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OEM Solutions Development & Sales

PERFORMANCE CONTROLLER PeC

MODBUS INTERFACE DESCRIPTION



1 Document History and Change Log

Date	Revision	Description
07.08.2015	1.0	Initial version
05.07/2017	2.0	Version for 5030 firmware release
19.09.2017	3.0	Default circuit 1 configuration is 1 variable and 1 fix
21.03.2018	4.0	Hardware alarms bitfields were corrected
18.05.2018	5.0	Corresponding to SW revision 5055
08.06.2018	6.0	Version 57
19.06.2018		Version 59 Added the configurable popup speed
		Version 67 EV3 communication variables
13.11.2019	7.0	Version 85 New pressure sensor Pack control defrost add delay maximum value changed
26.11.2019	8.0	Version 86 Minimum value for low pressure alarm was lowered
10.12.2019	9.0	Version 89
06.07.2020	17.0	
05.03.2021	18.0	Version 1 First version of this document for the new PEC models 72 and others.
21.03.2021	19	Changes for version 3
10.04.2021	20	Changes for version 4
28.06.2021	21	Changes for version 7
23.07.2021	22	Changes for version 9
02.09.2021	23	Changes for version 11
19.11.2021	24	Changes for version 16
21.12.2021	25	Changes for version 17
28.01.2022	26	Changes for version 18

2 Modbus Protocol Specification

2.1 Hardware

Supply for Modbus transceiver: 5V
 Overload / Short circuit protected
 Termination resistance: 120 Ohm
 SELV circuit

2.2 Modbus protocol details

Mode: RTU
 Modbus slave address: 7 (default)
 Baud rate: 19200 bps (default)
 Start bit: 1
 Data bits: 8
 Parity: even (default)
 Stop bits: 1 (default)
 Master response timeout: 200ms

2.3 Transmission Details

2.3.1 Modbus register address ranges

Config. data: Starting address: 0x0000
 Read-only data: Starting address: 0x0100
 Starting address: 0x0400
 Writable data: Starting address: 0x0200
 Config read only: Starting address: 0x0300
 Alarm read: Starting address: 0x6000
 Update pending...

2.3.2 Read Data transmission

Available through Modbus Function code 03 (0x03) Read Holding Registers

Request

Function code	1 Byte	0x03
Starting Address	2 Bytes	0x0000 to 0xFFFF
Register count	2 Bytes	1 to 125 (0x7D)

Response

Function code	1 Byte	0x03
Byte count	1 Byte	2 x N*
Holding Registers	N* x 2 Bytes	

*N = Quantity of Input Registers

Error

Error code	1 Byte	0x83
Exception code	1 Byte	01 or 02 or 03

01 = Function code not supported
 02 = Starting Address or register count out of range
 03 = Register count out of range

2.3.3 Write Data transmission (single register)

Available through Modbus Function code 06 (0x06) Write Holding Register

Request

Function code	1 Byte	0x06
Starting Address	2 Bytes	0x0000 to 0xFFFF
Value	2 Bytes	0x0000 to 0xFFFF

Response

Function code	1 Byte	0x06
Starting Address	2 Bytes	0x0000 to 0xFFFF
Value	2 Bytes	0x0000 to 0xFFFF

Error

Error code	1 Byte	0x86
Exception code	1 Byte	01 or 02 or 03

01 = Function code not supported

02 = Starting Address or register count out of range

2.3.4 Write Data transmission (multiple registers)

Available through Modbus Function code 16 (0x10) Write Holding Registers

Request

Function code	1 Byte	0x10
Start Address	2 Bytes	0x0000 to 0xFFFF
Register count	2 Bytes	0x0001 to 0x0078
Byte count	1 Byte	2 x N
Registers values	2 x N Bytes	Value

N = register count.

Response

Function code	1 Byte	0x10
Starting Address	2 Bytes	0x0000 to 0xFFFF
Register count	2 Bytes	0x0001 to 0x0078

Error

Error code	1 Byte	0x90
Exception code	1 Byte	01 or 02 or 03

01 = Function code not supported

02 = Register Address invalid

03 = Register Value out of range

2.3.5 Critical write registers

Registers whose description contains a [*] are only modifiable while the unit is stopped.

2.3.6 Write Data limitations

Any out of bounds write to a register will result in the new value to be rejected. No bounding is applied.

3 Data Description

3.1 Config. Parameters

Modbus address dec.	Modbus address hex.	Description	Min	Max	Unit	Def.	Scale	Remarks
1	0001	VS Compressor type [*]	0	9		3		R410A 0 = ZPV063 CT CSD-100 1 = ZPV066 CT CSD-100 2 = ZPV063 _xxx EV3XXX 3 = ZPV066 _4x9 EV3XXX 4 = ZPV066 _7x9 EV3XXX 5 = ZPV096 _4x9 EV3XXX 6 = ZPV096 _7x9 EV3XXX R32 7 = YPV0661T-4E9 EV3150B (deprecated) 8 = YPV0961T-4E9 EV3185B (deprecated) R290 9 = YBV0461E-9x9 ED3018B R32 10 = YPV0661T-4E9 EV3150B (new) 11 = YPV0961T-4E9 EV3185B (new) R410A 12 = ZPV0662E-4E9 EV3150B 13 = ZPV0962E-4E9 EV3185B R290 14 = YHV1191G-4X9 ED4038BU
2	0002	P1 sensor type [*] (Circuit 1 suction pressure sensor type)	0	4		1		0 = PT5N_07 (7 barg MAX) 1 = PT5N_18 (18 barg MAX) 2 = PT5N_30 (30 barg MAX) 3 = PT5N_50 (50 barg MAX) 4 = PT5N_10 (10 barg MAX)
3	0003	P2 sensor type [*] (Circuit 1 discharge pressure sensor type)	0	4		3		0 = PT5N_07 (7 barg MAX) 1 = PT5N_18 (18 barg MAX) 2 = PT5N_30 (30 barg MAX) 3 = PT5N_50 (50 barg MAX) 4 = PT5N_10 (10 barg MAX)
4	0004	P3 sensor type [*] (Circuit 2 suction pressure sensor type)	0	4		1		0 = PT5N_07 (7 barg MAX) 1 = PT5N_18 (18 barg MAX) 2 = PT5N_30 (30 barg MAX) 3 = PT5N_50 (50 barg MAX) 4 = PT5N_10 (10 barg MAX)
5	0005	P4 sensor type [*] (Circuit 2 discharge pressure sensor type)	0	4		3		0 = PT5N_07 (7 barg MAX) 1 = PT5N_18 (18 barg MAX) 2 = PT5N_30 (30 barg MAX) 3 = PT5N_50 (50 barg MAX) 4 = PT5N_10 (10 barg MAX)
6	0006	T1 sensor type (Circuit 1)	0	3		0		0 = TP1-NPX (NTC 10K) 1 = TP1-NHX (NTC 100K) 2 = Semitec 10K 3 = Shibaura 50K
7	0007	T2 sensor type (Circuit 1)	0	3		0		0 = TP1-NPX (NTC 10K) 1 = TP1-NHX (NTC 100K) 2 = Semitec 10K 3 = Shibaura 50K
8	0008	T3 sensor type (Circuit 1)	0	3		0		0 = TP1-NPX (NTC 10K) 1 = TP1-NHX (NTC 100K) 2 = Semitec 10K 3 = Shibaura 50K
9	0009	T4 sensor type (Circuit 1)	0	3		0		0 = TP1-NPX (NTC 10K) 1 = TP1-NHX (NTC 100K) 2 = Semitec 10K 3 = Shibaura 50K
10	000A	T5 sensor type (Circuit 1 Discharge temperature 1 sensor type)	0	3		0		0 = TP1-NPX (NTC 10K) 1 = TP1-NHX (NTC 100K) 2 = Semitec 10K 3 = Shibaura 50K
11	000B	T6 sensor type (Circuit 1 Discharge temperature 2 sensor type)	0	3		0		0 = TP1-NPX (NTC 10K) 1 = TP1-NHX (NTC 100K) 2 = Semitec 10K 3 = Shibaura 50K

12	000C	T7 sensor type (Circuit 1 Discharge temperature 3 sensor type)	0	3		0		0 = TP1-NPX (NTC 10K) 1 = TP1-NHX (NTC 100K) 2 = Semitec 10K 3 = Shibaura 50K
13	000D	Analog input sensor type	0	0		0		0-10V Type (not configurable)
14	000E	T8 sensor type (Circuit 2)	0	3		0		0 = TP1-NPX (NTC 10K) 1 = TP1-NHX (NTC 100K) 2 = Semitec 10K 3 = Shibaura 50K
15	000F	T9 sensor type (Circuit 2)	0	3		0		0 = TP1-NPX (NTC 10K) 1 = TP1-NHX (NTC 100K) 2 = Semitec 10K 3 = Shibaura 50K
16	0010	T10 sensor type (Circuit 2)	0	3		0		0 = TP1-NPX (NTC 10K) 1 = TP1-NHX (NTC 100K) 2 = Semitec 10K 3 = Shibaura 50K
17	0011	T11 sensor type (Circuit 2 Discharge temperature 1 sensor type)	0	3		0		0 = TP1-NPX (NTC 10K) 1 = TP1-NHX (NTC 100K) 2 = Semitec 10K 3 = Shibaura 50K
18	0012	T12 sensor type (Circuit 2 Discharge temperature 2 sensor type)	0	3		0		0 = TP1-NPX (NTC 10K) 1 = TP1-NHX (NTC 100K) 2 = Semitec 10K 3 = Shibaura 50K
19	0013	T13 sensor type (Circuit 2 Discharge temperature 3 sensor type)	0	3		0		0 = TP1-NPX (NTC 10K) 1 = TP1-NHX (NTC 100K) 2 = Semitec 10K 3 = Shibaura 50K
20	0014	Circuit 1 cooling control mode (EXV)	0	1		0		0 = self-adapting PID parameter 1 = manual PID parameter set
21	0015	Circuit 1 cooling superheat setpoint	0.0	20.0	K	5.0	¹ / ₁₀₀	Superheat setpoint in cooling mode. If setpoint is configured below 5K, low superheat performance improvement (LSPI) will be activated.
22	0016	Circuit 1 defrost start-up duration	1	600	s	10		Time span with fixed valve opening during start-up.
23	0017	Circuit 1 defrost start-up opening	0	100	%	10		Fixed valve opening applied during start-up duration.
24	0018	Circuit 1 heating control mode (EXV)	0	1		0		0 = self-adapting PID parameter 1 = manual PID parameter set
25	0019	Circuit 1 heating superheat setpoint	5.0	20.0	K	5.0	¹ / ₁₀₀	Setpoint adaptation in range of +2K.
26	001A	Circuit 1 heating start-up duration	1	60	s	5		Time span with fixed valve opening during start-up.
27	001B	Defrost minimum duration	15	1200	s	60		
28	001C	Operating mode reset on com failure	0	1		0		Upon communication failure, the operating is automatically reset to Off.
29	001D	Unit type [*]	0	1				0 = Synchronized (both circuits toggle the 4ways at the same time) 1 = Dissociated (both circuits are free to toggle their four way valves whenever they see fit. Capacity matching <u>can only be set unit wise</u>) Independent mode will be supported in a future release.
30	001E	Circuit 1 heating start-up speed duration	5	600	s	60		Time span at which the compressor runs at fixed speed during the initial start-up.
31	001F	Circuit 1 heating start-up speed	2700	4500	RPM	3000		Fixed speed applied to the compressor during heating start-up duration.
32	0020	Circuit 1 cooling start-up speed duration	5	600	s	30		Time span at which the compressor runs at fixed speed during the initial start-up.
33	0021	Pack control defrost start-up speed	2700	4500	RPM	3000		Target speed applied to the compressor during transition to defrost (without stop) and initial phase of defrost.
34	0022	Low superheat alarm threshold	1.0	5.0	K	1.5	¹ / ₁₀₀	Lower limit of allowed superheat.
35	0023	Low superheat alarm delay	10	120	s	90		Max duration below threshold before alarm triggers. Dead band = threshold +2K.
36	0024	Low pressure alarm threshold	0.6	10.0	barg	1.3	¹ / ₁₀₀	Lower limit value.
37	0025	Low pressure alarm delay	0	30	s	30		Max duration below threshold before alarm triggers. At threshold minus fixed dead band (0.5 bar), immediate alarm.

