User Guide

Modbus protocol for Genesis platform
Version 10.0

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

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

3   Address list

3.1   Read/Write Digital Registers

Mega	Diplomat Inverter	Address	De Facto Address	Scale	Description
COIL STATUS Function 1, 5 (5=write)					
X	X	3	4	1	Reset all alarms
	X	4	5	1	Enable internal additional heater
X	X	5	6	1	Enable external additional heater
	X	6	7	1	Enable HGW
X	X	7	8	1	Enable flow switch/pressure switch
X	X	8	9	1	Enable tap water
X	X	9	10	1	Enable heat
X	X	10	11	1	Enable active cooling
X	X	11	12	1	Enable mix valve 1
X	X	12	13	1	Enable TWC
X		13	14	1	Enable WCS
X		14	15	1	Enable hot gas pump
X	X	16	17	1	Enable mix valve 2 (EM)
X	X	17	18	1	Enable mix valve 3 (EM)
X	X	18	19	1	Enable mix valve 4 (EM)
X	X	19	20	1	Enable mix valve 5 (EM)
X	X	20	21	1	Enable brine out monitoring
X	X	21	22	1	Enable brine pump continuous operation
X	X	22	23	1	Enable system circulation pump
X		23	24	1	Enable dew point calculation
	X	24	25	1	Enable anti legionella
X	X	25	26	1	Enable additional heater only (No compressor). Requires Operation mode: Standby
	X	26	27	1	Enable current limitation
X	X	28	29	1	Enable pool (EM)
X		29	30	1	Enable surplus heat, chiller (no borehole)
X		30	31	1	Enable surplus heat, borehole (no chiller)
X	X	31	32	1	Enable external additional heater for pool (EM)
	X	32	33	1	Enable internal additional heater for pool (EM)
X	X	33	34	1	Enable passive cooling (EM)
X	X	34	35	1	Enable variable speed mode for condenser pump
X	X	35	36	1	Enable variable speed mode for brine pump
X	X	36	37	1	Enable cooling mode for mixing valve 1
X	X	37	38	1	Enable outdoor temp dependent for cooling with mixing valve 1
X	X	38	39	1	Enable internal brine pump to start when cooling is active for mixing valve 1
X	X	39	40	1	Enable outdoor temp dependent for external heater
X	X	40	41	1	Enable brine in monitoring
X	X	41	42	1	Enable fixed system supply set point, allows defacto address 40117
X	X	42	43	1	Enable evaporator freeze protection
X		43	44	1	Enable outdoor temp dependent for cooling with mixing valve 2 (EM3 only)*5

COIL STATUS Function 1, 5 (5=write)					
Mega	Diplomat Inverter	Address	De Facto Address	Scale	Description
X		44	45	1	Enable dew point calculation on mixing valve 2, requires room sensor for mixing valve 2 (EM3 only)
X		45	46	1	Enable outdoor temp dependent for heating with mixing valve 2 (EM3 only)*5
X		46	47	1	Enable outdoor temp dependent for cooling with mixing valve 3 (EM3 only)*5
X		47	48	1	Enable dew point calculation on mixing valve 3, requires room sensor for mixing valve 3 (EM3 only)
X		48	49	1	Enable outdoor temp dependent for heating with mixing valve 3 (EM3 only)*5
X		49	50	1	Enable outdoor temp dependent for cooling with mixing valve 4 (EM3 only)*5
X		50	51	1	Enable dew point calculation on mixing valve 4, requires room sensor for mixing valve 4 (EM3 only)
X		51	52	1	Enable outdoor temp dependent for heating with mixing valve 4 (EM3 only)*5
X		52	53	1	Enable outdoor temp dependent for cooling with mixing valve 5 (EM3 only)*5
X		53	54	1	Enable dew point calculation on mixing valve 5, requires room sensor for mixing valve 5 (EM3 only)
X		54	55	1	Enable outdoor temp dependent for heating with mixing valve 5 (EM3 only)*5
X		55	56	1	Enable internal brine pump to start when cooling is active for mixing valve 2 (EM3 only)
X		56	57	1	Enable internal brine pump to start when cooling is active for mixing valve 3 (EM3 only)
X		57	58	1	Enable internal brine pump to start when cooling is active for mixing valve 4 (EM3 only)
X		58	59	1	Enable internal brine pump to start when cooling is active for mixing valve 5 (EM3 only)

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

3.2   Read Digital Registers

INPUT STATUS Function 2					
Mega	Diplomat Inverter	Address	De Facto Address	Scale	Description
X	X	0	10001	1	Alarm active, Class: A
X	X	1	10002	1	Alarm active, Class: B
X	X	2	10003	1	Alarm active, Class: C
X		3	10004	1	Alarm active, Class: D - Genesis secondary
X		4	10005	1	Alarm active, Class: E - Legacy secondary
X	X	9	10010	1	High pressure switch alarm
X	X	10	10011	1	Low pressure level alarm
X	X	11	10012	1	High discharge pipe temperature alarm
X	X	12	10013	1	Operating pressure limit indication
X	X	13	10014	1	Discharge pipe sensor alarm
X	X	14	10015	1	Liquid line sensor alarm
X	X	15	10016	1	Suction gas sensor alarm
X	X	16	10017	1	Flow/pressure switch alarm

INPUT STATUS Function 2					
Mega	Diplomat Inverter	Address	De Facto Address	Scale	Description
X	X	22	10023	1	Power input phase detection alarm
X	X	23	10024	1	Inverter unit alarm
X	X	24	10025	1	System supply low temperature alarm
X	X	25	10026	1	Compressor low speed alarm
X	X	26	10027	1	Low super heat alarm
X	X	27	10028	1	Pressure ratio out of range alarm
X	X	28	10029	1	Compressor pressure outside envelope alarm
X	X	29	10030	1	Brine temperature out of range alarm
X	X	30	10031	1	Brine in sensor alarm
X	X	31	10032	1	Brine out sensor alarm
X	X	32	10033	1	Condenser in sensor alarm
X	X	33	10034	1	Condenser out sensor alarm
X	X	34	10035	1	Outdoor sensor alarm
X	X	35	10036	1	System supply line sensor alarm
X	X	36	10037	1	Mix valve 1 supply line sensor alarm
X	X	37	10038	1	Mix valve 2 supply line sensor alarm (EM)
X	X	38	10039	1	Mix valve 3 supply line sensor alarm (EM)
X	X	39	10040	1	Mix valve 4 supply line sensor alarm (EM)
X	X	40	10041	1	Mix valve 5 supply line sensor alarm (EM)
X		44	10045	1	WCS return line sensor alarm (EM)
X	X	45	10046	1	TWC supply line sensor alarm (EM)
X		46	10047	1	Cooling tank sensor alarm (EM)
X	X	47	10048	1	Cooling supply line sensor alarm (EM)
X		48	10049	1	Cooling circuit return line sensor alarm (EM)
X	X	49	10050	1	Brine delta out of range alarm
X	X	50	10051	1	Tap water mid sensor alarm
X	X	51	10052	1	TWC circulation return sensor alarm (EM)
	X	52	10053	1	HGW sensor alarm
	X	53	10054	1	Internal additional heater alarm
X	X	55	10056	1	Brine in high temperature alarm
X	X	56	10057	1	Brine in low temperature alarm
X	X	57	10058	1	Brine out low temperature alarm
X	X	58	10059	1	TWC circulation return low temperature alarm (EM)
X	X	59	10060	1	TWC supply low temperature alarm (EM)
X	X	60	10061	1	Mix valve 1 supply temperature deviation alarm
X	X	61	10062	1	Mix valve 2 supply temperature deviation alarm (EM)
X	X	62	10063	1	Mix valve 3 supply temperature deviation alarm (EM)
X	X	63	10064	1	Mix valve 4 supply temperature deviation alarm (EM)
X	X	64	10065	1	Mix valve 5 supply temperature deviation alarm (EM)
X		65	10066	1	WCS return line temperature deviation alarm (EM)
X	X	66	10067	1	Sum alarm
X		67	10068	1	Cooling circuit supply line temperature deviation alarm (EM)
X		68	10069	1	Cooling tank temperature deviation alarm (EM)
X		69	10070	1	Surplus heat temperature deviation alarm (EM)
X		70	10071	1	Humidity room sensor alarm

