Pump Controller Type EC 531
Modbus table from FW Version 1.23
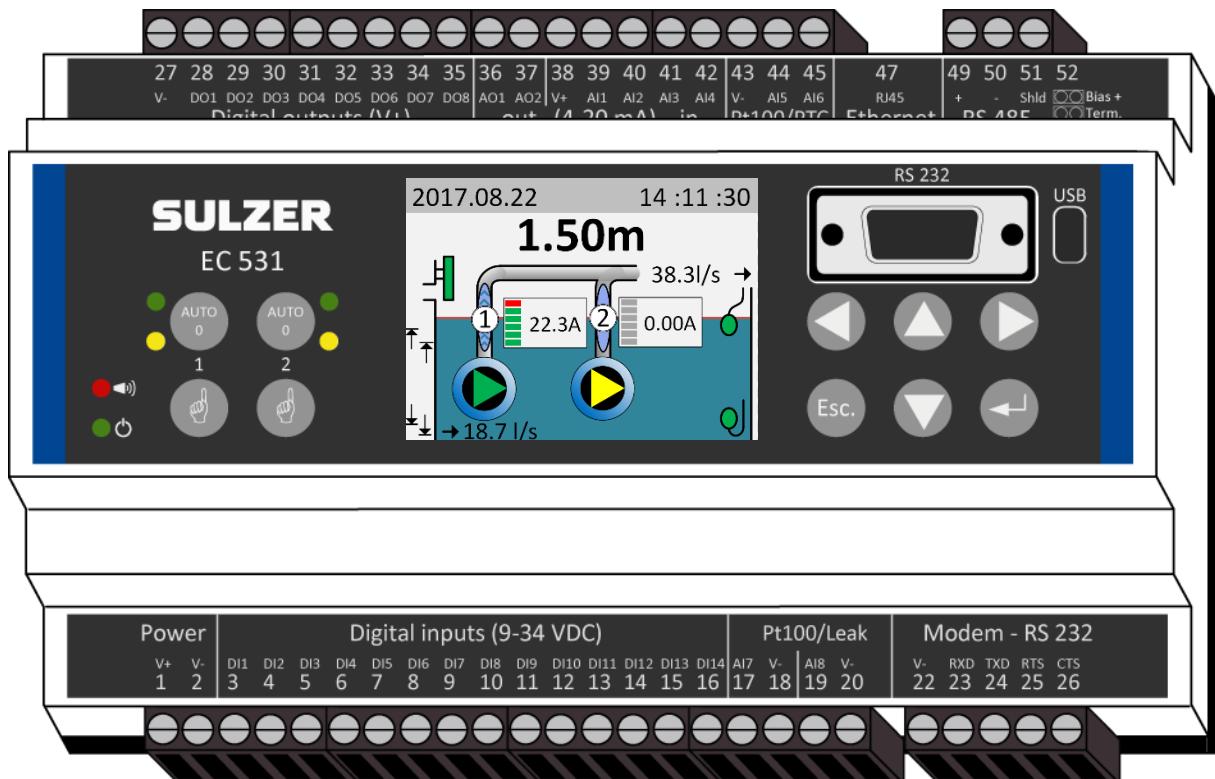
EN   **EC 531 Modbus register manual**

Table of Contents

1 Modbus IO number layout

1.1 Digital outputs

Main Controller EC 531

DO1	DO2	DO3	DO4	DO5	DO6	DO7	DO8
0	1	2	3	4	5	6	7

8 - 63	User IO	Read Write

1.2 Digital inputs

Main Controller EC 531

DI1	DI2	DI3	DI4	DI5	DI6	DI7	DI8	DI9	DI10	DI11	DI12	DI13	DI14
64	65	66	67	68	69	70	71	72	73	74	75	76	77

80-191	User IO	Read Write

1.3 Pump pit status

IO-Bit	Function	Note
192	High tariff	High tariff active
193	Main Power Monitor attached	On RS485 fieldbus
194	Low level float	
195	High level	
196	Low level	
197	High level float	
198	Drain pump float	
199		
200	High inflow	
201	Low inflow	
202	Backup start	
203	High pressure	
204	Low pressure	
205	Overflow switch	Digital input active
206	Overflow setpoint	Analogue setpoint on level sensor
207	Sensor Error	Analogue sensor error, cause in IO 208-210
208	Low Float, Analogue Sensor error	Incorrect level at low float
209	High Float, Analogue Sensor error	Incorrect level at high float
210	Level Freeze, Analogue Sensor error	Level is not changing
211		
212		
213		
214		
215		
216		
217	Emergency Power Mode	Pumps powered through emergency means (generator)
218	Incoming phase missing block	Main Power Monitor pump block cause
219	Over voltage block	"
220	Under voltage block	"
221	Unbalanced voltages block	"
222		
223		
224	Remote pump block	Write resets timeout timer. 0=Unblock, 1=Block
225	Pressure pump block	
226	Mixer pump block	

227	Pump reverse seq. block	
228		
229		
230		
231		
232	Mixer Relay	Write 1 to start sequence
233	Mixer run indicator	From Digital Input
234	Drain pump relay	Write 1 to start sequence
235	Drain pump run indicator	From Digital Input
236	Cleaner Flush control	Write 1 to start sequence
237		
238		
239		
240	Mixer Motor Protector	From Digital Input
241	Mixer High Temperature	From Digital Input
242	Mixer Leak	From Digital Input
243	Mixer Blocked	From Digital Input
244	Reset Motor Protector Mixer	Write 1 to start
245		
246		
247		
248	Drain Pump Motor Protector	From Digital Input
249	Drain Pump High Temperature	From Digital Input
250	Drain Pump Leak	From Digital Input
251	Drain Pump Blocked	From Digital Input
252	Reset Motor Protector Drain pump	Write 1 to start

256-495	User IO	Read Write

1.4   Comp. alarm status

IO-Bit	Function	Note
496	Not ackn, B-Alarm	
497	Not ackn. A-Alarm	
504	Active B-Alarm	
505	Active A-Alarm	
511	Ackn, Alarm Call	Same as ackn. to R333

1.5   Pump status (P1-P2)

IO-Bit P1	IO-Bit P2	Function	Note
512	640	Manual	Start reason
513	641	Level	Start reason
514	642	Float switch	Start reason
515	643	Level Derivate	Start reason
516	644	Pump Reverse	Start reason
517	645	Tariff pump down	Start reason
518	646	Run timer stop	Start reason
519	647	Run timer alternate	Start reason
520	648	High Float	Start reason
521	649	Setpoint	Status and remote control *1
522	650	Pump relay	Status and remote control *1
523	651	Alternator started	Status
524	652	Run indication Digital Input	Control Status
525	653	Run indication Motor current	Control Status
526	654	Run indication Field Bus	Control Status
527	655	Pump run indication	Configured source
528	656	Motor Protector	Input Status

529	657	High Temperature	Any source
530	658	Leakage	Any source
531	659	Block Operation (Digital input)	Input Status
532	660	Reset Motor Protector	Write 1 to start
533	661	Remote Block	
534	662	Pump fail (Digital input)	
535	663	Power Fail (Digital input)	
536	664	Over voltage	If Power Monitor Attached
537	665	Under voltage	"
538	666	Over current	"
539	667	Phase Unbalance	"
540	668	Emergency Power Block	Pump is blocked during Emergency Power mode
541	669	Output Pressure Block	
542	670	Low float	
543	671	Mixer Block	
544	672	Manual start	
545	673	Manual run	
546	674	Manual stop	
547	675	Pump Reverse Relay	Relay status
548	676	Digital Input Run Indication	
549	677	Amp Run Indication	
550	678	Field bus Run Indication	
551	679	Not in Auto	
552	680	Pump Reverse Sequence	Write 1 to start pump reverse
553	681	Pump Exercise	
554	682	4-20 mA motor current	1=Attached
555	683	RS 485 Fieldbus drive	1=Attached
556	684	RS 485 Power Monitor	1=Attached
557	685	Fieldbus drive fault	
558	686	Fieldbus drive not ready	
559	687	Pump Reverse Run Indication	
		Pump Hold Reason	**Auto restart when alarm > OFF**
560	688	Unused	
561	689	Fallen motor protector	
562	690	Unused	
563	691	Unused	
564	692	Leakage	
565	693	High temperature	
566	694	Unused	
567	695	D.IN Pump Error	
568	696	Phase missing	
569	697	Unused	
570	698	Unused	
571	699	Unused	
572	700	Unused	
573	701	Not in auto	
574	702	Motor drive - RS 485 com error	Modbus timeout
575	703	Drive fault	tripped VFD or soft starter
576	704	Leakage Oil Chamber	
577	705	Leakage Motor House	
578	706	Leakage El. Chamber	
579	707	Unused	
580	708	High temperature Stator L1	
581	709	High temperature Upper bearing	
582	710	High temperature Lower bearing	
583	711	High vibrations	
584	712	Unused	
585	713	High temperature stator L2	
586	714	High temperature stator L3	
587	715	High Voltage	

588	716	Low Voltage	
589	717	Unused	
590	718	Unused	
591	719	Unused	
		Pump Block Reason	**Alarm acknowledge required**
592	720	No run confirm	Yes
593	721	Fallen motor protector	"
594	722	High motor current	"
595	723	Unused	
596	724	Leakage	
597	725	High temperature	"
598	726	Unused	
599	727	D.IN Pump Error	"
600	728	Unused	
601	729	Unused	
602	730	Unused	
603	731	Unused	
604	732	Unused	
605	733	Unused	
606	734	Unused	
607	735	Unused	
608	736	Leakage Oil Chamber	"
609	737	Leakage Motor House	"
610	738	Leakage El. Chamber	"
611	739	Unused	
612	740	High temperature Stator L1	"
613	741	High temperature Upper bearing	"
614	742	High temperature Lower bearing	"
615	743	High vibrations	"
616	744	Spare	
617	745	High temperature stator L2	"
618	746	High temperature stator L3	"
619	747	Unused	
620	748	Unused	
621	749	Unused	
622	750	Unused	
623	751	Unused	
		IO Summary	
624	752	Floats attached	1=Yes
625	753	Start Float	1=ON
626	754	Stop Float	1= ON
627	755	Pump Blocked	Extern. or Internal
628	756	Pump Error Blocked	Pump Internal Failure Block
629	757	Hi Temperature EX Block	Write 0 to reset
630	758		
631	759		
		Best Efficiency Point Override	Run @ Max Frequency
632	760	Pump @ Max freq.	Any of below cause
633	761	Pump start counter	Pipe flush
634	762	All pumps running	Maximize capacity
635	763	High level alarm	Float or level setpoint

*1 = Remote Modbus control allowed when level is between start and stop, local conditions will override.

768-991	User IO	Read Write

1.6 **System info**

IO-Bit	Function	Note
992	Ackn. Personnel alarm	Write 0 or 1 to Reset timer
993	Spare = 0	
994	Local mode	
995		
996		

1.7 Alarm status

Alarm 0 = IO 1024 and so on

	IO-Bit	Octal	Hex
	1024-1275	2000-2373	400-4FB

Alarm status indicate 1 if alarm is active 0 when alarm is off, independent of alarm type (A/B)

Alarm numbers, which are set "Inactive", always show 0.

Alarm no.	IO-Bit	Description
0	1024	Unused
1	1025	Power fail
2	1026	Low supply voltage
3	1027	NV checksum error
4	1028	Personnel alarm
5	1029	High level pump pit
6	1030	Low level pump pit
7	1031	High level float
8	1032	Low level float
9	1033	High inflow
10	1034	Low inflow
11	1035	Backup start
12	1036	Remote blocked
13	1037	High Outlet pressure
14	1038	Low Outlet pressure
15	1039	Overflow
16	1040	Back-Pressure block
17	1041	Drain pump float
18	1042	Sensor error
19	1043	No run confirm mixer
20	1044	Fallen Motor Protector Mixer
21	1045	No run confirm drain pump
22	1046	Fallen Motor Protector Drain pump
23	1047	To many pumps blocked
24	1048	Motor protector Drain pump/Mixer reset error
25	1049	Emergency Power Mode
26	1050	Gen. alarm incoming phase missing
27	1051	Gen. alarm over voltage
28	1052	Gen. alarm under voltage
29	1053	Gen. alarm unbalanced phase voltages
30	1054	Gen. alarm high frequency
31	1055	Gen, alarm low frequency
		Pump 1
32	1056	P1: No run confirm
33	1057	P1: Fallen motor protector
34	1058	P1: High motor current
35	1059	P1: Low motor current
36	1060	P1: Leakage
37	1061	P1: High temperature
38	1062	P1: Low pump capacity Alarm
39	1063	P1: D.IN Pump Error
40	1064	P1: Phase missing
41	1065	P1: Motor protector reset unsuccessful
42	1066	P1: Max continuous runtime
43	1067	P1: Alarm blocked
44	1068	P1: Unused
45	1069	P1: Not in auto
46	1070	P1: Motor drive - RS 485 com error (Modbus timeout)
47	1071	P1: Drive fault (tripped VFD or soft starter)
48	1072	P1: Leakage Oil Chamber
49	1073	P1: Leakage Motor House
50	1074	P1: Leakage El. Chamber
51	1075	P1: Power monitor - RS 485 com error (Modbus timeout)
52	1076	P1: High temperature Stator wiring (L1)

Alarm no.	IO-Bit	Description
53	1077	P1: High temperature Upper bearing
54	1078	P1: High temperature Lower bearing
55	1079	P1: High vibrations
56	1080	P1: Spare
57	1081	P1: High temperature stator L2
58	1082	P1: High temperature stator L3
59	1083	P1: Spare
60	1084	P1: Pump reverse error (max attempts reached)
61	1085	P1: Warning low pump capacity
62	1086	P1: Unused
63	1087	P1: Unused
		Pump 2
64	1088	P2: No run confirm
65	1089	P2: Fallen motor protector
66	1090	P2: High motor current
67	1091	P2: Low motor current
68	1092	P2: Leakage
69	1093	P2: High Temperature
70	1094	P2: Low pump capacity alarm
71	1095	P2: D.IN Pump Error
72	1096	P2: Phase Missing
73	1097	P2: Motor protector reset error
74	1098	P2: Max continuous runtime
75	1099	P2: Alarm blocked
76	1100	P2: Unused
77	1101	P2: Not in auto
78	1102	P2: Motor drive - RS 485 com error (Modbus timeout)
79	1103	P2: Drive fault (tripped VFD or soft starter)
80	1104	P2: Leakage Oil Chamber
81	1105	P2: Leakage Motor Housing
82	1106	P2: Leakage El. Chamber
83	1107	P2: Power monitor - RS 485 com error (Modbus timeout)
84	1108	P2: High temperature stator (L1) (AI1 –AI8)
85	1109	P2: High temperature Upper bearing (AI1-AI8)
86	1110	P2: High temperature Lower bearing (AI1-AI8)
87	1111	P2: High Vibrations (AI1-AI4)
88	1112	P2: Spare
89	1113	P2: High temperature stator L2
90	1114	P2: High temperature stator L3
91	1115	P2: Spare
92	1116	P2: Pump reverse error (max attempts reached)
93	1117	P2: Warning low pump capacity
94	1118	P2: Unused
95	1119	P2: Unused
		AI User
96	1120	High alarm free choice AI1
97	1121	Low alarm free choice AI1
98	1122	High alarm free choice AI2
99	1123	Low alarm free choice AI2
100	1124	High alarm free choice AI3
101	1125	Low alarm free choice AI3
102	1126	High alarm free choice AI4
103	1127	Low alarm free choice AI4
104	1128	High alarm free choice AI5
105	1129	Low alarm free choice AI5
106	1130	High alarm free choice AI6
107	1131	Low alarm free choice AI6
108	1132	High alarm free choice AI7
109	1133	Low alarm free choice AI7
110	1134	High alarm free choice AI8
111	1135	Low alarm free choice AI8

		Pulse channels
112	1136	High precipitation pulse channel 1
113	1137	High power absorbed pulse channel 1
114	1138	High flow pulse channel 1
115	1139	Low flow pulse channel 1
116	1140	High precipitation pulse channel 2
117	1141	High power absorbed pulse channel 2
118	1142	High flow pulse channel 2
119	1143	Low flow pulse channel 2
120	1144	High precipitation pulse channel 3
121	1145	High power absorbed pulse channel 3
122	1146	High flow pulse channel 3
123	1147	Low flow pulse channel 3
124	1148	High precipitation pulse channel 4
125	1149	High absorbed pulse channel 4
126	1150	High flow pulse channel 4
127	1151	Low flow pulse channel 4
		Communication failure
128	1152	Main power monitor Com Error
129	1153	Unused
130	1154	Unused
131	1155	Unused
132	1156	Leakage Mixer
133	1157	High temperature Mixer
134	1158	Leakage drain pump
135	1159	High temperature drain pump
		Sensor/Cable Error AI1-AI8
136	1160	Sensor/Cable Error AI 1
137	1161	Sensor/Cable Error AI 2
138	1162	Sensor/Cable Error AI 3
139	1163	Sensor/Cable Error AI 4
140	1164	Sensor/Cable Error AI 5
141	1165	Sensor/Cable Error AI 6
142	1166	Sensor/Cable Error AI 7
143	1167	Sensor/Cable Error AI 8

Alarm no.	IO-Bit	Description
144	1168	Alarm digital input 1. Type = Alarm Input
145	1169	Alarm digital input 2
146	1170	Alarm digital input 3
147	1171	Alarm digital input 4
148	1172	Alarm digital input 5
149	1173	Alarm digital input 6
150	1174	Alarm digital input 7
151	1175	Alarm digital input 8
152	1176	Alarm digital input 9
153	1177	Alarm digital input 10
154	1178	Alarm digital input 11
155	1179	Alarm digital input 12
156	1180	Alarm digital input 13
157	1181	Alarm digital input 14
158	1182	Unused
159	1183	Unused

1.8 Latched alarm status

	IO-Bit	Octal	Hex
Alarm 0 = IO 1280 and so on	1280-1531	2400-2773	500-5FB

Latched alarm status is set to 1 when alarm goes active and are updated after Comli/Modbus readout with actual alarm status. This is made to not lose alarms, which have gone inactive before the call is ready.

1.9 Acknowledged alarms

	IO-Bit	Octal	Hex
Alarm 0 = IO 1536 and so on	1536-1787	3000-3373	600-6FB

Status for ackn. alarm are set to 0 each time a new alarm occurs and gives the possibility for a central system to acknowledge each alarm individually.
The acknowledge works the same way as local acknowledge on PC 441 and is made by writing a 1 to actual alarm bit.
This acknowledge is time stamped in the local alarm list. Even local acknowledge in substation acknowledge, actual IO-bits.
You can also acknowledge all alarms by write to R333 (if you have select that function).
For system that can handle the Comli/Modbus telegram for time stamped events, we recommend to use that method for readout of new alarms.

1.10 Pending alarms

	IO-Bit	Octal	Hex
Alarm 0 = IO 1792 and so on	1792-2043	3400-3773	700-7FB

Pending alarms bits maybe active even if alarm is set inactive.

2 Text Addresses

All text addresses are given in Hex format.