39	0027	High condensing pressure alarm threshold	0.0	50.0	barg	44.4	¹ / ₁₀₀	Limit value (67.92 °C for R410a).
40	0028	High condensing pressure alarm delay	0	300	s	10		Max duration above threshold before alarm triggers. No dead band.
41	0029	Alarm pause	0	30	min	10		Pause time the unit is stopped, due to alarm occurrence while compressor is running, before restarting. After pause time has expired all alarms (software), alarm shadows & alarm relay are cleared.
42	002A	Capacity control mode	0	1		0		Source capacities used for the capacity matching 0 = Actual capacities 1 = Standardized capacities
43	002B	Pack control circuit startup delay	0	600		0		Delay enforced before starting a compressor on an empty circuit.
44	002C	High superheat alarm threshold	16.0	80.0	K	30.0	¹ / ₁₀₀	Upper limit value.
45	002D	High superheat alarm delay	10	600	s	120		Max duration above threshold before alarm triggers. Dead band = threshold - 4K.
46	002E	Freeze alarm threshold	-50	5	°C	-20	¹ / ₁₀₀	Freeze alarm temperature limit enabled in cooling mode.
47	002F	Freeze alarm delay	10	600	s	60		Freeze alarm time delay.
48	0030	Stator heater	10	150	W	100		Power supplied by stator heater during standby-mode
49	0031	Defrost interval time override	60	1000	min	1000		Interval between defrosts after which defrost cycle is forced (timer is reset after every defrost execution). If defrost interval = max, internal defrost request will be disabled.
50	0032	Defrost duration	5	30	min	15		Max. duration time of a defrost. Exceeding duration time will stop the unit & trigger an alarm state.
51	0033	Defrost termination temperature	0.0	65.0	°C	21.0	¹ / ₁₀₀	Condensing Temperature at which the defrost terminates
52	0034	Defrost slow down proportion	0.0	100.0	%	50.0		Proportion applied to the speed reduction (towards the minimum speed) in case a slow down of the defrost speed is needed.
53	0035	Defrost control rate	0	100	RPM/s	20.0		Rate at which the VS compressor is accelerated during a defrost phase.
54	0036	Defrost minimum speed	2000	7000	RPM	2000		Additional minimum speed enforced during a defrost phase.
55	0037	Application alarm shadows clearance mode	0	1		1		State transition associated with the clearance of an application's alarm shadows. 0 = When leaving the alarm state 1 = When entering a control state (a state that is not off or alarm) Emerson strongly advises on setting this property to 0. The default value is set to 1 for backwards compatibility reasons.
56	0038	Alarm pause delay enforcement	0	1		0		Conditions of application of the alarm pause delay in case of alarm. Valid for application and circuit objects. 0 = If a compressor is running 1 = Unconditionally Emerson strongly advises on setting this property to 1. The default value is set to 0 for backwards compatibility reasons.
57	0039	VS alarms severity	0	1		1		Degree of severity of the variable speed alarms. 0 = Not severe, circuit can carry on 1 = Severe, circuit cannot carry on The default value of the parameter is 1 (severe). The default value is therefore NOT backwards compatible with versions prior to version 16.
61	003D	Oil recovery cycle speed	1200	6200	RPM	3500		Speed at which the compressor will run during the oil recovery cycle.
62	003E	Oil recovery detection speed	1000	6200	RPM	2200		Compressor running below this speed for oil recovery threshold duration (index 64), will trigger oil recovery cycle.
63	003F	Oil recovery cycle duration	0	30000	s	120		Compressor will run for this amount of time at oil recovery speed (index 61).

64	0040	Oil recovery detection duration	0	30000	s	7200		Compressor running for this amount of time below threshold value (index 62), will trigger an oil recovery cycle. Timer is reset when going back above threshold value.
65	0041	Circuit 2 cooling control mode	0	1		0		0 = self-adapting PID parameter 1 = manual PID parameter set
66	0042	Defrost detection delta threshold	1	12	K	5	1/100	Threshold value for defrost detection. Relative of delta temp (evap. – ambient) larger than a minimum value initiates a defrost. The minimum value is logged over the heating process and reset after a defrost. // Under construction
67	0043	Circuit 2 heating superheat setpoint	5.0	20.0	°C	5.0	1/100	Superheat setpoint used on the second circuit in heating mode.
68	0044	Circuit 2 cooling superheat setpoint	0.0	20.0	°C	5.0	1/100	Superheat setpoint used on the second circuit in cooling mode. If setpoint is configured below 5K, low superheat performance improvement (LSPi) will be activated.
69	0045	FREMAR frequency band	0	500	RPM	0		FREquency Management to Avoid Resonances. Hidden Frequency band centered to Freq. 1,2,3.
70	0046	FREMAR frequency 1	0	6200	RPM	0		Hidden center frequency 1 (0 RPM = disabled)
71	0047	FREMAR frequency 2	0	6200	RPM	0		Hidden center frequency 2 (0 RPM = disabled)
72	0048	FREMAR frequency 3	0	6200	RPM	0		Hidden center frequency 3 (0 RPM = disabled)
73	0049	Defrost detection delta absolute threshold	2.0	25.0	K	7.0	1/100	Threshold value for demand defrost detection. Absolute of delta temp (evap. – ambient) larger than threshold value initiates a defrost. // Under construction
74	004A	Pack control popup speed	1000	7500	RPM	5000		Increased speed used during variable speed compressor startup to help pressure separation (used if differential pressure on circuit 1 is smaller than cfg. 109).
75	004B	Maximum compressor speed	4500	7500	RPM	7500		Speed limit value in RPM in heating and cooling mode for artificial hardware limitation
76	004C	EXV capacity ratio band	0.0	300.0	%	0.5	1/100	Tolerance band (dead band), applied to a capacity change to enhance valve control.
78	004E	Circuit 2 heating control mode (EXV)	0	1		0		0 = self-adapting PID parameter 1 = manual PID parameter set
80	0050	Capacity source signal [*]	0	0		0		0 = Modbus 1 = Voltage
81	0051	EXV capacity scaling factor	0	100	%	90		Percentage of EXV capacity change actually applied.
83	0055	Circuit 1 Accessory power initial value	0	10000	W	150		Initial value to add as accessories electrical power consumption for COP computation.
84	0054	Circuit 2 Accessory power initial value	0	10000	W	150		Initial value to add as accessories electrical power consumption for COP computation.
85	0055	Pack control over capacity tolerance	0	25.0	%	5.0	1/100	Capacity request tolerance (dead band) above which we remove a fixed compressor.
86	0056	Pack control protection coupling	0	1		1		Enables or disables the coupling of the protections. That is the effect of a protection on the opposite circuit. This parameter should be off in the case of dissociated or independent unit types.
87	0057	Pack control accurate variable speed matching	0	1		0		Allow VS compressor speed adaptation when the current capacity is inside the capacity matching tolerance band. 0 = Disallowed 1 = Allowed This parameter is meaningful only if the unit is defined with a variable speed compressor.
88	0058	Circuit 1 cooling start-up duration	1	600	s	5		Time span with fixed valve opening during start-up.
90	005A	Circuit 1 cooling start-up speed	2700	4500	RPM	3000		Speed applied to the compressor during cooling start-up duration.
93	005D	Modbus slave address	1	63		7		Configurable Modbus slave address.
94	005E	4-way valve resting position [*]	0	1		0		Four-way control logic The logic is identical for both circuits 0: Cooling Open-circuit, Heating Closed-circuit 1: Cooling Closed-circuit, Heating Open-circuit

95	005F	Circuit 1 fixed speed 1 type [*]	0	6		0	R410A 0 = ZP122 1 = ZP292 R32 2 = YP137K1T-TFD 3 = YP154K1T-TFD 4 = YP182K1T-TFD 5 = YP232K1T-TED 6 = YP292K1T-TED 7 = n/a R410A 8 = ZP104 9 = ZP154 10 = ZP182 11 = ZP232 R32 12 = YP385K1T-TED 13 = YP485K1T-TED 14 = YP83K1T-TFD 15 = YP91K1T-TFD 16 = YP104K1T-TFD 17 = YP122K1T-TFD R410A 18 = ZP385 19 = ZP485 R290 20 = YH23 21 = YH28 22 = YH33 23 = YH38
96	0060	EXV type [*]	0	6		0	0 = undefined 1 = n/a 2 = EX4-6 3 = Customer version 1 (S) 4 = Customer version 2 (C) 5 = n/a 6 = EX7
99	0063	Pack control add delay	0	600	S	20	Delay enforced prior to adding a compressor.
100	0064	Pack control remove delay	0	600	S	20	Delay enforced prior to removing a compressor.
101	0065	Operating point speed limit	0.0	20.0	°C/s	0.5	¹ / ₁₀₀ Maximum rate of change above which pack control is delayed.
103	0067	Pack control defrost add delay	5	1800	S	10	Delay enforced prior to adding a compressor when the pack controller is in defrost mode.
104	0068	Modbus slave baud rate	0	2	bps	1	0 = 9600 1 = 19200 2 = 38400
105	0069	Modbus slave parity	0	3		1	0 = no parity, 2 stop bits 1 = even parity, 1 stop bit 2 = odd parity, 1 stop bit 3 = no parity, 1 stop bit
106	006A	Pack compressor minimum running time	30	1000	s	240	The minimum running time of a compressor after it is started.
107	006B	Pack compressor minimum stopping time	30	1000	s	120	The minimum shutdown time of a compressor after it is stopped.
109	006D	4-way valve switch min delta P	0	10	bar	3	¹ / ₁₀₀ The minimum pressure difference which allows the four-way to swap its position.
110	006E	Before defrost delay	0	120	s	0	Delay enforced before a defrost cycle.
111	006F	EXV 2 type [*]	0	6		0	0 = undefined 1 = n/a 2 = EX4-6 3 = Customer version 1 (S) 4 = Customer version 2 (C) 5 = n/a 6 = EX7
112	0070	Low superheat alarm enable	0	1		1	Enables the low superheat alarm. 0 = disable 1 = enable
117	0075	Automatic defrost detection	0	1		0	Enables the automatic defrost detection.

							0: Disabled 1: Enabled
121	0079	Circuit 2 Cooling start-up duration	1	600	s	5	Time span with fixed valve opening during start-up.
123	007B	Circuit 2 Heating start-up duration	1	60	s	5	Time span with fixed valve opening during start-up.
124	007C	VS drive control rate	10	100	RPM/s	10	Maximum speed change allowed for the variable speed compressor during a control phase.
125	007D	Pack control under capacity tolerance	0	25.0	%	5.00	1/100 Capacity request tolerance (dead band) below which we add a fixed compressor.
126	007E	Before heating delay	0	120	s	60	Delay enforced before starting in heating mode.
127	007F	Circuit 1 LSPI control Kp	0	10.0		1.0	1/1000 Kp applied when unit is in low superheat performance improvement (LSPI). Contact application engineering before modifying any of the LSPI related parameters
128	0080	Circuit 1 LSPI control Ki	0	10.0		0.015	1/1000 Ki applied when unit is in low superheat performance improvement (LSPI). Contact application engineering before modifying any of the LSPI related parameters
129	0081	Circuit 1 LSPI control Kd	0	10.0		1.5	1/1000 Kd applied when unit is in low superheat performance improvement (LSPI). Contact application engineering before modifying any of the LSPI related parameters
130	0082	Before cooling delay	0	120	s	60	Delay enforced before starting in cooling mode.
131	0083	Circuit 2 LSPI control Kp	0	10.0		1.0	1/1000 Kp applied when unit is in low superheat performance improvement (LSPI). Contact application engineering before modifying any of the LSPI related parameters
132	0084	Circuit 2 LSPI control Ki	0	10.0		0.015	1/1000 Ki applied when unit is in low superheat performance improvement (LSPI). Contact application engineering before modifying any of the LSPI related parameters
133	0085	Circuit 2 LSPI control Kd	0	10.0		1.5	1/1000 Kd applied when unit is in low superheat performance improvement (LSPI). Contact application engineering before modifying any of the LSPI related parameters
134	0086	Oil recovery cycle fixed speed count	0	3		2	For fixed speed compressors only circuit! Number of compressors that will run during an oil recovery cycle.
135	0087	Oil recovery detection fixed speed count	0	3		1	For fixed speed compressors only circuit! Number of compressors running (and below) that will trigger an oil recovery cycle after [cfg. 137] seconds
136	0088	Oil recovery cycle fixed speed duration	30	3600		60	For fixed speed compressors only circuit! Duration of an oil recovery cycle
137	0089	Oil recovery detection fixed speed duration	0	32400		7200	For fixed speed compressors only circuit! Time during which the number of compressors must be equal or below [cfg. 135] to trigger an oil recovery cycle. ! The oil recovery timer is only cleared on power up and on oil recovery.
150	0096	DO4 Meaning [*]	0	3		1	If compressor 1.3 is not available, then Relay 4 can be used to indicate some PEC status. 0: Alarm, negative logic (alarm = relay open) 1: Alarm, positive logic (alarm = relay closed) 2: Drive active, positive logic (speed <= 0 = relay closed) 3: Inactive
151	0097	Defrost envelope alarm delay	0	60	s	60	Envelope alarm disabled for this amount of time during defrost startup.
152	0098	Circuit 2 defrost start-up duration	1	600	s	10	Time span with fixed valve opening during start-up
153	0099	Circuit 2 defrost start-up opening	0	100	%	10	Fixed valve opening applied during start-up duration
157	009D	Circuit 1 heating Start-up Opening At -15°C ambient	0	100	%	35	Valve opening applied during start-up duration at -15 ambient temp.
158	009E	Circuit 1 heating Start-up Opening At +15°C ambient	0	100	%	35	Valve opening applied during start-up duration at +15 ambient temp.