INPUT STATUS Function 2					
Mega	Diplomat Inverter	Address	De Facto Address	Scale	Description
X		71	10072	1	Surplus heat supply line sensor alarm (EM)
X		72	10073	1	Surplus heat return line sensor alarm (EM)
X		73	10074	1	Cooling tank return line sensor alarm (EM)
X	X	74	10075	1	Temperature room sensor alarm
X	X	75	10076	1	Inverter unit communication alarm
X	X	76	10077	1	Pool return line sensor alarm
X	X	77	10078	1	External stop for pool, read only
X	X	78	10079	1	External start brine pump, read only
X		79	10080	1	External relay for brine/ground water pump.
X	X	81	10082	1	Tap water end tank sensor alarm
	X	82	10083	1	Maximum time for anti-legionella exceeded alarm
X		83	10084	1	Genesis secondary unit alarm - this specific secondary unit can't communicate with its primary unit
X		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.
X		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.
X		86	10087	1	Oil boost in progress
X	X	199	10200	1	Compressor control signal
X	X	201	10202	1	Smart Grid 1, EVU input
X	X	202	10203	1	External alarm input
X	X	204	10205	1	Smart Grid 2
X	X	206	10207	1	External additional heater control signal
X	X	209	10210	1	Mix valve 1 circulation pump control signal
X	X	210	10211	1	Condenser pump On/off control
X	X	211	10212	1	System circulation pump control signal
X		213	10214	1	Hot gas circulation pump control signal
X	X	218	10219	1	Brine pump On/off control
X	X	219	10220	1	External heater circulation pump control signal
X	X	220	10221	1	Heating season (winter) active
X	X	221	10222	1	External additional heater active
	X	222	10223	1	Internal additional heater active
	X	223	10224	1	HGW regulation control signal
X	X	224	10225	1	Heat pump stopping
X	X	225	10226	1	Heat pump OK to start
X	X	230	10231	1	TWC supply line circulation pump control signal (EM)
X		232	10233	1	WCS regulation control signal (EM)
X		233	10234	1	WCS circulation pump control signal (EM)
X	X	234	10235	1	TWC end tank heater control signal (EM)
X	X	235	10236	1	Pool directional valve position (EM)
X		236	10237	1	Cooling circuit circulation pump control signal (EM)
X	X	237	10238	1	Pool circulation pump control signal (EM)
X		238	10239	1	Surplus heat directional valve position (EM)
X		239	10240	1	Surplus heat circulation pump control signal (EM)

INPUT STATUS Function 2					
Mega	Diplomat Inverter	Address	De Facto Address	Scale	Description
X		240	10241	1	Cooling circuit regulation control signal (EM)
X		241	10242	1	Surplus heat regulation control signal (EM)
X		242	10243	1	Active cooling directional valve position (Borehole disconnected) (EM)
X		243	10244	1	Passive/Active cooling directional valve position (Cooling tank connected) (EM)
X	X	244	10245	1	Pool regulation control signal (EM)
X	X	245	10246	1	Indication when mixing valve 1 is producing passive cooling
X	X	246	10247	1	Compressor is unable to speed up

3.3   Read Analog Registers

INPUT REGISTERS Function 4					
Mega	Diplomat Inverter	Address	De Facto Address	Scale	Description
X	X	1	30002	1	Currently running: First prioritised demand *1
X	X	4	30005	100	Compressor available gears *3
X	X	5	30006	1	Compressor speed RPM
X	X	6	30007	100	External additional heater: Current demand (%)
X	X	7	30008	100	Discharge pipe temperature
X	X	8	30009	100	Condenser in temperature
X	X	9	30010	100	Condenser out temperature
X	X	10	30011	100	Brine in temperature
X	X	11	30012	100	Brine out temperature
X	X	12	30013	100	System supply line temperature
X	X	13	30014	100	Outdoor temperature
X	X	15	30016	100	Tap water top temperature
X	X	16	30017	100	Tap water lower temperature
X	X	17	30018	100	Tap water weighted temperature
X	X	18	30019	100	System supply line calculated set point
X	X	19	30020	100	Selected heat curve, (system) supply line
X	X	20	30021	100	Heat curve, X-coordinate 1 (highest outdoor temperature)
X	X	21	30022	100	Heat curve, X-coordinate 2
X	X	22	30023	100	Heat curve, X-coordinate 3
X	X	23	30024	100	Heat curve, X-coordinate 4
X	X	24	30025	100	Heat curve, X-coordinate 5
X	X	25	30026	100	Heat curve, X-coordinate 6
X	X	26	30027	100	Heat curve, X-coordinate 7 (lowest outdoor temperature)
X	X	36	30037	1	Cooling season integral value
X	X	39	30040	100	Condenser circulation pump speed (%)
X	X	40	30041	100	Mix valve 1 supply line temperature
X	X	41	30042	100	Buffer tank temperature
X	X	43	30044	100	Mix valve 1 position
X	X	44	30045	100	Brine circulation pump speed (%)
	X	45	30046	100	HGW supply line temperature
X		47	30048	1	Hot water directional valve position (%)

INPUT REGISTERS Function 4					
Mega	Diplomat Inverter	Address	De Facto Address	Scale	Description
X	X	48	30049	1	Compressor operating hours (MSB)
X	X	49	30050	1	Compressor operating hours (LSB)
X	X	50	30051	1	Tap water operating hours (MSB)
X	X	51	30052	1	Tap water operating hours (LSB)
X	X	52	30053	1	External additional heater operating hours (MSB)
X	X	53	30054	1	External additional heater operating hours (LSB)
X	X	54	30055	100	Compressor speed percent
X	X	55	30056	1	Currently running: Second prioritised demand *1
X	X	56	30057	1	Currently running: Third prioritised demand *1
X	X	57	30058	1	Software version: Major
X	X	58	30059	1	Software version: Minor
X	X	59	30060	1	Software version: Micro
X	X	60	30061	1	Compressor temporarily blocked, (start restriction timer)
X	X	61	30062	100	Compressor current gear
X	X	62	30063	1	Queued demand, first priority *1
X	X	63	30064	1	Queued demand, second priority *1
X	X	64	30065	1	Queued demand, third priority *1
X	X	65	30066	1	Queued demand, fourth priority *1
X	X	66	30067	1	Queued demand, fifth priority *1
	X	67	30068	1	Internal additional heater current step
X	X	68	30069	100	Buffer tank charge set point
	X	69	30070	100	Electric meter L1 current (A)
	X	70	30071	100	Electric meter L2 current (A)
	X	71	30072	100	Electric meter L3 current (A)
	X	72	30073	100	Electric meter L1-0 voltage (V)
	X	73	30074	100	Electric meter L2-0 voltage (V)
	X	74	30075	100	Electric meter L3-0 voltage (V)
	X	75	30076	10	Electric meter L1-L2 voltage (V)
	X	76	30077	10	Electric meter L2-L3 voltage (V)
	X	77	30078	10	Electric meter L3-L1 voltage (V)
	X	78	30079	1	Electric meter L1 power (W)
	X	79	30080	1	Electric meter L2 power (W)
	X	80	30081	1	Electric meter L3 power (W)
	X	81	30082	1	Electric meter - meter value (kWh)
X	X	82	30083	1	Comfort mode *4
	X	83	30084	10	Electric meter kWh total (LSB)
	X	84	30085	10	Electric meter kWh total (MSB)
X		85	30086	100	WCS valve position (EM)
X	X	86	30087	100	TWC valve position (EM)
X	X	87	30088	100	Mix valve 2 position (EM)
X	X	88	30089	100	Mix valve 3 position (EM)
X	X	89	30090	100	Mix valve 4 position (EM)
X	X	90	30091	100	Mix valve 5 position (EM)
X		91	30092	100	Dew point room (EM)
X		92	30093	100	Cooling supply line mix valve position (EM)
X		93	30094	100	Surplus heat fan speed (EM)
X	X	94	30095	100	Pool supply line mix valve position (EM)

