EN

KRONOTERM 1976

HEAT PUMPS

MAINTENANCE

INSTALLATION AND OPERATING MANUAL

Installation technician

BMS SYSTEM

Controller KSM V3.14-1

System ADAPT, VERSI, WPLV, ETERA, ADAPT^{MAX}

KRONOTERM INSTRUCTION SYSTEM

Document is a part of the KRONOTERM instruction system, which follows the project's lifecycle from design phase to service support.

Installation and operating manual_BMS_17-20-28-4023-04

Despite taking extensive care to ensure the accuracy of all figures and descriptions, KRONOTERM d.o.o. reserves the right to make corrections, changes to technical details, and changes to figures with no prior notice. Information herein is given based on the latest available product information at the time of drafting and printing this manual. We also reserve the right to suspend the sales of an individual product or even the entire sales program.

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Figures are symbolic and are only intended as a reference. Despite our efforts we cannot ensure that the products' true colors, proportions, or other graphical elements will be faithfully represented in print and on electronic screens. Products may differ from their visual representations.

Printed in Slovenia.

The original documentation is written in Slovenian. All other languages are translations.

Write to info@kronoterm.com for any additional questions.

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1 IMPORTANT INFORMATION

The instructions describe descriptions of the variables and the connection of the system to the KSM controller.

1.1 SYMBOLS

In the instructions, symbols highlight important information to limit risks.

This symbol indicates various risks for the user or the appliance.
DANGER: A risk that could lead to grave bodily harm.
WARNING: A risk that could lead to bodily harm.
CAUTION: A risk that could damage or destroy the appliance.

The symbol indicates information.
NOTE: Notification that provides important information about the appliance and the manufacturer's requirements.

1.2 INTRODUCTION

Modbus parameters are required to control the KSM controller via a central control system (BMS). These parameters are located at MA (Modbus address) 2000+.

1.3 LIMITATION OF LIABILITY

ATTENTION

By changing the MA parameters and confirming them, the authorized start-up operator and / or the device manufacturer does not take responsibility for incorrect operation of the heating system due to incorrect settings of MA 2000+ parameters in the BMS system.

1.4 CONDITIONS FOR CHANGING PARAMETERS

At least one of the following requirements must be met before changing MA parameters:

- The device user or system designer requires a change in user MA parameters.

ATTENTION

Before changing the MA parameters, think carefully about what you are setting so as not to cause system malfunction.

2 CONNECTING THE BMS TO THE KSM CONTROLLER

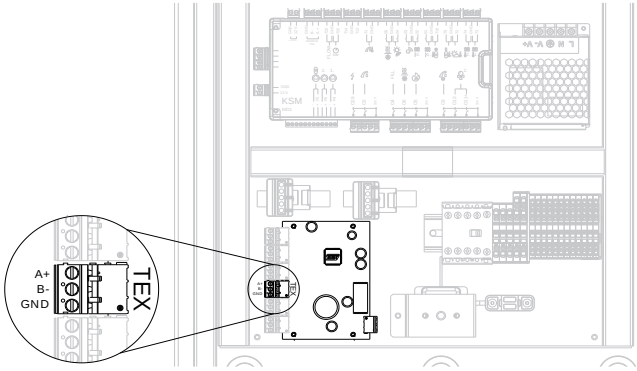

Figure 1: Terminal for connecting the BMS system to the regulator KSM

The device is connected via RS 485 communication. Connect to the TEX terminals on the KSM controller.

Picture 1: Connection of the BMS system to the controller KSM via the TEX terminal
We use the Modbus RS 485 protocol to read and write commands to holding registers 03 (read holding register) and 06 (write holding register).

Communication settings:

- Baud rate = 115200 (factory setting), 19200 *
- Data bits = 8
- Parity = none
- Stop bits = 1
- Modbus address is 20 (factory setting) *.

*Modbus address can be set by MA_4268.
*Baud rate can be set by MA_4270 (available from SW version 3.09-1).

3 MODBUS TABLE

* Modbus address (depending of BMS the address may be offset by -1)

MA*	Conversion and units	Description
2000	/	System operation
2001	/	Working function
2002	/	Additional activations
2003	/	Reserve source
2004	/	Alternative source
2006	/	Error/warning status
2007	/	Operation regime
2008	/	Operation program
2010	/	Fast heating of domestic hot water
2011	/	Defrost
2012	/	System activation
2013	/	Choice of program operation
2014	x 1°C	System temperature correction
2015	/	Activation of fast heating of domestic hot water
2016	/	Activation of additional source
2017	/	Regime switch
2018	/	Activation of reserve source
2022	/	Activation of holiday mode
2023	x 0,1°C	Desired domestic hot water temperature
2024	x 0,1°C	Current desired domestic hot water temperature
2026	/	Choice of domestic hot water operation
2027	/	Scheduled domestic hot water operation
2028	/	Circulation pump status
2030	x 0,1°C	Domestic hot water ECO mode offset
2031	x 0,1°C	Domestic hot water COM mode offset

MA*	Conversion and units	Description
2034	x 0,1°C	Current desired buffer tank /system temperature
2035	/	Choice of buffer tank operation
2037	/	Scheduled buffer tank operation status
2038	/	Main circulation pump operation status
2039	/	Remote deactivation status
2040	x 0,1°C	Buffer tank ECO mode offset
2041	x 0,1°C	Buffer tank COM mode offset
2042	/	Choice of loop 1 operation
2044	/	Loop 1 operation status on schedule
2045	/	Loop 1 circulation pump status
2046	/	Loop 1 thermostat and regulation status
2047	x 0,1°C	Loop 1 ECO mode offset
2048	x 0,1°C	Loop 1 COM mode offset
2049	x 0,1°C	Desired loop 2 temperature
2051	x 0,1°C	Current desired loop 2 temperature / room 2 temperature
2052	/	Choice of loop 2 operation
2054	/	Loop 2 operation status on schedule
2055	/	Loop 2 circulation pump status
2056	/	Loop 2 thermostat status
2057	x 0,1°C	Loop 2 ECO mode offset
2058	x 0,1°C	Loop 2 COM mode offset
2059	x 0,1°C	Desired loop 3 temperature
2061	x 0,1°C	Current desired loop 3 temperature / room 3 temperature
2062	/	Choice of loop 3 operation
2064	/	Loop 3 operation status on schedule
2065	/	Loop 3 circulation pump status

