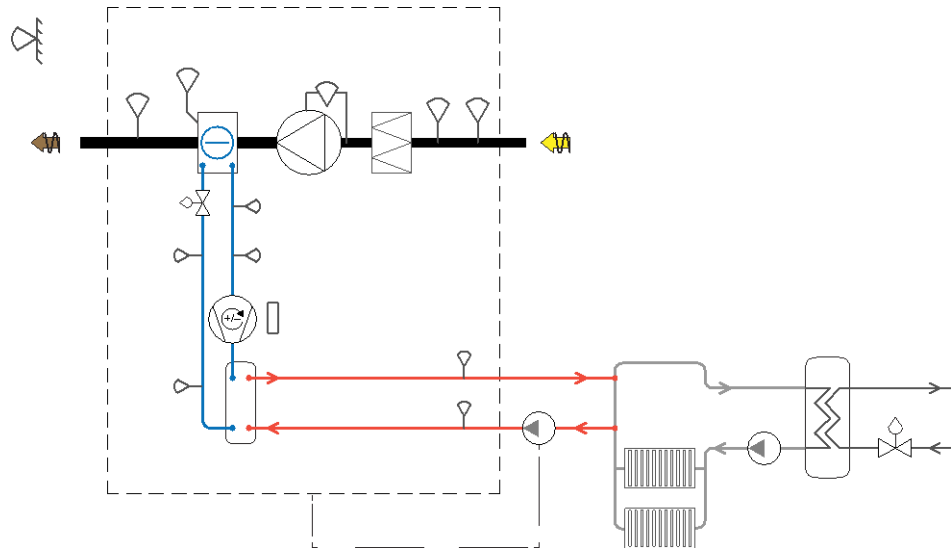




Air handling with focus on LCC



Climatix™

Modbus communication, slave mode

Reference addresses for standard

IV Produkt EHP application v3.22.xx



Air handling with the focus on LCC

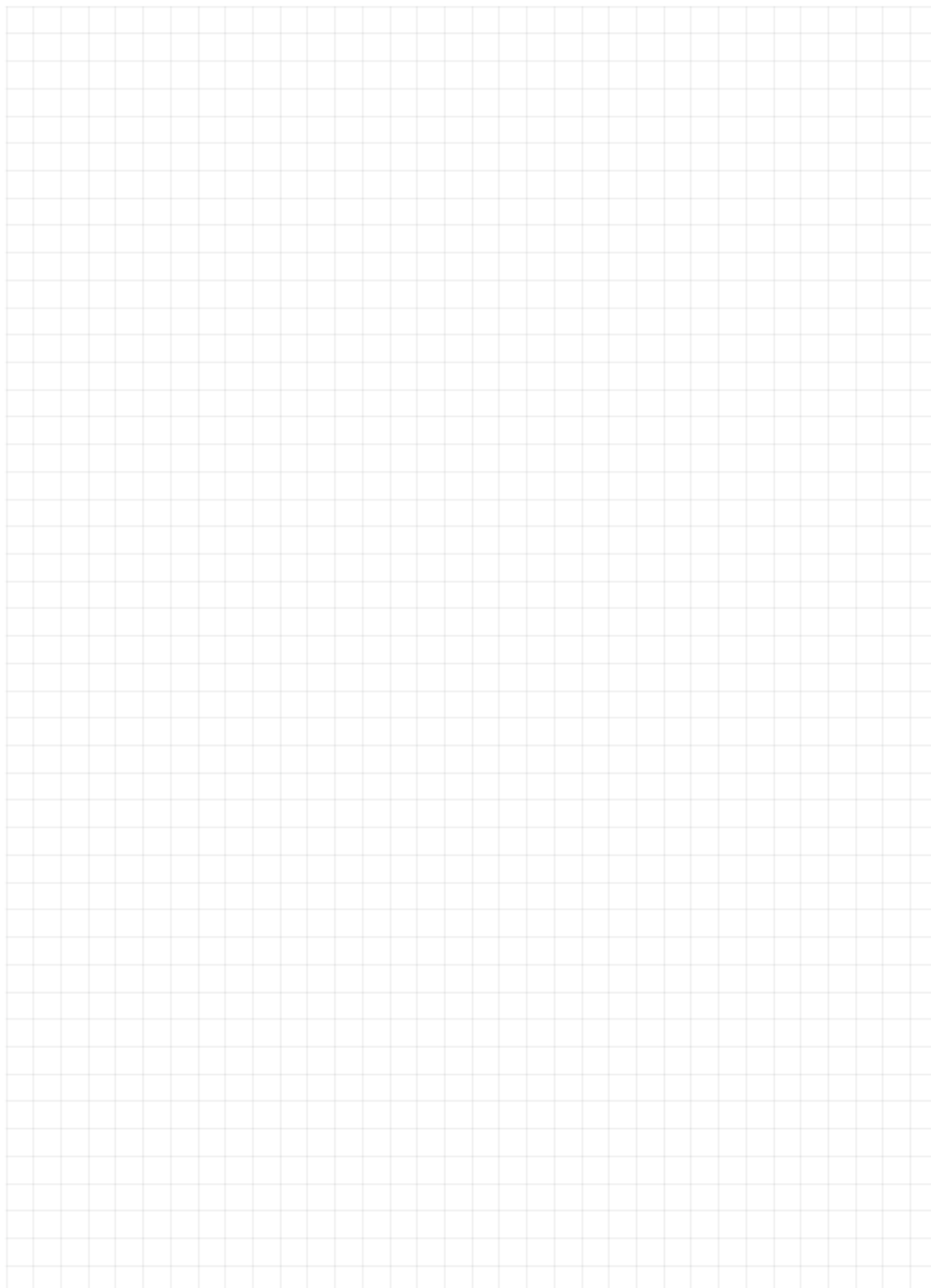
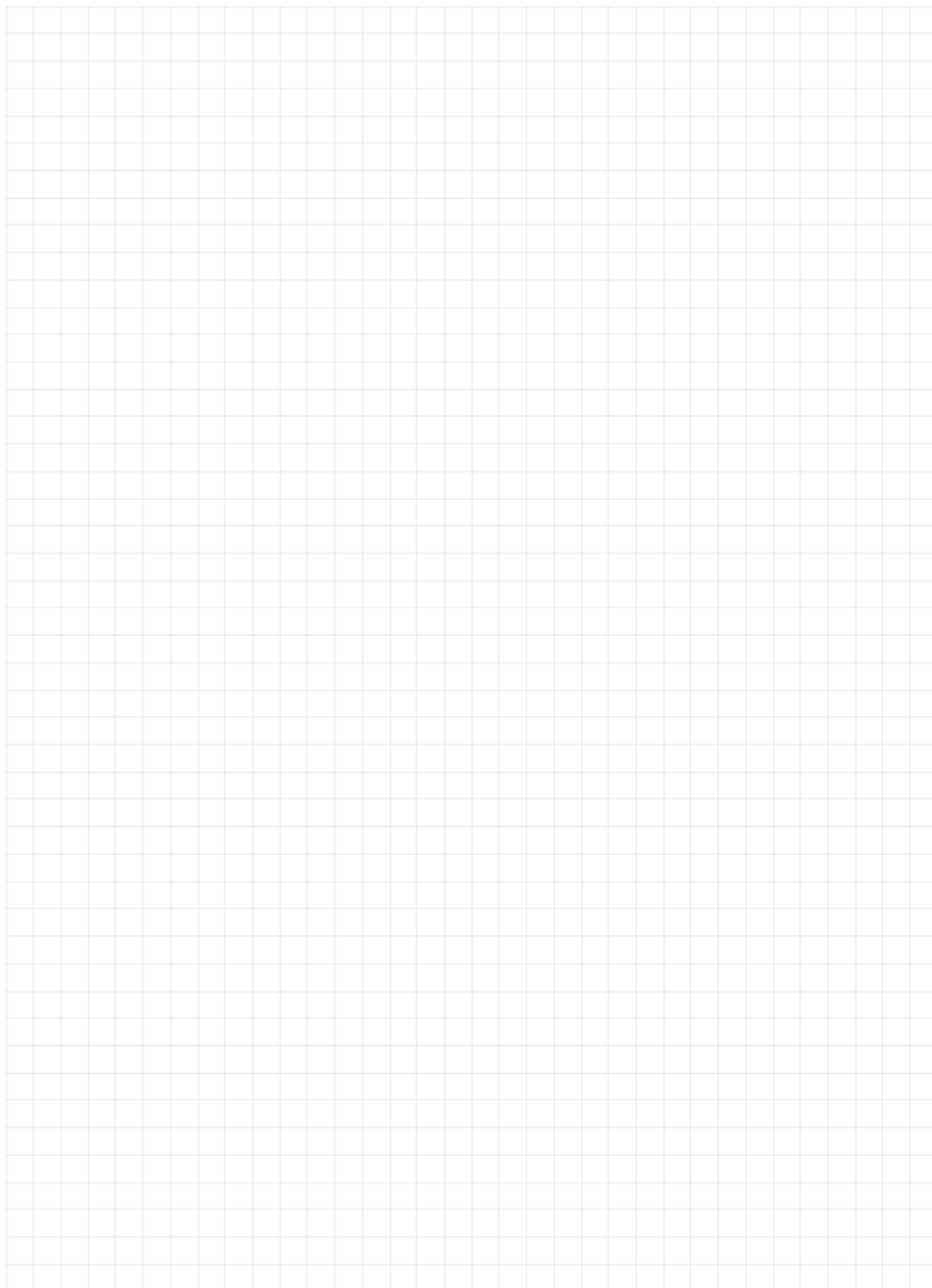