INPUT REGISTERS Function 4					
Mega	Diplomat Inverter	Address	De Facto Address	Scale	Description
X	X	95	30096	100	TWC supply line temperature (EM)
X	X	96	30097	100	TWC return temperature (EM)
X		97	30098	100	WCS return line temperature (EM)
X	X	98	30099	100	TWC end tank temperature (EM)
X	X	99	30100	100	Mix valve 2 supply line temperature (EM)
X	X	100	30101	100	Mix valve 3 supply line temperature (EM)
X	X	101	30102	100	Mix valve 4 supply line temperature (EM)
X		103	30104	100	Cooling circuit return line temperature (EM)
X		104	30105	100	Cooling tank temperature (EM)
X		105	30106	100	Cooling tank return line temperature (EM)
X		106	30107	100	Cooling circuit supply line temperature (EM)
X	X	107	30108	100	Mix valve 5 supply line temperature (EM)
X	X	109	30110	100	Mix valve 2 return line temperature (EM)
X	X	111	30112	100	Mix valve 3 return line temperature (EM)
X	X	113	30114	100	Mix valve 4 return line temperature (EM)
X	X	115	30116	100	Mix valve 5 return line temperature (EM)
X		117	30118	100	Surplus heat return line temperature (EM)
X		118	30119	100	Surplus heat supply line temperature (EM)
X	X	119	30120	100	Pool supply line temperature (EM)
X	X	120	30121	100	Pool return line temperature (EM)
X	X	121	30122	10	Room temperature sensor
X	X	122	30123	100	Bubble point, high pressure temperature
X	X	123	30124	100	Dew point, high pressure temperature
X	X	124	30125	100	Dew point, low pressure temperature
X	X	125	30126	100	Superheat temperature
X	X	126	30127	100	Sub cooling temperature
X	X	127	30128	100	Low pressure side, pressure (bar(g))
X	X	128	30129	100	High pressure side, pressure (bar(g))
X	X	129	30130	100	Liquid line temperature
X	X	130	30131	100	Suction gas temperature
X	X	131	30132	1	Heating season integral value
X	X	132	30133	100	P - value for gear shifting and demand calculation
X	X	133	30134	100	I - value for gear shifting and demand calculation
X	X	134	30135	100	D - value for gear shifting and demand calculation
X	X	135	30136	100	I - value for compressor ON/OFF (Buffer tank)
X	X	136	30137	100	P - value for compressor ON/OFF (Buffer tank)
X	X	137	30138	1	Mix valve cooling opening degree (EM2/3)
X	X	139	30140	1	Desired gear for tap water
X	X	140	30141	1	Desired gear for heating
X	X	141	30142	1	Desired gear for cooling
X	X	142	30143	1	Desired gear for pool
X		143	30144	1	Number of available secondaries Genesis
X		144	30145	1	Number of available secondaries Legacy
X	X	145	30146	1	Total distributed gears to all units
X	X	146	30147	1	Maximum gear out of all the currently requested gears
X	X	147	30148	100	Desired temperature distribution circuit Mix valve 1
X	X	148	30149	100	Desired temperature distribution circuit Mix valve 2

INPUT REGISTERS Function 4					
Mega	Diplomat Inverter	Address	De Facto Address	Scale	Description
X	X	149	30150	100	Desired temperature distribution circuit Mix valve 3
X	X	150	30151	100	Desired temperature distribution circuit Mix valve 4
X	X	151	30152	100	Desired temperature distribution circuit Mix valve 5
X		152	30153	1	Disconnect hot gas end tank, 0 = connected, 1 = disconnected
X		153	30154	1	Legacy heat pump compressor running (bit field)
X		154	30155	1	Legacy heat pump reporting alarm (bit field)
X		155	30156	1	Legacy heat pump start signal (bit field)
X		156	30157	1	Legacy heat pump tap water signal (bit field)
X		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.
X		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.
X		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.
X		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.
X		170	30171	1	Primary unit alarm - the combined output of all Class E alarms. This signal is a bit field, one bit for each legacy secondary heat pump unit.
X		171	30172	1	Primary unit alarm - general legacy heat pump alarm. This signal is a bit field, one bit for each legacy secondary heat pump unit. Detects if the sum alarm of the secondary unit is active.
X		173	30174	1	Primary unit alarm - the primary unit can not communicate with the corresponding expansion card for the legacy heat pump. This signal is a bit field, one bit for each legacy secondary heat pump unit.

3.4   Read/Write Analog Registers

Function 3, 6 (6=write)					
Mega	Diplomat Inverter	Address	De Facto Address	Scale	Description
X	X	0	40001	1	Operational mode *2
X	X	3	40004	100	Max limitation, set point curve radiator
X	X	4	40005	100	Min limitation, set point curve radiator
X	X	5	40006	100	Comfort wheel setting
X	X	6	40007	100	Set point heat curve, Y-coordinate 1 (highest outdoor temperature)
X	X	7	40008	100	Set point heat curve, Y-coordinate 2
X	X	8	40009	100	Set point heat curve, Y-coordinate 3
X	X	9	40010	100	Set point heat curve, Y-coordinate 4
X	X	10	40011	100	Set point heat curve, Y-coordinate 5
X	X	11	40012	100	Set point heat curve, Y-coordinate 6
X	X	12	40013	100	Set point heat curve, Y-coordinate 7 (lowest outdoor temperature)
X	X	16	40017	100	Heating season stop temperature
X	X	22	40023	100	Start temperature tap water
X	X	23	40024	100	Stop temperature tap water
X	X	26	40027	1	Minimum allowed gear in heating *3
X	X	27	40028	1	Maximum allowed gear in heating *3

