DG Data Sheet

KENDAL POWER STATION

09-Jul-97

Signal KKS	Signal Description	Alarm	Alarm	Termination	PLC term	I	Q	PW
* 0BDE 01	BDE01 3.3kV DG Isolator	CLOSED	NOT CLOSED	X05 : 166	1X 3	I 0.0		
* 0BDE01	BDE01 3.3kV DG Breaker	CLOSED	NOT CLOSED	X05 : 162	1X 4	I 0.1		
* 0BMA15	BMA15 Breaker indication (Service position)	OPENED	NOT OPENED	X05 : 130	1X 5	I 0.2		
* 0BMA14	BMA14 Breaker indication (Service position)	OPENED	NOT OPENED	X05 : 90	1X 6	I 0.3		
* 0BMA13	BMA13 Breaker indication (Service position)	OPENED	NOT OPENED	X05 : 50	1X 7	I 0.4		
* 0BMA12	BMA12 Breaker indication (Service position)	OPENED	NOT OPENED	X05 : 10	1X 8	I 0.5		
* 0BDE03	BDE03 3.3kV Transfer Breaker	OPENED	NOT OPENED	X05 : 189	1X 9	I 0.6		
* 0BMA15	BMA15 Breaker Mimic open push button	TRIP	NORMAL	Mimic	1X 10	I 0.7		
* 0BMA14	BMA14 Breaker Mimic open push button	TRIP	NORMAL	Mimic	1X 15	I 1.0		
* 0BMA13	BMA13 Breaker Mimic open push button	TRIP	NORMAL	Mimic	1X 16	I 1.1		
* 0BMA12	BMA12 Breaker Mimic open push button	TRIP	NORMAL	Mimic	1X 17	I 1.2		
	SYNCH Relay	IN PHASE	NOT IN PHASE	SCR	1X 18	I 1.3		
* 0BMA12	SYNCH Selector switch (SW3) set to	BMA12	BMA12 NOT SELECTED	SW3	1X 19	I 1.4		
* 0BMA13	SYNCH Selector switch (SW3) set to	BMA13	BMA13 NOT SELECTED	SW3	1X 20	I 1.5		
* 0BMA14	SYNCH Selector switch (SW3) set to	BMA14	BMA14 NOT SELECTED	SW3	1X 21	I 1.6		
* 0BMA15	SYNCH Selector switch (SW3) set to	BMA15	BMA15 NOT SELECTED	SW3	1X 22	I 1.7		
	Diesel Engine Radiator level	LOW	NORMAL	X05 : 300	1X 27	I 2.0		
	Diesel Engine Low oil pressure	TRIP	NORMAL	X05 : 301	1X 28	I 2.1		
	Diesel Engine Low oil pressure	ALARM	NORMAL	X05 : 302	1X 29	I 2.2		
	Diesel Engine temperature	TRIP	NORMAL	X05 : 303	1X 30	I 2.3		
	Diesel Engine temperature	ALARM	NORMAL	X05 : 304	1X 31	I 2.4		
	Diesel Engine Emergency stop	ACTIVE	NORMAL	X06 : 35	1X 32	I 2.5		
	Diesel Engine Emergency start	ACTIVE	NORMAL	X06 : 30	1X 33	I 2.6		
	Control panel DC	FAIL	NORMAL	X06 : 39	1X 34	I 2.7		
	Diesel Generator Day tank	LESS 10%	HIGHER 10%	X05 : 308	1X 39	I 3.0		
	Diesel Generator Day tank	LESS 50%	HIGHER 50%	X05 : 309	1X 40	I 3.1		
	Diesel Generator Day tank	LESS 95%	HIGHER 95%	X05 : 310	1X 41	I 3.2		
	Diesel Generator Bulk tank	LESS 95%	HIGHER 95%		1X 42	I 3.3		
	BMA15 (CAG) O/C Relay	OPERATE	NORMAL	X05 :136	1X 43	I 3.4		
	BMA14 (CAG) O/C Relay	OPERATE	NORMAL	X05 : 96	1X 44	I 3.5		
	BMA13 (CAG) O/C Relay	OPERATE	NORMAL	X05 : 56	1X 45	I 3.6		

Signal KKS	Signal Description	Alarm	Alarm	Termination	PLC term	I	Q	PW
	BMA12 (CAG) O/C Relay	OPERATE	NORMAL	X05 : 16	1X 46	I 3.7		
* 0BDE 01	BDE01 3.3kV DG Isolator link	OPENED	NOT OPENED	X05 : 168	2X 3	I 4.0		
* OBDE01	BDE01 3.3kV DG Breaker	OPENED	NOT OPENED	X05 : 164	2X 4	I 4.1		
* 0BMA15	BMA15 Breaker indication (Service position)	CLOSED	NOT CLOSED	X05 : 128	2X 5	I 4.2		
* 0BMA14	BMA14 Breaker indication (Service position)	CLOSED	NOT CLOSED	X05 : 88	2X 6	I 4.3		
* 0BMA13	BMA13 Breaker indication (Service position)	CLOSED	NOT CLOSED	X05 : 48	2X 7	I 4.4		
* 0BMA12	BMA12 Breaker indication (Service position)	CLOSED	NOT CLOSED	X05 : 8	2X 8	I 4.5		
* 0BDE03	BDE03 3.3kV Transfer Breaker	CLOSED	NOT CLOSED	X05 : 192	2X 9	I 4.6		
* 0BMA15	BMA15 Breaker Mimic close push button	CLOSE	NORMAL	Mimic	2X 10	I 4.7		
* 0BMA14	BMA14 Breaker Mimic close push button	CLOSE	NORMAL	Mimic	2X 15	I 5.0		
* 0BMA13	BMA13 Breaker Mimic close push button	CLOSE	NORMAL	Mimic	2X 16	I 5.1		
* 0BMA12	BMA12 Breaker Mimic close push button	CLOSE	NORMAL	Mimic	2X 17	I 5.2		
	Pulse from Synchrotech to	CLOSE	NORMAL	SYNCH	2X 18	I 5.3		
* 0BMA12	SYNCH Selector switch (SW3) set to	BMA12	BMA12 NOT SELECTED	SW3	2X 19	I 5.4		
* 0BMA13	SYNCH Selector switch (SW3) set to	BMA13	BMA13 NOT SELECTED	SW3	2X 20	I 5.5		
* 0BMA14	SYNCH Selector switch (SW3) set to	BMA14	BMA14 NOT SELECTED	SW3	2X 21	I 5.6		
* 0BMA15	SYNCH Selector switch (SW3) set to	BMA15	BMA15 NOT SELECTED	SW3	2X 22	I 5.7		
* 0BMA12	BMA12 DC	FAIL	NORMAL	X05 :12	2X 27	I 6.0		
* 0BMA13	BMA13 DC	FAIL	NORMAL	X05 : 52	2X 28	I 6.1		
* 0BMA14	BMA14 DC	FAIL	NORMAL	X05 : 92	2X 29	I 6.2		
* 0BMA15	BMA15 DC	FAIL	NORMAL	X05 : 132	2X 30	I 6.3		
* 0BMA13	380V board back up trip DC	FAIL	NORMAL	X05 : 54	2X 31	I 6.4		
	Transformer winding temp	ALARM	NORMAL	X05 : 178	2X 32	I 6.5		
* 0BDE01	BDE01 3.3kV Breaker TRC	FAULT	NORMAL	X06 : 38	2X 33	I 6.6		
	Oil priming pump circuit breaker	OFF	ON	X06 : 32	2X 34	I 6.7		
	Lockout relay (LR) on 380V board	ACTIVE	NOT ACTIVE	X05 : 74	2X 39	I 7.0		
* 0BDE03	BDE03 3.3kV Transfer breaker prot	TRIP	NORMAL	X05 : 180	2X 40	I 7.1		
* 0BDE03	BDE03 3.3kV Transfer breaker TRC	FAULT	NORMAL	X05 : 182	2X 41	I 7.2		
* 0BDE03	BDE03 3.3kV Transfer breaker DC	FAIL	NORMAL	X05 :181	2X 42	I 7.3		
* 0BDE03	BDE03 3.3kV Transfer breaker Isolator link	OPENED	NOT OPENED	X05 :183	2X 43	I 7.4		
* 0BDE03	BDE03 3.3kV Transfer breaker Isolator link	CLOSED	NOT CLOSED	X05 :184	2X 44	I 7.5		
	Fuel filling pump circuit breaker	OFF	ON	X08 :26	2X 45	I 7.6		
	Spare				2X 46	I 7.7		
* 0BDE01	BDE01 3.3kV Breaker cable earth link	ON	NOT ON	X05 : 170	3X 3	I 8.0		

Signal KKS	Signal Description	Alarm	Alarm	Termination	PLC term	I	Q	PW
* 0BMA15	BMA15 Breaker indication (Position)	SERVICE	NOT IN SERVICE	X05 : 150	3X 4	I 8.1		
* 0BMA14	BMA14 Breaker indication (Position)	SERVICE	NOT IN SERVICE	X05 : 110	3X 5	I 8.2		
* 0BMA13	BMA13 Breaker indication (Position)	SERVICE	NOT IN SERVICE	X05 : 70	3X 6	I 8.3		
* 0BMA12	BMA12 Breaker indication (Position)	SERVICE	NOT IN SERVICE	X05 : 30	3X 7	I 8.4		
	Synchronizing close push button	ACTIVE	NOT ACTIVE	SYNCH P-But	3X 8	I 8.5		
	Synchronizing switch (SW3) in	OFF	NOT IN OFF	SW3	3X 9	I 8.6		
	3.3kV Alternator voltage sensing	SENSING	NOT SENSING	X06 : 33	3X 10	I 8.7		
	SYNCH RELAY Voltage	LOWER	NOT LOWER	SYNCH RELAY	3X 15	I 9.0		
	SYNCH RELAY Voltage	RAISE	NOT RAISE	SYNCH RELAY	3X 16	I 9.1		
	SYNCH RELAY Speed	LOWER	NOT LOWER	SYNCH RELAY	3X 17	I 9.2		
	SYNCH RELAY Speed	RAISE	NOT RAISE	SYNCH RELAY	3X 18	I 9.3		
	Battery charger / Alternator charger	FAIL	NORMAL	X06 : 31	3X 19	I 9.4		
* 0BMY02	Master trip relay	OPERATED	NORMAL	X06 : 13	3X 20	I 9.5		
	Engine running starter cut off	CUT OFF	NORMAL	X06 : 26	3X 21	I 9.6		
	Mimic Alarm Acknowledgment push button	ACTIVE	NOT ACTIVE	Mimic P-But	3X 22	I 9.7		
	Mimic Reset software lockout Key switch	ACTIVE	NOT ACTIVE	Mimic K-Switch	3X 27	I 10.0		
	Engine Control switch position	OFF	NOT IN OFF	SW4	3X 28	I 10.1		
	Engine Control switch position	AUTO	NOT IN AUTO	SW4	3X 29	I 10.2		
	Engine Control switch position	TEST	NOT IN TEST	SW4	3X 30	I 10.3		
	Transformer DC	FAIL	NORMAL	X05 : 152	3X 31	I 10.4		
* 0BDE01	BDE01 3.3kV Breaker cable earth link	OFF	NOT OFF	X05 : 175	3X 32	I 10.5		
	Spare				3X 33	I 10.6		
	Spare				3X 34	I 10.7		
* 0BMA15	BMA15 Breaker indication (Position)	TEST	NOT IN TEST	X05 : 148	3X 39	I 11.0		
* 0BMA14	BMA14 Breaker indication (Position)	TEST	NOT IN TEST	X05 : 108	3X 40	I 11.1		
* 0BMA13	BMA13 Breaker indication (Position)	TEST	NOT IN TEST	X05 : 68	3X 41	I 11.2		
* 0BMA12	BMA12 Breaker indication (Position)	TEST	NOT IN TEST	X05 : 28	3X 42	I 11.3		
* 0BMA15	BMA15 Breaker indication (Position)	RACK OUT	NOT IN RACK OUT	X05 : 146	3X 43	I 11.4		
* 0BMA14	BMA14 Breaker indication (Position)	RACK OUT	NOT IN RACK OUT	X05 : 106	3X 44	I 11.5		
* 0BMA13	BMA13 Breaker indication (Position)	RACK OUT	NOT IN RACK OUT	X05 : 66	3X 45	I 11.6		
* 0BMA12	BMA12 Breaker indication (Position)	RACK OUT	NOT IN RACK OUT	X05 : 26	3X 46	I 11.7		
	(Relay 4) Voltage output	RAISE		Relay 4	4X 3		Q 12.0	
	(Relay 5) Voltage output	LOWER		Relay 5	4X 4		Q 12.1	
* 0BMA12	BMA12 Breaker command to (IPT 1)	OPEN		X05 : 17	4X 5		Q 12.2	

Signal KKS	Signal Description	Alarm	Alarm	Termination	PLC term	I	Q	PW
* 0BMA13	BMA13 Breaker command to (IPT 1)	OPEN		X05 : 57	4X 6		Q 12.3	
* 0BMA14	BMA14 Breaker command to (IPT 1)	OPEN		X05 : 97	4X 7		Q 12.4	
* 0BMA15	BMA15 Breaker command to (IPT 1)	OPEN		X05 : 137	4X 8		Q 12.5	
* 0BMA12	BMA12 Breaker command to (IPC 1)	CLOSE		X05 : 21	4X 9		Q 12.6	
* 0BMA13	BMA13 Breaker command to (IPC 1)	CLOSE		X05 : 61	4X 10		Q 12.7	
* 0BMA14	BMA14 Breaker command to (IPC 1)	CLOSE		X05 : 101	4X 15		Q 13.0	
* 0BMA15	BMA15 Breaker command to (IPC 1)	CLOSE		X05 : 141	4X 16		Q 13.1	
	(Relay 2) Diesel generator output to	START		Relay 2	4X 17		Q 13.2	
	(Relay 8) LF & LU output to	BLOCK		Relay 8	4X 18		Q 13.3	
* 0BMA12	BMA12 switch gear (Output to mimic)	DESCREPTION		Mimic	4X 19		Q 13.4	
* 0BMA13	BMA13 switch gear (Output to mimic)	DESCREPTION		Mimic	4X 20		Q 13.5	
* 0BMA14	BMA14 switch gear (Output to mimic)	DESCREPTION		Mimic	4X 21		Q 13.6	
* 0BMA15	BMA15 switch gear (Output to mimic)	DESCREPTION		Mimic	4X 22		Q 13.7	
	(Relay 9) Diesel Generator fuel alarm	OUTPUT		Relay 9	4X 27		Q 14.0	
	(Relay 11) 380V chopover system unhealthy	OUTPUT		Relay 11	4X 28		Q 14.1	
	(Relay 12) Diesel Generator fuel filling pump	OUTPUT		Relay 12	4X 29		Q 14.2	
	(Relay 10) Diesel generator system unhealth	OUTPUT		Relay 10	4X 30		Q 14.3	
	(Mimic) Diesel Generator radiator low	OUTPUT		Mimic	4X 31		Q 14.4	
	(Mimic) Diesel Generator low oil trip	OUTPUT		Mimic	4X 32		Q 14.5	
	(Mimic) Diesel Generator low oil alarm	OUTPUT		Mimic	4X 33		Q 14.6	
	(Mimic) Diesel Generator high engine temp a	OUTPUT		Mimic	4X 34		Q 14.7	
	(Mimic) Diesel Generator high engine temp tr	OUTPUT		Mimic	4X 39		Q 15.0	
	(Mimic) Diesel Generator emergency stop ac	OUTPUT		Mimic	4X 40		Q 15.1	
	(Mimic) Diesel Generator emergency start ac	OUTPUT		Mimic	4X 41		Q 15.2	
	(Mimic) Diesel Generator charger fail	OUTPUT		Mimic	4X 42		Q 15.3	
	(Mimic) 3.3kV DG switch gear unhealthy	OUTPUT		Mimic	4X 43		Q 15.4	
	(Mimic) 380V DG switch gear unhealthy	OUTPUT		Mimic	4X 44		Q 15.5	
	(Mimic) 380V DG switch gear 220V DC fail	OUTPUT		Mimic	4X 45		Q 15.6	
	(Mimic) Diesel Generator transformer windin	OUTPUT		Mimic	4X 46		Q 15.7	
	(Relay 6) Speed output	RAISE		Relay 6	5X 3		Q 16.0	
	(Relay 7) Speed output	LOWER		Relay 7	5X 4		Q 16.1	
* 0BMA12	BMA12 Breaker command to (IPT 2)	OPEN		X05 : 19	5X 5		Q 16.2	
* 0BMA13	BMA13 Breaker command to (IPT 2)	OPEN		X05 : 59	5X 6		Q 16.3	
* 0BMA14	BMA14 Breaker command to (IPT 2)	OPEN		X05 : 99	5X 7		Q 16.4	

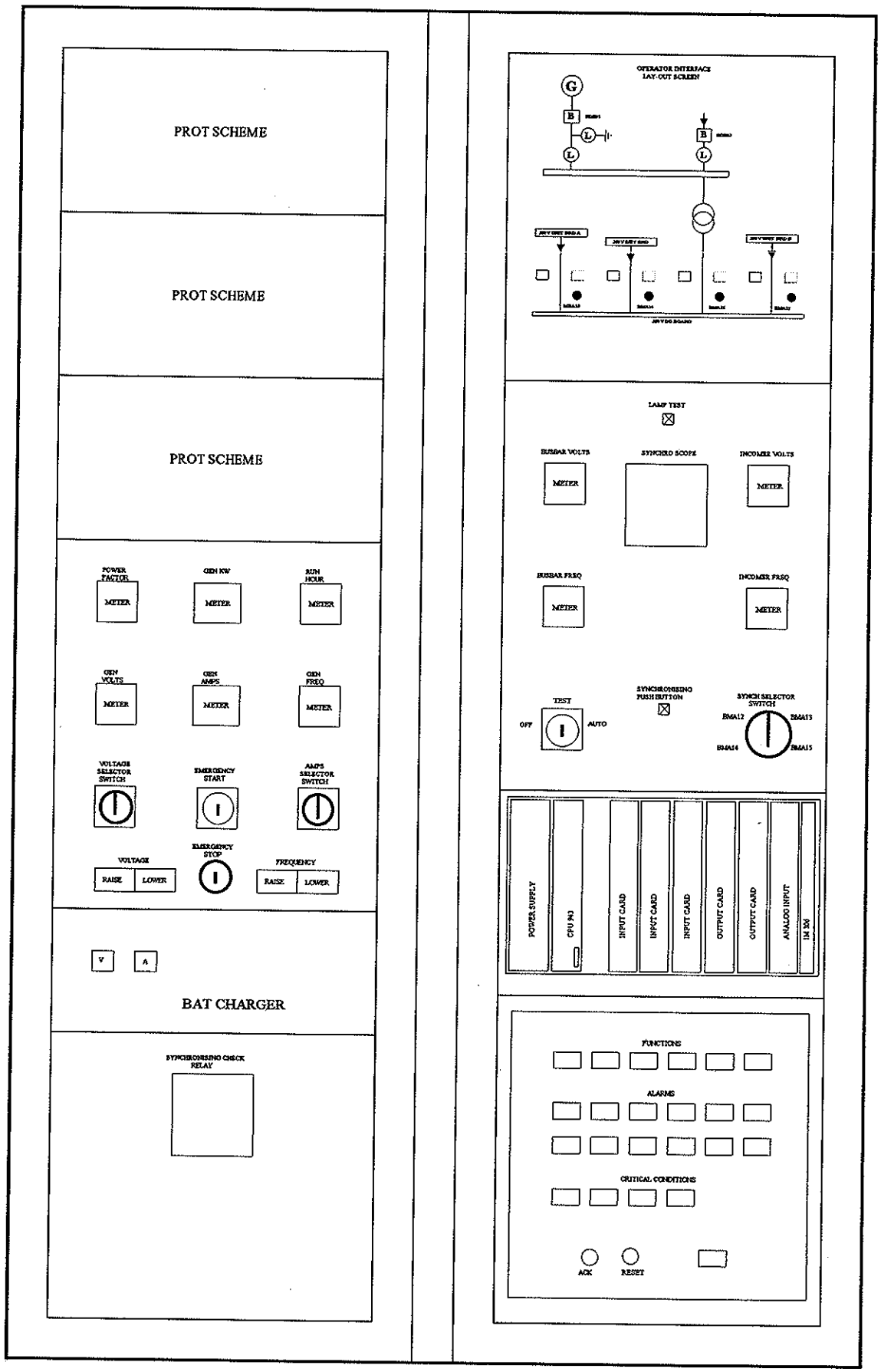
Signal KKS	Signal Description	Alarm	Alarm	Termination	PLC term	I	Q	PW
* 0BMA15	BMA15 Breaker command to (IPT 2)	OPEN		X05 : 139	5X 8		Q 16.5	
* 0BMA12	BMA12 Breaker command to (IPC 2)	CLOSE		X05 : 23	5X 9		Q 16.6	
* 0BMA13	BMA13 Breaker command to (IPC 2)	CLOSE		X05 : 63	5X 10		Q 16.7	
* 0BMA14	BMA14 Breaker command to (IPC 2)	CLOSE		X05 : 103	5X 15		Q 17.0	
* 0BMA15	BMA15 Breaker command to (IPC 2)	CLOSE		X05 : 143	5X 16		Q 17.1	
* 0BMA12	(Mimic) BMA12 Breaker fail to close	OUTPUT		Mimic	5X 17		Q 17.2	
* 0BMA13	(Mimic) BMA13 Breaker fail to close	OUTPUT		Mimic	5X 18		Q 17.3	
* 0BMA14	(Mimic) BMA14 Breaker fail to close	OUTPUT		Mimic	5X 19		Q 17.4	
* 0BMA15	(Mimic) BMA15 Breaker fail to close	OUTPUT		Mimic	5X 20		Q 17.5	
	(Mimic) 380V cable voltage unhealthy	OUTPUT		Mimic	5X 21		Q 17.6	
	(Mimic) PLC Healthy (On)	OUTPUT		Mimic	5X 22		Q 17.7	
	(Mimic) Control panel DC fail	OUTPUT		Mimic	5X 27		Q 18.0	
	(Mimic) 3.3kV breaker TRC unhealthy	OUTPUT		Mimic	5X 28		Q 18.1	
* 0BDE03	BDE03 3.3kV Transfer breaker command to	OPEN		X05 : 187	5X 29		Q 18.2	
	(Mimic) Diesel Generator fuel <10%	OUTPUT		Mimic	5X 30		Q 18.3	
	(Mimic) Diesel Generator fuel <50%	OUTPUT		Mimic	5X 31		Q 18.4	
	(Mimic) Diesel Generator fuel >95%	OUTPUT		Mimic	5X 32		Q 18.5	
	(Mimic) 3.3kVvoltage unhealthy	OUTPUT		Mimic	5X 33		Q 18.6	
* 0BDE01	BDE01 3.3kV Transfer breaker command to	CLOSE		X05 : 171	5X 34		Q 18.7	
	(Relay 3) Diesel Generator oil priming pump	OUTPUT		Relay 3	5X 39		Q 19.0	
	(Relay 1) Diesel Generator fuel relay	OUTPUT		Relay 1	5X 40		Q 19.1	
* 0BDE03	BDE03 3.3kV Transfer breaker command to	CLOSE		X05 : 185	5X 41		Q 19.2	
	(Mimic) Diesel Generator fail to start	OUTPUT		Mimic	5X 42		Q 19.3	
	(Mimic & LR) Software lockout	OUTPUT		Mimic X05 : 71	5X 43		Q 19.4	
* 0BDE01	BDE01 3.3kV Transfer breaker command to	OPEN		X05 : 173	5X 44		Q 19.5	
	(Relay 14) Diesel Generator alarm panel acti	OUTPUT		Relay 14	5X 45		Q 19.6	
	(Relay 15) 380V DG Board under voltage	OUTPUT		Relay 15	5X 46		Q 19.7	
	Diesel Generator WATTS	ANALOG INPUT		X06 : 11/12	6X 3/5			PW 128
	Diesel Generator Frequency	ANALOG INPUT		X06 : 42/43	6X 7/9			PW 130
	380V DG Board Busbar voltage	ANALOG INPUT		X05 : 3/4	6X 15/17			PW 132
* 0BMA12	BMA12 Cable voltage	ANALOG INPUT		X05 : 1/2	6X 19/21			PW 134
* 0BMA13	BMA13 Cable voltage	ANALOG INPUT		X05 : 41/42	6X 27/29			PW 136
* 0BMA14	BMA14 Cable voltage	ANALOG INPUT		X05 : 81/82	6X 31/33			PW 138
* 0BMA15	BMA15 Cable voltage	ANALOG INPUT		X05 : 121/122	6X 39/41			PW 140