MA*	Conversion and units	Description
2066	/	Loop 3 thermostat status
2067	x 0,1°C	Loop 3 ECO mode offset
2068	x 0,1°C	Loop 3 COM mode offset
2069	x 0,1°C	Desired loop 4 temperature
2071	x 0,1°C	Current desired loop 4 temperature / room 4 temperature
2072	/	Choice of loop 4 operation
2074	/	Loop 4 operation status on schedule
2075	/	Loop 4 circulation pump status
2076	/	Loop 4 thermostat status
2077	x 0,1°C	Loop 4 ECO mode offset
2078	x 0,1°C	Loop 4 COM mode offset
2079	x 0,1°C	Desired pool temperature
2080	x 0,1°C	Current desired pool temperature
2081	/	Choice of pool operation
2083	/	Pool operation status on schedule
2084	/	Pool circulation pump status
2085	/	Pool thermostat status
2086	x 0,1°C	Pool ECO mode offset
2087	x 0,1°C	Pool COM mode offset
2088	/	Alternative source circulation pump status
2089	hours	Operating hours compressor cooling
2090	hours	Operating hours compressor heating
2091	hours	Operating hours compressor DHW
2092	/	/
2093	hours	Operating hours main circulation pump
2094	hours	Operating hours DHW circulation pump
2095	hours	Operating hours additional source 1
2096	hours	Operating hours additional source 2
2097	hours	Operating hours alternative source

MA*	Conversion and units	Description
2098	hours	Operating hours heat source
2099	hours	Operating hours passive
2100		/
2101	x 0,1°C	HP inlet temperature
2102	x 0,1°C	DHW temperature
2103	x 0,1°C	Outside temperature
2104	x 0,1°C	HP outlet temperature
2105	x 0,1°C	Evaporating temperature
2106	x 0,1°C	Compressor temperature
2107	x 0,1°C	Alternative source temperature
2108	/	/
2109	x 0,1°C	Pool temperature
2110	x 0,1°C	Loop 2 temperature
2111	x 0,1°C	Loop 3 temperature
2112	x 0,1°C	Loop 4 temperature
2113	/	Error active (if we write 0 – error reset)
2114	/	Errors 1
2115	/	Errors 2
2117	/	Warnings 1
2118	/	Errors 1 - inverter
2119	/	Errors 2
2120	/	Warnings 1 - inverter
2121	/	Warnings 2 - inverter
2124	/	Warnings 3
2126	/	Errors 5 - cascada
2127	/	Errors
2128	x 0,1°C	Current desired loop 1 temperature
2129	x 1 W	Current power consumption
2130	x 0,1°C	Loop 1 temperature
2139	day	Holiday mode - days
2160	x 0,1°C	Loop 1 thermostat temperature
2161	x 0,1°C	Loop 2 thermostat temperature
2162	x 0,1°C	Loop 3 thermostat temperature
2163	x 0,1°C	Loop 4 thermostat temperature

MA*	Conversion and units	Description
2186	/	Thermostat failure
2187	x 0,1°C	Desired room 1 temperature
2188	x 0,1°C	Current desired loop 2 temperature
2189	x 0,1°C	Current desired loop 3 temperature
2190	x 0,1°C	Current desired loop 4 temperature
2191	x 0,1°C	Current desired room 1 temperature
2197	/	Remote activation [0 = /, 1 = remote deactivation]
2301	/	Thermal disinfection [0 = off, 1 = on]
2302	x 0,1°C	Thermal disinfection: Desired temperature
2303	day	Thermal disinfection: Period [0 = off]
2304	minutes	Thermal disinfection: Start (in minutes of day)
2305	x 0,1°C	Solar / biomass: Desired buffer tank temperature
2306	x 0,1°C	Solar / biomass: Desired domestic hot water
2307	/	Screed drying [0 = off, 1 = on]
2308	x 0,1°C	Buffer tank heating curve (-15 or 20)
2309	x 0,1°C	Loop 1 heating curve (-15 or 20)
2310	x 0,1°C	Loop 2 heating curve (-15 or 20)
2311	x 0,1°C	Loop 3 heating curve (-15 or 20)
2312	x 0,1°C	Loop 4 heating curve (-15 or 20)
2313	x 0,1°C	Buffer tank heating curve (+15 or 40)
2314	x 0,1°C	Loop 1 heating curve (+15 or 40)
2315	x 0,1°C	Loop 2 heating curve (+15 or 40)
2316	x 0,1°C	Loop 3 heating curve (+15 or 40)
2317	x 0,1°C	Loop 4 heating curve (+15 or 40)

MA*	Conversion and units	Description
2318	/	Compressor status [b0 = compressor 1, b1 = compressor 2]
2319	/	Status compressor protection [b0 = compressor protection, b1 = compressor start]
2320	/	Loop 1 adaptive curve [0 = off, 1 = on]
2321	/	Loop 2 adaptive curve [0 = off, 1 = on]
2322	/	Loop 3 adaptive curve [0 = off, 1 = on]
2323	/	Loop 4 adaptive curve [0 = off, 1 = on]
2324	/	Filling the heating system [0 = 0ff, 1 = on]
2325	x 0,1 bar	Setting of the pressure of the heating system
2326	x 0,1 bar	Heating system pressure
2327	%	Current HP load
2329	x 1 W	Current heating/cooling capacity
2330	/	SEC Mono / OUC 1 SW alarm 1
2331	/	SEC Mono / OUC 1 SW alarm 2
2332	/	SEC Mono / OUC 1 HW alarm 1
2333	/	SEC Mono / OUC 1 HW alarm 2
2334	/	SEC Mono / OUC VSS alarm 1
2335	/	SEC Mono / OUC VSS alarm 2
2336	/	SEC Mono / OUC VSS alarm 3
2337	/	SEC Mono / OUC VSS alarm 4
2338	/	SEC Mono / OUC VSS alarm 5
2339	/	Alarms additional
2340	/	Alarms additional
2341	/	Warnings additional
2349	x 1 m^3	Pumped ground water (high)
2350	x 1 m^3	Pumped ground water (low)

MA*	Conversion and units	Description
2360		Cascade status [b0 – cascade 1, b1 – cascade 2, b2 – cascade 3, b3 – cascade 4]
2361	x 1 W	Electrical energy heating mode + DHW (high)
2362	x 1 W	Electrical energy heating mode + DHW (low)
2363	x 1 W	Heating energy heating mode + DHW (high)
2364	x 1 W	Heating energy heating mode + DHW (low)
2371	x 0,01	COP
2372	x 0,01	SCOP

4 DESCRIPTONS OF VARIABLES

The variables below are described in more detail. The structure of the description is as follows:

SYSTEM OPERATION (MA_2000, R)

SYSTEM OPERATION – description:
MA_2000– Modbus address
R – Value type (R – read, RW – read and write)

4.1 STATUS

SYSTEM OPERATION (MA_2000, R)
System operation status:

0	off
1	on

WORKING FUNCTION (MA_2001, R)
The function that is performed:

0	heating
1	DHW
2	cooling
3	pool heating
4	thermal disinfection
5	standby
7	remote deactivation

ADDITIONAL ACTIVATIONS (MA_2002, R)
Status additional source, antifreeze program and PV signal. The data is binary coded.