					Function 3, 6 (6=write)
Mega	Diplomat Inverter	Address	De Facto Address	Scale	Description
X	X	28	40029	1	Maximum allowed gear in tap water *3
X	X	29	40030	1	Minimum allowed gear in tap water *3
X		30	40031	100	Cooling mix valve set point (EM)
X	X	31	40032	100	TWC mix valve set point (EM)
X		32	40033	100	WCS return line set point (EM)
X	X	33	40034	100	TWC mix valve lowest allowed opening degree (EM)
X	X	34	40035	100	TWC mix valve highest allowed opening degree (EM)
X	X	35	40036	100	TWC start temperature immersion heater (EM)
X	X	36	40037	100	TWC start delay immersion heater, seconds (EM)
X	X	37	40038	100	TWC stop temperature immersion heater (EM)
X		38	40039	100	WCS mix valve lowest allowed opening degree (EM)
X		39	40040	100	WCS mix valve highest allowed opening degree (EM)
X	X	40	40041	100	Mix valve 2 lowest allowed opening degree (EM)
X	X	41	40042	100	Mix valve 2 highest allowed opening degree (EM)
X	X	42	40043	100	Mix valve 3 lowest allowed opening degree (EM)
X	X	43	40044	100	Mix valve 3 highest allowed opening degree (EM)
X	X	44	40045	100	Mix valve 4 lowest allowed opening degree (EM)
X	X	45	40046	100	Mix valve 4 highest allowed opening degree (EM)
X	X	46	40047	100	Mix valve 5 lowest allowed opening degree (EM)
X	X	47	40048	100	Mix valve 5 highest allowed opening degree (EM)
X		48	40049	100	Surplus heat chiller set point (EM)
X		49	40050	100	Cooling supply line mix valve: Lowest allowed opening degree (EM)
X		50	40051	100	Cooling supply line mix valve: Highest allowed opening degree (EM)
X		51	40052	100	Surplus heat opening degree for starting fan 1 (EM)
X		52	40053	100	Surplus heat opening degree for starting fan 2 (EM)
X		53	40054	100	Surplus heat opening degree for stopping fan 1 (EM)
X		54	40055	100	Surplus heat opening degree for stopping fan 2 (EM)
X		55	40056	100	Surplus heat lowest allowed opening degree (EM)
X		56	40057	100	Surplus heat highest allowed opening degree (EM)
X	X	58	40059	100	Pool charge set point (EM)
X		59	40060	100	Pool mix valve lowest allowed opening degree (EM)
X		60	40061	100	Pool mix valve highest allowed opening degree (EM)
X	X	61	40062	1	Gear shift delay heating
X	X	62	40063	1	Gear shift delay pool
X	X	63	40064	1	Gear shift delay cooling
X	X	67	40068	100	Brine in high alarm limit
X	X	68	40069	100	Brine in low alarm limit
X	X	69	40070	100	Brine out low alarm limit
X	X	70	40071	100	Brine max delta limit
X		71	40072	100	Hot gas pump start temperature discharge pipe
X		72	40073	100	Hot gas pump lower stop limit temperature discharge pipe
X		73	40074	100	Hot gas pump upper stop limit temperature discharge pipe
X	X	75	40076	1	External additional heater start (PID sum)
X	X	76	40077	100	Condenser pump lowest allowed speed (%)
X	X	77	40078	100	Brine pump lowest allowed speed (%)
X	X	78	40079	100	External additional heater stop (PID sum)
X	X	79	40080	100	Condenser pump highest allowed speed (%)

Function 3, 6 (6=write)					
Mega	Diplomat Inverter	Address	De Facto Address	Scale	Description
X	X	80	40081	100	Brine pump highest allowed speed (%)
X	X	81	40082	100	Condenser pump standby speed (%)
X	X	82	40083	100	Brine pump standby speed (%)
X	X	85	40086	1	Minimum allowed gear in pool *3
X	X	86	40087	1	Maximum allowed gear in pool *3
X	X	87	40088	1	Minimum allowed gear in cooling *3
X	X	88	40089	1	Maximum allowed gear in cooling *3
X	X	105	40106	100	Start temp for cooling (EM)
X	X	106	40107	100	Stop temp for cooling (EM)
X	X	107	40108	100	Min limitation Set point curve radiator Mix valve 1
X	X	108	40109	100	Max limitation Set point curve radiator Mix valve 1
X	X	109	40110	100	Set point curve, Y-coordinate 1 Mix valve 1 (highest outdoor temperature)
X	X	110	40111	100	Set point curve, Y-coordinate 2 Mix valve 1
X	X	111	40112	100	Set point curve, Y-coordinate 3 Mix valve 1
X	X	112	40113	100	Set point curve, Y-coordinate 4 Mix valve 1
X	X	113	40114	100	Set point curve, Y-coordinate 5 Mix valve 1
X	X	114	40115	100	Set point curve, Y-coordinate 6 Mix valve 1
X	X	115	40116	100	Set point curve, Y-coordinate 7 Mix valve 1 (lowest outdoor temperature)
X	X	116	40117	100	Fixed system supply set point, requires defacto address 42 to be enabled
X	X	199	40200	100	Min limitation Set point curve radiator Mix valve 2
X	X	200	40201	100	Max limitation Set point curve radiator Mix valve 2
X	X	201	40202	100	Set point curve, Y-coordinate 1 Mix valve 2 (highest outdoor temperature)
X	X	202	40203	100	Set point curve, Y-coordinate 2 Mix valve 2
X	X	203	40204	100	Set point curve, Y-coordinate 3 Mix valve 2
X	X	204	40205	100	Set point curve, Y-coordinate 4 Mix valve 2
X	X	205	40206	100	Set point curve, Y-coordinate 5 Mix valve 2
X	X	206	40207	100	Set point curve, Y-coordinate 6 Mix valve 2
X	X	207	40208	100	Set point curve, Y-coordinate 7 Mix valve 2 (lowest outdoor temperature)
X	X	208	40209	100	Min limitation Set point curve radiator Mix valve 3
X	X	209	40210	100	Max limitation Set point curve radiator Mix valve 3
X	X	210	40211	100	Set point curve, Y-coordinate 1 Mix valve 3 (highest outdoor temperature)
X	X	211	40212	100	Set point curve, Y-coordinate 2 Mix valve 3
X	X	212	40213	100	Set point curve, Y-coordinate 3 Mix valve 3
X	X	213	40214	100	Set point curve, Y-coordinate 4 Mix valve 3
X	X	214	40215	100	Set point curve, Y-coordinate 5 Mix valve 3
X	X	215	40216	100	Set point curve, Y-coordinate 6 Mix valve 3
X	X	216	40217	100	Set point curve, Y-coordinate 7 Mix valve 3 (lowest outdoor temperature)
X	X	239	40240	100	Min limitation Set point curve radiator Mix valve 4
X	X	240	40241	100	Max limitation Set point curve radiator Mix valve 4
X	X	241	40242	100	Set point curve, Y-coordinate 1 Mix valve 4 (highest outdoor temperature)
X	X	242	40243	100	Set point curve, Y-coordinate 2 Mix valve 4
X	X	243	40244	100	Set point curve, Y-coordinate 3 Mix valve 4
X	X	244	40245	100	Set point curve, Y-coordinate 4 Mix valve 4
X	X	245	40246	100	Set point curve, Y-coordinate 5 Mix valve 4
X	X	246	40247	100	Set point curve, Y-coordinate 6 Mix valve 4
X	X	247	40248	100	Set point curve, Y-coordinate 7 Mix valve 4 (lowest outdoor temperature)
X	X	248	40249	100	Min limitation Set point curve radiator Mix valve 5

Function 3, 6 (6=write)					
Mega	Diplomat Inverter	Address	De Facto Address	Scale	Description
X	X	249	40250	100	Max limitation Set point curve radiator Mix valve 5
X	X	250	40251	100	Set point curve, Y-coordinate 1 Mix valve 5 (highest outdoor temperature)
X	X	251	40252	100	Set point curve, Y-coordinate 2 Mix valve 5
X	X	252	40253	100	Set point curve, Y-coordinate 3 Mix valve 5
X	X	253	40254	100	Set point curve, Y-coordinate 4 Mix valve 5
X	X	254	40255	100	Set point curve, Y-coordinate 5 Mix valve 5
X	X	255	40256	100	Set point curve, Y-coordinate 6 Mix valve 5
X	X	256	40257	100	Set point curve, Y-coordinate 7 Mix valve 5 (lowest outdoor temperature)
X	X	299	40300	10	Set point return temp from pool to heat exchanger (EM)
X	X	300	40301	10	Set point pool hysteresis (EM)
X	X	302	40303	100	Set point for supply line temp passive cooling with mixing valve 1
X	X	303	40304	100	Set point minimum outdoor temp when cooling is permitted
X	X	304	40305	100	External heater outdoor temp limit
X		305	40306	1	Selected mode for mixing valve 2, 0:Heat, 1:Cool, 2:Auto (EM3 only)
X		306	40307	100	Desired cooling temperature setpoint mixing valve 2 (EM3 only)
X		307	40308	100	Seasonal cooling temperature (outdoor temp.), mixing valve 2 (EM3 only)
X		308	40309	100	Seasonal heating temperature (outdoor temp.), mixing valve 2 (EM3 only)
X		309	40310	1	Selected mode for mixing valve 3, 0:Heat, 1:Cool, 2:Auto (EM3 only)
X		310	40311	100	Desired cooling temperature setpoint mixing valve 3 (EM3 only)
X		311	40312	100	Seasonal cooling temperature (outdoor temp.), mixing valve 3 (EM3 only)
X		312	40313	100	Seasonal heating temperature (outdoor temp.), mixing valve 3 (EM3 only)
X		313	40314	1	Selected mode for mixing valve 4, 0:Heat, 1:Cool, 2:Auto (EM3 only)
X		314	40315	100	Desired cooling temperature setpoint mixing valve 4 (EM3 only)
X		315	40316	100	Seasonal cooling temperature (outdoor temp.), mixing valve 4 (EM3 only)
X		316	40317	100	Seasonal heating temperature (outdoor temp.), mixing valve 4 (EM3 only)
X		317	40318	1	Selected mode for mixing valve 5, 0:Heat, 1:Cool, 2:Auto (EM3 only)
X		318	40319	100	Desired cooling temperature setpoint mixing valve 5 (EM3 only)
X		319	40320	100	Seasonal cooling temperature (outdoor temp.), mixing valve 5 (EM3 only)
X		320	40321	100	Seasonal heating temperature (outdoor temp.), mixing valve 5 (EM3 only)