Signal KKS	Signal Description	Alarm	Alarm	Termination	PLC term	I	Q	PW
	Spare	ANALOG INPUT			6X 43/45			PW 142

UNIT DIESEL GENERATOR CONTROL PANEL

RELAY PANEL

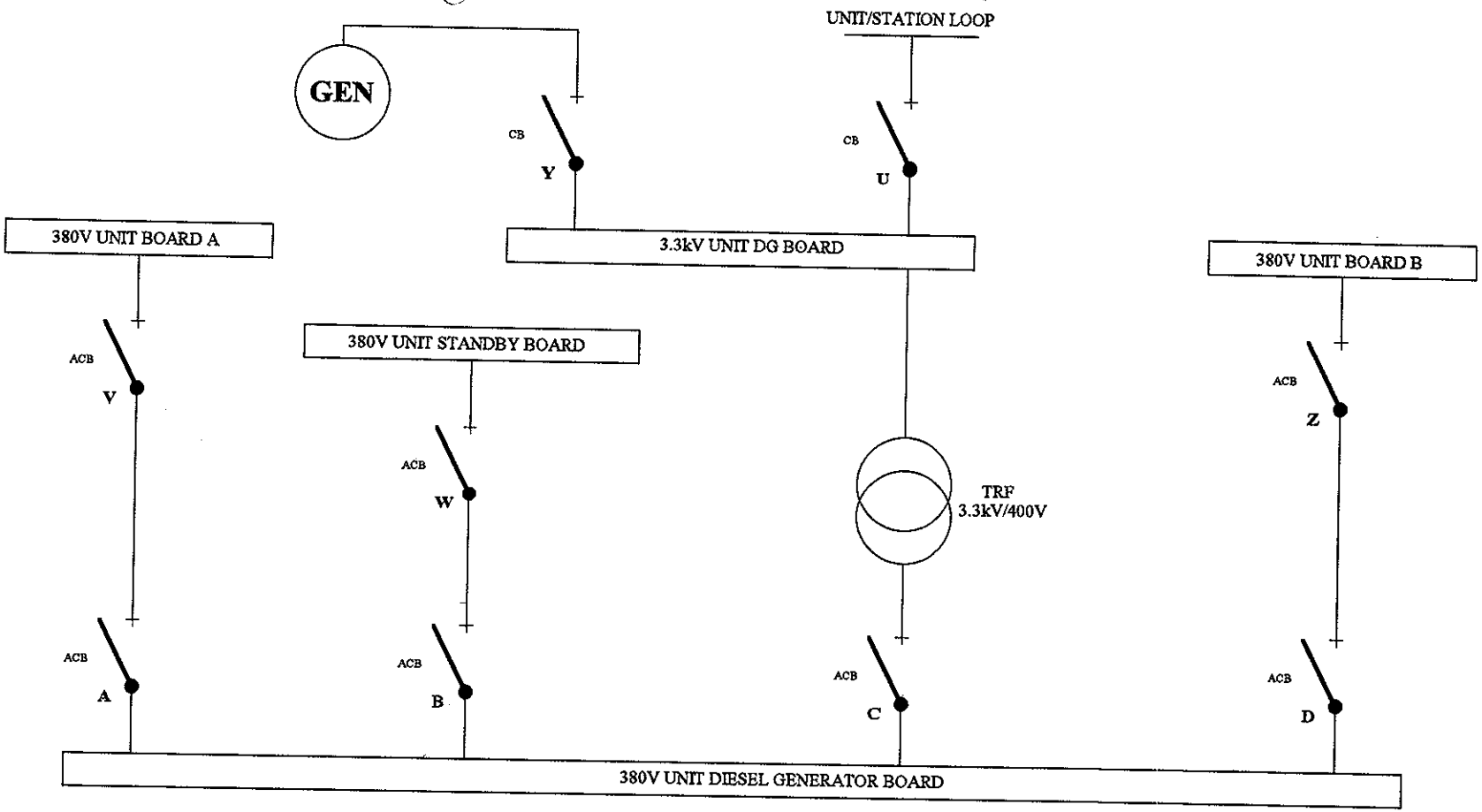
SYNCHRONIZING PANEL



Kendal Power Station

DRAWING NOT ON SCALE

A & J Control Solutions CC



LEGEND

CB: VACUUM CIRCUIT BREAKER
ACB: AIR CIRCUIT BREAKER

3

DRAWING NOT ON SCALE

A & J Control Solutions CC	**Kendal Power Station Unit Diesel Generator Layout**	CLIENT: Kendal Power Station PTM (F Holmes)	REV 1
			SHT 2
		DRAWING No KENPTM 0010-1	

A & J Control Solutions CC Cell: 082 457 2165 / 083 228 4536

		7	6	5	4	3	2	1	0	B	W	D
bytes	0	X	X	X	X	X	X	X	X	-	-	-
bytes	1	X	X	X	X	X	X	X	X	-	-	-
bytes	2	X	X	X	X	X	X	X	X	-	-	-
bytes	3	X	X	X	X	X	X	X	X	-	-	-
bytes	4	X	X	X	X	X	X	X	X	-	-	-
bytes	5	X	X	X	X	X	X	X	X	-	-	-
bytes	6	-	X	X	X	X	X	X	X	-	-	-
bytes	7	-	-	-	-	-	-	-	X	-	-	-
bytes	8	X	X	X	X	X	X	X	X	-	-	-
bytes	9	X	X	X	X	X	X	X	X	-	-	-
bytes	10	-	-	X	X	X	X	X	X	-	-	-
bytes	11	X	X	X	X	X	X	X	-	-	-	-
bytes	12	-	-	-	-	-	-	-	-	-	-	-
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bytes	54	-	-	-	-	-	-	-	-	-	-	-
bytes	55	-	-	-	-	-	-	-	-	-	-	-
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DATE: 09.07.97 01-07-1997	ENQUIRIES ABOUT THE PROGRAM: ALBERT PRETORIUS: 0135 928679 JOHAN GROBLER 083 228 4536	SIEMENS AG S5 115 PLC 943 PROCESSOR	THIS PROGRAM CONTROL THE ENGINE FOR THE 3,3KV DIESEL GENERATOR AND THE 380V BREAKERS ON THE DIESEL GENERATOR BOARD XRF file : U1DG@@XR.INI I/Q/F list -Inputs-	THE PROGRAM WAS TESTED AND COMMISSIONED BY PT&M. THE SOFTWARE DEVELOPMENT AND PROGRAMMING WERE DONE BY ALH PRETORIUS & SJ STOLS
MODIFICATION REV 2	AS MOD BY A&J CONTROL SOLUTIONS	SIMATIC S5		PAGE 1 +

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bytes	90	-	X	X	X	X	X	X	X	-	-	-
bytes	91	-	X	X	X	X	X	X	X	-	-	-
bytes	92	-	X	X	X	X	X	X	X	-	-	-
bytes	93	-	-	-	-	-	-	-	-	-	-	-
bytes	94	-	-	-	-	-	-	-	-	-	-	-
bytes	95	-	-	-	-	-	-	-	-	-	-	-

		7	6	5	4	3	2	1	0	B	W	D
bytes	96	-	-	-	-	-	-	-	-	-	-	-
bytes	97	-	-	-	-	-	-	-	-	-	-	-
bytes	98	-	-	-	-	-	-	-	-	-	-	-
bytes	99	-	-	-	-	-	-	-	-	-	-	-
bytes	100	X	X	X	X	X	X	X	X	-	-	-
bytes	101	X	X	X	X	-	X	X	X	-	-	-
bytes	102	-	-	X	X	X	-	X	X	-	-	-
bytes	103	-	-	-	-	-	-	-	-	-	-	-
bytes	104	-	-	-	-	-	-	-	-	-	-	-
bytes	105	-	-	-	-	-	-	-	-	-	-	-
bytes	106	-	-	-	-	-	-	-	-	-	-	-
bytes	107	-	-	-	-	-	-	-	-	-	-	-
bytes	108	-	-	-	-	-	-	-	-	-	-	-
bytes	109	-	-	-	-	-	-	-	-	-	-	-
bytes	110	-	-	-	-	-	-	-	-	-	-	-
bytes	111	-	-	-	-	-	-	-	-	-	-	-
bytes	112	-	-	-	-	-	-	-	-	-	-	-
bytes	113	-	-	-	-	-	-	-	-	-	-	-
bytes	114	-	-	-	-	-	-	-	-	-	-	-
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bytes	117	-	-	-	-	-	-	-	-	-	-	-
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bytes	122	-	-	-	-	-	-	-	-	-	-	-
bytes	123	-	-	-	-	-	-	-	-	-	-	-
bytes	124	-	-	-	-	-	-	-	-	-	-	-
bytes	125	-	-	-	-	-	-	-	-	-	-	-
bytes	126	-	-	-	-	-	-	-	-	-	-	-
bytes	127	-	-	-	-	-	-	-	-	-	-	-

	7	6	5	4	3	2	1	0	B	W	D
bytes 128	-	-	-	-	-	-	-	-	-	-	-
bytes 129	-	-	-	-	-	-	-	-	-	-	-
bytes 130	-	-	-	-	-	-	-	-	-	-	-
bytes 131	-	-	-	-	-	-	-	-	-	-	-
bytes 132	-	-	-	-	-	-	-	-	-	-	-
bytes 133	-	-	-	-	-	-	-	-	-	-	-
bytes 134	-	-	-	-	-	-	-	-	-	-	-
bytes 135	-	-	-	-	-	-	-	-	-	-	-
bytes 136	-	-	-	-	-	-	-	-	-	-	-
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bytes 139	-	-	-	-	-	-	-	-	-	-	-
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bytes 141	-	-	-	-	-	-	-	-	-	-	-
bytes 142	-	-	-	-	-	-	-	-	-	-	-
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bytes 149	-	-	-	-	-	-	-	-	-	-	-
bytes 150	-	-	-	-	-	X	X	X	-	-	-
bytes 151	-	-	-	-	-	-	-	-	-	-	-
bytes 152	-	-	-	-	-	-	-	-	-	-	-
bytes 153	-	-	-	-	-	-	-	-	-	-	-
bytes 154	-	-	-	-	-	-	-	-	-	-	-
bytes 155	-	-	-	-	-	-	-	-	-	-	-
bytes 156	-	-	-	-	-	-	-	-	-	-	-
bytes 157	-	-	-	-	-	-	-	-	-	-	-
bytes 158	-	-	-	-	-	-	-	-	-	-	-
bytes 159	-	-	-	-	-	-	-	-	-	-	-

	7	6	5	4	3	2	1	0	B	W	D
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bytes 161	-	-	-	-	-	-	-	-	-	-	-
bytes 162	-	-	-	-	-	-	-	-	-	-	-
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bytes 168	-	-	-	-	-	-	-	-	-	-	-
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bytes 171	-	-	-	-	-	-	-	-	-	-	-
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bytes 174	-	-	-	-	-	-	-	-	-	-	-
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bytes 190	-	-	-	-	-	-	-	-	-	-	-
bytes 191	-	-	-	-	-	-	-	-	-	-	-

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bytes 192	-	-	-	-	-	-	-	-	-	-	-
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bytes 194	-	-	-	-	-	-	-	-	-	-	-
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bytes 197	-	-	-	-	-	-	-	-	-	-	-
bytes 198	-	-	-	-	-	-	-	-	-	-	-
bytes 199	-	-	-	-	-	-	-	-	-	-	-
bytes 200				X		X	X	X	X	X	-
bytes 201					X			X	-	-	-
bytes 202	-	-	-	-	-	-	-	-	-	-	-
bytes 203	-	-	-	-	-	-	-	-	-	-	-
bytes 204	-	-	-	-	-	-	-	-	-	-	-
bytes 205	-	-	-	-	-	-	-	-	-	-	-
bytes 206	-	-	-	-	-	-	-	-	-	-	-
bytes 207	-	-	-	-	-	-	-	-	-	-	-
bytes 208	-	-	-	-	-	-	-	-	-	-	-
bytes 209	-	-	-	-	-	-	-	-	-	-	-
bytes 210				X	X	X	X	X	-	X	-
bytes 211									-	-	-
bytes 212	-	-	-	-	-	-	-	-	-	-	-
bytes 213	-	-	-	-	-	-	-	-	-	-	-
bytes 214	-	-	-	-	-	-	-	-	-	-	-
bytes 215	-	-	-	-	-	-	-	-	-	-	-
bytes 216	-	-	-	-	-	-	-	-	-	-	-
bytes 217	-	-	-	-	-	-	-	-	-	-	-
bytes 218	-	-	-	-	-	-	-	-	-	-	-
bytes 219	-	-	-	-	-	-	-	-	-	-	-
bytes 220					X			X	-	X	-
bytes 221									-	-	-
bytes 222	-	-	-	-	-	-	-	-	-	-	-
bytes 223	-	-	-	-	-	-	-	-	-	-	-

	7	6	5	4	3	2	1	0	B	W	D
bytes 224	-	-	-	-	-	-	-	-	-	-	-
bytes 225	-	-	-	-	-	-	-	-	-	-	-
bytes 226	-	-	-	-	-	-	-	-	-	-	-
bytes 227	-	-	-	-	-	-	-	-	-	-	-
bytes 228	-	-	-	-	-	-	-	-	-	-	-
bytes 229	-	-	-	-	-	-	-	-	-	-	-
bytes 230	-	-	-	-	-	-	-	-	-	-	-
bytes 231	-	-	-	-	-	-	-	-	-	-	-
bytes 232	-	-	-	-	-	-	-	-	-	-	-
bytes 233	-	-	-	-	-	-	-	-	-	-	-
bytes 234	-	-	-	-	-	-	-	-	-	-	-
bytes 235	-	-	-	-	-	-	-	-	-	-	-
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bytes 240	-	-	-	-	-	-	-	-	-	-	-
bytes 241	-	-	-	-	-	-	-	-	-	-	-
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bytes 244	-	-	-	-	-	-	-	-	-	-	-
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bytes 246	-	-	-	-	-	-	-	-	-	-	-
bytes 247	-	-	-	-	-	-	-	-	-	-	-
bytes 248	-	-	-	-	-	-	-	-	-	-	-
bytes 249	-	-	-	-	-	-	-	-	-	-	-
bytes 250	-	-	-	-	-	-	-	-	-	-	-
bytes 251	-	-	-	-	-	-	-	-	-	-	-
bytes 252	-	-	-	-	-	-	-	-	-	-	-
bytes 253	-	-	-	-	-	-	-	-	-	-	-
bytes 254									-	X	-
bytes 255									-	-	-

Assignment list

ABS operand	Symbolic operand	Operand comment
I 0.0	DGISOCLS	(1X3) 3.3KV D/G ISOLATOR CLOSED
I 0.1	3.3BRKCL	(1X4) 3.3KV BRKR CLOSED
I 0.2	BMA15OPE	(1X5) BMA15 BRKR OPENED
I 0.3	BMA14OPE	(1X6) BMA14 BRKR OPENED
I 0.4	BMA13OPE	(1X7) BMA13 BRKR OPENED
I 0.5	BMA12OPE	(1X8) BMA12 BRKR OPENED
I 0.6	03BRK OP	(1X9) BDE03 BREAKER IN OPEN POSITION
I 0.7	TRIP15	(1X10) BMA15 TRIP PUSHBUTTON
I 1.0	TRIP14	(1X15) BMA14 TRIP PUSHBUTTON
I 1.1	TRIP13	(1X16) BMA12 TRIP PUSHBUTTON
I 1.2	TRIP12	(1X17) BMA12 TRIP PUSHBUTTON
I 1.3	SCRSIGNA	(1X18) IN PHASE SIGNAL FROM SCR
I 1.4	SW4BMA12	(1X19) SYNCH SWITCH (SW4) SET TO BMA12
I 1.5	SW4BMA13	(1X20) SYNCH SWITCH (SW4) SET TO BMA13
I 1.6	SW4BMA14	(1X21) SYNCH SWITCH (SW4) SET TO BMA14
I 1.7	SW4BMA15	(1X22) SYNCH SWITCH (SW4) SET TO BMA15
I 2.0	RADLOW	(1X27) RADIATOR LOW LEVEL
I 2.1	LOPT	(1X28) LOW OIL PRESSURE TRIP
I 2.2	LOPA	(1X29) LOW OIL PRESSURE ALARM
I 2.3	HETT	(1X30) HIGH ENGINE TEMP TRIP
I 2.4	HETA	(1X31) HIGH ENGINE TEMP ALARM
I 2.5	ESTOP	(1X32) EMERGENCY STOPS
I 2.6	ESTART	(1X33) EMERENCY START
I 2.7	BMY01DC	(1X34) BMY01 DC FAIL
I 3.0	DTANK10	(1X39) DAY TANK <10%
I 3.1	DTANK50	(1X40) DAY TANK <50%
I 3.2	DTANK95	(1X41) DAY TANK <95%
I 3.3	BTANK95	(1X42) BULK TANK <95%
I 3.4	CAG15	(1X43) BMA15 LV O/C
I 3.5	CAG14	(1X44) BMA14 LV O/C
I 3.6	CAG13	(1X45) BMA13 LV O/C
I 3.7	CAG12	(1X46) BMA12 LV O/C
I 4.0	DGISOOPE	(2X3) 3.3KV D/G ISOLATOR OPENED
I 4.1	3.3BRKOP	(2X4) 3.3KV BRKR OPENED
I 4.2	15CLOSED	(2X5) BMA15 BRKR CLOSED
I 4.3	14CLOSED	(2X6) BMA14 BRKR CLOSED
I 4.4	13CLOSED	(2X7) BMA13 BRKR CLOSED
I 4.5	12CLOSED	(2X8) BMA12 BRKR CLOSED
I 4.6	03BRK CL	(2X9) BDE03 BREAKER IN CLOSE POSITION
I 4.7	CLOSE 15	(2X10) BMA15 CLOSE PUSHBUTTON
I 5.0	CLOSE 14	(2X15) BMA14 CLOSE PUSHBUTTON
I 5.1	CLOSE 13	(2X16) BMA13 CLOSE PUSHBUTTON
I 5.2	CLOSE 12	(2X17) BMA12 CLOSE PUSHBUTTON
I 5.3	SYNCHCLS	(2X18) CLOSE PULSE SIGNAL FROM SYNCHROTE
I 5.4	BMA12SYN	(2X19) SYNCH SWITCH (SW4) SET TO BMA12
I 5.5	BMA13SYN	(2X20) SYNCH SWITCH (SW4) SET TO BMA13
I 5.6	BMA14SYN	(2X21) SYNCH SWITCH (SW4) SET TO BMA14
I 5.7	BMA15SYN	(2X22) SYNCH SWITCH (SW4) SET TO BMA15
I 6.0	BMA12DC	(2X27) BMA12 DC FAIL
I 6.1	BMA13DC	(2X28) BMA13 DC FAIL
I 6.2	BMA14DC	(2X29) BMA14 DC FAIL
I 6.3	BMA15DC	(2X30) BMA15 DC FAIL
I 6.4	BTRIPDC	(2X31) BACK UP TRIP CCT (BMA13) DC FAIL
I 6.5	WTEMPALM	(2X32) TRANSFORMER WINDING TEMP ALARM
I 6.6	BDE01TRC	(2X33) TRC FAULT (BDE01)
I 6.7	OILCB	(2X34) OIL PRIMING PUMP CB OFF

Assignment list

ABS operand	Symbolic operand	Operand comment
I 7.0	LOCKOUT	(2X39) K36 & K37 LOCKOUT RELAYS ACTIVE
I 7.1	BDE03TRP	(2X40) PROT TRIP FROM BDE03
I 7.2	BDE03TRC	(2X41) BDE03 TRC FAULT
I 7.3	BDE03DC	(2X42) BDE03 DC FAIL & BDE0* BACKTRIP DC
I 7.4	03ISO OP	(2X43) BDE03 ISOLATOR OPEN
I 7.5	03ISO CL	(2X44) BDE03 ISOLATOR CLOSE
I 7.6	2X45	(2X45) FUEL FIILING PUMP
I 7.7	2X46	
I 8.0	CBLEARTH	(3X3) 3.3KV D/G CABLE EARTHED
I 8.1	15SERV	(3X4) BMA15 IN SERVICE POSITION
I 8.2	14SERV	(3X5) BMA14 IN SERVICE POSITION
I 8.3	13SERV	(3X6) BMA13 IN SERVICE POSITION
I 8.4	12SERV	(3X7) BMA12 IN SERVICE POSITION
I 8.5	SYNCHPB	(3X8) CLOSE PB FOR SYNCHRONISING
I 8.6	SW4OFF	(3X9) SYNCH SWITCH (SW4) IN OFF
I 8.7	ALTVOLT	(3X10) 3,3KV ALTERNATOR VOLTAGE SENSING
I 9.0	LVOLTS	(3X15) LOWER VOLTS SIGNAL FROM SYNCHROTE
I 9.1	RVOLTS	(3X16) RAISE VOLTS SIGNAL FROM SYNCHROTE
I 9.2	LSPEED	(3X17) LOWER SPEED SIGNAL FROM SYNCHROTE
I 9.3	RSPEED	(3X18) RAISE SPEED SIGNAL FROM SYNCHROTE
I 9.4	CHARFAIL	(3X19) BATTERY CHARGER/ALTERNATOR CHARGE
I 9.5	MTRIP	(3X20) MASTER TRIP
I 9.6	ENGRUN	(3X21) ENGINE RUNNING STARTER CUT OUT
I 9.7	ALARMPB	(3X22) ALARM ACKNOWLEDGE PB
I 10.0	LOCKPB	(3X27) SOFTWARE LOCKOUT RESET PB
I 10.1	SWOFF	(3X28) ENGINE SWITCH IN OFF POSITION
I 10.2	SWAUTO	(3X29) ENGINE SWITCH IN AUTO
I 10.3	SWTEST	(3X30) ENGINE SWITCH IN TEST
I 10.4	TRFDC	(3X31) TRANSFORMER DC FAIL
I 10.5	DGE_OFF	(3X32) D/G CABLE EARTH OFF
I 10.6	3X33	
I 10.7	3X34	
I 11.0	15TEST	(3X39) BMA15 IN TEST POSITION
I 11.1	14TEST	(3X40) BMA14 IN TEST POSITION
I 11.2	13TEST	(3X41) BMA13 IN TEST POSITION
I 11.3	12TEST	(3X42) BMA12 IN TEST POSITION
I 11.4	15 R.OUT	(3X43) BMA15 RACKED OUT
I 11.5	14 R.OUT	(3X44) BMA14 RACKED OUT
I 11.6	13 R.OUT	(3X45) BMA13 RACKED OUT
I 11.7	12 R.OUT	(3X46) BMA12 RACKED OUT
Q 12.0	Q-RAIS V	(4X3) RELAY 4 FOR RAISE VOLTS
Q 12.1	Q-LOWERV	(4X4) RELAY 5 FOR LOWER VOLTS
Q 12.2	12IPT1	(4X5) BMA12 IPT1
Q 12.3	13IPT1	(4X6) BMA13 IPT1
Q 12.4	14IPT1	(4X7) BMA14 IPT1
Q 12.5	15IPT1	(4X8) BMA15 IPT1
Q 12.6	12IPC1	(4X9) BMA12 IPC1
Q 12.7	13IPC1	(4X10) BMA13 IPC1
Q 13.0	14IPC1	(4X15) BMA14 IPC1
Q 13.1	15IPC1	(4X16) BMA15 IPC1
Q 13.2	Q-DGSTRT	(4X17) RELAY 2 FOR DG START RELAY
Q 13.3	Q-<U&<F	(4X18) RELAY 8 FOR <FREQ & <VOLT BLOCK
Q 13.4	12-DISCR	(4X19) BMA12 S/G DISCP
Q 13.5	13-DISCR	(4X20) BMA13 S/G DISCP
Q 13.6	14-DISCR	(4X21) BMA14 S/G DISCP
Q 13.7	15-DISCR	(4X22) BMA15 S/G DISCP

