

User Guide

Modbus protocol for Atlas, Calibra, Calibra Eco, Calibra Cool and Diplomat Inverter

Genesis platform: Version 13.00



The English language is used for the original instructions.
Other languages are a translation of the original instructions.
(Directive 2006/42/EC)

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1 Connecting Modbus

1.1 Connecting Modbus

The heat pump supports two Modbus protocols:

- Modbus RTU (connect to the BM-card (Port: MBe) located in the electrical cabinet)
- Modbus TCP/IP (connect to the RJ45 connection located on the display unit)

The settings for Modbus parameters can be found under Settings / BMS in the display.

For Modbus TCP/IP, if you have secondary units, you will need a network switch or router since the primary/secondary interface uses the same RJ45 connector for its communication. Make sure that you are not using the same port as the Primary uses to communicate to its secondaries.

2 Scale, function, negative numbers & MSB/LSB

2.1 Scale, function, negative numbers & MSB/LSB

| Scale | |
|-------|---|
| 1 | No conversion factor |
| 10 | Conversion factor 10, i.e. the transmitted value is a tenfold larger |
| 100 | Conversion factor 100, i.e. the transmitted value is a tenfold larger |

| Function | Function | Description |
|----------|-----------------------------------|---|
| 1 | Read Coil Status | Read one or more consecutive boolean registers |
| 2 | Read Input Status | Read one or more consecutive boolean registers |
| 3 | Read Holding Registers | Read one or more consecutive analog registers |
| 4 | Read Input Registers | Read one or more consecutive analog registers |
| 5 | Force Single Coil | Write to one boolean register |
| 6 | Preset Single Holding Register | Write to one analog register |
| 15 | Force Multiple Coils | Write one or more consecutive boolean registers |
| 16 | Preset Multiple Holding Registers | Write one or more consecutive analog registers |

Negative numbers

Negative numbers are represented by the upper half of each 16 bit register.

100 = 100
 ...
 2 = 2
 1 = 1
 0 = 0
 -1 = 65535
 -2 = 65534
 -3 = 65533
 ...
 -100 = 65436
 etc.

Example: if "Brine out low alarm limit" register is set to -5 °C then, since the register has a scale of 100, the value read on Modbus should be 65036, representing -500.

Observe that not all variables are signed, i.e. "Compressor operating hours (LSB)" is a strict positive number between 0 to 65535.

MSB/LSB

Some variables has potential to surpass their maximum value, for instance the variable "Compressor operating hours" can become larger than 65535.

For these specific variables, that might be affected by this, there are two registers, MSB (Most Significant Bit) and LSB (Least Significant Bit) that can be combined in order to get a 32 bit number representation of the value.

I.e. "Compressor operating hours" is separated in to "Compressor operating hours (MSB)" and "Compressor operating hours (LSB)". The LSB register is counting up by 1 for each hour that the compressor has been running and when it reaches 65535 then it will add 1 to the MSB register and reset the LSB register.

In order to obtain the total Compressor operating hours then the two registers are combined into a 32 bit register where the MSB address represents the upper 16 bits and LSB represents the lower 16 bits.

Example:

Compressor operating hours (MSB) = 2
 Compressor operating hours (LSB) = 2345
 Total Compressor operating hours = 2×65536 (MSB) + 2345 (LSB) = 133417 hours

2.2 Addressing

A "De Facto-standard" have come to be with the purpose of simpler integration. Addressing is done as follows:

| First variable of | Is addressed | Typical function(s) |
|-------------------|--------------|---------------------|
| COIL STATUS | 00001 | 1, 5 (5=write) |
| INPUT STATUS | 10001 | 2 |
| HOLDING REGISTERS | 40001 | 3, 6 (6=write) |
| INPUT REGISTERS | 30001 | 4 |

Observe that some systems cannot handle aforementioned addressing system. Commonly a combination of function and absolute reference to 0 is used. The address table shows both alternatives.

2.3 Factory default

| Parameter | Factory | Range |
|-------------|-----------|---|
| Speed | 19200 bps | 19200 (2400,4800,9600, 14400, 19200, 28800, 38400, 57600, 115200) |
| Parity | Even | Even, none, odd |
| Address | 1 | 1-247, not implemented on Modbus TCP/IP, the heat pump will respond to each address on its specific IP-address using the designated modbus port |
| Start bit | 1 | 1 |
| Stop bit | 1 | 1 stop bit when Even or Odd Parity and optional when Parity None is chosen |
| Data bit | 8 | Data bits can only be 8 bits |
| Port | 502 | 1-65535 |
| Modbus mode | RTU | RTU, TCP/IP |

2.4 Table key

| Reference to | |
|--------------|----------------------|
| 1 | Heating system |
| 2 | Hot water |
| 3 | TWC* |
| 4 | WCS * |
| 5 | Cooling |
| 6 | Pool |
| 7 | Distribution circuit |
| 8 | Buffer tank |
| 9 | Electric meter |
| 10 | Internal heat pump |

* The reference number, does not apply to every heat pump model.

3 Address list

3.1 Read/Write Digital Registers

| COILS - Function codes: 1=read coils, 5=write single coil, 15=write multiple coils | | | | | | |
|--|-----------------|--------------|---------|------------------|-------|---|
| Position number | Units | Reference to | Address | De Facto Address | Scale | Description |
| | active/inactive | | 3 | 4 | 1 | Reset all alarms |
| 117 | on/off | 1 | 5 | 6 | 1 | Enable external additional heater |
| 71 | on/off | | 7 | 8 | 1 | Enable flow switch/pressure switch |
| | on/off | 2 | 8 | 9 | 1 | Enable tap water |
| | on/off | 1 | 9 | 10 | 1 | Enable heat |
| | on/off | 5 | 10 | 11 | 1 | Enable active cooling |
| 107 | on/off | 7 | 11 | 12 | 1 | Enable mix valve 1 |
| | on/off | | 20 | 21 | 1 | Enable brine out monitoring |
| | on/off | | 21 | 22 | 1 | Enable brine pump continuous operation |
| 36 | on/off | 1 | 22 | 23 | 1 | Enable system circulation pump |
| 117 | on/off | 1 | 25 | 26 | 1 | Enable additional heater only (No compressor). Requires Operation mode: Standby |
| | on/off | | 26 | 27 | 1 | Enable current limitation |
| | on/off | 6 | 28 | 29 | 1 | Enable pool (EM) |
| | on/off | 6 | 31 | 32 | 1 | Enable external additional heater for pool (EM) |
| | on/off | 5 | 33 | 34 | 1 | Enable passive cooling (EM) |
| | on/off | 10 | 34 | 35 | 1 | Enable variable speed mode for condenser pump |
| | on/off | 10 | 35 | 36 | 1 | Enable variable speed mode for brine pump |
| 207 | on/off | | 37 | 38 | 1 | Enable outdoor temp dependent for cooling with mixing valve 1 |
| | on/off | | 38 | 39 | 1 | Enable internal brine pump to start when cooling is active for mixing valve 1 |
| | on/off | 1 | 39 | 40 | 1 | Enable outdoor temp dependent for external heater |
| | on/off | | 40 | 41 | 1 | Enable brine in monitoring |
| | on/off | | 41 | 42 | 1 | Enable fixed system supply set point, allows defacto address 40117 |
| | on/off | | 42 | 43 | 1 | Enable evaporator freeze protection |
| | on/off | | 59 | 60 | 1 | Enable continuous operation mode for condenser pump. |
| | on/off | | 62 | 61 | 1 | Allow current limiter to restrict external additional heater |
| | on/off | | 63 | 62 | 1 | Allow current limiter to restrict secondary heat pump units |