159	009F	Circuit 1 cooling Start-up Opening At -29°C evap.	0	100	%	35		Valve opening applied during start-up duration at -29 ambient temp.
160	00A0	Circuit 1 cooling Start-up Opening At +27°C evap.	0	100	%	35		Valve opening applied during start-up duration at +27 ambient temp.
161	00A1	Circuit 2 heating Start-up Opening At -15°C ambient	0	100	%	35		Valve opening applied during start-up duration at -15 ambient temp.
162	00A2	Circuit 2 heating Start-up Opening At +15°C ambient	0	100	%	35		Valve opening applied during start-up duration at +15 ambient temp.
163	00A3	Circuit 2 cooling Start-up Opening At -29°C evap.	0	100	%	35		Valve opening applied during start-up duration at -29 ambient temp.
164	00A4	Circuit 2 cooling Start-up Opening At +27°C evap.	0	100	%	35		Valve opening applied during start-up duration at +27 ambient temp.
188	00BC	4-way Switching Max Delta P	0	50	bar	10	$1/100$	The maximum pressure difference which allow the four-way to swap its position.
189	00BD	Pre-opening minimum opening (cooling)	5	100	%	10		The minimum opening produced during a pressure difference reduction phase. <i>If the 4-way is in cooling.</i>
190	00BE	Pre-opening Kp (cooling)	1.00	10.00		4.00	$1/1000$	The Kp used for pre-opening regulation. (There is no Ki and no Kd) The Kp scales the error between the pressure difference and the maximum delta pressure. <i>If the 4-way is in cooling.</i>
191	00BF	Pre-opening minimum opening (heating)	5	100	%	50		The minimum opening produced during a pressure difference reduction phase. <i>If the 4-way is in heating.</i>
192	00C0	Pre-opening Kp (heating)	1.00	10.00		4.00	$1/1000$	The Kp used for pre-opening regulation. (There is no Ki and no Kd) The Kp scales the error between the pressure difference and the maximum delta pressure. <i>If the 4-way is in heating.</i>
193	00C1	Transition to cooling stabilization delay	0	600	s	30		Additional stabilizing time enforced when the heating to cooling or heating to defrost phases have ended.
194	00C2	Transition to heating stabilization delay	0	600	s	30		Additional stabilizing time enforced when the cooling to heating or defrost to heating phases have ended.
202	00CA	VS drive shutdown rate	60	360	RPM/s	200		This rate is also used to set the drive's maximum ramp up and ramp down rates
205	00CD	Compound valve capacity ratio [*]	0.0	10.0		1.0	$1/1000$	Ratio of valve 1 capacity compared to valve 2 capacity. A ratio of 10 will disable valve 2 and allow regular single valve control
206	00CE	Compound valve activation percentage [*]	0	100.0	%	30.0	$1/100$	The compound percentage at which valve 2 starts to open
207	00CF	Pack base load compressor of circuit 1	-1	3		-1		-1 = Disabled 1 = Fixed speed 1 2 = Fixed speed 2 3 = Fixed speed 3
208	00D0	Pack base load compressor of circuit 2	-1	3		-1		-1 = Disabled 1 = Fixed speed 1 2 = Fixed speed 2 3 = Fixed speed 3
209	00D1	Pack circuit minimization / maximization	0	2		1		0 = Off 1 = Minimization 2 = Maximization
210	00D2	Minimum compressor speed	1000	2600	RPM	1000		Speed limit value in RPM in heating and cooling mode for artificial hardware limitation
211	00D3	Discharge temperature setpoint delta	-20.0	-5.0	K	-10.0	$1/100$	Temperature offset applied to the compressor limit temperature for the discharge control setpoint
212	00D4	Pack control defrost start-up speed duration	5	120	s	10		This parameter is only valid for a defrost starting after a transition with a stop.
213	00D5	Valve control mode [*]	0	1		0		0 : Regular 1 : Compound. Use the 2 available valves as 1 single valve. This compound mode cannot be used on a double circuit unit.
214	00D6	DO2 Meaning [*]	0	3		3		If compressor 1.1 is not available, then Relay 4 can be used to indicate some PEC status. 0: Alarm, negative logic (alarm = relay open)

							1: Alarm, positive logic (alarm = relay closed) 2: Drive active, positive logic (speed <> 0 = relay closed) 3: Inactive
215	00D7	DO3 Meaning [*]	0	3		3	If compressor 1.2 is not available, then Relay 4 can be used to indicate some PEC status. 0: Alarm, negative logic (alarm = relay open) 1: Alarm, positive logic (alarm = relay closed) 2: Drive active, positive logic (speed <> 0 = relay closed) 3: Inactive
216	00D8	Circuit 1 fixed speed 2 type [*]	0	6		0	See Modbus address 95
217	00D9	Circuit 1 fixed speed 3 type [*]	0	6		0	See Modbus address 95
218	00DA	Circuit 2 fixed speed 1 type [*]	0	6		0	See Modbus address 95
219	00DB	Circuit 2 fixed speed 2 type [*]	0	6		0	See Modbus address 95
220	00DC	Circuit 2 fixed speed 3 type [*]	0	6		0	See Modbus address 95
221	00DD	Circuit alarm shadows clearance mode	0	1		0	State transition associated with the clearance of a circuit's alarm shadows. 0 = When leaving the alarm state 1 = When entering a control state (a state that is not off or alarm)
222	00DE	Pack control prevention zone width	2.5	10.0	K	5.0	¹ / ₁₀₀ Width in kelvins of the no fixed speed addition zone in the compressor envelopes.
224	00E0	Pack control over capacity protection	0	1		0	0 = Disabled 1 = Enabled When enabled, the pack controller will forbid VS accelerations in situations of over capacity.
225	00E1	Pack control smooth addition	0	1		0	0 = Disabled 1 = Enabled In envelope prevention situations, if a fixed speed compressor is needed, the VS will first slow down to minimum speed before adding the needed compressor.

[*] This register is critical and can only be modified while the unit is not running. See 2.3.5.

3.2 Read Data

Modbus address dec.	Modbus address hex.	Description	Min	Max	Unit	Scale	Remarks
256	0100	PeC revision	0	0xFFFF			Software version label
257	0101	Boot loader revision	0	255			Internal boot loader revision
258	0102	Circuit 1 suction pressure	-327.68	327.67	barg	1/100	P1 pressure at suction port of compressor
259	0103	Circuit 1 discharge pressure	-327.68	327.67	barg	1/100	P2 pressure at discharge port of compressor
260	0104	Circuit 1 PHX temperature	-327.68	327.67	°C	1/100	T1 temperature at plate heat exchanger outlet (in cooling mode).
261	0105	Circuit 1 compressor suction temperature	-327.68	327.67	°C	1/100	T2 temperature at compressor suction
262	0106	Ambient temperature	-327.68	327.67	°C	1/100	T3 temperature from ambient sensor
263	0107	Circuit 1 liquid temperature	-327.68	327.67	°C	1/100	T4 temperature at the condenser outlet
264	0108	Circuit 1, compressor 1 disch. temp.	-327.68	327.67	°C	1/100	T5 temperature of compressor #1 (variable / fixed speed compressor)
265	0109	Circuit 1, compressor 2 disch. temp.	-327.68	327.67	°C	1/100	T6 temperature of compressor #2
266	010A	Circuit 1, compressor 3 disch. temp.	-327.68	327.67	°C	1/100	T7 temperature of compressor #3
267	010B	Voltage input	-327.68	327.67	V	1/100	Currently not supported.
268	010C	Circuit 2 suction pressure	-327.68	327.67	barg	1/100	P3 pressure at suction port of compressor
269	010D	Circuit 2 discharge pressure	-327.68	327.67	barg	1/100	P4 pressure at discharge port of compressor
270	010E	Circuit 2 PHX temperature	-327.68	327.67	°C	1/100	T8 temperature at plate heat exchanger outlet (in cooling mode).
271	010F	Circuit 2 compressor suction temperature	-327.68	327.67	°C	1/100	T9 temperature at compressor suction
272	0110	Circuit 2 liquid temperature	-327.68	327.67	°C	1/100	T10 temperature at the condenser outlet
273	0111	Circuit 2, compressor 1 disch. temp.	-327.68	327.67	°C	1/100	T11 temperature of compressor #1
274	0112	Circuit 2, compressor 2 disch. temp.	-327.68	327.67	°C	1/100	T12 temperature of compressor #2
275	0113	Circuit 2, compressor 3 disch. temp.	-327.68	327.67	°C	1/100	T13 temperature of compressor #3
276	0114	Circuit 1 Alarm1 shadow					Value of the alarm 1 field from the last "alarm-state" occurrence.
279	0117	Circuit 1 Alarm 2 shadow					Value of the alarm 2 field from the last "alarm-state" occurrence.
280	0118	Digital inputs	0	32767			Bit field representing the active inputs. Bit 0 = Heating/Cooling (currently not supported) Bit 1 = Demand (currently not supported) Bit 2 = Feedback safety circuit 1 Bit 3 = Feedback safety circuit 2 Bit 4 = Power loss indication All other bits are not used
		Digital outputs	0	32767			Bit field representing the active outputs. Bit 0 = Circuit 2 4-way valve Bit 1 = Circuit 2 fixed speed compressor #1 Bit 2 = Circuit 2 fixed speed compressor #2 Bit 3 = Circuit 2 fixed speed compressor #3 Bit 4 = Circuit 1 4-way valve Bit 5 = Circuit 1 fixed speed compressor #1 Bit 6 = Circuit 1 fixed speed compressor #2 Bit 7 = Circuit 1 fixed speed compressor #3 All other bits are unused.
282	011A	Circuit 1 valve opening	0	32767	%	1/100	Current opening EXV valve
283	011B	Circuit 1 evaporator superheat	-327.68	327.67	K	1/100	Superheat measured at evaporator outlet (in cooling mode).
284	011C	Circuit 1 superheat setpoint	0	327.67	K	1/100	Evaporator superheat setpoint processed by the logic at current operating conditions (note: this may be different from the user-configured setpoint).
285	011D	Circuit 2 valve opening	0	327.67	K	1/100	Current opening EXV valve
286	011E	Circuit 2 evaporator superheat	-327.68	327.67	K	1/100	Superheat measured at evaporator outlet (in cooling mode).
287	011F	Circuit 1 Hardware Alarm 1 shadow					Value of the hardware alarm 1 field from the last "alarm-state" occurrence.

288	0120	Unit's COP	0	32.767	1/1000		Actual calculated COP based on coefficients
289	0121	Circuit 1 Hardware Alarm 2 shadow					Value of the hardware alarm 2 field from the last "alarm-state" occurrence.
290	0122	Circuit 1 differential pressure	0	327.67	barg	1/100	Pressure difference between the discharge and the suction pressures on circuit 1.
291	0123	Compressor running speed	0	7000	RPM	1/100	Actual running speed of variable speed compressor.
292	0124	Circuit 1 evaporating temperature	-327.68	327.67	°C	1/100	Evaporating temperature computed from suction pressure. (index 258)
293	0125	Circuit 1 compressor superheat	-327.68	327.67	K	1/100	Superheat computed at compressor inlet.
294	0126	Circuit 1 condensing temperature	-327.68	327.67	°C	1/100	Condensing temperature computed from discharge pressure. (index 259)
295	0127	Alarm set 1 (Software alarms) (clears automatically once the controller is in alarm state)					Bit 0: Circuit 1 low pressure Bit 1: Circuit 1 low superheat Bit 2: Circuit 1 high superheat Bit 3: Circuit 2 defrost termination overtime Bit 4: Circuit 2 4-way valve insufficient press. diff. Bit 5: Circuit 1 refrigerant loss (warning) Bit 6: Circuit 1 high condensing pressure Bit 7: Circuit 1 envelope Tc low (warning) Bit 8: Circuit 1 envelope Tc high (warning) Bit 9: Circuit 1 envelope Te low (warning) Bit 10: Circuit 1 envelope Te high (warning) Bit 11: Circuit 1 freeze Alarm Bit 12: Circuit 1 envelope alarm Bit 13: Circuit 1 defrost termination overtime Bit 14: Circuit 1 compressor 1 high discharge temp. Bit 15: Circuit 2 superheat low
296	0128	Alarm set 2 (Software alarms) (clears automatically once the controller is in alarm state)					Bit 0: Circuit 2 superheat high Bit 1: Circuit 2 refrigerant loss(warning) Bit 2: Circuit 1 compressor 2 high discharge temp. Bit 3: Circuit 1 compressor 3 high discharge temp. Bit 4: Circuit 2 low pressure Bit 5: Circuit 2 high condensing pressure Bit 6: Circuit 2 compressor 1 high discharge Bit 7: Circuit 2 compressor 2 high discharge Bit 8: Circuit 2 compressor 3 high discharge Bit 9: Circuit 2 envelope Tc low(warning) Bit 10: Circuit 2 envelope Tc high(warning) Bit 11: Circuit 2 envelope Te low(warning) Bit 12: Circuit 2 envelope Te high(warning) Bit 13: Circuit 2 envelope alarm Bit 14: Circuit 2 freeze alarm Bit 15: Circuit 1 4-way valve insufficient press. diff.
297	0129	Hardware Alarm set 1 Triggers direct alarm state/shutdown (clears automatically once alarm conditions are mitigated)					Bit 0: P1 sensor Bit 1: P2 sensor Bit 2: T1 sensor Bit 3: T2 sensor Bit 4: T3 sensor Bit 5: T4 sensor Bit 6: T5 sensor Bit 7: T6 sensor Bit 8: T7 sensor Bit 9: P3 sensor Bit 10: P4 sensor Bit 11: T8 sensor Bit 12: T9 sensor Bit 13: T10 sensor Bit 14: T11 sensor Bit 15: T12 sensor
298	012A	Hardware Alarm set 2 Triggers direct alarm state/shutdown (clears automatically once alarm conditions are mitigated)					Bit 0: T13 sensor Bit 1: VS Drive communication Bit 2: EEPROM failure Bit 3: System controller communication timeout (30s timeout, any new communication resets the timer and clears the alarm) Bit 4: VS Drive alarm Bit 5: VS Drive configuration alarm Bit 6: Circuit 1 feedback safety Bit 7: Circuit 2 feedback safety Bit 8: System power loss