Assignment list

ABS operand	Symbolic operand	Operand comment
Q 14.0	C.FUELAL	(4X27) RELAY 9 FOR COMMOM FUEL ALARM
Q 14.1	Q-CHPUNH	(4X28) RELAY 11 FOR 380V CHOPOVER UNHEAL
Q 14.2	Q-FUELFI	(4X29) RELAY 12 FOR FUEL FILLING PUMP
Q 14.3	Q DG.UNH	(4X30) RELAY 10 FOR DIESEL GEN SYSTEM UN
Q 14.4	Q-RADLOW	(4X31) RAD LOW WATER LEVEL
Q 14.5	Q-LOPTRP	(4X32) LOW OIL PRESSURE TRIP
Q 14.6	OUTLOPA	(4X33) LOW OIL PRESSURE ALARM
Q 14.7	OUTHETT	(4X34) HIGH ENGINE TEMP ALARM
Q 15.0	OUTHETA	(4X39) HIGH ENGINE TEMP TRIP
Q 15.1	OUTESTOP	(4X40) EMERGENCY STOP
Q 15.2	OUTESTAR	(4X41) EMERGENCY START
Q 15.3	OUTCHFAI	(4X42) BATTERY CHARGER FAIL
Q 15.4	BDE01UNH	(4X43) 3.3KV SWITCHGEAR UNHEALTHY
Q 15.5	15SWUNH	(4X44) BMA 15 380V DG SWITCHGEAR UNHEAL
Q 15.6	CNTDCFAI	(4X45) 380V DG DC FAIL
Q 15.7	TRF DCFA	(4X46) TRANSFORMER DC FAIL ALARM
Q 16.0	OUTRSPEE	(5X3) RELAY 6 FOR RAISE SPEED
Q 16.1	OUTLSPEE	(5X4) RELAY 7 FOR LOWER SPEED
Q 16.2	12IPT2	(5X5) BMA12 IPT2
Q 16.3	13IPT2	(5X6) BMA13 IPT2
Q 16.4	14IPT2	(5X7) BMA14 IPT2
Q 16.5	15IPT2	(5X8) BMA15 IPT2
Q 16.6	12IPC2	(5X9) BMA12 IPC2
Q 16.7	13IPC2	(5X10) BMA13 IPC2
Q 17.0	14IPC2	(5X15) BMA14 IPC2
Q 17.1	15IPC2	(5X16) BMA15 IPC2
Q 17.2	12CLFAIL	(5X17) BMA12 BRKR CLOSE FAIL
Q 17.3	13CLFAIL	(5X18) BMA13 BRKR CLOSE FAIL
Q 17.4	14CLFAIL	(5X19) BMA14 BRKR CLOSE FAIL
Q 17.5	15CLFAIL	(5X20) BMA15 BRKR CLOSE FAIL
Q 17.6	CBLVOLTS	(5X21) 380V CABLE VOLTS UNHEALTHY
Q 17.7	PLCFAULT	(5X22) PLC FAULT
Q 18.0	TRCFAULT	(5X27) TRC FAULT
Q 18.1	01DCFAIL	(5X28) BMY 01 DC FAIL
Q 18.2	BDE03IPT	(5X29) BDE03 IPT RELAY
Q 18.3	OUTF10	(5X30) FUEL <10%
Q 18.4	OUTF50	(5X31) FUEL <50%
Q 18.5	OUTF95	(5X32) FUEL <95%
Q 18.6	OUTVOLT	(5X33) 3,3KV VOLTAGE UNHEALTHY
Q 18.7	BDE01IPC	(5X34) BDE01 IPC RELAY
Q 19.0	OUTPRIMP	(5X39) RELAY 3 FOR OIL PRIMING PUMP
Q 19.1	FUELSOL	(5X40) RELAY 1 FOR FUEL SOLENOIDE
Q 19.2	BDE03IPC	(5X41) BDE03 IPC RELAY
Q 19.3	DG.FAILS	(5X42) DG FAIL TO START
Q 19.4	SWLOCKOU	(5X43) 380V CONTROL LOCKOUT
Q 19.5	BDE01IPT	(5X44) BDE01 IPT RELAY
Q 19.6	LAP.ACTI	(5X45) D/G PLC LAP ACTIVE
Q 19.7	BBUNDERV	(5X46) 380V DG BRD UNDERVOLTAGE TO STN C
PW 128	WATTS	(6X3/5) GENERATOR WATTS
PW 130	FREQ	(6X7/9) GENERATOR FREQUENCY
PW 132	BB VOLT	(6X15/17) 380V BB VOLTAGE
PW 134	BMA12 CV	(6X19/21) BMA12 CABLE VOLTAGE
PW 136	BMA13 CV	(6X27/29) BMA13 CABLE VOLTAGE
PW 138	BMA14 CV	(6X31/33) BMA14 CABLE VOLTAGE
PW 140	BMA15 CV	(6X39/41) BMA15 CABLE VOLTAGE
PW 142		

Assignment list

ABS operand	Symbolic operand	Operand comment
F 1.0	DUMMY0	(F1.0) PERMANENT 0 SIGNAL
F 1.1	DUMMY1	(F1.1) PERMANENT 1 SIGNAL
F 1.2		
F 1.3		
F 1.4		
F 1.5		
F 1.6		
F 1.7		
F 3.0	PROT.TRP	(F3.0) CAG TRIP ON 380V DG BRD
F 3.1	PLC.FLT	(F3.1) PLC FAULTY
F 3.2		
F 3.3		
F 3.4		
F 3.5		
F 3.6		
F 3.7		
F 5.0	FCLPERM	(F5.0) CLOSE PERMISSION FOR SYNCH
F 5.1	FSYNCH12	(F5.1) SYNCH SELECT TO BMA12
F 5.2	FSYNCH13	(F5.2) SYNCH SELECT TO BMA13
F 5.3	FSYNCH14	(F5.3) SYNCH SELECT TO BMA14
F 5.4	FSYNCH15	(F5.4) SYNCH SELECT TO BMA15
F 8.0	GENSTP	(F8.0) DIESEL GEN STOP MANIPULATION
F 8.1		
F 8.2		
F 8.3		
F 8.4		
F 8.5		
F 8.6		
F 8.7		
F 10.0	LINKOPEN	(F10.0) BDE 01 ISOLATOR OPENED
F 10.1	LINKCLSE	(F10.1) BDE01 ISOLATOR CLOSED
F 10.2	BRKRCLSE	(F10.2) BDE01 BREAKER CLOSED
F 10.3	FBRKOPEN	(F10.3) BDE 01 BREAKER OPENED
F 10.4	SETSTN	(F10.4) TRANSFER LINK SET TO STN
F 10.5	SETUNIT	(F10.5) TRANSFER LINK SET TO UNIT
F 10.6	DGEN_OFF	(F10.6) 3.3KV D/G CABLE EARTH OFF
F 10.7	DGEN_ON	(F10.7) 3.3KV D/G CABLE EARTH ON
F 15.0	DG.INCOM	(F15.0) DG IS INCOMMER FOR SYNCHRONISING
F 15.1	B/B.INC	(F15.1) DG IS ON B/B FOR SYNCHRONISING
F 15.2	F15.2	
F 15.3	F15.3	
F 15.4	F15.4	
F 15.5		
F 15.6		
F 15.7		
F 16.0	WATT.OK	(F16.0) GEN WATTS HEALTHY
F 16.1	FREQ.OK	(F16.1) GEN FREQUENCY HEALTHY
F 16.2	BBVL.OK	(F16.2) BUSBAR VOLTS HEALTHY
F 16.3	BMA12.OK	(F16.3) BMA12 CABLE VOLTS HEALTHY
F 16.4	BMA13.OK	(F16.4) BMA13 CABLE VOLTS HEALTHY
F 16.5	BMA14.OK	(F16.5) BMA14 CABLE VOLTS HEALTHY
F 16.6	BMA15.OK	(F16.6) BMA15 CABLE VOLTS HEALTHY
F 17.0	WATT.<	(F17.0) GEN WATTS LOW
F 17.1	FREQ.<	(F17.1) GEN FREQUENCY LOW
F 17.2	BBVL.<	(F17.2) BUSBAR VOLTS LOW

Assignment list

ABS operand	Symbolic operand	Operand comment
F 17.3	BMA12.<	(F17.3) BMA12 CABLE LOW
F 17.4	BMA13.<	(F17.4) BMA13 CABLE VOLTS LOW
F 17.5	BMA14.<	(F17.5) BMA14 CABLE VOLTS LOW
F 17.6	BMA15.<	(F17.6) BMA15 CABLE VOLTS LOW
F 18.0	WATT.>	(F18.0) GEN WATTS HIGH
F 18.1	FREQ.>	(F18.1) GEN FREQUENCY HIGH
F 18.2	BBVL.>	(F18.2) BUSBAR VOLTS HIGH
F 18.3	BMA12.>	(F18.3) BMA12 CABLE VOLTS HIGH
F 18.4	BMA13.>	(F18.4) BMA13 CABLE VOLTS HIGH
F 18.5	BMA14.>	(F18.5) BMA14 CABLE VOLTS HIGH
F 18.6	BMA15.>	(F18.6) BMA15 CABLE VOLTS HIGH
F 18.7		
F 19.0		
F 19.1	PLCERR	(F19.1) PLC ERROR FLAG
F 19.2		
F 19.3	CNTRST	(F19.3) FLAG FOR 1 CYCLE RESET PULSE
F 19.4	RESETFLG	(F19.4) 1 CYCLE RESET FLAG
F 19.5	MTRIPFLG	(F19.5) MASTER TRIP FLAG
F 19.6		
F 19.7		
F 20.0	ENGOFFF	(F20.0) ENGINE SWITCH IN OFF
F 20.1	ENGTESTF	(F20.1) ENGINE SWITCH IN TEST
F 20.2	ENGAUTOF	(F20.2) ENGINE SWITCH IN AUTO
F 20.3	STRTCNDF	(F20.3) ENGINE STOP/START CONDITION
F 20.4	ENGPROTF	(F20.4) ENGINE PROTECTION
F 20.5	AUTOCNTR	(F20.5) AUTO GEN CONTROL WITHOUT SYNCH.
F 20.6	RESTART	(F20.6) RESTART TIMER BEFORE NEW ATTEMP
F 20.7	ENGRUNF	(F20.7) ENGINE RUNNING
F 21.0	FUEL<10%	(F21.0) FUEL LOWER THAN 10 %
F 21.1	WATER.LO	(F21.1) WATER LEVEL LOW
F 21.2	ENGTEMP1	(F21.2) ENGINE TEMP STAGE 1 ALARM
F 21.3	ENGTEMP2	(F21.3) ENGINE TEMP STAGE 2 ALARM
F 21.4	EMERGSTP	(F21.4) EMERGENCY STOP
F 21.5	CHRGFAIL	(F21.5) CHARGER FAIL
F 21.6	FUEL<50%	(F21.6) FUEL LOWER THAN 50 %
F 21.7	FUEL>95%	(F21.7) FUEL >95% DAY TANK
F 22.0	FUELBLK	(F22.0) BULK TANK >95%
F 22.1	R_SPEED	(F22.1) SPEED RAISE SIGNAL
F 22.2	L_SPEED	(F22.2) SPEED LOWER SIGNAL
F 22.3	R_VOLTS	(F22.3) VOLTAGE RAISE SIGNAL
F 22.4	L_VOLTS	(F22.4) VOLTAGE LOWER SIGNAL
F 22.5	F22.5	(F22.5)
F 22.6	F22.6	(F22.6)
F 22.7	F22.7	(F22.7)
F 25.0	LVBRKRLO	(F25.0) CAG PROTECTION FLAG
F 25.1	GENVLT	(F25.1) ALTERNATOR VOLTAGE SENSING
F 25.2	GENFLAG	(F25.2) GEN VOLTS HEALTHY GENER FLAG
F 25.3	BB_R_SP	(F25.3) BUSBAR (INC) RAISE SPEED SIGNAL
F 25.4	BB_L_SP	(F25.4) BUSBAR (INC) LOWER SPEED SIGNAL
F 25.5	BB_R_VOL	(F25.5) BUSBAR (INC) RAISE VOLTAGE SIG
F 25.6	BB_L_VOL	(F25.6) BUSBAR (INC LOWER VOLTAGE SIG
F 25.7	F25.7	(F25.7)
F 27.0	15VLT=	(F27.0) GEN VOLTS HEALTHY TO SUPPLY BB
F 27.1	15VLT<	(F27.1) GEN VOLTS LOW
F 27.2	15VLT>	(F27.2) GEN VOLTS HIGH
F 27.3	DG_R_SP	(F27.3) GEN (INC) RAISE SPEED SIGNAL

Assignment list

ABS operand	Symbolic operand	Operand comment
F 27.4	DG_L_SP	(F27.4) GEN (INC) LOWER SPEED SIGNAL
F 27.5	DG_R_VOL	(F27.5) GEN (INC) RAISE VOLTAGE SIG
F 27.6	DG_L_VOL	(F27.6) GEN (INC) LOWER VOLTAGE SIG
F 27.7	F27.7	(F27.7)
F 30.0	12OPEN	(F30.0) BMA12 BRKR OPENED
F 30.1	12CLOSE	(F30.1) BMA12 BRKR CLOSED
F 30.2	13OPEN	(F30.2) BMA13 BRKR OPENED
F 30.3	13CLOSE	(F30.3) BMA13 BRKR CLOSED
F 30.4	14OPEN	(F30.4) BMA14 BRKR OPENED
F 30.5	14CLOSE	(F30.5) BMA14 BRKR CLOSED
F 30.6	15OPEN	(F30.6) BMA15 BRKR OPENED
F 30.7	15CLOSE	(F30.7) BMA15 BRKR CLOSED
F 31.0	F12SERV	(F31.0) BMA12 BRKR IN SERVICE
F 31.1	F12TEST	(F31.1) BMA12 BRKR IN TEST
F 31.2	F12OUT	(F31.2) BMA12 BRKR RACKED OUT
F 31.3	F13SERV	(F31.3) BMA13 BRKR IN SERVICE
F 31.4	F13TEST	(F31.4) BMA13 BRKR IN TEST
F 31.5	F13OUT	(F31.5) BMA13 BRKR RACKED OUT
F 31.6	F14SERV	(F31.6) BMA14 BRKR IN SERVICE
F 31.7	F14TEST	(F31.7) BMA14 BRKR IN TEST
F 32.0	F14OUT	(F32.0) BMA14 BRKR RACKED OUT
F 32.1	F15SERV	(F32.1) BMA15 BRKR IN SERVICE
F 32.2	F15TEST	(F32.2) BMA15 BRKR IN TEST
F 32.3	F15OUT	(F32.3) BMA15 BRKR RACKED OUT
F 32.4	F32.4	
F 32.5	F32.5	
F 32.6	F32.6	
F 32.7	F32.7	
F 36.0	BDE03CLS	(F36.0) BDE03 BREAKER CLOSE INDICATION
F 36.1	BDE03OPN	(F36.1) BDE03 BREAKER OPEN INDICATION
F 36.2		
F 36.3		
F 36.4		
F 36.5		
F 36.6		
F 36.7	BDE01 OCOMM	(F36.7) BDE01 OPEN COMMAND
F 40.0	12CCOMM	(F40.0) BMA12 CLOSE COMMAND
F 40.1	13CCOMM	(F40.1) BMA13 CLOSE COMMAND
F 40.2	14CCOMM	(F40.2) BMA14 CLOSE COMMAND
F 40.3	15CCOMM	(F40.3) BMA15 CLOSE COMMAND
F 40.4	12OCOMM	(F40.4) BMA12 OPEN COMMAND
F 40.5	13OCOMM	(F40.5) BMA13 OPEN COMMAND
F 40.6	14OCOMM	(F40.6) BMA14 OPEN COMMAND
F 40.7	15OCOMM	(F40.7) BMA15 OPEN COMMAND
FY90	ANERR	(FY90) ANALOG ERROR
FY91	RANOVER	(FY91) ANALOG RANGE OVERFLOW
FY92	SAMPLIN	(FY92) SAMPLING STILL ACTIVE
F 100.0	DGFAIL	(F100.0) DG GEN FAIL TO START
F 100.1	DGV.UNH	(F100.1) DG VOLTAGE UNHEALTY
F 100.2	12.DISCR	(F100.2) BMA12 SWITCHGEAR DISCREPANCY
F 100.3	13.DISCR	(F100.3) BMA13 SWITCHGEAR DISCREPANCY
F 100.4	14.DISCR	(F100.4) BMA14 SWITCHGEAR DISCREPANCY
F 100.5	15.DISCR	(F100.5) BMA15 SWITCHGEAR DISCREPANCY
F 100.6	LOILP.S2	(F100.6) LOW OIL PRESSURE STAGE 2
F 100.7	LOILP.S1	(F100.7) LOW OIL PRESSURE STAGE 1

Assignment list

ABS operand	Symbolic operand	Operand comment
F 101.0	3.3DISCR	(F101.0) 3.3KV SWITCGEAR DISCREPANCY
F 101.1	15UNHEAL	(F101.1) BMA 15 SWITCHGEAR UNHEALTHY
F 101.2	BMA DCFL	(F101.2) 380V DG BOARD DC FAIL
F 101.3	TRF DCFL	(F101.3) 3.3kV/400V TRFR DC FAIL
F 101.4	12CLSFLT	(F101.4) BMA 12 FAILED TO CLOSE
F 101.5	13CLSFLT	(F101.5) BMA 13 FAILED TO CLOSE
F 101.6	14CLSFLT	(F101.6) BMA 14 FAILED TO CLOSE
F 101.7	15CLSFLT	(F101.7) BMA 15 FAILED TO CLOSE
F 102.0	F102.0	
F 102.1	BDE01UN	(F102.1) BDE 01 SWITCHGEAR UNHEALTHY
F 102.3	12UNHEAL	(F102.3) BMA12 SWITCHGEAR UNHEALTHY
F 102.4	13UNHEAL	(F102.4) BMA13 SWITCHGEAR UNHEALTHY
F 102.5	14UNHEAL	(F102.5) BMA14 SWITCHGEAR UNHEALTHY
F 102.6		
F 102.7		
FW 200	SCRAT200	(FW200) SCRATCH PAD FLAG WORD
FW 210	SCRAT210	(FW210) SCRATCH PAD FLAG WORD
FW 220	SCRATCH	(FW220) SCRATCH PAD FLAG WORD
T 20	T20	(T20) TIMER FOR ENGINE TRIPS
T 21	T21	(T21)
T 22	T22	(T22)
T 23	T23	(T23) ALARM PULSING
T 24	T24	(T24) ALARM PULSING
T 25	T25	(T25) ALARM PULSING
T 26	T26	(T26)
T 27	T27	(T27)
T 28	T28	(T28) TIMER FOR ALTERNATOR VOLT SENSING
T 29	T29	(T29)
T 38	T38	(T38)
T 40	T40	(T40) TIMER FOR LOW OIL PRESSURE STAGE 1
T 41	T41	(T41) TIMER FOR LOW OIL PRESSURE STAGE 2
T 42	T42	(T42)
T 43	T43	(T43)
T 44	T44	(T44) TIMER FOR CHARGE FAIL
T 49	T49	(T49) TIMER FOR ENGINE SWITCH (TEST)
T 50	T50	(T50) TIMER 1 FOR FAST FLASHER
T 51	T51	(T51) TIMER 2 FOR FAST FLASHER
T 52	T52	(T52) TIMER 1 FOR SLOW FLASHER
T 53	T53	(T53) TIMER 2 FOR SLOW FLASHER
T 54	T54	(T54)
T 55	T55	(T55) BMA12 BRKR FAIL TO CLOSE
T 56	T56	(T56) BMA13 BRKR FAIL TO CLOSE
T 57	T57	(T57) BMA14 BRKR FAIL TO CLOSE
T 58	T58	(T58) BMA15 BRKR FAIL TO CLOSE
T 59	T59	(T59)
T 60	SP_RAISE	(T60) SPEED RAISE TIME
T 61	SP_LOWER	(T61) SPEED LOWER TIME
T 62	VO_RAISE	(T62) VOLTAGE RAISE TIME
T 63	VO_LOWER	(T63) VOLTAGE LOWER TIME
C 10		SECOND COUNTER
C 11		MINUTE COUNTER
C 12		HOUR COUNTER
C 20		ENGINE START COUNTER
PB 1		DUMMY FLAGS
PB 5		TIME
PB 6		FUEL FILLING
PB 7		OIL PRIMING PUMP
PB 17		CAG PROTECTION

