 0 = Function disabled<br>1 = Function enabled | 0 | 1 | 0 | W |
| **Description**: Feedback speed | | | | | |
| MV[78] | % | 1 | 20 | 10 | R |
| MV[144] | % | 1 | 20 | 10 | W |

### 4.2.3.14. BOOST

| OBJECT TYPE [INSTANCE] | VALUES | MIN | MAX | DEF | ACCESS |
|---|---|---|---|---|---|
| **Description**: Enabling the BOOST function | | | | | |
| MV[79] | 0 = Function disabled<br>1 = Function enabled | 0 | 1 | 0 | R |
| MV[145] | 0 = Function disabled<br>1 = Function enabled | 0 | 1 | 0 | W |
| **Description**: Activation value | | | | | |
| AI[20] | °C | -15.0 | 120.0 | 100.0 | R |
| | °F | 5.0 | 248.0 | 212.0 | |
| | Bar | 0.0 | 60.0 | 45.0 | |
| | Psi | 0.0 | 870.2 | 652.6 | |
| AO[10] | °C | -15.0 | 120.0 | 100.0 | W |
| | °F | 5.0 | 248.0 | 212.0 | |
| | Bar | 0.0 | 60.0 | 45.0 | |
| | Psi | 0.0 | 870.2 | 652.6 | |

| OBJECT TYPE [INSTANCE] | VALUES | MIN | MAX | DEF | ACCESS |
|---|---|---|---|---|---|
| **Description**: Hysteresis | | | | | |
| AI[21] | °C | 1.0 | 30.0 | 3.0 | R |
| | °F | 1.8 | 54.0 | 5.4 | |
| | Bar | 0.1 | 15.0 | 1.0 | |
| | Psi | 1.4 | 217.5 | 14.5 | |
| AO[11] | °C | 1.0 | 30.0 | 3.0 | W |
| | °F | 1.8 | 54.0 | 5.4 | |
| | Bar | 0.1 | 15.0 | 1.0 | |
| | Psi | 1.4 | 217.5 | 14.5 | |

### 4.2.3.15. CUTOFF

| OBJECT TYPE [INSTANCE] | VALUES | MIN | MAX | DEF | ACCESS |
|---|---|---|---|---|---|
| **Description**: Function enable | | | | | |
| MV[80] | 0 = Function disabled<br>1 = Function enabled | 0 | 1 | 0 | R |
| MV[146] | 0 = Function disabled<br>1 = Function enabled | 0 | 1 | 0 | W |
| **Description**: Activation value | | | | | |
| AI[22] | °C | -25.0 | 80.0 | 20.0 | R |
| | °F | -13.0 | 176.0 | 68.0 | |
| | Bar | 0.0 | 60.0 | 0.0 | |
| | Psi | 0.0 | 870.2 | 0.0 | |
| AO[12] | °C | -25.0 | 80.0 | 20.0 | W |
| | °F | -13.0 | 176.0 | 68.0 | |
| | Bar | 0.0 | 60.0 | 0.0 | |
| | Psi | 0.0 | 870.2 | 0.0 | |
| **Description**: Hysteresis | | | | | |
| AI[23] | °C | 1.0 | 30.0 | 3.0 | R |
| | °F | 1.8 | 54.0 | 5.4 | |
| | Bar | 0.1 | 15.0 | 0.1 | |
| | Psi | 1.4 | 217.5 | 1.4 | |
| AO[13] | °C | 1.0 | 30.0 | 3.0 | W |
| | °F | 1.8 | 54.0 | 5.4 | |
| | Bar | 0.1 | 15.0 | 0.1 | |
| | Psi | 1.4 | 217.5 | 1.4 | |

### 4.2.3.16. THERMOSTAT

| OBJECT TYPE [INSTANCE] | VALUES | MIN | MAX | DEF | ACCESS |
|---|---|---|---|---|---|
| **Description**: Function enable | | | | | |
| MV[81] | 0 = Function disabled<br>1 = Function enabled | 0 | 1 | 0 | R |
| MV[147] | 0 = Function disabled<br>1 = Function enabled | 0 | 1 | 0 | W |
| **Description**: Activation value | | | | | |
| AI[24] | °C | -35.0 | 80.0 | 15.0 | R |
| | °F | -31.0 | 176.0 | 59.0 | |
| AO[14] | °C | -35.0 | 80.0 | 15.0 | W |
| | °F | -31.0 | 176.0 | 59.0 | |
| **Description**: Hysteresis | | | | | |
| AI[25] | °C | 1.0 | 30.0 | 5.0 | R |
| | °F | 1.8 | 54.0 | 5.4 | |
| AO[15] | °C | 1.0 | 30.0 | 5.0 | W |
| | °F | 1.8 | 54.0 | 5.4 | |
| **Description**: Function disabled during control | | | | | |
| MV[82] | 0 = Function enabled during control<br>1 = Function disabled during control | 0 | 1 | 0 | R |
| MV[148] | 0 = Function enabled during control<br>1 = Function disabled during control | 0 | 1 | 0 | W |

### 4.2.3.17. THRESHOLD

| OBJECT TYPE [INSTANCE] | VALUES | MIN | MAX | DEF | ACCESS |
|---|---|---|---|---|---|
| **Description**: Enabling the THRESHOLD function | | | | | |
| MV[83] | 0 = Function disabled<br>1 = Function enabled | 0 | 1 | 0 | R |
| MV[149] | 0 = Function disabled<br>1 = Function enabled | 0 | 1 | 0 | W |
| **Description**: THRESHOLD speed | | | | | |
| MV[84] | % | 1 | 100 | 30 | R |
| MV[150] | % | 1 | 100 | 30 | W |