4   Heat pump unit

4.1   Heat pump unit

Mega	Diplomat Inverter	Address	De Facto Address	Scale	Description
X	X	3	4	1	Reset all alarms
	X	4	5	1	Enable internal additional heater
X	X	5	6	1	Enable external additional heater
X	X	7	8	1	Enable flow switch/pressure switch
X	X	8	9	1	Enable tap water
X	X	9	10	1	Enable heat
X	X	20	21	1	Enable brine out monitoring
X	X	21	22	1	Enable brine pump continuous operation
X	X	22	23	1	Enable system circulation pump
X	X	25	26	1	Enable additional heater only (No compressor). Requires Operation mode: Standby
X	X	34	35	1	Enable variable speed mode for condenser pump
X	X	35	36	1	Enable variable speed mode for brine pump
X	X	39	40	1	Enable outdoor temp dependent for external heater
X	X	42	43	1	Enable evaporator freeze protection
X	X	0	10001	1	Alarm active, Class: A
X	X	1	10002	1	Alarm active, Class: B
X	X	2	10003	1	Alarm active, Class: C
X		3	10004	1	Alarm active, Class: D - Genesis secondary
X		4	10005	1	Alarm active, Class: E - Legacy secondary
X	X	9	10010	1	High pressure switch alarm
X	X	10	10011	1	Low pressure level alarm
X	X	11	10012	1	High discharge pipe temperature alarm
X	X	12	10013	1	Operating pressure limit indication
X	X	13	10014	1	Discharge pipe sensor alarm
X	X	14	10015	1	Liquid line sensor alarm
X	X	15	10016	1	Suction gas sensor alarm
X	X	16	10017	1	Flow/pressure switch alarm
X	X	22	10023	1	Power input phase detection alarm
X	X	23	10024	1	Inverter unit alarm
X	X	25	10026	1	Compressor low speed alarm
X	X	26	10027	1	Low super heat alarm
X	X	27	10028	1	Pressure ratio out of range alarm
X	X	28	10029	1	Compressor pressure outside envelope alarm
X	X	29	10030	1	Brine temperature out of range alarm
X	X	30	10031	1	Brine in sensor alarm
X	X	31	10032	1	Brine out sensor alarm
X	X	32	10033	1	Condenser in sensor alarm
X	X	33	10034	1	Condenser out sensor alarm
X	X	34	10035	1	Outdoor sensor alarm
X	X	49	10050	1	Brine delta out of range alarm
	X	53	10054	1	Internal additional heater alarm
X	X	55	10056	1	Brine in high temperature alarm

Mega	Diplomat Inverter	Address	De Facto Address	Scale	Description
X	X	56	10057	1	Brine in low temperature alarm
X	X	57	10058	1	Brine out low temperature alarm
X	X	66	10067	1	Sum alarm
X	X	75	10076	1	Inverter unit communication alarm
X		79	10080	1	External relay for brine/ground water pump.
X	X	81	10082	1	Tap water end tank sensor alarm
	X	82	10083	1	Maximum time for anti-legionella exceeded alarm
X		83	10084	1	Genesis secondary unit alarm - this specific secondary unit can't communicate with its primary unit
X		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.
X		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.
X		86	10087	1	Oil boost in progress
X	X	199	10200	1	Compressor control signal
X	X	201	10202	1	Smart Grid 1, EVU input
X	X	202	10203	1	External alarm input
X	X	204	10205	1	Smart Grid 2
X	X	206	10207	1	External additional heater control signal
X	X	210	10211	1	Condenser pump On/off control
X	X	218	10219	1	Brine pump On/off control
X	X	219	10220	1	External heater circulation pump control signal
X	X	221	10222	1	External additional heater active
	X	222	10223	1	Internal additional heater active
X	X	224	10225	1	Heat pump stopping
X	X	225	10226	1	Heat pump OK to start
X	X	246	10247	1	Compressor is unable to speed up
X	X	4	30005	100	Compressor available gears *3
X	X	5	30006	1	Compressor speed RPM
X	X	6	30007	100	External additional heater: Current demand (%)
X	X	7	30008	100	Discharge pipe temperature
X	X	8	30009	100	Condenser in temperature
X	X	9	30010	100	Condenser out temperature
X	X	10	30011	100	Brine in temperature
X	X	11	30012	100	Brine out temperature
X	X	13	30014	100	Outdoor temperature
X	X	36	30037	1	Cooling season integral value
X	X	39	30040	100	Condenser circulation pump speed (%)
X	X	44	30045	100	Brine circulation pump speed (%)
X	X	48	30049	1	Compressor operating hours (MSB)
X	X	49	30050	1	Compressor operating hours (LSB)
X	X	52	30053	1	External additional heater operating hours (MSB)
X	X	53	30054	1	External additional heater operating hours (LSB)
X	X	54	30055	100	Compressor speed percent
X	X	55	30056	1	Currently running: Second prioritised demand *1
X	X	56	30057	1	Currently running: Third prioritised demand *1

Mega	Diplomat Inverter	Address	De Facto Address	Scale	Description
X	X	57	30058	1	Software version: Major
X	X	58	30059	1	Software version: Minor
X	X	59	30060	1	Software version: Micro
X	X	60	30061	1	Compressor temporarily blocked, (start restriction timer)
X	X	61	30062	100	Compressor current gear
X	X	62	30063	1	Queued demand, first priority *1
X	X	63	30064	1	Queued demand, second priority *1
X	X	64	30065	1	Queued demand, third priority *1
X	X	65	30066	1	Queued demand, fourth priority *1
X	X	66	30067	1	Queued demand, fifth priority *1
	X	67	30068	1	Internal additional heater current step
X	X	82	30083	1	Comfort mode *4
X	X	121	30122	10	Room temperature sensor
X	X	122	30123	100	Bubble point, high pressure temperature
X	X	123	30124	100	Dew point, high pressure temperature
X	X	124	30125	100	Dew point, low pressure temperature
X	X	125	30126	100	Superheat temperature
X	X	126	30127	100	Sub cooling temperature
X	X	127	30128	100	Low pressure side, pressure (bar(g))
X	X	128	30129	100	High pressure side, pressure (bar(g))
X	X	129	30130	100	Liquid line temperature
X	X	130	30131	100	Suction gas temperature
X	X	131	30132	1	Heating season integral value
X	X	132	30133	100	P - value for gear shifting and demand calculation
X	X	133	30134	100	I - value for gear shifting and demand calculation
X	X	134	30135	100	D - value for gear shifting and demand calculation
X	X	135	30136	100	I - value for compressor ON/OFF (Buffer tank)
X	X	136	30137	100	P - value for compressor ON/OFF (Buffer tank)
X		143	30144	1	Number of available secondaries Genesis
X		144	30145	1	Number of available secondaries Legacy
X	X	145	30146	1	Total distributed gears to all units
X	X	146	30147	1	Maximum gear out of all the currently requested gears
X		153	30154	1	Legacy heat pump compressor running (bit field)
X		154	30155	1	Legacy heat pump reporting alarm (bit field)
X		155	30156	1	Legacy heat pump start signal (bit field)
X		156	30157	1	Legacy heat pump tap water signal (bit field)
X		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.
X		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.
X		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.
X		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.
X		170	30171	1	Primary unit alarm - the combined output of all Class E alarms. This signal is a bit field, one bit for each legacy secondary heat pump unit.