Assignment list

ABS operand	Symbolic operand	Operand comment
PB 18		BREAKER DISCREPANCY
PB 19		BREAKER UNHEALTHY
PB 20		ENGINE FLAGS
PB 21		ENGINE CONTROL
PB 22		SYNCH CONTROL BB-INCOMMING
PB 23		SYNCH CONTROL DG-INCOMMING
PB 30		BMA12 CONTROL
PB 31		BMA13 CONTROL
PB 32		BMA14 CONTROL
PB 33		BMA15 CONTROL
PB 49		AUTO SYNCHRONISE
PB 50		ALARM
PB 51		FUNCTION RELAYS
PB 70		ANALOG SCALING
PB 71		ANALOG HEALTHY
PB 72		VOLTAGE UNHEALTHY
PB 80		BREAKER COMMANDS
PB 85		BREAKER FAIL
PB 100		ERROR PROCESSING
DB 5		TIME DATA BLOCK
DB 50		ALARM DATA BLOCK
FB 7		OIL PRIMING PUMP FUNCTION BLOCK
FB 50		ALARM FUNCTION BLOCK
FB 75		ERROR FUNCTION BLOCK

Statement list

Block: OB 1 Symbol: Comment: Lib no.: Length: 31

Segment 1 0000 ORGANISING BLOCK

Address	Oprt	Absolute/ Symbolic - Operand	KT	Operand comment	Line comment
0000	:JU	PB 100 PB 100		ERROR PROCESSING	ERROR PROCESSING
0001	:JU	PB 1 PB 1		DUMMY FLAGS	DUMMY 1 AND 0 FLAGS
0002	:JU	PB 5 PB 5		TIME	24 HR CLOCK GENERATOR
0003	:JU	PB 6 PB 6		FUEL FILLING	FUEL FILLING CONTROL
0004	:JU	PB 70 PB 70		ANALOG SCALING	ANALOG SCALING
0005	:JU	PB 7 PB 7		OIL PRIMING PUMP	OIL PRIMING PUMP
0006	:JU	PB 17 PB 17		CAG PROTECTION	CAG PROTECTION FLAGS
0007	:JU	PB 18 PB 18		BREAKER DISCREPANCY	BREAKER DISCREPANCY FLAGS
0008	:JU	PB 19 PB 19		BREAKER UNHEALTHY	BREAKER UNHEALTHY FLAGS
0009	:JU	PB 20 PB 20		ENGINE FLAGS	ENGINE RELATED FLAGS
000A	:JU	PB 71 PB 71		ANALOG HEALTHY	ANALOG HEALTHY GENERATION
000B	:JU	PB 72 PB 72		VOLTAGE UNHEALTHY	VOLTAGE UNHEALTHY FLAG
000C	:JU	PB 21 PB 21		ENGINE CONTROL	ENGINE CONTROL
000D	:JU	PB 45			SYNCHRONISE SELECTOR CONTROL
000E	:JU	PB 22 PB 22		SYNCH CONTROL BB-INCOMMING	SYNCH.CNTRL-B/B INCOMMING
000F	:JU	PB 23 PB 23		SYNCH CONTROL DG-INCOMMING	SYNCH.CNTRL-DG INCOMMING
0010	:JU	PB 49 PB 49		AUTO SYNCHRONISE	AUTO SYNCHRONISE 200KW
0011	:JU	PB 31 PB 31		BMA13 CONTROL	BMA13 BREAKER CONTROL
0012	:JU	PB 32 PB 32		BMA14 CONTROL	BMA14 BREAKER CONTROL
[illegible]	:JU	PB 30 PB 30		BMA12 CONTROL	BMA12 BREAKER CONTROL
[illegible]	:JU	PB 33 PB 33		BMA15 CONTROL	BMA15 BREAKER CONTROL
0015	:JU	PB 50 PB 50		ALARM	ALARM
0016	:JU	PB 51 PB 51		FUNCTION RELAYS	FUNCTION RELAYS
0017	:JU	PB 80 PB 80		BREAKER COMMANDS	BREAKER OPEN.CLOSE OUTPUTS
0018	:JU	PB 85 PB 85		BREAKER FAIL	BREAKER FAIL TO CLOSE
0019	:BE				

JU PB 34 PB34 BDE01 Control. BDE01 Breaker Control.

DATE: 09.07.97 01-07-1997	ENQUIRIES ABOUT THE PROGRAM:	SIEMENS AG	THIS PROGRAM CONTROL THE ENGINE FOR THE 3,3KV DIESEL	THE PROGRAM WAS TESTED AND COMMISSIONED BY PT&M.
MODIFICATION REV 2	ALBERT PRETORIUS: 0135 928679 JOHAN GROBLER 083 228 4536	S5 115 PLC 943 PROCESSOR	GENERATOR AND THE 380V BREAKERS ON THE DIESEL GENERATOR BOARD	PAGE THE SOFTWARE DEVELOPMENT
	AS MOD BY A&J CONTROL SOLUTIONS	SIMATIC S5	Program file : Block: Segm : C:U1DG@@ST.S5D OB 1 1	AND PROGRAMMING WERE DONE BY ALH PRETORIUS & SJ STOLS

Statement list

Block: OB 13 Symbol: Comment: Lib no.: Length: 8

Segment 1 0000

Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
0000	:A	F 1.1	DUMMY1		(F1.1) PERMANENT 1 SIGNAL	
0001	:S	F 3.2	F 3.2			
0002	:BE					

7

Statement list

Block: OB 21 Symbol: Comment: Lib no.: Length: 10

Segment 1 0000 Address	Oprt	Absolute/ Symbolic - Operand	KT	Operand comment	Line comment
0000	:JU	FB 13			
0001 Name	:TIME				
0002	:AN	F 12.1			SET FLAG TO RETRIEVE
0003	:S	F 12.1			OLD TIME BEFORE
0004	:BE				POWER WENT DOWN

Statement list

Block: OB 22 Symbol: Comment: Lib no.: Length: 10

Segment 1 0000

Address	Oprt	Absolute/ Symbolic - Operand	KT	Operand comment	Line comment
0000	:JU	FB 13			
0001 Name	:TIMB				
0002	:AN	F 12.1			
0003	:S	F 12.1			
0004	:BE				

Statement list

Block: OB 23 Symbol: Comment: Lib no.: Length: 8

Segment 1 0000 Address	Oprt	Absolute/ Symbolic - Operand	KT	Operand comment	Line comment
0000	:STL				
0001	:S	F 210.0			
0002	:BE				

Statement list

Block: OB 24 Symbol: Comment: Lib no.: Length: 8

Segment 1 0000 Address	Oprt	Absolute/ Symbolic - Operand	KT	Operand comment	Line comment
0000	:STL				
0001	:S	F 210.1			
0002	:BE				

Statement list

Block: OB 27 Symbol: Comment: Lib no.: Length: 8

Segment 1 0000

Address	Oprt	Absolute/ Symbolic - Operand	KT	Operand comment	Line comment
0000	:STL				
0001	:S	F 210.2			
0002	:BE				

Statement list

Block: OB 31 Symbol: Comment: Lib no.: Length: 8

Segment 1 0000 Address	Oprt	Absolute/ Symbolic - Operand	KT	Operand comment	Line comment
0000		:NOP 1			
0002		:BE			

Statement list

Block: OB 34 Symbol: Comment: Lib no.: Length: 8

Segment 1 0000

Address	Oprt	Absolute/ Symbolic - Operand	KT	Operand comment	Line comment
0000	:STL				
0001	:S	F 210.4			
0002	:BE				

Statement list

Block: PB 1 Symbol: PB 1 Comment: DUMMY FLAGS Lib no.: Length: 11

Segment 1 0000

Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
0000	:STL					
0001	:A	F 1.0	DUMMY0		(F1.0) PERMANENT 0 SIGNAL	DUMMY 0 FLAG
0002	:R	F 1.0	DUMMY0		(F1.0) PERMANENT 0 SIGNAL	
0003	:AN	F 1.1	DUMMY1		(F1.1) PERMANENT 1 SIGNAL	
0004	:S	F 1.1	DUMMY1		(F1.1) PERMANENT 1 SIGNAL	DUMMY 1 FLAG
0005	:BE					

8

Statement list

Block: PB 5 Symbol: PB 5 Comment: TIME Lib no.: Length: 83

Segment 3 0074 24 HR CLOCK GENERATOR Address	Oprt	Absolute/ Symbolic - Operand	KT	Operand comment	Line comment
003A	:C	DB 5 DB 5		TIME DATA BLOCK	
003B	:A	F 50.5			
003C	:L	DW 2			
003D	:S	C 12 C 12		HOUR COUNTER	HOURS
003E	:A	F 50.5			
003F	:L	DW 1			
0040	:S	C 11 C 11		MINUTE COUNTER	MINUTES
0041	:A	F 50.5			
0042	:L	KT 080.0			
0044	:SD	T 90			
0045	:A	T 90			
0046	:R	F 50.5			
0047	:A	F 12.1			
0048	:BEC				
0049	:LC	C 11 C 11		MINUTE COUNTER	
004A	:T	DW 10			
004B	:LC	C 12 C 12		HOUR COUNTER	
004C	:T	DW 11			
004D	:BE				

Statement list

Block: PB 5 Symbol: PB 5 Comment: TIME Lib no.: Length: 83

Segment 1 0000 retrieve old time

Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
0000	:A	F 12.1				set by OB21/OB22
0001	:AN	F 56.0				ONE CYCLE PULSE
0002	:=	F 56.1				
0003	:A	F 56.1				
0004	:S	F 56.0				
0005	:AN	F 12.1				
0006	:R	F 56.0				
0007	:C	DB 5	DB 5		TIME DATA BLOCK	
0008	:A	F 12.1				
0009	:L	DW 10				old minutes
000A	:S	C 11	C 11		MINUTE COUNTER	minute counter
000B	:A	F 12.1				
000C	:L	DW 11				old hours
000D	:S	C 12	C 12		HOUR COUNTER	hour counter
000E	:A	F 12.1				
000F	:L	KT 200.0				KEEP COUNTER SET FOR
0011	:SD	T 95				A SMALL TIME TO ENSURE
0012	:A	T 95				THAT IT IS PROPERLY
0013	:R	F 12.1				SET
[illegible]	:***					

Segment 2 002A normal time

Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
0015	:A	F 3.2	F 3.2			
0016	:AN	F 50.0				
0017	:=	F 50.1				
0018	:A	F 50.1				
0019	:S	F 50.0				
001A	:AN	F 3.2	F 3.2			
001B	:R	F 50.0				
001C	:A	F 50.0				ONE SECOND PULSE
001D	:CU	C 10	C 10		SECOND COUNTER	ONE CYCLE PULSE
001E	:L	C 10	C 10		SECOND COUNTER	
001F	:L	KF +59				
0021	:>F					
0022	:R	C 10	C 10		SECOND COUNTER	
0023	:CU	C 11	C 11		MINUTE COUNTER	
0024	:L	C 11	C 11		MINUTE COUNTER	
0025	:L	KF +59				SECOND COUNTER
0027	:>F					
0028	:R	C 11	C 11		MINUTE COUNTER	
0029	:CU	C 12	C 12		HOUR COUNTER	
002A	:L	C 12	C 12		HOUR COUNTER	
[illegible]	:L	KF +23				MINUTE COUNTER
[illegible]	:>F					
002E	:R	C 12	C 12		HOUR COUNTER	
002F	:L	C 11	C 11		MINUTE COUNTER	
0030	:T	FY 53				
0031	:L	C 12	C 12		HOUR COUNTER	HOUR COUNTER
0032	:T	FY 52				
0033	:A	F 3.2	F 3.2			
0034	:L	KT 020.0				
0036	:SD	T 127				
0037	:A	T 127				
0038	:R	F 3.2	F 3.2			
0039	:***					

Statement list

Block: PB 6 Symbol: PB 6 Comment: FUEL FILLING Lib no.: Length: 11

Segment 1 0000 FUEL FILLING PUMP

Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
0000	:A	I 3.1	DTANK50		(1X40) DAY TANK <50%	
0001	:S	Q 14.2	Q-FUELPI		(4X29) RELAY 12 FOR FUEL FILLING PUMP	
0002	:AN	I 3.2	DTANK95		(1X41) DAY TANK <95%	
0003	:R	Q 14.2	Q-FUELPI		(4X29) RELAY 12 FOR FUEL FILLING PUMP	FUEL FILLING PUMP
0004	:NOP	0				
0005	:BE					

Statement list

Block: PB 7 Symbol: PB 7 Comment: OIL PRIMING PUMP Lib no.: Length: 8

Segment 1 0000 Address	Oprt	Absolute/ Symbolic - Operand	KT	Operand comment	Line comment
0000	:JU	FB 7 FB 7		OIL PRIMING PUMP FUNCTION BLOCK	
0001 Name	:OIL PRIM				
0002	:BE				

Oil Priming Pump

Statement list

Block: PB 17 Symbol: PB 17 Comment: CAG PROTECTION Lib no.: Length: 50

Segment 1 0000 BMA CAG TRIPS

Address	Oprt	Absolute/	Symbolic -	Operand	KT	Operand comment	Line comment
0000	:A	I 4.2	15CLOSED			(2X5) BMA15 BRKR CLOSED	
0001	:A	I 3.4	CAG15			(1X43) BMA15 LV O/C	
0002	:A	F 32.1	F15SERV			(F32.1) BMA15 BRKR IN SERVICE	
0003	:O						
0004	:A	I 4.3	14CLOSED			(2X6) BMA14 BRKR CLOSED	
0005	:A	I 3.5	CAG14			(1X44) BMA14 LV O/C	
0006	:A	F 31.6	F14SERV			(F31.6) BMA14 BRKR IN SERVICE	
0007	:O						
0008	:A	I 4.4	13CLOSED			(2X7) BMA13 BRKR CLOSED	
0009	:A	I 3.6	CAG13			(1X45) BMA13 LV O/C	
000A	:A	F 31.3	F13SERV			(F31.3) BMA13 BRKR IN SERVICE	
000B	:O						
000C	:A	I 4.5	12CLOSED			(2X8) BMA12 BRKR CLOSED	
000D	:A	I 3.7	CAG12			(1X46) BMA12 LV O/C	
000E	:A	F 31.0	F12SERV			(F31.0) BMA12 BRKR IN SERVICE	
000F	:O(						
0010	:O	I 3.7	CAG12		01	(1X46) BMA12 LV O/C	
0011	:O	I 3.6	CAG13		01	(1X45) BMA13 LV O/C	
0012	:O	I 3.5	CAG14		01	(1X44) BMA14 LV O/C	
0013	:O	I 3.4	CAG15		01	(1X43) BMA15 LV O/C	
0014	:AN	I 7.0	LOCKOUT		01	(2X39) K36 & K37 LOCKOUT RELAYS ACTIVE	
0015	:)				01		
0016	:S	F 25.0	LVBRKRLO			(F25.0) CAG PROTECTION FLAG	CAG PROTECTION FLAG
0017	:***						

Segment 2 0030 MASTER TRIP FLAG

Address	Oprt	Absolute/	Symbolic -	Operand	KT	Operand comment	Line comment
0018	:A	I 9.5	MTRIP			(3X20) MASTER TRIP	
0019	:S	F 19.5	MTRIPFLG			(F19.5) MASTER TRIP FLAG	
001A	:A	I 9.7	ALARMPB			(3X22) ALARM ACKNOWLEDGE PB	
001B	:R	F 19.5	MTRIPFLG			(F19.5) MASTER TRIP FLAG	MASTER TRIP FLAG
001C	:NOP	0					
001D	:***						

Segment 3 003C RESET SOFTWARE LOCKOUT

Address	Oprt	Absolute/	Symbolic -	Operand	KT	Operand comment	Line comment
001E	:A	I 10.0	LOCKPB			(3X27) SOFTWARE LOCKOUT RESET PB	
001F	:AN	F 19.3	CNTRST			(F19.3) FLAG FOR 1 CYCLE RESET PULSE	
0020	:=	F 19.4	RESETFLG			(F19.4) 1 CYCLE RESET FLAG	
0021	:A	F 19.4	RESETFLG			(F19.4) 1 CYCLE RESET FLAG	
0022	:S	F 19.3	CNTRST			(F19.3) FLAG FOR 1 CYCLE RESET PULSE	
0023	:AN	I 10.0	LOCKPB			(3X27) SOFTWARE LOCKOUT RESET PB	
0024	:R	F 19.3	CNTRST			(F19.3) FLAG FOR 1 CYCLE RESET PULSE	RESET SOFTWARE LOCKOUT
0025	:NOP	0					
0026	:***						

Segment 4 004E RESET CAG PROTECTION

Address	Oprt	Absolute/	Symbolic -	Operand	KT	Operand comment	Line comment
0027	:A	F 19.4	RESETFLG			(F19.4) 1 CYCLE RESET FLAG	
0028	:A	I 7.0	LOCKOUT			(2X39) K36 & K37 LOCKOUT RELAYS ACTIVE	
0029	:R	F 25.0	LVBRKRLO			(F25.0) CAG PROTECTION FLAG	RESET CAG PROTECTION
002A	:***						

DATE: 09.07.97	ENQUIRIES ABOUT THE PROGRAM:		THIS PROGRAM CONTROL THE	THE PROGRAM WAS TESTED	
01-07-1997		SIEMENS AG	ENGINE FOR THE 3,3KV DIESEL	AND COMMISSIONED BY PT&M.	
	ALBERT PRETORIUS: 0135 928679	S5 115 PLC	GENERATOR AND THE 380V BREAKERS		PAGE
MODIFICATION	JOHAN GROBLER 083 228 4536	943 PROCESSOR	ON THE DIESEL GENERATOR BOARD	THE SOFTWARE DEVELOPMENT	
REV 2			Program file : Block: Segm :	AND PROGRAMMING WERE DONE	6
	AS MOD BY A&J CONTROL SOLUTIONS	SIMATIC S5	C:U1DG@@ST.S5D PB 17 1	BY ALH PRETORIUS & SJ STOLS	+

CAG PROTECTION

Statement list

Block: PB 17 Symbol: PB 17 Comment: CAG PROTECTION Lib no.: Length: 50

Segment 5 0056 Address	Oprt	Absolute/ Symbolic - Operand	KT	Operand comment	Line comment
002B	:STL				
002C	:BE				

Statement list

Block: PB 18 Symbol: PB 18 Comment: BREAKER DISCREPANCY Lib no.: Length: 183

Segment 1 0000 BMA12 BREAKER OPEN INDICATION

Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
0000	:A	I 0.5	BMA12OPE		(1X8) BMA12 BRKR OPENED	
0001	:AN	I 4.5	12CLOSED		(2X8) BMA12 BRKR CLOSED	
0002	:=	F 30.0	12OPEN		(F30.0) BMA12 BRKR OPENED	BMA12 BREAKER OPENED
0003	:***					

Segment 2 0008 BMA12 BREAKER CLOSE INDICATION

Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
0004	:AN	I 0.5	BMA12OPE		(1X8) BMA12 BRKR OPENED	
0005	:A	I 4.5	12CLOSED		(2X8) BMA12 BRKR CLOSED	
0006	:=	F 30.1	12CLOSE		(F30.1) BMA12 BRKR CLOSED	BMA12 BREAKER CLOSED
0007	:***					

Segment 3 0010 BMA12 IN SERVICE POSITION

Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
0008	:A	I 8.4	12SERV		(3X7) BMA12 IN SERVICE POSITION	
0009	:A	I 11.3	12TEST		(3X42) BMA12 IN TEST POSITION	
000A	:A	I 11.7	12 R.OUT		(3X46) BMA12 RACKED OUT	
000B	:=	F 31.0	F12SERV		(F31.0) BMA12 BRKR IN SERVICE	BMA12 IN SERVICE POSITION
000C	:***					

Segment 4 001A BMA12 IN TEST POSITION

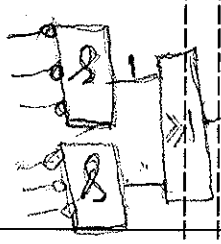
Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
000D	:AN	I 8.4	12SERV		(3X7) BMA12 IN SERVICE POSITION	
000E	:AN	I 11.3	12TEST		(3X42) BMA12 IN TEST POSITION	
000F	:A	I 11.7	12 R.OUT		(3X46) BMA12 RACKED OUT	
0010	:=	F 31.1	F12TEST		(F31.1) BMA12 BRKR IN TEST	BMA12 IN TEST POSITION
0011	:***					

Segment 5 0024 BMA12 IN RACKED OUT POSTION

Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
0012	:AN	I 8.4	12SERV		(3X7) BMA12 IN SERVICE POSITION	
0013	:A	I 11.3	12TEST		(3X42) BMA12 IN TEST POSITION	
0014	:AN	I 11.7	12 R.OUT		(3X46) BMA12 RACKED OUT	
0015	:=	F 31.2	F12OUT		(F31.2) BMA12 BRKR RACKED OUT	BMA12 IN RACKED OUT POSITION
0016	:***					

Segment 6 002E BMA12 SWITCHGEAR DISCREPANCY

Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
0017	:AN	F 31.0	F12SERV		(F31.0) BMA12 BRKR IN SERVICE	SERVICE
0018	:AN	F 31.1	F12TEST		(F31.1) BMA12 BRKR IN TEST	TEST
0019	:AN	F 31.2	F12OUT		(F31.2) BMA12 BRKR RACKED OUT	
001A	:O					SERVICE
001B	:AN	F 30.0	12OPEN		(F30.0) BMA12 BRKR OPENED	RACKED OUT
001C	:AN	F 30.1	12CLOSE		(F30.1) BMA12 BRKR CLOSED	
001D	:AN	F 31.2	F12OUT		(F31.2) BMA12 BRKR RACKED OUT	TEST
001E	:=	F 100.2	12.DISCR		(F100.2) BMA12 SWITCHGEAR DISCREPANCY	RACKED OUT
001F	:***					



Segment 7 0040 BMA13 BREAKER OPEN INDICATION

Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
0020	:A	I 0.4	BMA13OPE		(1X7) BMA13 BRKR OPENED	
0021	:AN	I 4.4	13CLOSED		(2X7) BMA13 BRKR CLOSED	
0022	:=	F 30.2	13OPEN		(F30.2) BMA13 BRKR OPENED	BMA13 BREAKER OPENED
0023	:***					

DATE: 09.07.97 01-07-1997	ENQUIRIES ABOUT THE PROGRAM:	SIEMENS AG	THIS PROGRAM CONTROL THE ENGINE FOR THE 3,3KV DIESEL	THE PROGRAM WAS TESTED AND COMMISSIONED BY PT&M.
	ALBERT PRETORIUS: 0135 928679	S5 115 PLC	GENERATOR AND THE 380V BREAKERS	PAGE
MODIFICATION REV 2	JOHAN GROBLER 083 228 4536	943 PROCESSOR	ON THE DIESEL GENERATOR BOARD Program file : Block: Segm :	THE SOFTWARE DEVELOPMENT AND PROGRAMMING WERE DONE
	AS MOD BY A&J CONTROL SOLUTIONS	SIMATIC S5	C:U1DG@@ST.S5D PB 18 1	BY ALH PRETORIUS & SJ STOLS +

Breaker Discrepancy 13

Statement list

Block: PB 18 Symbol: PB 18 Comment: BREAKER DISCREPANCY Lib no.: Length: 183

Segment 8 0048 BMA13 BREAKER CLOSE INDICATION						
Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
0024	:AN	I 0.4	BMA13OPE		(1X7) BMA13 BRKR OPENED	
0025	:A	I 4.4	13CLOSED		(2X7) BMA13 BRKR CLOSED	
0026	:=	F 30.3	13CLOSE		(F30.3) BMA13 BRKR CLOSED	BMA13 BREAKER CLOSED
0027	:***					