Label	Bits	Value
2002-b0	0000 0000 0000 0001	1
2002-b1	0000 0000 0000 0010	2
2002-b2	0000 0000 0000 0100	4
2002-b3	0000 0000 0000 1000	8
2002-b4	0000 0000 0001 0000	16
2002-b5	0000 0000 0010 0000	32
2002-b11	0000 1000 0000 0000	2048
2002-b12	0001 0000 0000 0000	4096
2002-b13	0010 0000 0000 0000	8192
2002-b14	0100 0000 0000 0000	16384

2002-b0:	Activation of additional source
2002-b1:	Additional source 2 is active
2002-b2:	Antifreeze program is active
2002-b3:	PV signal is active
2002-b4:	Additional source 1 is active
2002-b5:	Additional source 1 and 2 is active
2002-b11:	Silent mode status
2002-b12:	Boos mode status
2002-b13:	Compressor protection is active
2002-b14:	Compressor startup is active

RESERVE SOURCE (MA_2003, R)
Reserve source status:

0	off
1	on

ALTERNATIVE SOURCE (MA_2004, R)
Alternative source status:

0	off,
1	on.

ERROR/WARNING STATUS (MA_2006, R)
Status:

0	no error,
1	warning
2	error
3	notification

OPERATION REGIME (MA_2007, R)
Operation regime status:

0	cooling
1	heating
2	heating and cooling off

OPERATION PROGRAM (MA_2008, R)
Additional programs status:

0	normal operating
1	general operation in ECO mode
2	general operation in COM mode
4	screed drying program is active

FAST HEATING DHW (MA_2010, R)
Fast heating DHW status:

0	off
1	on

DEFROST (MA_2011, R)
Defrost status:

0	off
1	on

SYSTEM ACTIVATION (MA_2012, RW)
Use this parameter to turn the system on / off (HP and heating loops):

0	off
1	on

CHOICE OF PROGRAM OPERATION (MA_2013, RW)
General operating program switch:

0	normal mode
1	ECO mode
2	COM mode

SYSTEM TEMPERATURE CORRECTION (MA_2014, RW)
Temperature correction of the entire system. +/- 4 °C

ACTIVATION OF FAST HEATING OF DHW (MA_2015, RW)
Activation of fast heating of DHW:

0	off
1	on

ACTIVATION OF ADDITIONAL SOURCE (MA_2016, RW)
Activation of additional source in addition to the heat pump:

0	off
1	on

REGIME SWITCH (MA_2017, RW)
Switch between operation regimes:

1	cooling
2	heating
3	auto regime
4	off mode

Label	Bits	Value
2017-b8	0000 0001 0000 0000	256

2017-b8: On/off function for auto regime switch.

ACTIVATION OF RESERVE SOURCE (MA_2018, RW)
Activation of reserve source – additional source operation instead heat pump:

0	off
1	on

ACTIVATION OF HOLIDAY MODE (MA_2022, RW)
Activation of holiday mode. For activation you need to insert number of days on MA_2139:

0	off
1	on

HOLIDAY MODE - DAYS (MA_2139, RW)
Number of days for holiday mode.

REMOTE ACTIVATION (MA_2197, RW)

0	normal operation
1	remote deactivation.

COMPRESSOR STATUS (MA_2318, R)
Value is binary encrypted.

Label	Bits	Value
MA_2318-b0	0000 0000 0000 0001	1
MA_2318-b1	0000 0000 0000 0010	2

MA_2318-b0 Operating status of 1. compressor
MA_2318-b1 Operating status of 2. compressor

COMPRESSOR STATUS (MA_2319, R)
Value is binary encrypted.

Label	Bits	Value
MA_2319-b0	0000 0000 0000 0001	1
MA_2319-b1	0000 0000 0000 0010	2

MA_2319-b0 Compressor protection status
MA_2319-b1 Compressor start up status

CURRENT HEAT PUMP LOAD (MA_2327, RW)
Current capacity of the heat pump expressed as a percentage of the currently available capacity.

FILLING THE HEATING SYSTEM (MA_2324, RW)
Activation of filling the heating system if the device allows it:

0	off,
1	on.

SETTING OF THE PRESSURE OF THE HEATING SYSTEM (MA_2325, RW)
Setting of the pressure of the heating system for filling. To turn on the filling, the pressure must drop by 0,5 bar.

HEATING SYSTEM PRESSURE (MA_2326, R)
Measured heating system pressure.

SCREED DRYING (MA_2307, RW)
Activation/deactivation of screed drying program.

0	off
1	on

4.2 DOMESTIC HOT WATER

DESIRED DOMESTIC HOT WATER TEMPERATURE (MA_2023, RW)
Display of set DHW temperature.

CURRENT DESIRED DHW TEMPERATURE (MA_2024, R)
Display of the current calculated DHW temperature.
Value 5000 = OFF.

CHOICE OF DHW OPERATION (MA_2026, RW)

0	off
1	normal mode
2	scheduled operation

SCHEDULED DHW OPERATION (MA_2027, R)
Status of DHW operation:

0	off
1	normal
2	ECO
3	COM

CIRCULATION PUMP STATUS (MA_2028, R)
Value is binary encrypted.

Label	Bits	Value
MA_2028-b0	0000 0000 0000 0001	1
MA_2028-b1	0000 0000 0000 0010	2

MA_2028-b0 Circulation pump status
MA_2028-b1 CP for DHW status

DHW ECO MODE OFFSET (MA_2030, RW)
Offset in ECO mode.

DHW COM MODE OFFSET (MA_2031, RW)
Offset in COM mode.

THERMAL DISINFECTION (MA_2301, RW)
Switch on or off thermal disinfection of DHW.

0	off
1	on

THERMAL DISINFECTION – DESIRED TEMPERATURE (MA_2302, RW)
Setting for desired thermal disinfection temperature.

THERMAL DISINFECTION - PERIOD (MA_2303, RW)
Period for thermal disinfection. Insert the number of days.

THERMAL DISINFECTION – START TIME (MA_2304, RW)
Setting the start time for thermal disinfection. Insert the minute of day (value 240 = 4:00).

4.3 BUFFER TANK

BUFFER TANK HEATING CURVE AT -15 °C/+20 °C (MA_2308, RW)
Setting of heating curve at outdoor temperature -15 °C for heating and for cooling at 20 °C.

BUFFER TANK HEATING CURVE AT +15 °C/+40 °C (MA_2313, RW)
Setting of heating curve at outdoor temperature +15 °C for heating and for cooling at 40 °C.

CURRENT DESIRED BUFFER TANK/SYSTEM TEMPERATURE (MA_2034, R)
Current desired buffer tank / whole system temperature.

CHOICE OF BUFFER TANK OPERATION (MA_2035, RW)

0	off
1	normal mode
2	scheduled operation

SCHEDULED BUFFER TANK OPERATION (MA_2037, R)

0	off
1	Normal
2	ECO
3	COM

MAIN CIRCULATION PUMP OPERATION STATUS (MA_2038, R)

0	Off
1	On

REMOTE DEACTIVATION (MA_2039, R)
Status of remote deactivation.

0	off,
1	on.

BUFFER TANK ECO MODE OFFSET (MA_2040, RW)
Offset in ECO mode.

BUFFER TANK COM MODE OFFSET (MA_2041, RW)
Offset in COM mode.

4.4 LOOP 1

LOOP 1 HEATING CURVE AT -15 °C/+20 °C (MA_2309, RW)
Setting of heating curve at outdoor temperature -15 °C for heating and for cooling at 20 °C.