						Bit 9: VS Drive locked (needs 2 minutes power off cycle on drive to reset) Bit 10: Valve configuration alarm Bit 11: Valve 1 alarm Bit 12: Valve 2 alarm Bit 13: VS Drive startup alarm Bit 14: Pack configuration alarm Bit 15: n/a
299	012B	Application Alarm1 shadow				Value of the alarm 1 field from the last "alarm-state" occurrence.
300	012C	Application Alarm2 shadow				Value of the alarm 2 field from the last "alarm-state" occurrence.
301	012D	Application Hardware Alarm 1 shadow				Value of the hardware alarm 1 field from the last "alarm-state" occurrence.
302	012E	Application Hardware Alarm 2 shadow				Value of the hardware alarm 2 field from the last "alarm-state" occurrence.
303	012F	Circuit 2 compressor superheat	-327.68	327.67	K	$\frac{1}{100}$ Superheat at compressor inlet on circuit 2.
305	0131	Drive power up status	0	1		0 = unpowered 1 = powered
306	0132	Circuit 2 differential pressure	0	327.67	barg	$\frac{1}{100}$ Pressure difference between the discharge and the suction pressures on circuit 2.
307	0133	Drive safe torque off signal	0	1		Only valid for CT Drive. Drive enable. 0 = Disable 1 = Enable
308	0134	Drive Motor Phase current	0	327.67	A	$\frac{1}{100}$ Valid only for EV3 Drive. Phase current (RMS) from inverter to motor.
310	0136	Circuit 1 Hardware Alarm 3 shadow				Value of the hardware alarm 3 field from the last "alarm-state" occurrence.
311	0137	VS Drive AC line current	0	327.67	A	$\frac{1}{100}$ Current drawn from main supply.
312	0138	Drive first fault 1				See [cfg. 495]
313	0139	Drive first fault 2				See [cfg. 496]
314	013A	Drive first fault 3				See [cfg. 497]
315	013B	Drive first fault 4				See [cfg. 498]
316	013C	VS Speed drop status				Bit 0: Configuration Status Bit 1: Speed Foldback Bit 2: PFC Temperature Foldback Bit 3: AC Input Current Foldback Bit 4: Compressor Phase Current Bit 5: Compressor Power Module Temperature Bit 6: DLT Temperature Bit 7: Envelope Bit 8: Autosaved Data Bit 9: Torque limit Bit 10: Ambient Temperature Bit 11: n/a Bit 12: Outside Compressor Envelope Bit 13-15: n/a
318	013E	Circuit 2 Alarm1 shadow				Value of the alarm 1 field from the last "alarm-state" occurrence.
319	013F	Circuit 2 Alarm2 shadow				Value of the alarm 2 field from the last "alarm-state" occurrence.
320	0140	Speed Demand	0	7000	RPM	Speed computed to meet capacity request at current operating conditions (note: this is not the actual running speed of the compressor).
321	0141	Circuit 1 Pack controller mode				0 = Idle 1 = Normal 2 = Prepare 4 way reversal 3 = Defrost 4 = Startup
322	0142	Pack controller state				0 = Keep 1 = Remove pending (waiting the remove delay time before removing a compressor) 2 = Removing (attempting to remove a compressor) 3 = Add pending (waiting the add delay time before adding a compressor) 4 = Adding (attempting to add a compressor)
323	0143	Circuit 2 evaporating temperature	-327.68	327.67	°C	$\frac{1}{100}$ Evaporating temperature computed from suction pressure. (index 268)

324	0144	Circuit 2 condensing temperature	-327.68	327.67	°C	1/100	Condensing temperature computed from discharge pressure. (index 269)
325	0145	Circuit 1 variable speed compressor delay before start/stop	0	1000	s		When the compressor is running or stopped, this variable indicates the time left before it can be stopped or started respectively. A value of 0 indicates that the compressor can be stopped/started without any delay.
326	0146	Circuit 1 fixed speed compressor 2 delay before start/stop	0	1000	s		When the compressor is running or stopped, this variable indicates the time left before it can be stopped or started respectively. A value of 0 indicates that the compressor can be stopped/started without any delay.
327	0147	Circuit 1 fixed speed compressor 3 delay before start/stop	0	1000	s		When the compressor is running or stopped, this variable indicates the time left before it can be stopped or started respectively. A value of 0 indicates that the compressor can be stopped/started without any delay.
328	0148	Circuit 1's COP	0	32.767	1/1000		Actual calculated COP based on coefficients
329	0149	Circuit 2's COP	0	32.767	1/1000		Actual calculated COP based on coefficients
330	014A	Unit's SCOP	0	32.767	1/1000		Seasonal Coefficient Of Performance in heating
331	014B	Circuit 1 heating state	0	5			0 = Off 1 = Start-up (Fixed start-up valve opening) 2 = na 3 = Superheat control 4 = MOP protection 5 = Discharge protection
332	014C	Hardware Alarm set 3					Bit 0: Tier II board # 1 communication (smart only) Bit 1: Tier II board # 2 communication (smart only) Bit 2: Tier II board # 3 communication (smart only) Bit 3: Tier II board # 4 communication (smart only) Bit 4: Tier II board # 5 communication (smart only) Bit 5: Tier II board # 6 communication (smart only) Bit 6: Circuit 1 emergency off Bit 7: Circuit 2 emergency off Bit 8: Circuit 1 compressor 1 emergency off Bit 9: Circuit 1 compressor 2 emergency off Bit 10: Circuit 1 compressor 3 emergency off Bit 11: Circuit 2 compressor 1 emergency off Bit 12: Circuit 2 compressor 2 emergency off Bit 13: Circuit 2 compressor 3 emergency off Bit 14: Circuit 1 compressor 2 oil cooling Bit 15: Circuit 2 compressor 2 oil cooling
334	014E	Application Hardware Alarm 3 shadow					Value of the hardware alarm 3 field from the last "alarm-state" occurrence.
337	0151	Circuit 2 Hardware Alarm 1 shadow					Value of the hardware alarm 1 field from the last "alarm-state" occurrence.
338	0152	Application state					0 : Off (compressor off and disconnected, EXVs closed, alarms-, shadows & -relay/bit and "Alarm pause"-counter cleared!) 1 : Cooling 2 : Heating 3 : Alarm (Compressor is shut down, write alarm shadow & alarm history, raise alarm-relay/bit) 4 : Heating to cooling (EXV opening and speed will transit to start up opening and 2700 RPM) 5 : Defrost (Defrost procedure is performed) 6 : Waiting (after "alarm state", at the end Alarm, -shadow and alarm-relay is cleared) 7 : Stand by (Stator heating is on) 8 : Cooling to heating 9 : Shutdown (Ramping down compressor) 10 : Manual

						(Caution! All actuators are in "Manual control" without any safety protection by PeC!)	
						11 : Compressor start (Start to reverse cycle)	
						12 : EVU Lock	
						13 : Heating to defrost	
						14 : Defrost to heating	
						15 : Emergency shutdown	
339	0153	Circuit 2 Hardware Alarm 2 shadow				Value of the hardware alarm 2 field from the last "alarm-state" occurrence.	
340	0154	Circuit 1 cooling state	0	4		0 = Idle (No capacity demand) 1 = Startup (Fixed start-up valve opening) 2 = na 3 = Superheat control 4 = Low superheat control 5 = Discharge protection	
341	0155	Circuit 1 valve 1 opening	0	327.67	%	1/100	Valid only if compound valve mode is selected Current opening of EXV valve 1
342	0156	Circuit 1 valve 2 opening	0	327.67	%	1/100	Valid only if compound valve mode is selected Current opening of EXV valve 2
343	0155	Circuit 2 fixed speed compressor 1 delay before start/stop	0	1000	s		When the compressor is running or stopped, this variable indicates the time left before it can be stopped or started respectively. A value of 0 indicates that the compressor can be stopped/started without any delay.
344	0156	Circuit 2 fixed speed compressor 2 delay before start/stop	0	1000	s		When the compressor is running or stopped, this variable indicates the time left before it can be stopped or started respectively. A value of 0 indicates that the compressor can be stopped/started without any delay.
345	0157	Circuit 2 fixed speed compressor 3 delay before start/stop	0	1000	s		When the compressor is running or stopped, this variable indicates the time left before it can be stopped or started respectively. A value of 0 indicates that the compressor can be stopped/started without any delay.
346	0158	Circuit 2 Hardware Alarm 3 shadow					Value of the hardware alarm 3 field from the last "alarm-state" occurrence.
348	015C	VSS Speed control state	0	5			0 = Idle 1 = Startup (fixed start-up compressor speed) 2 = Popped up 3 = Control
349	015D	Circuit 1 Defrost delta	-30.0	30.0	K	1/100	Temperature difference between the ambient temperature and the evaporating temperature on circuit 1.
350	015E	Circuit 1 fixed speed compressor 1 delay before start/stop	0	1000	s		When the compressor is running or stopped, this variable indicates the time left before it can be stopped or started respectively. A value of 0 indicates that the compressor can be stopped/started without any delay.
351	015F	Circuit 1 defrost state	0	2			0 = Idle 1 = Control 2 = Done
352	0160	Capacity request	0	100	%		Capacity request (in percentage of the maximum total capacity at the current operating point).
353	0161	Circuit 2 Defrost delta	-30.0	30.0	K	1/100	Temperature difference between the ambient temperature and the evaporating temperature on circuit 2.
354	0162	VSS Drive input current	0	30.0	A	1/100	Computed drive input current from compressor coefficients.
355	0163	Circuit 2 defrost state	0	2			0 = Idle 1 = Control 2 = Done
356	0164	Circuit 1 pressure ratio	0	30.0		1/100	Ratio of absolute discharge pressure divided by suction pressure.
357	0165	Circuit 2 pressure ratio	0	30.0		1/100	Ratio of absolute discharge pressure divided by suction pressure.
358	0166	Unit's SEER	0	32.767		1/1000	Seasonal Coefficient Of Performance in cooling
359	0167	Circuit 1 Defrost trigger	0	327.67	K	1/100	Normalized temperature difference between ambient and evap. temp. (ΔT - Δth3) Compared to configured threshold values 66, 73 to initiate a defrost

360	0168	Stator heater power	0	25	W		Stator heater power mirrored from configured value.
361	0169	Pack control next compressor position	-1	10			Position of the next compressor to be added or removed. -1 = No compressor 0 = Circuit 1 VS 1 1 = Circuit 1 FS 1 2 = Circuit 1 FS 2 3 = Circuit 1 FS 3 4 = n/a 5 = n/a 6 = Circuit 2 FS 1 7 = Circuit 2 FS 2 8 = Circuit 2 FS 3
362	016A	Drive minimum speed	0	32767	RPM		Minimum drive speed allowable at current operating point.
363	016B	Drive maximum speed	0	32767	RPM		Maximum drive speed allowable at current operating point.
364	016C	EV3 Drive communication failures	0	62536			Number of communication failures from drive since previous start-up.
365	016D	EV3 Drive communication status	0	0xFFFF			Bit 0: Communication failure H Bit 1: Communication failure M Bit 2: Communication failure L Bit 3: Time out H Bit 4: Time out M Bit 5: Time out L Bit 6: Buffer Overflow Bit 7: Write overflow
366	016E	CT Drive communication failures	0	62536			Number of communication failures from drive since previous start-up.
367	016F	CT Drive communication status	0	0xFFFF			Bit 0: Communication failure H Bit 1: Communication failure M Bit 2: Communication failure L Bit 3: Time out H Bit 4: Time out M Bit 5: Time out L Bit 6: Buffer Overflow Bit 7: Write overflow
368	0170	Defrost reason	0	3			0 = Unit start-up 1 = External demand (Modbus) 2 = Timer interval 3 = Digital Input 1 (if enabled) 4 = Absolute trigger (index 73) 5 = Defrost delta variation (index 66) 6 = LOP recovery / Te low recovery
369	0171	Reset reason					Bitfield Bit 0: Power on Bit 1: External reset Bit 2: Watchdog reset Bit 3: Brown out Bit 4: Software reset Bit 5-15: n/a The bitfield is reset 60 seconds after a controller's startup.
370	0172	Pack control next compressor schedule	-1	600			Time left before next compressor addition or removal.
371	0173	Circuit 1 Defrost trigger minimum	-30.0	30.0	K	1/100	Minimum value logged of the defrost trigger (Index 359, since last defrost).
372	0174	Circuit 2 Defrost trigger	0	327.67	K	1/100	Normalized temperature difference between ambient and evap. temp. ($\Delta T - \Delta th3$) Compared to configured threshold values 66, 73 to initiate a defrost
373	0175	Circuit 2 Defrost trigger minimum	-30.0	30.0	K	1/100	Minimum value logged of the defrost trigger (Index 372, since last defrost)
375	0177	Pack needed combination	0	0xFFFF			Bitfield Combination that is intended to be used for the whole unit and for any circuit's mode. Bit 00 : Circuit 1 VS 1 Bit 01 : Circuit 1 FS 1 Bit 02 : Circuit 1 FS 2 Bit 03 : Circuit 1 FS 3 Bit 04 : n/a