*5) Should always be set to 1 i auto mode

3.2 Read Digital Registers

| DISCRETE INPUTS - Function codes: 2=read discrete inputs | | | | | | |
|--|-----------------|--------------|---------|------------------|-------|------------------------|
| Position number | Units | Reference to | Address | De Facto Address | Scale | Description |
| | active/inactive | | 0 | 10001 | 1 | Alarm active, Class: A |
| | active/inactive | | 1 | 10002 | 1 | Alarm active, Class: B |

| DISCRETE INPUTS - Function codes: 2=read discrete inputs | | | | | | |
|--|---------------------|--------------|---------|------------------|-------|--|
| Position number | Units | Reference to | Address | De Facto Address | Scale | Description |
| | active/ inactive | | 2 | 10003 | 1 | Alarm active, Class: C |
| | active/ inactive | | 3 | 10004 | 1 | Alarm active, Class: D - Genesis secondary |
| | active/ inactive | 10 | 9 | 10010 | 1 | High pressure switch alarm |
| | active/ inactive | 10 | 10 | 10011 | 1 | Low pressure level alarm |
| | active/ inactive | 10 | 11 | 10012 | 1 | High discharge pipe temperature alarm |
| | On/Off | 10 | 12 | 10013 | 1 | Operating pressure limit indication |
| | active/ inactive | 10 | 13 | 10014 | 1 | Discharge pipe sensor alarm |
| | active/ inactive | 10 | 14 | 10015 | 1 | Liquid line sensor alarm |
| | active/ inactive | 10 | 15 | 10016 | 1 | Suction gas sensor alarm |
| 71 | active/ inactive | | 16 | 10017 | 1 | Flow/pressure switch alarm |
| | active/ inactive | | 22 | 10023 | 1 | Power input phase detection alarm |
| | active/ inactive | 10 | 23 | 10024 | 1 | Inverter unit alarm |
| 51 | active/ inactive | 1 | 24 | 10025 | 1 | System supply low temperature alarm |
| | active/ inactive | 10 | 25 | 10026 | 1 | Compressor low speed alarm |
| | active/ inactive | 10 | 26 | 10027 | 1 | Low super heat alarm |
| | active/ inactive | 10 | 27 | 10028 | 1 | Pressure ratio out of range alarm |
| | active/ inactive | 10 | 28 | 10029 | 1 | Compressor pressure outside envelope alarm |
| | active/ inactive | | 29 | 10030 | 1 | Brine temperature out of range alarm |
| | active/ inactive | 10 | 30 | 10031 | 1 | Brine in sensor alarm |
| | active/ inactive | 10 | 31 | 10032 | 1 | Brine out sensor alarm |
| | active/ inactive | 10 | 32 | 10033 | 1 | Condenser in sensor alarm |
| | active/ inactive | 10 | 33 | 10034 | 1 | Condenser out sensor alarm |
| 50 | active/ inactive | | 34 | 10035 | 1 | Outdoor sensor alarm |
| 51 | active/ inactive | 1 | 35 | 10036 | 1 | System supply line sensor alarm |
| 108 | active/ inactive | 7 | 36 | 10037 | 1 | Mix valve 1 supply line sensor alarm |
| 58 | active/ inactive | 5 | 47 | 10048 | 1 | Cooling supply line sensor alarm (EM) |
| | active/ inactive | | 49 | 10050 | 1 | Brine delta out of range alarm |

| DISCRETE INPUTS - Function codes: 2=read discrete inputs | | | | | | |
|--|---------------------|--------------|---------|------------------|-------|--|
| Position number | Units | Reference to | Address | De Facto Address | Scale | Description |
| 53 | active/ inactive | 2 | 50 | 10051 | 1 | Tap water mid sensor alarm |
| | active/ inactive | | 55 | 10056 | 1 | Brine in high temperature alarm |
| | active/ inactive | | 56 | 10057 | 1 | Brine in low temperature alarm |
| | active/ inactive | | 57 | 10058 | 1 | Brine out low temperature alarm |
| 108 | active/ inactive | 7 | 60 | 10061 | 1 | Mix valve 1 supply temperature deviation alarm |
| | active/ inactive | | 66 | 10067 | 1 | Sum alarm |
| 58 | active/ inactive | 5 | 67 | 10068 | 1 | Cooling circuit supply line temperature deviation alarm (EM) |
| 62 | active/ inactive | | 74 | 10075 | 1 | Temperature room sensor alarm |
| | active/ inactive | 10 | 75 | 10076 | 1 | Inverter unit communication alarm |
| 60 | active/ inactive | 6 | 76 | 10077 | 1 | Pool return line sensor alarm |
| | on/off | 6 | 77 | 10078 | 1 | External stop for pool, read only |
| | on/off | | 78 | 10079 | 1 | External start brine pump, read only |
| | on/off | | 79 | 10080 | 1 | External relay for brine/ground water pump. |
| | active/ inactive | | 83 | 10084 | 1 | Genesis secondary unit alarm - this specific secondary unit can't communicate with its primary unit |
| | active/ inactive | | 84 | 10085 | 1 | Primary unit alarm - the primary has detected other primary units on the same network with a network mask that is allowing conflict. Change network settings in order to avoid problem. For instance change port number on the primary and its secondary unit. |
| | active/ inactive | | 85 | 10086 | 1 | Primary unit alarm - the primary has not detected all secondary units. Make sure that the primary/secondary settings are correct and the network mask and port and number of Genesis secondaries settings are correct. |
| | on/off | 10 | 86 | 10087 | 1 | Oil boost in progress |
| | active/ inactive | | 87 | 10088 | 1 | Tap water top sensor alarm. |
| | on/off | 10 | 199 | 10200 | 1 | Compressor control signal |
| | on/off | | 201 | 10202 | 1 | Smart Grid 1, EVU input |
| | active/ inactive | | 202 | 10203 | 1 | External alarm input |
| | on/off | | 204 | 10205 | 1 | Smart Grid 2 |
| 117 | on/off | 1 | 206 | 10207 | 1 | External additional heater control signal |
| 109 | on/off | 7 | 209 | 10210 | 1 | Mix valve 1 circulation pump control signal |
| | on/off | 10 | 210 | 10211 | 1 | Condenser pump On/off control |
| 36 | on/off | 1 | 211 | 10212 | 1 | System circulation pump control signal |
| | on/off | 10 | 218 | 10219 | 1 | Brine pump On/off control |
| 176 | on/off | 1 | 219 | 10220 | 1 | External heater circulation pump control signal |
| | on/off | 1 | 220 | 10221 | 1 | Heating season (winter) active |
| 117 | on/off | 1 | 221 | 10222 | 1 | External additional heater active |
| | on/off | 10 | 224 | 10225 | 1 | Heat pump stopping |
| | on/off | 10 | 225 | 10226 | 1 | Heat pump OK to start |

| DISCRETE INPUTS - Function codes: 2=read discrete inputs | | | | | | |
|--|--------|--------------|---------|------------------|-------|--|
| Position number | Units | Reference to | Address | De Facto Address | Scale | Description |
| 101 | on/off | 6 | 235 | 10236 | 1 | Pool directional valve position (EM) |
| 38 | on/off | 5 | 236 | 10237 | 1 | Cooling circuit circulation pump control signal (EM) |
| 76 | on/off | 5 | 238 | 10239 | 1 | Surplus heat directional valve position (EM) |
| | on/off | 5 | 240 | 10241 | 1 | Cooling circuit regulation control signal (EM) |
| 79 | on/off | 5 | 242 | 10243 | 1 | Active cooling directional valve position (Borehole disconnected) (EM) |
| | on/off | | 245 | 10246 | 1 | Indication when mixing valve 1 is producing passive cooling |
| | on/off | 10 | 246 | 10247 | 1 | Compressor is unable to speed up |