2.1 Analogue input alarms

Address (Hex)	Description	Scale/Unit/Note
0	Analogue in 1	User test
1	Analogue in 2	User text
2	Analogue in 3	User text
3	Analogue in 4	User text
4	Analogue in 5	User text
5	Analogue in 6	User text
6	Analogue in 7	User text
7	Analogue in 8	User text
100	Analogue in 1	User unit
101	Analogue in 2	User unit
102	Analogue in 3	User unit
103	Analogue in 4	User unit
104	Analogue in 5	User unit
105	Analogue in 6	User unit
106	Analogue in 7	User unit
107	Analogue in 8	User unit

2.2 Digital input alarms

Address (Hex)	Description	
300	Digital in 1	DI alarm text
301	Digital in 2	DI alarm text
302	Digital in 3	DI alarm text
303	Digital in 4	DI alarm text
304	Digital in 5	DI alarm text
305	Digital in 6	DI alarm text
306	Digital in 7	DI alarm text
307	Digital in 8	DI alarm text
308	Digital in 9	DI alarm text
309	Digital in 10	DI alarm text
30A	Digital in 11	DI alarm text
30B	Digital in 12	DI alarm text
30C	Digital in 13	DI alarm text
30D	Digital in 14	DI alarm text

2.3 Pulse inputs

Address (Hex)	Description	
540	Pulse channel 1	Pulse type text
541	Pulse channel 2	Pulse type text
542	Pulse channel 3	Pulse type text
543	Pulse channel 4	Pulse type text
550	Pulse channel 1	Pulse flow unit text
551	Pulse channel 2	Pulse flow unit text
552	Pulse channel 3	Pulse flow unit text
553	Pulse channel 4	Pulse flow unit text
560	Pulse channel 1	Pulse volume unit text
561	Pulse channel 2	Pulse volume unit text
562	Pulse channel 3	Pulse volume unit text
563	Pulse channel 4	Pulse volume unit text

2.4 Pump Tag Name

Address (Hex)	Description	
590	Pump 1	Tag Name (max 10 char)
591	Pump 2	Tag Name

2.5 Tele and alarm setup

Address (Hex)	Description
800	Mac address (unique Ethernet ID)
801	SMS phone no 1
802	SMS phone no 2
812	PIN code for GSM modem
815	Remote (AquaWeb server) IP address
816	GPRS apn.
817	GPRS apn continued.
818	GPRS User name
819	GPRS Password
820	Local GPRS IP Address
830	Static IP Address
831	Static Net Mask
832	Static Gateway
834	Dynamic IP Address
835	Dynamic Net Mask
836	Dynamic Gateway
980	Current Date
981	Current Time

2.6 Digital history time stamped events in chronological order

Event type: ALARM ON/ALARM OFF/ALARM ACKN./D.IN-D.OUT ON/OFF

Text like: Date(YYMMDDMMSS)[TAB]Event type[TAB]Source

Address (Hex)	Description
2000	Last time stamped event
2001	Event before last
2002	And so on. Max 4096 events backwards
……	
2FFF	

3 CA 531 Modbus Register

3.1 Remote/Local status

Register no	Description	Scale factor/ unit / note
0	Local Mode	1 = Local

3.2 Analogue inputs/Outputs in engineering units

Register no	Description	Scale factor/ unit / note
1	AIN 1. Function/User defined	Function/User defined
2	AIN 2. Function/User defined	Function/User defined
3	AIN 3. Function/User defined	Function/User defined
4	AIN 4. Function/User defined	Function/User defined
5	AIN 5. Function/User defined	Function/User defined
6	AIN 6. Function/User defined	Function/User defined
7	AIN 7. Function/User defined	Function/User defined
8	AIN 8. Function/User defined	Function/User defined
12	AO 1. mA output	0.001 mA
13	AO 2. mA output	0.001 mA
16	PID Setpoint	0.01 m
17	PID Current value	0.01 m
18	PID Output	0.01 %
19	Setpoint flags	
20	Output flags	
22	P1 state	0=Motor Disabled, 1=Motor Off-OK, 2=Moto Run, 3=Motor Error Run, 4=Motor blocked, 5= Motor Error Blocked, 6=Motor Reversing
23	P2 state	0=Motor Disabled, 1=Motor Off-OK, 2=Moto Run, 3=Motor Error Run, 4=Motor blocked, 5= Motor Error Blocked, 6=Motor Reversing
24	P1 State M-0-A Switch	0=Man, 1=0, 2=Auto
25	P2 State M-0-A Switch	0=Man, 1=0, 2=Auto
26	P1 Reverse status	0=OK, 1=Timer block (R1824), 2=Alarm block, ack. required
27	P2 Reverse status	0=OK, 1=Timer block (R1824), 2=Alarm block, ack. required

3.3 Actual values in engineering units

Register no	Description	Scale factor/ unit / note		
35	Actual head	0.01 m	(0.01 Ft)	Head, incl. actual pit level
36	Nominal head P1	0.01 m	(0.01 Ft)	Pump capacity head
37	Nominal head P2	0.01 m	(0.01 Ft)	Pump capacity head
38 + 39	Pit Volume	1 liter	(1 Gal)	
40	Pit Level	0.01 m	(0.01 Ft)	
41	Inflow	0.1 l/s	(1 GPM)	
42	Outflow	0.1 l/s	(1 GPM)	
43	Overflow level	1 mm	(0.01 Inch)	
44	Overflow flow m3/h	0.1 m3/h	(1 GPM)	
45	Overflow flow l /s	0.1 l/s	(1 GPM)	
46	Last pump capacity P1	0.1 l/s	(1 GPM)	
47	Last pump capacity P2	0.1 l/s	(1 GPM)	
48	Latest Energy efficiency P1	0.001 kWh/m3	(1 kWh/Mgal)	
49	Latest Energy efficiency P2	0.001 kWh/m3	(1 kWh/Mgal)	
50	Motor Current P1	0.1 A		
51	Motor Current P2	0.1 A		
52	Vibrations P1	0.1 mm/s	(0.01 Inch/h)	
53	Vibrations P2	0.1 mm/s	(0.01 Inch/h)	

Register no	Description	Scale factor/ unit / note	
54	Precipitation/Effect/Flow Ch. 1	0.1 l/s*ha/ 0.1 kW/m3/h	(0.01 inch/h, 1 GPM)
55	Precipitation/Effect/Flow Ch. 2	0.1 l/s*ha/ 0.1 kW/m3/h	(0.01 inch/h, 1 GPM)
56	Precipitation/Effect/Flow Ch. 3	0.1 l/s*ha/ 0.1 kW/m3/h	(0.01 inch/h, 1 GPM)
57	Precipitation/Effect/Flow Ch. 4	0.1 l/s*ha/ 0.1 kW/m3/h	(0.01 inch/h, 1 GPM)
58	Supply voltage	0.1 V	
59	PCB Temperature	1 °C	
60	Pit level above sea	0.01 m Pit level with reg. 1530 sea level offset added	
61	Outlet Pressure	0.1 bar	(0.1 PSI)
62	Total pump head (Outlet press.)	0.01 m	(0.01 Ft)
63+64	No pump capacity calculations	P1	
65+66	No pump capacity calculations	P2	
67	No starts since last pump reverse	P1	
68	No starts since last pump reverse	P2	
70	P1 Temperature Stator L1	0.1 °C	(0.1°F) Pt100 Sensor
71	P1 Temperature Stator L2	0.1 °C	
72	P1 Temperature Stator L3	0.1 °C	
73	P1 Temperature upper bearing	0.1 °C	
74	P1 Temperature lower bearing	0.1 °C	
75	P1 Motor Temperature	0.1 °C	
78+79	P1 Runtime last pump cycle	seconds	
80	P2 Temperature Stator L1	0.1 °C	(0.1°F) Pt100 Sensor
81	P2 Temperature Stator L2	0.1 °C	
82	P2 Temperature Stator L3	0.1 °C	
83	P2 Temperature upper bearing	0.1 °C	
84	P2 Temperature lower bearing	0.1 °C	
85	P2 Motor Temperature	0.1 °C	
88+89	P2 Runtime last pump cycle	seconds	

All temperatures in °F. If US units selected.

Register no	Description	Scale factor/ unit / note
Main Power Monitor		
90	Current	0.1 A
91	Line Current L1	0.1 A
92	Line Current L2	0.1 A
93	Line Current L3	0.1 A
94	Average LN Voltage	0.1 V
95	Line Voltage L1	0.1 V
96	Line Voltage L2	0.1 V
97	Line Voltage L3	0.1 V
98	Average LL Voltage	0.1 V
99	L1-L2 Voltage	0.1 V
100	L2-L3 Voltage	0.1 V
101	L3-L1 Voltage	0.1 V
102	Main Power	0.1 kW
103	Main frequency	0.01 Hz
104	Power Factor	0.01
Pump info counters		
110	No enabled pumps	
111	No pumps running	
112	No pumps blocked	
113	No alternate enabled pumps	
114	No alternated pumps running	
115	Alternator index	0-1
VFD/Power monitor Pump 1		
120	Current	0.1 A
121	Line Current L1	0.1 A
122	Line Current L2	0.1 A
123	Line Current L3	0.1 A
124	Average LN Voltage	0.1 V
125	Line Voltage L1	0.1 V
126	Line Voltage L2	0.1 V
127	Line Voltage L3	0.1 V
128	Average LL Voltage	0.1 V
129	L1-L2 Voltage	0.1 V
130	L2-L3 Voltage	0.1 V
131	L3-L1 Voltage	0.1 V VFD
132	Pump Power	0.1 kW	Shows Drive output power if no power monitor
133	Input Freq.	0.01 Hz
134	Power Factor	0.01
135	Drive Control	
136	Drive Status	Bitmask	0=Off, 1=Run, 2=Disabled, 4=Fault, 16=Tune in
137	Set frequency	0.01 Hz	To speed drive
138	Current frequency	0.01 Hz	From speed drive
139	Rotation Speed	1 rpm
140	Motor Voltage	0.1 V
141	Motor Power	0.1 kW	Drive output power
142	Motor Current	0.1 A
143	Torque Nm	1 Nm
144	Torque %	0.1 %

VFD/Power monitor Pump 2

150	Current	0.1 A	
151	Line Current L1	0.1 A	
152	Line Current L2	0.1 A	
153	Line Current L3	0.1 A	
154	Average LN Voltage	0.1 V	
155	Line Voltage L1	0.1 V	
156	Line Voltage L2	0.1 V	
157	Line Voltage L3	0.1 V	
158	Average LL Voltage	0.1 V	
159	L1-L2 Voltage	0.1 V	
160	L2-L3 Voltage	0.1 V	
161	L3-L1 Voltage	0.1 V	
162	Pump Power	0.1 kW	Shows Drive output power if no power monitor
163	Input Freq.	0.01 Hz	
164	Power Factor	0.01	
165	Drive Control		
166	Drive Status	Bitmask	0=Off, 1=Run, 2=Disabled, 4=Fault, 16=Tune in
167	Set frequency	0.01 Hz	To speed drive
168	Current frequency	0.01 Hz	From speed drive
169	Rotation Speed	1 rpm	
170	Motor Voltage	0.1 V	
171	Motor Power	0.1 kW	Drive output power
172	Motor Current	0.1 A	
173	Torque Nm	1 Nm	
174	Torque %	0.1 %	

Analogue mA inputs

180	AI 1. mA input	0.001 mA
181	AI 2. mA input	0.001 mA
182	AI 3. mA input	0.001 mA
183	AI 4. mA input	0.001 mA

Best Efficiency Point status

190	P1 Energy efficiency	0,0001 kWh/m3 (1 kWh/Mgal)	
191	P1 BEP frequency	0,01 Hz	
192	P1 BEP step	0,01 Hz	0,10 – 3,00
193	P1 BEP last step direction	0=decr. 1=incr.	Write 2 to reset BEP freq. to system config freq.
194	P1 Filtered efficiency index	volume/energy	Higher is better
195	P1 Last raw efficiency index	volume/energy	
196	P1 Drive start ramp	seconds	Measured value
200	P2 Energy efficiency	0,0001 kWh/m3 (1 kWh/Mgal)	
201	P2 BEP frequency	0,01 Hz	
202	P2 BEP step	0,01 Hz	0,10 – 3,00
203	P2 BEP last step direction	0=decr. 1=incr.	Write 2 to reset BEP freq. to system config freq.
204	P2 Filtered efficiency index	volume/energy	Higher is better
205	P2 Last raw efficiency index	volume/energy	
206	P2 Drive start ramp	seconds	Measured value

3.4 IO-bits 0-255

Register no	Description	Scale factor/ unit / note
312	IO 0 -15	Read only
313	IO 16-31	Read only
314	IO 32-47	Read only
315	IO 48-63	Read only
316	IO 64-79	Read only
317	IO 80-95	Read only
318	IO 96-111	Read only
319	IO 112-127	Read only
320	IO 128-143	Read only
321	IO 144-159	Read only
322	IO 160-175	Read only
323	IO 176-191	Read only
324	IO 192-207	Read only
325	IO 208-223	Read only
326	IO 224-239	Read only
327	IO 240-255	Read only

3.5 Acknowledge alarm dialup

Register no	Description	Scale factor/ unit / note
333	Write to ackn. Alarm dialup	for value 1 master takes response for disconnecting
34	" " "	" "

3.6 GPRS status

Register no	Description	Scale factor/ unit / note
334	GPRS CSQ	Signal strength 0-31
335	GPRS connect count	
336	GPRS connect status	0=disconnected, 1=reconnecting, 2=connected
337	urc.ProfileId	From last ^SIS msg
338	urc.Cause	From last ^SIS msg
339	urc.InfoId	From last ^SIS msg
340	Previous urc.IfoId	^SIS msg before last

3.7 Raw AD values

Register no	Description	Scale factor/ unit / note
385 - 401	Factory reserved	Calibration AI/AO
402	AI 1	User
403	AI 2	User
404	AI 3	User
405	AI 4	User
406	AI 5	Pt100
407	AI 6	Pt100
408	AI 7	Pt100
409	AI 8	Pt100
410	AI 9	Motor Current P1
411	AI 10	Motor Current P2
412	AI 11	Motor Freq. VFD P1
413	AI 12	Motor Freq. VFD P2
414	AI 13	Motor Power P1
415	AI 14	Motor Power P2
416	AI 15	Mains Voltage
417	AI 16	Not used

3.8 Unfiltered AI values

Register no	Description	Scale factor/ unit / note
421	AI 1 User	0.01%
422	AI 2 User	0.01%
423	AI 3 User	0.01%
424	AI 4 User	0.01%
425	AI 5 Pt100	0.01%
426	AI 6 Pt100	0.01%
427	AI 7 Pt100	0.01%
428	AI 8 Pt100	0.01%

3.9 Communication status

Register no	Description	Scale factor/ unit / note
Service port RS 232		
460	Overflow counter	
461	Parity error counter	
462	Framing error counter	
463	Break counter	
464	Error messages counter	
465	Ok Messages counter	
466	Checksum error counter	
467	Communication Active	
Com port RS 485		
470	Overflow counter	
471	Parity error counter	
472	Framing error counter	
473	Break counter	
474	Error messages counter	
475	Ok Messages counter	
476	Checksum error counter	
477	Communication Active	
Modem Port RS 232		
480	Overflow counter	
481	Parity error counter	
482	Framing error counter	
483	Break counter	
484	Error messages counter	
485	Ok Messages counter	
486	Checksum error counter	
487	Communication Active	
GPRS		
494	Error messages counter	
495	Ok Messages counter	
496	Checksum error counter	
497	Communication Active	
USB Port		
504	Error messages counter	
505	Ok Messages counter	
506	Checksum error counter	
507	Communication Active	
Ethernet Port		
514	Error messages counter	
515	Ok Messages counter	
516	Checksum error counter	
517	Communication Active	

3.10 General info

Register no	Description	Scale factor/ unit / note
443	Program version	100 = 1.00
444	Special version	0 = Standard version
445	Station type	68=EC 531
446	CPU clock frequency	1/1000 in MHz and three decimals
447	Program version in hex	1.00 = 0x100
449	GSM-GPRS signal (CSQ)	0-31, 99=unknown (also in Reg 34)
583-584	Station number	Station identification for monitoring systems
31-32	" "	" " "

3.11 Accumulated total values

Register no	Description	Scale factor/ unit / note		
600-601	Overflow volume	0.1 m3	(1 gal)	
602-603	Overflow count	times		
604-605	Overflow time	sec		
606-607	Pit Flow volume	0.1 m3	(1 gal)	
608-609	Pit Efficiency	0.001 kWh/m3	(1 kWh/Mgal)	Average value
610-611	Pit Energy consumption	0.1 kWh		
612-613	Multi start count	times		
614-615	Multi runtime	sec		
616-617	P1 Flow volume	1 liter	(0.1 gal)	
618-619	P1 Efficiency	0.001 kWh/m3	(1 kWh/Mgal)	Average value
620-621	P1 Energy consumption	0.1 kWh		
622-623	P1 start count	times		
624-625	P1 run time	sec		
626-627	P1 nominal cap.	0.1 l/s	(1 GPM)	
628-629	P2 Flow volume.	1 liter	(0.1 gal)	
630-631	P2 Efficiency	0.001 kWh/m3	(1 kWh/Mgal)	Average value
632-633	P2 Energy consumption.	0.1 kWh		
634-635	P2 start count	times		
636-637	P2 run time	sec		
638-639	P2 nominal cap.	0.1 l/s	(1 GPM)	
640-641	Mixer start cont.	times		
642-643	Mixer run time	sec		
644-645	No Power On	times		
646-647	Power On time	sec		
648-649	Pulse Ch. 1	0.1 kWh/ mm/m3	(0.01 inch)	
650-651	Pulse Ch. 2	0.1 kWh/ mm/m3	(0.01 inch)	
652-653	Pulse Ch. 3	0.1 kWh/ mm/m3	(0.01 inch)	
654-655	Pulse Ch. 4	0.1 kWh/ mm/m3	(0.01 inch)	
656-657	Drain pump runtime	sec		
658-659	Drain pump start count	times		
660-679	Spare			

3.12 **Accumulated values today**

Register no	Description	Scale factor/ unit / note	
680-681	Overflow volume	0.1 m3	(1 gal)
682-683	Overflow count	times	
684-685	Overflow time	sec	
686-687	Pit Pumped volume	0.1 m3	(1 gal)
688-689	Pit Efficiency	0.001 kWh/m3	(1 kWh/Mgal)
690-691	Pit Energy consumption	0.1 kW	
692-693	Multi start count	times	
694-695	Multi runtime	sec	
696-697	P1 Pumped volume	1 liter	(0.1 gal)
698-699	P1 Efficiency	0.001 kWh/m3	(1 kWh/Mgal)
700-701	P1 Energy consumption	0.1 kW	
702-703	P1 start count	times	
704-705	P1 run time	sec	
706-707	P1 nominal cap.	0.1 l/s	(1 GPM)
708-709	P2 Pumped volume.	1 liter	(0.1 gal)
710-711	P2 Efficiency	0.001 kWh/m3	(1 kWh/Mgal)
712-713	P2 Energy consumption.	0.1 kW	
714-715	P2 start count	times	
716-717	P2 run time	sec	
718-719	P2 nominal cap.	0.1 l/s	(1 GPM)
720-721	Mixer start cont.	times	
722-723	Mixer run time	sec	
724-725	No Power On	times	
726-727	Power On time	sec	
728-729	Pulse Ch. 1	0.1 kWh/ mm/m3	(0.01 inch)
730-731	Pulse Ch. 2	0.1 kWh/ mm/m3	(0.01 inch)
732-733	Pulse Ch. 3	0.1 kWh/ mm/m3	(0.01 inch)
734-735	Pulse Ch. 4	0.1 kWh/ mm/m3	(0.01 inch)
736-737	Drain pump runtime	sec	
738-739	Drain pump start count	times	
740-759	Spare		