						Bit 05 : n/a Bit 06 : Circuit 2 FS 1 Bit 07 : Circuit 2 FS 2 Bit 08 : Circuit 2 FS 3 Bit 09 : n/a Bit 10 : n/a Bit 11 : n/a Bit 12 : n/a Bit 13 : n/a Bit 14 : n/a Bit 15 : n/a
378	017A	Circuit 2 heating state	0	5		0 = Off 1 = Start-up (Fixed start-up valve opening) 2 = na 3 = Superheat control 4 = MOP protection 5 = Discharge protection
379	017B	Circuit 2 cooling state	0	4		0 = Idle (No capacity demand) 1 = Startup (Fixed start-up valve opening) 2 = na 3 = Superheat control 4 = Low superheat control 5 = Discharge protection
380	017C	ED3 Drive communication failures	0	62535		Number of communication failures from drive since previous start-up.
381	017D	ED3 Drive communication status	0	0xFFFF		Bit 0: Communication failure H Bit 1: Communication failure M Bit 2: Communication failure L Bit 3: Time out H Bit 4: Time out M Bit 5: Time out L Bit 6: Buffer Overflow Bit 7: Write overflow
383	017F	Circuit 1 fixed speed 1 capacity	0	6553.5	kW	1/10 Capacity evaluated from the thermodynamic computations.
384	0180	Circuit 1 variable speed capacity	0	6553.5	kW	1/10 Capacity evaluated at current operating point and speed. Mass flow is evaluated from coefficients and enthalpy change from thermodynamic computations.
385	0181	Circuit 1 variable speed maximum capacity	0	6553.5	kW	1/10 Maximum available heating/cooling capacity at current operating point with max. possible speed
386	0182	Circuit 1 variable speed minimum capacity	0	6553.5	kW	1/10 Minimum available heating/cooling capacity at current operating point with min. possible speed
387	0183	Heating Energy (high)	0	2 ¹⁶ - 1	Wh	1/10 Accumulated heating energy, initialized at reset with config read only index 1 [Unit: 1/10 Wh] (MSB part)
388	0184	Heating Energy (low)	0	2 ¹⁶ - 1		Accumulated heating energy, initialized at reset with config read only index 1 [Unit: 1/10 Wh] (LSB part)
389	0185	Electrical Energy Heating mode (high)	0	2 ¹⁶ - 1	Wh	1/10 Accumulated electrical energy in heating mode, initialized at reset with config read only index 2 [Unit: 1/10 Wh]
390	0186	Electrical Energy Heating mode (low)	0	2 ¹⁶ - 1		
391	0187	Cooling Energy (high)	0	2 ¹⁶ - 1	Wh	1/10 Accumulated cooling energy, initialized at reset with config read only index 10 [Unit: 1/10 Wh]
392	0188	Cooling Energy (low)	0	2 ¹⁶ - 1		
393	0189	Electrical Energy Cooling mode (high)	0	2 ¹⁶ - 1	Wh	1/10 Accumulated electrical energy in cooling mode, initialized at reset with config read only index 11 [Unit: 1/10 Wh]
394	018A	Electrical Energy Cooling mode (low)	0	2 ¹⁶ - 1		
395	018B	Internal timer (high)	0	2 ¹⁶ - 1	s	1/10 The second timer the application is using for its time associated tasks.
396	018C	Internal timer (low)	0	2 ¹⁶ - 1		
397	018D	Drive communication monitor	0	300	s	Valid only for CT drive. Keep alive counter of the drive
398	018E	Drive Trip count	0	65535		Valid only for CT drive. The number of trips the drive has encountered so far.
399	018F	Drive System state	0	5		Valid only for CT drive. 0 = Idle

400	0190						1 = Stator heating 2 = Soft-start 3 = Normal running 4 = Defrost cycle 5 = Oil boost 6 = Controlled shutdown 20 = Tripped
		Drive Control word	0	63			Valid only for CT drive. Bit 0 : Start/run Bit 1 : Controlled shutdown Bit 2 : Stator heating control Bit 3 : Defrost cycle trigger Bit 4 : Reset trips if possible Bit 5 : Trip on communication loss
		Drive Active trip	0	255			Valid only for CT drive. Current trip reason
		Drive Configuration	0	65535			Valid only for CT drive. Bit 0: Enable the CSD100 motor thermal model Bit 1: Reserved Bit 2: <u>Disable</u> short cycle protection Bit 3: <u>Disable</u> CSD100 envelope control Bit 4: Reserved Bit 5: Reserved Bit 6: <u>Disable</u> oil control Bit 7: Enable defrost cycle control Bit 8: Select control source for Start/run and stator heater (1: system control word, 0: digital input) Bit 9: <u>Disable</u> DLT protection Bit 10: <u>Disable</u> locked rotor on start indicator Bit 11: <u>Disable</u> reversed rotation indicator Bit 12: <u>Disable</u> lost rotor ride-through Bit 13: <u>Disable</u> DLT temperature transmission Bits 14 to 15: Reserved Nothing in description file
		Drive Trip shadow	0	255			Shadow of the latest active trip CT CSD-100 drive
		Drive Version	0	255		1/100	<major version>.<minor version>
		Circuit 1 fixed speed 2 capacity	0	6553.5	kW	1/10	Capacity evaluated from the thermodynamic computations.
		Circuit 1 fixed speed 3 capacity	0	6553.5	kW	1/10	Capacity evaluated from the thermodynamic computations.
		Circuit 2 fixed speed 1 capacity	0	6553.5	kW	1/10	Capacity evaluated from the thermodynamic computations.
		Max. Available capacity	0	6553.5	kW	1/10	Maximum available heating/cooling capacity at current operating point with max. possible speed
		Circuit 2 fixed speed 2 capacity	0	6553.5	kW	1/10	Capacity evaluated from the thermodynamic computations.
		Circuit 2 fixed speed 3 capacity	0	6553.5	kW	1/10	Capacity evaluated from the thermodynamic computations.
		System capacity	0	6553.5	kW	1/10	The current total system capacity
		Circuit 2 Pack controller mode					0 = Idle 1 = Normal 2 = Prepare 4 way reversal 3 = Defrost 4 = Startup
Pack current combination	0	0xFFFF			Bitfield Combination that is currently running. For the whole unit and for any circuit's mode. Bit 00 : Circuit 1 VS 1 Bit 01 : Circuit 1 FS 1 Bit 02 : Circuit 1 FS 2 Bit 03 : Circuit 1 FS 3 Bit 04 : n/a Bit 05 : n/a Bit 06 : Circuit 2 FS 1 Bit 07 : Circuit 2 FS 2 Bit 08 : Circuit 2 FS 3 Bit 09 : n/a Bit 10 : n/a Bit 11 : n/a		

						Bit 12 : n/a Bit 13 : n/a Bit 14 : n/a Bit 15 : n/a
416	01A0	USB logging index	0	99999		Current alarm file index
417	01A1	Circuit 1 cooling capacity	0	6553.5	kW	1/10
418	01A2	Circuit 2 cooling capacity	0	6553.5	kW	1/10
419	01A3	Circuit 1 variable speed 1 state	0	7		0 = Disabled 1 = Alarm 2 = Startable 3 = Starting 4 = Started 5 = Stoppable 6 = Stopping 7 = Stopped
420	01A4	Circuit 1 fixed speed 1 state	0	7		0 = Disabled 1 = Alarm 2 = Startable 3 = Starting 4 = Started 5 = Stoppable 6 = Stopping 7 = Stopped
421	01A5	Circuit 1 fixed speed 2 state	0	7		0 = Disabled 1 = Alarm 2 = Startable 3 = Starting 4 = Started 5 = Stoppable 6 = Stopping 7 = Stopped
422	01A6	Circuit 1 fixed speed 3 state	0	7		0 = Disabled 1 = Alarm 2 = Startable 3 = Starting 4 = Started 5 = Stoppable 6 = Stopping 7 = Stopped
424	01A8	Circuit 2 fixed speed 1 state	0	7		0 = Disabled 1 = Alarm 2 = Startable 3 = Starting 4 = Started 5 = Stoppable 6 = Stopping 7 = Stopped
425	01A9	Circuit 2 fixed speed 2 state	0	7		0 = Disabled 1 = Alarm 2 = Startable 3 = Starting 4 = Started 5 = Stoppable 6 = Stopping 7 = Stopped
426	01AA	Circuit 2 fixed speed 3 state	0	7		0 = Disabled 1 = Alarm 2 = Startable 3 = Starting 4 = Started 5 = Stoppable 6 = Stopping 7 = Stopped
427	01AB	Logging index (high)	0	65535		Current index used by the internal logging (high part)
428	01AC	Logging index (low)	0	65535		Current index used by the internal logging (high part)
429	01AD	Drive reactive current	0	327.67	A	1/100 Valid only for CT drive.
430	01AE	Drive output frequency	-2000.0	2000.0	Hz	Valid only for CT drive.
431	01AF	Drive output voltage	0	400.0	V	1/100 Valid only for CT drive.

432	01B0	Drive output power	0	100.0	kW	1/100	Valid only for CT drive.
433	01B1	Drive torque producing current	0	327.67	A	1/100	Valid only for CT drive.
434	01B2	Drive analog input 1 destination	0	0			Valid only for CT drive.
435	01B3	Drive analog input 2 destination	0	0			Valid only for CT drive.
436	01B4	Drive analog input 3 destination	0	0			Valid only for CT drive.
438	01B5	Circuit 1 variable speed 1 runtime HI	0	32768	s		Total running time of the variable speed compressor in seconds (MSB part)
439	01B6	Circuit 1 variable speed 1 runtime LO	0	32768	s		Total running time of the variable speed compressor in seconds (LSB part)
440	01B8	Circuit 1 fixed speed 1 runtime HI	0	32768	s		Total running time of the fix compressor 1.1 in seconds (MSB part)
441	01B9	Circuit 1 fixed speed 1 runtime LO	0	32768	s		Total running time of the fix compressor 1.1 in seconds (LSB part)
442	01BA	Circuit 1 fixed speed 2 runtime HI	0	32768	s		Total running time of the fix compressor 1.2 in seconds (MSB part)
443	01BB	Circuit 1 fixed speed 2 runtime LO	0	32768	s		Total running time of the fix compressor 1.2 in seconds (LSB part)
444	01BC	Circuit 1 fixed speed 3 runtime HI	0	32768	s		Total running time of the fix compressor 1.3 in seconds (MSB part)
445	01BD	Circuit 1 fixed speed 3 runtime LO	0	32768	s		Total running time of the fix compressor 1.3 in seconds (LSB part)
448	01C0	Circuit 2 fixed speed 1 runtime HI	0	32768	s		Total running time of the fix compressor 2.1 in seconds (MSB part)
449	01C1	Circuit 2 fixed speed 1 runtime LO	0	32768	s		Total running time of the fix compressor 2.1 in seconds (LSB part)
450	01C2	Circuit 2 fixed speed 2 runtime HI	0	32768	s		Total running time of the fix compressor 2.2 in seconds (MSB part)
451	01C3	Circuit 2 fixed speed 2 runtime LO	0	32768	s		Total running time of the fix compressor 2.2 in seconds (LSB part)
452	01C4	Circuit 2 fixed speed 3 runtime HI	0	32768	s		Total running time of the fix compressor 2.3 in seconds (MSB part)
453	01C5	Circuit 2 fixed speed 3 runtime HI	0	32768	s		Total running time of the fix compressor 2.3 in seconds (MSB part)
454	01C6	USB logging state	0	3			Describes the current status of the USB logging 0 = No stick plugged 1 = Active 2 = Inactive (see w. 551 for further details) 3 = Error (see r. 455 for further details) Once logging is inactive, the only mean to restart it is to unplug the stick and plug it back.
455	01C7	USB logging error	0	29			1 = USB stick failure 10 - 12 = Mass storage failure 20 - 29 = FAT system failure
456	01C8	Circuit 1 variable speed or fixed speed 1 theoretical discharge temperature	0.0	327.67	°C	1/100	Estimated discharge temperature of the circuit considering only its variable speed compressor
457	01C9	Circuit 1 fixed speed 2 theoretical discharge temperature	0.0	327.67	°C	1/100	Estimated discharge temperature of the circuit considering only its variable speed compressor
458	01CA	Circuit 1 fixed speed 3 theoretical discharge temperature	0.0	327.67	°C	1/100	Estimated discharge temperature of the circuit considering only its variable speed compressor
459	01CB	Circuit 2 fixed speed 1 theoretical discharge temperature	0.0	327.67	°C	1/100	Estimated discharge temperature of the circuit considering only its variable speed compressor
460	01CC	Circuit 2 fixed speed 2 theoretical discharge temperature	0.0	327.67	°C	1/100	Estimated discharge temperature of the circuit considering only its variable speed compressor
461	01CD	Circuit 2 fixed speed 3 theoretical discharge temperature	0.0	327.67	°C	1/100	Estimated discharge temperature of the circuit considering only its variable speed compressor
462	01CE	Circuit 2 superheat setpoint	0.0	20.0	K	1/100	
463	01CF	Circuit 1 internal state	0	31			0 = Disabled 1 = Off 2 = Stand-by 3 = Cooling 4 = Cooling after heating 5 = Heating 6 = Heating after defrost 7 = Alarm 8 = Shutdown 9 = Defrost 10 = Cooling to heating without stop 11 = Heating to cooling without stop 12 = Defrost to heating without stop