3.3 Read Analog Registers

| INPUT REGISTERS - Function codes: 4=read input registers | | | | | | |
|--|----------|--------------|---------|------------------|-------|---|
| Position number | Units | Reference to | Address | De Facto Address | Scale | Description |
| | enum | | 1 | 30002 | 1 | Currently running: First prioritised demand *1 |
| | bitfield | | 2 | 30003 | 1 | Currently running: Bit registers that shows the all the current running demands according to *6 |
| | | 10 | 4 | 30005 | 100 | Compressor available gears *3 |
| | rpm | 10 | 5 | 30006 | 1 | Compressor speed |
| 117 | % | 1 | 6 | 30007 | 100 | External additional heater: Current demand (%) |
| | °C | 10 | 7 | 30008 | 100 | Discharge pipe temperature |
| | °C | 10 | 8 | 30009 | 100 | Condenser in temperature |
| | °C | 10 | 9 | 30010 | 100 | Condenser out temperature |
| | °C | 10 | 10 | 30011 | 100 | Brine in temperature |
| | °C | 10 | 11 | 30012 | 100 | Brine out temperature |
| 51 | °C | 1 | 12 | 30013 | 100 | System supply line temperature |
| 50 | °C | | 13 | 30014 | 100 | Outdoor temperature |
| 55 | °C | 2 | 15 | 30016 | 100 | Tap water top temperature |
| 53 | °C | 2 | 16 | 30017 | 100 | Tap water lower temperature |
| 53/55 | °C | 2 | 17 | 30018 | 100 | Tap water weighted temperature |
| 51 | °C | 1 | 18 | 30019 | 100 | System supply line calculated set point |
| 51 | °C | 1 | 19 | 30020 | 100 | Selected heat curve, (system) supply line |
| 51 | °C | 1 | 20 | 30021 | 100 | Heat curve, X-coordinate 1 (highest outdoor temperature) |
| 51 | °C | 1 | 21 | 30022 | 100 | Heat curve, X-coordinate 2 |
| 51 | °C | 1 | 22 | 30023 | 100 | Heat curve, X-coordinate 3 |
| 51 | °C | 1 | 23 | 30024 | 100 | Heat curve, X-coordinate 4 |
| 51 | °C | 1 | 24 | 30025 | 100 | Heat curve, X-coordinate 5 |
| 51 | °C | 1 | 25 | 30026 | 100 | Heat curve, X-coordinate 6 |
| 51 | °C | 1 | 26 | 30027 | 100 | Heat curve, X-coordinate 7 (lowest outdoor temperature) |
| | °C | | 27 | 30028 | 100 | System return line temperature. |
| | | 10 | 30 | 30031 | 100 | Calculated demand (heat) |
| | | 5 | 36 | 30037 | 1 | Cooling season integral value |
| | % | 10 | 39 | 30040 | 100 | Condenser circulation pump speed (%) |
| 108 | °C | 7 | 40 | 30041 | 100 | Mix valve 1 supply line temperature |
| 136 | °C | 8 | 41 | 30042 | 100 | Buffer tank temperature |
| 107 | % | 7 | 43 | 30044 | 100 | Mix valve 1 position |

| INPUT REGISTERS - Function codes: 4=read input registers | | | | | | |
|--|--------|--------------|---------|------------------|-------|---|
| Position number | Units | Reference to | Address | De Facto Address | Scale | Description |
| | % | 10 | 44 | 30045 | 100 | Brine circulation pump speed (%) |
| 77 | % | 2 | 47 | 30048 | 1 | Tap water valve position (%) |
| | h | 10 | 48 | 30049 | 1 | Compressor operating hours (MSB) |
| | h | 10 | 49 | 30050 | 1 | Compressor operating hours (LSB) |
| | h | 2 | 50 | 30051 | 1 | Tap water operating hours (MSB) |
| | h | 2 | 51 | 30052 | 1 | Tap water operating hours (LSB) |
| 117 | h | 1 | 52 | 30053 | 1 | External additional heater operating hours (MSB) |
| 117 | h | 1 | 53 | 30054 | 1 | External additional heater operating hours (LSB) |
| | % | 10 | 54 | 30055 | 100 | Compressor speed percent |
| | enum | | 55 | 30056 | 1 | Currently running: Second prioritised demand *1 |
| | enum | | 56 | 30057 | 1 | Currently running: Third prioritised demand *1 |
| | | 10 | 60 | 30061 | 1 | Compressor temporarily blocked, (start restriction timer) |
| | | 10 | 61 | 30062 | 100 | Compressor current gear |
| | enum | | 62 | 30063 | 1 | Queued demand, first priority *1 |
| | enum | | 63 | 30064 | 1 | Queued demand, second priority *1 |
| | enum | | 64 | 30065 | 1 | Queued demand, third priority *1 |
| | enum | | 65 | 30066 | 1 | Queued demand, fourth priority *1 |
| | enum | | 66 | 30067 | 1 | Queued demand, fifth priority *1 |
| 317 | step | | 67 | 30068 | 1 | Active step internal immersion heater |
| 51/136 | °C | 8 | 68 | 30069 | 100 | Buffer tank charge set point |
| | A | 9 | 69 | 30070 | 100 | Electric meter L1 current (A) |
| | A | 9 | 70 | 30071 | 100 | Electric meter L2 current (A) |
| | A | 9 | 71 | 30072 | 100 | Electric meter L3 current (A) |
| | V | 9 | 72 | 30073 | 100 | Electric meter L1-0 voltage (V) |
| | V | 9 | 73 | 30074 | 100 | Electric meter L2-0 voltage (V) |
| | V | 9 | 74 | 30075 | 100 | Electric meter L3-0 voltage (V) |
| | V | 9 | 75 | 30076 | 10 | Electric meter L1-L2 voltage (V) |
| | V | 9 | 76 | 30077 | 10 | Electric meter L2-L3 voltage (V) |
| | V | 9 | 77 | 30078 | 10 | Electric meter L3-L1 voltage (V) |
| | W | 9 | 78 | 30079 | 1 | Electric meter L1 power (W) |
| | W | 9 | 79 | 30080 | 1 | Electric meter L2 power (W) |
| | W | 9 | 80 | 30081 | 1 | Electric meter L3 power (W) |
| | kWh | 9 | 81 | 30082 | 1 | Electric meter - meter value (kWh) |
| | enum | | 82 | 30083 | 1 | Current Smart Grid mode *4 |
| | | 9 | 83 | 30084 | 10 | Electric meter kWh total (LSB) |
| | | 9 | 84 | 30085 | 10 | Electric meter kWh total (MSB) |
| 58 | °C | 5 | 106 | 30107 | 100 | Cooling circuit supply line temperature (EM) |
| 62 | °C | | 121 | 30122 | 10 | Room temperature sensor |
| | °C | 10 | 122 | 30123 | 100 | Bubble point, high pressure temperature |
| | °C | 10 | 123 | 30124 | 100 | Dew point, high pressure temperature |
| | °C | 10 | 124 | 30125 | 100 | Dew point, low pressure temperature |
| | K | 10 | 125 | 30126 | 100 | Superheat temperature |
| | K | 10 | 126 | 30127 | 100 | Sub cooling temperature |
| | bar(g) | 10 | 127 | 30128 | 100 | Low pressure side, pressure (bar(g)) |
| | bar(g) | 10 | 128 | 30129 | 100 | High pressure side, pressure (bar(g)) |
| | °C | 10 | 129 | 30130 | 100 | Liquid line temperature |
| | °C | 10 | 130 | 30131 | 100 | Suction gas temperature |