3.13 Accumulated values yesterday

Register no	Description	Scale factor/ unit / note	
760-761	Overflow volume	0.1 m3	(1 gal)
762-763	Overflow count	times	
764-665	Overflow time	sec	
766-767	Pit Flow volume	0.1 m3	(1 gal)
768-769	Pit Efficiency	0.001 kWh/m3 (1 kWh/Mgal)	
770-771	Pit Energy consumption	0.1 kW	
772-773	Multi start count	times	
774-775	Multi runtime	sec	
776-777	P1 Flow volume	1 liter	(0.1 gal)
778-779	P1 Efficiency	0.001 kWh/m3 (1 kWh/Mgal)	
780-781	P1 Energy consumption	0.1 kW	
782-783	P1 start count	times	
784-785	P1 run time	sec	
786-787	P1 nominal cap.	0.1 l/s	(1 GPM)
788-789	P2 Flow volume.	1 liter	(0.1 gal)
790-791	P2 Efficiency	0.001 kWh/m3 (1 kWh/Mgal)	
792-793	P2 Energy consumption.	0.1 kW	
794-795	P2 start count	times	
796-797	P2 run time	sec	
798-799	P2 nominal cap.	0.1 l/s	(1 GPM)
800-801	Mixer start cont.	times	
802-803	Mixer run time	sec	
804-805	No Power On	times	
806-807	Power On time	sec	
808-809	Pulse Ch. 1	0.1 kWh/ mm/m3	(0.01 inch)
810-811	Pulse Ch. 2	0.1 kWh/ mm/m3	(0.01 inch)
812-813	Pulse Ch. 3	0.1 kWh/ mm/m3	(0.01 inch)
814-815	Pulse Ch. 4	0.1 kWh/ mm/m3	(0.01 inch)
816-817	Drain pump runtime	sec	
818-819	Drain pump start count	times	
820-839	Spare		

3.14 **Accumulated values 2 days ago**

Register no	Description	Scale factor/ unit / note	
840-841	Overflow volume	0.1 m3	(1 gal)
842-843	Overflow count	times	
844-845	Overflow time	sec	
846-847	Pit Flow volume	0.1 m3	(1 gal)
848-849	Pit Efficiency	0.001 kWh/m3	(1 kWh/Mgal)
850-851	Pit Energy consumption	0.1 kW	
852-853	Multi start count	times	
854-855	Multi runtime	sec	
856-857	P1 Flow volume	1 liter	(0.1 gal)
858-859	P1 Efficiency	0.001 kWh/m3	(1 kWh/Mgal)
860-861	P1 Energy consumption	0.1 kW	
862-863	P1 start count	times	
864-865	P1 run time	sec	
866-867	P1 nominal cap.	0.1 l/s	(1 GPM)
868-869	P2 Flow volume.	1 liter	(0.1 gal)
870-871	P2 Efficiency	0.001 kWh/m3	(1 kWh/Mgal)
872-873	P2 Energy consumption.	0.1 kW	
874-875	P2 start count	times	
876-877	P2 run time	sec	
878-879	P2 nominal cap.	0.1 l/s	(1 GPM)
880-881	Mixer start cont.	times	
882-883	Mixer run time	sec	
884-885	No Power On	times	
886-887	Power On time	sec	
888-889	Pulse Ch. 1	0.1 kWh/ mm/m3	(0.01 inch)
890-891	Pulse Ch. 2	0.1 kWh/ mm/m3	(0.01 inch)
892-893	Pulse Ch. 3	0.1 kWh/ mm/m3	(0.01 inch)
894-895	Pulse Ch. 4	0.1 kWh/ mm/m3	(0.01 inch)
896-897	Drain pump runtime	sec	
898-899	Drain pump start count	times	
900-919	Spare		

3.15 **Accumulated values 3 days ago**

Register no	Description	Scale factor/ unit / note	
920-921	Overflow volume	0.1 m3	(1 gal)
922-923	Overflow count	times	
924-925	Overflow time	sec	
926-927	Pit Flow volume	0.1 m3	(1 gal)
928-929	Pit Efficiency	0.001 kWh/m3	(1 kWh/Mgal)
930-931	Pit Energy consumption	0.1 kW	
932-933	Multi start count	times	
934-935	Multi run time	sec	
936-937	P1 Flow volume	1 liter	(0.1 gal)
938-939	P1 Efficiency	0.001 kWh/m3	(1 kWh/Mgal)
940-941	P1 Energy consumption	0.1 kW	
942-943	P1 start count	times	
944-945	P1 run time	sec	
946-947	P1 nominal cap.	0.1 l/s	(1 GPM)
948-949	P2 Flow volume.	1 liter	(0.1 gal)
950-951	P2 Efficiency	0.001 kWh/m3	(1 kWh/Mgal)
952-953	P2 Energy consumption.	0.1 kW	
954-955	P2 start count	times	
956-957	P2 run time	sec	
958-959	P2 nominal cap.	0.1 l/s	(1 GPM)
960-961	Mixer start cont.	times	
962-963	Mixer run time	sec	
964-965	No Power On	times	
966-967	Power On time	sec	
968-969	Pulse Ch. 1	0.1 kWh/ mm/m3	(0.01 inch)
970-971	Pulse Ch. 2	0.1 kWh/ mm/m3	(0.01 inch)
972-973	Pulse Ch. 3	0.1 kWh/ mm/m3	(0.01 inch)
974-975	Pulse Ch. 4	0.1 kWh/ mm/m3	(0.01 inch)
976-977	Drain pump runtime	sec	
978-979	Drain pump start count	times	
980-999	Spare		

3.16 Accumulated values 4 days ago

Register no	Description	Scale factor/ unit / note	
1000-1001	Overflow volume	0.1 m3	(1 gal)
1002-1003	Overflow count	times	
1004-1005	Overflow time	sec	
1006-1007	Pit Flow volume	0.1 m3	(1 gal)
1008-1009	Pit Efficiency	0.001 kWh/m3	(1 kWh/Mgal)
1010-1011	Pit Energy consumption	0.1 kW	
1012-1013	Multi pump start count	times	
1014-1015	Multi pump run time	sec	
1016-1017	P1 Flow volume	1 liter	(0.1 gal)
1018-1019	P1 Efficiency	0.001 kWh/m3	(1 kWh/Mgal)
1020-1021	P1 Energy consumption	0.1 kW	
1022-1023	P1 start count	times	
1024-1025	P1 run time	sec	
1026-1027	P1 nominal cap.	0.1 l/s	(1 GPM)
1028-1029	P2 Flow volume.	1 liter	(0.1 gal)
1030-1031	P2 Efficiency	0.001 kWh/m3	(1 kWh/Mgal)
1032-1033	P2 Energy consumption.	0.1 kW	
1034-1035	P2 start count	times	
1036-1037	P2 run time	sec	
1038-1039	P2 nominal cap.	0.1 l/s	(1 GPM)
1040-1041	Mixer start cont.	times	
1042-1043	Mixer run time	sec	
1044-1045	No Power On	times	
1046-1047	Power On time	sec	
1048-1049	Pulse Ch. 1	0.1 kWh/ mm/m3	(0.01 inch)
1050-1051	Pulse Ch. 2	0.1 kWh/ mm/m3	(0.01 inch)
1052-1053	Pulse Ch. 3	0.1 kWh/ mm/m3	(0.01 inch)
1054-1055	Pulse Ch. 4	0.1 kWh/ mm/m3	(0.01 inch)
1056-1057	Drain pump runtime	sec	
1058-1059	Drain pump start count	times	
1060-1079	Spare		

3.17 **Accumulated values 5 days ago**

Register no	Description	Scale factor/ unit / note	
1080-1081	Overflow volume	0.1 m3	(1 gal)
1082-1083	Overflow count	times	
1084-1085	Overflow time	sec	
1086-1087	Pit Flow volume	0.1 m3	(1 gal)
1088-1089	Pit Efficiency	0.001 kWh/m3 (1 kWh/Mgal)	
1090-1091	Pit Energy consumption	0.1 kW	
1092-1093	Multi pump start count	times	
1094-1095	Multi pump run time	sec	
1096-1097	P1 Flow volume	1 liter	(0.1 gal)
1098-1099	P1 Efficiency	0.001 kWh/m3 (1 kWh/Mgal)	
1100-1101	P1 Energy consumption	0.1 kW	
1102-1103	P1 start count	times	
1104-1105	P1 run time	sec	
1106-1107	P1 nominal cap.	0.1 l/s	(1 GPM)
1108-1109	P2 Flow volume.	1 liter	(0.1 gal)
1110-1111	P2 Efficiency	0.001 kWh/m3 (1 kWh/Mgal)	
1112-1113	P2 Energy consumption.	0.1 kW	
1114-1115	P2 start count	times	
1116-1117	P2 run time	sec	
1118-1119	P2 nominal cap.	0.1 l/s	(1 GPM)
1120-1121	Mixer start cont.	times	
1122-1123	Mixer run time	sec	
1124-1125	No Power On	times	
1126-1127	Power On time	sec	
1128-1129	Pulse Ch. 1	0.1 kWh/ mm/m3	(0.01 inch)
1130-1131	Pulse Ch. 2	0.1 kWh/ mm/m3	(0.01 inch)
1132-1133	Pulse Ch. 3	0.1 kWh/ mm/m3	(0.01 inch)
1134-1135	Pulse Ch. 4	0.1 kWh/ mm/m3	(0.01 inch)
1136-1137	Drain pump runtime	sec	
1138-1139	Drain pump start count	times	
1140-1159	Spare		

3.18 **Accumulated values 6 days ago**

Register no	Description	Scale factor/ unit / note		
1160-1161	Overflow volume	0.1 m3	(1 gal)	
1162-1163	Overflow count	times		
1164-1165	Overflow time	sec		
1166-1167	Pit Flow volume	0.1 m3	(1 gal)	
1168-1169	Pit Efficiency	0.001 kWh/m3	(1 kWh/Mgal)	
1170-1171	Pit Energy consumption	0.1 kW		
1172-1173	Multi pump start count	times		
1174-1175	Multi pump run time	sec		
1176-1177	P1 Flow volume	1 liter	(0.1 gal)	
1178-1179	P1 Efficiency	0.001 kWh/m3	(1 kWh/Mgal)	
1180-1181	P1 Energy consumption	0.1 kW		
1182-1183	P1 start count	times		
1184-1185	P1 run time	sec		
1186-1187	P1 nominal cap.	0.1 l/s	(1 GPM)	
1188-1189	P2 Flow volume.	1 liter	(0.1 gal)	
1190-1191	P2 Efficiency	0.001 kWh/m3	(1 kWh/Mgal)	
1192-1193	P2 Energy consumption.	0.1 kW		
1194-1195	P2 start count	times		
1196-1197	P2 run time	sec		
1198-1199	P2 nominal cap.	0.1 l/s	(1 GPM)	
1200-1201	Mixer start cont.	times		
1202-1203	Mixer run time	sec		
1204-1205	No Power On	times		
1206-1207	Power On time	sec		
1208-1209	Pulse Ch. 1	0.1 kWh/ mm/m3		(0.01 inch)
1210-1211	Pulse Ch. 2	0.1 kWh/ mm/m3		(0.01 inch)
1212-1213	Pulse Ch. 3	0.1 kWh/ mm/m3		(0.01 inch)
1214-1215	Pulse Ch. 4	0.1 kWh/ mm/m3		(0.01 inch)
1216-1217	Drain pump runtime	sec		
1218-1219	Drain pump start count	times		
1220-1239	Spare			

3.19 **Accumulated values 7 days ago**

Register no	Description	Scale factor/ unit / note	
1240-1241	Overflow volume	0.1 m3	(1 gal)
1242-1243	Overflow count	times	
1244-1245	Overflow time	sec	
1246-1247	Pit Flow volume	0.1 m3	(1 gal)
1248-1249	Pit Efficiency	0.001 kWh/m3	(1 kWh/Mgal)
1250-1251	Pit Energy consumption	0.1 kW	
1252-1253	Multi pump start count	times	
1254-1255	Multi pump run time	sec	
1256-1257	P1 Flow volume	1 liter	(0.1 gal)
1258-1259	P1 Efficiency	0.001 kWh/m3	(1 kWh/Mgal)
1260-1261	P1 Energy consumption	0.1 kW	
1262-1263	P1 start count	times	
1264-1265	P1 run time	sec	
1266-1267	P1 nominal cap.	0.1 l/s	(1 GPM)
1268-1269	P2 Flow volume.	1 liter	(0.1 gal)
1270-1271	P2 Efficiency	0.001 kWh/m3	(1 kWh/Mgal)
1272-1273	P2 Energy consumption.	0.1 kW	
1274-1275	P2 start count	times	
1276-1277	P2 run time	sec	
1278-1279	P2 nominal cap.	0.1 l/s	(1 GPM)
1280-1281	Mixer start cont.	times	
1282-1283	Mixer run time	sec	
1284-1285	No Power On	times	
1286-1287	Power On time	sec	
1288-1289	Pulse Ch. 1	0.1 kWh/ mm/m3	(0.01 inch)
1290-1291	Pulse Ch. 2	0.1 kWh/ mm/m3	(0.01 inch)
1292-1293	Pulse Ch. 3	0.1 kWh/ mm/m3	(0.01 inch)
1294-1295	Pulse Ch. 4	0.1 kWh/ mm/m3	(0.01 inch)
1296-1297	Drain pump runtime	sec	
1298-1299	Drain pump start count	times	
1300-1319	Spare		

3.20 **System configuration**

Register no	Description	Scale factor/ unit / note	
1400	Menu language	0=Swe/ 1=Eng/ 2=Ger/ 3=Fre ……..	
1401	Date format	0=YY:MM:DD / 1=DD:MM/YY/ 2=MM:DD:YY	
1402	Units	0=Metric / 1= Us Units (Only metric support in V.1.xx	
1403	LCD Back light time	min, 0= always On	
1404	Pit fill graphics range	centimeter (0.01 ft)	
1405	Ack all alarms on reg 333	0 = disabled, 1 = Write to reg. 333 acknowledges all alarms	
1407	Main voltage	1 V	(type 400V)
1408	Main frequency	1 Hz	(type 50Hz)
1411	Hide Start-Stop levels	0=NO, 1=YES	
1412	Main graphics Show Mixer	0=NO, 1=YES	
1413	Main graphics Show P1	0=NO, 1=YES	
1414	Main graphics Show P2	0=NO, 1=YES	

Menu language   0=Swe/ 1=Eng/ 2=Ger/ 3=Fre ……..
Date format   0=YY:MM:DD / 1=DD:MM/YY/ 2=MM:DD:YY

3.21 **Pit configuration**

Register no	Description	Scale factor/ unit / note
1420	Pit flags 1	Bit mapped register, See IO-bits.
1421	Pit flags 2	" " " " "
1423	Min time between relay changess	
1424	Max No. pumps running	0=1 pump/1=2 Pumps
1425	Alternate when all pumps off	0=Every Pump stop, 1=All pumps off
1426	Pump alternation	0=Off/1=Normal/2=Asymmetrical
1427	P1 run time ratio	1-99 % Asymmetrical alternation
1428	Runtime to alternation	min. Runtime alternation
1429	Fast level change start	0/1 1 = enabled
1430	Min no. pumps running	0-2 Level change start
1431	Max no. pumps running	0-2
1432	Level change to start	0.01 m (0.01 ft)
1433	/ time unit	min
1434	Fast level change stop	0/1 1 = enabled
1435	Min no. pumps running	0-2 Level change stop
1436	Max no. pumps running	0-2
1437	Level change to stop	0.01 m (0.01 ft)
1438	/ time unit	min
1440	Calculation interval inflow	s Inflow
1441	Enable inflow calculation	0/1
1442	Static head	0.01 mH2O (0.01ft) System curve static lifting height
1445	Pressure sensor inlet offset	0.01 m (0.01ft) Overrides system curve if installed
1447	Flow compensation 2 pumps	1 % Alternative to pump/system curve
1449	Pit shape	0 = rectangular, 1 = conic
1450	Pit level 0	0.01 m (0.01 ft) Pit area
1451	Pit area 0	0.01 m2 (0.01 ft2)
1452	Pit level 1	0.01 m (0.01 ft)
1453	Pit area 1	0.01 m2 (0.01 ft2)
1454	Pit level 2	0.01m (0.01 ft)
1455	Pit area 2	0.01 m2 (0.01 ft2)
1456	Pit level 3	0.01 m (0.01 ft)
1457	Pit area 3	0.01 m2 (0.01 ft2)
1458	Pit level 4	0.01 m (0.01 ft)
1459	Pit area 4	0.01 m2 (0.01 ft2)
1460	Pit level 5	0.01m (0.01 ft)
1461	Pit area 5	0.01 m2 (0.01 ft2)
1462	Pit level 6	0.01 m (0.01 ft)
1463	Pit area 6	0.01 m2 (0.01 ft2)
1464	Pit level 7	0.01 m (0.01 ft)
1465	Pit area 7	0.01 m2 (0.01 ft2)
1466	Pit level 8	0.01m (0.01 ft)
1467	Pit area 8	0.01 m2 (0.01 ft2)
1468	Pit level 9	0.01m (0.01 ft)
1469	Pit area 9	0.01 m2 (0.01 ft2)
1470	Auto set warning threshold @	% pump capacity Default 80%
1471	Enable pump capacity calc.	0/1
1472	Min level calc. pump capacity	0.01 m (0.01 ft) Pump capacity
1473	Max level calc. pump capacity	0.01 m (0.01 ft)
1474	No calculations before alarm	Prevent Low pump capacity alarm until reached
1475	Start delay	s
1476	Calculation time	s
1477	Stop delay	s
1478	Auto set alarm threshold @	% pump capacity Default 70%

Register no	Description	Scale factor/ unit / note	
1479	Remote block enable	0=off, /1=on	
1480	Remote block timeout	s	0 = No timeout
1481	Back-Pressure block setpoint	0.1 bar	(0.1 PSI)
1482	Back-Pressure block timeout	s	0 = No timeout
1483	Back-Pressure block delay	s	
1484	Back-Pressure block enable	0=off, /1=on	
1485	High float run on time	s	High float backup control
1487	High float sensor control	0=off, 1=on	Enable
1488	Sensor level at high float	0.01 m	(0.01 ft)
1489	Max difference at high float	+/-0.01 m	(0.01 ft)
1491	Low float sensor control	0=off, 1=on	Enable
1492	Sensor level at low float	0.01 m	(0.01 ft)
1493	Max difference at low float	+/-0.01 m	(0.01 ft)
1494	Low float pump block enable	0/1	
1496	level derivate sensor control	0=off, 1=on	Enable
1497	Sensor control time	s	
1498	Min level change	0.01m	(0.01 ft)
1499	Hi tariff control enable		Tariff control
1500	Hi tariff pump pre-start	min	Tariff control
1501	Pump down level	0.01 m	(0.01 ft)
1502	Monday peak 1 On	min	0-1440 min
1503	Monday peak 1 Off	min	
1504	Monday peak 2 On	min	
1505	Monday peak 2 Off	min	
1506	Tuesday peak 1 On	min	
1507	Tuesday peak 1 Off	min	
1508	Tuesday peak 2 On	min	
1509	Tuesday peak 2 Off	min	
1510	Wednesday peak 1 On	min	
1511	Wednesday peak 1 Off	min	
1512	Wednesday peak 2 On	min	
1513	Wednesday peak 2 Off	min	
1514	Thursday peak 1 On	min	
1515	Thursday peak 1 Off	min	
1516	Thursday peak 2 On	min	
1517	Thursday peak 2 Off	min	
1518	Friday peak 1 On	min	
1519	Friday peak 1 Off	min	
1520	Friday peak 2 On	min	
1521	Friday peak 2 Off	min	
1522	Saturday peak 1 On	min	
1523	Saturday peak 1 Off	min	
1524	Saturday peak 2 On	min	
1525	Saturday peak 2 Off	min	
1526	Sunday peak 1 On	min	
1527	Sunday peak 1 Off	min	
1528	Sunday peak 2 On	min	
1529	Sunday peak 2 Off	min	
1530	Relative level m.a.s.	0.01 m	(0.01 ft)
1532	No starts to alt. stop level	times	
1533	Alternative stop level	0.01 m	(0.01 ft)
1534	Alternative Stop delay	s	
1537	Stop Pumps on phase missing		0=No 1=Yes
1538	Stop Pumps on high mains voltage		0=No 1=Yes
1539	Stop Pumps on low mains voltage		0=No 1=Yes
1540	Stop Pumps on phase unbalance		0=No 1=Yes