LOOP 1 HEATING CURVE AT +15 °C/+40 °C (MA_2314, RW)
Setting of heating curve at outdoor temperature +15 °C for heating and for cooling at 40 °C.

CURRENT DESIRED LOOP 1 TEMPERATURE (MA_2128, RW)
Display of the current desired loop 1 temperature.

DESIRED ROOM 1 TEMPERATURE (MA_2187, RW)
Setting the room temperature in case of KT-1/2A installed in system.

CURRENT DESIRED ROOM 1 TEMPERATURE (MA_2191, R)
Display of current desired room 1 temperature.

CHOICE OF LOOP 1 OPERATION (MA_2042, RW)

0	off,
1	normal mode,
2	scheduled operation.

LOOP 1 OPERATION STATUS ON SCHEDULE (MA_2044, R)

0	off
1	normal
2	ECO
3	COM

LOOP 1 CIRCULATION PUMP STATUS (MA_2045, R)

0	Off
1	On

LOOP 1 THERMOSTAT AND REGULATION STATUS (MA_2046, R)

Label	Bits	Value
MA_2046-b0	0000 0000 0000 0001	1
MA_2046-b8	0000 0001 0000 0000	2

MA_2046-b0 Thermostat status (0-off, 1-on)
MA_2046-b8 Regulation status (0-constant, 1-weather)

LOOP 1 ECO MODE OFFSET (MA_2047, RW)
Offset in ECO mode.

LOOP 1 COM MODE OFFSET (MA_2048, RW)
Offset in COM mode.

LOOP 1 ADAPTIVE CURVE (MA_2320, RW)

0	off
1	on

4.5 LOOP 2

LOOP 2 HEATING CURVE AT -15 °C/+20 °C (MA_2310, RW)
Setting of heating curve at outdoor temperature -15 °C for heating and for cooling at 20 °C.

LOOP 2 HEATING CURVE AT +15 °C/+40 °C (MA_2315, RW)
Setting of heating curve at outdoor temperature +15 °C for heating and for cooling at 40 °C.

CURRENT DESIRED LOOP 2 TEMPERATURE (MA_2188, R)
Display of the current desired loop 2 temperature.

DESIRED ROOM 2 TEMPERATURE (MA_2049, RW)
Setting the room temperature in case of KT-1/2A installed in system.

CURRENT DESIRED ROOM 2 TEMPERATURE (MA_2051, R)
Display of current desired room 2 temperature in case of KT-1/2A installed in system.

CHOICE OF LOOP 2 OPERATION (MA_2052, RW)

0	off
1	normal mode
2	scheduled operation

LOOP 2 OPERATION STATUS ON SCHEDULE (MA_2054, R)

0	off
1	normal
2	ECO
3	COM

LOOP 2 CIRCULATION PUMP STATUS (MA_2055, R)

0	off
1	on

LOOP 2 THERMOSTAT STATUS (MA_2056, R)

0	Off
1	On

LOOP 2 ECO MODE OFFSET (MA_2057, RW)
Offset in ECO mode.

LOOP 2 COM MODE OFFSET (MA_2058, RW)
Offset in COM mode.

LOOP 2 ADAPTIVE CURVE (MA_2321, RW)

0	off
1	on

4.6 LOOP 3

LOOP 3 HEATING CURVE AT -15 °C/+20 °C (MA_2311, RW)
Setting of heating curve at outdoor temperature -15 °C for heating and for cooling at 20 °C.

LOOP 3 HEATING CURVE AT +15 °C/+40 °C (MA_2316, RW)
Setting of heating curve at outdoor temperature +15 °C for heating and for cooling at 40 °C.

CURRENT DESIRED LOOP 3 TEMPERATURE (MA_2189, R)
Display of the current desired loop 3 temperature.

DESIRED ROOM 3 TEMPERATURE (MA_2059, RW)
Setting the room temperature in case of KT-1/2A installed in system.

CURRENT DESIRED ROOM 3 TEMPERATURE (MA_2061, R)
Display of current desired room 3 temperature in case of KT-1/2A installed in system.

CHOICE OF LOOP 3 OPERATION (MA_2062, RW)

0	off
1	normal mode
2	scheduled operation

LOOP 3 OPERATION STATUS ON SCHEDULE (MA_2064, R)

0	off
1	normal
2	ECO
3	COM

LOOP 3 CIRCULATION PUMP STATUS (MA_2065, R)

0	off
1	on

LOOP 3 THERMOSTAT STATUS (MA_2066, R)

0	Off
1	On

LOOP 3 ECO MODE OFFSET (MA_2067, RW)
Offset in ECO mode.

LOOP 3 COM MODE OFFSET (MA_2068, RW)
Offset in COM mode.

LOOP 3 ADAPTIVE CURVE (MA_2322, RW)

0	off
1	on

4.7 LOOP 4

LOOP 4 HEATING CURVE AT –15 °C/+20 °C (MA_2312, RW)
Setting of heating curve at outdoor temperature -15 °C for heating and for cooling at 20 °C.

LOOP 4 HEATING CURVE AT +15 °C/+40 °C (MA_2317, RW)
Setting of heating curve at outdoor temperature +15 °C for heating and for cooling at 40 °C.

CURRENT DESIRED LOOP 4 TEMPERATURE (MA_2190, R)
Display of the current desired loop 4 temperature.

DESIRED ROOM 4 TEMPERATURE (MA_2069, RW)
Setting the room temperature in case of KT-1/2A installed in system.

CURRENT DESIRED ROOM 4 TEMPERATURE (MA_2071, R)
Display of current desired room 4 temperature in case of KT-1/2A installed in system.

CHOICE OF LOOP 4 OPERATION (MA_2072, RW)

0	Off
1	normal mode
2	scheduled operation

LOOP 4 OPERATION STATUS ON SCHEDULE (MA_2074, R)

0	off
1	normal
2	ECO
3	COM

LOOP 4 CIRCULATION PUMP STATUS (MA_2075, R)

0	Off
1	On

LOOP 4 THERMOSTAT STATUS (MA_2076, R)

0	off
1	on

LOOP 4 ECO MODE OFFSET (MA_2077, RW)
Offset in ECO mode.

LOOP 4 COM MODE OFFSET (MA_2078, RW)
Offset in COM mode.

LOOP 4 ADAPTIVE CURVE (MA_2323, RW)

0	off
1	on

4.8 POOL

DESIRED POOL TEMPERATURE (MA_2079, RW)
Setting of desired pool temperature.

CURRENT DESIRED POOL TEMPERATURE (MA_2080, R)
Display current desired pool temperature.

CHOICE OF POOL OPERATION (MA_2081, RW)

0	off
1	normal mode
2	scheduled operation

POOL OPERATION STATUS ON SCHEDULE (MA_2083, R)

0	off
1	normal
2	ECO
3	COM

POOL CIRCULATION PUMP STATUS (MA_2084, R)

0	off
1	on

POOL THERMOSTAT STATUS (MA_2085, R)

0	off
1	on

POOL ECO MODE OFFSET (MA_2086, RW)
Offset in ECO mode.