| INPUT REGISTERS - Function codes: 4=read input registers | | | | | | |
|--|---------------------|--------------|---------|------------------|-------|---|
| Position number | Units | Reference to | Address | De Facto Address | Scale | Description |
| | | 1 | 131 | 30132 | 1 | Heating season integral value |
| 74 | % | 5 | 137 | 30138 | 1 | Mix valve cooling opening degree (EM2/3) |
| | | 2 | 139 | 30140 | 1 | Desired gear for tap water |
| | | 1 | 140 | 30141 | 1 | Desired gear for heating |
| | | 5 | 141 | 30142 | 1 | Desired gear for cooling |
| | | 6 | 142 | 30143 | 1 | Desired gear for pool |
| | | | 143 | 30144 | 1 | Number of available secondaries Genesis |
| | | | 145 | 30146 | 1 | Total distributed gears to all units |
| | | | 146 | 30147 | 1 | Maximum gear out of all the currently requested gears |
| 108 | °C | 7 | 147 | 30148 | 100 | Desired temperature distribution circuit Mix valve 1 |
| | active/ inactive | | 160 | 30161 | 1 | Primary unit alarm - the combined output of all Class D alarms. This signal is a bit field, one bit for each secondary heat pump unit. |
| | active/ inactive | | 161 | 30162 | 1 | Primary unit alarm - the primary unit has lost communication with one or more Genesis secondaries. This signal is a bit field, one bit for each heat pump. |
| | active/ inactive | | 162 | 30163 | 1 | Primary unit alarm - Class A alarm detected on the Genesis secondary heat pump unit. This signal is a bit field, one bit for each secondary heat pump unit. |
| | active/ inactive | | 163 | 30164 | 1 | Primary unit alarm - Class B alarm detected on the Genesis secondary heat pump unit. This signal is a bit field, one bit for each secondary heat pump unit. |
| | | | 311 | 30312 | 1 | Control software version: Major |
| | | | 312 | 30313 | 1 | Control software version: Minor |
| | | | 313 | 30314 | 1 | Control software version: Micro |
| | % | | 315 | 30316 | 100 | Expansion valve opening degree |
| | °C | | 319 | 30320 | 1 | Inverter temperature |

3.4 Read/Write Analog Registers

| HOLDING REGISTERS - Function codes: 3=read holding registers, 6=write single register, 16=write multiple registers | | | | | | |
|--|-------|--------------|---------|------------------|-------|--|
| Position number | Units | Reference to | Address | De Facto Address | Scale | Description |
| | enum | | 0 | 40001 | 1 | Operational mode *2 |
| 51 | °C | 1 | 3 | 40004 | 100 | Max limitation, set point curve radiator |
| 51 | °C | 1 | 4 | 40005 | 100 | Min limitation, set point curve radiator |
| | | | 5 | 40006 | 100 | Comfort wheel setting |
| 51 | °C | 1 | 6 | 40007 | 100 | Set point heat curve, Y-coordinate 1 (highest outdoor temperature) |
| 51 | °C | 1 | 7 | 40008 | 100 | Set point heat curve, Y-coordinate 2 |
| 51 | °C | 1 | 8 | 40009 | 100 | Set point heat curve, Y-coordinate 3 |
| 51 | °C | 1 | 9 | 40010 | 100 | Set point heat curve, Y-coordinate 4 |
| 51 | °C | 1 | 10 | 40011 | 100 | Set point heat curve, Y-coordinate 5 |
| 51 | °C | 1 | 11 | 40012 | 100 | Set point heat curve, Y-coordinate 6 |
| 51 | °C | 1 | 12 | 40013 | 100 | Set point heat curve, Y-coordinate 7 (lowest outdoor temperature) |
| 50 | °C | 1 | 16 | 40017 | 100 | Heating season stop temperature |
| 53/55 | °C | 2 | 22 | 40023 | 100 | Start temperature tap water (only valid when tap water mode is Normal) |

| HOLDING REGISTERS - Function codes: 3=read holding registers, 6=write single register, 16=write multiple registers | | | | | | |
|--|-------|--------------|---------|------------------|-------|---|
| Position number | Units | Reference to | Address | De Facto Address | Scale | Description |
| 53/55 | °C | 2 | 23 | 40024 | 100 | Stop temperature tap water (only valid when tap water mode is Normal) |
| | | 1 | 26 | 40027 | 1 | Minimum allowed gear in heating *3 |
| | | 1 | 27 | 40028 | 1 | Maximum allowed gear in heating *3 |
| | | 2 | 28 | 40029 | 1 | Maximum allowed gear in tap water *3 (only valid when tap water mode is Normal) |
| | | 2 | 29 | 40030 | 1 | Minimum allowed gear in tap water *3 (only valid when tap water mode is Normal) |
| 74 | % | 5 | 30 | 40031 | 100 | Cooling mix valve set point (EM) |
| 74 | % | 5 | 49 | 40050 | 100 | Cooling supply line mix valve: Lowest allowed opening degree (EM) |
| 74 | % | 5 | 50 | 40051 | 100 | Cooling supply line mix valve: Highest allowed opening degree (EM) |
| 183 | % | 6 | 58 | 40059 | 100 | Pool charge set point (EM) |
| | min | 1 | 61 | 40062 | 1 | Gear shift delay heating |
| | min | 6 | 62 | 40063 | 1 | Gear shift delay pool |
| | min | 5 | 63 | 40064 | 1 | Gear shift delay cooling |
| | °C | 10 | 67 | 40068 | 100 | Brine in high alarm limit |
| | °C | 10 | 68 | 40069 | 100 | Brine in low alarm limit |
| | °C | 10 | 69 | 40070 | 100 | Brine out low alarm limit |
| | K | | 70 | 40071 | 100 | Brine max delta limit |
| 117 | | 1 | 75 | 40076 | 1 | External additional heater start (PID sum) |
| | % | 10 | 76 | 40077 | 100 | Condenser pump lowest allowed speed (%) |
| | % | 10 | 77 | 40078 | 100 | Brine pump lowest allowed speed (%) |
| 117 | | 1 | 78 | 40079 | 100 | External additional heater stop (PID sum) |
| | % | 10 | 79 | 40080 | 100 | Condenser pump highest allowed speed (%) |
| | % | 10 | 80 | 40081 | 100 | Brine pump highest allowed speed (%) |
| | % | 10 | 81 | 40082 | 100 | Condenser pump standby speed (%) |
| | % | 10 | 82 | 40083 | 100 | Brine pump standby speed (%) |
| | | 6 | 85 | 40086 | 1 | Minimum allowed gear in pool *3 |
| | | 6 | 86 | 40087 | 1 | Maximum allowed gear in pool *3 |
| | | 5 | 87 | 40088 | 1 | Minimum allowed gear in cooling *3 |
| | | 5 | 88 | 40089 | 1 | Maximum allowed gear in cooling *3 |
| | °C | 5 | 105 | 40106 | 100 | Start temp for cooling (EM) |
| | °C | 5 | 106 | 40107 | 100 | Stop temp for cooling (EM) |
| 108 | °C | 7 | 107 | 40108 | 100 | Min limitation Set point curve radiator Mix valve 1 |
| 108 | °C | 7 | 108 | 40109 | 100 | Max limitation Set point curve radiator Mix valve 1 |
| 108 | °C | 7 | 109 | 40110 | 100 | Set point curve, Y-coordinate 1 Mix valve 1 (highest outdoor temperature) |
| 108 | °C | 7 | 110 | 40111 | 100 | Set point curve, Y-coordinate 2 Mix valve 1 |
| 108 | °C | 7 | 111 | 40112 | 100 | Set point curve, Y-coordinate 3 Mix valve 1 |
| 108 | °C | 7 | 112 | 40113 | 100 | Set point curve, Y-coordinate 4 Mix valve 1 |
| 108 | °C | 7 | 113 | 40114 | 100 | Set point curve, Y-coordinate 5 Mix valve 1 |
| 108 | °C | 7 | 114 | 40115 | 100 | Set point curve, Y-coordinate 6 Mix valve 1 |
| 108 | °C | 7 | 115 | 40116 | 100 | Set point curve, Y-coordinate 7 Mix valve 1 (lowest outdoor temperature) |
| 51 | °C | | 116 | 40117 | 100 | Fixed system supply set point, requires defacto address 42 to be enabled |