Segment 9 0050 BMA13 IN SERVICE POSITION						
Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
0028	:A	I 8.3	13SERV		(3X6) BMA13 IN SERVICE POSITION	
0029	:A	I 11.2	13TEST		(3X41) BMA13 IN TEST POSITION	
002A	:A	I 11.6	13 R.OUT		(3X45) BMA13 RACKED OUT	
002B	:=	F 31.3	F13SERV		(F31.3) BMA13 BRKR IN SERVICE	BMA13 IN SERVICE POSITION
002C	:***					

Segment 10 005A BMA13 IN TEST POSITION						
Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
002D	:AN	I 8.3	13SERV		(3X6) BMA13 IN SERVICE POSITION	
002E	:AN	I 11.2	13TEST		(3X41) BMA13 IN TEST POSITION	
002F	:A	I 11.6	13 R.OUT		(3X45) BMA13 RACKED OUT	
0030	:=	F 31.4	F13TEST		(F31.4) BMA13 BRKR IN TEST	BMA13 IN TEST POSITION
0031	:***					

Segment 11 0064 BMA13 IN RACKED OUT POSITION						
Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
0032	:AN	I 8.3	13SERV		(3X6) BMA13 IN SERVICE POSITION	
0033	:A	I 11.2	13TEST		(3X41) BMA13 IN TEST POSITION	
0034	:AN	I 11.6	13 R.OUT		(3X45) BMA13 RACKED OUT	
0035	:=	F 31.5	F13OUT		(F31.5) BMA13 BRKR RACKED OUT	BMA13 IN RACKED OUT POSITION
0036	:***					

Segment 12 006E BMA13 BREAKER DISCREPANCY ALARMS						
Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
0037	:AN	F 31.3	F13SERV		(F31.3) BMA13 BRKR IN SERVICE	
0038	:AN	F 31.4	F13TEST		(F31.4) BMA13 BRKR IN TEST	
0039	:AN	F 31.5	F13OUT		(F31.5) BMA13 BRKR RACKED OUT	
003A	:O					
003B	:AN	F 30.2	13OPEN		(F30.2) BMA13 BRKR OPENED	
003C	:AN	F 30.3	13CLOSE		(F30.3) BMA13 BRKR CLOSED	
003D	:AN	F 31.5	F13OUT		(F31.5) BMA13 BRKR RACKED OUT	
003E	:=	F 100.3	13.DISCR		(F100.3) BMA13 SWITCHGEAR DISCREPANCY	BMA13 BREAKER DISCREPANCY
003F	:***					

Segment 13 0080 BMA14 OPEN INDICATION						
Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
0040	:A	I 0.3	BMA14OPE		(1X6) BMA14 BRKR OPENED	
0041	:AN	I 4.3	14CLOSED		(2X6) BMA14 BRKR CLOSED	
0042	:=	F 30.4	14OPEN		(F30.4) BMA14 BRKR OPENED	BMA14 BREAKER OPENED
0043	:***					

Segment 14 0088 BMA14 CLOSE INDICATION						
Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
0044	:AN	I 0.3	BMA14OPE		(1X6) BMA14 BRKR OPENED	
0045	:A	I 4.3	14CLOSED		(2X6) BMA14 BRKR CLOSED	
0046	:=	F 30.5	14CLOSE		(F30.5) BMA14 BRKR CLOSED	BMA14 BREAKER CLOSED
0047	:***					

Statement list

Block: PB 18 Symbol: PB 18 Comment: BREAKER DISCREPANCY Lib no.: Length: 183

Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
Segment 15 0090 BMA14 IN SERVICE POSITION						
0048	:A	I 8.2	14SERV		(3X5) BMA14 IN SERVICE POSITION	
0049	:A	I 11.1	14TEST		(3X40) BMA14 IN TEST POSITION	
004A	:A	I 11.5	14 R.OUT		(3X44) BMA14 RACKED OUT	
004B	:=	F 31.6	F14SERV		(F31.6) BMA14 BRKR IN SERVICE	BMA14 IN SERVICE POSITION
004C	:***					
Segment 16 009A BMA14 IN TEST POSITION						
004D	:AN	I 8.2	14SERV		(3X5) BMA14 IN SERVICE POSITION	
004E	:AN	I 11.1	14TEST		(3X40) BMA14 IN TEST POSITION	
004F	:A	I 11.5	14 R.OUT		(3X44) BMA14 RACKED OUT	
0050	:=	F 31.7	F14TEST		(F31.7) BMA14 BRKR IN TEST	BMA14 IN TEST POSITION
0051	:***					
Segment 17 00A4 BMA14 IN RACKED OUT POSITION						
0052	:AN	I 8.2	14SERV		(3X5) BMA14 IN SERVICE POSITION	
[illegible]3	:A	I 11.1	14TEST		(3X40) BMA14 IN TEST POSITION	
[illegible]4	:AN	I 11.5	14 R.OUT		(3X44) BMA14 RACKED OUT	
0055	:=	F 32.0	F14OUT		(F32.0) BMA14 BRKR RACKED OUT	BMA14 IN RACKED OUT POSITION
0056	:***					
Segment 18 00AE BMA14 DISCREPANCY ALARMS						
0057	:AN	F 31.6	F14SERV		(F31.6) BMA14 BRKR IN SERVICE	
0058	:AN	F 31.7	F14TEST		(F31.7) BMA14 BRKR IN TEST	
0059	:AN	F 32.0	F14OUT		(F32.0) BMA14 BRKR RACKED OUT	
005A	:O					
005B	:AN	F 30.4	14OPEN		(F30.4) BMA14 BRKR OPENED	
005C	:AN	F 30.5	14CLOSE		(F30.5) BMA14 BRKR CLOSED	
005D	:AN	F 32.0	F14OUT		(F32.0) BMA14 BRKR RACKED OUT	
005E	:=	F 100.4	14.DISCR		(F100.4) BMA14 SWITCHGEAR DISCREPANCY	BMA14 DISCREPANCY
005F	:***					
Segment 19 00C0 BMA15 OPEN INDICATION						
0060	:A	I 0.2	BMA15OPE		(1X5) BMA15 BRKR OPENED	
0061	:AN	I 4.2	15CLOSED		(2X5) BMA15 BRKR CLOSED	
0062	:=	F 30.6	15OPEN		(F30.6) BMA15 BRKR OPENED	BMA15 BREAKER OPENED
0063	:***					
[illegible]ent 20 00C8 BMA15 CLOSE INDICATION						
0064	:AN	I 0.2	BMA15OPE		(1X5) BMA15 BRKR OPENED	
0065	:A	I 4.2	15CLOSED		(2X5) BMA15 BRKR CLOSED	
0066	:=	F 30.7	15CLOSE		(F30.7) BMA15 BRKR CLOSED	BMA15 BREAKER CLOSED
0067	:***					
Segment 21 00D0 BMA 15 IN SERVICE POSITION						
0068	:A	I 8.1	15SERV		(3X4) BMA15 IN SERVICE POSITION	
0069	:A	I 11.0	15TEST		(3X39) BMA15 IN TEST POSITION	
006A	:A	I 11.4	15 R.OUT		(3X43) BMA15 RACKED OUT	
006B	:=	F 32.1	F15SERV		(F32.1) BMA15 BRKR IN SERVICE	BMA15 IN SERVICE POSITION
006C	:***					

Statement list

Block: PB 18 Symbol: PB 18 Comment: BREAKER DISCREPANCY Lib no.: Length: 183

Segment 22 00DA BMA15 IN TEST POSITION

Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
006D	:AN	I 8.1	15SERV		(3X4) BMA15 IN SERVICE POSITION	
006E	:AN	I 11.0	15TEST		(3X39) BMA15 IN TEST POSITION	
006F	:A	I 11.4	15 R.OUT		(3X43) BMA15 RACKED OUT	
0070	:=	F 32.2	F15TEST		(F32.2) BMA15 BRKR IN TEST	BMA15 IN TEST POSITION
0071	:***					

Segment 23 00E4 BMA 15 IN RACKED OUT POSITION

Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
0072	:AN	I 8.1	15SERV		(3X4) BMA15 IN SERVICE POSITION	
0073	:A	I 11.0	15TEST		(3X39) BMA15 IN TEST POSITION	
0074	:AN	I 11.4	15 R.OUT		(3X43) BMA15 RACKED OUT	
0075	:=	F 32.3	F15OUT		(F32.3) BMA15 BRKR RACKED OUT	BMA15 IN RACKED OUT POSITION
0076	:***					

Segment 24 00EE BMA15 DISCREPANCY ALARMS

Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
0077	:AN	F 32.1	F15SERV		(F32.1) BMA15 BRKR IN SERVICE	
0078	:AN	F 32.2	F15TEST		(F32.2) BMA15 BRKR IN TEST	
0079	:AN	F 32.3	F15OUT		(F32.3) BMA15 BRKR RACKED OUT	
007A	:O					
007B	:AN	F 30.6	15OPEN		(F30.6) BMA15 BRKR OPENED	
007C	:AN	F 30.7	15CLOSE		(F30.7) BMA15 BRKR CLOSED	
007D	:AN	F 32.3	F15OUT		(F32.3) BMA15 BRKR RACKED OUT	
007E	:=	F 100.5	15.DISCR		(F100.5) BMA15 SWITCHGEAR DISCREPANCY	BMA15 DISCREPANCY
007F	:***					

Segment 25 0100 BDE01 OPEN INDICATION

Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
0080	:A	I 4.1	3.3BRKOP		(2X4) 3.3KV BRKR OPENED	
0081	:AN	I 0.1	3.3BRKCL		(1X4) 3.3KV BRKR CLOSED	
0082	:=	F 10.3	FBRKOPEN		(F10.3) BDE 01 BREAKER OPENED	BDE01 BREAKER OPENED
0083	:***					

Segment 26 0108 BDE01 CLOSE INDICATION

Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
0084	:AN	I 4.1	3.3BRKOP		(2X4) 3.3KV BRKR OPENED	
0085	:A	I 0.1	3.3BRKCL		(1X4) 3.3KV BRKR CLOSED	
0086	:=	F 10.2	BRKRCLSE		(F10.2) BDE01 BREAKER CLOSED	BDE01 BREAKER CLOSED
0087	:***					

Segment 27 0110 BDE01 ISOLATOR OPEN INDICATION

Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
0088	:A	I 4.0	DGISOOPE		(2X3) 3.3KV D/G ISOLATOR OPENED	
0089	:AN	I 0.0	DGISOCLS		(1X3) 3.3KV D/G ISOLATOR CLOSED	
008A	:=	F 10.0	LINKOPEN		(F10.0) BDE 01 ISOLATOR OPENED	BDE01 ISOLATOR LINK OPENED
008B	:***					

Segment 28 0118 BDE01 ISOLATOR CLOSE INDICATION

Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
008C	:AN	I 4.0	DGISOOPE		(2X3) 3.3KV D/G ISOLATOR OPENED	
008D	:A	I 0.0	DGISOCLS		(1X3) 3.3KV D/G ISOLATOR CLOSED	
008E	:=	F 10.1	LINKCLSE		(F10.1) BDE01 ISOLATOR CLOSED	BDE01 ISOLATOR LINK CLOSED
008F	:***					

Statement list

Block: PB 18 Symbol: PB 18 Comment: BREAKER DISCREPANCY Lib no.: Length: 183

Segment 29 0120 BDE01 EARTH SWITCH OFF							
Address	Oprt	Absolute/ Symbolic -		Operand	KT	Operand comment	Line comment
0090	:A	I	10.5	DGE_OFF		(3X32) D/G CABLE EARTH OFF	
0091	:AN	I	8.0	CBLEARTH		(3X3) 3.3KV D/G CABLE EARTHED	
0092	:=	F	10.6	DGEN_OFF		(F10.6) 3.3KV D/G CABLE EARTH OFF	BDE01 EARTH SWITCH OFF
0093	:***						
Segment 30 0128 BDE01 EARTH SWITCH ON							
Address	Oprt	Absolute/ Symbolic -		Operand	KT	Operand comment	Line comment
0094	:AN	I	10.5	DGE_OFF		(3X32) D/G CABLE EARTH OFF	
0095	:A	I	8.0	CBLEARTH		(3X3) 3.3KV D/G CABLE EARTHED	
0096	:=	F	10.7	DGEN_ON		(F10.7) 3.3KV D/G CABLE EARTH ON	BDE01 EARTH SWITCH ON
0097	:***						
Segment 31 0130 BDE03 BREAKER IN CLOSE POSITION							
Address	Oprt	Absolute/ Symbolic -		Operand	KT	Operand comment	Line comment
0098	:A	I	4.6	03BRK CL		(2X9) BDE03 BREAKER IN CLOSE POSITION	
0099	:AN	I	0.6	03BRK OP		(1X9) BDE03 BREAKER IN OPEN POSITION	
009A	:=	F	36.0	BDE03CLS		(F36.0) BDE03 BREAKER CLOSE INDICATION	BDE03 BREAKER CLOSED
009B	:***						
Segment 32 0138 BDE03 BREAKER IN OPEN POSITION							
Address	Oprt	Absolute/ Symbolic -		Operand	KT	Operand comment	Line comment
009C	:AN	I	4.6	03BRK CL		(2X9) BDE03 BREAKER IN CLOSE POSITION	
009D	:A	I	0.6	03BRK OP		(1X9) BDE03 BREAKER IN OPEN POSITION	
009E	:=	F	36.1	BDE03OPN		(F36.1) BDE03 BREAKER OPEN INDICATION	BDE03 BREAKER OPENED
009F	:***						
Segment 33 0140 BDE DISCREPANCY ALARMS							
Address	Oprt	Absolute/ Symbolic -		Operand	KT	Operand comment	Line comment
00A0	:AN	F	10.2	BRKRCLSE		(F10.2) BDE01 BREAKER CLOSED	
00A1	:AN	F	10.3	FBRKOPEN		(F10.3) BDE 01 BREAKER OPENED	
00A2	:O						
00A3	:AN	F	10.0	LINKOPEN		(F10.0) BDE 01 ISOLATOR OPENED	
00A4	:AN	F	10.1	LINKCLSE		(F10.1) BDE01 ISOLATOR CLOSED	
00A5	:=	F	101.0	3.3DISCR		(F101.0) 3.3KV SWITCGEAR DISCREPANCY	3.3kV BREAKER DISCREPANCY
00A6	:***						
Segment 34 014E COMMON DC FAIL ALARM							
Address	Oprt	Absolute/ Symbolic -		Operand	KT	Operand comment	Line comment
00A7	:O	I	6.0	BMA12DC		(2X27) BMA12 DC FAIL	
00A8	:O	I	6.1	BMA13DC		(2X28) BMA13 DC FAIL	
00A9	:O	I	6.2	BMA14DC		(2X29) BMA14 DC FAIL	
00AA	:O	I	6.3	BMA15DC		(2X30) BMA15 DC FAIL	
00AB	:O	I	6.4	BTRIPDC		(2X31) BACK UP TRIP CCT (BMA13) DC FAIL	
00AC	:O	I	10.4	TRFDC		(3X31) TRANSFORMER DC FAIL	
00AD	:=	F	101.2	BMA DCFL		(F101.2) 380V DG BOARD DC FAIL	COMMON 380V & TRF DC FAIL
00AE	:***						
Segment 35 015E							
Address	Oprt	Absolute/ Symbolic -		Operand	KT	Operand comment	Line comment
00AF	:STL						
00B0	:						
00B1	:BE						

Statement list

Block: PB 19 Symbol: PB 19 Comment: BREAKER UNHEALTHY Lib no.: Length: 41

Segment 1 0000 BDE UNHEALTHY FLAG CREATION Address |Oprt| Absolute/ Symbolic - Operand	KT	Operand comment	Line comment
0000 :ON F 10.1 LINKCLSE		(F10.1) BDE01 ISOLATOR CLOSED	
0001 :ON F 10.6 DGEN_OFF		(F10.6) 3.3KV D/G CABLE EARTH OFF	
0002 :ON F 10.2 BRKRCLSE		(F10.2) BDE01 BREAKER CLOSED	
0003 :O F 19.5 MTRIPFLG		(F19.5) MASTER TRIP FLAG	
0004 :O F 101.0 3.3DISCR		(F101.0) 3.3KV SWITCGEAR DISCREPANCY	
0005 := F 102.1 BDE01UN		(F102.1) BDE 01 SWITCHGEAR UNHEALTHY	BDE01 UNHEALTHY
0006 :***			
Segment 2 000E BMA12 UNHEALTHY **Address |Oprt| Absolute/ Symbolic - Operand**	**KT**	**Operand comment**	**Line comment**
0007 :O I 6.0 BMA12DC		(2X27) BMA12 DC FAIL	
0008 :ON F 31.0 F12SERV		(F31.0) BMA12 BRKR IN SERVICE	
0009 :O F 100.2 12.DISCR		(F100.2) BMA12 SWITCHGEAR DISCREPANCY	
000A :O F 25.0 LVBRKRLO		(F25.0) CAG PROTECTION FLAG	
000B :ON F 16.3 BMA12.OK		(F16.3) BMA12 CABLE VOLTS HEALTHY	
000C := F 102.3 12UNHEAL		(F102.3) BMA12 SWITCHGEAR UNHEALTHY	BMA12 UNHEALTHY
000D :***			
Segment 3 001C BMA13 UNHEALTHY Address |Oprt| Absolute/ Symbolic - Operand	KT	Operand comment	Line comment
000E :ON F 31.3 F13SERV		(F31.3) BMA13 BRKR IN SERVICE	
000F :O F 100.3 13.DISCR		(F100.3) BMA13 SWITCHGEAR DISCREPANCY	
0010 :O I 6.1 BMA13DC		(2X28) BMA13 DC FAIL	
0011 :O F 25.0 LVBRKRLO		(F25.0) CAG PROTECTION FLAG	
0012 :ON F 16.4 BMA13.OK		(F16.4) BMA13 CABLE VOLTS HEALTHY	
0013 := F 102.4 13UNHEAL		(F102.4) BMA13 SWITCHGEAR UNHEALTHY	BMA13 UNHEALTHY
0014 :***			
Segment 4 002A BMA14 UNHEALTHY FLAG **Address |Oprt| Absolute/ Symbolic - Operand**	**KT**	**Operand comment**	**Line comment**
0015 :O F 100.4 14.DISCR		(F100.4) BMA14 SWITCHGEAR DISCREPANCY	
0016 :ON F 31.6 F14SERV		(F31.6) BMA14 BRKR IN SERVICE	
0017 :O I 6.2 BMA14DC		(2X29) BMA14 DC FAIL	
0018 :O F 25.0 LVBRKRLO		(F25.0) CAG PROTECTION FLAG	
0019 :ON F 16.5 BMA14.OK		(F16.5) BMA14 CABLE VOLTS HEALTHY	
001A := F 102.5 14UNHEAL		(F102.5) BMA14 SWITCHGEAR UNHEALTHY	BMA14 UNHEALTHY
001B :***			
Segment 5 0038 BMA15 UNHEALTHY **Address |Oprt| Absolute/ Symbolic - Operand**	**KT**	**Operand comment**	**Line comment**
001C :O F 100.5 15.DISCR		(F100.5) BMA15 SWITCHGEAR DISCREPANCY	
001D :ON F 32.1 F15SERV		(F32.1) BMA15 BRKR IN SERVICE	
001E :O I 6.3 BMA15DC		(2X30) BMA15 DC FAIL	
001F :O F 25.0 LVBRKRLO		(F25.0) CAG PROTECTION FLAG	
0020 := F 101.1 15UNHEAL		(F101.1) BMA 15 SWITCHGEAR UNHEALTHY	BMA15 UNHEALTHY
0021 :***			
Segment 6 0044 **Address |Oprt| Absolute/ Symbolic - Operand**	**KT**	**Operand comment**	**Line comment**
0022 :STL			
0023 :BE			

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MODIFICATION REV 2	AS MOD BY A&J CONTROL SOLUTIONS	SIMATIC S5	Program file : Block: Segm : C:U1DG@@ST.S5D PB 19 1	THE SOFTWARE DEVELOPMENT AND PROGRAMMING WERE DONE BY ALH PRETORIUS & SJ STOLS

PAGE 13

Breake. Unhealthy

Statement list

Block: PB 20 Symbol: PB 20 Comment: ENGINE FLAGS Lib no.: Length: 112

Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
Segment 1 0000 SWITCH IN OFF POSITION						
0000	:A	I 10.1	SWOFF		(3X28) ENGINE SWITCH IN OFF POSITION	
0001	:AN	I 10.2	SWAUTO		(3X29) ENGINE SWITCH IN AUTO	
0002	:AN	I 10.3	SWTEST		(3X30) ENGINE SWITCH IN TEST	
0003	:=	F 20.0	ENGOFFF		(F20.0) ENGINE SWITCH IN OFF	ENGINE SWITCH IN OFF
0004	:***					
Segment 2 000A SWITCH ON TEST						
0005	:AN	I 10.1	SWOFF		(3X28) ENGINE SWITCH IN OFF POSITION	
0006	:AN	I 10.2	SWAUTO		(3X29) ENGINE SWITCH IN AUTO	
0007	:A	I 10.3	SWTEST		(3X30) ENGINE SWITCH IN TEST	
0008	:L	KT 300.0				
000A	:SD	T 49	T49		(T49) TIMER FOR ENGINE SWITCH (TEST)	
000B	:NOP	0				
000C	:NOP	0				
000D	:NOP	0				
000E	:A	T 49	T49		(T49) TIMER FOR ENGINE SWITCH (TEST)	
000F	:=	F 20.1	ENGTESTF		(F20.1) ENGINE SWITCH IN TEST	ENGINE SWITCH IN TEST
0010	:***					
Segment 3 0022 SWITCH IN AUTO						
0011	:AN	I 10.1	SWOFF		(3X28) ENGINE SWITCH IN OFF POSITION	
0012	:A	I 10.2	SWAUTO		(3X29) ENGINE SWITCH IN AUTO	
0013	:AN	I 10.3	SWTEST		(3X30) ENGINE SWITCH IN TEST	
0014	:=	F 20.2	ENGAUTOF		(F20.2) ENGINE SWITCH IN AUTO	ENGINE SWITCH IN AUTO
0015	:***					
Segment 4 002C ENGINE RUNNING FLAG						
0016	:O	I 8.7	ALTVOLT		(3X10) 3,3KV ALTERNATOR VOLTAGE SENSING	
0017	:O	I 9.6	ENGRUN		(3X21) ENGINE RUNNING STARTER CUT OUT	
0018	:=	F 20.7	ENGRUNF		(F20.7) ENGINE RUNNING	ENGINE RUNNING
0019	:***					
Segment 5 0034 ENGINE TRIPS OPERATED						
001A	:A(					
001B	:ON	I 2.0	RADLOW	01	(1X27) RADIATOR LOW LEVEL	
001C	:ON	I 2.3	HETT	01	(1X30) HIGH ENGINE TEMP TRIP	
001D	:ON	I 2.1	LOPT	01	(1X28) LOW OIL PRESSURE TRIP	
001E	:O	F 100.1	DGV.UNH	01	(F100.1) DG VOLTAGE UNHEALTY	
001F	:)			01		
0020	:A	F 20.7	ENGRUNF		(F20.7) ENGINE RUNNING	
0021	:L	KT 300.1				
0023	:SD	T 20	T20		(T20) TIMER FOR ENGINE TRIPS	
0024	:NOP	0				
0025	:NOP	0				
0026	:NOP	0				
0027	:A	T 20	T20		(T20) TIMER FOR ENGINE TRIPS	
0028	:S	F 20.4	ENGPROTF		(F20.4) ENGINE PROTECTION	ENGINE PROTECTION
0029	:A	I 9.7	ALARMPB		(3X22) ALARM ACKNOWLEDGE PB	
002A	:R	F 20.4	ENGPROTF		(F20.4) ENGINE PROTECTION	ENGINE PROTECTION
002B	:NOP	0				
002C	:***					