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1 About this document

1.1 Revision history

Version	Date	Changes
.01	2013-06-19	First edition
.02	2015-05-19	Addresses for Use of internal Modbus added. Text revision of existing addresses.
.03	2017-10-24	Addresses for Use of internal Modbus added. Text revision of existing addresses. Examples of useful addresses added.

1.2 Before you start

Validity

This document applies to the following product:

Name	Type (ASN)	Version
IVP EHP application	POL63x.00	v3.02.xx



This document is a supplement to the general integration guide for Climatix Modbus communication, slave mode.

That document must be read first and all general information such as document conventions, important information on safety, trademarks, copyright etc. are valid for this document as well.



This document only contains the unique information for the product mentioned above. All general engineering information such as mounting modules, communication settings etc. are described in the integration guide.

Prerequisite

User has read the general Modbus integration guide for Climatix, CB1J3960en.

1.3 Reference documents

Further information

The following documents contain additional information on the products described in this manual:

Document	Order no.
Data sheet "Communication module Modbus"	CB1Q3934en
Basic documentation "Modbus communication module"	CB1P3934en
Integration Guide "Modbus communication, slave mode"	CB1J3960en

2 Application

2.1 General information

What are standard applications?

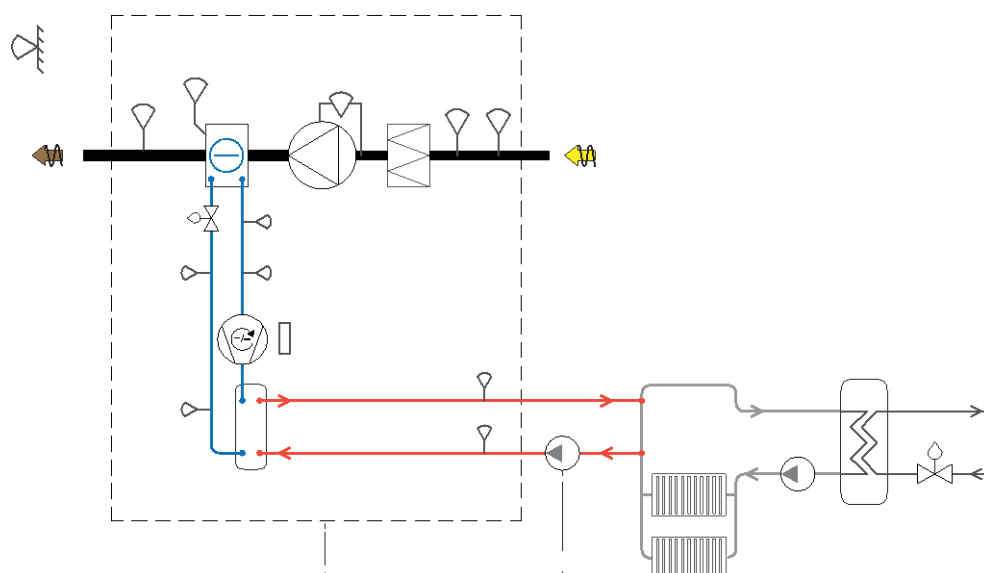
Standard applications for Climatix comprise predefined monitoring and control functions for a particular plant type.

Features:

- OEM customers receive standard applications as a set of loadable files. They can be loaded in the controller via SD card.
- An HMI operator unit allows for assigning inputs and outputs to the respective plant as well as select, configure and parameterize the required functions.

