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## 2 Purpose of this document

The purpose of this document is to provide a list and a simple explanation of the BACnet objects implemented in the “ecocirc XL” and “ecocirc XLplus” electronic drive.

For further information related to the BACnet standard protocol, refers to “**ANSI/ASHRAE Standard 135-2004, BACnet A Data Communication Protocol For Building Automation and Control Networks**” document or latest version of the same.

## 3 Legend

<b>MS/TP</b>	Master-Slave / Token Passing
<b>UART</b>	Universal Asynchronous Receiver/Transmitter
<b>MIN</b>	Minimum
<b>MAX</b>	Maximum
<b>DEF</b>	Default
<b>R</b>	Readable
<b>R/W</b>	Readable & Writable
<b>RPM</b>	Round per Minute
<b>Q</b>	Flow
<b>H</b>	Head
<b>P</b>	Power
<b>PROP.</b>	Proportional
<b>W</b>	Watt
<b>A</b>	Ampere
<b>LSW / MSW</b>	Least Significant Word / Most Significant Word
<b>PWR</b>	Power
<b>FW</b>	Firmware
<b>KI</b>	Integral constant
<b>KP</b>	Proportional constant
<b>EIA</b>	Electronic Industries Alliance
<b>N.U.</b>	Not Used
<b>N.D.</b>	Not Defined
<b>N.A.</b>	Not Accessible
<b>N.P.</b>	Not Present

## 4 BACnet Protocol Implementation Conformance Statement (PICS)

<b>DATE</b>	05 June 2014
<b>VENDOR NAME</b>	Xylem
<b>PRODUCT NAME</b>	ecocirc XL
<b>PRODUCT MODEL NUMBER</b>	ecocirc XL... (see table below)
<b>APPLICATION SOFTWARE VERSION</b>	-
<b>FIRMWARE REVISION</b>	00104
<b>BACNET PROTOCOL VERSION</b>	-

### 4.1 Product model number

The ecocirc XL is a range of electronic circulators based on the same software; the PICS are the same for all products listed below.

PRODUCT	OPTIONS
ecocirc XLplus 25-80	-
ecocirc XLplus 25-100	-
ecocirc XLplus 32-80	(F) (B)
ecocirc XLplus 32-100	(F) (B)
ecocirc XLplus 32-120 F	(D) (B)
ecocirc XLplus 40-80 F	(D)
ecocirc XLplus 40-100 F	(D)
ecocirc XLplus 40-120 F	(D) (B)
ecocirc XLplus 50-80 F	(D) (B)
ecocirc XLplus 50-100 F	-
ecocirc XLplus 50-120 F	(D) (B)
ecocirc XLplus 65-80 F	(D) (B)
ecocirc XLplus 65-120 F	(D) (B)
ecocirc XLplus 80-120 F	(D)
ecocirc XLplus 100-120 F	-
ecocirc XL 20-35	(B)
ecocirc XL 36-45	(B)
ecocirc XL 15-75	(B)
ecocirc XL 55-45	(B)
ecocirc XL 20-140	(B)
ecocirc XL 65-130	(B)
ecocirc XL 40-200	(B)
ecocirc XL 70-145	(B)
ecocirc XL 40-275	(B)
ecocirc XL 70-145	(B)

ecocirc XL 40-275	(B)
ecocirc XL 95-125	(B)
ecocirc XL 27-375	(B)
ecocirc XL 105-155	(B)
ecocirc XL 45-340	(B)

**B** = Bronze  
**F** = Flanged  
**D** = Twin

## 4.2 Product description

ecocirc XL and ecocirc XLplus is a wet rotor circulation pump with energy-efficient electronically commutated permanent magnet technology, ECM technology. Being equipped with an advance electronic drive with communication capabilities, the pump can be used as a stand-alone or network device with BACnet (or ModBus) communication