POOL COM MODE OFFSET (MA_2087, RW)
Offset in COM mode.

4.9 ALTERNATIVE SOURCE

ALTERNATIVE SOURCE CIRCULATION PUMP STATUS (MA_2088, R)

0	Off
1	On

DESIRED BUFFER TANK TEMPERATURE (MA_2305, RW)
Setting for desired buffer tank temperature with solar/biomass heating.

DESIRED DHW TEMPERATURE (MA_2306, RW)
Setting for desired DHW temperature with solar/biomass heating.

4.10 OPERATING HOURS

MA	Description
2089	Operating hours compressor cooling
2090	Operating hours compressor heating
2091	Operating hours compressor DHW
2092	/
2093	Operating hours main circulation pump
2094	Operating hours DHW circulation pump
2095	Operating hours additional source 1
2096	Operating hours additional source 2
2097	Operating hours alternative source
2098	Operating hours heat source
2099	Operating hours passive

4.11 TEMPERATURES

MA	Description
2101	HP inlet temperature
2102	DHW temperature
2103	Outside temperature
2104	HP outlet temperature
2105	Evaporating temperature
2106	Compressor temperature
2107	Alternative source temperature
2108	/
2109	Pool temperature
2130	Loop 1 temperature
2110	Loop 2 temperature
2111	Loop 3 temperature
2112	Loop 4 temperature
2160	Loop 1 thermostat temperature
2161	Loop 2 thermostat temperature
2162	Loop 3 thermostat temperature
2163	Loop 4 thermostat temperature

4.12 ENERGY

MA	Description
2129	Current power consumption
2329	Current heating/cooling capacity
2349	Pumped ground water (high)
2350	Pumped ground water (low)
2361	Electrical energy - heating + DHW (high)*
2362	Electrical energy - heating + DHW (low)*
2363	Heating energy – heating + DHW (high)*
2364	Heating energy – heating + DHW (low)*
2371	COP
2372	SCOP

* data (32 bit) is divided in two MA (high + low))

4.13 ERRORS

ERROR ACTIVE (MA_2113, RW)

0	no error,
1	error is active,

To confirm/delete error send value 0. If the error can be deleted manually the value remains 0, otherwise the error remain active.

ERROR 1 (MA_2114, R)

Value is binary encrypted.

Label	Bits	Value	Description
b0	0000 0000 0000 0001	1	
b1	0000 0000 0000 0010	2	
b2	0000 0000 0000 0100	4	
b3	0000 0000 0000 1000	8	High pressure
b4	0000 0000 0001 0000	16	
b5	0000 0000 0010 0000	32	
b6	0000 0000 0100 0000	64	
b7	0000 0000 1000 0000	128	Low pressure
b8	0000 0001 0000 0000	256	CP phase control
b9	0000 0010 0000 0000	512	No water flow
b10	0000 0100 0000 0000	1024	
b11	0000 1000 0000 0000	2048	Alarm household water
b12	0001 0000 0000 0000	4096	
b13	0010 0000 0000 0000	8192	
b14	0100 0000 0000 0000	16384	
b15	1000 0000 0000 0000	32768	

ERROR 2 (MA_2115, R)

Label	Bits	Value	Description
b0	0000 0000 0000 0001	1	Failure module 1
b1	0000 0000 0000 0010	2	Failure module 2
b2	0000 0000 0000 0100	4	
b3	0000 0000 0000 1000	8	
b4	0000 0000 0001 0000	16	
b5	0000 0000 0010 0000	32	Communication failure – outdoor unit
b6	0000 0000 0100 0000	64	
b7	0000 0000 1000 0000	128	
b8	0000 0001 0000 0000	256	Max. number of defrosting
b9	0000 0010 0000 0000	512	
b10	0000 0100 0000 0000	1024	Heat source temperature outside the operating range
b11	0000 1000 0000 0000	2048	
b12	0001 0000 0000 0000	4096	Reset of module 1
b13	0010 0000 0000 0000	8192	Reset of module 2
b14	0100 0000 0000 0000	16384	Reset of module 3
b15	1000 0000 0000 0000	32768	Reset of module 4

ERROR (MA_2116, R)

Label	Bits	Value	Description
b0	0000 0000 0000 0001	1	
b1	0000 0000 0000 0010	2	
b2	0000 0000 0000 0100	4	Temp. sensor fault – condenser inlet (T28)
b3	0000 0000 0000 1000	8	Temp. sensor fault – condenser outlet (T27)
b4	0000 0000 0001 0000	16	
b5	0000 0000 0010 0000	32	
b6	0000 0000 0100 0000	64	
b7	0000 0000 1000 0000	128	
b8	0000 0001 0000 0000	256	
b9	0000 0010 0000 0000	512	
b10	0000 0100 0000 0000	1024	
b11	0000 1000 0000 0000	2048	
b12	0001 0000 0000 0000	4096	
b13	0010 0000 0000 0000	8192	
b14	0100 0000 0000 0000	16384	
b15	1000 0000 0000 0000	32768	

WARNING (MA_2117, R)

Label	Bits	Value	Description
b0	0000 0000 0000 0001	1	High pressure - heating
b1	0000 0000 0000 0010	2	High pressure - household water
b2	0000 0000 0000 0100	4	High pressure - cooling
b3	0000 0000 0000 1000	8	High pressure - defrosting
b4	0000 0000 0001 0000	16	Low pressure - heating
b5	0000 0000 0010 0000	32	Low pressure - household water
b6	0000 0000 0100 0000	64	Low pressure - cooling
b7	0000 0000 1000 0000	128	Low pressure - defrosting
b8	0000 0001 0000 0000	256	No flow
b9	0000 0010 0000 0000	512	
b10	0000 0100 0000 0000	1024	Outlet minimum temperature
b11	0000 1000 0000 0000	2048	
b12	0001 0000 0000 0000	4096	Source outlet temperature outside the operating range
b13	0010 0000 0000 0000	8192	Remote deactivation
b14	0100 0000 0000 0000	16384	
b15	1000 0000 0000 0000	32768	Source inlet temperature outside the operating range

ERROR (MA_2118, R)

Label	Bits	Value	Description
b0	0000 0000 0000 0001	1	DC Peak (IPM Fault)
b1	0000 0000 0000 0010	2	Max CT
b2	0000 0000 0000 0100	4	DC Link Voltage is low or high
b3	0000 0000 0000 1000	8	High/Low Pressure switch activated
b4	0000 0000 0001 0000	16	Voltage is too low or too high
b5	0000 0000 0010 0000	32	Problem in DC compressor connections
b6	0000 0000 0100 0000	64	PSC Fault
b7	0000 0000 1000 0000	128	DC Link voltage is high
b8	0000 0001 0000 0000	256	High current in compressor phases
b9	0000 0010 0000 0000	512	Temperature at discharge pipe is too high
b10	0000 0100 0000 0000	1024	Low pressure
b11	0000 1000 0000 0000	2048	Problem in CT sensor
b12	0001 0000 0000 0000	4096	Problem in discharge-pipe temperature sensor
b13	0010 0000 0000 0000	8192	Problem in external temperature sensor
b14	0100 0000 0000 0000	16384	Problem in intermediate evaporator temperature sensor
b15	1000 0000 0000 0000	32768	Problem in suction-pipe temperature sensor