Standard application EHP v3.02.xx

Standard application EHP v3.02.xx is available at this time. It contains all common functions to control and monitor air conditioning units (**Extract Heat Pump**). The following diagram provides an overview of selectable measured values and control equipment:



Modbus registers

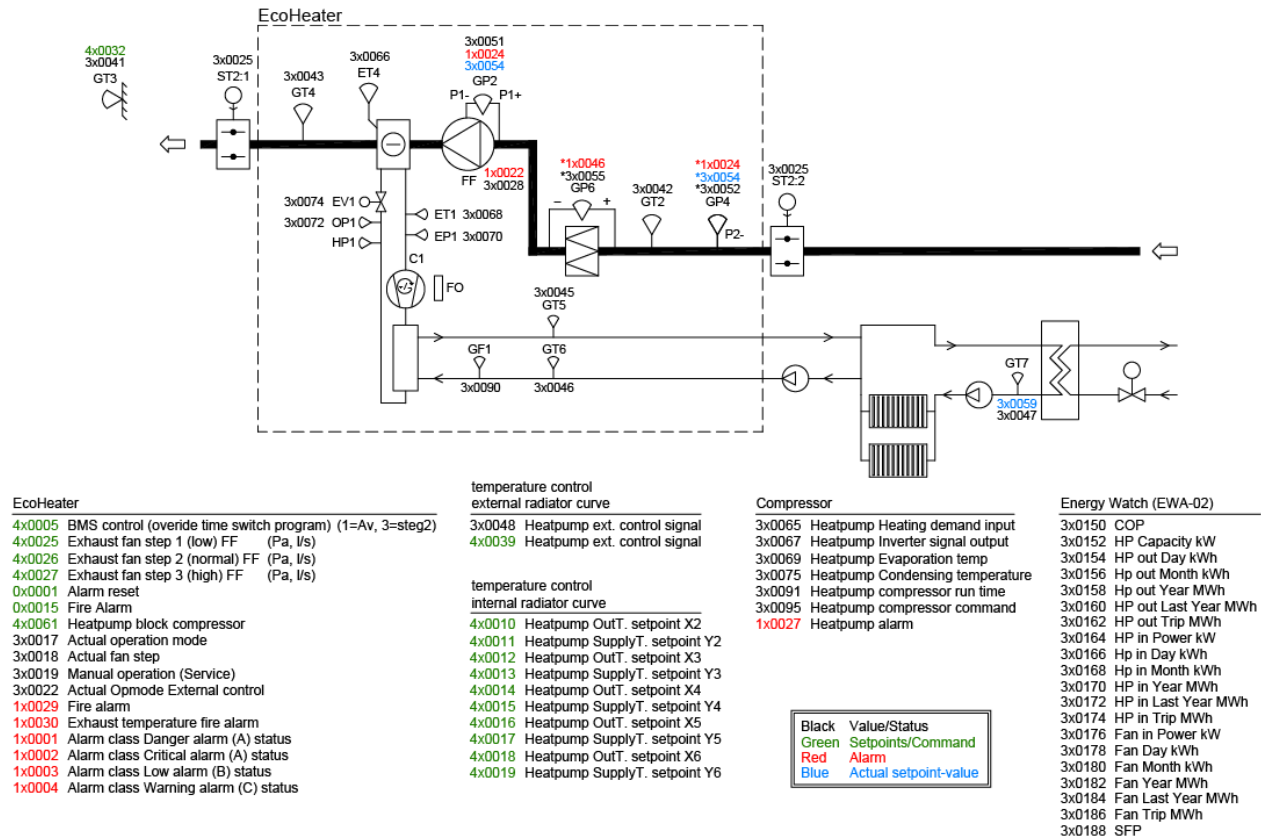
The set of loadable files mentioned above also includes a mapping file for integration in a higher building automation and control system via communications module. The Climatix controller automatically assumes the Modbus registers required for integration as per the plant data points and functions configured and parameterized previously.

The following tables list the predefined Modbus registers supporting standard application EHP v3.02.xx to ensure standardized and simple integration.

Examples of useful Modbus addresses

Click on the image title (link) for a full size pdf or see IV Produkt homepage.
The pdf can be downloaded, then it possible to copy Modbus addresses etc.

[Modbus addresses for EHP in general, examples](#)



3 Reference Modbus addresses

3.1 General

Purpose

This section describes the reference addresses used in the specific application, see chapter 1.2 "Before you start".

Modbus data formats

Modbus type	Description	Reference	Datatype
Coil status	Read/Write Discrete output	0x	1bit
Input states	Read Discrete input	1x	1bit
Input register	Read Input register	3x	16bit signed or unsigned word
Holding register	Read/Write Output register	4x	16bit signed or unsigned word

Addresses used

All reference addresses from 0001-0125 for on-board and -1000 for module are generated and can be accessed even if not listed. As a result, multiple coils/registers can be forced/reset even if there is a gap between two reference addresses.



Do not read/write any addresses above 0125/1000. Doing so causes an exception and communication fails.

All address types starts with 1, and due to that some Master devices starts with 0 it's in that case necessary to subtract all addresses in this document with 1.

Presentation

Values and states are presented as follows:



- 16 bit real values are presented in their actual value/unit. E.g. °C, %, Pa, l/s (Normally Signed Word).
- 16 bit states are presented as a number, see the reference address description (Unsigned Word). Texts for each state are represented in the last column separated with * (Example *Off*On* = 0=Off and 1=On)
- 1 bit status are presented as 0=Off and 1=On.
- 1 bit alarms are presented as 0=Normal and 1=Alarm.

Alarms and status are presented both as input states and as input registers.

Examples

A real value is 215, and presented by a 16 bit register binary as: MSB 11010111 LSB.

The 16 bit register "BMS override time program" is used and set binary to state 6: MSB 00000110 LSB.

Decimals

When Modbus uses a 16 bit register to handle real values, a factor is needed for decimals. E.g. factor 10 for 1 decimal, factor 100 for 2 decimals, etc.

Example 1: Present values

The present supply air temperature is 20.6 °C and is multiplied by 10 in the Climatix controller. It is presented as 206 at Modbus and must be divided by 10 in the master device to return to 20.6 °C.

Example 2: Setpoints

To set the temperature setpoint 21.5°C at the master device, multiply it by 10 to present it as 215 at Modbus. The Climatix controller then divides by 10 to return to 21.5 °C.

Override I/Os

Inputs that are possible to override via Modbus is marked with (I/O), these must first be setup to be overridden via communication, see Integration guide.

3.2 Coil status

Table of coil states

Address	Description	Values /Units	Remarks
Present value			
0x0001	Alarm acknowledge	0-1	Off*On
0x0002	Enable communicationtest	0-1	No*Yes
0x0003	Communicationtest puls	0-1	0*1
0x0004	Fire damper test	0-1	Passive*Active
0x0007	Energymeter reset partial	0-1	Passive*Active
Tracking value			
0x0011	Emergency stop input	0-1	Off*On, (I/O)
0x0012	External control input 1	0-1	Off*On, (I/O)
0x0013	External control input 2	0-1	Off*On, (I/O)
0x0014	Summer/Winter changeover input	0-1	Winter*Summer, (I/O)
0x0015	Fire alarm input	0-1	OK*Alarm, (I/O)