Mega	Diplomat Inverter	Address	De Facto Address	Scale	Description
X		171	30172	1	Primary unit alarm - general legacy heat pump alarm. This signal is a bit field, one bit for each legacy secondary heat pump unit. Detects if the sum alarm of the secondary unit is active.
X		173	30174	1	Primary unit alarm - the primary unit can not communicate with the corresponding expansion card for the legacy heat pump. This signal is a bit field, one bit for each legacy secondary heat pump unit.
X	X	26	40027	1	Minimum allowed gear in heating *3
X	X	27	40028	1	Maximum allowed gear in heating *3
X	X	28	40029	1	Maximum allowed gear in tap water *3
X	X	29	40030	1	Minimum allowed gear in tap water *3
X	X	61	40062	1	Gear shift delay heating
X	X	62	40063	1	Gear shift delay pool
X	X	63	40064	1	Gear shift delay cooling
X	X	67	40068	100	Brine in high alarm limit
X	X	68	40069	100	Brine in low alarm limit
X	X	69	40070	100	Brine out low alarm limit
X	X	70	40071	100	Brine max delta limit
X		71	40072	100	Hot gas pump start temperature discharge pipe
X		72	40073	100	Hot gas pump lower stop limit temperature discharge pipe
X		73	40074	100	Hot gas pump upper stop limit temperature discharge pipe
X	X	75	40076	1	External additional heater start (PID sum)
X	X	76	40077	100	Condenser pump lowest allowed speed (%)
X	X	77	40078	100	Brine pump lowest allowed speed (%)
X	X	78	40079	100	External additional heater stop (PID sum)
X	X	79	40080	100	Condenser pump highest allowed speed (%)
X	X	80	40081	100	Brine pump highest allowed speed (%)
X	X	81	40082	100	Condenser pump standby speed (%)
X	X	82	40083	100	Brine pump standby speed (%)
X	X	85	40086	1	Minimum allowed gear in pool *3
X	X	86	40087	1	Maximum allowed gear in pool *3
X	X	87	40088	1	Minimum allowed gear in cooling *3
X	X	88	40089	1	Maximum allowed gear in cooling *3
X	X	304	40305	100	External heater outdoor temp limit

5   Heat

5.1   Heating system

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

5.2   Mix valve 1

Mega	Diplomat Inverter	Address	De Facto Address	Scale	Description
X	X	11	12	1	Enable mix valve 1
X	X	36	37	1	Enable cooling mode for mixing valve 1
X	X	37	38	1	Enable outdoor temp dependent for cooling with mixing valve 1
X	X	38	39	1	Enable internal brine pump to start when cooling is active for mixing valve 1
X	X	36	10037	1	Mix valve 1 supply line sensor alarm
X	X	60	10061	1	Mix valve 1 supply temperature deviation alarm

Mega	Diplomat Inverter	Address	De Facto Address	Scale	Description
X	X	209	10210	1	Mix valve 1 circulation pump control signal
X	X	245	10246	1	Indication when mixing valve 1 is producing passive cooling
X	X	40	30041	100	Mix valve 1 supply line temperature
X	X	43	30044	100	Mix valve 1 position
X	X	147	30148	100	Desired temperature distribution circuit Mix valve 1
X	X	107	40108	100	Min limitation Set point curve radiator Mix valve 1
X	X	108	40109	100	Max limitation Set point curve radiator Mix valve 1
X	X	109	40110	100	Set point curve, Y-coordinate 1 Mix valve 1 (highest outdoor temperature)
X	X	110	40111	100	Set point curve, Y-coordinate 2 Mix valve 1
X	X	111	40112	100	Set point curve, Y-coordinate 3 Mix valve 1
X	X	112	40113	100	Set point curve, Y-coordinate 4 Mix valve 1
X	X	113	40114	100	Set point curve, Y-coordinate 5 Mix valve 1
X	X	114	40115	100	Set point curve, Y-coordinate 6 Mix valve 1
X	X	115	40116	100	Set point curve, Y-coordinate 7 Mix valve 1 (lowest outdoor temperature)
X	X	302	40303	100	Set point for supply line temp passive cooling with mixing valve 1
X	X	303	40304	100	Set point minimum outdoor temp when cooling is permitted

5.3   Mix valve 2

Mega	Diplomat Inverter	Address	De Facto Address	Scale	Description
X	X	16	17	1	Enable mix valve 2 (EM)
X	X	37	10038	1	Mix valve 2 supply line sensor alarm (EM)
X	X	61	10062	1	Mix valve 2 supply temperature deviation alarm (EM)
X	X	87	30088	100	Mix valve 2 position (EM)
X	X	99	30100	100	Mix valve 2 supply line temperature (EM)
X	X	109	30110	100	Mix valve 2 return line temperature (EM)
X	X	148	30149	100	Desired temperature distribution circuit Mix valve 2
X	X	40	40041	100	Mix valve 2 lowest allowed opening degree (EM)
X	X	41	40042	100	Mix valve 2 highest allowed opening degree (EM)
X	X	199	40200	100	Min limitation Set point curve radiator Mix valve 2
X	X	200	40201	100	Max limitation Set point curve radiator Mix valve 2
X	X	201	40202	100	Set point curve, Y-coordinate 1 Mix valve 2 (highest outdoor temperature)
X	X	202	40203	100	Set point curve, Y-coordinate 2 Mix valve 2
X	X	203	40204	100	Set point curve, Y-coordinate 3 Mix valve 2
X	X	204	40205	100	Set point curve, Y-coordinate 4 Mix valve 2
X	X	205	40206	100	Set point curve, Y-coordinate 5 Mix valve 2
X	X	206	40207	100	Set point curve, Y-coordinate 6 Mix valve 2
X	X	207	40208	100	Set point curve, Y-coordinate 7 Mix valve 2 (lowest outdoor temperature)
X		305	40306	1	Selected mode for mixing valve 2, 0:Heat, 1:Cool, 2:Auto (EM3 only)
X		306	40307	100	Desired cooling temperature setpoint mixing valve 2 (EM3 only)
X		307	40308	100	Seasonal cooling temperature (outdoor temp.), mixing valve 2 (EM3 only)
X		308	40309	100	Seasonal heating temperature (outdoor temp.), mixing valve 2 (EM3 only)
X		43	44	1	Enable outdoor temp dependent for cooling with mixing valve 2 (EM3 only)*5
X		44	45	1	Enable dew point calculation on mixing valve 2, requires room sensor for mixing valve 2 (EM3 only)

Mega	Diplomat Inverter	Address	De Facto Address	Scale	Description
X		45	46	1	Enable outdoor temp dependent for heating with mixing valve 2 (EM3 only)*5
X		55	56	1	Enable internal brine pump to start when cooling is active for mixing valve 2 (EM3 only)