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Engine Flags 15

Statement list

Block: PB 20 Symbol: PB 20 Comment: ENGINE FLAGS Lib no.: Length: 112

Segment 6 005A ENGINE PROTECTION ALARM FLAGS Address	Oprt	Absolute/ Symbolic - Operand	KT	Operand comment	Line comment
002D	:A	I 3.0 DTANK10		(1X39) DAY TANK <10%	
002E	:=	F 21.0 FUEL<10%		(F21.0) FUEL LOWER THAN 10 %	
002F	:AN	I 2.0 RADLOW		(1X27) RADIATOR LOW LEVEL	
0030	:=	F 21.1 WATER.LO		(F21.1) WATER LEVEL LOW	
0031	:AN	I 2.4 HETA		(1X31) HIGH ENGINE TEMP ALARM	
0032	:=	F 21.2 ENGTEMP1		(F21.2) ENGINE TEMP STAGE 1 ALARM	
0033	:AN	I 2.3 HETT		(1X30) HIGH ENGINE TEMP TRIP	
0034	:=	F 21.3 ENGTEMP2		(F21.3) ENGINE TEMP STAGE 2 ALARM	
0035	:AN	I 2.5 ESTOP		(1X32) EMERGENCY STOPS	
0036	:=	F 21.4 EMERGSTP		(F21.4) EMERGENCY STOP	
0037	:AN	I 9.4 CHARFAIL		(3X19) BATTERY CHARGER/ALTERNATOR CHARGE	
0038	:L	KT 800.2			
003A	:SD	T 44 T44		(T44) TIMER FOR CHARGE FAIL	
003B	:A	T 44 T44		(T44) TIMER FOR CHARGE FAIL	
003C	:=	F 21.5 CHRGFAIL		(F21.5) CHARGER FAIL	
003D	:A	I 3.1 DTANK50		(1X40) DAY TANK <50%	
003E	:=	F 21.6 FUEL<50%		(F21.6) FUEL LOWER THAN 50 %	
003F	:AN	I 3.2 DTANK95		(1X41) DAY TANK <95%	
0040	:=	F 21.7 FUEL>95%		(F21.7) FUEL >95% DAY TANK	
0041	:AN	I 3.3 BTANK95		(1X42) BULK TANK <95%	
0042	:=	F 22.0 FUELBLK		(F22.0) BULK TANK >95%	
0043	:AN	I 8.7 ALTVOLT		(3X10) 3,3KV ALTERNATOR VOLTAGE SENSING	
0044	:A	Q 19.1 FUELSOL		(5X40) RELAY 1 FOR FUEL SOLENOIDE	
0045	:L	KT 200.1			
0047	:SD	T 28 T28		(T28) TIMER FOR ALTERNATOR VOLT SENSING	
0048	:A	T 28 T28		(T28) TIMER FOR ALTERNATOR VOLT SENSING	
0049	:=	F 25.1 GENVLT		(F25.1) ALTERNATOR VOLTAGE SENSING	
004A	:AN	I 2.6 ESTART		(1X33) EMERENCY START	
004B	:=	F 29.0			
004C	:***				

Segment 7 009A ST 1 LOW OIL PRESSURE ALARM FLAG Address	Oprt	Absolute/ Symbolic - Operand	KT	Operand comment	Line comment
004D	:AN	I 2.2 LOPA		(1X29) LOW OIL PRESSURE ALARM	
004E	:A	F 20.7 ENGRUNF		(F20.7) ENGINE RUNNING	
004F	:L	KT 100.1			
0051	:SD	T 40 T40		(T40) TIMER FOR LOW OIL PRESSURE STAGE 1	
0052	:NOP	0			
0053	:NOP	0			
0054	:NOP	0			
0055	:A	T 40 T40		(T40) TIMER FOR LOW OIL PRESSURE STAGE 1	
0056	:=	F 100.7 LOILP.S1		(F100.7) LOW OIL PRESSURE STAGE 1	LOW OIL PRESSURE STAGE 1
0057	:***				

Segment 8 00B0 ST 2 LOW OIL PRESSURE ALARM FLAG Address	Oprt	Absolute/ Symbolic - Operand	KT	Operand comment	Line comment
0058	:AN	I 2.1 LOPT		(1X28) LOW OIL PRESSURE TRIP	
0059	:A	F 20.7 ENGRUNF		(F20.7) ENGINE RUNNING	
005A	:L	KT 100.1			
005C	:SD	T 41 T41		(T41) TIMER FOR LOW OIL PRESSURE STAGE 2	
005D	:NOP	0			
005E	:NOP	0			
005F	:NOP	0			
0060	:A	T 41 T41		(T41) TIMER FOR LOW OIL PRESSURE STAGE 2	
0061	:=	F 100.6 LOILP.S2		(F100.6) LOW OIL PRESSURE STAGE 2	LOW OIL PRESSURE STAGE 2
0062	:***				

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MODIFICATION REV 2	AS MOD BY A&J CONTROL SOLUTIONS	SIMATIC S5	Program file : Block: Segm : C:U1DG@@ST.S5D PB 20 6	THE SOFTWARE DEVELOPMENT AND PROGRAMMING WERE DONE BY ALH PRETORIUS & SJ STOLS 15 +

Statement list

Block: PB 20 Symbol: PB 20 Comment: ENGINE FLAGS Lib no.: Length: 112

Segment 9 00C6 START CONDITION

Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
0063	:AN	F 102.1	BDE01UN		(F102.1) BDE 01 SWITCHGEAR UNHEALTHY	
0064	:AN	F 101.1	15UNHEAL		(F101.1) BMA 15 SWITCHGEAR UNHEALTHY	
0065	:AN	F 20.4	ENGPROTF		(F20.4) ENGINE PROTECTION	
0066	:A	I 2.5	ESTOP		(1X32) EMERGENCY STOPS	
0067	:=	F 20.3	STRTCNDF		(F20.3) ENGINE STOP/START CONDITION	ENGINE STOP/START CONDITION
0068	:***					

Segment 10 00D2

Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
0069	:STL					
006A	:BE					

Statement list

Block: PB 21 Symbol: PB 21 Comment: ENGINE CONTROL Lib no.: Length: 208

Segment 1 0000 START PULSE

Address	Oprt	Absolute/ Symbolic - Operand	KT	Operand comment	Line comment
0000	:A(				
0001	:A F 20.2	ENGAUTOF	01	(F20.2) ENGINE SWITCH IN AUTO	
0002	:A(		01		
0003	:AN F 16.2	BBVL.OK	02	(F16.2) BUSBAR VOLTS HEALTHY	
0004	:L KT 250.0		02		
0006	:SD T 38	T38	02	(T38)	
0007	:NOP 0		02		
0008	:NOP 0		02		
0009	:NOP 0		02		
000A	:A T 38	T38	02	(T38)	
000B	:)		02		
000C	:O F 20.1	ENGTESTF	01	(F20.1) ENGINE SWITCH IN TEST	
000D	:)		01		
000E	:A F 20.3	STRTCNDF		(F20.3) ENGINE STOP/START CONDITION	
000F	:S Q 19.1	FUELSOL		(5X40) RELAY 1 FOR FUEL SOLENOIDE	FUEL SOLENOIDE
0010	:***				

Segment 2 0022 Engine stop manipulation

Address	Oprt	Absolute/ Symbolic - Operand	KT	Operand comment	Line comment
0011	:O(		01		
0012	:A(		02	(F31.0) BMA12 BRKR IN SERVICE	
0013	:ON F 31.0	F12SERV	02		
0014	:O		02	(F30.0) BMA12 BRKR OPENED	
0015	:A F 30.0	12OPEN	02	(F17.3) BMA12 CABLE LOW	
0016	:A F 17.3	BMA12.<	02		
0017	:)		01		
0018	:A(		02	(F31.3) BMA13 BRKR IN SERVICE	
0019	:ON F 31.3	F13SERV	02		
001A	:O		02	(F30.2) BMA13 BRKR OPENED	
001B	:A F 30.2	13OPEN	02	(F17.4) BMA13 CABLE VOLTS LOW	
001C	:A F 17.4	BMA13.<	02		
001D	:)		01		
001E	:A(		02	(F31.6) BMA14 BRKR IN SERVICE	
001F	:ON F 31.6	F14SERV	02		
0020	:O		02	(F30.4) BMA14 BRKR OPENED	
0021	:A F 30.4	14OPEN	02	(F17.5) BMA14 CABLE VOLTS LOW	
0022	:A F 17.5	BMA14.<	02		
0023	:)		01	(F20.2) ENGINE SWITCH IN AUTO	
0024	:A F 20.2	ENGAUTOF	01	(F20.4) ENGINE PROTECTION	
0025	:A F 20.4	ENGPROTF	01	(F30.7) BMA15 BRKR CLOSED	
0026	:A F 30.7	15CLOSE	01	(F32.1) BMA15 BRKR IN SERVICE	
0027	:A F 32.1	F15SERV	01	(F16.2) BUSBAR VOLTS HEALTHY	
0028	:A F 16.2	BBVL.OK	01		
0029	:= F 200.0		01		
002A	:A F 200.0		01		
002B	:L KT 180.3		01	(T21)	
002D	:SD T 21	T21	01		
002E	:NOP 0		01		
002F	:NOP 0		01		
0030	:NOP 0		01	(T21)	
0031	:A T 21	T21	01		
0032	:)			(F20.4) ENGINE PROTECTION	
0033	:O		01		
0034	:A F 20.4	ENGPROTF	01	(F20.2) ENGINE SWITCH IN AUTO	
0035	:A(		01		
0036	:ON F 200.0			(F8.0) DIESEL GEN STOP MANIPULATION	ENGINE STOP MANIPULATION
0037	:ON F 20.2	ENGAUTOF			
0038	:)				
0039	:= F 8.0	GENSTP			
003A	:***				

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Engine Control

Statement list

Block: PB 21 Symbol: PB 21 Comment: ENGINE CONTROL Lib no.: Length: 208

Segment 3 0076 Stop control Address	Oprt	Absolute/ Symbolic - Operand	KT	Operand comment	Line comment
003B	:O(				
003C	:A F 20.0	ENGOFFF	01	(F20.0) ENGINE SWITCH IN OFF	
003D	:A F 30.6	15OPEN	01	(F30.6) BMA15 BRKR OPENED	
003E	:O		01		
003F	:A F 20.2	ENGAUTOF	01	(F20.2) ENGINE SWITCH IN AUTO	
0040	:A I 8.7	ALTVOLT	01	(3X10) 3,3KV ALTERNATOR VOLTAGE SENSING	
0041	:A F 30.6	15OPEN	01	(F30.6) BMA15 BRKR OPENED	
0042	:L KT 600.2		01		
0044	:SD T 22	T22	01	(T22)	
0045	:NOP 0		01		
0046	:NOP 0		01		
0047	:NOP 0		01		
0048	:A T 22	T22	01	(T22)	
0049	:)		01		
004A	:O F 8.0	GENSTP		(F8.0) DIESEL GEN STOP MANIPULATION	
004B	:O F 102.1	BDE01UN		(F102.1) BDE 01 SWITCHGEAR UNHEALTHY	
004C	:ON I 2.5	ESTOP		(1X32) EMERGENCY STOPS	
004D	:O(				
004E	:A F 100.1	DGV.UNH	01	(F100.1) DG VOLTAGE UNHEALTY	
004F	:L KT 100.1		01		
0051	:SD T 27	T27	01	(T27)	
0052	:NOP 0		01		
0053	:NOP 0		01		
0054	:NOP 0		01		
0055	:A T 27	T27	01	(T27)	
0056	:)		01		
0057	:R Q 19.1	FUELSOL		(5X40) RELAY 1 FOR FUEL SOLENOIDE	FUEL SOLENOIDE
0058	:***				

Segment 4 00B2 10 SEC PULSING CIRCUIT Address	Oprt	Absolute/ Symbolic - Operand	KT	Operand comment	Line comment
0059	:A T 24	T24		(T24) ALARM PULSING	
005A	:AN T 25	T25		(T25) ALARM PULSING	
005B	:L KT 100.1				
005D	:SP T 23	T23		(T23) ALARM PULSING	
005E	:NOP 0				
005F	:NOP 0				
0060	:NOP 0				
0061	:A T 23	T23		(T23) ALARM PULSING	
0062	:CU C 20	C 20		ENGINE START COUNTER	
0063	:NOP 0				
0064	:NOP 0				
0065	:NOP 0				
0066	:A I 9.7	ALARMPB		(3X22) ALARM ACKNOWLEDGE PB	ALARM ACKNOWLEDGE
0067	:R C 20	C 20		ENGINE START COUNTER	
0068	:NOP 0				
0069	:NOP 0				
006A	:NOP 0				
006B	:***				

Segment 5 00D8 START TIME PULSE FOR STARTER Address	Oprt	Absolute/ Symbolic - Operand	KT	Operand comment	Line comment
006C	:A F 20.7	ENGRUNF		(F20.7) ENGINE RUNNING	ENGINE RUNNING
006D	:L KT 200.1				
006F	:SF T 29	T29		(T29)	
0070	:NOP 0				
0071	:NOP 0				
0072	:NOP 0				
0073	:A T 29	T29		(T29)	

Statement list

Block: PB 21 Symbol: PB 21 Comment: ENGINE CONTROL Lib no.: Length: 208

0074	:=	F	20.6	RESTART			(F20.6) RESTART TIMER BEFORE NEW ATTEMP	RESTART TIMER BEFORE NEW ATTEMP
0075	:***							

Segment 6 00EC START TIME PULSE FOR STARTER MOT

Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
0076	:A(					
0077	:AN	F	20.6 RESTART	01	(F20.6) RESTART TIMER BEFORE NEW ATTEMP	
0078	:A	Q	19.1 FUELSOL	01	(5X40) RELAY 1 FOR FUEL SOLENOIDE	
0079	:AN	F	100.0 DGFAIL	01	(F100.0) DG GEN FAIL TO START	
007A	:AN	F	20.0 ENGOFFF	01	(F20.0) ENGINE SWITCH IN OFF	
007B	:L	KT	030.0	01		
007D	:SD	T	24 T24	01	(T24) ALARM PULSING	
007E	:NOP	0		01		
007F	:NOP	0		01		
0080	:NOP	0		01		
0081	:A	T	24 T24	01	(T24) ALARM PULSING	
0082	:)			01		
0083	:AN	T	25 T25		(T25) ALARM PULSING	
0084	:=	Q	13.2 Q-DGSTRT		(4X17) RELAY 2 FOR DG START RELAY	ENGINE START
0085	:***					

Segment 7 010C

Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
0086	:AN	T	23 T23		(T23) ALARM PULSING	
0087	:A	T	24 T24		(T24) ALARM PULSING	
0088	:L	KT	100.1			
008A	:SP	T	25 T25		(T25) ALARM PULSING	
008B	:NOP	0				
008C	:NOP	0				
008D	:NOP	0				
008E	:NOP	0				
008F	:***					

Segment 8 0120

Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
0090	:L	C	20 C 20		ENGINE START COUNTER	
0091	:L	KF	+3			
0093	:>F					
0094	:=	F	100.0 DGFAIL		(F100.0) DG GEN FAIL TO START	ENGINE FAIL TO START
0095	:***					

Segment 9 012C AUTO CONTROL NEEDED

Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
0096	:A	F	20.7 ENGRUNF		(F20.7) ENGINE RUNNING	
0097	:A	I	8.6 SW4OFF		(3X9) SYNCH SWITCH (SW4) IN OFF	
0098	:A	F	20.2 ENGAUTOF		(F20.2) ENGINE SWITCH IN AUTO	
0099	:A(					
009A	:A(			01		
009B	:ON	F	30.1 12CLOSE	02	(F30.1) BMA12 BRKR CLOSED	
009C	:ON	F	31.0 F12SERV	02	(F31.0) BMA12 BRKR IN SERVICE	
009D	:)			02		
009E	:A(			01		
009F	:ON	F	30.3 13CLOSE	02	(F30.3) BMA13 BRKR CLOSED	
00A0	:ON	F	31.3 F13SERV	02	(F31.3) BMA13 BRKR IN SERVICE	
00A1	:)			02		
00A2	:A(			01		
00A3	:ON	F	30.5 14CLOSE	02	(F30.5) BMA14 BRKR CLOSED	
00A4	:ON	F	31.6 F14SERV	02	(F31.6) BMA14 BRKR IN SERVICE	
00A5	:)			02		
00A6	:A	F	30.7 15CLOSE	01	(F30.7) BMA15 BRKR CLOSED	
00A7	:A	F	32.1 F15SERV	01	(F32.1) BMA15 BRKR IN SERVICE	

Statement list

Block: PB 21 Symbol: PB 21 Comment: ENGINE CONTROL Lib no.: Length: 208

00A8	:ON	F	30.7	15CLOSE	01	(F30.7) BMA15 BRKR CLOSED			
00A9	:ON	F	32.1	F15SERV	01	(F32.1) BMA15 BRKR IN SERVICE			
00AA	:)				01				
00AB	:L	KT	030.1						
00AD	:SD	T	26	T26		(T26)			
00AE	:NOP	0							
00AF	:NOP	0							
00B0	:NOP	0							
00B1	:A	T	26	T26		(T26)			
00B2	:=	F	20.5	AUTOCNTR		(F20.5) AUTO GEN CONTROL WITHOUT SYNCH.	AUTO CONTROL WITHOUT SYNCH		
00B3	:***								

Segment 10 0168 RAISE SPEED

Address	Oprt	Absolute/	Symbolic -	Operand	KT	Operand comment	Line comment
00B4	:A	Q	19.1	FUELSOL		(5X40) RELAY 1 FOR FUEL SOLENOIDE	
00B5	:A	F	17.1	FREQ.<		(F17.1) GEN FREQUENCY LOW	
00B6	:A	F	20.5	AUTOCNTR		(F20.5) AUTO GEN CONTROL WITHOUT SYNCH.	
00B7	:AN	Q	16.1	OUTLSPEE		(5X4) RELAY 7 FOR LOWER SPEED	
00B8	:=	F	22.1	R_SPEED		(F22.1) SPEED RAISE SIGNAL	RAISE SPEED
00B9	:***						

Segment 11 0174 LOWER SPEED

Address	Oprt	Absolute/	Symbolic -	Operand	KT	Operand comment	Line comment
00BA	:A	F	18.1	FREQ.>		(F18.1) GEN FREQUENCY HIGH	
00BB	:A	F	20.5	AUTOCNTR		(F20.5) AUTO GEN CONTROL WITHOUT SYNCH.	
00BC	:AN	Q	16.1	OUTLSPEE		(5X4) RELAY 7 FOR LOWER SPEED	
00BD	:=	F	22.2	L_SPEED		(F22.2) SPEED LOWER SIGNAL	LOWER SPEED
00BE	:***						

Segment 12 017E RAISE VOLTS

Address	Oprt	Absolute/	Symbolic -	Operand	KT	Operand comment	Line comment
00BF	:A	F	27.1	15VLT<		(F27.1) GEN VOLTS LOW	
00C0	:A	F	20.5	AUTOCNTR		(F20.5) AUTO GEN CONTROL WITHOUT SYNCH.	
00C1	:AN	Q	12.1	Q-LOWERV		(4X4) RELAY 5 FOR LOWER VOLTS	
00C2	:=	F	22.3	R_VOLTS		(F22.3) VOLTAGE RAISE SIGNAL	RAISE VOLTAGE
00C3	:***						

Segment 13 0188 LOWER VOLTAGE

Address	Oprt	Absolute/	Symbolic -	Operand	KT	Operand comment	Line comment
00C4	:A	F	27.2	15VLT>		(F27.2) GEN VOLTS HIGH	
00C5	:A	F	20.5	AUTOCNTR		(F20.5) AUTO GEN CONTROL WITHOUT SYNCH.	
00C6	:AN	Q	12.0	Q-RAIS V		(4X3) RELAY 4 FOR RAISE VOLTS	
00C7	:=	F	22.4	L_VOLTS		(F22.4) VOLTAGE LOWER SIGNAL	LOWER VOLTAGE
00C8	:***						

Segment 14 0192

Address	Oprt	Absolute/	Symbolic -	Operand	KT	Operand comment	Line comment
00C9	:STL						
00CA	:BE						

Statement list

Block: PB 22 Symbol: PB 22 Comment: SYNCH CONTROL BB-INCOMMING Lib no.: Length: 48

Segment 1 0000 BUSBAR "INCOMMING" CONTROL							
Address	Oprt	Absolute/	Symbolic -	Operand	KT	Operand comment	Line comment
0000	:A	F 30.7	15CLOSE			(F30.7) BMA15 BRKR CLOSED	
0001	:A	F 32.1	F15SERV			(F32.1) BMA15 BRKR IN SERVICE	
0002	:A(						
0003	:A	F 30.0	12OPEN		01	(F30.0) BMA12 BRKR OPENED	
0004	:A	F 31.0	F12SERV		01	(F31.0) BMA12 BRKR IN SERVICE	
0005	:ON	F 31.0	F12SERV		01	(F31.0) BMA12 BRKR IN SERVICE	
0006	:)				01		
0007	:A(						
0008	:A	F 30.2	13OPEN		01	(F30.2) BMA13 BRKR OPENED	
0009	:A	F 31.3	F13SERV		01	(F31.3) BMA13 BRKR IN SERVICE	
000A	:ON	F 31.3	F13SERV		01	(F31.3) BMA13 BRKR IN SERVICE	
000B	:)				01		
000C	:A(						
000D	:A	F 30.4	14OPEN		01	(F30.4) BMA14 BRKR OPENED	
000E	:A	F 31.6	F14SERV		01	(F31.6) BMA14 BRKR IN SERVICE	
000F	:ON	F 31.6	F14SERV		01	(F31.6) BMA14 BRKR IN SERVICE	
0010	:)				01		
0011	:A	F 20.2	ENGAUTOF			(F20.2) ENGINE SWITCH IN AUTO	
0012	:AN	I 8.6	SW4OFF			(3X9) SYNCH SWITCH (SW4) IN OFF	
0013	:=	F 15.1	B/B.INC			(F15.1) DG IS ON B/B FOR SYNCHRONISING	
0014	:***						

Segment 2 002A LOWER VOLT CONTROL (B/B INC.)							
Address	Oprt	Absolute/	Symbolic -	Operand	KT	Operand comment	Line comment
0015	:A	I 9.1	RVOLTS			(3X16) RAISE VOLTS SIGNAL FROM SYNCHROTE	
0016	:A	F 15.1	B/B.INC			(F15.1) DG IS ON B/B FOR SYNCHRONISING	
0017	:AN	Q 12.0	Q-RAIS V			(4X3) RELAY 4 FOR RAISE VOLTS	
0018	:=	F 25.6	BB_L_VOL			(F25.6) BUSBAR (INC LOWER VOLTAGE SIG	
0019	:***						