| HOLDING REGISTERS - Function codes: 3=read holding registers, 6=write single register, 16=write multiple registers | | | | | | |
|--|-------|--------------|---------|------------------|-------|---|
| Position number | Units | Reference to | Address | De Facto Address | Scale | Description |
| | enum | | 117 | 40118 | 1 | Outdoor temperature source, is an enumeration where 0 = designated PT1000 sensor located on BM-card. 1 = BMS register 40119 (De Facto). When the source is BMS the outdoor temperature alarm is automatically removed when the sensor data is valid. If no valid sensor data is present the heat pump will use its designated PT1000 sensor and if that sensor is missing the heat pump will use 0 degrees C as a fallback value. |
| | °C | | 118 | 40119 | 100 | Outdoor temperature sensor, this register will be the source of the outdoor temperature given that BMS-address 40118 is set to 1. The valid range of the temperature is between -50 to 200 degrees C. If this register is not updated with a new temperature within 12 hours or the value is outside the valid range, the fallback logic will be triggered stated in description of BMS register 40118. This signal is automatically filtered in the heat pump. |
| | A | | 119 | 40120 | 1 | Maximum phase current |
| | A | | 120 | 40121 | 1 | Compressor current hysteresis |
| 108 | enum | | 298 | 40299 | 1 | Selected mode for mixing valve 1, 0:Heat, 1:Cool, 2:Auto |
| | °C | 6 | 299 | 40300 | 10 | Set point return temp from pool to heat exchanger (EM) |
| | K | 6 | 300 | 40301 | 10 | Set point pool hysteresis (EM) |
| 108 | °C | 5 | 302 | 40303 | 100 | Set point for supply line temp passive cooling with mixing valve 1 |
| | °C | 5 | 303 | 40304 | 100 | Set point minimum outdoor temp when cooling is permitted |
| | °C | 1 | 304 | 40305 | 100 | External heater outdoor temp limit |
| 317 | enum | | 321 | 40322 | 1 | Enabled immersion heater *7 |

4 Heat pump unit

4.1 Heat pump unit

| Position number | Units | Reference to | Address | De Facto Address | Scale | Description |
|-----------------|-----------------|--------------|---------|------------------|-------|---|
| | on/off | | 3 | 4 | 1 | Reset all alarms |
| 117 | on/off | 1 | 5 | 6 | 1 | Enable external additional heater |
| 71 | on/off | | 7 | 8 | 1 | Enable flow switch/pressure switch |
| | on/off | 2 | 8 | 9 | 1 | Enable tap water |
| | on/off | 1 | 9 | 10 | 1 | Enable heat |
| | on/off | 10 | 20 | 21 | 1 | Enable brine out monitoring |
| | on/off | 10 | 21 | 22 | 1 | Enable brine pump continuous operation |
| 36 | on/off | 1 | 22 | 23 | 1 | Enable system circulation pump |
| 117 | on/off | 1 | 25 | 26 | 100 | Enable additional heater only (No compressor). Requires Operation mode: Standby |
| | on/off | 10 | 34 | 35 | 1 | Enable variable speed mode for condenser pump |
| 117 | on/off | 10 | 35 | 36 | 1 | Enable variable speed mode for brine pump |
| | on/off | | 39 | 40 | 1 | Enable outdoor temp dependent for external heater |
| | on/off | 10 | 42 | 43 | 1 | Enable evaporator freeze protection |
| | on/off | | 59 | 60 | 1 | Enable continuous operation mode for condenser pump. |
| | on/off | | 60 | 61 | 1 | Allow current limiter to restrict external additional heater |
| | on/off | | 61 | 62 | 1 | Allow current limiter to restrict secondary heat pump units |
| | active/inactive | | 0 | 10001 | 1 | Alarm active, Class: A |
| | active/inactive | | 1 | 10002 | 1 | Alarm active, Class: B |
| | active/inactive | | 2 | 10003 | 1 | Alarm active, Class: C |
| | active/inactive | | 3 | 10004 | 1 | Alarm active, Class: D - Genesis secondary |
| | active/inactive | 10 | 9 | 10010 | 1 | High pressure switch alarm |
| | active/inactive | 10 | 10 | 10011 | 1 | Low pressure level alarm |
| | active/inactive | 10 | 11 | 10012 | 1 | High discharge pipe temperature alarm |
| | on/off | 10 | 12 | 10013 | 1 | Operating pressure limit indication |
| | active/inactive | 10 | 13 | 10014 | 1 | Discharge pipe sensor alarm |
| | active/inactive | 10 | 14 | 10015 | 1 | Liquid line sensor alarm |
| | active/inactive | 10 | 15 | 10016 | 1 | Suction gas sensor alarm |
| 71 | active/inactive | | 16 | 10017 | 1 | Flow/pressure switch alarm |
| | active/inactive | | 22 | 10023 | 1 | Power input phase detection alarm |
| | active/inactive | 10 | 23 | 10024 | 1 | Inverter unit alarm |

| Position number | Units | Reference to | Address | De Facto Address | Scale | Description |
|-----------------|---------------------|--------------|---------|------------------|-------|--|
| | active/ inactive | 10 | 25 | 10026 | 1 | Compressor low speed alarm |
| | active/ inactive | 10 | 26 | 10027 | 1 | Low super heat alarm |
| | active/ inactive | 10 | 27 | 10028 | 1 | Pressure ratio out of range alarm |
| | active/ inactive | | 28 | 10029 | 1 | Compressor pressure outside envelope alarm |
| | active/ inactive | 10 | 29 | 10030 | 1 | Brine temperature out of range alarm |
| | active/ inactive | 10 | 30 | 10031 | 1 | Brine in sensor alarm |
| | active/ inactive | 10 | 31 | 10032 | 1 | Brine out sensor alarm |
| | active/ inactive | 10 | 32 | 10033 | 1 | Condenser in sensor alarm |
| | active/ inactive | 10 | 33 | 10034 | 1 | Condenser out sensor alarm |
| 50 | active/ inactive | | 34 | 10035 | 1 | Outdoor sensor alarm |
| | active/ inactive | | 49 | 10050 | 1 | Brine delta out of range alarm |
| | active/ inactive | | 55 | 10056 | 1 | Brine in high temperature alarm |
| | active/ inactive | | 56 | 10057 | 1 | Brine in low temperature alarm |
| | active/ inactive | 10 | 57 | 10058 | 1 | Brine out low temperature alarm |
| | active/ inactive | | 66 | 10067 | 1 | Sum alarm |
| | active/ inactive | 10 | 75 | 10076 | 1 | Inverter unit communication alarm |
| | on/off | | 79 | 10080 | 1 | External relay for brine/ground water pump. |
| | active/ inactive | | 83 | 10084 | 1 | Genesis secondary unit alarm - this specific secondary unit can't communicate with its primary unit |
| | active/ inactive | | 84 | 10085 | 1 | Primary unit alarm - the primary has detected other primary units on the same network with a network mask that is allowing conflict. Change network settings in order to avoid problem. For instance change port number on the primary and its secondary unit. |
| | active/ inactive | | 85 | 10086 | 1 | Primary unit alarm - the primary has not detected all secondary units. Make sure that the primary/secondary settings are correct and the network mask and port and number of Genesis secondaries settings are correct. |
| | on/off | 10 | 86 | 10087 | 1 | Oil boost in progress |
| | active/ inactive | | 87 | 10088 | 1 | Tap water top sensor alarm. |
| | on/off | 10 | 199 | 10200 | 1 | Compressor control signal |
| | on/off | | 201 | 10202 | 1 | Smart Grid 1, EVU input |
| | on/off | | 202 | 10203 | 1 | External alarm input |
| | on/off | | 204 | 10205 | 1 | Smart Grid 2 |
| 117 | on/off | | 206 | 10207 | 1 | External additional heater control signal |
| | on/off | 10 | 210 | 10211 | 1 | Condenser pump On/off control |
| | on/off | 10 | 218 | 10219 | 1 | Brine pump On/off control |