5.4 Mix valve 3

Mega	Diplomat Inverter	Address	De Facto Address	Scale	Description
X	X	17	18	1	Enable mix valve 3 (EM)
X	X	38	10039	1	Mix valve 3 supply line sensor alarm (EM)
X	X	62	10063	1	Mix valve 3 supply temperature deviation alarm (EM)
X	X	88	30089	100	Mix valve 3 position (EM)
X	X	100	30101	100	Mix valve 3 supply line temperature (EM)
X	X	111	30112	100	Mix valve 3 return line temperature (EM)
X	X	149	30150	100	Desired temperature distribution circuit Mix valve 3
X	X	42	40043	100	Mix valve 3 lowest allowed opening degree (EM)
X	X	43	40044	100	Mix valve 3 highest allowed opening degree (EM)
X	X	208	40209	100	Min limitation Set point curve radiator Mix valve 3
X	X	209	40210	100	Max limitation Set point curve radiator Mix valve 3
X	X	210	40211	100	Set point curve, Y-coordinate 1 Mix valve 3 (highest outdoor temperature)
X	X	211	40212	100	Set point curve, Y-coordinate 2 Mix valve 3
X	X	212	40213	100	Set point curve, Y-coordinate 3 Mix valve 3
X	X	213	40214	100	Set point curve, Y-coordinate 4 Mix valve 3
X	X	214	40215	100	Set point curve, Y-coordinate 5 Mix valve 3
X	X	215	40216	100	Set point curve, Y-coordinate 6 Mix valve 3
X	X	216	40217	100	Set point curve, Y-coordinate 7 Mix valve 3 (lowest outdoor temperature)
X		309	403010	1	Selected mode for mixing valve 3, 0:Heat, 1:Cool, 2:Auto (EM3 only)
X		310	403011	100	Desired cooling temperature setpoint mixing valve 3 (EM3 only)
X		311	403012	100	Seasonal cooling temperature (outdoor temp.), mixing valve 3 (EM3 only)
X		312	403013	100	Seasonal heating temperature (outdoor temp.), mixing valve 3 (EM3 only)
X		46	47	1	Enable outdoor temp dependent for cooling with mixing valve 3 (EM3 only)*5
X		47	48	1	Enable dew point calculation on mixing valve 3, requires room sensor for mixing valve 3 (EM3 only)
X		48	49	1	Enable outdoor temp dependent for heating with mixing valve 3 (EM3 only)*5
X		56	57	1	Enable internal brine pump to start when cooling is active for mixing valve 3 (EM3 only)

5.5 Mix valve 4

Mega	Diplomat Inverter	Address	De Facto Address	Scale	Description
X	X	18	19	1	Enable mix valve 4 (EM)
X	X	39	10040	1	Mix valve 4 supply line sensor alarm (EM)
X	X	63	10064	1	Mix valve 4 supply temperature deviation alarm (EM)
X	X	89	30090	100	Mix valve 4 position (EM)
X	X	101	30102	100	Mix valve 4 supply line temperature (EM)

Mega	Diplomat Inverter	Address	De Facto Address	Scale	Description
X	X	113	30114	100	Mix valve 4 return line temperature (EM)
X	X	150	30151	100	Desired temperature distribution circuit Mix valve 4
X	X	44	40045	100	Mix valve 4 lowest allowed opening degree (EM)
X	X	45	40046	100	Mix valve 4 highest allowed opening degree (EM)
X	X	239	40240	100	Min limitation Set point curve radiator Mix valve 4
X	X	240	40241	100	Max limitation Set point curve radiator Mix valve 4
X	X	241	40242	100	Set point curve, Y-coordinate 1 Mix valve 4 (highest outdoor temperature)
X	X	242	40243	100	Set point curve, Y-coordinate 2 Mix valve 4
X	X	243	40244	100	Set point curve, Y-coordinate 3 Mix valve 4
X	X	244	40245	100	Set point curve, Y-coordinate 4 Mix valve 4
X	X	245	40246	100	Set point curve, Y-coordinate 5 Mix valve 4
X	X	246	40247	100	Set point curve, Y-coordinate 6 Mix valve 4
X	X	247	40248	100	Set point curve, Y-coordinate 7 Mix valve 4 (lowest outdoor temperature)
X		313	40314	1	Selected mode for mixing valve 4, 0:Heat, 1:Cool, 2:Auto (EM3 only)
X		314	40315	100	Desired cooling temperature setpoint mixing valve 4 (EM3 only)
X		315	40316	100	Seasonal cooling temperature (outdoor temp.), mixing valve 4 (EM3 only)
X		314	40317	100	Seasonal heating temperature (outdoor temp.), mixing valve 4 (EM3 only)
X		49	50	1	Enable outdoor temp dependent for cooling with mixing valve 4 (EM3 only)*5
X		50	51	1	Enable dew point calculation on mixing valve 4, requires room sensor for mixing valve 4 (EM3 only)
X		51	52	1	Enable outdoor temp dependent for heating with mixing valve 4 (EM3 only)*5
X		57	58	1	Enable internal brine pump to start when cooling is active for mixing valve 4 (EM3 only)

5.6   Mix valve 5

Mega	Diplomat Inverter	Address	De Facto Address	Scale	Description
X	X	19	20	1	Enable mix valve 5 (EM)
X	X	40	10041	1	Mix valve 5 supply line sensor alarm (EM)
X	X	64	10065	1	Mix valve 5 supply temperature deviation alarm (EM)
X	X	90	30091	100	Mix valve 5 position (EM)
X	X	107	30108	100	Mix valve 5 supply line temperature (EM)
X	X	115	30116	100	Mix valve 5 return line temperature (EM)
X	X	151	30152	100	Desired temperature distribution circuit Mix valve 5
X	X	46	40047	100	Mix valve 5 lowest allowed opening degree (EM)
X	X	47	40048	100	Mix valve 5 highest allowed opening degree (EM)
X	X	248	40249	100	Min limitation Set point curve radiator Mix valve 5
X	X	249	40250	100	Max limitation Set point curve radiator Mix valve 5
X	X	250	40251	100	Set point curve, Y-coordinate 1 Mix valve 5 (highest outdoor temperature)
X	X	251	40252	100	Set point curve, Y-coordinate 2 Mix valve 5
X	X	252	40253	100	Set point curve, Y-coordinate 3 Mix valve 5
X	X	253	40254	100	Set point curve, Y-coordinate 4 Mix valve 5
X	X	254	40255	100	Set point curve, Y-coordinate 5 Mix valve 5
X	X	255	40256	100	Set point curve, Y-coordinate 6 Mix valve 5
X	X	256	40257	100	Set point curve, Y-coordinate 7 Mix valve 5 (lowest outdoor temperature)
X		317	40318	1	Selected mode for mixing valve 5, 0:Heat, 1:Cool, 2:Auto (EM3 only)

Mega	Diplomat Inverter	Address	De Facto Address	Scale	Description
X		318	40319	100	Desired cooling temperature setpoint mixing valve 5 (EM3 only)
X		319	40320	100	Seasonal cooling temperature (outdoor temp.), mixing valve 5 (EM3 only)
X		320	40321	100	Seasonal heating temperature (outdoor temp.), mixing valve 5 (EM3 only)
X		52	53	1	Enable outdoor temp dependent for cooling with mixing valve 5 (EM3 only)*5
X		51	54	1	Enable dew point calculation on mixing valve 5, requires room sensor for mixing valve 5 (EM3 only)
X		50	55	1	Enable outdoor temp dependent for heating with mixing valve 5 (EM3 only)*5
X		58	59	1	Enable internal brine pump to start when cooling is active for mixing valve 5 (EM3 only)