1541	Power monitor deblock delay s	Over/under voltage ……
1544	Demand manual reset on hi pump temp.	0= No, 1=Yes Reset = Write 0 to IO 629 and 757
1545	Block Alarm high float	0=Never block, 1= 1 pump running, 2= 2 pump running
1547	Max. pumps running during emergency power	0 = 1 pump, 1 = 2 pumps

3.22 **Pump 1 configuration**

Register no	Description	Scale factor/ unit / note		
1600	Actual start level	0.01 m (0.01 ft) Read only, normal or hi tariff		
1601	Actual stop level	0.01 m (0.01 ft) Read only, normal or hi tariff		
1602	Pump Type	0-4	0 = Pump disabled, 1=On/Off control, 2=VFD manual speed, 3=VFD PID control, 4=VFD Best Efficiency Point	
1603	Normal start level	0.01 m	(0.01 ft)	
1604	Normal stop level	0.01 m	(0.01 ft)	
1605	Normal random start range	+/- 0.01m	(0.01 ft)	
1606	High tariff start level	0.01 m	(0.01 ft)	
1607	High tariff stop level	0.01 m	(0.01 ft)	
1608	High tariff random start range	+/- 0.01m	(0.01 ft)	
1609	Start delay	s		
1610	Stop delay	s		
1611	High float backup run	0 = disabled, 1= enabled		
1612	Running indicator	0=any source, 1=Control Output, 2=Digital input, 3=Motor Current, 4=field bus		
1613	Min run current	0.1 A Run Confirm		
1614	Alternative stop level on	0 = disabled, 1= enabled	Pump down every [R1532] pump start	
1615	Max continuous runtime	min		
1616	Normal start level	0.01 m	(0.01 ft)	With reg. 1530 sea level offset
1617	Normal stop level	0.01 m	(0.01 ft)	With reg. 1530 sea level offset
1618	High tariff start level	0.01 m	(0.01 ft)	With reg. 1530 sea level offset
1619	High tariff stop level	0.01 m	(0.01 ft)	With reg. 1530 sea level offset
1620	Point 1 Total head (H max)	0.01 mH20	(0.01ft)	QH curve
1621	Point 1 Min Flow	0.1 l/s	(0.1 GPM)	Taken from QH curve
1622	Point 2 Total head (H duty)	0.01 mH2O	(0.01 ft)	Best efficiency duty point
1623	Point 2 Flow duty point	0.1 l/s	(0.1 GPM)	
1624	Point 3 Total head (H min)	0.01 mH2O	(0.01 ft)	
1625	Point 3 Max Flow	0.1 l/s	(0.1 GPM)	
1626	Total Head	0.01 mH20	(0.01 ft)	System curve
1627	Auto-set low pump capacity threshold	0 = Inactive, 1 = Trig, 2 = Running. Alarm @ 70 %, warning @ 80%		
1628	Auto-set calculation counter	0-8	Auto sequence takes 4-8 calculations to complete	
1629	Pump reverse counter	status	Counts to R1816 threshold and block R1824 minutes	
1630	Pump reverse enable	0=No /1=Yes		
1631	Pump starts between reverse	If enabled under common settings R1823		
1632	Calculated QH curve exponent	0,0001	0,9000 – 5,0000 or 0,0	

Register no	Description	Scale factor/ unit / note	
1635	Control run (pump exercise) enable	0=No /1=Yes	
1636	Hi temperature motor stop pump	0=No /1=Yes	
1637	Hi temperature stator L1 stop pump	0=No /1=Yes	
1638	Hi temperature stator L2 stop pump	0=No /1=Yes	
1639	Hi temperature stator L3 stop pump	0=No /1=Yes	
1640	Hi temperature upper bearing stop pump	0=No /1=Yes	
1641	Hi temperature lower bearing stop pump	0=No /1=Yes	
1642	High vibration stop pump	0=No /1=Yes	
1643	Leakage general stop pump	0=No /1=Yes	
1644	Leakage oil chamber stop pump	0=No /1=Yes	
1645	Leakage motor housing stop pump	0=No /1=Yes	
1646	Leakage connection chamber stop pump	0=No /1=Yes	
1647	High motor current Alarm block	0=No /1=Yes	
1648	Motor protector Alarm block	0=No /1=Yes	
1649	No run confirmation Alarm block	0=No /1=Yes	
1650	Pump error Alarm block	0=No /1=Yes	
1651	High vibration Alarm block	0=No /1=Yes	
1652	Hi temperature motor Alarm block	0=No /1=Yes	
1653	Hi temperature stator L1 Alarm block	0=No /1=Yes	
1654	Hi temperature stator L2 Alarm block	0=No /1=Yes	
1655	Hi temperature stator L3 Alarm block	0=No /1=Yes	
1656	Hi temperature upper bearing Alarm block	0=No /1=Yes	
1657	Hi temperature lower bearing Alarm block	0=No /1=Yes	
1658	Leakage general Alarm block	0=No /1=Yes	
1659	Leakage oil chamber Alarm block	0=No /1=Yes	
1660	Leakage motor housing Alarm block	0=No /1=Yes	
1661	Leakage connection chamber Alarm block	0=No /1=Yes	
1662	Reverse error Alarm block	0=No /1=Yes	Max attempts within time limit reached
1663	Emergency Power Mode Alarm Block	0=No /1=Yes	
1664	BEP Start @ max freq. every x start	0=OFF	
1665	BEP max freq. run time	Seconds	Or until pump cap. calc. complete
1666	BEP @ max freq. if all pumps running	0=No /1=Yes	
1667	All pumps max freq. delay	Seconds	
1668	BEP @ max freq. on high level alarm	0=No /1=Yes	

3.23 **Pump 2 configuration**

Register no	Description	Scale factor/ unit / note		
1700	Actual start level	0.01 m (0.01 ft) Read only, normal or hi tariff		
1701	Actual stop level	0.01 m (0.01 ft) Read only, normal or hi tariff		
1702	Pump Type	0-4	0 = Pump disabled, 1=On/Off control, 2=VFD manual speed, 3=VFD PID control, 4=VFD Best Efficiency Point	
1703	Normal start level	0.01 m	(0.01 ft)	
1704	Normal stop level	0.01 m	(0.01 ft)	
1705	Normal random start range	+/- 0.01m	(0.01 ft)	
1706	High tariff start level	0.01 m	(0.01 ft)	
1707	High tariff stop level	0.01 m	(0.01 ft)	
1708	High tariff random start range	+/- 0.01m	(0.01 ft)	
1709	Start delay	s		
1710	Stop delay	s		
1711	High float backup run	0 = disabled, 1= enabled		
1712	Running indicator	0=any source, 1=Control Output, 2=Digital input, 3=Motor Current, 4=field bus		
1713	Min run current	0.1 A Run Confirm		
1714	Alternative stop level on	0 = disabled, 1= enabled	Pump down every [R1532] pump start	
1715	Max continuous runtime	min		
1716	Normal start level	0.01 m	(0.01 ft)	With reg. 1530 sea level offset
1717	Normal stop level	0.01 m	(0.01 ft)	With reg. 1530 sea level offset
1718	High tariff start level	0.01 m	(0.01 ft)	With reg. 1530 sea level offset
1719	High tariff stop level	0.01 m	(0.01 ft)	With reg. 1530 sea level offset
1720	Point 1 Total head (H max)	0.01 mH20	(0.01ft)	QH curve
1721	Point 1 Min Flow	0.1 l/s	(0.1 GPM)	Taken from QH curve
1722	Point 2 Total head (H mid)	0.01 mH2O	(0.01 ft)	Best efficiency duty point
1723	Point 2 Flow duty point	0.1 l/s	(0.1 GPM)	
1724	Point 3 Total head (H min)	0.01 mH2O	(0.01 ft)	
1725	Point 3 Max Flow	0.1 l/s	(0.1 GPM)	
1726	Total Head	0.01 mH20	(0.01 ft)	System curve
1727	Auto-set low pump capacity threshold		0 = Inactive, 1 = Trig auto-set, 2 = Auto-set running	
1728	Auto-set calculation counter	0-8	Auto sequence takes 4-8 calculations to complete	
1729	Pump reverse counter	status	Counts to R1816 threshold and blocks R1824 minutes	
1730	Pump reverse enable		0=No /1=Yes	
1731	Pump starts between reverse		If enabled under common settings R1823	
1732	Calculated QH curve exponent	0,0001	0,9000 – 5,0000 or 0,0	

Register no	Description	Scale factor/ unit / note	
1736	Hi temperature motor stop pump	0=No /1=Yes	
1737	Hi temperature stator L1 stop pump	0=No /1=Yes	
1738	Hi temperature stator L2 stop pump	0=No /1=Yes	
1739	Hi temperature stator L3 stop pump	0=No /1=Yes	
1740	Hi temperature upper bearing stop pump	0=No /1=Yes	
1741	Hi temperature lower bearing stop pump	0=No /1=Yes	
1742	High vibration stop pump	0=No /1=Yes	
1743	Leakage general stop pump	0=No /1=Yes	
1744	Leakage oil chamber stop pump	0=No /1=Yes	
1745	Leakage motor housing stop pump	0=No /1=Yes	
1746	Leakage connection chamber stop pump	0=No /1=Yes	
1747	High motor current Alarm block	0=No /1=Yes	
1748	Motor protector Alarm block	0=No /1=Yes	
1749	No run confirmation Alarm block	0=No /1=Yes	
1750	Pump error Alarm block	0=No /1=Yes	
1751	High vibration Alarm block	0=No /1=Yes	
1752	Hi temperature motor Alarm block	0=No /1=Yes	
1753	Hi temperature stator L1 Alarm block	0=No /1=Yes	
1754	Hi temperature stator L2 Alarm block	0=No /1=Yes	
1755	Hi temperature stator L3 Alarm block	0=No /1=Yes	
1756	Hi temperature upper bearing Alarm block	0=No /1=Yes	
1757	Hi temperature lower bearing Alarm block	0=No /1=Yes	
1758	Leakage general Alarm block	0=No /1=Yes	
1759	Leakage oil chamber Alarm block	0=No /1=Yes	
1760	Leakage motor housing Alarm block	0=No /1=Yes	
1761	Leakage connection chamber Alarm block	0=No /1=Yes	
1762	Reverse error Alarm block	0=No /1=Yes	Max attempts within time limit reached
1763	Emergency Power Mode Alarm Block	0=No /1=Yes	
1764	BEP Start @ max freq. every x start	0=OFF	
1765	BEP max freq. run time	Seconds	Or until pump cap. calc. complete
1766	BEP @ max freq. if all pumps running	0=No /1=Yes	
1767	Max freq. delay	Seconds	
1768	BEP @ max freq. on high level alarm	0=No /1=Yes	
1799	Copy setup from Pump 1	Writing 1(=Yes) initiates copy sequence	

3.24 **Pump 1-2 common configuration**

Register no	Description	Scale factor/ unit / note	
1800	Log pump events	0=Timestamp off, 1=on.	
1802	Pulse time	s	Reset motor protector
1803	Pause time	s	
1804	Max no attempts	Max 3	
1810	Max stand still time	min	Control run
1811	Control runtime	s	
1812	Start if level >	0.01 m	(0.01 ft)
1813	Start if level <	0.01 m	(0.01 ft)
1814	Reversing delay time	second	
1815	Reversing run time	s	
1816	Max no reverse attempts	No attempts / time frame in R1824	
1817	Pump relay when rev	0=Off / 1=On	
1818	Stop pumps before reversing	0=Off / 1= On	
1819	Rev. when fallen M-prot.	0=No / 1=Yes	
1820	Rev. when D.in pump fail	0=No / 1=Yes	
1821	Rev. when low pump capacity	0=No / 1=Yes	
1822	Rev. when overcurrent	0=No / 1=Yes	
1823	Rev. on pump starts	0=No / 1=Yes	
1824	Max attempts reset time	minutes	nn attempts/xx minutes before reset of max attempts counters (R1629, 1729)
1825	Max attempts block time	hours	Reverse block time when attempts/minutes is reached
1826	Manual reverse reset	0=No / 1= Yes	Require alarm acknowledge to restart pump reversing

3.25 **Overflow configuration**

Register no	Description	Scale factor/ unit / note	
1840	Overflow measuring	0=Off /1=Sensor (MD 131) /2=Level	
1841	Overflow calculation	0=Exp+Const / 1=Lock on inflow	
1842-1843	Exponent 1	0.0001	
1844-1845	Constant 1	0.0001	
1846-1847	Exponent 2	0.0001	
1848-1849	Constant 2	0.0001	
1850	Level at overflow	0.001 m	(0.001ft)

3.26 Digital inputs configuration

Register no	Description	Scale factor/ unit / note
1860	DI 1. Function	0=Off/ 1=Run ind./2=Manuel start *
1861	DI 1. Pump/Ch.	0=P1/1=P2 or 0=CH1 3=CH4 For some functions
1862	DI 1. NO/NC	0=NO / 1=NC
1863	DI 1. Event log	0=Off / 1= On
1864	DI 1. Extra	Sub type High Motor Temp/Leakage
1865	DI 2. Function	0=Off/ 1=Run ind./2=Manuel start
1866	DI 2. Pump/Ch.	0=P1/1=P2
1867	DI 2. NO/NC	0=NO / 1=NC
1868	DI 2. Event log	0=Off / 1= On
1869	DI 2. Extra	Sub type High Motor Temp/Leakage
1870	DI 3. Function	0=Off/ 1=Run ind./2=Manuel start
1871	DI 3. Pump/Ch.	0=P1/1=P2
1872	DI 3. NO/NC	0=NO / 1=NC
1873	DI 3. Event log	0=Off / 1= On
1874	DI 3. Extra	Sub type High Motor Temp/Leakage
1875	DI 4. Function	0=Off/ 1=Run ind./2=Manuel start
1876	DI 4. Pump/Ch.	0=P1/1=P2/
1877	DI 4. NO/NC	0=NO / 1=NC
1878	DI 4. Event log	0=Off / 1= On
1879	DI 4. Extra	Sub type High Motor Temp/Leakage
1880	DI 5. Function	0=Off/ 1=Run ind./2=Manuel start
1881	DI 5. Pump/Ch.	0=P1/1=P2
1882	DI 5. NO/NC	0=NO / 1=NC
1883	DI 5. Event log	0=Off / 1= On
1884	DI 5. Extra	Sub type High Motor Temp/Leakage
1885	DI 6. Function	0=Off/ 1=Run ind./2=Manuel start
1886	DI 6. Pump/Ch.	0=P1/1=P2
1887	DI 6. NO/NC	0=NO / 1=NC
1888	DI 6. Event log	0=Off / 1= On
1889	DI 6. Extra	Sub type High Motor Temp/Leakage
1890	DI 7. Function	0=Off/ 1=Run ind./2=Manuel start
1891	DI 7. Pump/Ch.	0=P1/1=P2
1892	DI 7. NO/NC	0=NO / 1=NC
1893	DI 7. Event log	0=Off / 1= On
1894	DI 7. Extra	Sub type High Motor Temp/Leakage
1895	DI 8. Function	0=Off/ 1=Run ind./2=Manuel start
1896	DI 8. Pump/Ch.	0=P1/1=P2
1897	DI 8. NO/NC	0=NO / 1=NC
1898	DI 8. Event log	0=Off / 1= On
1899	DI 8. Extra	Sub type High Motor Temp/Leakage
1900	DI 9. Function	0=Off/ 1=Run ind./2=Manuel start
1901	DI 9. Pump/Ch.	0=P1/1=P2
1902	DI 9. NO/NC	0=NO / 1=NC
1903	DI 9. Event log	0=Off / 1= On
1904	DI 8. Extra	Sub type High Motor Temp/Leakage
1905	DI 10. Function	0=Off/ 1=Run ind./2=Manuel start
1906	DI 10 Pump/Ch.	0=P1/1=P2
1907	DI 10 NO/NC	0=NO / 1=NC
1908	DI 10. Event log	0=Off / 1= On
1909	DI 10. Extra	Sub type High Motor Temp/Leakage
1910	DI 11. Function	0=Off/ 1=Run ind./2=Manuel start
1911	DI 11. Pump/Ch.	0=P1/1=P2
1912	DI 11. NO/NC	0=NO / 1=NC
1913	DI 11. Event log	0=Off / 1= On
1914	DI 11. Extra	Sub type High Motor Temp/Leakage
1915	DI 12. Function	0=Off/ 1=Run ind./2=Manuel start
1916	DI 12. Pump/Ch.	0=P1/1=P2
1917	DI 12. NO/NC	0=NO / 1=NC
1918	DI 12. Event log	0=Off / 1= On
1919	DI 12. Extra	Sub type High Motor Temp/Leakage

1920	DI 13. Function	0=Off/ 1=Run ind./2=Manuel start
1921	DI 13. Pump/Ch.	0=P1/1=P2
1922	DI 13. NO/NC	0=NO / 1=NC
1923	DI 13. Event log	0=Off / 1= On
1924	DI 13. Extra	Sub type High Motor Temp/Leakage
1925	DI 14. Function	0=Off/ 1=Run ind./2=Manuel start
1926	DI 14. Pump/Ch.	0=P1/1=P2
1927	DI 14. NO/NC	0=NO / 1=NC
1928	DI 14. Event log	0=Off / 1= On
1929	DI 14. Extra	Sub type High Motor Temp/Leakage
1938	DI 1. Delay	0-999 sec. Delay for input type "Alarm Reset"
1939	DI 2. Delay	0-999 sec. Delay for input type "Alarm Reset"
1940	DI 3. Delay	0-999 sec. Delay for input type "Alarm Reset"
1941	DI 4. Delay	0-999 sec. Delay for input type "Alarm Reset"
1942	DI 5. Delay	0-999 sec. Delay for input type "Alarm Reset"
1943	DI 6. Delay	0-999 sec. Delay for input type "Alarm Reset"
1944	DI 7. Delay	0-999 sec. Delay for input type "Alarm Reset"
1945	DI 8. Delay	0-999 sec. Delay for input type "Alarm Reset"
1946	DI 9. Delay	0-999 sec. Delay for input type "Alarm Reset"
1947	DI 10. Delay	0-999 sec. Delay for input type "Alarm Reset"
1948	DI 11. Delay	0-999 sec. Delay for input type "Alarm Reset"
1949	DI 12. Delay	0-999 sec. Delay for input type "Alarm Reset"
1950	DI 13. Delay	0-999 sec. Delay for input type "Alarm Reset"
1951	DI 14. Delay	0-999 sec. Delay for input type "Alarm Reset"