User Guide

Modbus protocol for Atlas, Calibra, Calibra Eco, Calibra Cool and Diplomat Inverter

| Position number | Units | Reference to | Address | De Facto Address | Scale | Description |
|-----------------|--------|--------------|---------|------------------|-------|---|
| | on/off | 1 | 219 | 10220 | 1 | External heater circulation pump control signal |
| 117 | on/off | 1 | 221 | 10222 | 1 | External additional heater active |
| | on/off | 10 | 224 | 10225 | 1 | Heat pump stopping |
| | on/off | 10 | 225 | 10226 | 1 | Heat pump OK to start |
| | on/off | 10 | 246 | 10247 | 1 | Compressor is unable to speed up |
| | | 10 | 4 | 30005 | 100 | Compressor available gears *3 |
| | rpm | 10 | 5 | 30006 | 1 | Compressor speed |
| 117 | % | 1 | 6 | 30007 | 100 | External additional heater: Current demand (%) |
| | °C | 10 | 7 | 30008 | 100 | Discharge pipe temperature |
| | °C | 10 | 8 | 30009 | 100 | Condenser in temperature |
| | °C | 10 | 9 | 30010 | 100 | Condenser out temperature |
| | °C | 10 | 10 | 30011 | 100 | Brine in temperature |
| | °C | 10 | 11 | 30012 | 100 | Brine out temperature |
| 50 | °C | | 13 | 30014 | 100 | Outdoor temperature |
| | | 5 | 36 | 30037 | 1 | Cooling season integral value |
| | % | 10 | 39 | 30040 | 100 | Condenser circulation pump speed (%) |
| | % | 10 | 44 | 30045 | 100 | Brine circulation pump speed (%) |
| | h | 10 | 48 | 30049 | 1 | Compressor operating hours (MSB) |
| | h | 10 | 49 | 30050 | 1 | Compressor operating hours (LSB) |
| 117 | h | 1 | 52 | 30053 | 1 | External additional heater operating hours (MSB) |
| 117 | h | 1 | 53 | 30054 | 1 | External additional heater operating hours (LSB) |
| | % | 10 | 54 | 30055 | 100 | Compressor speed percent |
| | enum | | 55 | 30056 | 1 | Currently running: Second prioritised demand *1 |
| | enum | | 56 | 30057 | 1 | Currently running: Third prioritised demand *1 |
| | | 10 | 60 | 30061 | 1 | Compressor temporarily blocked, (start restriction timer) |
| | | 10 | 61 | 30062 | 100 | Compressor current gear |
| | enum | | 62 | 30063 | 1 | Queued demand, first priority *1 |
| | enum | | 63 | 30064 | 1 | Queued demand, second priority *1 |
| | enum | | 64 | 30065 | 1 | Queued demand, third priority *1 |
| | enum | | 65 | 30066 | 1 | Queued demand, fourth priority *1 |
| | enum | | 66 | 30067 | 1 | Queued demand, fifth priority *1 |
| 317 | step | | 67 | 30068 | 1 | Active step internal immersion heater |
| | enum | | 82 | 30083 | 1 | Current Smart Grid mode *4 |
| 62 | | | 121 | 30122 | 10 | Room temperature sensor |
| | °C | 10 | 122 | 30123 | 100 | Bubble point, high pressure temperature |
| | °C | 10 | 123 | 30124 | 100 | Dew point, high pressure temperature |
| | °C | 10 | 124 | 30125 | 100 | Dew point, low pressure temperature |
| | K | 10 | 125 | 30126 | 100 | Superheat temperature |
| | K | 10 | 126 | 30127 | 100 | Sub cooling temperature |
| | bar(g) | 10 | 127 | 30128 | 100 | Low pressure side, pressure (bar(g)) |
| | bar(g) | 10 | 128 | 30129 | 100 | High pressure side, pressure (bar(g)) |
| | °C | 10 | 129 | 30130 | 100 | Liquid line temperature |
| | °C | 10 | 130 | 30131 | 100 | Suction gas temperature |
| | | 1 | 131 | 30132 | 1 | Heating season integral value |
| | | | 311 | 30312 | 1 | Control software version: Major |
| | | | 312 | 30313 | 1 | Control software version: Minor |
| | | | 313 | 30314 | 1 | Control software version: Micro |
| | % | | 315 | 30316 | 100 | Expansion valve opening degree |

| Position number | Units | Reference to | Address | De Facto Address | Scale | Description |
|-----------------|-------|--------------|---------|------------------|-------|---|
| | °C | | 319 | 30320 | 1 | Inverter temperature |
| | | 1 | 26 | 40027 | 1 | Minimum allowed gear in heating *3 |
| | | 1 | 27 | 40028 | 1 | Maximum allowed gear in heating *3 |
| | | 1 | 61 | 40062 | 1 | Gear shift delay heating |
| | °C | 10 | 67 | 40068 | 100 | Brine in high alarm limit |
| | °C | 10 | 68 | 40069 | 100 | Brine in low alarm limit |
| | °C | 10 | 69 | 40070 | 100 | Brine out low alarm limit |
| | K | 10 | 70 | 40071 | 100 | Brine max delta limit |
| 117 | | 1 | 75 | 40076 | 1 | External additional heater start (PID sum) |
| | % | 10 | 76 | 40077 | 100 | Condenser pump lowest allowed speed (%) |
| | % | 10 | 77 | 40078 | 100 | Brine pump lowest allowed speed (%) |
| 117 | | 1 | 78 | 40079 | 100 | External additional heater stop (PID sum) |
| | % | 10 | 79 | 40080 | 100 | Condenser pump highest allowed speed (%) |
| | % | 10 | 80 | 40081 | 100 | Brine pump highest allowed speed (%) |
| | % | 10 | 81 | 40082 | 100 | Condenser pump standby speed (%) |
| | % | 10 | 82 | 40083 | 100 | Brine pump standby speed (%) |
| | enum | | 117 | 40118 | 1 | Outdoor temperature source, is an enumeration where 0 = designated PT1000 sensor located on BM-card. 1 = BMS register 40119 (De Facto). When the source is BMS the outdoor temperature alarm is automatically removed when the sensor data is valid. If no valid sensor data is present the heat pump will use its designated PT1000 sensor and if that sensor is missing the heat pump will use 0 degrees C as a fallback value. |
| | °C | | 118 | 40119 | 100 | Outdoor temperature sensor, this register will be the source of the outdoor temperature given that BMS-address 40118 is set to 1. The valid range of the temperature is between -50 to 200 degrees C. If this register is not updated with a new temperature within 12 hours or the value is outside the valid range, the fallback logic will be triggered stated in description of BMS register 40118. This signal is automatically filtered in the heat pump. |
| | A | | 119 | 40120 | 1 | Maximum phase current |
| | A | | 120 | 40121 | 1 | Compressor current hysteresis |
| | °C | 1 | 304 | 40305 | 100 | External heater outdoor temp limit |
| 317 | enum | | 321 | 40322 | 1 | Enabled immersion heater *7 |