3.3 Input states

Table of input states

Address	Description	Values /Units	Remarks
Present value			
1x0001	Alarm class Danger alarm (A) status	0-1	Normal*Alarm
1x0002	Alarm class Critical alarm (A) status	0-1	Normal*Alarm
1x0003	Alarm class Low alarm (B) status	0-1	Normal*Alarm
1x0004	Alarm class Warning alarm (C) status	0-1	Normal*Alarm
1x0005	Manual mode	0-1	Auto*Manual
1x0006	Communicationtest puls	0-1	0*1
1x0011	Emergency stop input	0-1	Off*On
1x0012	External control input 1	0-1	Off*On
1x0013	External control input 2	0-1	Off*On
1x0014	Summer/Winter changeover input	0-1	Winter*Summer
1x0015	Auxiliary input	0-1	Off*On
Alarm value			
1x0016	Outside air damper feedback	0-1	OK*Alarm
1x0017	Extract air damper feedback	0-1	OK*Alarm
1x0018	Fire damper closed	0-1	OK*Alarm
1x0019	Fire damper opened	0-1	OK*Alarm
1x0020	Fire damper no move	0-1	OK*Alarm
1x0022	Exhaust fan alarm	0-1	OK*Alarm
1x0023	Exhaust fan feedback	0-1	OK*Alarm
1x0024	Exhaust fan deviation alarm	0-1	OK*Alarm

Input states, continued

Table of input states,
cont.

Address	Description	Values /Units	Remarks
1x0025	Fan operating hours alarm	0-1	OK*Alarm
1x0026	Fire fan feedback	0-1	OK*Alarm
1x0027	Heatpump alarm	0-1	OK*Alarm
1x0028	Heatpump feedback	0-1	OK*Alarm
1x0029	Fire alarm	0-1	OK*Alarm
1x0030	Exhaust temperature fire alarm	0-1	OK*Alarm
1x0031	Auxiliary alarm	0-1	OK*Alarm
1x0032	Manual mode	0-1	OK*Alarm
1x0033	Modbus comm alarm	0-1	OK*Alarm
1x0034	Processbus comm alarm	0-1	OK*Alarm
1x0035	Outside air temperature	0-1	OK*Alarm
1x0036	Exhaust air temperature	0-1	OK*Alarm
1x0037	Extract air temperature	0-1	OK*Alarm
1x0038	Heatpump water outgoing temperature	0-1	OK*Alarm
1x0039	Heatpump water return temperature	0-1	OK*Alarm
1x0040	Heatpump water supply temperature	0-1	OK*Alarm
1x0041	Heatpump external control signal	0-1	OK*Alarm
1x0042	Heatpump Block compressor	0-1	OK*Alarm
1x0043	Auxiliary temperature	0-1	OK*Alarm
1x0044	Exhaust air flow	0-1	OK*Alarm
1x0045	Exhaust air pressure	0-1	OK*Alarm
1x0046	Exhaust filter alarm	0-1	OK*Alarm
1x0047	External setpoint	0-1	OK*Alarm
1x0048	Auxiliary temperature 1	0-1	OK*Alarm
1x0049	Auxiliary alarm 1	0-1	OK*Alarm
1x0050	Auxiliary alarm 2	0-1	OK*Alarm
1x0051	Auxiliary alarm 3	0-1	OK*Alarm
1x0052	Auxiliary alarm 4	0-1	OK*Alarm
1x0053	Auxiliary alarm 5	0-1	OK*Alarm
1x0054	Aux Active Signal	0-1	OK*Alarm
1x0055	Aux Temp control alarm	0-1	OK*Alarm
1x0056	Exhaust Filter fire alarm	0-1	OK*Alarm
1x0057	Waterflow	0-1	OK*Alarm
1x0058	Waterflow Alarm	0-1	OK*Alarm
1x0059	Extract air temp Block Heatpump	0-1	OK*Alarm
1x0060	Heatpump Compressor	0-1	OK*Alarm
1x0061	Heatpump Evaporation coil temp	0-1	OK*Alarm
1x0062	Heatpump Communication Offline EVD	0-1	OK*Alarm
1x0063	Heatpump Low pressure	0-1	OK*Alarm
1x0064	Heatpump Low temp of evaporation	0-1	OK*Alarm
1x0065	Heatpump Suction Temp	0-1	OK*Alarm
1x0066	Heatpump MOP	0-1	OK*Alarm
1x0067	Heatpump High pressure	0-1	OK*Alarm
1x0068	Heatpump Motor expansion valve	0-1	OK*Alarm
1x0069	Heatpump Low super heat	0-1	OK*Alarm
1x0070	Heatpump Low suction temp	0-1	OK*Alarm
1x0071	Modbus sensor communication	0-1	OK*Alarm
1x0072	Modbus Energy meter communication	0-1	OK*Alarm

Input states, *continued*

Table of input states,
cont.

Address	Description	Values /Units	Remarks
1x0073	Modbus Heatpump communication	0-1	OK*Alarm
1x0074	Modbus Ebm Fan communication	0-1	OK*Alarm
1x0075	Heatpump Operating hours	0-1	OK*Alarm
1x0076	Pump Heating Alarm	0-1	OK*Alarm
1x0077	Pump Heating Feedback	0-1	OK*Alarm
1x0078	Pump Extra Heating Alarm	0-1	OK*Alarm
1x0079	Pump Extra Heating Feedback	0-1	OK*Alarm

3.4 Input register

Input register table

Address	Description	Values /Units	Remarks
Unsigned Word			
3x0001	General status (Word 1)	0-65535	0-1 for each bit or counted binary to a decimal number
Bit0	- Alarm class danger (A)		
Bit1	- Alarm class critical (A)		
Bit2	- Alarm class low (B)		
Bit3	- Alarm class warning (C)		
Bit4	-		
Bit5	- Manual control active		
Bit6	- Summer mode		
Bit7	- Communication test puls		
Bit8	-		
Bit9	- Preheating, extra heating register		
Bit10	-		
Bit11	-		
Bit12	-		
Bit13	-		
Bit14	-		
Bit15	-		
3x0002	General status (Word 2)	0-65535	0-1 for each bit or counted binary to a decimal number
Bit0	-		
Bit1	-		
Bit2	-		
Bit3	-		
Bit4	-		
Bit5	-		
Bit6	-		
Bit7	-		
Bit8	-		
Bit9	-		
Bit10	-		
Bit11	-		
Bit12	-		
Bit13	-		
Bit14	-		
Bit15	-		
3x0003	General status (Word 3)	0-65535	0-1 for each bit or counted binary to a decimal number
Bit0	-		
Bit1	-		
Bit2	-		
Bit3	-		
Bit4	-		
Bit5	-		
Bit6	-		
Bit7	-		
Bit8	-		
Bit9	-		
Bit10	-		
Bit11	-		
Bit12	-		
Bit13	-		
Bit14	-		
Bit15	-		

Input register, *continued*

Input register table,
cont.