* See appendices 4.1 Digital input types

3.27 **Digital outputs configuration**

Register no	Description	Scale factor/ unit / note
2000	DO 1. Function	0=Off/ 1=Pump Control/2= Reset motor protector *
2001	DO 1. Pump no.	0=P1/1=P2/ For some functions
2002	DO 1. NO/NC	0=NO / 1=NC
2003	DO 1. Event log	0=On / 1= Off
2004	DO 2. Function	0=Off/ 1=Pump Control/2= Reset motor protector
2005	DO 2. Pump no.	0=P1/1=P2
2006	DO 2. NO/NC	0=NO / 1=NC
2007	DO 2. Event log	0=On / 1= Off
2008	DO 3. Function	0=Off/ 1=Pump Control/2= Reset motor protector
2009	DO 3. Pump	0=P1/1=P2
2010	DO 3. NO/NC	0=NO / 1=NC
2011	DO 3. Event log	0=On / 1= Off
2012	DO 4. Function	0=Off/ 1=Pump Control/2= Reset motor protector
2013	DO 4. Pump	0=P1/1=P2
2014	DO 4. NO/NC	0=NO / 1=NC
2015	DO 4. Event log	0=On / 1= Off
2016	DO 5. Function	0=Off/ 1=Pump Control/2= Reset motor protector
2017	DO 5. Pump	0=P1/1=P2
2018	DO 5. NO/NC	0=NO / 1=NC
2019	DO 5. Event log	0=On / 1= Off
2020	DO 6. Function	0=Off/ 1=Pump Control/2= Reset motor protector
2021	DO 6. Pump	0=P1/1=P2
2022	DO 6. NO/NC	0=NO / 1=NC
2023	DO 6. Event log	0=On / 1= Off
2024	DO 7. Function	0=Off/ 1=Pump Control/2= Reset motor protector
2025	DO 7. Pump	0=P1/1=P2
2026	DO 7. NO/NC	0=NO / 1=NC
2027	DO 7. Event log	0=On / 1= Off
2028	DO 8. Function	0=Off/ 1=Pump Control/2= Reset motor protector
2029	DO 8. Pump	0=P1/1=P2
2030	DO 8. NO/NC	0=NO / 1=NC
2031	DO 8. Event log	0=On / 1= Off

* See appendices 4.2 Digital output types and "Overlaid Digital out parameters" at R.2340

3.28 **Mixer configuration**

Register no	Description	Scale factor/ unit / note	
2080	Stop pump when mixer run	0=No / 1=Yes	
2081	Mixer runtime	s	
2082	Start count interval	times	0=disabled
2083	Timer interval	minutes	0=disabled
2084	Max level for start	0.01 m	(0.01 ft)
2085	Min level for start	0.01 m	(0.01 ft)
2086	Run indicator	0=Off / 1= Digital input	

3.29 **Cleaner configuration**

Register no	Description	Scale factor/ unit / note
2095	Spool on pump start/stop	0=Start / 1=Stop
2096	Spool time	s
2097	No start/stop to spool	time

3.30 Drain pump configuration

Register no	Description	Scale factor/ unit / note
2100	Start delay	s
2101	Stop delay	s
2102	Run indicator	0=Off / 1=Digital input

3.31 Analogue inputs configuration

Register no	Description	Scale factor/ unit / note
2120	AI 1. Function	1=Pit Level / 2=Motor Current
2121	AI 1. Signal range	0=4-20mA / 1=0-20mA Not Used
2122	AI 1. Scale 0%=	0.01 m (0.01 ft)
2123	AI 1. Scale 100%=	0.01 m (0.01 ft)
2124	AI 1. Dead band	0.1 %
2125	AI 1. Zero offset	0.01 m (0.01 ft)
2126	AI 1. Filter constant	s
2127	AI 1. No decimals	If free choice else temperature source
2128	AI 1. Pump no.	0=P1 / 1=P2
2129	AI 1. Leakage source	If Xylem MiniCas Selected
2130	AI 2. Function	1=Pit Level / 2=Motor Current
2131	AI 2. Signal range	0=4-20mA / 1=0-20mA Not used
2132	AI 2. Scale 0%=	0.1 A/0.1 bar/0.1mm/s/User unit (0.1 PSI/0.01 Inch/h)
2133	AI 2. Scale 100%=	0.1 A/…
2134	AI 2. Dead band	0.1 %
2135	AI 2. Zero offset	0.01 m (0.01 ft)
2136	AI 2. Filter constant	s
2137	AI 2. No decimals	If free choice else temperature source
2138	AI 2. Pump no.	0=P1 / 1=P2
2139	AI 2. Leakage source	If Xylem MiniCas Selected
2140	AI 3. Function	1=Pit Level/ 2=Motor Current
2141	AI 3. Signal range	0=4-20mA / 1=0-20mA Not Used
2142	AI 3. Scale 0%=	0.1 A/0.1 bar/0.1mm/s/User unit (0.1 PSI/0.01 Inch/h)
2143	AI 3. Scale 100%=	0.1 A/ …
2144	AI 3. Dead band	0.1 %
2145	AI 3. Zero offset	0.01 m (0.01 ft)
2146	AI 3. Filter constant	s
2147	AI 3. No decimals	If free choice else temperature source
2148	AI 3. Pump no.	0=P1 / 1=P2
2149	AI 3. Leakage source	If Xylem MiniCas Selected
2150	AI 4. Function	2=Current P2 / 3= Current P2 …*
2151	AI 4. Signal range	0=4-20mA / 1=0-20mA Not used
2152	AI 4. Scale 0%=	0.1 A / …
2153	AI 4. Scale 100%=	0.1 A / …
2154	AI 4. Dead band	0.1 %
2155	AI 4. Zero offset	0.01 m (0.01 ft)
2156	AI 4. Filter constant	s
2157	AI 4. No decimals	If free choice else temperature source
2158	AI 4. Pump no.	0=P1 / 1=P2
2159	AI 4. Leakage Source	If Xylem MiniCas selected

Register no	Description	Scale factor/ unit / note
2160	AI 5. Function	0=OFF, 7=Motor temperature, 8=User type
2161	AI 5. Sensor Type	0=Pt100 / 1=PTC
2162	Not Used	
2163	Not Used	
2164	AI 5. Dead band	0.1 %
2165	AI 5. Zero offset	0.1 °C
2166	AI 5. Filter constant	s
2167	AI 5. No decimals	If free choice else temperature source
2168	AI 5. Pump no.	0=P1 / 1=P2
2169	AI 5. Sensor position	0=Generic, 1= L1, 2=L2, 3=L3, 4=Upper bearing, 5=Lower bearing
2170	AI 6. Function	0=OFF, 7=Motor temperature, 8=User type
2171	AI 6. Sensor Type	0=Pt100 / 1=PTC
2172	Not Used	
2173	Not Used	
2174	AI 6. Dead band	0.1 %
2175	AI 6. Zero offset	0.1 °C
2176	AI 6. Filter constant	s
2177	AI 6. No decimals	If free choice else temperature source
2178	AI 6. Pump no.	0=P1 / 1=P2
2179	AI 6. Sensor position	0=Generic, 1= L1, 2=L2, 3=L3, 4=Upper bearing, 5=Lower bearing
2180	AI 7. Function	0=OFF, 7=Motor temperature, 8=User type, 9=Leakage
2181	AI 7. Sensor Type	0=Pt100 / 1=Leakage, (forced 0 if R2080 = 7, forced 1 if R2080 = 9)
2182	Not Used	
2183	Not Used	
2184	AI 7. Dead band	0.1 %
2185	AI 7. Zero offset	0.1 °C
2186	AI 7. Filter constant	s
2187	AI 7. No decimals	If free choice else temperature source
2188	AI 7. Pump no.	0=P1 / 1=P2
2189	AI 7. Leakage source	0=Generic, 1= Oil Chamber, 2= Electrical, 3=Motor housing
	AI 7. Temp. sensor position	0=Generic, 1= L1, 2=L2, 3=L3, 4=Upper bearing, 5=Lower bearing
2190	AI 8. Function	0=OFF, 7=Motor temperature, 8=User type, 9=Leakage
2191	AI 8. Sensor Type	0=Pt100 / 1=Leakage, (forced 0 if R2090 = 7, forced 1 if R2090 = 9)
2192	Not Used	
2193	Not Used	
2194	AI 8. Dead band	0.1 %
2195	AI 8. Zero offset	0.1 °C
2196	AI 8. Filter constant	s
2197	AI 8. No decimals	If free choice
2198	AI 8. Pump no.	0=P1 / 1=P2
2199	AI 8. Leakage source	0=Generic, 1= Oil Chamber, 2= Electrical, 3=Motor housing
	AI 0. Temp. sensor position	0=Generic, 1= L1, 2=L2, 3=L3, 4=Upper bearing, 5=Lower bearing

* See appendices 4.3 Analogue inputs types

3.32 Analogue outputs configuration

Register no	Description	Scale factor/ unit / note
2200	AO 1. Function	0=Off/1=Pit level/ 2=Inflow *
2201	AO 1. Signal range	0=0-20mA / 1=0-20mA
2202	AO 1. Scale 0%=	
2203	AO 1. Scale 100%=	
2204	AO 1. Filter constant	s
2205	AO 1. Data Register	Only for output type "Data Register"
2210	AO 2. Function	0=Off/1=Pit level/ 2=Inflow *
2211	AO 2. Signal range	0=0-20mA / 1=0-20mA
2212	AO 2. Scale 0%=	
2213	AO 2. Scale 100%=	
2214	AO 2. Filter constant	s
2215	AO 2. Data Register	Only for output type "Data Register"

* See appendices 4.3 Analogue output types

3.33 Pulse channels configuration

Register no	Description	Scale factor/ unit / note
2221	Ch. 1. Function	0=Precipitation/ 1= Energy / 2= Flow
2222-2223	Ch. 1. Scale 1 pulse =	0.0001 mm / 0.0001 kW/ 0.0001m3 (Inch/kW/gal)
2225	Ch. 2. Function	0=Precipitation/ 1= Energy / 2= Flow
2226-2227	Ch. 2. Scale 1 pulse =	0.0001 mm / 0.0001 kW/ 0.0001m3 (Inch/kW/gal)
2229	Ch. 3. Function	0=Precipitation/ 1= Energy / 2= Flow
2230-2231	Ch. 3. Scale 1 pulse =	0.0001 mm / 0.0001 kW/ 0.0001m3 (Inch/kW/gal)
2233	C4. Function	0=Precipitation/ 1= Energy / 2= Flow
2234-2235	Ch. 4. Scale 1 pulse =	0.0001 mm / 0.0001 kW/ 0.0001m3(Inch/kW/gal)

3.34 **Log channels configuration**

Register no	Description	Scale factor/ unit / note
2240	Ch. 1. Log signal	0= Closed/1=Level / 2=Inflow /3=Outflow ………*
2241	Ch. 1. Function	0=Closed/1=Act. Value/2=Average value/3=Min/4=Max
2242	Ch. 1. Index	Pump and Pulse channel (0=first instance), Analogue input = 1-8
2243	Ch. 1. Log interval	min
2245	Ch. 2. Log signal	0= Closed/1=Level / 2=Inflow /3=Outflow ………*
2246	Ch. 2. Function	0=Closed/1=Act. Value/2=Average value /3=Min/4=Max
2247	Ch. 2. Index	Pump and Pulse channel (0=first instance), Analogue input = 1-8
2248	Ch. 2. Log interval	min
2250	Ch. 3. Log signal	0= Closed/1=Level / 2=Inflow /3=Outflow ………*
2251	Ch. 3. Function	0=Closed/1=Act. Value/2=Average value /3=Min/4=Max
2252	Ch. 3. Index	Pump and Pulse channel (0=first instance), Analogue input = 1-8
2253	Ch. 3. Log interval	min
2255	Ch. 4. Log signal	0= Closed/1=Level / 2=Inflow /3=Outflow ………*
2256	Ch. 4. Function	0=Closed/1=Act. Value/2=Average value /3=Min/4=Max
2257	Ch. 4. Index	Pump and Pulse channel (0=first instance), Analogue input = 1-8
2258	Ch. 4. Log interval	min
2260	Ch. 5. Log signal	0= Closed/1=Level / 2=Inflow /3=Outflow ………*
2261	Ch. 5. Function	0=Closed/1=Act. Value/2=Average value /3=Min/4=Max
2262	Ch. 5. Index	Pump and Pulse channel (0=first instance), Analogue input = 1-8
2263	Ch. 5. Log interval	min
2265	Ch. 6. Log signal	0= Closed/1=Level / 2=Inflow /3=Outflow ………*
2266	Ch. 6. Function	0=Closed/1=Act. Value/2=Average value /3=Min/4=Max
2267	Ch. 6. Index	Pump and Pulse channel (0=first instance), Analogue input = 1-8
2268	Ch. 6. Log interval	min
2270	Ch. 7. Log signal	0= Closed/1=Level / 2=Inflow /3=Outflow ………*
2271	Ch. 7. Function	0=Closed/1=Act. Value/2=Average value /3=Min/4=Max
2272	Ch. 7. Index	Pump and Pulse channel (0=first instance), Analogue input = 1-8
2273	Ch. 7. Log interval	min
2275	Ch. 8. Log signal	0= Closed/1=Level / 2=Inflow /3=Outflow ………*
2276	Ch. 8. Function	0=Closed/1=Act. Value/2=Average value /3=Min/4=Max
2277	Ch. 8. Index	Pump and Pulse channel (0=first instance), Analogue input = 1-8
2278	Ch. 8. Log interval	min
2280	Ch. 9. Log signal	0= Closed/1=Level / 2=Inflow /3=Outflow ………*
2281	Ch. 9. Function	0=Closed/1=Act. Value/2=Average value /3=Min/4=Max
2282	Ch. 9. Index	Pump and Pulse channel (0=first instance), Analogue input = 1-8
2283	Ch. 9. Log interval	min
2285	Ch. 10. Log signal	0= Closed/1=Level / 2=Inflow /3=Outflow ………*
2286	Ch. 10. Function	0=Closed/1=Act. Value/2=Average value /3=Min/4=Max
2287	Ch. 10. Index	Pump and Pulse channel (0=first instance), Analogue input = 1-8
2288	Ch. 10. Log interval	min
2290	Ch. 11. Log signal	0= Closed/1=Level / 2=Inflow /3=Outflow ………*
2291	Ch. 11. Function	0=Closed/1=Act. Value/2=Average value /3=Min/4=Max
2292	Ch. 11. Index	Pump and Pulse channel (0=first instance), Analogue input = 1-8
2293	Ch. 11. Log interval	min

Register no	Description	Scale factor/ unit / note
2295	Ch. 12. Log signal	0= Closed/1=Level / 2=Inflow /3=Outflow ………*
2296	Ch. 12. Function	0=Closed/1=Act. Value/2=Average value /3=Min/4=Max
2297	Ch. 12. Index	Pump and Pulse channel (0=first instance), Analogue input = 1-8
2298	Ch. 12. Log interval	min
2300	Ch. 13. Log signal	0= Closed/1=Level / 2=Inflow /3=Outflow ………*
2301	Ch. 13. Function	0=Closed/1=Act. Value/2=Average value /3=Min/4=Max
2302	Ch. 13. Index	Pump and Pulse channel (0=first instance), Analogue input = 1-8
2303	Ch. 13. Log interval	min
2305	Ch. 14. Log signal	0= Closed/1=Level / 2=Inflow /3=Outflow ………*
2306	Ch. 14. Function	0=Closed/1=Act. Value/2=Average value /3=Min/4=Max
2307	Ch. 14. Index	Pump and Pulse channel (0=first instance), Analogue input = 1-8
2308	Ch. 14. Log interval	min
2310	Ch. 15. Log signal	0= Closed/1=Level / 2=Inflow /3=Outflow ………*
2311	Ch. 15. Function	0=Closed/1=Act. Value/2=Average value /3=Min/4=Max
2312	Ch. 15. Index	Pump and Pulse channel (0=first instance), Analogue input = 1-8
2313	Ch. 15. Log interval	min
2315	Ch. 16. Log signal	0= Closed/1=Level / 2=Inflow /3=Outflow ………*
2316	Ch. 16. Function	0=Closed/1=Act. Value/2=Average value /3=Min/4=Max
2317	Ch. 16. Index	Pump and Pulse channel (0=first instance), Analogue input = 1-8
2318	Ch. 16. Log interval	min

* See appendices 4.5 Log and Trend signals

3.35 **Overlaid Digital out parameters**

Digital output type Logic IO configuration

Register no	Description	Scale factor/ unit / note
2340	DO 1. Sign.1 type	0=Off/ 1=True OR 2=Inv OR 3=True AND 4=Inv AND
2341	DO 1. Sign.1 IO no	Modbus / Comli IO
2342	DO 1. Sign.2 type	0=Off/ 1=True OR 2=Inv OR 3=True AND 4=Inv AND
2343	DO 1. Sign.2 IO no	Modbus / Comli IO
2344	DO 1. Sign.3 type	0=Off/ 1=True OR 2=Inv OR 3=True AND 4=Inv AND
2345	DO 1. Sign.3 IO no	Modbus / Comli IO
2346	DO 1. Sign.4 type	0=Off/ 1=True OR 2=Inv OR 3=True AND 4=Inv AND
2347	DO 1. Sign.4 IO no	Modbus / Comli IO
2350	DO 2. Sign.1 type	0=Off/ 1=True OR 2=Inv OR 3=True AND 4=Inv AND
2351	DO 2. Sign.1 IO no	Modbus / Comli IO
2352	DO 2. Sign.2 type	0=Off/ 1=True OR 2=Inv OR 3=True AND 4=Inv AND
2353	DO 2. Sign.2 IO no	Modbus / Comli IO
2354	DO 2. Sign.3 type	0=Off/ 1=True OR 2=Inv OR 3=True AND 4=Inv AND
2355	DO 2. Sign.3 IO no	Modbus / Comli IO
2356	DO 2. Sign.4 type	0=Off/ 1=True OR 2=Inv OR 3=True AND 4=Inv AND
2357	DO 2. Sign.4 IO no	Modbus / Comli IO
2360	DO 3. Sign.1 type	0=Off/ 1=True OR 2=Inv OR 3=True AND 4=Inv AND
2361	DO 3. Sign.1 IO no	Modbus / Comli IO
2362	DO 3. Sign.2 type	0=Off/ 1=True OR 2=Inv OR 3=True AND 4=Inv AND
2363	DO 3. Sign.2 IO no	Modbus / Comli IO
2364	DO 3. Sign.3 type	0=Off/ 1=True OR 2=Inv OR 3=True AND 4=Inv AND
2365	DO 3. Sign.3 IO no	Modbus / Comli IO
2366	DO 3. Sign.4 type	0=Off/ 1=True OR 2=Inv OR 3=True AND 4=Inv AND
2367	DO 3. Sign.4 IO no	Modbus / Comli IO
2370	DO 4. Sign.1 type	0=Off/ 1=True OR 2=Inv OR 3=True AND 4=Inv AND
2371	DO 4. Sign.1 IO no	Modbus / Comli IO
2372	DO 4. Sign.2 type	0=Off/ 1=True OR 2=Inv OR 3=True AND 4=Inv AND
2373	DO 4. Sign.2 IO no	Modbus / Comli IO
2374	DO 4. Sign.3 type	0=Off/ 1=True OR 2=Inv OR 3=True AND 4=Inv AND
2375	DO 4. Sign.3 IO no	Modbus / Comli IO
2376	DO 4. Sign.4 type	0=Off/ 1=True OR 2=Inv OR 3=True AND 4=Inv AND
2377	DO 4. Sign.4 IO no	Modbus / Comli IO
2380	DO 5. Sign.1 type	0=Off/ 1=True OR 2=Inv OR 3=True AND 4=Inv AND
2381	DO 5. Sign.1 IO no	Modbus / Comli IO
2382	DO 5. Sign.2 type	0=Off/ 1=True OR 2=Inv OR 3=True AND 4=Inv AND
2383	DO 5. Sign.2 IO no	Modbus / Comli IO
2384	DO 5. Sign.3 type	0=Off/ 1=True OR 2=Inv OR 3=True AND 4=Inv AND
2385	DO 5. Sign.3 IO no	Modbus / Comli IO
2386	DO 5. Sign.4 type	0=Off/ 1=True OR 2=Inv OR 3=True AND 4=Inv AND
2387	DO 5. Sign.4 IO no	Modbus / Comli IO
2390	DO 6. Sign.1 type	0=Off/ 1=True OR 2=Inv OR 3=True AND 4=Inv AND
2391	DO 6. Sign.1 IO no	Modbus / Comli IO
2392	DO 6. Sign.2 type	0=Off/ 1=True OR 2=Inv OR 3=True AND 4=Inv AND
2393	DO 6. Sign.2 IO no	Modbus / Comli IO
2394	DO 6. Sign.3 type	0=Off/ 1=True OR 2=Inv OR 3=True AND 4=Inv AND
2395	DO 6. Sign.3 IO no	Modbus / Comli IO
2396	DO 6. Sign.4 type	0=Off/ 1=True OR 2=Inv OR 3=True AND 4=Inv AND
2397	DO 6. Sign.4 IO no	Modbus / Comli IO