## 4.3 BACnet standardized device profile (Annex L)

<input type="checkbox"/>	BACnet Advanced Workstation	(B-AWS)
<input type="checkbox"/>	BACnet Operator Workstation	(B-OWS)
<input type="checkbox"/>	BACnet Operator Display	(B-OD)
<input type="checkbox"/>	BACnet Building Controller	(B-BC)
<input type="checkbox"/>	BACnet Advanced Application Controller	(B-AAC)
<input type="checkbox"/>	BACnet Application Specific Controller	(B-ASC)
<input type="checkbox"/>	BACnet Smart Sensor	(B-SS)
<input checked="" type="checkbox"/>	BACnet Smart Actuator	(B-SA)

## 4.4 BACnet interoperability building blocks supported (Annex K)

### 4.4.1 Data sharing

<input type="checkbox"/>	Data Sharing – Read Property-A	DS-RP-A
<input checked="" type="checkbox"/>	Data Sharing – Read Property-B	DS-RP-B
<input type="checkbox"/>	Data Sharing – Read Property Multiple-A	DS-RPM-A
<input type="checkbox"/>	Data Sharing – Read Property Multiple-B	DS-RPM-B
<input type="checkbox"/>	Data Sharing – Write Property-A	DS-WP-A
<input checked="" type="checkbox"/>	Data Sharing – Write Property-B	DS-WP-B
<input type="checkbox"/>	Data Sharing – Write Property Multiple-A	DS-WPM-A
<input type="checkbox"/>	Data Sharing – Write Property Multiple-B	DS-WPM-B
<input type="checkbox"/>	Data Sharing – Change of Value-A	DS-COV-A
<input type="checkbox"/>	Data Sharing – Change of Value-B	DS-COV-B

<input type="checkbox"/>	Data Sharing – Change of Value Property-A	DS-COVP-A
<input type="checkbox"/>	Data Sharing – Change of Value Property-B	DS-COVP-B
<input type="checkbox"/>	Data Sharing – Change of Value Unsolicited-A	DS-COVU-A
<input type="checkbox"/>	Data Sharing – Change of Value Unsolicited-B	DS-COVU-B
<input type="checkbox"/>	Data Sharing – View-A	DS-V-A
<input type="checkbox"/>	Data Sharing – Advanced View-A	DS-AV-A
<input type="checkbox"/>	Data Sharing – Modify-A	DS-M-A
<input type="checkbox"/>	Data Sharing – Advanced Modify-A	DS-AM-A

#### 4.4.2 Alarm and event management

N.P.

#### 4.4.3 Scheduling

N.P.

#### 4.4.4 Trending

N.P.

#### 4.4.5 Device Management

<input type="checkbox"/>	Device Management – Dynamic Device Binding-A	DM-DDB-A
<input checked="" type="checkbox"/>	Device Management – Dynamic Device Binding-B	DM-DDB-B
<input type="checkbox"/>	Device Management – Dynamic Object Binding-A	DM-DOB-A
<input type="checkbox"/>	Device Management – Dynamic Object Binding-B	DM-DOB-B
<input type="checkbox"/>	Device Management – Device Communication Control-A	DM-DCC-A
<input type="checkbox"/>	Device Management – Device Communication Control -B	DM-DCC-B
<input type="checkbox"/>	Device Management – Private Transfer-A	DM-PT-A
<input type="checkbox"/>	Device Management – Private Transfer-B	DM-PT-B
<input type="checkbox"/>	Device Management – Text Message-A	DM-TM-A
<input type="checkbox"/>	Device Management – Text Message-B	DM-TM-B
<input type="checkbox"/>	Device Management – Time Synchronization-A	DM-TS-A
<input type="checkbox"/>	Device Management – Time Synchronization-B	DM-TS-B
<input type="checkbox"/>	Device Management – UTC Time Synchronization-A	DM-UTC-A
<input type="checkbox"/>	Device Management – UTC Time Synchronization-B	DM-UTC-B
<input type="checkbox"/>	Device Management – Reinitialize Device-A	DM-RD-A
<input type="checkbox"/>	Device Management – Reinitialize Device-B	DM-RD-B
<input type="checkbox"/>	Device Management – Backup and Restore-A	DM-BR-A
<input type="checkbox"/>	Device Management – Backup and Restore-B	DM-BR-B