Address	Description	Values /Units	Remarks
3x0004	General status (Word 4)	0-65535	0-1 for each bit or counted binary to a decimal number
Bit0	-		
Bit1	-		
Bit2	-		
Bit3	-		
Bit4	-		
Bit5	-		
Bit6	-		
Bit7	-		
Bit8	-		
Bit9	-		
Bit10	-		
Bit11	-		
Bit12	-		
Bit13	-		
Bit14	-		
Bit15	-		
3x0005	Digital inputs (Word 1)	0-65535	0-1 for each bit or counted binary to a decimal number
Bit0	- Emergency stop		
Bit1	- External control 1		
Bit2	- External control 2		
Bit3	- Summer/winter changeover		
Bit4	- Alarm acknowledge		
Bit5	- Heatpump Block compressor indication		
Bit6	-		
Bit7	-		
Bit8	- Aux input		
Bit9	-		
Bit10	-		
Bit11	-		
Bit12	-		
Bit13	-		
Bit14	-		
Bit15	-		
3x0006	Digital inputs (Word 2)	0-65535	0-1 for each bit or counted binary to a decimal number
Bit0	- Dampers open		
Bit1	- Fire dampers open		
Bit2	- Fire dampers closed		
Bit3	-		
Bit4	-		
Bit5	- Exhaust fan feedback		
Bit6	-		
Bit7	-		
Bit8	-		
Bit9	-		
Bit10	-		
Bit11	- Fire dampers 2 open		
Bit12	- Fire dampers 2 closed		
Bit13	-		
Bit14	-		
Bit15	-		

Input register, *continued*

Input register table,
cont.

Address	Description	Values /Units	Remarks
3x0007	Digital inputs (Word 3)	0-65535	0-1 for each bit or counted binary to a decimal number
Bit0	-		
Bit1	-		
Bit2	-		
Bit3	-		
Bit4	-		
Bit5	-		
Bit6	-		
Bit7	-		
Bit8	-		
Bit9	-		
Bit10	-		
Bit11	-		
Bit12	-		
Bit13	-		
Bit14	-		
Bit15	-		
3x0008	Digital inputs (Word 4)	0-65535	0-1 for each bit or counted binary to a decimal number
Bit0	-		
Bit1	-		
Bit2	-		
Bit3	-		
Bit4	-		
Bit5	-		
Bit6	-		
Bit7	-		
Bit8	-		
Bit9	-		
Bit10	-		
Bit11	-		
Bit12	-		
Bit13	-		
Bit14	-		
Bit15	-		
3x0009	Digital outputs (Word 1)	0-65535	0-1 for each bit or counted binary to a decimal number
Bit0	-		
Bit1	- Extract damper		
Bit2	- Fire damper		
Bit3	- Fire damper 2		
Bit4	-		
Bit5	-		
Bit6	-		
Bit7	-		
Bit8	-		
Bit9	- Exhaust fan, running		
Bit10	- Exhaust fan, off		
Bit11	- Exhaust fan, stage 1		
Bit12	- Exhaust fan, stage 2		
Bit13	- Exhaust fan, stage 3		
Bit14	-		
Bit15	-		

Input register, *continued*

Input register table,
cont.

Address	Description	Values /Units	Remarks
3x0010	Digital outputs (Word 2)	0-65535	0-1 for each bit or counted binary to a decimal number
Bit0	- Heatpump Unit status - Waiting		
Bit1	- Heatpump Unit status - UnitOn		
Bit2	- Heatpump Unit status - OFFbyALR		
Bit3	- Heatpump Unit status - OFFbyNET		
Bit4	- Heatpump Unit status - OFFbyBMS		
Bit5	- Heatpump Unit status - OFFbySCH		
Bit6	- Heatpump Unit status - OFFbyDIN		
Bit7	- Heatpump Unit status - OFFbyKey		
Bit8	- Heatpump Unit status - Manual		
Bit9	- Heatpump Unit status - -		
Bit10	- Heatpump Unit status - HighcondTmp		
Bit11	- Heatpump Unit status - FrostProtOpr		
Bit12	- Heatpump Unit status - Custom3		
Bit13	- Heatpump Unit status - Custom4		
Bit14	-		
Bit15	- Heatpump compressor command		
3x0011	Digital outputs (Word 3)	0-65535	0-1 for each bit or counted binary to a decimal number
Bit0	-		
Bit1	-		
Bit2	-		
Bit3	-		
Bit4	-		
Bit5	-		
Bit6	- Heatpump Command		
Bit7	-		
Bit8	-		
Bit9	-		
Bit10	-		
Bit11	-		
Bit12	-		
Bit13	-		
Bit14	-		
Bit15	-		
3x0012	Digital outputs (Word 4)	0-65535	0-1 for each bit or counted binary to a decimal number
Bit0	- Aux TSP command		
Bit1	- Aux operation mode indication		
Bit2	- Aux operation mode indication 2		
Bit3	- Aux Temp Output		
Bit4	-		
Bit5	-		
Bit6	-		
Bit7	-		
Bit8	- Alarm output, high (and low)		
Bit9	- Alarm output, low		
Bit10	-		
Bit11	-		
Bit12	-		
Bit13	-		
Bit14	-		
Bit15	-		

Input register, *continued*

Input register table,
cont.

Address	Description	Values /Units	Remarks
3x0013	Alarms (Word 1)	0-65535	0-1 for each bit or counted binary to a decimal number
Bit0	- Dampers		
Bit1	- Fire dampers		
Bit2	- Fire dampers 2		
Bit3	-		
Bit4	- Exhaust fan		
Bit5	- Fan operating hours		
Bit6	- Fire fan		
Bit7	-		
Bit8	-		
Bit9	-		
Bit10	-		
Bit11	-		
Bit12	-		
Bit13	-		
Bit14	-		
Bit15	-		
3x0014	Alarms (Word 2)	0-65535	0-1 for each bit or counted binary to a decimal number
Bit0	- Heatpump Operating hours		
Bit1	- Heatpump Compressor		
Bit2	- Heatpump Evaporation coil temp		
Bit3	- Heatpump Low pressure		
Bit4	- Heatpump Suction Temp		
Bit5	- Heatpump High pressure		
Bit6	- Heatpump Low super heat		
Bit7	- Heatpump Low temp of evaporation		
Bit8	- Heatpump MOP		
Bit9	- Heatpump Motor expansion valve		
Bit10	- Heatpump Low suction temp		
Bit11	- Heatpump Communication Offline EVD		
Bit12	- Heatpump Alarm		
Bit13	- Fire alarm		
Bit14	-		
Bit15	- Filter alarm		
3x0015	Alarms (Word 3)	0-65535	0-1 for each bit or counted binary to a decimal number
Bit0	- Out temperature		
Bit1	- Waterflow		
Bit2	-		
Bit3	-		
Bit4	-		
Bit5	- Extract temperature		
Bit6	- Exhaust temperature		
Bit7	-		
Bit8	-		
Bit9	- Heatpump water supply temperature		
Bit10	- Heatpump water outgoing temperature		
Bit11	- Auxiliary sensor/active signal		
Bit12	- Heatpump water return temperature		
Bit13	-		
Bit14	-		
Bit15	-		

Input register, *continued*

Input register table,
cont.