Register no	Description	Scale factor/ unit / note
2400	DO 7. Sign.1 type	0=Off/ 1=True OR 2=Inv OR 3=True AND 4=Inv AND
2401	DO 7. Sign.1 IO no	Modbus / Comli IO
2402	DO 7. Sign.2 type	0=Off/ 1=True OR 2=Inv OR 3=True AND 4=Inv AND
2403	DO 7. Sign.2 IO no	Modbus / Comli IO
2404	DO 7. Sign.3 type	0=Off/ 1=True OR 2=Inv OR 3=True AND 4=Inv AND
2405	DO 7. Sign.3 IO no	Modbus / Comli IO
2406	DO 7. Sign.4 type	0=Off/ 1=True OR 2=Inv OR 3=True AND 4=Inv AND
2407	DO 7. Sign.4 IO no	Modbus / Comli IO
2410	DO 8. Sign.1 type	0=Off/ 1=True OR 2=Inv OR 3=True AND 4=Inv AND
2411	DO 8. Sign.1 IO no	Modbus / Comli IO
2412	DO 8. Sign.2 type	0=Off/ 1=True OR 2=Inv OR 3=True AND 4=Inv AND
2413	DO 8. Sign.2 IO no	Modbus / Comli IO
2414	DO 8. Sign.3 type	0=Off/ 1=True OR 2=Inv OR 3=True AND 4=Inv AND
2415	DO 8. Sign.3 IO no	Modbus / Comli IO
2416	DO 8. Sign.4 type	0=Off/ 1=True OR 2=Inv OR 3=True AND 4=Inv AND
2417	DO 8. Sign.4 IO no	Modbus / Comli IO

Digital output type Data Register Setpoint

Register no	Description	Scale factor/ unit / note
2340	DO 1. Data Register	Source value register number 0-4529
2341	DO 1. Setpoint on	0-65535
2342	DO 1. Setpoint off	0-65535
2343	DO 1. Setpoint delay	seconds
2350	DO 2. Data Register	Source value register number 0-4529
2351	DO 2. Setpoint on	0-65535
2352	DO 2. Setpoint off	0-65535
2353	DO 2. Setpoint delay	seconds
2360	DO 3. Data Register	Source value register number 0-4529
2361	DO 3. Setpoint on	0-65535
2362	DO 3. Setpoint off	0-65535
2363	DO 3. Setpoint delay	seconds
2370	DO 4. Data Register	Source value register number 0-4529
2371	DO 4. Setpoint on	0-65535
2372	DO 4. Setpoint off	0-65535
2373	DO 4. Setpoint delay	seconds
2380	DO 5. Data Register	Source value register number 0-4529
2381	DO 5. Setpoint on	0-65535
2382	DO 5. Setpoint off	0-65535
2383	DO 5. Setpoint delay	seconds
2390	DO 6. Data Register	Source value register number 0-4529
2391	DO 6. Setpoint on	0-65535
2392	DO 6. Setpoint off	0-65535
2393	DO 6. Setpoint delay	seconds
2400	DO 7. Data Register	Source value register number 0-4529
2401	DO 7. Setpoint on	0-65535
2402	DO 7. Setpoint off	0-65535
2403	DO 7. Setpoint delay	seconds
2410	DO 8. Data Register	Source value register number 0-4529
2411	DO 8. Setpoint on	0-65535
2412	DO 8. Setpoint off	0-65535
2413	DO 8. Setpoint delay	seconds

Digital output type Alarm Alert

Register no	Description	Scale factor/ unit / note
2340	DO 1. On Time	seconds
2341	DO 1. Pause Time	seconds
2342	DO 1. Alert source	0=Unack. al. 1=Active al. 2= both
2350	DO 2. On Time	seconds
2351	DO 2. Pause Time	seconds
2352	DO 2. Alert source	0=Unack. al. 1=Active al. 2= both
2360	DO 3. On Time	seconds
2361	DO 3. Pause Time	seconds
2362	DO 3. Alert source	0=Unack. al. 1=Active al. 2= both
2370	DO 4. On Time	seconds
2371	DO 4. Pause Time	seconds
2372	DO 4. Alert source	0=Unack. al. 1=Active al. 2= both
2380	DO 5. On Time	seconds
2381	DO 5. Pause Time	seconds
2382	DO 5. Alert source	0=Unack. al. 1=Active al. 2= both
2390	DO 6. On Time	seconds
2391	DO 6. Pause Time	seconds
2392	DO 6. Alert source	0=Unack. al. 1=Active al. 2= both
2400	DO 7. On Time	seconds
2401	DO 7. Pause Time	seconds
2402	DO 7. Alert source	0=Unack. al. 1=Active al. 2= both
2410	DO 8. On Time	seconds
2411	DO 8. Pause Time	seconds
2412	DO 8. Alert source	0=Unack. al. 1=Active al. 2= both

Digital output type Auto Reset Alert

Register no	Description	Scale factor/ unit / note
2340	DO 1. Pre-alert time	seconds
2350	DO 2. Pre-alert time	seconds
2360	DO 3. Pre-alert time	seconds
2370	DO 4. Pre-alert time	seconds
2380	DO 5. Pre-alert time	seconds
2390	DO 6. Pre-alert time	seconds
2400	DO 7. Pre-alert time	seconds
2410	DO 8. Pre-alert time	seconds

System alarms configuration

Register no	Description	Scale factor/ unit / note
Power fail:		**Alarm 1**
2500	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
2501	Delay	s
2504	Trig new crash log block	0 = No, 1 = Yes
Low supply voltage:		**Alarm 2**
2505	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
2506	Delay	s
2507	Limit	0.1 V
2508	Hysteresis	0.1 V
2509	Trig new crash log block	0 = No, 1 = Yes
High PCB temperature:		**Alarm 3**
2510	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
2511	Delay	s
2512	Limit	degrees
2513	Hysteresis	degrees
2514	Trig new crash log block	0 = No, 1 = Yes
Personnel alarm:		**Alarm 4**
2515	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
2516	Delay	s
2517	Max time to reset	min
2519	Trig new crash log block	0 = No, 1 = Yes

3.36 **Pit alarms configuration**

Register no	Description	Scale factor/ unit / note
High level:		**Alarm 5**
2520	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
2521	Delay	s
2522	Limit	0.01 m (0.01 ft)
2523	Hysteresis	0.01 m (0.01 ft)
2524	Trig new crash log block	0 = No, 1 = Yes
Low level:		**Alarm 6**
2525	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
2526	Delay	s
2527	Limit	0.01 m (0.01 ft)
2528	Hysteresis	0.01 m (0.01 ft)
2529	Trig new crash log block	0 = No, 1 = Yes
High level float:		**Alarm 7**
2530	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
2531	Delay	s
2534	Trig new crash log block	0 = No, 1 = Yes
Low level float:		**Alarm 8**
2535	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
2536	Delay	s
2539	Trig new crash log block	0 = No, 1 = Yes
High inflow:		**Alarm 9**
2540	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
2541	Delay	s
2542	Limit	0.1 l/s (1 GPM)
2543	Hysteresis	0.1 l/s (1 GPM)
2544	Trig new crash log block	0 = No, 1 = Yes
Low inflow:		**Alarm 10**
2545	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
2546	Delay	s
2547	Limit	0.1 l/s (1 GPM)
2548	Hysteresis	0.1 l/s (1 GPM)
2549	Trig new crash log block	0 = No, 1 = Yes
Backup running:		**Alarm 11**
2550	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
2551	Delay	s
2554	Trig new crash log block	0 = No, 1 = Yes
Remote block:		**Alarm 12**
2555	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
2556	Delay	s
2559	Trig new crash log block	0 = No, 1 = Yes
High outlet pressure:		**Alarm 13**
2560	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
2561	Delay	s
2562	Limit	0.1 bar (0.1 PSI)
2563	Hysteresis	0.1 bar (0.1 PSI)
2564	Trig new crash log block	0 = No, 1 = Yes
Low outlet pressure:		**Alarm 14**
2565	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
2566	Delay	s
2567	Limit	0.1 bar (0.1 PSI)
2568	Hysteresis	0.1 bar (0.1 PSI)
2569	Trig new crash log block	0 = No, 1 = Yes

Register no	Description	Scale factor/ unit / note
Overflow:		**Alarm 15**
2570	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
2571	Delay	s
2574	Trig new crash log block	0 = No, 1 = Yes
High Back-Pressure block:		**Alarm 16**
2575	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
2576	Delay	s
2579	Trig new crash log block	0 = No, 1 = Yes
Drain pump float:		**Alarm 17**
2580	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
2581	Delay	s
2584	Trig new crash log block	0 = No, 1 = Yes
Level sensor error:		**Alarm 18**
2585	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
2586	Delay	s
2589	Trig new crash log block	0 = No, 1 = Yes
No run confirm mixer:		**Alarm 19**
2590	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
2591	Delay	
2594	Trig new crash log block	0 = No, 1 = Yes
Motor protector mixer:		**Alarm 20**
2595	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
2596	Delay	s
2599	Trig new crash log block	0 = No, 1 = Yes
No run confirm drain pump:		**Alarm 21**
2600	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
2601	Delay	
2604	Trig new crash log block	0 = No, 1 = Yes
Motor protector drain pump:		**Alarm 22**
2605	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
2606	Delay	
2609	Trig new crash log block	0 = No, 1 = Yes
To many pump blocked:		**Alarm 23**
2610	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
2611	Delay	s
2612	Limit	Min no pumps available (0-2)
2614	Trig new crash log block	0 = No, 1 = Yes
Motor protector reset error Mixer/Drain pump:		**Alarm 24**
2615	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
2616	Delay	s
2619	Trig new crash log block	0 = No, 1 = Yes
Emergency power mode:		**Alarm 25**
2620	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
2621	Delay	s
2624	Trig new crash log block	0 = No, 1 = Yes

3.37 Power alarms

Register no	Description	Scale factor/ unit / note
Incoming phase missing:		**Alarm 26**
2625	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
2626	Delay	s
2629	Trig new crash log block	0 = No, 1 = Yes
Over voltage:		**Alarm 27**
2630	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
2631	Delay	s
2632	Limit	0.1 %
2633	Hysteresis	0.1 %
2634	Trig new crash log block	0 = No, 1 = Yes
Under voltage:		**Alarm 28**
2635	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
2636	Delay	s
2637	Limit	0.1 %
2638	Hysteresis	0.1 %
2639	Trig new crash log block	0 = No, 1 = Yes
Unbalanced voltage:		**Alarm 29**
2640	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
2641	Delay	s
2642	Limit	0.1 %
2643	Hysteresis	0.1 %
2644	Trig new crash log block	0 = No, 1 = Yes
High frequency:		**Alarm 30**
2645	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
2646	Delay	s
2647	Limit	0.1 Hz
2648	Hysteresis	0.1 %
2649	Trig new crash log block	0 = No, 1 = Yes
Low frequency:		**Alarm 31**
2650	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
2651	Delay	s
2652	Limit	0.1 %
2653	Hysteresis	0.1 %
2654	Trig new crash log block	0 = No, 1 = Yes

3.38 Pump 1-2 alarms configuration

Alarm Parameters	Al. No	Register P1	Al. No	Register P2	Scale factor/ unit / note
No run confirm	32	2655	64	2815	0=Inactive, 1=B-alarm, 2=A-alarm
Delay		2656		2816	Sec
Trig new crash log		2659		2819	0 = No, 1 = Yes
Fallen motor protect.	33	2660	65	2820	0=Inactive, 1=B-alarm, 2=A-alarm
Delay		2661		2821	Sec
Trig new crash log		2664		2824	0 = No, 1 = Yes
High motor current	34	2665	66	2825	0=Inactive, 1=B-alarm, 2=A-alarm
Delay		2666		2826	Sec
Limit		2667		2827	0.1 A
Hysteresis		2668		2828	0.1 A
Trig new crash log		2669		2829	0 = No, 1 = Yes
Low motor current	35	2670	67	2830	0=Inactive, 1=B-alarm, 2=A-alarm
Delay		2671		2831	Sec
Limit		2672		2832	0.1 A
Hysteresis		2673		2833	0.1 A
Trig new crash log		2674		2834	0 = No, 1 = Yes
Leakage	36	2675	68	2835	0=Inactive, 1=B-alarm, 2=A-alarm
Delay		2676		2836	Sec
Trig new crash log		2679		2839	0 = No, 1 = Yes
High Motor temp.	37	2680	69	2840	0=Inactive, 1=B-alarm, 2=A-alarm
Delay		2681		2841	Sec
Limit		2682		2842	0.1 °C (°F)
Hysteresis		2683		2843	0.1 °C (°F)
Trig new crash log		2684		2844	0 = No, 1 = Yes
Low pump capacity 1	38	2685	70	2845	0=Inactive, 1=B-alarm, 2=A-alarm
Delay		2686		2846	Sec
Limit		2687		2847	0.1 l/s (GPM)
Hysteresis		2688		2848	0.1 l/s (GPM)
Trig new crash log		2689		2849	0 = No, 1 = Yes
D.IN Pump error	39	2690	71	2850	0=Inactive, 1=B-alarm, 2=A-alarm
Delay		2691		2851	Sec
Trig new crash log		2694		2854	0 = No, 1 = Yes
Phase missing	40	2695	72	2855	0=Inactive, 1=B-alarm, 2=A-alarm
Delay		2696		2856	Sec
Trig new crash log		2699		2859	0 = No, 1 = Yes
M.prot. reset error	41	2700	73	2860	0=Inactive, 1=B-alarm, 2=A-alarm
Delay		2701		2861	Sec
Trig new crash log		2704		2864	0 = No, 1 = Yes
Max contin. runtime	42	2705	74	2865	0=Inactive, 1=B-alarm, 2=A-alarm
Delay		2706		2866	Sec
Trig new crash log		2709		2869	0 = No, 1 = Yes
Pump alarm blocked	43	2710	75	2870	0=Inactive, 1=B-alarm, 2=A-alarm
Delay		2711		2871	Sec
Trig new crash log		2714		2874	0 = No, 1 = Yes
Spare	44	2715	76	2875	0=Inactive, 1=B-alarm, 2=A-alarm
Delay		2716		2876	Sec
Trig new crash log		2719		2879	0 = No, 1 = Yes
Pump not in auto	45	2720	77	2880	0=Inactive, 1=B-alarm, 2=A-alarm
Delay		2721		2881	Sec
Trig new crash log		2724		2884	0 = No, 1 = Yes
VFD Com error	46	2725	78	2885	0=Inactive, 1=B-alarm, 2=A-alarm
Delay		2726		2886	Sec
Trig new crash log		2729		2889	0 = No, 1 = Yes
VFD Drive fault	47	2730	79	2890	0=Inactive, 1=B-alarm, 2=A-alarm
Delay		2731		2891	Sec
Al. Ackn Resets Drive		3414		3424	0 = No, 1 = Yes
Trig new crash log		2734		2894	0 = No, 1 = Yes

Leakage Oil	48	2735	80	2895	0=Inactive, 1=B-alarm, 2=A-alarm
Delay		2736		2896	Sec
Trig new crash log		2739		2899	
Leakage El. Chamber	49	2740	81	2900	0=Inactive, 1=B-alarm, 2=A-alarm
Delay		2741		2901	Sec
Trig new crash log		2744		2904	0 = No, 1 = Yes
Leakage motor house	50	2745	82	2905	0=Inactive, 1=B-alarm, 2=A-alarm
Delay		2746		2906	Sec
Trig new crash log		2749		2909	0 = No, 1 = Yes
PM com error	51	2750	83	2910	0=Inactive, 1=B-alarm, 2=A-alarm
Delay		2751		2911	Sec
Trig new crash log		2754		2914	0 = No, 1 = Yes
High temp. stator L1	52	2755	84	2915	0=Inactive, 1=B-alarm, 2=A-alarm
Delay		2756		2916	Sec
Limit		2757		2917	0.1 °C (°F)
Hysteresis		2758		2918	0.1 °C (°F)
Trig new crash log		2759		2919	0 = No, 1 = Yes
Hi. temp. up. bearing	53	2760	85	2920	0=Inactive, 1=B-alarm, 2=A-alarm
Delay		2761		2921	Sec
Limit		2762		2922	0.1 °C (°F)
Hysteresis		2763		2923	0.1 °C (°F)
Trig new crash log		2764		2924	0 = No, 1 = Yes
Hi. temp lo. bearing	54	2765	86	2925	0=Inactive, 1=B-alarm, 2=A-alarm
Delay		2766		2926	Sec
Limit		2767		2927	0.1 °C (°F)
Hysteresis		2768		2928	0.1 °C (°F)
Trig new crash log		2769		2929	0 = No, 1 = Yes
High vibrations	55	2770	87	2930	0=Inactive, 1=B-alarm, 2=A-alarm
Delay		2771		2931	Sec
Limit		2772		2932	0.1 mm/s (0.01 Inch/s)
Hysteresis		2773		2933	0.1 mm/s (0.01 Inch/s)
Trig new crash log		2774		2934	0 = No, 1 = Yes
Wrong phase order	56	2775	88	2935	0=Inactive, 1=B-alarm, 2=A-alarm
Delay		2776		2936	Sec
Trig new crash log		2279		2929	0 = No, 1 = Yes
Hi. temp stator L2	57	2780	89	2940	0=Inactive, 1=B-alarm, 2=A-alarm
Delay		2781		2941	Sec
Limit		2782		2942	0.1 °C (°F)
Hysteresis		2783		2943	0.1 °C (°F)
Trig new crash log		2784		2944	0 = No, 1 = Yes
Hi. temp stator L3	58	2785	90	2945	0=Inactive, 1=B-alarm, 2=A-alarm
Delay		2786		2946	Sec
Limit		2787		2947	0.1 °C (°F)
Hysteresis		2788		2948	0.1 °C (°F)
Trig new crash log		2789		2949	0 = No, 1 = Yes
Spare	59	2790	91	2950	
Delay		2791		2951	
Trig new crash log		2794		2954	0 = No, 1 = Yes
Pump rev. error	60	2795	92	2955	Max no reverse attempts reached
Delay		2796		2956	
Trig new crash log		2799		2959	0 = No, 1 = Yes
Low pump pcap 2	61	2800	93	2960	0=Inactive.. Not Blocking. Only Warning
Delay		2801		2961	sec
Limit		2802		2962	0.1 l/s (GPM)
Hysteresis		2803		2963	0.1 l/s (GPM)
Trig new crash log		2804		2964	0 = No, 1 = Yes
Unused	62-63	2805-2810	94-95	2965-2970	