<input type="checkbox"/>	Device Management – Restart-A	DM-R-A
<input type="checkbox"/>	Device Management – Restart-B	DM-R-B
<input type="checkbox"/>	Device Management – List Manipulation-A	DM-LM-A
<input type="checkbox"/>	Device Management – List Manipulation-B	DM-LM-B
<input type="checkbox"/>	Device Management – Object Creation and Deletion-A	DM-OCD-A
<input type="checkbox"/>	Device Management – Object Creation and Deletion-B	DM-OCD-B
<input type="checkbox"/>	Device Management – Virtual Terminal-A	DM-VT-A
<input type="checkbox"/>	Device Management – Virtual Terminal-B	DM-VT-B
<input type="checkbox"/>	Device Management – Automatic Network Mapping-A	DM-ANM-A
<input type="checkbox"/>	Device Management – Automatic Device Mapping-A	DM-ADM-A
<input type="checkbox"/>	Device Management – Automatic Time Synchronization-A	DM-ATS-A
<input type="checkbox"/>	Device Management – Manual Time Synchronization-A	DM-MTS-A

#### 4.4.6 Network Management

N.P.

#### 4.5 Standard object types supported

OBJECT TYPE	SUPPORTED	CREATED DINAMICALLY	DELETED DINAMICALLY
Analog Input (*)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Analog Output	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Analog Value (**)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

(\*) See par. 6.2 for further specification

(\*\*) See par. 6.1 for further specification

#### 4.6 Segmentation capability

N.P.

#### 4.7 Data Link Layer options

<input type="checkbox"/>	BACnet IP, (Annex J)	
<input type="checkbox"/>	BACnet IP, (Annex J), Foreign Device	
<input type="checkbox"/>	ISO 8802-3, Ethernet (Clause 7)	
<input type="checkbox"/>	ANSI/ATA 878.1, 2.5Mb. ARCNET (Clause 8)	
<input type="checkbox"/>	ANSI/ATA 878.1, 2.5Mb. ARCNET (Clause 8), baud rate(s)	
<input checked="" type="checkbox"/>	MS/TP master (Clause 9), baud rate(s)	4800 9600 14400 19200 38400 (*)

		56000 57600
<input type="checkbox"/>	MS/TP slave (Clause 9), baud rate(s)	
<input type="checkbox"/>	Point-To-Point, EIA 232 (Clause 10), baud rate(s)	
<input type="checkbox"/>	Point-To-Point, modem (Clause 10), baud rate(s)	
<input type="checkbox"/>	LonTalk (Clause 11), medium	
<input type="checkbox"/>	Other	

(\*) It's suggested to set a baud rate equal or greater than 38400bps to avoid timing issues

#### 4.8 *Device address binding*

Is static device binding supported?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
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#### 4.9 *Networking options*

N.P.

#### 4.10 *Network security options*

N.P.

#### 4.11 *Character sets supported*

N.P.

## 5 BACnet Device Object Identifier

For ecocirc XL and ecocirc XLplus, each device Object Identifier is calculated using the serial number ("S/N") printed on the silver label stuck on the drive side, and then following the next steps:

1. Perform the binary conversion (on 32 bits) of the hexadecimal serial number "S/N"
2. Remove the first 10 bits on the left of the binary number obtained after step 1
3. Perform the conversion, into a decimal number, of the 22 bits obtained after step 2
4. The Device Object Identifier is then the result of the decimal conversion in step 3

### **Example 1:**

ecocirc XL "S/N" = 9F70E603

- 1) 9F70E603 = 1001 1111 0111 0000 1110 0110 0000 0011 (32 bits)
- 2) ~~1001 1111 01~~11 0000 1110 0110 0000 0011 → 11 0000 1110 0110 0000 0011 (22 bits)
- 3) 11 0000 1110 0110 0000 0011 → **3204611**

Object\_id = 3204611.

### **Example 2:**

ecocirc XL "S/N" = 3F10E603

- 1) 3F10E603 = 0011 1111 0001 0000 1110 0110 0000 0011 (32 bits)
- 2) ~~0011 1111 00~~01 0000 1110 0110 0000 0011 → 01 0000 1110 0110 0000 0011 (22 bits)
- 3) 01 0000 1110 0110 0000 0011 → **1107459**

Object\_id = 1107459.