6   Tap water

6.1   Tap water

Mega	Diplomat Inverter	Address	De Facto Address	Scale	Description
X		14	15	1	Enable hot gas pump
	X	24	25	1	Enable anti legionella
X	X	50	10051	1	Tap water mid sensor alarm
X		213	10214	1	Hot gas circulation pump control signal
X	X	15	30016	100	Tap water top temperature
X	X	16	30017	100	Tap water lower temperature
X	X	17	30018	100	Tap water weighted temperature
X	X	50	30051	1	Tap water operating hours (MSB)
X	X	51	30052	1	Tap water operating hours (LSB)
X	X	139	30140	1	Desired gear for tap water
X	X	22	40023	100	Start temperature tap water
X	X	23	40024	100	Stop temperature tap water

6.2   TWC

Mega	Diplomat Inverter	Address	De Facto Address	Scale	Description
X	X	12	13	1	Enable TWC
X	X	45	10046	1	TWC supply line sensor alarm (EM)
X	X	51	10052	1	TWC circulation return sensor alarm (EM)
X	X	58	10059	1	TWC circulation return low temperature alarm (EM)
X	X	59	10060	1	TWC supply low temperature alarm (EM)
X	X	81	10082	1	Tap water end tank sensor alarm
X	X	230	10231	1	TWC supply line circulation pump control signal (EM)
X	X	234	10235	1	TWC end tank heater control signal (EM)
X	X	86	30087	100	TWC valve position (EM)
X	X	95	30096	100	TWC supply line temperature (EM)
X	X	96	30097	100	TWC return temperature (EM)
X	X	98	30099	100	TWC end tank temperature (EM)
X	X	31	40032	100	TWC mix valve set point (EM)
X	X	33	40034	100	TWC mix valve lowest allowed opening degree (EM)
X	X	34	40035	100	TWC mix valve highest allowed opening degree (EM)
X	X	35	40036	100	TWC start temperature immersion heater (EM)
X	X	36	40037	100	TWC start delay immersion heater, seconds (EM)
X	X	37	40038	100	TWC stop temperature immersion heater (EM)

6.3   WCS

Mega	Diplomat Inverter	Address	De Facto Address	Scale	Description
X		13	14	1	Enable WCS
X		44	10045	1	WCS return line sensor alarm (EM)

Mega	Diplomat Inverter	Address	De Facto Address	Scale	Description
X		65	10066	1	WCS return line temperature deviation alarm (EM)
X		232	10233	1	WCS regulation control signal (EM)
X		233	10234	1	WCS circulation pump control signal (EM)
X		85	30086	100	WCS valve position (EM)
X		97	30098	100	WCS return line temperature (EM)
X		32	40033	100	WCS return line set point (EM)
X		38	40039	100	WCS mix valve lowest allowed opening degree (EM)
X		39	40040	100	WCS mix valve highest allowed opening degree (EM)

6.4   HGW

Mega	Diplomat Inverter	Address	De Facto Address	Scale	Description
	X	6	7	1	Enable HGW
	X	52	10053	1	HGW sensor alarm
	X	45	30046	100	HGW supply line temperature
	X	47	30048	1	HGW mix valve position (%)
	X	223	10224	1	HGW regulation control signal

7   Cooling

7.1   Cooling

Mega	Diplomat Inverter	Address	De Facto Address	Scale	Description
X	X	10	11	1	Enable active cooling
X		30	31	1	Enable surplus heat, borehole (no chiller)
X	X	33	34	1	Enable passive cooling (EM)
X	X	78	10079	1	External start brine pump, read only
X	X	141	30142	1	Desired gear for cooling

7.2   Cooling tank

Mega	Diplomat Inverter	Address	De Facto Address	Scale	Description
X		46	10047	1	Cooling tank sensor alarm (EM)
X	X	47	10048	1	Cooling supply line sensor alarm (EM)
X		68	10069	1	Cooling tank temperature deviation alarm (EM)
X		73	10074	1	Cooling tank return line sensor alarm (EM)
X		242	10243	1	Active cooling directional valve position (Borehole disconnected) (EM)
X		243	10244	1	Passive/Active cooling directional valve position (Cooling tank connected) (EM)
X	X	104	30105	100	Cooling tank temperature (EM)
X	X	105	30106	100	Cooling tank return line temperature (EM)
X		105	40106	100	Start temp for cooling (EM)
X		106	40107	100	Stop temp for cooling (EM)

7.3   Cooling circuit

Mega	Diplomat Inverter	Address	De Facto Address	Scale	Description
X		23	24	1	Enable dew point calculation
X		48	10049	1	Cooling circuit return line sensor alarm (EM)
X		67	10068	1	Cooling circuit supply line temperature deviation alarm (EM)
X		70	10071	1	Humidity room sensor alarm
X		236	10237	1	Cooling circuit circulation pump control signal (EM)
X		240	10241	1	Cooling circuit regulation control signal (EM)
X		91	30092	100	Dew point room (EM)
X		92	30093	100	Cooling supply line mix valve position (EM)
X		103	30104	100	Cooling circuit return line temperature (EM)
X		106	30107	100	Cooling circuit supply line temperature (EM)
X	X	137	30138	1	Mix valve cooling opening degree (EM2/3)
X		30	40031	100	Cooling mix valve set point (EM)
X		49	40050	100	Cooling supply line mix valve: Lowest allowed opening degree (EM)
X		50	40051	100	Cooling supply line mix valve: Highest allowed opening degree (EM)

7.4   Surplus heat

Mega	Diplomat Inverter	Address	De Facto Address	Scale	Description
X		29	30	1	Enable surplus heat, chiller (no borehole)
X		69	10070	1	Surplus heat temperature deviation alarm (EM)
X		71	10072	1	Surplus heat supply line sensor alarm (EM)
X		72	10073	1	Surplus heat return line sensor alarm (EM)
X		238	10239	1	Surplus heat directional valve position (EM)
X		239	10240	1	Surplus heat circulation pump control signal (EM)
X		241	10242	1	Surplus heat regulation control signal (EM)
X		93	30094	100	Surplus heat fan speed (EM)
X		117	30118	100	Surplus heat return line temperature (EM)
X		118	30119	100	Surplus heat supply line temperature (EM)
X		48	40049	100	Surplus heat chiller set point (EM)
X		51	40052	100	Surplus heat opening degree for starting fan 1 (EM)
X		52	40053	100	Surplus heat opening degree for starting fan 2 (EM)
X		53	40054	100	Surplus heat opening degree for stopping fan 1 (EM)
X		54	40055	100	Surplus heat opening degree for stopping fan 2 (EM)
X		55	40056	100	Surplus heat lowest allowed opening degree (EM)
X		56	40057	100	Surplus heat highest allowed opening degree (EM)

8   Pool

8.1   Pool

Mega	Diplomat Inverter	Address	De Facto Address	Scale	Description
X	X	28	29	1	Enable pool (EM)
X	X	31	32	1	Enable external additional heater for pool (EM)
	X	32	33	1	Enable internal additional heater for pool (EM)
X	X	76	10077	1	Pool return line sensor alarm
X	X	77	10078	1	External stop for pool, read only
X	X	235	10236	1	Pool directional valve position (EM)
X	X	237	10238	1	Pool circulation pump control signal (EM)
X	X	244	10245	1	Pool regulation control signal (EM)
X		94	30095	100	Pool supply line mix valve position (EM)
X	X	119	30120	100	Pool supply line temperature (EM)
X	X	120	30121	100	Pool return line temperature (EM)
X	X	142	30143	1	Desired gear for pool
X	X	58	40059	100	Pool charge set point (EM)
X		59	40060	100	Pool mix valve lowest allowed opening degree (EM)
X		60	40061	100	Pool mix valve highest allowed opening degree (EM)
X	X	299	40300	10	Set point return temp from pool to heat exchanger (EM)
X	X	300	40301	10	Set point pool hysteresis (EM)

9   Electric meter

9.1   Electric meter

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

Footnotes:
*1) 1: Manual operation, 2: Defrost, 3: Hot water, 4: Heat, 5: Cool, 6: Pool, 7: Anti legionella, 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

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.

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