Address	Description	Values /Units	Remarks
3x0016	Alarms (Word 4)	0-65535	0-1 for each bit or counted binary to a decimal number
Bit0	-		
Bit1	- Exhaust pressflow and deviation		
Bit2	-		
Bit3	-		
Bit4	-		
Bit5	-		
Bit6	-		
Bit7	-		
Bit8	-		
Bit9	- External setpoint		
Bit10	- Auxiliary alarm		
Bit11	- Auxiliary 1-5 alarm		
Bit12	- Manual control		
Bit13	-		
Bit14	- Communication test		
Bit15	- Modbus master, Processbus		

Present value, Unsigned Word

3x0017	Actual operating mode 0=Off 1=On 2= 3= 4= 5= 6= 7= 8=Firedamper test 9=Fire 10=Stop 11=Overrun 12=Startup	0-12	Off*On*Na*Na*Na*Na*Na*Na* Firedampertest*Fire*Stop*Overrun* Startup
3x0018	Actual fan step	0-3	Off*Stage1*Stage2*Stage3
3x0019	Manual operation (Service)	0-1	Auto*Off
3x0020	Time Scheduler operation	0-3	Off*Stage1*Stage2*Stage3
3x0021	Time Switch Program steps	0-3	Off*Stage1*Stage2*Stage3
3x0022	Actual Opmode External control	0-4	Auto*Off*Stage 1*Stage 2*Stage 3
3x0023	Fire damper state	0-3	NotDefined*Closed*Moving*Opened

Input register, *continued*

Input register table,
cont.

Address	Description	Values /Units	Remarks
3x0024			
3x0025	Extract air damper command	0-1	Off*On
3x0026	Fire damper command	0-1	Off*On
3x0027	Exhaust fan command	0-3	Off*Stage1*Stage2*Stage3
3x0028	Exhaust fan output signal	0 - 100%	
3x0029	Fire fan command	0-1	Off*On
3x0030	Heatpump output signal	0 - 100%	
3x0031	Heatpump command	0-1	Off*On
3x0032	Auxiliary operation mode output	0-1	Off*On
3x0033	Auxiliary time switch program output	0-1	Off*On
3x0034	Auxiliary analog output fan	0 - 100%	
3x0035	Alarm output 1	0-1	Normal*Alarm
3x0036	Alarm output 2	0-1	Normal*Alarm
3x0037	Aux Temp control output signal	0 - 100%	
3x0038	Auxiliary operation mode output 2	0-1	Off*On
3x0039	Actual summer comp fan	0 - 100%	
3x0040	Actual winter comp fan	0 - 100%	
Present value, Signed Word			
3x0041	Outside air temperature	-x.y - +x.y °C	(factor 10)
3x0042	Extract air temperature	-x.y - +x.y °C	(factor 10)
3x0043	Exhaust air temperature	-x.y - +x.y °C	(factor 10)
3x0044	Aux Temp control temperature	-x.y - +x.y °C	(factor 10)
3x0045	Heatpump water outg. temperature	-x.y - +x.y °C	(factor 10)
3x0046	Heatpump water return temperature	-x.y - +x.y °C	(factor 10)
3x0047	Heatpump water supply temperature	-x.y - +x.y °C	(factor 10)
3x0048	Heatpump external control signal	-x.y - +x.y %	(factor 10)
3x0049	Auxiliary temperature	-x.y - +x.y %	(factor 10)
3x0050	Auxiliary temperature 1	-x.y - +x.y %	(factor 10)
3x0051	Exhaust air flow	0 - x l/s	(factor 10)
3x0052	Exhaust air pressure	0 - x Pa	(factor 10)
3x0053	External setpoint	-x.y - +x.y °C	(factor 10)
3x0054	Actual exhaust fan setpoint	0 - x	%, Pa or l/s, Unsigned
3x0055	Exhaust filter	0 - x Pa	(factor 10)
3x0056	Auxiliary temp output	0-1	Off*On
3x0057	Sensible effect	-x.y - +x.y kW	(factor 10)
3x0058	Manual switch Continuous run	0-3	Off*Stage 1*Stage 2*Stage 3
3x0059	Act. Hetpump setpoint (Heat Curv)	-x.y - +x.y °C	(factor 10)
Present value, Unsigned Word			
3x0060	Energy actual power	x.y - +x.y W	
3x0061	Energy average power	x.y - +x.y W	
3x0062	Energy operating hours	x.y - +x.y h	
3x0063	Energy partial	x.y - +x.y kWh	
3x0064	Energy total	x.y - +x.y kWh	
Present value, Signed Word			
3x0065	Heatpump Heating demand input	-x.y - +x.y %	(factor 10)
3x0066	Heatpump Evaporation coil temp	-x.y - +x.y °C	(factor 10)
3x0067	Heatpump Inverter signal output	-x.y - +x.y %	(factor 10)
3x0068	Heatpump Suction temp	-x.y - +x.y °C	(factor 10)

Input register, *continued*

Input register table,
cont.

Address	Description	Values /Units	Remarks
Present value, Signed Word			
3x0069	Heatpump Evaporation temp	-x.y - +x.y °C	(factor 10)
3x0070	Heatpump Low pressure	-x.y - +x.y bar	(factor 10)
3x0071	Heatpump Superheat temp.	-x.y - +x.y K	(factor 10)
3x0072	Heatpump High pressure	-x.y - +x.y bar	(factor 10)
3x0073			
3x0074	Heatpump Expansion valve output signal	-x.y - +x.y %	(factor 10)
3x0075	Heatpump Condensing temperature	-x.y - +x.y °C	(factor 10)
3x0076	Heatpump Antifreeze prev. threshold	-x.y - +x.y °C	(factor 10)
3x0077	Heatpump Coil temp. limit threshold	-x.y - +x.y °C	(factor 10)
Unsigned long 32bit, each address also uses following address			
3x0078	Energy actual power	x.y - +x.y W	(factor 10) 32-bit
3x0080	Energy average power	x.y - +x.y W	(factor 10) 32-bit
3x0082	Energy operating hours	x.y - +x.y h	(factor 10) 32-bit
3x0084	Energy partial	x.y - +x.y kWh	(factor 10) 32-bit
3x0086	Energy total	x.y - +x.y kWh	(factor 10) 32-bit
Present value, Signed Word			
3x0088	Heatpump Block compressor indication	0-1	Off*On
3x0089	Auxiliary Active signal	-x.y - +x.y %	(factor 10)
3x0090	Waterflow	-x.y - +x.yy l/s	(factor 100)
3x0091	Heatpump compressor run time	0 - x h	
3x0092	Heatpump Start count	0 - x	
3x0093	Exhaust fan Motor run time	0 - x h	
3x0094	Heatpump Unit status	0-13	Unsigned word 0=Waiting 1=Unit On 2=Off By Alarm 3=Off By Net. 4=Off By BMS. 5=Off By Schedule 6=Off By DIN 7=OFF By Key 8=Manual 9=-- 10=High condenser Temp 11=Frost Protection Operation 12=Custom 3 13=Custom 4
3x0095	Heatpump compressor command	0-1	Off*On
3x0096	Exhaust air flow m3/s	-x.y - +x.yy m3/s	(factor 100)
3x0098	Exhaust air flow m3/h	-x.y - +x.yy m3/h	32-Bit

Input register, *continued*

Input register table,
cont.