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## 6 BACnet Virtual Memory

The complete data-set managed by ecocirc XLplus is accessible considering a BACnet virtual memory made exclusively of 2 objects: Analog Values (whose “Present\_Value” Property is readable and writable) and Analog Inputs (whose “Present\_Value” Property is readable).

### 6.1 Virtual Memory – Analog Values table

It is a set of Analogue Values objects, whose “Present\_Value” Property is readable and writable [R/W], used for *standard settings*: generally the same operations or functions a user can perform/activate through the user interface.

OBJECT_IDENTIFIER	OBJECT_NAME	UNITS	PRESENT_VALUE			Description
			MIN	MAX	DEF	
0	ON OFF	-	0	1	1	<b>OPERATING MODE</b> 0 = OFF 1 = ON
1	OP. MODALITY	-	1	3	2	<b>CONTROL MODE<sup>1</sup></b> 1 = CONSTANT PRESSURE 2 = PROPORTIONAL PRESSURE 3 = CONSTANT CURVE
2	NIGHT MODE	-	0	1	0	<b>NIGHT-MODE ACTIVATION</b> 0 = NOT ACTIVE 1 = ACTIVE
3	AIR VENTING	-	0	1	1	<b>AIR VENTING PROCEDURE</b> 0 = NOT ACTIVE 1 = ACTIVE
4	A. VEN. PWR ON	-	0	1	1	<b>AIR VENTING POWER ON</b> 0 = NOT ACTIVE 1 = ACTIVE
5	PROP. H S.P.	[m]	2,40	10,00	5,00	<b>PROPORTIONAL PRESSURE SETPOINT<sup>2</sup></b> (for CONTROL MODE = 2)
6	CONST. H S.P.	[m]	1,20	9,00	5,00	<b>CONSTANT PRESSURE SETPOINT<sup>2</sup></b> (for CONTROL MODE = 1)
7	RPM S.P.	[rpm]	1500	4500	2000	<b>CONSTANT CURVE SETPOINT<sup>2</sup></b> (for CONTROL MODE = 3)
8	T REG. TYPE	-	0	2	0	<b>TEMPERATURE CONTROL MODE</b> 0 = NOT ACTIVE 1 = PROP. TEMPERATURE TO HEAD 2 = CONSTANT TEMPERATURE
9	ABS T S.P.	[°C]	(-10)30	110	50	<b>ABSOLUTE TEMPERATURE SETPOINT<sup>3</sup></b>
10	DIFF T S.P.	[°C]	5	30	20	<b>DIFFERENTIAL TEMPERATURE SETPOINT</b>

11	T ACQ. TYPE	-	0	2	0	<b>TEMPERATURE PROBE</b> 0 = INTERNAL 1 = EXTERNAL 2 = DIFFERENTIAL
12	T SLOPE	-	0	1	0	<b>TEMPERATURE SLOPE</b> 0 = INCREASING 1 = DECREASING
13	KP CONST. T	-	1	5000	50	<b>K<sub>P</sub> FOR TEMPERATURE CONTROL</b>
14	KI CONST. T	-	0	500	5	<b>K<sub>I</sub> FOR TEMPERATURE CONTROL</b>
15	T PI PERIOD	[ms]	100	10000	1000	<b>TEMPERATURE CONTROL SAMPLING TIME</b>
16	CIRC. CONF	-	0	2	2	<b>CIRCULATOR CONFIGURATION</b> 0 = TWIN MASTER 1 = TWIN SLAVE 2 = SINGLE
17	TWIN MOD.	-	0	3	1	<b>TWIN PUMPS CONTROL MODE</b> 0 = BACKUP 1 = ALTERNATE 2 = PARALLEL 3 = FORCED PARALLEL
18	LOG IDX SEL.	-	0	7	0	<b>DATA-LOG MATRIX ROW INDEX<sup>4</sup></b>

<sup>1</sup> [CONTROL MODE = 0] is reserved for future implementation

<sup>2</sup> The MIN, MAX and DEFAULT value depends strictly on the pump model: values in the table are only for reference.