Segment 3 0034 RAISE VOLT CONTROL (B/B INC.)							
Address	Oprt	Absolute/	Symbolic -	Operand	KT	Operand comment	Line comment
001A	:AN	Q 12.1	Q-LOWERV			(4X4) RELAY 5 FOR LOWER VOLTS	
001B	:A	F 15.1	B/B.INC			(F15.1) DG IS ON B/B FOR SYNCHRONISING	
001C	:A	I 9.0	LVOLTS			(3X15) LOWER VOLTS SIGNAL FROM SYNCHROTE	
001D	:=	F 25.5	BB_R_VOL			(F25.5) BUSBAR (INC) RAISE VOLTAGE SIG	
001E	:***						

Segment 4 003E RAISE SPEED CONTROL (B/B INC.)							
Address	Oprt	Absolute/	Symbolic -	Operand	KT	Operand comment	Line comment
001F	:AN	Q 16.1	OUTLSPEE			(5X4) RELAY 7 FOR LOWER SPEED	
0020	:A	F 15.1	B/B.INC			(F15.1) DG IS ON B/B FOR SYNCHRONISING	
0021	:A	I 9.2	LSPEED			(3X17) LOWER SPEED SIGNAL FROM SYNCHROTE	
0022	:=	F 25.3	BB_R_SP			(F25.3) BUSBAR (INC) RAISE SPEED SIGNAL	
0023	:***						

Segment 5 0048 LOWER SPEED CONTROL (B/B INC)							
Address	Oprt	Absolute/	Symbolic -	Operand	KT	Operand comment	Line comment
0024	:AN	Q 16.0	OUTRSPEE			(5X3) RELAY 6 FOR RAISE SPEED	
0025	:A	F 15.1	B/B.INC			(F15.1) DG IS ON B/B FOR SYNCHRONISING	
0026	:A	I 9.3	RSPEED			(3X18) RAISE SPEED SIGNAL FROM SYNCHROTE	
0027	:=	F 25.4	BB_L_SP			(F25.4) BUSBAR (INC) LOWER SPEED SIGNAL	
0028	:***						

DATE: 09.07.97 01-07-1997	ENQUIRIES ABOUT THE PROGRAM:		THIS PROGRAM CONTROL THE	THE PROGRAM WAS TESTED	
		SIEMENS AG	ENGINE FOR THE 3,3KV DIESEL	AND COMMISSIONED BY PT&M.	
	ALBERT PRETORIUS: 0135 928679	S5 115 PLC	GENERATOR AND THE 380V BREAKERS		PAGE
MODIFICATION REV 2	JOHAN GROBLER 083 228 4536	943 PROCESSOR	ON THE DIESEL GENERATOR BOARD	THE SOFTWARE DEVELOPMENT	
			Program file : Block: Segm :	AND PROGRAMMING WERE DONE	21
	AS MOD BY A&J CONTROL SOLUTIONS	SIMATIC S5	C:U1DG@@ST.S5D PB 22 1	BY ALH PRETORIUS & SJ STOLS	+

Synch Control 17

Statement list

Block: PB 22 Symbol: PB 22 Comment: SYNCH CONTROL BB-INCOMMING Lib no.: Length: 48

Segment 6 0052

Address	Oprt	Absolute/ Symbolic - Operand	KT	Operand comment	Line comment
0029	:STL				
002A	:BE				

Statement list

Block: PB 23 Symbol: PB 23 Comment: SYNCH CONTROL DG-INCOMMING Lib no.: Length: 89

002A	:A	F	200.0						
002B	:A	F	200.1						
002C	:=	Q	16.0	OUTRSPEE			(5X3) RELAY 6 FOR RAISE SPEED		RAISE SPEED
002D	:***								

Segment 7 005C LOWER SPEED

Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
002E	:O	F 22.2	L_SPEED		(F22.2) SPEED LOWER SIGNAL	
002F	:O	F 25.4	BB_L_SP		(F25.4) BUSBAR (INC) LOWER SPEED SIGNAL	
0030	:O	F 27.4	DG_L_SP		(F27.4) GEN (INC) LOWER SPEED SIGNAL	
0031	:L	KT 100.1				
0033	:SP	T 61	SP_LOWER		(T61) SPEED LOWER TIME	
0034	:NOP	0				
0035	:NOP	0				
0036	:NOP	0				
0037	:A	T 61	SP_LOWER		(T61) SPEED LOWER TIME	
0038	:=	Q 16.1	OUTLSPEE		(5X4) RELAY 7 FOR LOWER SPEED	LOWER SPEED
0039	:***					

Segment 8 0074 RAISE VOLTAGE

Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
003A	:O	F 22.3	R_VOLTS		(F22.3) VOLTAGE RAISE SIGNAL	
003B	:O	F 25.5	BB_R_VOL		(F25.5) BUSBAR (INC) RAISE VOLTAGE SIG	
003C	:O	F 27.5	DG_R_VOL		(F27.5) GEN (INC) RAISE VOLTAGE SIG	
003D	:L	KT 030.1				
003F	:SP	T 62	VO_RAISE		(T62) VOLTAGE RAISE TIME	
0040	:NOP	0				
0041	:NOP	0				
0042	:NOP	0				
0043	:A	T 62	VO_RAISE		(T62) VOLTAGE RAISE TIME	
0044	:=	Q 12.0	Q-RAIS V		(4X3) RELAY 4 FOR RAISE VOLTS	RAISE VOLTAGE
0045	:***					

Segment 9 008C LOWER VOLTAGE

Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
0046	:O	F 22.4	L_VOLTS		(F22.4) VOLTAGE LOWER SIGNAL	
0047	:O	F 25.6	BB_L_VOL		(F25.6) BUSBAR (INC LOWER VOLTAGE SIG	
0048	:O	F 27.6	DG_L_VOL		(F27.6) GEN (INC) LOWER VOLTAGE SIG	
0049	:L	KT 030.1				
004B	:SP	T 63	VO_LOWER		(T63) VOLTAGE LOWER TIME	
004C	:NOP	0				
004D	:NOP	0				
004E	:NOP	0				
004F	:A	T 63	VO_LOWER		(T63) VOLTAGE LOWER TIME	
0050	:=	Q 12.1	Q-LOWERV		(4X4) RELAY 5 FOR LOWER VOLTS	LOWER VOLTAGE
0051	:***					

Segment 10 00A4

Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
0052	:STL					
0053	:BE					

Statement list

Block: PB 23 Symbol: PB 23 Comment: SYNCH CONTROL DG-INCOMMING Lib no.: Length: 89

Segment 1 0000 SYNCH. CONTROL (DG INCOMER) Address	Oprt	Absolute/ Symbolic - Operand	KT	Operand comment	Line comment
0000	:A F 16.2	BBVL.OK		(F16.2) BUSBAR VOLTS HEALTHY	
0001	:A F 30.6	15OPEN		(F30.6) BMA15 BRKR OPENED	
0002	:A F 5.4	FSYNCH15		(F5.4) SYNCH SELECT TO BMA15	
0003	:A F 32.1	F15SERV		(F32.1) BMA15 BRKR IN SERVICE	
0004	:= F 15.0	DG.INCOM		(F15.0) DG IS INCOMMER FOR SYNCHRONISING	DG IS INCOMMER
0005	:***				

Segment 2 000C LOWER VOLTS (DG INCOMER) Address	Oprt	Absolute/ Symbolic - Operand	KT	Operand comment	Line comment
0006	:A I 9.0	LVOLTS		(3X15) LOWER VOLTS SIGNAL FROM SYNCHROTE	
0007	:A F 15.0	DG.INCOM		(F15.0) DG IS INCOMMER FOR SYNCHRONISING	
0008	:AN Q 12.0	Q-RAIS V		(4X3) RELAY 4 FOR RAISE VOLTS	
0009	:= F 27.6	DG_L_VOL		(F27.6) GEN (INC) LOWER VOLTAGE SIG	(DG INCOMER) LOWER VOLTAGE
000A	:***				

Segment 3 0016 RAISE VOLTS (DG INCOMER) Address	Oprt	Absolute/ Symbolic - Operand	KT	Operand comment	Line comment
000B	:A I 9.1	RVOLTS		(3X16) RAISE VOLTS SIGNAL FROM SYNCHROTE	
000C	:A F 15.0	DG.INCOM		(F15.0) DG IS INCOMMER FOR SYNCHRONISING	
000D	:AN Q 12.1	Q-LOWERV		(4X4) RELAY 5 FOR LOWER VOLTS	
000E	:= F 27.5	DG_R_VOL		(F27.5) GEN (INC) RAISE VOLTAGE SIG	(DG INCOMER) RAISE VOLTAGE
000F	:***				

Segment 4 0020 LOWER SPEED (DG INCOMER) Address	Oprt	Absolute/ Symbolic - Operand	KT	Operand comment	Line comment
0010	:A I 9.2	LSPEED		(3X17) LOWER SPEED SIGNAL FROM SYNCHROTE	
0011	:A F 15.0	DG.INCOM		(F15.0) DG IS INCOMMER FOR SYNCHRONISING	
0012	:AN Q 16.0	OUTRSPEE		(5X3) RELAY 6 FOR RAISE SPEED	
0013	:= F 27.4	DG_L_SP		(F27.4) GEN (INC) LOWER SPEED SIGNAL	(DG INCOMER) LOWER SPEED
0014	:***				

Segment 5 002A RAISE SPEED (DG INCOMER) Address	Oprt	Absolute/ Symbolic - Operand	KT	Operand comment	Line comment
0015	:A I 9.3	RSPEED		(3X18) RAISE SPEED SIGNAL FROM SYNCHROTE	
0016	:A F 15.0	DG.INCOM		(F15.0) DG IS INCOMMER FOR SYNCHRONISING	
0017	:AN Q 16.1	OUTLSPEE		(5X4) RELAY 7 FOR LOWER SPEED	
0018	:= F 27.3	DG_R_SP		(F27.3) GEN (INC) RAISE SPEED SIGNAL	(DG INCOMMER) RAISE SPEED
0019	:***				

Segment 6 0034 RAISE SPEED SIGNAL Address	Oprt	Absolute/ Symbolic - Operand	KT	Operand comment	Line comment
001A	:A(				
001B	:O F 22.1	R_SPEED	01	(F22.1) SPEED RAISE SIGNAL	
001C	:O F 25.3	BB_R_SP	01	(F25.3) BUSBAR (INC) RAISE SPEED SIGNAL	
001D	:O F 27.3	DG_R_SP	01	(F27.3) GEN (INC) RAISE SPEED SIGNAL	
001E	:O F 6.0		01		
001F	:L KT 200.1		01		
0021	:SP T 60	SP_RAISE	01	(T60) SPEED RAISE TIME	
0022	:NOP 0		01		
0023	:NOP 0		01		
0024	:NOP 0		01		
0025	:A T 60	SP_RAISE	01	(T60) SPEED RAISE TIME	
0026	:)		01		
0027	:C DB 50	DB 50		ALARM DATA BLOCK	
0028	:L DR 1				
0029	:T FY 200				

DATE: 09.07.97 01-07-1997	ENQUIRIES ABOUT THE PROGRAM:	SIEMENS AG	THIS PROGRAM CONTROL THE	THE PROGRAM WAS TESTED	
	ALBERT PRETORIUS: 0135 928679	S5 115 PLC	ENGINE FOR THE 3,3KV DIESEL	AND COMMISSIONED BY PT&M.	PAGE
MODIFICATION REV 2	JOHAN GROBLER 083 228 4536	943 PROCESSOR	GENERATOR AND THE 380V BREAKERS ON THE DIESEL GENERATOR BOARD	THE SOFTWARE DEVELOPMENT	
	AS MOD BY A&J CONTROL SOLUTIONS	SIMATIC S5	Program file : Block: Segm : C:U1DG@@ST.S5D PB 23 1	AND PROGRAMMING WERE DONE BY ALH PRETORIUS & SJ STOLS	23

Synch Control 18

Statement list

Block: PB 30 Symbol: PB 30 Comment: BMA12 CONTROL Lib no.: Length: 109

Segment 1 0000 BMA12 CLOSE COMMAND Address	Oprt	Absolute/ Symbolic - Operand	KT	Operand comment	Line comment
0000	:A(				
0001	:AN F 102.3	12UNHEAL	01	(F102.3) BMA12 SWITCHGEAR UNHEALTHY	
0002	:A F 30.0	12OPEN	01	(F30.0) BMA12 BRKR OPENED	
0003	:AN F 40.1	13CCOMM	01	(F40.1) BMA13 CLOSE COMMAND	
0004	:AN F 40.2	14CCOMM	01	(F40.2) BMA14 CLOSE COMMAND	
0005	:AN F 40.3	15CCOMM	01	(F40.3) BMA15 CLOSE COMMAND	
0006	:AN F 16.2	BBVL.OK	01	(F16.2) BUSBAR VOLTS HEALTHY	
0007	:A(		01		
0008	:O F 30.2	13OPEN	02	(F30.2) BMA13 BRKR OPENED	
0009	:O		02		
000A	:AN F 31.3	F13SERV	02	(F31.3) BMA13 BRKR IN SERVICE	
000B	:AN F 100.3	13.DISCR	02	(F100.3) BMA13 SWITCHGEAR DISCREPANCY	
000C	:)		02		
000D	:A(		01		
000E	:O F 30.4	14OPEN	02	(F30.4) BMA14 BRKR OPENED	
000F	:O		02		
0010	:AN F 31.6	F14SERV	02	(F31.6) BMA14 BRKR IN SERVICE	
0011	:AN F 100.4	14.DISCR	02	(F100.4) BMA14 SWITCHGEAR DISCREPANCY	
0012	:)		02		
0013	:A(		01		
0014	:O F 30.6	15OPEN	02	(F30.6) BMA15 BRKR OPENED	
0015	:O		02		
0016	:AN F 32.1	F15SERV	02	(F32.1) BMA15 BRKR IN SERVICE	
0017	:AN F 100.5	15.DISCR	02	(F100.5) BMA15 SWITCHGEAR DISCREPANCY	
0018	:)		02		
0019	:AN T 32		01		
001A	:AN T 34		01		
001B	:AN T 36		01		
001C	:O		01		
001D	:A F 5.1	FSYNCH12	01	(F5.1) SYNCH SELECT TO BMA12	
001E	:A I 1.3	SCRSIGNA	01	(1X18) IN PHASE SIGNAL FROM SCR	
001F	:A(		01		
0020	:O I 8.5	SYNCHPB	02	(3X8) CLOSE PB FOR SYNCHRONISING	
0021	:O I 5.3	SYNCHCLS	02	(2X18) CLOSE PULSE SIGNAL FROM SYNCHROTR	
0022	:)		02		
0023	:O		01		
0024	:A F 30.0	12OPEN	01	(F30.0) BMA12 BRKR OPENED	
0025	:A F 31.1	F12TEST	01	(F31.1) BMA12 BRKR IN TEST	
0026	:A I 5.2	CLOSE 12	01	(2X17) BMA12 CLOSE PUSHBUTTON	
0027	:AN I 1.2	TRIP12	01	(1X17) BMA12 TRIP PUSHBUTTON	
0028	:AN F 100.2	12.DISCR	01	(F100.2) BMA12 SWITCHGEAR DISCREPANCY	
0029	:)		01		
002A	:AN F 101.4	12CLSFLT		(F101.4) BMA 12 FAILED TO CLOSE	
002B	:L KT 100.0				
002D	:SE T 31				
002E	:NOP 0				
002F	:NOP 0				
0030	:NOP 0				
0031	:A T 31				
0032	:= F 40.0	12CCOMM		(F40.0) BMA12 CLOSE COMMAND	BMA12 CLOSE COMMAND
0033	:***				

Segment 2 0068 CLOSE PREVENT Address	Oprt	Absolute/ Symbolic - Operand	KT	Operand comment	Line comment
0034	:A F 40.0	12CCOMM		(F40.0) BMA12 CLOSE COMMAND	
0035	:L KT 050.0				
0037	:SF T 30				
0038	:NOP 0				
0039	:NOP 0				
003A	:NOP 0				

DATE: 09.07.97 01-07-1997	ENQUIRIES ABOUT THE PROGRAM: ALBERT PRETORIUS: 0135 928679 JOHAN GROBLER 083 228 4536	SIEMENS AG S5 115 PLC 943 PROCESSOR	THIS PROGRAM CONTROL THE ENGINE FOR THE 3,3KV DIESEL GENERATOR AND THE 380V BREAKERS ON THE DIESEL GENERATOR BOARD Program file : Block: Segm : C:U1DG@@ST.S5D PB 30 1	THE PROGRAM WAS TESTED AND COMMISSIONED BY PT&M. THE SOFTWARE DEVELOPMENT AND PROGRAMMING WERE DONE BY ALH PRETORIUS & SJ STOLS
MODIFICATION REV 2	AS MOD BY A&J CONTROL SOLUTIONS	SIMATIC S5		PAGE 25

Statement list

Block: PB 30 Symbol: PB 30 Comment: BMA12 CONTROL Lib no.: Length: 109

Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
003B	:NOP	0				
003C	:***					
Segment 3	007A	BMA12 OPEN COMMAND				
003D	:O	F 25.0	LVBRKRLO		(F25.0) CAG PROTECTION FLAG	
003E	:O(					
003F	:AN	F 16.3	BMA12.OK	01	(F16.3) BMA12 CABLE VOLTS HEALTHY	
0040	:A	F 31.0	F12SERV	01	(F31.0) BMA12 BRKR IN SERVICE	
0041	:A	F 30.1	12CLOSE	01	(F30.1) BMA12 BRKR CLOSED	
0042	:AN	F 16.2	BBVL.OK	01	(F16.2) BUSBAR VOLTS HEALTHY	
0043	:L	KT 010.0		01		
0045	:SD	T 47		01		
0046	:A	T 47		01		
0047	:)			01		
0048	:O					
0049	:A(					
004A	:A	F 31.0	F12SERV	01	(F31.0) BMA12 BRKR IN SERVICE	
004B	:A	F 30.1	12CLOSE	01	(F30.1) BMA12 BRKR CLOSED	
004C	:A	F 31.3	F13SERV	01	(F31.3) BMA13 BRKR IN SERVICE	
004D	:A	F 30.3	13CLOSE	01	(F30.3) BMA13 BRKR CLOSED	
004E	:O			01		
004F	:A	F 31.0	F12SERV	01	(F31.0) BMA12 BRKR IN SERVICE	
0050	:A	F 30.1	12CLOSE	01	(F30.1) BMA12 BRKR CLOSED	
0051	:A	F 31.6	F14SERV	01	(F31.6) BMA14 BRKR IN SERVICE	
0052	:A	F 30.5	14CLOSE	01	(F30.5) BMA14 BRKR CLOSED	
0053	:O			01		
0054	:A	F 31.0	F12SERV	01	(F31.0) BMA12 BRKR IN SERVICE	
0055	:A	F 30.1	12CLOSE	01	(F30.1) BMA12 BRKR CLOSED	
0056	:A	F 32.1	F15SERV	01	(F32.1) BMA15 BRKR IN SERVICE	
0057	:A	F 30.7	15CLOSE	01	(F30.7) BMA15 BRKR CLOSED	
0058	:)			01		
0059	:A	I 1.2	TRIP12		(1X17) BMA12 TRIP PUSHBUTTON	
005A	:O					
005B	:A	F 31.1	F12TEST		(F31.1) BMA12 BRKR IN TEST	
005C	:A	F 30.1	12CLOSE		(F30.1) BMA12 BRKR CLOSED	
005D	:A	I 1.2	TRIP12		(1X17) BMA12 TRIP PUSHBUTTON	
005E	:AN	I 5.2	CLOSE 12		(2X17) BMA12 CLOSE PUSHBUTTON	
005F	:O					
0060	:A	F 18.0	WATT.>		(F18.0) GEN WATTS HIGH	
0061	:A	F 30.7	15CLOSE		(F30.7) BMA15 BRKR CLOSED	
0062	:A	F 31.0	F12SERV		(F31.0) BMA12 BRKR IN SERVICE	
0063	:A	F 30.1	12CLOSE		(F30.1) BMA12 BRKR CLOSED	
0064	:=	F 40.4	12OCOMM		(F40.4) BMA12 OPEN COMMAND	BMA12 OPEN COMMAND
0065	:***					
Segment 4	00CC					
0066	:STL					
0067	:BE					

Kendal CD Cooking

Statement list

Block: PB 31 Symbol: PB 31 Comment: BMA13 CONTROL Lib no.: Length: 112

Segment 1 0000 BMA13 CLOSE COMMAND

Address	Oprt	Absolute/ Symbolic - Operand	KT	Operand comment	Line comment
0000	:A(				
0001	:AN F 102.4	13UNHEAL	01	(F102.4) BMA13 SWITCHGEAR UNHEALTHY	
0002	:A F 30.2	13OPEN	01	(F30.2) BMA13 BRKR OPENED	
0003	:AN F 40.0	12CCOMM	01	(F40.0) BMA12 CLOSE COMMAND	
0004	:AN F 40.2	14CCOMM	01	(F40.2) BMA14 CLOSE COMMAND	
0005	:AN F 40.3	15CCOMM	01	(F40.3) BMA15 CLOSE COMMAND	
0006	:AN F 16.2	BBVL.OK	01	(F16.2) BUSBAR VOLTS HEALTHY	
0007	:A(		01		
0008	:O F 30.0	12OPEN	02	(F30.0) BMA12 BRKR OPENED	
0009	:O		02		
000A	:AN F 31.0	F12SERV	02	(F31.0) BMA12 BRKR IN SERVICE	
000B	:AN F 100.2	12.DISCR	02	(F100.2) BMA12 SWITCHGEAR DISCREPANCY	
000C	:)		02		
000D	:A(		01		
000E	:O F 30.4	14OPEN	02	(F30.4) BMA14 BRKR OPENED	
000F	:O		02		
0010	:AN F 31.6	F14SERV	02	(F31.6) BMA14 BRKR IN SERVICE	
0011	:AN F 100.4	14.DISCR	02	(F100.4) BMA14 SWITCHGEAR DISCREPANCY	
0012	:)		02		
[illegible]3	:A(		01		
[illegible]14	:O F 30.6	15OPEN	02	(F30.6) BMA15 BRKR OPENED	
0015	:O		02		
0016	:AN F 32.1	F15SERV	02	(F32.1) BMA15 BRKR IN SERVICE	
0017	:AN F 100.5	15.DISCR	02	(F100.5) BMA15 SWITCHGEAR DISCREPANCY	
0018	:)		02		
0019	:AN T 30		01		
001A	:AN T 34		01		
001B	:AN T 36		01		
001C	:O		01		
001D	:A F 5.2	FSYNCH13	01	(F5.2) SYNCH SELECT TO BMA13	
001E	:A I 1.3	SCRSIGNA	01	(1X18) IN PHASE SIGNAL FROM SCR	
001F	:A(		01		
0020	:O I 8.5	SYNCHPB	02	(3X8) CLOSE PB FOR SYNCHRONISING	
0021	:O I 5.3	SYNCHCLS	02	(2X18) CLOSE PULSE SIGNAL FROM SYNCHROTE	
0022	:)		02		
0023	:O		01		
0024	:A F 30.2	13OPEN	01	(F30.2) BMA13 BRKR OPENED	
0025	:A F 31.4	F13TEST	01	(F31.4) BMA13 BRKR IN TEST	
0026	:A I 5.1	CLOSE 13	01	(2X16) BMA13 CLOSE PUSHBUTTON	
0027	:AN I 1.1	TRIP13	01	(1X16) BMA12 TRIP PUSHBUTTON	
0028	:AN F 100.3	13.DISCR	01	(F100.3) BMA13 SWITCHGEAR DISCREPANCY	
0029	:)		01		
002A	:AN F 101.5	13CLSFLT		(F101.5) BMA 13 FAILED TO CLOSE	
002B	:L KT 100.0				
[illegible]2D	:SE T 33				
002E	:NOP 0				
002F	:NOP 0				
0030	:NOP 0				
0031	:A T 33				
0032	:= F 40.1	13CCOMM		(F40.1) BMA13 CLOSE COMMAND	BMA13 CLOSE COMMAND
0033	:***				