						13 = Transition stopped 14 = Heating to defrost without stop 15 = Preopening for cooling 16 = Preopening for heating 17 = Preopening for defrost 18 = Syncing for cooling 19 = Syncing for heating 20 = Syncing for defrost 21 = Ready for cooling 22 = Ready for cooling reversal 23 = Ready for heating 24 = Ready for heating reversal 25 = Ready for defrost 26 = Shutdown for alarm 27 = Shutdown for transition 28 = Shutdown for fast transition 29 = Shutdown for emergency 30 = Ready syncing 31 = Heating to defrost starting 32 = Starting cooling 33 = Starting cooling reversal 34 = Starting heating 35 = Starting heating reversal
464	01D0	Circuit 2 internal state	0	31		See Circuit 1 internal state for details
475	01DB	Circuit 1 maximum discharge temp.	0.0	327.67	°C	1/100 The maximum discharge temperature that can be seen on circuit 1. Only the running compressors discharge temperatures are considered.
476	01DC	Circuit 2 maximum discharge temp.	0.0	327.67	°C	1/100 The maximum discharge temperature that can be seen on circuit 2. Only the running compressors discharge temperatures are considered.
477	01DD	Circuit 1 mean discharge temp.	0.0	327.67	°C	1/100 The mean discharge temperature that can be seen on circuit 1. Only the running compressors discharge temperatures are considered.
478	01DE	Circuit 2 mean discharge temp.	0.0	327.67	°C	1/100 The mean discharge temperature that can be seen on circuit 2. Only the running compressors discharge temperatures are considered.
479	01DF	Drive 1 compressor model number	0	32768		Valid only for EV3 drive
480	01E0	Drive 1 high pressure switch type	0	100		Valid only for EV3 drive 0 = disabled (configured value) 1 = not used 100 = normally closed
481	01E1	Drive 1 scroll thermistor model	0	200		Valid only for EV3 drive 0 = n/a (configured value) 100 = inside 200 = outside
482	01E2	Drive 1 torque	0	32768		Valid only for EV3 drive Current torque produced by the compressor
483	01E3	Drive 1 torque limit	0	32768		Valid only for EV3 drive Torque limit below which the drive will stop
484	01E4	Drive 1 DC bus voltage	0	32768		Valid only for EV3 drive
485	01E5	Drive 1 AC line voltage	0	32768		Valid only for EV3 drive
486	01E6	Drive 1 AC line power	0	32768		Valid only for EV3 drive (Not available in 3ph version)
487	01E7	Drive 1 board temperature	0	32768		Valid only for EV3 drive Actual temperature of DSP CPU (lower board)
488	01E8	Drive 1 Inverter Module Ph A Temp.	-327.68	327.67	°C	1/100 Valid only for EV3 drive Actual temperature of inside IGBT component
489	01E9	Drive 1 Inverter Module Ph B Temp.	-327.68	327.67	°C	1/100 Valid only for EV3 drive Actual temperature of inside IGBT component
490	01EA	Drive 1 Inverter Module Ph C Temp.	-327.68	327.67	°C	1/100 Valid only for EV3 drive Actual temperature of inside IGBT component
491	01EB	Drive 1 PFC Module Ph A Temp.	-327.68	327.67	°C	1/100 Valid only for EV3 drive (Not available in 3ph version) temp. inside PFC
492	01EC	Drive 1 PFC Module Ph B Temp.	-327.68	327.67	°C	1/100 Valid only for EV3 drive (Not available in 3ph version) temp. inside PFC
493	01ED	Drive 1 motor temperature	-327.68	327.67	°C	1/100 Valid only for EV3 drive Motor stator temperature
494	01EE	Drive 1 discharge temperature	0	327.67	°C	1/100 Valid only for EV3 drive
495	01EF	Drive 1 faults 1				Valid only for EV3 drive

496	01F0					Bit 0: Compressor Phase Over Current Bit 1: AC Input Over Current (SW) Bit 2: DC Bus Over Voltage (SW) Bit 3: DC Bus Under Voltage Bit 4: AC Input Over Voltage Bit 5: AC Input Under Voltage Bit 6: AC Input Loss of Phase/AC Voltage Imbalance Bit 7: Inverter Desaturation Bit 8: High Pressure Switch Fault Bit 9: Compressor Loss of Phase Bit 10: Loss of Compressor Motor Control Bit 11: Compressor Power Module Over Temp Bit 12: PFC-IGBT Over Temp Bit 13: Compressor Startup Fault Bit 14: Compressor Motor Thermistor Fault Bit 15: Precharge Relay Open
		Drive 1 faults 2				Valid only for EV3 drive Bit 0: DC Voltage Low Bit 1: Compressor Phase Over Current (interm.) Bit 2: Compressor Phase Current Foldback Timeout Bit 3: Compressor Power Module Temperature Fold Back Timeout Bit 4: AC Input Current Foldback Timeout Bit 5: DLT Temperature Timeout Bit 6: Auto Config Communication Timeout Bit 7: Modbus Communication Lost Bit 8: DLT High Temp Bit 9: Compressor Motor Temperature High Bit 10: Board Temperature High Bit 11: Compressor Power Module Temperature High Bit 12: PFC-IGBT Temperature High Bit 13: DSP to PFC Communication Lost Bit 14: Comms to DSP Communication Lost Bit 15: n/a
		Drive 1 faults 3				Valid only for EV3 drive Bit 0: Compressor Phase Current Imbalance Bit 1: 3 Phase PFC Current Imbalance Bit 2: Micro Electronic Fault Bit 3: Motor Overspeed Bit 4: EEPROM Fault Bit 5: High Pressure Transducer Fault Bit 6: Compressor Model Configuration Error Bit 7: High Press. Sensor Type Configuration Error Bit 8: Compressor U-Phase OverCurrent/Sensor Fault Bit 9: Compressor V-Phase OverCurrent/Sensor Fault Bit 10: Compressor W-Phase OverCurrent/Sensor Fault Bit 11: Compressor HW Over Current Bit 12: PFC Current Sensor Fault Bit 13: AC Input Voltage Sensor Fault Bit 14: DC Bus Voltage Sensor Fault Bit 15: Compressor Over Load
		Drive 1 faults 4				Valid only for EV3 drive Bit 0: Inverter Temperature Imbalance Bit 1: PFC Temp Imbalance Bit 2: DLT Temp Sensor Open or Short Fault Bit 3: Motor Temperature Low Bit 4: Board Temperature Low Bit 5: Power Module Temperature Sensor Open/Short fault Bit 6: PFC-IGBT Temperature Sensor Fault Open/Short Fault Bit 7: Comms ADC Failure Bit 8: PFC HW Over Current
497	01F1					
498	01F2					

						Bit 9: PFC SW Over Current Bit 10: PFC Over Voltage Bit 11: Expansion Space (READ BIT) Bit 12: Expansion Space (READ BIT) Bit 13: Expansion Space (READ BIT) Bit 14: Expansion Space (READ BIT) Bit 15: Fault Limit Lockout
499	01F3	Drive 1 EEPROM version	-32768	32767		Valid only for EV3 drive (MSB part)
500	01F4	Drive 1 EEPROM version	-32768	32767		Valid only for EV3 drive (LSB part)
501	01F5	Drive 1 DSP version	-32768	32767		Valid only for EV3 drive (MSB part)
502	01F6	Drive 1 DSP version	-32768	32767		Valid only for EV3 drive (LSB part)
503	01F7	Drive 1 DSP software version	-32768	32767		Valid only for EV3 drive (MSB part)
504	01F8	Drive 1 DSP software version	-32768	32767		Valid only for EV3 drive (LSB part)
505	01F9	Drive 1 faults 1 shadow				Valid only for EV3 drive Value of the Drive faults 1 field when the last alarm occurred
506	01FA	Drive 1 faults 2 shadow				Valid only for EV3 drive Value of the Drive faults 2 field when the last alarm occurred
507	01FB	Drive 1 faults 3 shadow				Valid only for EV3 drive Value of the Drive faults 3 field when the last alarm occurred
508	01FC	Drive 1 faults 4 shadow				Valid only for EV3 drive Value of the Drive faults 4 field when the last alarm occurred
509	01FD	Drive 1 model number	0	4000		Valid only for EV3 drive Internal number of the drive
510	01FE	Drive 1 status				Valid only for EV3 drive Bit 0: PFC Chip Reset Bit 1: DSP Chip Reset Bit 2: Drive Running Status Bit 3: PFC Status Bit 4: Compressor Status Bit 5: Compressor Parameter Update Bit 6: Compressor Frequency Descending Protection Bit 7: Protection State Bit 8: Compressor Frequency Stable Bit 9: Compressor Frequency Increase Bit 10: Compressor Frequency Decrease Bit 11: Compressor Frequency Set Outside Bit 12: Compressor Starting Bit 13: Compressor Re-Starting Bit 14: n/a Bit 15: n/a
511	01FF	Pack protection mode				Circuit 1 Bit 0: Oil protection Bit 1: Envelope protection Bit 2: Envelope prevention Bit 3: Point protection Bit 4: Superheat protection Bit 5: Envelope emergency Bit 6: Overcapacity protection Bit 7: n/a Circuit 2 Bit 8: Oil protection Bit 9: Envelope protection Bit 10: Envelope prevention Bit 11: Point protection Bit 12: Superheat protection Bit 13: Envelope emergency Bit 14: Overcapacity protection Bit 15: n/a

1024	0400	Circuit 1 Variable speed Alarm 1 shadow				Value of the alarm 1 field from the last "alarm-state" occurrence.
1025	0401	Circuit 1 Variable speed Alarm 2 shadow				Value of the alarm 2 field from the last "alarm-state" occurrence.
1026	0402	Circuit 1 Variable speed Hardware Alarm 1 shadow				Value of the hardware alarm 1 field from the last "alarm-state" occurrence.
1027	0403	Circuit 1 Variable speed Hardware Alarm 2 shadow				Value of the hardware alarm 2 field from the last "alarm-state" occurrence.
1028	0404	Circuit 1 Fixed speed 1 Alarm 1 shadow				Value of the alarm 1 field from the last "alarm-state" occurrence.
1029	0405	Circuit 1 Fixed speed 1 Alarm 2 shadow				Value of the alarm 2 field from the last "alarm-state" occurrence.
1030	0406	Circuit 1 Fixed speed 1 Hardware Alarm 1 shadow				Value of the hardware alarm 1 field from the last "alarm-state" occurrence.
1031	0407	Circuit 1 Fixed speed 1 Hardware Alarm 2 shadow				Value of the hardware alarm 2 field from the last "alarm-state" occurrence.
1032	0408	Circuit 1 Fixed speed 2 Alarm 1 shadow				Value of the alarm 1 field from the last "alarm-state" occurrence.
1033	0409	Circuit 1 Fixed speed 2 Alarm 2 shadow				Value of the alarm 2 field from the last "alarm-state" occurrence.
1034	040A	Circuit 1 Fixed speed 2 Hardware Alarm 1 shadow				Value of the hardware alarm 1 field from the last "alarm-state" occurrence.
1035	040B	Circuit 1 Fixed speed 2 Hardware Alarm 2 shadow				Value of the hardware alarm 2 field from the last "alarm-state" occurrence.
1036	040C	Circuit 1 Fixed speed 3 Alarm 1 shadow				Value of the alarm 1 field from the last "alarm-state" occurrence.
1037	040D	Circuit 1 Fixed speed 3 Alarm 2 shadow				Value of the alarm 2 field from the last "alarm-state" occurrence.
1038	040E	Circuit 1 Fixed speed 3 Hardware Alarm 1 shadow				Value of the hardware alarm 1 field from the last "alarm-state" occurrence.
1039	040F	Circuit 1 Fixed speed 3 Hardware Alarm 2 shadow				Value of the hardware alarm 2 field from the last "alarm-state" occurrence.
1044	0414	Circuit 2 Fixed speed 1 Alarm 1 shadow				Value of the alarm 1 field from the last "alarm-state" occurrence.
1045	0415	Circuit 2 Fixed speed 1 Alarm 2 shadow				Value of the alarm 2 field from the last "alarm-state" occurrence.
1046	0416	Circuit 2 Fixed speed 1 Hardware Alarm 1 shadow				Value of the hardware alarm 1 field from the last "alarm-state" occurrence.
1047	0417	Circuit 2 Fixed speed 1 Hardware Alarm 2 shadow				Value of the hardware alarm 2 field from the last "alarm-state" occurrence.
1048	0418	Circuit 2 Fixed speed 2 Alarm 1 shadow				Value of the alarm 1 field from the last "alarm-state" occurrence.
1049	0419	Circuit 2 Fixed speed 2 Alarm 2 shadow				Value of the alarm 2 field from the last "alarm-state" occurrence.
1050	0420	Circuit 2 Fixed speed 2 Hardware Alarm 1 shadow				Value of the hardware alarm 1 field from the last "alarm-state" occurrence.
1051	0421	Circuit 2 Fixed speed 2 Hardware Alarm 2 shadow				Value of the hardware alarm 2 field from the last "alarm-state" occurrence.
1052	0422	Circuit 2 Fixed speed 3 Alarm 1 shadow				Value of the alarm 1 field from the last "alarm-state" occurrence.
1053	0423	Circuit 2 Fixed speed 3 Alarm 2 shadow				Value of the alarm 2 field from the last "alarm-state" occurrence.
1054	0424	Circuit 2 Fixed speed 3 Hardware Alarm 1 shadow				Value of the hardware alarm 1 field from the last "alarm-state" occurrence.
1055	0425	Circuit 1 Fixed speed 3 Hardware Alarm 2 shadow				Value of the hardware alarm 2 field from the last "alarm-state" occurrence.
1056	0426	Alarm set 3 (Software alarms) (clears automatically once the controller is in alarm state)				Bit 0: Circuit 1 Compressor 1 wet suction Bit 1: Circuit 1 Compressor 2 wet suction Bit 2: Circuit 1 Compressor 3 wet suction Bit 3: Circuit 2 Compressor 1 wet suction Bit 4: Circuit 2 Compressor 2 wet suction Bit 5: Circuit 2 Compressor 3 wet suction Bit 6-15: n/a
1057	0427	Alarm set 4 (Software alarms) (clears automatically once the controller is in alarm state)				Bit 0-15: n/a
1058	0428	Application Alarm 3 shadow				Value of the alarm 3 field from the last "alarm-state" occurrence.
1059	0429	Application Alarm 4 shadow				Value of the alarm 4 field from the last "alarm-state" occurrence.