<sup>3</sup> In case [T REG. TYPE = 1], the ABSOLUTE TEMPERATURE SET POINT can be set from 30°C to 110°C.

In case [T REG. TYPE = 2], the ABSOLUTE TEMPERATURE SET POINT can be set from -10°C to 110°C.

<sup>4</sup> This object is the selection index (from 0 to 7) of one of the 8 errors stored in the error queue; all the other information related to each error can be collected using the Analog Input Objects from 28 to 43 (see par. 6.2)

## 6.2 Virtual Memory – Analog Inputs table

It is a set of Analogue Inputs objects, whose “Present\_Value” Property is readable [R], used for *standard settings*: generally the same data a user can acquire through the user interface.

OBJECT_IDENTIFIER	OBJECT_NAME	UNITS	PRESENT_VALUE			Description
			MIN	MAX	DEF	
0	POWER	[W]	...	...	...	<b>INPUT POWER<sup>1</sup></b>
1	CURR. H	[m]	...	...	...	<b>HEAD [H]</b> <sup>Error! Bookmark not defined.</sup>
2	CURR. Q	[m <sup>3</sup> /h]	...	...	...	<b>FLOW [Q]</b> <sup>Error! Bookmark not defined.</sup>
3	CURR. RPM	[rpm]	...	...	...	<b>SPEED</b> <sup>Error! Bookmark not defined.</sup>
4	CAN TEMP	[°C]	-20,0	130,0	...	<b>WATER TEMPERATURE<sup>2</sup></b>
5	EXT. TEMP	[°C]	-20,0	130,0	...	<b>EXTERNAL WATER TEMPERATURE<sup>2</sup></b>
6	WIND 1 TEMP	[°C]	0	255	...	<b>WINDING 1 TEMPERATURE<sup>3</sup></b>
7	WIND 2 TEMP	[°C]	0	255	...	<b>WINDING 2 TEMPERATURE<sup>3</sup></b>
8	WIND 3 TEMP	[°C]	0	255	...	<b>WINDING 3 TEMPERATURE<sup>3</sup></b>
9	MODULE TEMP	[°C]	0	255	...	<b>POWER MODULE TEMPERATURE<sup>3</sup></b>
10	IQ	[A]	...	...	...	<b>QUADRATURE CURRENT</b> <sup>Error! Bookmark not defined.</sup>
11	IO B.F. STS	-	0	65535	0	<b>BIT FIELDS STATUS I/O<sup>4</sup></b> Bit 0: 0/10V SIGNAL STATUS Bit 1: 4/20mA SIGNAL STATUS Bit 2: START/STOP SIGNAL STATUS Bit 3: TEMP PROBE SIGNAL STATUS Bit 4 ÷ 7: N. U. Bit 8: OUTPUT RELAY STATUS Bit 9 ÷ 15: N. U.
12	ALARM 1 B.F.	-	0	65535	0	<b>BIT FIELDS ALARM 14</b> Bit 0: WATER PROBE ALARM (A1) Bit 1: WATER OVERTEMPERATURE ALARM (A2) Bit 2: POWER MODULE OVERTEMP. ALARM (A3) Bit 3: N. U. Bit 4: DATA MEMORY CORRUPTED ALARM (A5) Bit 5: EXT. WATER TEMP. PROBE ALARM <sup>5</sup> (A6) Bit 6: PRESSURE SENSOR ALARM (A7) Bit 7 ÷ 10: N. U. Bit 11: TWIN COMM. LOST <sup>6</sup> (A12) Bit 12: TWIN COMM. LOST <sup>7</sup> (A12) Bit 13 ÷ 15: N. U.