ERROR (MA_2119, R)

Label	Bits	Value	Description
b0	0000 0000 0000 0001	1	Problem in evaporator input sensor
b1	0000 0000 0000 0010	2	Nominal high voltage
b2	0000 0000 0000 0100	4	No communication between inverter PCB and main PCB
b3	0000 0000 0000 1000	8	No communication between inverter PI485 and main PCB
b4	0000 0000 0001 0000	16	Phase sequence incorrect
b5	0000 0000 0010 0000	32	Internal and external unit communication malfunction
b6	0000 0000 0100 0000	64	EEPROM malfunction
b7	0000 0000 1000 0000	128	Too high temperature at condenser input
b8	0000 0001 0000 0000	256	Temperature at discharge pipe is too high
b9	0000 0010 0000 0000	512	Too low evaporation temperature
b10	0000 0100 0000 0000	1024	Problem in discharge-pipe temperature sensor
b11	0000 1000 0000 0000	2048	Fan malfunction
b12	0001 0000 0000 0000	4096	Too high input current
b13	0010 0000 0000 0000	8192	Too high pressure ratio
b14	0100 0000 0000 0000	16384	No model set
b15	1000 0000 0000 0000	32768	Error in the external unit

WARNING (MA_2120, R)

Label	Bits	Value	Description
b0	0000 0000 0000 0001	1	DC Peak (IPM Fault)
b1	0000 0000 0000 0010	2	Max CT
b2	0000 0000 0000 0100	4	DC Link Voltage is low or high
b3	0000 0000 0000 1000	8	High/Low Pressure switch activated
b4	0000 0000 0001 0000	16	Voltage is too low or too high
b5	0000 0000 0010 0000	32	Problem in DC compressor connections
b6	0000 0000 0100 0000	64	PSC Fault
b7	0000 0000 1000 0000	128	DC Link voltage is high
b8	0000 0001 0000 0000	256	High current in compressor phases
b9	0000 0010 0000 0000	512	Temperature at discharge pipe is too high
b10	0000 0100 0000 0000	1024	Low pressure
b11	0000 1000 0000 0000	2048	Problem in CT sensor
b12	0001 0000 0000 0000	4096	Problem in discharge-pipe temperature sensor
b13	0010 0000 0000 0000	8192	Problem in external temperature sensor
b14	0100 0000 0000 0000	16384	Problem in intermediate evaporator temperature sensor
b15	1000 0000 0000 0000	32768	Problem in suction-pipe temperature sensor

WARNING (MA_2121, R)

Label	Bits	Value	Description
b0	0000 0000 0000 0001	1	Problem in evaporator input sensor
b1	0000 0000 0000 0010	2	Nominal high voltage
b2	0000 0000 0000 0100	4	No communication between inverter PCB and main PCB
b3	0000 0000 0000 1000	8	No communication between inverter PI485 and main PCB
b4	0000 0000 0001 0000	16	Phase sequence incorrect
b5	0000 0000 0010 0000	32	Internal and external unit communication malfunction
b6	0000 0000 0100 0000	64	EEPROM malfunction
b7	0000 0000 1000 0000	128	Too high temperature at condenser input
b8	0000 0001 0000 0000	256	Temperature at discharge pipe is too high
b9	0000 0010 0000 0000	512	Too low evaporation temperature
b10	0000 0100 0000 0000	1024	Problem in discharge-pipe temperature sensor
b11	0000 1000 0000 0000	2048	Fan malfunction
b12	0001 0000 0000 0000	4096	Too high input current
b13	0010 0000 0000 0000	8192	Too high pressure ratio
b14	0100 0000 0000 0000	16384	
b15	1000 0000 0000 0000	32768	

WARNING (MA_2124, R)

Label	Bits	Value	Description
b0	0000 0000 0000 0001	1	
b1	0000 0000 0000 0010	2	
b2	0000 0000 0000 0100	4	
b3	0000 0000 0000 1000	8	
b4	0000 0000 0001 0000	16	
b5	0000 0000 0010 0000	32	
b6	0000 0000 0100 0000	64	
b7	0000 0000 1000 0000	128	No response from cascade modules
b8	0000 0001 0000 0000	256	Cascade module 1 has to be inspected
b9	0000 0010 0000 0000	512	Cascade module 2 has to be inspected
b10	0000 0100 0000 0000	1024	Cascade module 3 has to be inspected
b11	0000 1000 0000 0000	2048	Cascade module 4 has to be inspected
b12	0001 0000 0000 0000	4096	
b13	0010 0000 0000 0000	8192	
b14	0100 0000 0000 0000	16384	
b15	1000 0000 0000 0000	32768	

ERROR (MA_2126, R)

Label	Bits	Value	Description
b0	0000 0000 0000 0001	1	
b1	0000 0000 0000 0010	2	Communication failure with cascade module 2
b2	0000 0000 0000 0100	4	Communication failure with cascade module 3
b3	0000 0000 0000 1000	8	Communication failure with cascade module 4
b4	0000 0000 0001 0000	16	
b5	0000 0000 0010 0000	32	
b6	0000 0000 0100 0000	64	
b7	0000 0000 1000 0000	128	
b8	0000 0001 0000 0000	256	Failure on cascade module 1
b9	0000 0010 0000 0000	512	Failure on cascade module 2
b10	0000 0100 0000 0000	1024	Failure on cascade module 3
b11	0000 1000 0000 0000	2048	Failure on cascade module 4
b12	0001 0000 0000 0000	4096	
b13	0010 0000 0000 0000	8192	
b14	0100 0000 0000 0000	16384	
b15	1000 0000 0000 0000	32768	

ERROR (MA_2127, R)

Oznaka	Biti	Vrednost	Opis
b0	0000 0000 0000 0001	1	Pressure. sensor fault - heating source (T31)
b1	0000 0000 0000 0010	2	No flow - heat source
b2	0000 0000 0000 0100	4	No flow - ground water
b3	0000 0000 0000 1000	8	
b4	0000 0000 0001 0000	16	
b5	0000 0000 0010 0000	32	
b6	0000 0000 0100 0000	64	
b7	0000 0000 1000 0000	128	
b8	0000 0001 0000 0000	256	
b9	0000 0010 0000 0000	512	
b10	0000 0100 0000 0000	1024	
b11	0000 1000 0000 0000	2048	
b12	0001 0000 0000 0000	4096	
b13	0010 0000 0000 0000	8192	
b14	0100 0000 0000 0000	16384	
b15	1000 0000 0000 0000	32768	

ERROR (MA_2186, R)