1060	042A	Circuit 1 Alarm 3 shadow				Value of the alarm 3 field from the last "alarm-state" occurrence.
1061	042B	Circuit 1 Alarm 4 shadow				Value of the alarm 4 field from the last "alarm-state" occurrence.
1062	042C	Circuit 2 Alarm 3 shadow				Value of the alarm 3 field from the last "alarm-state" occurrence.
1063	042D	Circuit 2 Alarm 4 shadow				Value of the alarm 4 field from the last "alarm-state" occurrence.
1064	042E	Circuit 1 Variable speed Alarm 3 shadow				Value of the alarm 3 field from the last "alarm-state" occurrence.
1065	042F	Circuit 1 Variable speed Alarm 4 shadow				Value of the alarm 4 field from the last "alarm-state" occurrence.
1066	0430	Circuit 1 Fixed speed 1 Alarm 3 shadow				Value of the alarm 3 field from the last "alarm-state" occurrence.
1067	0431	Circuit 1 Fixed speed 1 Alarm 4 shadow				Value of the alarm 4 field from the last "alarm-state" occurrence.
1068	0432	Circuit 1 Fixed speed 2 Alarm 3 shadow				Value of the alarm 3 field from the last "alarm-state" occurrence.
1069	0433	Circuit 1 Fixed speed 2 Alarm 4 shadow				Value of the alarm 4 field from the last "alarm-state" occurrence.
1070	0434	Circuit 1 Fixed speed 3 Alarm 3 shadow				Value of the alarm 3 field from the last "alarm-state" occurrence.
1071	0435	Circuit 1 Fixed speed 3 Alarm 4 shadow				Value of the alarm 4 field from the last "alarm-state" occurrence.
1074	0439	Circuit 2 Fixed speed 1 Alarm 3 shadow				Value of the alarm 3 field from the last "alarm-state" occurrence.
1075	043A	Circuit 2 Fixed speed 1 Alarm 4 shadow				Value of the alarm 4 field from the last "alarm-state" occurrence.
1076	043B	Circuit 2 Fixed speed 2 Alarm 3 shadow				Value of the alarm 3 field from the last "alarm-state" occurrence.
1077	043C	Circuit 2 Fixed speed 2 Alarm 4 shadow				Value of the alarm 4 field from the last "alarm-state" occurrence.
1078	043D	Circuit 2 Fixed speed 3 Alarm 3 shadow				Value of the alarm 3 field from the last "alarm-state" occurrence.
1079	043E	Circuit 2 Fixed speed 3 Alarm 4 shadow				Value of the alarm 4 field from the last "alarm-state" occurrence.
1080	043F	Circuit 1 time left before state change	0	1000	s	Time left before end of: - Alarm phase - Transition phase
1081	043A	Circuit 2 time left before state change	0	1000	s	Time left before end of: - Alarm phase - Transition phase
1082	043B	Circuit 1 Variable speed Hardware Alarm 3 shadow				Value of the hardware alarm 3 field from the last "alarm-state" occurrence.
1083	043C	Circuit 1 Fixed speed 1 Hardware Alarm 3 shadow				Value of the hardware alarm 3 field from the last "alarm-state" occurrence.
1084	043D	Circuit 1 Fixed speed 2 Hardware Alarm 3 shadow				Value of the hardware alarm 3 field from the last "alarm-state" occurrence.
1085	043D	Circuit 1 Fixed speed 3 Hardware Alarm 3 shadow				Value of the hardware alarm 3 field from the last "alarm-state" occurrence.
1087	043F	Circuit 2 Fixed speed 1 Hardware Alarm 3 shadow				Value of the hardware alarm 3 field from the last "alarm-state" occurrence.
1088	0440	Circuit 2 Fixed speed 2 Hardware Alarm 3 shadow				Value of the hardware alarm 3 field from the last "alarm-state" occurrence.
1089	0441	Circuit 2 Fixed speed 3 Hardware Alarm 3 shadow				Value of the hardware alarm 3 field from the last "alarm-state" occurrence.
1090	0442	Circuit 1 valve protections (cooling only)				Bit 0: Low superheat protection Bit 1: High superheat protection Bit 2: Floodback protection Bit 3: Discharge protection Bit 4-15: n/a
1091	0443	Circuit 2 valve protections (cooling only)				Bit 0: Low superheat protection Bit 1: High superheat protection Bit 2: Floodback protection Bit 3: Discharge protection Bit 4-15: n/a
1094	0446	Drive 2 compressor model number	0	32768		Valid only for EV3 drive
1095	0447	Drive 2 high pressure switch type	0	100		Valid only for EV3 drive 0 = disabled (configured value) 1 = not used 100 = normally closed

1096	0448	Drive 2 scroll thermistor model	0	200			Valid only for EV3 drive 0 = n/a (configured value) 100 = inside 200 = outside
1097	0449	Drive 2 torque	0	32768			Valid only for EV3 drive Current torque produced by the compressor
1098	044A	Drive 2 torque limit	0	32768			Valid only for EV3 drive Torque limit below which the drive will stop
1099	044B	Drive 2 DC bus voltage	0	32768			Valid only for EV3 drive
1100	044C	Drive 2 AC line voltage	0	32768			Valid only for EV3 drive
1101	044D	Drive 2 AC line power	0	32768			Valid only for EV3 drive (Not available in 3ph version)
1102	044E	Drive 2 board temperature	0	32768			Valid only for EV3 drive Actual temperature of DSP CPU (lower board)
1103	044F	Drive 2 Inverter Module Ph A Temp.	-327.68	327.67	°C	1/100	Valid only for EV3 drive Actual temperature of inside IGBT component
1104	0450	Drive 2 Inverter Module Ph B Temp.	-327.68	327.67	°C	1/100	Valid only for EV3 drive Actual temperature of inside IGBT component
1105	0451	Drive 2 Inverter Module Ph C Temp.	-327.68	327.67	°C	1/100	Valid only for EV3 drive Actual temperature of inside IGBT component
1106	0452	Drive 2 PFC Module Ph A Temp.	-327.68	327.67	°C	1/100	Valid only for EV3 drive (Not available in 3ph version) temp. inside PFC
1107	0453	Drive 2 PFC Module Ph B Temp.	-327.68	327.67	°C	1/100	Valid only for EV3 drive (Not available in 3ph version) temp. inside PFC
1108	0454	Drive 2 motor temperature	-327.68	327.67	°C	1/100	Valid only for EV3 drive Motor stator temperature
1109	0455	Drive 2 discharge temperature	0	327.67	°C	1/100	Valid only for EV3 drive
1110	0456	Drive 2 faults 1					See Drive 1 faults 1 at [495]
1111	0457	Drive 2 faults 2					See Drive 1 faults 2 at [496]
1112	0458	Drive 2 faults 3					See Drive 1 faults 3 at [497]
1113	0459	Drive 2 faults 4					See Drive 1 faults 4 at [498]
1114	045A	Drive 2 EEPROM version	-32768	32767			Valid only for EV3 drive (MSB part)
1115	045B	Drive 2 EEPROM version	-32768	32767			Valid only for EV3 drive (LSB part)
1116	045C	Drive 2 DSP version	-32768	32767			Valid only for EV3 drive (MSB part)
1117	045D	Drive 2 DSP version	-32768	32767			Valid only for EV3 drive (LSB part)
1118	045E	Drive 2 DSP software version	-32768	32767			Valid only for EV3 drive (MSB part)
1119	045F	Drive 2 DSP software version	-32768	32767			Valid only for EV3 drive (LSB part)
1120	0460	Drive 2 faults 1 shadow					Valid only for EV3 drive Value of the Drive 2 faults 1 field when the last alarm occurred
1121	0461	Drive 2 faults 2 shadow					Valid only for EV3 drive Value of the Drive 2 faults 2 field when the last alarm occurred
1122	0462	Drive 2 faults 3 shadow					Valid only for EV3 drive Value of the Drive 2 faults 3 field when the last alarm occurred
1123	0463	Drive 2 faults 4 shadow					Valid only for EV3 drive Value of the Drive 2 faults 4 field when the last alarm occurred
1124	0464	Drive 2 model number	0	4000			Valid only for EV3 drive Internal number of the drive
1125	0465	Drive 2 status					See Drive 1 status at [510]
1126	0466	Circuit 2 variable speed capacity	0	6553.5	kW	1/10	Capacity evaluated at current operating point and speed. Mass flow is evaluated from coefficients and enthalpy change from thermodynamic computations.
1127	0467	Circuit 2 variable speed maximum capacity	0	6553.5	kW	1/10	Maximum available heating/cooling capacity at current operating point with max. possible speed
1128	0468	Circuit 2 variable speed minimum capacity	0	6553.5	kW	1/10	Minimum available heating/cooling capacity at current operating point with min. possible speed

1129	0469	Circuit 2 variable speed compressor delay before start/stop	0	1000	s	When the compressor is running or stopped, this variable indicates the time left before it can be stopped or started respectively. A value of 0 indicates that the compressor can be stopped/started without any delay.
1130	046A	Circuit 2 Variable speed Hardware Alarm 4 shadow				Value of the hardware alarm 4 field from the last "alarm-state" occurrence.

3.3 Read Data (Smart only)

Modbus address dec.	Modbus address hex.	Description	Min	Max	Unit	Scale	Remarks
20736	5100	Tier II board # 1 scroll temperature	-327.68	327.67	°C	1/100	
20737	5101	Tier II board # 2 scroll temperature	-327.68	327.67	°C	1/100	
20738	5102	Tier II board # 3 scroll temperature	-327.68	327.67	°C	1/100	
20739	5103	Tier II board # 4 scroll temperature	-327.68	327.67	°C	1/100	
20740	5104	Tier II board # 5 scroll temperature	-327.68	327.67	°C	1/100	
20741	5105	Tier II board # 6 scroll temperature	-327.68	327.67	°C	1/100	
20742	5106	Tier II board # 1 oil sump temperature	-327.68	327.67	°C	1/100	
20743	5107	Tier II board # 2 oil sump temperature	-327.68	327.67	°C	1/100	
20744	5108	Tier II board # 3 oil sump temperature	-327.68	327.67	°C	1/100	
20745	5109	Tier II board # 4 oil sump temperature	-327.68	327.67	°C	1/100	
20746	510A	Tier II board # 5 oil sump temperature	-327.68	327.67	°C	1/100	
20747	510B	Tier II board # 6 oil sump temperature	-327.68	327.67	°C	1/100	
20748	510C	Tier II board # 1 thrust plate temperature	-327.68	327.67	°C	1/100	
20749	510D	Tier II board # 2 thrust plate temperature	-327.68	327.67	°C	1/100	
20750	510E	Tier II board # 3 thrust plate temperature	-327.68	327.67	°C	1/100	
20751	510F	Tier II board # 4 thrust plate temperature	-327.68	327.67	°C	1/100	
20752	5110	Tier II board # 5 thrust plate temperature	-327.68	327.67	°C	1/100	
20753	5111	Tier II board # 6 thrust plate temperature	-327.68	327.67	°C	1/100	
20754	5112	Tier II board # 1 communication status	0	0xFFFF			Bit 0: Error on high priority communication Bit 1: Error on medium priority communication Bit 2: Error on low priority communication Bit 3: High priority batch incomplete Bit 4: Medium priority batch incomplete Bit 5: Low priority batch incomplete Bit 6: Buffer overflow Bit 7: Write overflow
20755	5113	Tier II board # 1 communication failures	0	65535			
20756	5114	Tier II board # 2 communication status	0	0xFFFF			Bit 0: Error on high priority communication Bit 1: Error on medium priority communication Bit 2: Error on low priority communication Bit 3: High priority batch incomplete Bit 4: Medium priority batch incomplete Bit 5: Low priority batch incomplete Bit 6: Buffer overflow Bit 7: Write overflow
20757	5115	Tier II board # 2 communication failures	0	65535			
20758	5116	Tier II board # 3 communication status	0	0xFFFF			Bit 0: Error on high priority communication Bit 1: Error on medium priority communication Bit 2: Error on low priority communication Bit 3: High priority batch incomplete Bit 4: Medium priority batch incomplete Bit 5: Low priority batch incomplete Bit 6: Buffer overflow Bit 7: Write overflow
20759	5117	Tier II board # 3 communication failures	0	65535			
20760	5118	Tier II board # 4 communication status	0	0xFFFF			Bit 0: Error on high priority communication Bit 1: Error on medium priority communication Bit 2: Error on low priority communication Bit 3: High priority batch incomplete Bit 4: Medium priority batch incomplete Bit 5: Low priority batch incomplete Bit 6: Buffer overflow Bit 7: Write overflow
20761	5119	Tier II board # 4 communication failures	0	65535			
20762	511A	Tier II board # 5 communication status	0	0xFFFF			Bit 0: Error on high priority communication Bit 1: Error on medium priority communication Bit 2: Error on low priority communication Bit 3: High priority batch incomplete