13	<b>ALARM 2 B.F.</b>	-	0	65535	0	<p><b>BIT FIELDS ALARM 24</b></p> <p>Bit 0: INTERNAL ALARM<sup>8</sup> (A20)            Bit 1: INTERNAL ALARM<sup>9</sup> (A20)            Bit 2: INTERNAL ALARM<sup>10</sup> (A20)            Bit 3: INTERNAL ALARM<sup>11</sup> (A20)            Bit 4: INTERNAL ALARM<sup>12</sup> (A20)            Bit 5: INTERNAL ALARM<sup>13</sup> (A20)            Bit 6: INTERNAL ALARM<sup>14</sup> (A20)            Bit 7 ÷ 15 = N.U.</p>
14	<b>ERROR 1 B.F.</b>	-	0	65535	0	<p><b>BIT FIELDS ERRORS4</b></p> <p>Bit 0: INTERNAL COMM. LOST (E1)            Bit 1: MOTOR OVERLOAD (E2)            Bit 2: DC-BUS OVERVOLTAGE (E3)            Bit 3: TRIP CONTROL ERROR (E4)            Bit 4: DATA MEMORY CORRUPTED ERROR<sup>15</sup> (E5)            Bit 5: GRID VOLTAGE ERROR (E6)            Bit 6: MOTOR WINDING TEMPERATURE ERROR (E7)            Bit 7: POWER MODULE TEMPERATURE ERROR (E8)<sup>16</sup>            Bit 8: NTC HW ERROR (E9)<sup>17</sup>            Bit 9: DATA MEMORY CORRUPTED ERROR<sup>18</sup> (E5)            Bit 10: DATA MEMORY CORRUPTED ERROR<sup>19</sup> (E5)            Bit 11: DRY-RUN DETECT (E10)            Bit 12: NTC POWER MODULE FAIL (E9)            Bit 13: ROTOR BLOCKED (E4)            Bit 14: MOTOR UNCONNECTED (E9)            Bit 15 = N.U.</p>
15	<b>CURR. ERROR</b>	-	0	65535	0	<p><b>ACTIVE ERROR CODE</b></p> <p>0 = NO ERROR            1 = INTERNAL COMM. LOST            2 = MOTOR OVERLOAD            3 = DC-BUS OVERVOLTAGE            4 = TRIP CONTROL ERROR            5 = DATA MEMORY CORRUPTED ERROR            6 = GRID VOLTAGE ERROR            7 = MOTOR WINDING TEMPERATURE ERROR            8 = POWER MODULE TEMPERATURE ERROR            9 = GENERIC HW ERROR            10 = DRY-RUN DETECT</p>
16	<b>SLAVE PWR</b>	[W]	...	...	...	<b>TWIN SLAVE INPUT POWER</b> <small>Error! Bookmark not defined.</small>
17	<b>SLAVE H</b>	[m]	...	...	...	<b>TWIN SLAVE HEAD [H]</b> <small>Error! Bookmark not defined.</small>
18	<b>SLAVE Q</b>	[m <sup>3</sup> /h]-	...	...	...	<b>TWIN SLAVE FLOW [Q]</b> <small>Error! Bookmark not defined.</small>
19	<b>SLAVE RPM</b>	[rpm]	...	...	...	<b>TWIN SLAVE SPEED</b> <small>Error! Bookmark not defined.</small>
20	<b>SLAVE W.1 T</b>	[°C]	0	255	...	<b>TWIN SLAVE WINDING 1 TEMPERATURE3</b>
21	<b>SLAVE W.2 T</b>	[°C]	0	255	...	<b>TWIN SLAVE WINDING 2 TEMPERATURE3</b>
22	<b>SLAVE W.3 T</b>	[°C]	0	255	...	<b>TWIN SLAVE WINDING 3 TEMPERATURE3</b>
23	<b>SLAVE MOD. T</b>	[°C]	0	255	...	<b>TWIN SLAVE POWER MODULE TEMPERATURE3</b>
24	<b>SLAVE IQ</b>	[A]	...	...	...	<b>TWIN SLAVE QUADRATURE CURRENT</b> <small>Error! Bookmark not defined.</small>