Address	Description	Values /Units	Remarks
3x0100	Ebm Exhaust fan Alarm	0-12	Unsigned word 0=Nu 1=Mains Over Volt. 2=Mains Under Volt. 3=DC-link Under.Volt. 4=DC-link Over Volt. 5=Internal Electronics 6=Locked 7=Hall Sensor 8=Overheat 9=Com. Error 10=Power Overheat 11=Phase fail 12=Normal
3x0101	Ebm Exhaust fan Warning	0-11	Unsigned word 0=Nu 1= Open circuit at input 2= Actual speed less than low limit 3= Brake operation 4= Low DC-link voltage 5= High electronics temp 6= High motor temp 7= High output stage temp 8= Mesh power limitation 9= High line impedance 10= Mesh current limitation 11= Normal
3x0102	Ebm Exhaust fan DC link current	0 . x.y A	(factor 10)
3x0103	Ebm Exhaust fan DC link voltage	0 . x.y V	(factor 10)
3x0104	Ebm Exhaust fan Speed	0 . x.y rpm	(factor 10)
3x0105	Ebm Exhaust fan Max speed	0 . x.y rpm	(factor 10)
3x0106	Ebm Exhaust fan Power module temp	-x.y - +x.y °C	(factor 10)
3x0107	Ebm Exhaust fan Motor temp	-x.y - +x.y °C	(factor 10)
3x0108	Ebm Exhaust fan Electronics temp	-x.y - +x.y °C	(factor 10)
3x0109	Ebm Exhaust fan Power	0 . x.y W	(factor 10)
3x0110	Ebm Exhaust fan Motor run time	0-65535 h, min	(factor 10)
3x0111	Ebm Exhaust fan Motor run time HH	0-65535 h	(factor 10)
3x0112	Ebm Exhaust fan Motor run time MM	0-59 min	(factor 10)
3x0120	Actual exhaust fan setpoint	-x.y - +x.y Pa, l/s, %, 3m/s or 3m/h	32-Bit (factor 100)

Input register, *continued*

Energy Watch

Input register table,
cont.

Address	Description	Values /Units	Remarks	Release
Unsigned long 32bit, each address also uses following address				
3x0150	Heat Pump energy COP	-x.y - +x.yy	32-bit (factor 10)	
3x0152	Heat Pump Output Power	-x.y - +x.yy kW	32-bit (factor 10)	
3x0154	Heat Pump Output Power Today	-x.y - +x.yy kWh	32-bit	
3x0156	Heat Pump Output Power Month	-x.y - +x.yy kWh	32-bit	
3x0158	Heat Pump Output Power Year	-x.y - +x.yy MWh	32-bit (factor 100)	
3x0160	Heat Pump Output Power Last Year	-x.y - +x.yy MWh	32-bit (factor 100)	
3x0162	Heat Pump Output Power Trip meter	-x.y - +x.yy MWh	32-bit (factor 100)	
3x0164	Heat Pump Input Power	-x.y - +x.yy kW	32-bit (factor 10)	
3x0166	Heat Pump Input Power Today	-x.y - +x.yy kWh	32-bit (factor 10)	
3x0168	Heat Pump Input Power Month	-x.y - +x.yy kWh	32-bit	
3x0170	Heat Pump Input Power Year	-x.y - +x.yy MWh	32-bit (factor 100)	
3x0172	Heat Pump Input Power Last Year	-x.y - +x.yy MWh	32-bit (factor 100)	
3x0174	Heat Pump Input Power Trip Meter	-x.y - +x.yy MWh	32-bit (factor 100)	
3x0176	Fans Input power	-x.y - +x.yy kW	32-bit (factor 10)	
3x0178	Fans Input Power Today	-x.y - +x.yy kWh	32-bit (factor 10)	
3x0180	Fans Input Power Month	-x.y - +x.yy kWh	32-bit	
3x0182	Fans Input Power Year	-x.y - +x.yy MWh	32-bit (factor 100)	
3x0184	Fans Input Power Last Year	-x.y - +x.yy MWh	32-bit (factor 100)	
3x0186	Fans Input Power Trip Meter	-x.y - +x.yy MWh	32-bit (factor 100)	
3x0188	Fans SFP	-x.y - +x.yy SFP	32-bit (factor 10)	

Input register, *continued*

Energy Watch

Input register table,
cont.

Address	Description	Values /Units	Remarks	Release
Signed word				
3x0190	Ziehl Exhaust Fan Power	-x.y - +x.y kW	(factor 10)	
3x0191	Ziehl Exhaust Fan Alarm	0 - x	Unsigned word	
3x0192	Ziehl Exhaust Fan Motor Volt	-x.y - +x.y V	(factor 10)	
3x0193	Ziehl Exhaust Fan Current	-x.y - +x.y A	(factor 10)	
3x0194	Ziehl Exhaust Fan DC-Volt	-x.y - +x.y V	(factor 10)	
3x0195	Ziehl Exhaust Fan Speed	-x.y - +x.y rpm	(factor 10)	
3x0196	Ziehl Exhaust Fan Heatsink Temp	-x.y - +x.y °C	(factor 10)	
3x0200	Heat Pump Status	0 - 8	0= Nu 1= Return AirTemp 2= Air Flow Low 3= Water Flow Low 4= Return High 5= External Demand HP 6= No Heating Demand 7= Alarm 8= Run	
3x0201	Heat Pump command	0 - 2	0= Off 1= On 2= NULL	
3x0202	Ex. Heating	0 - +x.y %		
3x0203	Ex. Heating command	0 - 2	0= Off 1= On 2= NULL	