5 Heat

5.1 Heating system

| Position number | Units | Reference to | Address | De Facto Address | Scale | Description |
|-----------------|-----------------|--------------|---------|------------------|-------|--|
| | on/off | | 41 | 42 | 1 | Enable fixed system supply set point, allows defacto address 40117 |
| 51 | active/inactive | 1 | 24 | 10025 | 1 | System supply low temperature alarm |
| 51 | active/inactive | 1 | 35 | 10036 | 1 | System supply line sensor alarm |
| 62 | active/inactive | | 74 | 10075 | 1 | Temperature room sensor alarm |
| 36 | on/off | 1 | 211 | 10212 | 1 | System circulation pump control signal |
| | | 1 | 220 | 10221 | 1 | Heating season (winter) active |
| 51 | °C | 1 | 12 | 30013 | 100 | System supply line temperature |
| 51 | °C | 1 | 18 | 30019 | 100 | System supply line calculated set point |
| 51 | °C | 1 | 19 | 30020 | 100 | Selected heat curve, (system) supply line |
| 50 | °C | 1 | 20 | 30021 | 100 | Heat curve, X-coordinate 1 (highest outdoor temperature) |
| 50 | °C | 1 | 21 | 30022 | 100 | Heat curve, X-coordinate 2 |
| 50 | °C | 1 | 22 | 30023 | 100 | Heat curve, X-coordinate 3 |
| 50 | °C | 1 | 23 | 30024 | 100 | Heat curve, X-coordinate 4 |
| 50 | °C | 1 | 24 | 30025 | 100 | Heat curve, X-coordinate 5 |
| 50 | °C | 1 | 25 | 30026 | 100 | Heat curve, X-coordinate 6 |
| 50 | °C | 1 | 26 | 30027 | 100 | Heat curve, X-coordinate 7 (lowest outdoor temperature) |
| | °C | | 27 | 30028 | 100 | System return line temperature. |
| | | 10 | 30 | 30031 | 100 | Calculated demand (heat) |
| | °C | 8 | 41 | 30042 | 100 | Buffer tank temperature |
| | °C | 8 | 68 | 30069 | 100 | Buffer tank charge set point |
| | | 1 | 140 | 30141 | 1 | Desired gear for heating |
| 51 | °C | 1 | 3 | 40004 | 100 | Max limitation, set point curve radiator |
| 51 | °C | 1 | 4 | 40005 | 100 | Min limitation, set point curve radiator |
| | | 1 | 5 | 40006 | 100 | Comfort wheel setting |
| 51 | °C | 1 | 6 | 40007 | 100 | Set point heat curve, Y-coordinate 1 (highest outdoor temperature) |
| 51 | °C | 1 | 7 | 40008 | 100 | Set point heat curve, Y-coordinate 2 |
| 51 | °C | 1 | 8 | 40009 | 100 | Set point heat curve, Y-coordinate 3 |
| 51 | °C | 1 | 9 | 40010 | 100 | Set point heat curve, Y-coordinate 4 |
| 51 | °C | 1 | 10 | 40011 | 100 | Set point heat curve, Y-coordinate 5 |
| 51 | °C | 1 | 11 | 40012 | 100 | Set point heat curve, Y-coordinate 6 |
| 51 | °C | 1 | 12 | 40013 | 100 | Set point heat curve, Y-coordinate 7 (lowest outdoor temperature) |
| | °C | 1 | 16 | 40017 | 100 | Heating season stop temperature |
| 51 | °C | | 116 | 40117 | 100 | Fixed system supply set point, requires defacto address 42 to be enabled |

5.2 Mix valve 1

| Position number | Units | Reference to | Address | De Facto Address | Scale | Description |
|-----------------|-----------------|--------------|---------|------------------|-------|---|
| 107 | on/off | 7 | 11 | 12 | 1 | Enable mix valve 1 |
| 107 | on/off | 5 | 37 | 38 | 1 | Enable outdoor temp dependent for cooling with mixing valve 1 |
| | on/off | 5 | 38 | 39 | 1 | Enable internal brine pump to start when cooling is active for mixing valve 1 |
| 108 | active/inactive | 7 | 36 | 10037 | 1 | Mix valve 1 supply line sensor alarm |
| 108 | active/inactive | 7 | 60 | 10061 | 1 | Mix valve 1 supply temperature deviation alarm |
| 109 | on/off | 7 | 209 | 10210 | 1 | Mix valve 1 circulation pump control signal |
| 107 | on/off | 5 | 245 | 10246 | 1 | Indication when mixing valve 1 is producing passive cooling |
| 108 | °C | 7 | 40 | 30041 | 100 | Mix valve 1 supply line temperature |
| 107 | % | 7 | 43 | 30044 | 100 | Mix valve 1 position |
| 108 | °C | 7 | 147 | 30148 | 100 | Desired temperature distribution circuit Mix valve 1 |
| 108 | °C | 7 | 107 | 40108 | 100 | Min limitation Set point curve radiator Mix valve 1 |
| 108 | °C | 7 | 108 | 40109 | 100 | Max limitation Set point curve radiator Mix valve 1 |
| 108 | °C | 7 | 109 | 40110 | 100 | Set point curve, Y-coordinate 1 Mix valve 1 (highest outdoor temperature) |
| 108 | °C | 7 | 110 | 40111 | 100 | Set point curve, Y-coordinate 2 Mix valve 1 |
| 108 | °C | 7 | 111 | 40112 | 100 | Set point curve, Y-coordinate 3 Mix valve 1 |
| 108 | °C | 7 | 112 | 40113 | 100 | Set point curve, Y-coordinate 4 Mix valve 1 |
| 108 | °C | 7 | 113 | 40114 | 100 | Set point curve, Y-coordinate 5 Mix valve 1 |
| 108 | °C | 7 | 114 | 40115 | 100 | Set point curve, Y-coordinate 6 Mix valve 1 |
| 108 | °C | 7 | 115 | 40116 | 100 | Set point curve, Y-coordinate 7 Mix valve 1 (lowest outdoor temperature) |
| 108 | enum | | 298 | 40299 | 1 | Selected mode for mixing valve 1, 0:Heat, 1:Cool, 2:Auto |
| 108 | °C | 5 | 302 | 40303 | 100 | Set point for supply line temp passive cooling with mixing valve 1 |
| | °C | 5 | 303 | 40304 | 100 | Set point minimum outdoor temp when cooling is permitted |

6 Tap water

6.1 Tap water

| Position number | Units | Reference to | Address | De Facto Address | Scale | Description |
|-----------------|-----------------|--------------|---------|------------------|-------|---|
| 34 | on/off | | 14 | 15 | 1 | Enable hot gas pump |
| 53 | active/inactive | 2 | 50 | 10051 | 1 | Tap water mid sensor alarm |
| 55 | °C | 2 | 15 | 30016 | 100 | Tap water top temperature |
| 53 | °C | 2 | 16 | 30017 | 100 | Tap water lower temperature |
| 53/55 | °C | 2 | 17 | 30018 | 100 | Tap water weighted temperature |
| 77 | % | 2 | 47 | 30048 | 1 | Tap water valve position (%) |
| | h | 2 | 50 | 30051 | 1 | Tap water operating hours (MSB) |
| | h | 2 | 51 | 30052 | 1 | Tap water operating hours (LSB) |
| | | 2 | 139 | 30140 | 1 | Desired gear for tap water |
| 53/55 | °C | 2 | 22 | 40023 | 100 | Start temperature tap water (only valid when tap water mode is Normal) |
| 53/55 | °C | 2 | 23 | 40024 | 100 | Stop temperature tap water (only valid when tap water mode is Normal) |
| | | 2 | 28 | 40029 | 1 | Maximum allowed gear in tap water *3 (only valid when tap water mode is Normal) |
| | | 2 | 29 | 40030 | 1 | Minimum allowed gear in tap water *3 (only valid when tap water mode is Normal) |