Label	Bits	Value	Description
b0	0000 0000 0000 0001	1	Heating loop thermostat failure 1
b1	0000 0000 0000 0010	2	Heating loop thermostat failure 2
b2	0000 0000 0000 0100	4	Heating loop thermostat failure 3
b3	0000 0000 0000 1000	8	Heating loop thermostat failure 4
b4	0000 0000 0001 0000	16	
b5	0000 0000 0010 0000	32	
b6	0000 0000 0100 0000	64	
b7	0000 0000 1000 0000	128	
b8	0000 0001 0000 0000	256	
b9	0000 0010 0000 0000	512	
b10	0000 0100 0000 0000	1024	
b11	0000 1000 0000 0000	2048	
b12	0001 0000 0000 0000	4096	
b13	0010 0000 0000 0000	8192	
b14	0100 0000 0000 0000	16384	
b15	1000 0000 0000 0000	32768	

WARNING (MA_2330, R)

Label	Bits	Value	Description
b0	0000 0000 0000 0001	1	Low pressure
b1	0000 0000 0000 0010	2	Low superheat
b2	0000 0000 0000 0100	4	High superheat
b3	0000 0000 0000 1000	8	
b4	0000 0000 0001 0000	16	EVI high superheat
b5	0000 0000 0010 0000	32	Refrigerant loss
b6	0000 0000 0100 0000	64	High cond. Pressure
b7	0000 0000 1000 0000	128	Envelope Tc low
b8	0000 0001 0000 0000	256	Envelope Tc high
b9	0000 0010 0000 0000	512	Envelope Te low
b10	0000 0100 0000 0000	1024	Envelope Te high
b11	0000 1000 0000 0000	2048	Freeze alarm
b12	0001 0000 0000 0000	4096	Envelope alarm
b13	0010 0000 0000 0000	8192	Defrost term. By time
b14	0100 0000 0000 0000	16384	MCU Arithmetic error
b15	1000 0000 0000 0000	32768	High discharge temperature

ERROR (MA_2331, R)

Label	Bits	Value	Description
b0	0000 0000 0000 0001	1	4-way valve
b1	0000 0000 0000 0010	2	High disharge zone (warning)
b2	0000 0000 0000 0100	4	
b3	0000 0000 0000 1000	8	
b4	0000 0000 0001 0000	16	
b5	0000 0000 0010 0000	32	
b6	0000 0000 0100 0000	64	
b7	0000 0000 1000 0000	128	
b8	0000 0001 0000 0000	256	
b9	0000 0010 0000 0000	512	
b10	0000 0100 0000 0000	1024	
b11	0000 1000 0000 0000	2048	
b12	0001 0000 0000 0000	4096	
b13	0010 0000 0000 0000	8192	
b14	0100 0000 0000 0000	16384	
b15	1000 0000 0000 0000	32768	

ERROR (MA_2332, R)

Label	Bits	Value	Description
b0	0000 0000 0000 0001	1	Main valve (EEV)
b1	0000 0000 0000 0010	2	Valve 2 (EEV 2)
b2	0000 0000 0000 0100	4	Stator heater feedback
b3	0000 0000 0000 1000	8	Pressure. sensor fault - low pressure (T23)
b4	0000 0000 0001 0000	16	Pressure. sensor fault - high pressure (T22)
b5	0000 0000 0010 0000	32	Drive speed feedback
b6	0000 0000 0100 0000	64	Temp. sensor fault - suction pipe compressor (T19) / liquid pipe - heating (T20) *
b7	0000 0000 1000 0000	128	Temp. sensor fault - liquid pipe - heating (T20) / outdoor, heat pump (T17) *
b8	0000 0001 0000 0000	256	Temp. sensor fault - discharge (T18) / suction evaporator (T33) *
b9	0000 0010 0000 0000	512	Temp. sensor fault - liquid pipe - cooling (T21) / suction pipe compressor (T19) *
b10	0000 0100 0000 0000	1024	Temp. sensor fault - inlet HP (T16) / Temp. sensor fault - discharge condenser (T34) *
b11	0000 1000 0000 0000	2048	Temp. sensor fault - outdoor, heat pump (T17) / inlet HP (T16) *
b12	0001 0000 0000 0000	4096	Temp. sensor fault - outlet HP (T15)
b13	0010 0000 0000 0000	8192	/ Temp. sensor fault - discharge (T18) *
b14	0100 0000 0000 0000	16384	VSS communication
b15	1000 0000 0000 0000	32768	

*

ERROR (MA_2333, R)

Label	Bits	Value	Description
b0	0000 0000 0000 0001	1	High pressure switch
b1	0000 0000 0000 0010	2	VSS locked
b2	0000 0000 0000 0100	4	EEPROM failure
b3	0000 0000 0000 1000	8	Communication timeout to system controller
b4	0000 0000 0001 0000	16	Compressor alarm (VSS1...VSS5)
b5	0000 0000 0010 0000	32	Drive configuration alarm
b6	0000 0000 0100 0000	64	SEC / OUC compressor package configuration alarm
b7	0000 0000 1000 0000	128	
b8	0000 0001 0000 0000	256	
b9	0000 0010 0000 0000	512	
b10	0000 0100 0000 0000	1024	
b11	0000 1000 0000 0000	2048	
b12	0001 0000 0000 0000	4096	
b13	0010 0000 0000 0000	8192	
b14	0100 0000 0000 0000	16384	
b15	1000 0000 0000 0000	32768	

ERROR (MA_2334, R)

Label	Bits	Value	Description
b0	0000 0000 0000 0001	1	Compressor U current sensor fault
b1	0000 0000 0000 0010	2	Compressor V current sensor fault
b2	0000 0000 0000 0100	4	Compressor W current sensor fault
b3	0000 0000 0000 1000	8	PFC current sensor fault
b4	0000 0000 0001 0000	16	IPM temperature sensor fault
b5	0000 0000 0010 0000	32	PFC temperature sensor fault
b6	0000 0000 0100 0000	64	DLT sensor fault
b7	0000 0000 1000 0000	128	
b8	0000 0001 0000 0000	256	
b9	0000 0010 0000 0000	512	
b10	0000 0100 0000 0000	1024	
b11	0000 1000 0000 0000	2048	
b12	0001 0000 0000 0000	4096	
b13	0010 0000 0000 0000	8192	
b14	0100 0000 0000 0000	16384	
b15	1000 0000 0000 0000	32768	

ERROR (MA_2335, R)

Label	Bits	Value	Description
b0	0000 0000 0000 0001	1	Communication lost fault
b1	0000 0000 0000 0010	2	EEPROM failure
b2	0000 0000 0000 0100	4	AC over current fault
b3	0000 0000 0000 1000	8	AC over voltage fault
b4	0000 0000 0001 0000	16	AC under voltage fault
b5	0000 0000 0010 0000	32	DC over voltage fault
b6	0000 0000 0100 0000	64	DC under voltage fault
b7	0000 0000 1000 0000	128	High pressure fault
b8	0000 0001 0000 0000	256	Input loss of phase fault
b9	0000 0010 0000 0000	512	IPM over heat fault
b10	0000 0100 0000 0000	1024	IGBT over heat fault
b11	0000 1000 0000 0000	2048	Compressor code fault
b12	0001 0000 0000 0000	4096	
b13	0010 0000 0000 0000	8192	
b14	0100 0000 0000 0000	16384	
b15	1000 0000 0000 0000	32768	