						Bit 4: Medium priority batch incomplete Bit 5: Low priority batch incomplete Bit 6: Buffer overflow Bit 7: Write overflow
20763	511B	Tier II board # 5 communication failures	0	65535		
20764	511C	Tier II board # 6 communication status	0	0xFFFF		Bit 0: Error on high priority communication Bit 1: Error on medium priority communication Bit 2: Error on low priority communication Bit 3: High priority batch incomplete Bit 4: Medium priority batch incomplete Bit 5: Low priority batch incomplete Bit 6: Buffer overflow Bit 7: Write overflow
20765	511D	Tier II board # 6 communication failures	0	65535		
20770	5122	Oil analysis I indicator for comp. 1.1	-32768	32767		
20771	5123	Oil analysis I indicator for comp. 1.2	-32768	32767		
20772	5124	Oil analysis I indicator for comp. 1.3	-32768	32767		
20773	5125	Oil analysis I indicator for comp. 2.1	-32768	32767		
20774	5126	Oil analysis I indicator for comp. 2.2	-32768	32767		
20775	5127	Oil analysis I indicator for comp. 2.3	-32768	32767		
20776	5128	Oil analysis P indicator for comp. 1.1	-32768	32767		
20777	5129	Oil analysis P indicator for comp. 1.2	-32768	32767		
20778	512A	Oil analysis P indicator for comp. 1.3	-32768	32767		
20779	512B	Oil analysis P indicator for comp. 2.1	-32768	32767		
20780	512C	Oil analysis P indicator for comp. 2.2	-32768	32767		
20781	512D	Oil analysis P indicator for comp. 2.3	-32768	32767		
20782	512E	Oil analysis D indicator for comp. 1.1	-32768	32767		
20783	512F	Oil analysis D indicator for comp. 1.2	-32768	32767		
20784	5130	Oil analysis D indicator for comp. 1.3	-32768	32767		
20785	5131	Oil analysis D indicator for comp. 2.1	-32768	32767		
20786	5132	Oil analysis D indicator for comp. 2.2	-32768	32767		
20787	5133	Oil analysis D indicator for comp. 2.3	-32768	32767		
20788	5134	Oil analysis theor. oil temp. for comp. 1.1	-327.68	327.67	°C	1/100
20789	5135	Oil analysis theor. oil temp. for comp. 1.2	-327.68	327.67	°C	1/100
20790	5136	Oil analysis theor. oil temp. for comp. 1.3	-327.68	327.67	°C	1/100
20791	5137	Oil analysis theor. oil temp. for comp. 2.1	-327.68	327.67	°C	1/100
20792	5138	Oil analysis theor. oil temp. for comp. 2.2	-327.68	327.67	°C	1/100
20793	5139	Oil analysis theor. oil temp. for comp. 2.3	-327.68	327.67	°C	1/100
20794	513A	Oil analysis starvation indicator for compressor 1.1	-32768	32767		
20795	513B	Oil analysis starvation indicator for compressor 1.2	-32768	32767		
20796	513C	Oil analysis starvation indicator for compressor 1.3	-32768	32767		
20797	513D	Oil analysis starvation indicator for compressor 2.1	-32768	32767		
20798	513E	Oil analysis starvation indicator for compressor 2.2	-32768	32767		
20799	513F	Oil analysis starvation indicator for compressor 2.3	-32768	32767		

3.4 Write Data

Modbus address dec.	Modbus address hex.	Description	Min	Max	Unit	Def	Scale	Remarks
512	0200	Factory default [*]	0	1		0		1 = Resets all configuration parameters to default values. This variable is self-resetting.
513	0201	Compressor reset [*]	0	1		0		1 = Resets all logged runtime information from the compressors.
514	0202	Operating mode	0	5		0		0 = Off (system is shutdown, compressor disconnected, EXVs closed, alarm, -shadow and relays cleared!) 1 = Cooling 2 = Heating 3 = Standby (Stator heater function active) 4 = Manual (Caution! All controls are manual without any safety logic). 5 = Emergency (same as off mode, however compressors are shut-down immediately)
515	0203	Capacity request	0	100.0	%	0	1/100	Capacity asked to the controller as a percentage of the maximum capacity at the current operating conditions.
516	0204	Circuit 1 manual valve enable	0	1		0		1 = Enables manual control of valve on Circuit 1.
517	0205	Circuit 1 manual valve opening	0.0	300.0	%	0.0	1/100	The opening to be applied to the expansion valve 0 – 100%; 200% = valve close; 300% = valve reference.
518	0206	Circuit 2 manual valve enable	0	1		0		1 = Enables manual control of valve on Circuit 2.
519	0207	Circuit 2 manual valve opening	0.0	300.0	%	0.0	1/100	The opening to be applied to the expansion valve 0 – 100%; 200% = valve close; 300% = valve reference.
520	0208	Manual pack control enable	0	1		0		1 = Enables manual control of compressor speed, without respecting allowable speed envelope.
521	0209	Manual pack compressor speed	0	7200	RPM	0		The speed applied to the compressor. <i>To be used in conjunction with register 520.</i>
522	020A	Manual four-way valve circuit 2 enable	0	1		0		1 = Enables manual control of four-way 2
523	020B	Manual four-way valve circuit 2 active	0	1		0		1 = Activates four-way 2 (relay is closed)
524	020C	Manual pack fixed speed active	0	63		0		Bit field Bit 0 : FS 1.1 Bit 1 : FS 1.2 Bit 2 : FS 1.3 Bit 3 : FS 2.1 Bit 4 : FS 2.2 Bit 5 : FS 2.3 <i>To be used in conjunction with register 520.</i>
530	0212	Manual four-way valve circuit 1 enable	0	1		0		1 = Enables manual control of four-way 1
531	0213	Manual four-way valve circuit 1 active	0	1		0		1 = Activates four-way 2 (relay is closed)
538	021A	Circuit 1 Defrost start	0	1		0		1 = Starts a defrost, if applied during heating operating mode <u>On synchronous units, (see configuration register 29), this variable is the only one triggering a defrost.</u>
540	021C	Circuit 1 Defrost stop	0	1		0		1 = Stops current defrost, if applied during defrost operating mode
541	021D	Seasonal efficiency reset	0	1		0		1 = resets all SEER computations
542	021E	Circuit 1 Accessory power	0	100	W	0		Accessory power not computable by the controller used for COP and other computations.
543	021F	Circuit 2 Accessory power	0	100	W	0		Accessory power not computable by the controller used for COP and other computations.

544	0220	Logging data erase [*]	0	1				Clear all archived events, alarms and data.
545	0221	Write Modbus Parameters [*]	0	1		0		Update the configuration parameters for Modbus communication.
548	0224	Clear shadow alarms registers	0	1		0		Clear all the shadow alarms that are still advertised. Attention, this variable will only be used while the unit is in off state.
549	0225	Circuit 1 emergency off	0	1		0		Triggers an emergency off alarm on circuit 1.
550	0226	Circuit 2 emergency off	0	1		0		Triggers an emergency off alarm on circuit 2.
551	0227	USB logging	0	1		1		0 = Off 1 = On Use this variable to stop USB logging prior to stick removal in order to avoid any data loss or corruption. (see r. 454 for further details)
552	0228	Circuit 2 Defrost start	0	1		0		1 = Starts a defrost, if applied during heating operating mode
553	0229	Circuit 2 Defrost stop	0	1		0		1 = Stops current defrost, if applied during defrost operating mode
554	022A	Circuit 1 Compressor 1 emergency off	0	1		0		Triggers an emergency off alarm on compressor 1.1 (variable or fixed speed)
555	022A	Circuit 1 Compressor 2 emergency off	0	1		0		Triggers an emergency off alarm on compressor 1.2
556	022A	Circuit 1 Compressor 3 emergency off	0	1		0		Triggers an emergency off alarm on compressor 1.3
557	022A	Circuit 2 Compressor 1 emergency off	0	1		0		Triggers an emergency off alarm on compressor 2.1 (variable or fixed speed)
558	022A	Circuit 2 Compressor 2 emergency off	0	1		0		Triggers an emergency off alarm on compressor 2.2
559	022A	Circuit 2 Compressor 3 emergency off	0	1		0		Triggers an emergency off alarm on compressor 2.3

[*] This register is critical and can only be modified while the unit is not running. See 2.3.5.

3.5 Config Read only

(Variables stored in permanent memory and updated periodically.)

Modbus address dec.	Modbus address hex.	Description	Min	Max	Unit	Scale	Remarks
768	0300	Alarms logging records	0	256			Number of stored alarm records ¹
769	0301	Heating Energy	0	655,350	kWh	10	Accumulated heating energy ²
770	0302	Electrical Energy Heating mode	0	655,350	kWh	10	Accumulated electrical energy in heating mode ²
771	0303	Envelope extension operation time	0.0	2000.0	h	1/6	Time spend in envelope extension (max 2000h) ²
772	0304	Defrost count	0	2 ¹⁶ - 1			Nbr. Defrosts during lifetime ²
773	0305	Compressor start count	0	2 ¹⁶ - 1			Nbr. of compressor starts during lifetime ²
774	0306	Cooling Energy	0	655,350	kWh	10	Accumulated cooling energy ²
775	0307	Electrical Energy Cooling mode	0	655,350	kWh	10	Accumulated electrical energy in cooling mode ²
776	0308	Variable speed compressor runtime (High)	0	2 ¹⁶ - 1	h		Total running time of the variable speed compressor in seconds (MSB part) ²
777	0309	Variable speed compressor runtime (Low)	0	2 ¹⁶ - 1	h		Total running time of the variable speed compressor in seconds (LSB part) ²
778	030A	Fixed speed compressor 1.1 runtime (High)	0	2 ¹⁶ - 1	s		Total running time of the fix compressor 1.1 in seconds (MSB part) ²
779	030B	Fixed speed compressor 1.1 runtime (Low)	0	2 ¹⁶ - 1	s		Total running time of the fix compressor 1.1 in seconds (LSB part) ²
780	030C	Fixed speed compressor 1.2 runtime (High)	0	2 ¹⁶ - 1	s		Total running time of the fix compressor 1.2 in seconds (MSB part) ²
781	030D	Fixed speed compressor 1.2 runtime (Low)	0	2 ¹⁶ - 1	s		Total running time of the fix compressor 1.2 in seconds (LSB part) ²
782	030E	Fixed speed compressor 1.3 runtime (High)	0	2 ¹⁶ - 1	s		Total running time of the fix compressor 1.3 in seconds (MSB part) ²
783	030F	Fixed speed compressor 1.3 runtime (Low)	0	2 ¹⁶ - 1	s		Total running time of the fix compressor 1.3 in seconds (LSB part) ²
786	0312	Fixed speed compressor 2.1 runtime (High)	0	2 ¹⁶ - 1	s		Total running time of the fix compressor 2.1 in seconds (MSB part) ²
787	0313	Fixed speed compressor 2.1 runtime (Low)	0	2 ¹⁶ - 1	s		Total running time of the fix compressor 2.1 in seconds (LSB part) ²
788	0314	Fixed speed compressor 2.2 runtime (High)	0	2 ¹⁶ - 1	s		Total running time of the fix compressor 2.2 in seconds (MSB part) ²
789	0315	Fixed speed compressor 2.2 runtime (Low)	0	2 ¹⁶ - 1	s		Total running time of the fix compressor 2.2 in seconds (LSB part) ²
790	0316	Fixed speed compressor 2.3 runtime (High)	0	2 ¹⁶ - 1	s		Total running time of the fix compressor 2.3 in seconds (MSB part) ²
791	0317	Fixed speed compressor 2.3 runtime (Low)	0	2 ¹⁶ - 1	s		Total running time of the fix compressor 2.3 in seconds (LSB part) ²

¹ update on alarm

² update rate: 24h

Factory default command resets the config Read only values



3.6 Alarm records //Update pending

Modbus address dec.	Modbus address hex.	Description	Min	Max	Unit	Scale	Remarks