6.2 HGW

| Position number | Units | Reference to | Address | De Facto Address | Scale | Description |
|-----------------|-----------------|--------------|---------|------------------|-------|-------------------------------|
| 364 | on/off | | 6 | 7 | 1 | Enable HGW |
| 364 | active/inactive | 2 | 52 | 10053 | 1 | HGW sensor alarm |
| 364 | on/off | 2 | 223 | 10224 | 1 | HGW regulation control signal |
| 407 | °C | 2 | 45 | 30046 | 100 | HGW supply line temperature |
| 364 | % | 2 | 47 | 30048 | 1 | HGW mix valve position (%) |

7 Cooling

7.1 Cooling

| Position number | Units | Reference to | Address | De Facto Address | Scale | Description |
|-----------------|--------|--------------|---------|------------------|-------|--------------------------------------|
| | On/Off | 5 | 10 | 11 | 1 | Enable active cooling |
| | On/Off | 5 | 33 | 34 | 1 | Enable passive cooling (EM) |
| | | 5 | 63 | 40064 | 1 | Gear shift delay cooling |
| | | 5 | 87 | 40088 | 1 | Minimum allowed gear in cooling *3 |
| | | 5 | 88 | 40089 | 1 | Maximum allowed gear in cooling *3 |
| 345 | On/Off | 5 | 78 | 10079 | 1 | External start brine pump, read only |
| | | 5 | 141 | 30142 | 1 | Desired gear for cooling |

7.2 Cooling circuit

| Position number | Units | Reference to | Address | De Facto Address | Scale | Description |
|-----------------|-----------------|--------------|---------|------------------|-------|--|
| 58 | active/inactive | 5 | 67 | 10068 | 1 | Cooling circuit supply line temperature deviation alarm (EM) |
| 38 | on/off | 5 | 236 | 10237 | 1 | Cooling circuit circulation pump control signal (EM) |
| | on/off | 5 | 240 | 10241 | 1 | Cooling circuit regulation control signal (EM) |
| 58 | °C | 5 | 106 | 30107 | 100 | Cooling circuit supply line temperature (EM) |
| 74 | on/off | 5 | 137 | 30138 | 1 | Mix valve cooling opening degree (EM2/3) |
| 74 | % | 5 | 30 | 40031 | 100 | Cooling mix valve set point (EM) |
| 74 | % | 5 | 49 | 40050 | 100 | Cooling supply line mix valve: Lowest allowed opening degree (EM) |
| 74 | % | 5 | 50 | 40051 | 100 | Cooling supply line mix valve: Highest allowed opening degree (EM) |

8 Pool

8.1 Pool

| Position number | Units | Reference to | Address | De Facto Address | Scale | Description |
|-----------------|-----------------|--------------|---------|------------------|-------|--|
| | on/off | 6 | 28 | 29 | 1 | Enable pool (EM) |
| | on/off | 6 | 31 | 32 | 1 | Enable external additional heater for pool (EM) |
| 60 | active/inactive | 6 | 76 | 10077 | 1 | Pool return line sensor alarm |
| 342 | on/off | 6 | 77 | 10078 | 1 | External stop for pool, read only |
| 101 | on/off | 6 | 235 | 10236 | 1 | Pool directional valve position (EM) |
| 183 | °C | 6 | 119 | 30120 | 100 | Pool supply line temperature (EM) |
| 60 | °C | 6 | 120 | 30121 | 100 | Pool return line temperature (EM) |
| | | 6 | 142 | 30143 | 1 | Desired gear for pool |
| 183 | °C | 6 | 58 | 40059 | 100 | Pool charge set point (EM) |
| | | 6 | 62 | 40063 | 1 | Gear shift delay pool |
| | | 6 | 85 | 40086 | 1 | Minimum allowed gear in pool *3 |
| | | 6 | 86 | 40087 | 1 | Maximum allowed gear in pool *3 |
| 60 | °C | 6 | 299 | 40300 | 10 | Set point return temp from pool to heat exchanger (EM) |
| 60 | K | 6 | 300 | 40301 | 10 | Set point pool hysteresis (EM) |

9 Electric meter

9.1 Electric meter

For this function, the accessory "Current limiter" is required.

| Position number | Units | Reference to | Address | De Facto Address | Scale | Description |
|-----------------|--------|--------------|---------|------------------|-------|------------------------------------|
| | on/off | 9 | 26 | 27 | 1 | Enable current limitation |
| | A | 9 | 69 | 30070 | 100 | Electric meter L1 current (A) |
| | A | 9 | 70 | 30071 | 100 | Electric meter L2 current (A) |
| | A | 9 | 71 | 30072 | 100 | Electric meter L3 current (A) |
| | V | 9 | 72 | 30073 | 100 | Electric meter L1-0 voltage (V) |
| | V | 9 | 73 | 30074 | 100 | Electric meter L2-0 voltage (V) |
| | V | 9 | 74 | 30075 | 100 | Electric meter L3-0 voltage (V) |
| | V | 9 | 75 | 30076 | 10 | Electric meter L1-L2 voltage (V) |
| | V | 9 | 76 | 30077 | 10 | Electric meter L2-L3 voltage (V) |
| | V | 9 | 77 | 30078 | 10 | Electric meter L3-L1 voltage (V) |
| | W | 9 | 78 | 30079 | 1 | Electric meter L1 power (W) |
| | W | 9 | 79 | 30080 | 1 | Electric meter L2 power (W) |
| | W | 9 | 80 | 30081 | 1 | Electric meter L3 power (W) |
| | kWh | 9 | 81 | 30082 | 1 | Electric meter - meter value (kWh) |
| | | 9 | 83 | 30084 | 10 | Electric meter kWh total (LSB) |
| | | 9 | 84 | 30085 | 10 | Electric meter kWh total (MSB) |

Footnotes:

***1)** 1: Manual operation, 2: Defrost, 3: Hot water, 4: Heat, 5: Active Cooling, 6: Pool, 7: Anti legionella, 8: Passive Cooling 98: Standby 99: No demand 100: OFF

***2)** 1: OFF, 2: Standby, 3: ON/Auto

***3)** Different heat pumps have different number of available gears.

For instance: Commercial can have 10, while domestic can have 9 gears.

***4)** These applies to Smart grid function. 1: EVU, 4: Normal, 5: Comfort, 6: Boost

***5)** Should always be set to 1 i auto mode

***6)** Bit 0: Manual operation Bit 1: Defrost, Bit 2: Hot water, Bit 3: Heat, Bit 4: Active Cooling, Bit 5: Pool, Bit 6: Anti legionella, Bit 7: Passive Cooling, Bit 8: Reserved, Bit 9: Standby, Bit 10: No demand, Bit 11: OFF

***7)** 0=Disable immersion heater, 2=Internal immersion heater enabled

Thermia AB reserves the right to make changes in the software protocol availability and related documents without further notice. By controlling and/or interacting with the heat pump the user takes full responsibility for any consequences. Thermia AB will not take any liability for damages on equipment, properties or personal injuries occurring as a consequence of any attempts of remotely controlling the heat pumps or system.



User Guide

Modbus protocol for Atlas, Calibra, Calibra Eco, Calibra Cool and Diplomat Inverter

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