3.39 AI1 – AI8 user alarms configuration

Register no	Description	Scale factor/ unit / note
AI 1 High alarm:		**Alarm 96**
2975	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
2976	Delay	s
2977	Limit	User unit and decimals
2978	Hysteresis	
2979	Trig new crash log block	0 = No, 1 = Yes
AI 1 Low alarm:		**Alarm 97**
2980	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
2981	Delay	s
2982	Limit	User unit and decimals
2983	Hysteresis	
2984	Trig new crash log block	0 = No, 1 = Yes
AI 2 High alarm:		**Alarm 98**
2985	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
2986	Delay	s
2987	Limit	User unit and decimals
2988	Hysteresis	
2989	Trig new crash log block	0 = No, 1 = Yes
AI 2 Low alarm:		**Alarm 99**
2990	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
2991	Delay	s
2992	Limit	User unit and decimals
2993	Hysteresis	
2994	Trig new crash log block	0 = No, 1 = Yes
AI 3 High alarm:		**Alarm 100**
2995	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
2996	Delay	s
2997	Limit	User unit and decimals
2998	Hysteresis	
2999	Trig new crash log block	0 = No, 1 = Yes
AI 3 Low alarm:		**Alarm 101**
3000	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
3001	Delay	s
3002	Limit	User unit and decimals
3003	Hysteresis	
3004	Trig new crash log block	0 = No, 1 = Yes
AI 4 High alarm:		**Alarm 102**
3005	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
3006	Delay	s
3007	Limit	User unit and decimals
3008	Hysteresis	
3009	Trig new crash log block	0 = No, 1 = Yes
AI 4 Low alarm:		**Alarm 103**
3010	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
3011	Delay	s
3012	Limit	User unit and decimals
3013	Hysteresis	
3014	Trig new crash log block	0 = No, 1 = Yes
AI 5 High alarm:		**Alarm 104**
3015	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
3016	Delay	s
3017	Limit	User unit and decimals
3018	Hysteresis	
3019	Trig new crash log block	0 = No, 1 = Yes

AI 5 Low alarm: **Alarm 105**

3020	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
3021	Delay	s
3022	Limit	User unit and decimals
3023	Hysteresis	
3024	Trig new crash log block	0 = No, 1 = Yes

AI 6 High alarm: **Alarm 106**

3025	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
3026	Delay	s
3027	Limit	User unit and decimals
3028	Hysteresis	
3029	Trig new crash log block	0 = No, 1 = Yes

AI 6 Low alarm: **Alarm 107**

3030	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
3031	Delay	s
3032	Limit	User unit and decimals
3033	Hysteresis	
3034	Trig new crash log block	0 = No, 1 = Yes

AI 7 High alarm: **Alarm 108**

3035	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
3036	Delay	s
3037	Limit	User unit and decimals
3038	Hysteresis	
3039	Trig new crash log block	0 = No, 1 = Yes

AI 7 Low alarm: **Alarm 109**

3040	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
3041	Delay	s
3042	Limit	User unit and decimals
3043	Hysteresis	
3044	Trig new crash log block	0 = No, 1 = Yes

AI 8 High alarm: **Alarm 110**

3045	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
3046	Delay	s
3047	Limit	User unit and decimals
3048	Hysteresis	
3049	Trig new crash log block	0 = No, 1 = Yes

AI 8 Low alarm: **Alarm 111**

3050	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
3051	Delay	s
3052	Limit	User unit and decimals
3053	Hysteresis	
3054	Trig new crash log block	0 = No, 1 = Yes

3.40 **Pulse channels 1-4 alarms configuration**

Register no	Description	Scale factor/ unit / note
Ch. 1 if precipitation selected:		**Alarm 112**
3055	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
3056	Delay	s
3057	Limit	0.1 l/s*ha (0.01 inch/h)
3058	Hysteresis	0.1 l/s*ha (0.01 inch/h)
3059	Trig new crash log block	0 = No, 1 = Yes
Ch. 1 if energy selected:		**Alarm 113**
3060	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
3061	Delay	s
3062	Limit	0.1 kW
3063	Hysteresis	0.1 kW
3064	Trig new crash log block	0 = No, 1 = Yes
Ch1 if low selected: High flow		**Alarm 114**
3065	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
3066	Delay	s
3067	Limit	0.1 m3/h (GPM)
3068	Hysteresis	0.1 m3/h (GPM)
3069	Trig new crash log block	0 = No, 1 = Yes
Ch1 if flow selected: Low flow		**Alarm 115**
3070	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
3071	Delay	s
3073	Limit	0.1 m3/h (GPM)
3074	Hysteresis	0.1 m3/h (GPM)
3074	Trig new crash log block	0 = No, 1 = Yes
Ch. 2 if precipitation selected:		**Alarm 116**
3075	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
3076	Delay	s
3077	Limit	0.1 l/s*ha (0.01 inch/h)
3078	Hysteresis	0.1 l/s*ha (0.01 inch/h)
3079	Trig new crash log block	0 = No, 1 = Yes
Ch. 2 if energy selected:		**Alarm 117**
3080	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
3081	Delay	s
3082	Limit	0.1 kW
3083	Hysteresis	0.1 kW
3084	Trig new crash log block	0 = No, 1 = Yes
Ch. 2 if flow selected: High flow		**Alarm 118**
3085	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
3086	Delay	s
3087	Limit	0.1 m3/h (GPM)
3088	Hysteresis	0.1 m3/h (GPM)
3089	Trig new crash log block	0 = No, 1 = Yes
Ch. 2 if flow selected: Low flow		**Alarm 119**
3090	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
3091	Delay	s
3092	Limit	0.1 m3/h (GPM)
3093	Hysteresis	0.1 m3/h (GPM)
3094	Trig new crash log block	0 = No, 1 = Yes

Register no	Description	Scale factor/ unit / note
Ch. 3 if precipitation selected:		**Alarm 120**
3095	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
3096	Delay	s
3097	Limit	0.1 l/s*ha (0.01 inch/h)
3098	Hysteresis	0.1 l/s*ha (0.01 inch/h)
3099	Trig new crash log block	0 = No, 1 = Yes
Ch. 3 if energy selected:		**Alarm 121**
3100	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
3101	Delay	s
3102	Limit	0.1 kW
3103	Hysteresis	0.1 kW
3104	Trig new crash log block	0 = No, 1 = Yes
Ch. 3 if flow selected: High flow		**Alarm 122**
3105	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
3106	Delay	s
3107	Limit	0.1 m3/h (GPM)
3108	Hysteresis	0.1 m3/h (GPM)
3109	Trig new crash log block	0 = No, 1 = Yes
Ch. 3 if flow selected: Low flow		**Alarm 123**
3110	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
3111	Delay	s
3112	Limit	0.1 m3/h (GPM)
3113	Hysteresis	0.1 m3/h (GPM)
3114	Trig new crash log block	0 = No, 1 = Yes
Ch. 4 if precipitation selected:		**Alarm 124**
3115	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
3116	Delay	s
3117	Limit	0.1 l/s*ha (0.01 inch/h)
3118	Hysteresis	0.1 l/s*ha (0.01 inch/h)
3119	Trig new crash log block	0 = No, 1 = Yes
Ch. 4 if energy selected:		**Alarm 125**
3120	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
3121	Delay	s
3122	Limit	0.1 kW
3123	Hysteresis	0.1 kW
3124	Trig new crash log block	0 = No, 1 = Yes
Ch. 4 if flow selected: High flow		**Alarm 126**
3125	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
3126	Delay	s
3127	Limit	0.1 m3/h (GPM)
3128	Hysteresis	0.1 m3/h (GPM)
3129	Trig new crash log block	0 = No, 1 = Yes
Ch. 4 if flow selected: Low flow		**Alarm 127**
3130	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
3131	Delay	s
3132	Limit	0.1 m3/h (GPM)
3133	Hysteresis	0.1 m3/h (GPM)
3134	Trig new crash log block	0 = No, 1 = Yes

3.41 Common alarms configuration

Register no	Description	Scale factor/ unit / note
Main Power Monitor Communication failure		**Alarm 128**
3135	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
3136	Delay	s
3139	Trig new crash log block	0 = No, 1 = Yes
Spare		**Alarm 129**
3140	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
3141	Delay	s
3144	Trig new crash log block	0 = No, 1 = Yes
Spare		**Alarm 130**
3145	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
3146	Delay	s
3149	Trig new crash log block	0 = No, 1 = Yes
Spare		**Alarm 131**
3150	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
3151	Delay	s
3154	Trig new crash log block	0 = No, 1 = Yes
Leakage Mixer		**Alarm 132**
3155	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
3156	Delay	s
3159	Trig new crash log block	0 = No, 1 = Yes
High Temperature Mixer		**Alarm 133**
3160	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
3161	Delay	s
3164	Trig new crash log block	0 = No, 1 = Yes
Leakage Drain Pump		**Alarm 134**
3165	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
3166	Delay	s
3169	Trig new crash log block	0 = No, 1 = Yes
High Temperature Drain Pump		**Alarm 135**
3170	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
3171	Delay	s
3174	Trig new crash log block	0 = No, 1 = Yes

3.42 Sensor/Cable errors alarms

Register no	Description	Scale factor/ unit / note
AI 1 Sensor/Cable Error:		**Alarm 136**
3175	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
3176	Delay	s
3179	Trig new crash log block	0 = No, 1 = Yes
AI 2 Sensor/Cable Error:		**Alarm 137**
3180	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
3181	Delay	
3184	Trig new crash log block	0 = No, 1 = Yes
AI 3 Sensor/Cable Error:		**Alarm 138**
3185	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
3186	Delay	
3189	Trig new crash log block	0 = No, 1 = Yes

AI 4 Sensor/Cable Error: **Alarm 139**

3190	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
3191	Delay	
3194	Trig new crash log block	0 = No, 1 = Yes

AI 5 Sensor/Cable Error: **Alarm 140**

3195	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
3196	Delay	s
3199	Trig new crash log block	0 = No, 1 = Yes

AI 6 Sensor/Cable Error: **Alarm 141**

3200	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
3201	Delay	
3204	Trig new crash log block	0 = No, 1 = Yes

AI 7 Sensor/Cable Error: **Alarm 142**

3205	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
3206	Delay	
3209	Trig new crash log block	0 = No, 1 = Yes

AI 8 Sensor/Cable Error: **Alarm 143**

3210	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
3211	Delay	
3214	Trig new crash log block	0 = No, 1 = Yes

3.43 Digital Inputs User Alarms

DI 1 user text alarm: **Alarm 144**

3215	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
3216	Delay	s
3219	Trig new crash log block	0 = No, 1 = Yes

DI 2 user text alarm: **Alarm 145**

3220	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
3221	Delay	s
3224	Trig new crash log block	0 = No, 1 = Yes

DI 3 user text alarm: **Alarm 146**

3225	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
3226	Delay	s
3229	Trig new crash log block	0 = No, 1 = Yes

DI 4 user text alarm: **Alarm 147**

3230	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
3231	Delay	s
3234	Trig new crash log block	0 = No, 1 = Yes

DI 5 user text alarm: **Alarm 148**

3235	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
3236	Delay	s
3239	Trig new crash log block	0 = No, 1 = Yes

DI 6 user text alarm: **Alarm 149**

3240	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
3241	Delay	s
3244	Trig new crash log block	0 = No, 1 = Yes

DI 7 user text alarm: **Alarm 150**

3245	Priority	0=Inactive, 1=B-alarm, 2=A-alarm
3246	Delay	s
3249	Trig new crash log block	0 = No, 1 = Yes

DI 8 user text alarm: **Alarm 151**
3250   Priority   0=Inactive, 1=B-alarm, 2=A-alarm
3251   Delay   s
3254   Trig new crash log block   0 = No, 1 = Yes

DI 9 user text alarm: **Alarm 152**
3255   Priority   0=Inactive, 1=B-alarm, 2=A-alarm
3256   Delay   s
3259   Trig new crash log block   0 = No, 1 = Yes

DI 10 user text alarm: **Alarm 153**
3260   Priority   0=Inactive, 1=B-alarm, 2=A-alarm
3261   Delay   s
3264   Trig new crash log block   0 = No, 1 = Yes

DI 11 user text alarm: **Alarm 154**
3265   Priority   0=Inactive, 1=B-alarm, 2=A-alarm
3266   Delay   s
3269   Trig new crash log block   0 = No, 1 = Yes

DI 12 user text alarm: **Alarm 155**
3270   Priority   0=Inactive, 1=B-alarm, 2=A-alarm
3271   Delay   s
3274   Trig new crash log block   0 = No, 1 = Yes

DI 13 user text alarm: **Alarm 156**
3275   Priority   0=Inactive, 1=B-alarm, 2=A-alarm
3276   Delay   s
3279   Trig new crash log block   0 = No, 1 = Yes

DI 14 user text alarm: **Alarm 157**
3280   Priority   0=Inactive, 1=B-alarm, 2=A-alarm
3281   Delay   s
3284   Trig new crash log block   0 = No, 1 = Yes

Spare Alarm 158, 159

3.44 VFD/Power Monitor configuration

Register no	Description	Scale factor/ unit / note
3405	Poll Interval	1 sec
3406	P1 Drive Auto Reset	0=No, 1=Yes, fieldbus reset using Motor Protector Auto Reset seq.
3407	P2 Drive Auto Reset	0=No, 1=Yes, fieldbus reset using Motor Protector Auto Reset seq.
3408	P1 capacity @ min Freq	0.1 % Min Freq in R.3415
3409	P2 capacity @ min Freq	0.1 % Min Freq in R.3425

VFD Pump 1

3410	Manufacture	
3411	Model	
3412	Modbus Id	
3413	Fieldbus Control function	0=Monitor, 1=On/off, 2=Manual, 3=AUTO (depends on R.1602)
3414	Ackn Alarm 47 Resets Drive	0=No, 1=Yes
3415	Min Freq.	0.1 Hz
3416	Max Freq.	0.1 Hz
3417	Man Freq.	0.1 Hz
3418	Rev Freq.	0.1 Hz
3419	Control Freq.	0.01 Hz Manual or PID

VFD Pump 2

3420	Manufacture	
3421	Model	
3422	Modbus Id	
3423	Fieldbus Control function	0=Monitor, 1=On/off, 2=Manual, 3=AUTO (depends on R.1702)
3424	Ackn Alarm 79 Resets Drive	0=No, 1=Yes
3425	Min Freq.	0.1 Hz
3426	Max Freq.	0.1 Hz
3427	Man Freq.	0.1 Hz
3428	Rev Freq.	0.1 Hz
3429	Control Freq.	0.01 Hz Manual or PID

Main Power Monitor

3430	Manufacture
3431	Model
3432	Modbus Id
3434	Use P1 power monitor for main power data.

Power Monitor Pump 1

3440	Manufacture
3441	Model
3442	Modbus Id

Power Monitor Pump 2

3450	Manufacture
3451	Model
3452	Modbus Id

3.45 Communication Setup

Register no	Description	Scale factor/ unit / note
Service port (RS323 on front):		
3460	Baud rate	0=Off/ 1= 300/2=600 ….10=115200
3461	Parity	0=None/1=Odd/2=Even/3=Mark
3463	Protocol	Read only, always 0 (Modus RTU)
3464	Protocol Id	Read only always Modbus Id 1
3465	Message timeout	s
3466	Crossref. Tab	0=Off/1=On
Com port Modem		
3470	Baud rate	0=Off/ 1= 300/2=600 ….10=115200
3471	Parity	0=None/1=Odd/2=Even/3=Mark
3472	Service	0=GPRS Hayes enable, 1=Transparent
3473	Protocol	0=Modbus RTU/ 1=Modbus TCP
3474	Protocol id	
3475	Message timeout	s
3476	Cross reference	0=Off/ 1=On
3477	Modem Type	0=Off/1= CA 521/ 2=CA 523/ 3=CA524/ 4=Generic SMS
3478	Heart beat timeout	min
RS485 Port		
3480	Baud rate	0=Off/ 1= 300/2=600 ….10=115200
3481	Parity	0=None/1=Odd/2=Even/3=Mark
3482	Service	1=Modbus Slave/2=Modbus Master
3483	Protocol	0=Modus RTU/ 1= Modbus TCP
3484	Protocol Id	Modbus Id
3485	Message timeout	min
3486	Crossref. Tab	0=Off/1=On
USB Port		
3493	Protocol	0=Modus RTU/ 1= Modbus TCP
3494	Protocol Id	Read Only, Modbus Id always 1
3495	Message timeout	s
3496	Crossref. Tab	0=Off/1=On
GPRS Virtual Port		
3501	TCP Type	0=AW Client/1=TCP Server/2=TCP Server + Heartbeat
3503	Protocol	0=Modus RTU/ 1= Modbus TCP
3504	Protocol Id	Modbus Id
3505	Message timeout	s
3506	Crossref. Tab	0=Off/1=On
3507	TCP Port No.	
3508	IP4 Address MSB	
3509	IP4 Address LSB	

Register no	Description	Scale factor/ unit / note
Ethernet Port (Internet)		
3511	TCP Type	1=TCP Server
3512	Service	Always Modbus Slave?
3513	Protocol	0=Modus RTU/ 1= Modbus TCP
3514	Protocol Id	Modbus Id
3514	Message timeout	s
3516	Crossref. Tab	0=Off/1=On
3517	TCP Port No.	Default 502
3518	IP Address MSB	
3519	IP Address LSB	
3520	Static IP Address MSB	
3521	Static IP Address LSB	
3522	Static Net Mask MSB	
3523	Static Net Mask LSB	
3524	Static Gateway MSB	
3525	Static Gateway LSB	
3526	Static/Dynamic IP	0=Static/1=Dynamic (DHCP)
3527	Link Stat?	
3528	Dynamic Actual IP Address MSB	
3529	Dynamic Actual IP Address LSB	
3530	Dynamic Actual Net Mask MSB	
3531	Dynamic Actual Net Mask LSB	
3532	Dynamic Actual Gateway MSB	
3533	Dynamic Actual Gateway LSB	
3534	Ethernet HW Off/On	

SMS alarms

Register no	Description	Scale factor/ unit / note
3536	SMS alarm enable	0=Disabled, 1=A-ON, 2=A-ON/OFF, 3=A+B-ON, 4=A+B-ON/OFF
3537	Second SMS no	0= backup only, 1=send always