3.5 Holding register

Holding register table

Address	Description	Values /Units	Remarks
Unsigned Word			
4x0001	Control bits	0-65535	
Bit0	- Emergency stop input		I/O
Bit1	- External control input 1		I/O
Bit2	- External control input 2		I/O
Bit3	- Su/Wi changeover input		I/O
Bit4	-		
Bit5	-		
Bit6	-		
Bit7	- Fire alarm input		I/O
Bit8	-		
Bit9	-		
Bit10	-		
Bit11	-		
Bit12	-		
Bit13	-		
Bit14	-		
Bit15	- Communicationtest puls		
Present value, Unsigned Word			
4x0005	BMS control/override time switch program (steps)	0-4	Auto*Off*Stage 1*Stage 2*Stage 3
4x0006	Auxiliary BMS TSP output	0-2	Auto*Off*On
4x0007	Manual operation (Service)	0-1	Auto*Off
4x0008	External control, off delay	0 - x h	
4x0009	External control, fan step	0-4	Auto*Off*1Step*2Step*3Step
4x0046	Manual switch Continuous run	0-3	Off*Stage 1*Stage 2*Stage 3
Present value, Signed Word			
4x0010	Heatpump OutT. setpoint X2	-x.y - +x.y °C	(factor 10)
4x0011	Heatpump SupplyT. setpoint Y2	-x.y - +x.y °C	(factor 10)
4x0012	Heatpump OutT. setpoint X3	-x.y - +x.y °C	(factor 10)
4x0013	Heatpump SupplyT. setpoint Y3	-x.y - +x.y °C	(factor 10)
4x0014	Heatpump OutT. setpoint X4	-x.y - +x.y °C	(factor 10)
4x0015	Heatpump SupplyT. setpoint Y4	-x.y - +x.y °C	(factor 10)
4x0016	Heatpump OutT. setpoint X5	-x.y - +x.y °C	(factor 10)
4x0017	Heatpump SupplyT. setpoint Y5	-x.y - +x.y °C	(factor 10)
4x0018	Heatpump OutT. setpoint X6	-x.y - +x.y °C	(factor 10)
4x0019	Heatpump SupplyT. setpoint Y6	-x.y - +x.y °C	(factor 10)
4x0020			
4x0021			
4x0022			
4x0023	Aux. temp setpoint 1	-x.y - +x.y °C	(factor 10)
4x0024	Aux. temp setpoint 2	-x.y - +x.y °C	(factor 10)

Holding register, *continued*

Holding register table,
cont.

Address	Description	Values /Units	Remarks
Present value, Unsigned Word			
4x0025	Exhaust fan step 1 setpoint	0 - x	%, Pa or l/s depending on configuration
4x0026	Exhaust fan step 2 setpoint	0 - x	%, Pa or l/s
4x0027	Exhaust fan step 3 setpoint	0 - x	%, Pa or l/s
4x0028	Exhaust fan max force setpoint	0 - x	%, Pa or l/s
Present value, Signed Word			
4x0029	Blocking High speed outT. (Fan)	-x.y - +x.y °C	(factor 10)
Present value, Unsigned Word			
4x0030	Exhaust fan setpoint, Firemode	0 - x	%, Pa or l/s depending on configuration
4x0031			
Tracking value, Signed Word			
4x0032	Outside air temperature	-x.y - +x.y °C	(factor 10)
4x0033	Extract air temperature	-x.y - +x.y °C	(factor 10)
4x0034	Exhaust air temperature	-x.y - +x.y °C	(factor 10)
4x0035			
4x0036	Heatpump water outg. Temp.	-x.y - +x.y °C	(factor 10)
4x0037	Heatpump water return temp.	-x.y - +x.y °C	(factor 10)
4x0038	Heatpump water supply temp.	-x.y - +x.y °C	(factor 10)
4x0039	Heatpump ext. control signal	-x.y - +x.y %	(factor 10)
4x0040	Auxiliary temperature	-x.y - +x.y °C	(factor 10)
4x0041	Auxiliary temperature 1	-x.y - +x.y °C	(factor 10)
4x0042	Exhaust air flow	0 - x l/s	(factor 10)
4x0043	Exhaust air pressure	0 - x Pa	(factor 10)
4x0044	Aux Temp Control	-x.y - +x.y °C	(factor 10)
4x0045	Exhaust filter pressure	0 - x Pa	(factor 10)
4x0046	See page above		
4x0047	ReturnTemp. setpoint, Firemode	-x.y - +x.y °C	(factor 10)
4x0048	Summer Comp. Exhaust Fan Delta	-x.y - +x.y %	(factor 10)
4x0049	Summer Comp. Exhaust Fan Start Temp.	-x.y - +x.y °C	(factor 10)
4x0050	Summer Comp. Exhaust Fan End Temp.	-x.y - +x.y °C	(factor 10)
4x0051	Winter Comp. Exhaust Fan Delta	-x.y - +x.y %	(factor 10)
4x0052	Winter Comp. Exhaust Fan Start Temp.	-x.y - +x.y °C	(factor 10)
4x0053	Winter Comp. Exhaust Fan End Temp.	-x.y - +x.y °C	(factor 10)
4x0054	Max deviation Exhaust fan	0 - x	%, Pa or l/s

Holding register, *continued*

Holding register table,
cont.

Address	Description	Values /Units	Remarks
Loop and cascade controller settings			
	X Controller Gain	-x.yy - +x.yy	(factor 100), Signed Word
	X Controller Integral	0 - x sec	Unsigned Word
	X Controller Differential	0 - x sec	Unsigned Word
4x0055	Exhaust fan	-x.yy - +x.yy	Gain
4x0056	Exhaust fan	0 - x sec	Integral
4x0057	Exhaust fan	0 - x sec	Differential
4x0058	Heating 2	-x.yy - +x.yy	Gain
4x0059	Heating 2	0 - x sec	Integral
4x0060	Heating 2	0 - x sec	Differential
Tracking value, Signed Word			
4x0061	Heatpump Block compressor	0 -1	Off-On
4x0062	Aux Active Signal	-x.y - +x.y	(factor 10)
4x0063	Aux Temp Control Setpoint	-x.y - +x.y °C	(factor 10) -x.y - +x.y °C
4x0064	Exhaust filter setpoint, Firemode	-x.y - +x.y °C	(factor 10)
4x0065	Waterflow limit	-x.y - +x.yy l/s	(factor 100)
4x0066	Extract air temp Block Heatpump	-x.y - +x.y °C	(factor 10)
Unsigned long			
4x0070	Exhaust Fan step 1 setpoint	0 - +x.yy	Pa, l/s, %, 3m/s or 3m/h (factor 100) depending on configuration
4x0072	Exhaust Fan step 2 setpoint	0 - +x.yy	Pa, l/s, %, 3m/s or 3m/h (factor 100) depending on configuration
4x0074	Exhaust Fan step 3 setpoint	0 - +x.yy	Pa, l/s, %, 3m/s or 3m/h (factor 100) depending on configuration
4x0076	Exhaust Fan Max Force	0 - +x.yy	Pa, l/s, %, 3m/s or 3m/h (factor 100) depending on configuration
Signed word			
4x0080	Pump Heating start temp	-x.y - +x.y °C	(factor 10)
4x0081	Pump Extra Heating start temp	-x.y - +x.y °C	(factor 10)

Holding register, *continued*

Holding register table,
cont.

Address	Description	Values /Units	Remarks
Loop and cascade controller settings			
	X Controller Gain	-x.yy - +x.yy	(factor 100), Signed Word
	X Controller Integral	0 - x sec	Unsigned Word
	X Controller Differential	0 - x sec	Unsigned Word
4x0082	Heating control	-x.yy - +x.yy	Gain
4x0083	Heating control	0 - x sec	Integral
4x0084	Heating control	0 - x sec	Differential

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