ERROR (MA_2336, R)

Label	Bits	Value	Description
b0	0000 0000 0000 0001	1	Compressor HW over current
b1	0000 0000 0000 0010	2	Compressor U phase over current
b2	0000 0000 0000 0100	4	Compressor V phase over current
b3	0000 0000 0000 1000	8	Compressor W phase over current
b4	0000 0000 0001 0000	16	Compressor loss of phase
b5	0000 0000 0010 0000	32	Compressor lost rotor
b6	0000 0000 0100 0000	64	Compressor startup failure
b7	0000 0000 1000 0000	128	
b8	0000 0001 0000 0000	256	Compressor over load
b9	0000 0010 0000 0000	512	Compressor DLT over temperature
b10	0000 0100 0000 0000	1024	
b11	0000 1000 0000 0000	2048	Compressor IPM desat. Protection
b12	0001 0000 0000 0000	4096	Compressor lost rotor 2
b13	0010 0000 0000 0000	8192	Compressor lost rotor 3
b14	0100 0000 0000 0000	16384	
b15	1000 0000 0000 0000	32768	

ERROR (MA_2337, R)

Label	Bits	Value	Description
b0	0000 0000 0000 0001	1	PFC HW over current
b1	0000 0000 0000 0010	2	PFC SW over current
b2	0000 0000 0000 0100	4	PFC over voltage
b3	0000 0000 0000 1000	8	
b4	0000 0000 0001 0000	16	
b5	0000 0000 0010 0000	32	
b6	0000 0000 0100 0000	64	
b7	0000 0000 1000 0000	128	
b8	0000 0001 0000 0000	256	
b9	0000 0010 0000 0000	512	
b10	0000 0100 0000 0000	1024	
b11	0000 1000 0000 0000	2048	
b12	0001 0000 0000 0000	4096	
b13	0010 0000 0000 0000	8192	
b14	0100 0000 0000 0000	16384	
b15	1000 0000 0000 0000	32768	

ERROR (MA_2338, R)

Label	Bits	Value	Description
b0	0000 0000 0000 0001	1	
b1	0000 0000 0000 0010	2	
b2	0000 0000 0000 0100	4	
b3	0000 0000 0000 1000	8	
b4	0000 0000 0001 0000	16	
b5	0000 0000 0010 0000	32	
b6	0000 0000 0100 0000	64	A/D fault
b7	0000 0000 1000 0000	128	
b8	0000 0001 0000 0000	256	
b9	0000 0010 0000 0000	512	
b10	0000 0100 0000 0000	1024	Wrong addressing
b11	0000 1000 0000 0000	2048	
b12	0001 0000 0000 0000	4096	
b13	0010 0000 0000 0000	8192	
b14	0100 0000 0000 0000	16384	
b15	1000 0000 0000 0000	32768	

ERROR (MA_2339, R)

Label	Bits	Value	Description
b0	0000 0000 0000 0001	1	Temp. sensor fault - DHW (T1)
b1	0000 0000 0000 0010	2	Temp. sensor fault - outdoor heating system (T2)
b2	0000 0000 0000 0100	4	Temp. sensor fault - 1. loop (T3)
b3	0000 0000 0000 1000	8	Temp. sensor fault - 2. loop (T4)
b4	0000 0000 0001 0000	16	Temp. sensor fault - 3. loop (T5)
b5	0000 0000 0010 0000	32	Temp. sensor fault - 4. loop (T6)
b6	0000 0000 0100 0000	64	Temp. sensor fault - pool (T7)
b7	0000 0000 1000 0000	128	Temp. sensor fault - solar/biomass (T8)
b8	0000 0001 0000 0000	256	Temp. sensor fault - buffer tank 1 (T9)
b9	0000 0010 0000 0000	512	Temp. sensor fault - buffer tank 2 (T10)
b10	0000 0100 0000 0000	1024	Temp. sensor fault - source inlet (T11)
b11	0000 1000 0000 0000	2048	Temp. sensor fault - source outlet (T12)
b12	0001 0000 0000 0000	4096	Temp. sensor fault - outlet HP (T15)
b13	0010 0000 0000 0000	8192	Temp. sensor fault - inlet HP (T16)
b14	0100 0000 0000 0000	16384	Temp. sensor fault - outlet after electrical heater (T13)
b15	1000 0000 0000 0000	32768	Temp. sensor fault - inlet indoor unit (T14)

ERROR (MA_2340, R)

Label	Bits	Value	Description
b0	0000 0000 0000 0001	1	Temp. sensor fault - outdoor, heat pump (T17)
b1	0000 0000 0000 0010	2	Temp. sensor fault - discharge (T18)
b2	0000 0000 0000 0100	4	Temp. sensor fault - suction pipe compressor (T19)
b3	0000 0000 0000 1000	8	Temp. sensor fault - liquid pipe - heating (T20)
b4	0000 0000 0001 0000	16	Temp. sensor fault - liquid pipe - cooling (T21)
b5	0000 0000 0010 0000	32	Pressure. sensor fault - high pressure (T22)
b6	0000 0000 0100 0000	64	Pressure. sensor fault - low pressure (T23)
b7	0000 0000 1000 0000	128	Pressure. sensor fault - heating system (T25)
b8	0000 0001 0000 0000	256	Flow sensor fault - heating system (T26)
b9	0000 0010 0000 0000	512	SD card fault
b10	0000 0100 0000 0000	1024	4-way valve x times/day
b11	0000 1000 0000 0000	2048	Low superheat x times/day
b12	0001 0000 0000 0000	4096	High superheat x times/day
b13	0010 0000 0000 0000	8192	Envelope Tc high x times/day
b14	0100 0000 0000 0000	16384	Envelope Te low x times/day
b15	1000 0000 0000 0000	32768	

WARNING (MA_2341, R)

Label	Bits	Value	Description
b0	0000 0000 0000 0001	1	High condensing temp. - heating
b1	0000 0000 0000 0010	2	High condensing temp. - DHW
b2	0000 0000 0000 0100	4	High condensing temp. - cooling
b3	0000 0000 0000 1000	8	High condensing temp. - defrosting
b4	0000 0000 0001 0000	16	Low pressure - heating system
b5	0000 0000 0010 0000	32	Heating out of range
b6	0000 0000 0100 0000	64	Cooling out of range
b7	0000 0000 1000 0000	128	Low pressure - heat source
b8	0000 0001 0000 0000	256	No flow - heat source
b9	0000 0010 0000 0000	512	No flow - ground water
b10	0000 0100 0000 0000	1024	
b11	0000 1000 0000 0000	2048	
b12	0001 0000 0000 0000	4096	
b13	0010 0000 0000 0000	8192	
b14	0100 0000 0000 0000	16384	
b15	1000 0000 0000 0000	32768	

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