3.46 PID Regulator

Register no	Description	Scale factor/ unit / note
Runtime status		
16	Current setpoint	0.01m (0.01ft)
17	Process value	0.01m (0.01ft)
18	Output signal	0.1%
19	Setpoint flags	0=Intern setpoint, 1 = Extern setpoint (AI)
20	Output flags	0=Auto, 1=Manuel, 2=Blocked
Settings		
3548	Setpoint	0.01 m
3549	Setpoint high tariff	0.01 m
3550	Setpoint	Adjusted with reg. 1530 meter above sea level
3551	Setpoint high tariff	Adjusted with reg. 1530 meter above sea level
3552	Extern setpoint input	0=Off, 1=AI1, 2=AI2, 3=AI3, 4=AI4
3553	Max setpoint	0.01m (0.01ft)
3554	Min setpoint	0.01m (0.01ft)
3555	Start setpoint	0.01m (0.01ft)
3556	Max output	0.1%
3557	Min output	0.1%
3558	Block output	0.1%
3559	Zero dev. output	0.1%
3560	Start output	0.1%
3561	Max output change	0.1% / s
3562	Direct/Reverse effect	0=Reverse, 1=Direct
3563	Setpoint tracking	0=No, 1=Yes
3564	Output when blocked	0=Freeze output, 1=Setup block signal
3565	Setpoint when start	0=Last setpoint, 1=Setup start setpoint, 2= Extern setpoint
3566	Output state when start	0=Last state, 1=Auto, 2=Man, 3=Internal blocked
3567	Pump cap. calc. full speed	0=No, 1=Yes (also valid for manual speed)
3569-3570	P-Band	0 - 99.999
3571-3572	I-Time	0 - 9999.99 s
3573-3574	D-Time	0 - 9999.99 s
3576	VFD Min speed	0.1%
3577	Locked speed pumping out	0.1%
3578	Lock speed delay	s

3.47 Register Cross Reference Config

Register no	Description
Register no	**Description**
13312	Cross reference for Data register 0
13313	Scale factor and sign flag for Data register 0
13314	Cross reference for Data register 1
13315	Scale factor and sign flag for Data register 1
…	
13822	Cross reference for Data register 254
13823	Scale factor and sign flag for Data register 25

3.48 IO Cross Reference Config

13824	Cross reference for IO bit 0
13825	Cross reference for IO bit 1
…	
14079	Cross reference for IO bit 255

3.49 **Get log data ch1-ch16**

Ch1 start at base address	R16384	(4000H)
Ch2 start at base address	R18432	(4800H)
Ch3 start at base address	R20480	(5000H)
Ch4 start at base address	R22528	(5800H)
Ch5 start at base address	R24576	(6000H)
Ch6 start at base address	R26624	(6800H)
Ch7 start at base address	R28672	(7000H)
Ch8 start at base address	R30720	(7800H)
Ch9 start at base address	R32768	(8000H)
Ch10 start at base address	R34816	(8800H)
Ch11 start at base address	R36864	(9000H)
Ch12 start at base address	R38912	(9800H)
Ch13 start at base address	R40960	(A000H)
Ch14 start at base address	R43008	(A800H)
Ch15 start at base address	R45056	(B000H)
Ch16 start at base address	R47104	(B800H)

Register no	Description	Scale factor/ unit / note
Base + 0	Day (block) select	0-15, 0=Today, 1=Yesterday/2=2 days ago ….15
Base + 1	No logged days	0-16
Base + 2	No logged values in block	
Base + 3	Log signal in block	* 0=Level/1=Inflow…..
Base + 4	Log object no	** 0-3
Base + 5	No decimals	0 - 4
Base + 6	Log intervall in block	min
Base + 7	Log function in block	0=Closed/1=Act. value/ 2=Average value/ 3=Min/ 4=Max
Base + 8	Year in block	
Base + 9	Month in block	1-12
Base +10	Date in block	1-32
Base +11	Time for activate block	0 = 00:00/1=00:01/2=00:02…1439=23:59 (Interval=1min)
Base +12	First logged value	00:00-00:01 (1 min interval)
Base +13	Second logged value	00:01-00:02
.		
.		
Base + 1451	Last logged value	23:59-24:00 (1 min interval)

* See appendices 3.5 Log and trend signals

** Log object no:
Signal type: 7,8,9,10,11,12,13,19,20 Select logged pump P1–P4 , P1=0… P4=3
Signal type: 16 Free choice, Select logged signal AI2-AI5, AI2=0
Signal type: 18 Pulse channel, Select channel CH1-CH4, CH1=0

4 Appendices

4.1 Digital input types

Type no.	Function	
0	DI Off	
1	Run Indication (0=P1, P2, Mixer, Drain pump)	
2	Manuel start (0=P1, P2, Mixer, Drain pump)	Flank trig, starts run sequence
3	Set Manual (0=P1, P2, Mixer, Drain pump)	M-0-A Switch, Forced Run
4	Set Auto (0=P1, 1=P2)	M-0-A Switch
5	Start float (0=P1, 1=P2, 2=Pit)	
6	Pump failure (0=P1, P2)	
7	Pump Motor protector (0=P1, P2, Mixer, Drain pump)	
8	High motor temperature Pump (0=P1, P2)	
9	Leakage Pump (0=P1-P2)	
10	Stop float (0= P1, P2, Pit,)	
11	Low level float	
12	Overflow float	
13	High level float	
14	Start float drain pump	
15	Local mode	
16	Alarm reset	
17	Power fail	
18	DI pulse channel (CH 1 – CH4)	
19	Block PID Controller	
20	Alarm input (free alarm text)	
21	Block operation (0=P1, P2, Mixer, Drain pump)	
22	Leakage Mixer-Drain pump (0=Mixer, 1=Drain pump)	
23	High motor temp. Mixer-Drain pump (0=Mixer, 1=Drain pump)	

Extra Sub Type DI High Pump Motor Temperature (type 8)

0	High Motor temperature general
1	High Temperature Stator L1 P1-P2
2	High Temperature Stator L2 P1-P2
3	High Temperature Stator L3 P1-P2
4	High Temperature Upper Bearing P1-P2
5	High Temperature Lower Bearing P1-P2

Extra Sub Type DI Pump Leakage (type 9)

0	Leakage general
1	Leakage Oil chamber P1-P2
2	Leakage Motor Housing P1-P2
3	Leakage Electrical box P1-P2

4.2   **Digital output types**

Type no.	Function	
0	DO Off	
1	Pump control (P1-P2)	Register setup choose between P1 and P2
2	Reset motor protector	(P1, P2, Mixer, Drain pump, All)
3	Pump fail (P1-P2)	
4	Not enough pumps available	
5	One pump fail (P1-P2)	
6	Mixer control	
7	Drain pump control	
8	Cleaner control	
9	Modem control	
10	Remote control	
11	Personnel alarm	
12	High level	
13	Alarm alert	(B alarm, A alarm, A&B alarm)
14	Not Ackn. Alarm	(B alarm, A alarm, A&B alarm)
15	Active Alarm	(B alarm, A alarm, A&B alarm)
16	Pump Reversing (P1-P2)	
17	Logic IO	
18	Data Register Setpoint	
19	Auto Reset Alert	Alert before "trip" auto reset, that may cause pump start

Some types have additional config. starting at register 2340

4.3   **Analogue inputs types**

Type no.	Function		
0	AI Off		
1	Pit level	0.01m	(AI 1-4)
2	Motor Current P1-P2.	0.1A	(AI 1-4)
3	Outlet Pressure	0.1 bar	(AI 1-4)
4	Vibrations P1-P2	0.1 mm/s	(AI 1-4)
5	Xylem MiniCas Sim. P1-P2		(AI 1-4)
6	Outflow meter	0.1 l/s	(AI 1-4)
7	Motor temperature	**See Sub Type**	
8	Free Choice	User	(AI 1-8)

Motor temperature sub type no. (if motor temperature or MiniCas selected)

0	Motor temperature	0.1 °C	(Pt100 AI1-8)
1	Temperature Stator L1 P1-P2	0.1 °C	(Pt100 AI1-8)
2	Temperature Stator L2 P1-P2	0.1 °C	(Pt100 AI1-8)
3	Temperature Stator L3 P1-P2	0.1 °C	(Pt100 AI1-8)
4	Temperature Upper Bearing P1-P2	0.1 °C	(Pt100 AI1-8)
5	Temperature Lower Bearing P1-P2	0.1 °C	(Pt100 AI1-8)

Leakage Sub Type no. AI7, AI8 in Leakage mode Or AI1-AI4 Type Xylem MiniCas selected

0	Leakage P1-P2
1	Leakage Oil chamber P1-P2
2	Leakage Motor Housing P1-P2
3	Leakage Electrical connect box P1-P2

4.4   **Analogue outputs types**

Type no.	Function		
0	AO Off		
1	Pit level		
2	Pit Inflow		
3	Pit Outflow		
4	Pit Overflow		
5	Pulse channel 1		
6	Pulse channel 2		
7	Pulse channel 3		
8	Pulse channel 4		
9	PID Controller output		
10	Data Register	0-65535	(long=4000000000)
11	Data Register 2-complement	+-32767	(long=+-2000000000)
12	Set Freq. P1		
13	Set Freq. P2		

4.5   **Log and Trend signals**

Default = unsigned (0-65535) data. Possible negative data as 2-complement.

Type no.	Function	Scale/Note	
0	Closed		
1	Level Pit	0.01 m	2-complement
2	Inflow Pit	0.1 l/s	
3	Outflow Pit	0.1 l/s	
4	Overflow level	0.001 m	
5	Overflow flow	0.1 l/s	
6	Back-Pressure	0.1 bar	
7	Motor current P1-P2	0.1 A	Register choose between P1 and P2
8	Pump capacity P1-P2	0.1 l/s	"
9	Power factor P1-P2	0.01	"
10	Temperature Motor P1-P2	0.1 °C	2-complement
11	Temp. Stator wiring L1 P1-P2	0.1 °C	2-complement
12	Temp. Stator wiring L2 P1-P2	0.1 °C	2-complement
13	Temp. Stator wiring L3 P1-P2	0.1 °C	2-complement
14	Temp. Upper bearing P1-P2	0.1 °C	"
15	Temp. Lower bearing P1-P2	0.1 °C	"
16	Vibration P1-P2	0.1 mm/s	
17	Main voltage	0.1 V	
18	Main frequency	0.1 Hz	
19	Free choice AI1-AI8	User choice 2-complement	
20	Power supply	0.1 V	
21	Pulse channel 1-4	0.1 l/s*ha / 0. 1kW / 0.1 l/s	
22	PID controller output	0.1 %	
23	Data register	0-65535	
24	Data register 2 complement	signed data	
25	Set frequency	0.01 Hz	To Drive
26	Actual frequency	0.01 Hz	From Drive
27	Motor Power	0.1 KW	From Drive / Power monitor
28	Motor Volt	0.1 V	From Drive / Power monitor
29	Motor Torque	0.1 %	From Drive
30	Outflow meter	0.1 l/s	Extern flowmeter
31	Total head	0.01 m	If pressure sensor attached
32	PCB temperature	1 °C	
33	BEP frequency P1-P1	0.01 Hz	
34	BEP efficiency P1-P2	0.0001 kWh / m3 (1 kWh / Mgal)	
35	Main power	0.1 kW	
36	Actual head	0.01 m	Used in flow calculation

4.6   **Crash log**

EC 531 is continuously saving raw analogue input data every second.

Following signals are saved:
1. DC supply voltage
2. mA input 1 (default as level sensor)
3. mA input 2
4. mA input 3
5. mA input 4
6. AI 5 - pt100/PTC P1
7. AI 6 - pt100/PTC P2
8. AI 7 - pt100/Leak P1
9. AI 8 - pt100/Leak P2

Fieldbus data if motor drives or power monitors are attached
10. Motor current P1
11. Motor current P2
12. Frequency P1
13. Frequency P2
14. Power P1
15. Power P2
16. Mains voltage

The crash log can be triggered by any new alarm.
Each crash block contains data for 8192 seconds (131072 data samples)
Eight crash blocks are stored with a time stamp, ID no and alarm no for the trigger alarm.

When a trigger alarm occurs, the last 90 minutes of analogue data second samples are saved, and the following 45 minutes of data are added to the "crash block".

The last 23 hours of data and up to eight crash blocks are stored and can be retrieved to a PC with the AquaProg tool.

AD data is 16 bit raw unscaled AD data, and scale info is contained in the first 11 registers info header.
Field bus data comes in engineering units and if the header for 100% scale is set to zero, no rescaling except for decimal adjustment is required.

Signal type can be read as text 1536-1551 for Signal 1-16.
Engineering units as text 1552-1567.

Read crash log data:

Info of stored crash logs are starts at register 53248

53248	Block readout select	write selected block 0-7, 0 = latest
53249	No of stored blocks	0 = no crash data stored (max 8)

Info for Selected Block

53250	Year	Trigger time
53251	Month	Trigger time
53252	Day	Trigger time
53253	Hour	Trigger time
53254	Minute	Trigger time
53255	Second	Trigger time
53256	No of stored data values (seconds) before trig time	
53257	Total no of stored data values in crash block (max 8192)	
53258	Crash no ID (Hi Word)	
53259	Crash no ID (Lo Word)	

Info for latest Block 0

53260	Year	Trigger time
53261	Month	Trigger time
53262	Day	Trigger time
53263	Hour	Trigger time
53264	Minute	Trigger time
53265	Second	Trigger time
53266	No of stored data values (seconds) before trig time	
53267	Total no of stored data values in crash block (max 8192)	
53268	Crash no ID (Hi Word)	
53269	Crash no ID (Lo Word)	

Info for second latest Block 1

53270	Year	Trigger time
53271	Month	Trigger time
53272	Day	Trigger time
53273	Hour	Trigger time
53274	Minute	Trigger time
53275	Second	Trigger time
53276	No of stored data values (seconds) before trig time	
53277	Total no of stored data values in crash block (max 8192)	
53278	Crash no ID (Hi Word)	
53279	Crash no ID (Lo Word)	

Info for next previous Block 2

53280	Year	Trigger time
53281	Month	Trigger time
53282	Day	Trigger time
53283	Hour	Trigger time
53284	Minute	Trigger time
53285	Second	Trigger time
53286	No of stored data values (seconds) before trig time	
53287	Total no of stored data values in crash block (max 8192)	
53288	Crash no ID (Hi Word)	
53289	Crash no ID (Lo Word)	

Info for next previous Block 3

53290	Year	Trigger time
53291	Month	Trigger time
53292	Day	Trigger time
53293	Hour	Trigger time
53294	Minute	Trigger time
53295	Second	Trigger time
53296	No of stored data values (seconds) before trig time	
53297	Total no of stored data values in crash block (max 8192)	
53298	Crash no ID (Hi Word)	
53299	Crash no ID (Lo Word)	

Info for next previous Block 4

53300	Year	Trigger time
53301	Month	Trigger time
53302	Day	Trigger time
53303	Hour	Trigger time
53304	Minute	Trigger time
53305	Second	Trigger time
53306	No of stored data values (seconds) before trig time	
53307	Total no of stored data values in crash block (max 8192)	
53308	Crash no ID (Hi Word)	
53309	Crash no ID (Lo Word)	

Info for next previous Block 5

53310	Year	Trigger time
53311	Month	Trigger time
53312	Day	Trigger time
53313	Hour	Trigger time
53314	Minute	Trigger time
53315	Second	Trigger time
53316	No of stored data values (seconds) before trig time	
53317	Total no of stored data values in crash block (max 8192)	
53318	Crash no ID (Hi Word)	
53319	Crash no ID (Lo Word)	

Info for next previous Block 6

53320	Year	Trigger time
53321	Month	Trigger time
53322	Day	Trigger time
53323	Hour	Trigger time
53324	Minute	Trigger time
53325	Second	Trigger time
53326	No of stored data values (seconds) before trig time	
53327	Total no of stored data values in crash block (max 8192)	
53328	Crash no ID (Hi Word)	
53329	Crash no ID (Lo Word)	

Info for oldest Block 7

53330	Year	Trigger time
53331	Month	Trigger time
53332	Day	Trigger time
53333	Hour	Trigger time
53334	Minute	Trigger time
53335	Second	Trigger time
53336	No of stored data values (seconds) before trig time	
53337	Total no of stored data values in crash block (max 8192)	
53338	Crash no ID (Hi Word)	
53339	Crash no ID (Lo Word)	

Each signal has a dedicated read out area of 256 registers

Data is 16 bit raw unscaled AD data, and scale info is contained in the first 11 registers info header

Base register:

Signal 1	53504	DC supply voltage
Signal 2	53760	mA input 1 (default level sensor)
Signal 3	54016	mA input 2
Signal 4	54016	mA input 3
Signal 5	50176	mA input 4
Signal 6	50432	AI 5 - pt100/PTC P1
Signal 7	50688	AI 6 - pt100/PTC P2
Signal 8	50944	AI 7 - pt100/Leak P1
Signal 9	51200	AI 8 - pt100/Leak P2
Signal 10	51456	Motor current P1
Signal 11	51712	Motor current P2
Signal 12	51968	Frequency P1
Signal 13	52224	Frequency P2
Signal 14	52480	Power P1
Signal 15	52736	Power P2
Signal 16	52992	Mains voltage

By reading 11 consecutive registers from the base + 0 register, the readout data counter in base +9-10 is set to time for first data in block

By reading from base + 9, max 122 registers in each telegram, the data time in base + 9-10 is incremented with the no of data values (seconds) in each telegram.

Continue reading from base + 9 until all data up to block end time in base +7-8 is reached.
If base + 9-10 has a higher start value than block end in base +7-8 the first data is from day before crash log trig.
User can set data start time by write to base +9-10.

Base + 0   Selected Block index 0-7, Reading resets base + 9-10 to first data in block
Base + 1   Crash trig alarm number.
Base + 2   Raw data 0 % value.
Base + 3   Raw data 100 % value.
Base + 4   0 % engineering value.
Base + 5   100 % engineering value.
Base + 6   Number of decimals in engineering value.
Base + 7   Time for last data in block, in seconds from midnight. High word (MSW)
Base + 8   Time for last data in block, in seconds from midnight. Low word (LSW)
Base + 9   Time for first data in seconds from midnight. High word (MSW)
Base + 10   Time for first data in seconds from midnight. Low word (LSW)
Base + 11   First data value
Base + 12   Second data value
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Base + 130   Max 122 data registers in one telegram

4.7 Read seconds data

Is similar to reading crash log blocks except for base + 0 and base + 1.
Up to 23 hours and 57 minutes of data can be retrieved.

By reading 11 consecutive registers from the base + 0 register, the readout data counter in base +9-10 is set to oldest data since last boot.
Base + 7-8 is set to actual time (last data) for this read.

If unit has been powered off, all stored data (almost 24 hours) can be read out by reading 10 consecutive registers, starting from the base + 1 register. EC 531 have no date info for data older than last boot.

By reading from base + 9, max 122 registers in each telegram, the data time in base + 9-10 is incremented with the no of data values (seconds) in each telegram.

Continue reading from base + 9 until all data up to start time in base +7-8 is reached.
If base + 9-10 has a higher start value than start time in base +7-8 the first data is from yesterday.
User can set any data start time by write to base +9-10.

Base + 0	Reading resets data to oldest data since last boot, reads 0, or 1 if < 86144 samples
Base + 1	Reads same as Base + 0
Base + 2	Raw data 0 % value.
Base + 3	Raw data 100 % value.
Base + 4	0 % engineering value.
Base + 5	100 % engineering value.
Base + 6	Number of decimals in engineering value.
Base + 7	Time for last data (now), in seconds from midnight. High word (MSW)
Base + 8	Time for last data (now), in seconds from midnight. Low word (LSW)
Base + 9	Time for first data in base + 11, in seconds from midnight. High word (MSW)
Base + 10	Time for first data in base + 11, in seconds from midnight. Low word (LSW)
Base + 11	First data value
Base + 12	Second data value
.	
.	
Base + 130	Max 122 data registers in one telegram