25	SLAVE B.F. A1	-	0	65535	0	TWIN SLAVE BIT FIELDS ALARM 1 <sup>20</sup>
26	SLAVE B.F. A2	-	0	65535	0	TWIN SLAVE BIT FIELDS ALARM 2 <sup>21</sup>
27	SLAVE B.F. E2	-	0	65535	0	TWIN SLAVE BIT FIELDS ERRORS <sup>22</sup>
28	LOG ACT ERR	-	0	10	0	ACTIVE ERROR CODE X <sup>23</sup>
29	LOG ERR STA T	[s]	0	4294967296	0	START TIME ERROR X23
30	LOG ERR END T	[s]	0	4294967296	0	END TIME ERROR X23
31	LOG ERR B.F.	-	0	65535	0	BIT FIELDS ERROR X23
32	LOG ERR COUNT	-	0	40000	0	COUNTER ERROR X23
33	LOG RPM SET	[rpm]	...	...	...	SPEED SETPOINT23
34	LOG RPM VALUE	[rpm]	...	...	...	SPEED23
35	LOG IQ	[A]	...	...	...	QUADRATURE CURRENT23
36	LOG AL 1 B.F.	-	0	65535	0	BIT FIELDS ALARM 123
37	LOG AL 2 B.F.	-	0	65535	0	BIT FIELDS ALARM 223
38	LOG B.F. IO	-	0	65535	0	BIT FIELDS STATUS I/O23
39	LOG PWR	[W]	...	...	...	INPUT POWER23
40	LOG Q	[m <sup>3</sup> /h]-	...	...	...	FLOW [Q]23
41	LOG H	[m]-	...	...	...	HEAD [H]23
42	LOG PWR M T	[°C]	0	255	...	POWER MODULE TEMPERATURE23
43	LOG ON-OFF	-	0	1	1	OPERATING MODE23
44	-	-	-	-	-	-
45	-	-	-	-	-	-
46	-	-	-	-	-	-
47	-	-	-	-	-	-
48	LIFE TMR	[s]	0	4294967296	0	LIFE TIMER
49	TMR P 0-25	[s]	0	4294967296	0	POWER CONSUMPTION 0-25 TIMER
50	TMR P 25-50	[s]	0	4294967296	0	POWER CONSUMPTION 25-50 TIMER

51	<b>TMR P 50-75</b>	[s]	0	4294967296	0	<b>POWER CONSUMPTION 50-75 TIMER</b>
52	<b>TMR P 75-100</b>	[s]	0	4294967296	0	<b>POWER CONSUMPTION 75-100 TIMER</b>

- <sup>1</sup> The MIN, MAX and DEFAULT value depends strictly on the pump model.
- <sup>2</sup> If Present Value = 3.40282347e+38F the temperature probe could be in a fault condition.
- <sup>3</sup> If Present Value = 255 the temperature probe could be in a fault condition.
- <sup>4</sup> The Present Value of this Object has to be converted in a 16bit binary data (i.e. 35 ⇒ 0b0000000000100011).
- <sup>5</sup> This alarm is enabled only if "TEMP. CONTROL MODE" is active (> 0)
- <sup>6</sup> This bit field is enabled only in Twin Slave
- <sup>7</sup> This bit field is enabled only in Twin Master
- <sup>8</sup> This bit field refers to internal communication problem, specifically UNKNOWN COMMAND
- <sup>9</sup> This bit field refers to internal communication problem, specifically INCORRECT DATA LENGTH
- <sup>10</sup> This bit field refers to internal communication problem, specifically INCORRECT DATA VALUE
- <sup>11</sup> This bit field refers to internal communication problem, specifically INCORRECT MOTOR CONFIGURATION
- <sup>12</sup> This bit field refers to internal communication problem, specifically INCORRECT PWM FREQUENCY
- <sup>13</sup> This bit field refers to internal communication problem, specifically PARAMETER NOT SAVED
- <sup>14</sup> This bit field refers to internal communication problem, specifically COMMAND NOT ACCEPTED
- <sup>15</sup> This bit field refers to EEPROM data corruption
- <sup>16</sup> This bit field refers to over-temperature, probe open or shortened
- <sup>17</sup> This bit field refers to stuck probe
- <sup>18</sup> This bit field refers to factory data corruption
- <sup>19</sup> This bit field refers to hydraulic maps corruption
- <sup>20</sup> Bit Field alarm with the same active bits as in object 12
- <sup>21</sup> Bit Field alarm with the same active bits as in object 13
- <sup>22</sup> Bit Field error with the same active bits as in object 14
- <sup>23</sup> Log information referring to error number X, selected by Analog Value object n°18 (see par. 6.1)