Segment 2 0068 CLOSE PREVENT TIME

Address	Oprt	Absolute/ Symbolic - Operand	KT	Operand comment	Line comment
0034	:A F 40.1	13CCOMM		(F40.1) BMA13 CLOSE COMMAND	
0035	:L KT 050.0				
0037	:SF T 32				
0038	:NOP 0				
0039	:NOP 0				
003A	:NOP 0				

Statement list

Block: PB 31 Symbol: PB 31 Comment: BMA13 CONTROL Lib no.: Length: 112

```
003B      :NOP 0
003C      :***
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Segment 3 007A BMA13 OPEN COMMAND

Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
003D	:O	F 25.0	LVBRKRLO		(F25.0) CAG PROTECTION FLAG	
003E	:O(					
003F	:AN	F 16.4	BMA13.OK	01	(F16.4) BMA13 CABLE VOLTS HEALTHY	
0040	:A	F 31.3	F13SERV	01	(F31.3) BMA13 BRKR IN SERVICE	
0041	:A	F 30.3	13CLOSE	01	(F30.3) BMA13 BRKR CLOSED	
0042	:AN	F 16.2	BBVL.OK	01	(F16.2) BUSBAR VOLTS HEALTHY	
0043	:L	KT 020.0		01		
0045	:SD	T 48		01		
0046	:NOP	0		01		
0047	:NOP	0		01		
0048	:NOP	0		01		
0049	:A	T, 48		01		
004A	:)			01		
004B	:O					
004C	:A(					
004D	:A	F 31.3	F13SERV	01	(F31.3) BMA13 BRKR IN SERVICE	
004E	:A	F 30.3	13CLOSE	01	(F30.3) BMA13 BRKR CLOSED	
004F	:A	F 31.0	F12SERV	01	(F31.0) BMA12 BRKR IN SERVICE	
0050	:A	F 30.1	12CLOSE	01	(F30.1) BMA12 BRKR CLOSED	
0051	:O			01		
0052	:A	F 31.3	F13SERV	01	(F31.3) BMA13 BRKR IN SERVICE	
0053	:A	F 30.3	13CLOSE	01	(F30.3) BMA13 BRKR CLOSED	
0054	:A	F 31.6	F14SERV	01	(F31.6) BMA14 BRKR IN SERVICE	
0055	:A	F 30.5	14CLOSE	01	(F30.5) BMA14 BRKR CLOSED	
0056	:O			01		
0057	:A	F 31.3	F13SERV	01	(F31.3) BMA13 BRKR IN SERVICE	
0058	:A	F 30.3	13CLOSE	01	(F30.3) BMA13 BRKR CLOSED	
0059	:A	F 32.1	F15SERV	01	(F32.1) BMA15 BRKR IN SERVICE	
005A	:A	F 30.7	15CLOSE	01	(F30.7) BMA15 BRKR CLOSED	
005B	:)			01		
005C	:A	I 1.1	TRIP13		(1X16) BMA13 TRIP PUSHBUTTON	
005D	:O					
005E	:A	F 31.4	F13TEST		(F31.4) BMA13 BRKR IN TEST	
005F	:A	F 30.3	13CLOSE		(F30.3) BMA13 BRKR CLOSED	
0060	:A	I 1.1	TRIP13		(1X16) BMA12 TRIP PUSHBUTTON	
0061	:AN	I 5.1	CLOSE 13		(2X16) BMA13 CLOSE PUSHBUTTON	
0062	:O					
0063	:A	F 18.0	WATT.>		(F18.0) GEN WATTS HIGH	
0064	:A	F 30.7	15CLOSE		(F30.7) BMA15 BRKR CLOSED	
0065	:A	F 31.3	F13SERV		(F31.3) BMA13 BRKR IN SERVICE	
0066	:A	F 30.3	13CLOSE		(F30.3) BMA13 BRKR CLOSED	
0067	:=	F 40.5	13OCOMM		(F40.5) BMA13 OPEN COMMAND	BMA13 OPEN COMMAND
0068	:***					

Segment 4 00D2

Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
0069	:STL					
006A	:BE					

Statement list

Block: PB 32 Symbol: PB 32 Comment: BMA14 CONTROL Lib no.: Length: 112

Segment 1 0000 BMA14 CLOSE COMMAND

Address	Oprt	Absolute/ Symbolic - Operand	KT	Operand comment	Line comment
0000	:A(				
0001	:AN F 102.5	14UNHEAL	01	(F102.5) BMA14 SWITCHGEAR UNHEALTHY	
0002	:A F 30.4	14OPEN	01	(F30.4) BMA14 BRKR OPENED	
0003	:AN F 40.0	12CCOMM	01	(F40.0) BMA12 CLOSE COMMAND	
0004	:AN F 40.1	13CCOMM	01	(F40.1) BMA13 CLOSE COMMAND	
0005	:AN F 40.3	15CCOMM	01	(F40.3) BMA15 CLOSE COMMAND	
0006	:AN F 16.2	BBVL.OK	01	(F16.2) BUSBAR VOLTS HEALTHY	
0007	:A(		01		
0008	:O F 30.0	12OPEN	02	(F30.0) BMA12 BRKR OPENED	
0009	:O		02		
000A	:AN F 31.0	F12SERV	02	(F31.0) BMA12 BRKR IN SERVICE	
000B	:AN F 100.2	12.DISCR	02	(F100.2) BMA12 SWITCHGEAR DISCREPANCY	
000C	:)		02		
000D	:A(		01		
000E	:O F 30.2	13OPEN	02	(F30.2) BMA13 BRKR OPENED	
000F	:O		02		
0010	:AN F 31.3	F13SERV	02	(F31.3) BMA13 BRKR IN SERVICE	
0011	:AN F 100.3	13.DISCR	02	(F100.3) BMA13 SWITCHGEAR DISCREPANCY	
0012	:)		02		
0013	:A(		01		
0014	:O F 30.6	15OPEN	02	(F30.6) BMA15 BRKR OPENED	
0015	:O		02		
0016	:AN F 32.1	F15SERV	02	(F32.1) BMA15 BRKR IN SERVICE	
0017	:AN F 100.5	15.DISCR	02	(F100.5) BMA15 SWITCHGEAR DISCREPANCY	
0018	:)		02		
0019	:AN T 30		01		
001A	:AN T 32		01		
001B	:AN T 36		01		
001C	:O		01		
001D	:A F 5.3	FSYNCH14	01	(F5.3) SYNCH SELECT TO BMA14	
001E	:A I 1.3	SCRSIGNA	01	(1X18) IN PHASE SIGNAL FROM SCR	
001F	:A(		01		
0020	:O I 8.5	SYNCHPB	02	(3X8) CLOSE PB FOR SYNCHRONISING	
0021	:O I 5.3	SYNCHCLS	02	(2X18) CLOSE PULSE SIGNAL FROM SYNCHROTE	
0022	:)		02		
0023	:O		01		
0024	:A F 30.4	14OPEN	01	(F30.4) BMA14 BRKR OPENED	
0025	:A F 31.7	F14TEST	01	(F31.7) BMA14 BRKR IN TEST	
0026	:A I 5.0	CLOSE 14	01	(2X15) BMA14 CLOSE PUSHBUTTON	
0027	:AN I 1.0	TRIP14	01	(1X15) BMA14 TRIP PUSHBUTTON	
0028	:AN F 100.4	14.DISCR	01	(F100.4) BMA14 SWITCHGEAR DISCREPANCY	
0029	:)		01		
002A	:AN F 101.6	14CLSFLT		(F101.6) BMA 14 FAILED TO CLOSE	
002B	:L KT 100.0				
002C	:SE T 35				
002E	:NOP 0				
002F	:NOP 0				
0030	:NOP 0				
0031	:A T 35				
0032	:= F 40.2	14CCOMM		(F40.2) BMA14 CLOSE COMMAND	BMA14 CLOSE COMMAND
0033	:***				

Segment 2 0068 CLOSE PREVENT

Address	Oprt	Absolute/ Symbolic - Operand	KT	Operand comment	Line comment
0034	:A F 40.2	14CCOMM		(F40.2) BMA14 CLOSE COMMAND	
0035	:L KT 050.0				
0037	:SF T 34				
0038	:NOP 0				
0039	:NOP 0				
003A	:NOP 0				

DATE: 09.07.97 01-07-1997	ENQUIRIES ABOUT THE PROGRAM:	SIEMENS AG	THIS PROGRAM CONTROL THE	THE PROGRAM WAS TESTED
	ALBERT PRETORIUS: 0135 928679	S5 115 PLC	ENGINE FOR THE 3,3KV DIESEL	AND COMMISSIONED BY PT&M.
MODIFICATION REV 2	JOHAN GROBLER 083 228 4536	943 PROCESSOR	GENERATOR AND THE 380V BREAKERS	PAGE
	AS MOD BY A&J CONTROL SOLUTIONS	SIMATIC S5	ON THE DIESEL GENERATOR BOARD Program file : Block: Segm : C:U1DG@@ST.S5D PB 32 1	THE SOFTWARE DEVELOPMENT AND PROGRAMMING WERE DONE BY ALH PRETORIUS & SJ STOLS 29

Statement list

Block: PB 32 Symbol: PB 32 Comment: BMA14 CONTROL Lib no.: Length: 112

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003B      :NOP 0
003C      :***
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Segment 3 007A BMA14 OPEN COMMAND

Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
003D	:O	F 25.0	LVBRKRLO		(F25.0) CAG PROTECTION FLAG	
003E	:O(					
003F	:AN	F 16.5	BMA14.OK	01	(F16.5) BMA14 CABLE VOLTS HEALTHY	
0040	:A	F 31.6	F14SERV	01	(F31.6) BMA14 BRKR IN SERVICE	
0041	:A	F 30.5	14CLOSE	01	(F30.5) BMA14 BRKR CLOSED	
0042	:AN	F 16.2	BBVL.OK	01	(F16.2) BUSBAR VOLTS HEALTHY	
0043	:L	KT 020.0		01		
0045	:SD	T 42	T42	01	(T42)	
0046	:NOP	0		01		
0047	:NOP	0		01		
0048	:NOP	0		01		
0049	:A	T 42	T42	01	(T42)	
004A	:)			01		
004B	:O					
004C	:A(					
004D	:A	F 31.6	F14SERV	01	(F31.6) BMA14 BRKR IN SERVICE	
004E	:A	F 30.5	14CLOSE	01	(F30.5) BMA14 BRKR CLOSED	
[illegible]	:A	F 31.0	F12SERV	01	(F31.0) BMA12 BRKR IN SERVICE	
[illegible]	:A	F 30.1	12CLOSE	01	(F30.1) BMA12 BRKR CLOSED	
0051	:O			01		
0052	:A	F 31.6	F14SERV	01	(F31.6) BMA14 BRKR IN SERVICE	
0053	:A	F 30.5	14CLOSE	01	(F30.5) BMA14 BRKR CLOSED	
0054	:A	F 31.3	F13SERV	01	(F31.3) BMA13 BRKR IN SERVICE	
0055	:A	F 30.3	13CLOSE	01	(F30.3) BMA13 BRKR CLOSED	
0056	:O			01		
0057	:A	F 31.6	F14SERV	01	(F31.6) BMA14 BRKR IN SERVICE	
0058	:A	F 30.5	14CLOSE	01	(F30.5) BMA14 BRKR CLOSED	
0059	:A	F 32.1	F15SERV	01	(F32.1) BMA15 BRKR IN SERVICE	
005A	:A	F 30.7	15CLOSE	01	(F30.7) BMA15 BRKR CLOSED	
005B	:)			01		
005C	:A	I 1.0	TRIP14		(1X15) BMA14 TRIP PUSHBUTTON	
005D	:O					
005E	:A	F 31.7	F14TEST		(F31.7) BMA14 BRKR IN TEST	
005F	:A	F 30.5	14CLOSE		(F30.5) BMA14 BRKR CLOSED	
0060	:A	I 1.0	TRIP14		(1X15) BMA14 TRIP PUSHBUTTON	
0061	:AN	I 5.0	CLOSE 14		(2X15) BMA14 CLOSE PUSHBUTTON	
0062	:O					
0063	:A	F 18.0	WATT.>		(F18.0) GBN WATTS HIGH	
0064	:A	F 30.7	15CLOSE		(F30.7) BMA15 BRKR CLOSED	
0065	:A	F 31.6	F14SERV		(F31.6) BMA14 BRKR IN SERVICE	
0066	:A	F 30.5	14CLOSE		(F30.5) BMA14 BRKR CLOSED	
0067	:=	F 40.6	14OCOMM		(F40.6) BMA14 OPEN COMMAND	BMA14 OPE COMMAND
[illegible]	:***					

Segment 4 00D2

Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
0069	:STL					
006A	:BE					

DATE: 09.07.97 01-07-1997	ENQUIRIES ABOUT THE PROGRAM: ALBERT PRETORIUS: 0135 928679 JOHAN GROBLER 083 228 4536	SIEMENS AG S5 115 PLC 943 PROCESSOR	THIS PROGRAM CONTROL THE ENGINE FOR THE 3,3KV DIESEL GENERATOR AND THE 380V BREAKERS ON THE DIESEL GENERATOR BOARD Program file : Block: Segm :	THE PROGRAM WAS TESTED AND COMMISSIONED BY PT&M. THE SOFTWARE DEVELOPMENT AND PROGRAMMING WERE DONE BY ALH PRETORIUS & SJ STOLS
MODIFICATION REV 2	AS MOD BY A&J CONTROL SOLUTIONS	SIMATIC S5	C:U1DG@@ST.S5D PB 32 2	PAGE 30

Statement list

Block: PB 33 Symbol: PB 33 Comment: BMA15 CONTROL Lib no.: Length: 108

Segment 1 0000 BMA15 CLOSE COMMAND

Address	Oprt	Absolute/ Symbolic - Operand	KT	Operand comment	Line comment
0000	:A(				
0001	:AN F 101.1	15UNHEAL	01	(F101.1) BMA 15 SWITCHGEAR UNHEALTHY	
0002	:AN F 27.1	15VLT<	01	(F27.1) GEN VOLTS LOW	
0003	:AN F 17.1	FREQ.<	01	(F17.1) GEN FREQUENCY LOW	
0004	:A F 30.6	15OPEN	01	(F30.6) BMA15 BRKR OPENED	
0005	:AN F 40.0	12CCOMM	01	(F40.0) BMA12 CLOSE COMMAND	
0006	:AN F 40.1	13CCOMM	01	(F40.1) BMA13 CLOSE COMMAND	
0007	:AN F 40.2	14CCOMM	01	(F40.2) BMA14 CLOSE COMMAND	
0008	:A(		01		
0009	:O F 30.0	12OPEN	02	(F30.0) BMA12 BRKR OPENED	
000A	:O		02		
000B	:AN F 31.0	F12SERV	02	(F31.0) BMA12 BRKR IN SERVICE	
000C	:AN F 100.2	12.DISCR	02	(F100.2) BMA12 SWITCHGEAR DISCREPANCY	
000D	:)		02		
000E	:A(		01		
000F	:O F 30.2	13OPEN	02	(F30.2) BMA13 BRKR OPENED	
0010	:O		02		
0011	:AN F 31.3	F13SERV	02	(F31.3) BMA13 BRKR IN SERVICE	
0012	:AN F 100.3	13.DISCR	02	(F100.3) BMA13 SWITCHGEAR DISCREPANCY	
0013	:)		02		
0014	:A(		01		
0015	:O F 30.4	14OPEN	02	(F30.4) BMA14 BRKR OPENED	
0016	:O		02		
0017	:AN F 31.6	F14SERV	02	(F31.6) BMA14 BRKR IN SERVICE	
0018	:AN F 100.4	14.DISCR	02	(F100.4) BMA14 SWITCHGEAR DISCREPANCY	
0019	:)		02		
001A	:AN T 30		01		
001B	:AN T 32		01		
001C	:AN T 34		01		
001D	:O		01		
001E	:A F 5.4	FSYNCH15	01	(F5.4) SYNCH SELECT TO BMA15	
001F	:A I 1.3	SCRSIGNA	01	(1X18) IN PHASE SIGNAL FROM SCR	
0020	:A(		01		
0021	:O I 8.5	SYNCHPB	02	(3X8) CLOSE PB FOR SYNCHRONISING	
0022	:O I 5.3	SYNCHCLS	02	(2X18) CLOSE PULSE SIGNAL FROM SYNCHROTE	
0023	:)		02		
0024	:O		01		
0025	:A F 30.6	15OPEN	01	(F30.6) BMA15 BRKR OPENED	
0026	:A F 32.2	F15TEST	01	(F32.2) BMA15 BRKR IN TEST	
0027	:A I 4.7	CLOSE 15	01	(2X10) BMA15 CLOSE PUSHBUTTON	
0028	:AN I 0.7	TRIP15	01	(1X10) BMA15 TRIP PUSHBUTTON	
0029	:AN F 100.5	15.DISCR	01	(F100.5) BMA15 SWITCHGEAR DISCREPANCY	
002A	:)		01		
002B	:AN F 101.7	15CLSFLT		(F101.7) BMA 15 FAILED TO CLOSE	
002C	:L KT 100.0				
002E	:SE T 37				
002F	:NOP 0				
0030	:NOP 0				
0031	:NOP 0				
0032	:A T 37				
0033	:= F 40.3	15CCOMM		(F40.3) BMA15 CLOSE COMMAND	BMA15 CLOSE COMMAND
0034	:***				

Segment 2 006A CLOSE PREVENT

Address	Oprt	Absolute/ Symbolic - Operand	KT	Operand comment	Line comment
0035	:A F 40.3	15CCOMM		(F40.3) BMA15 CLOSE COMMAND	
0036	:L KT 050.0				
0038	:SF T 36				
0039	:NOP 0				
003A	:NOP 0				

92

Statement list

Block: PB 33 Symbol: PB 33 Comment: BMA15 CONTROL Lib no.: Length: 108

003B	:NOP	0							
003C	:NOP	0							
003D	:***								
Segment 3	007C BMA15 OPEN COMMAND								
Address	Oprt	Absolute/	Symbolic -	Operand	KT	Operand comment			Line comment
003E	:O	F	25.0	LVBRKRLO		(F25.0) CAG PROTECTION FLAG			
003F	:O(								
0040	:AN	F	16.6	BMA15.OK	01	(F16.6) BMA15 CABLE VOLTS HEALTHY			
0041	:A	F	32.1	F15SERV	01	(F32.1) BMA15 BRKR IN SERVICE			
0042	:A	F	30.7	15CLOSE	01	(F30.7) BMA15 BRKR CLOSED			
0043	:AN	F	16.2	BBVL.OK	01	(F16.2) BUSBAR VOLTS HEALTHY			
0044	:L	KT	020.0		01				
0046	:SD	T	43	T43	01	(T43)			
0047	:NOP	0			01				
0048	:NOP	0			01				
0049	:NOP	0			01				
004A	:A	T	43	T43	01	(T43)			
004B	:)				01				
004C	:O								
004D	:A(								
004E	:A	F	32.1	F15SERV	01	(F32.1) BMA15 BRKR IN SERVICE			
004F	:A	F	30.7	15CLOSE	01	(F30.7) BMA15 BRKR CLOSED			
0050	:A	F	31.0	F12SERV	01	(F31.0) BMA12 BRKR IN SERVICE			
0051	:A	F	30.1	12CLOSE	01	(F30.1) BMA12 BRKR CLOSED			
0052	:O				01				
0053	:A	F	31.6	F14SERV	01	(F31.6) BMA14 BRKR IN SERVICE			
0054	:A	F	30.7	15CLOSE	01	(F30.7) BMA15 BRKR CLOSED			
0055	:A	F	31.3	F13SERV	01	(F31.3) BMA13 BRKR IN SERVICE			
0056	:A	F	30.3	13CLOSE	01	(F30.3) BMA13 BRKR CLOSED			
0057	:O				01				
0058	:A	F	32.1	F15SERV	01	(F32.1) BMA15 BRKR IN SERVICE			
0059	:A	F	30.7	15CLOSE	01	(F30.7) BMA15 BRKR CLOSED			
005A	:A	F	31.6	F14SERV	01	(F31.6) BMA14 BRKR IN SERVICE			
005B	:A	F	30.5	14CLOSE	01	(F30.5) BMA14 BRKR CLOSED			
005C	:)				01				
005D	:A	I	0.7	TRIP15		(1X10) BMA15 TRIP PUSHBUTTON			
005E	:O								
005F	:A	F	32.2	F15TEST		(F32.2) BMA15 BRKR IN TEST			
0060	:A	F	30.7	15CLOSE		(F30.7) BMA15 BRKR CLOSED			
0061	:A	I	0.7	TRIP15		(1X10) BMA15 TRIP PUSHBUTTON			
0062	:AN	I	4.7	CLOSE 15		(2X10) BMA15 CLOSE PUSHBUTTON			
0063	~~:=~~	~~F~~	~~40.7~~	~~15OCOMM~~		~~(F40.7) BMA15 OPEN COMMAND~~			~~BMA15 OPEN COMMAND~~
0064	:***								
Segment 4	00CA								
Address	Oprt	Absolute/	Symbolic -	Operand	KT	Operand comment			Line comment
0065	:STL								
0066	:BE								

O

A F 101.7 IS CLSFLT (F101.7) BMA IS Failed To Close

A F 20.1 ENGTESTF (F 20.1) Engine Test Switch is 'TEST'

= F 40.7 IS OCOMM (F40.7) BMA IS OPEN COMMAND : BMA IS OPEN COMMAND

DATE: 09.07.97 01-07-1997	ENQUIRIES ABOUT THE PROGRAM:	SIEMENS AG	THIS PROGRAM CONTROL THE	THE PROGRAM WAS TESTED	
	ALBERT PRETORIUS: 0135 928679	S5 115 PLC	ENGINE FOR THE 3,3KV DIESEL	AND COMMISSIONED BY PT&M.	
MODIFICATION REV 2	JOHAN GROBLER 083 228 4536	943 PROCESSOR	GENERATOR AND THE 380V BREAKERS		PAGE
	AS MOD BY A&J CONTROL SOLUTIONS	SIMATIC S5	ON THE DIESEL GENERATOR BOARD Program file : Block: Segm : C:U1DG@@ST.S5D PB 33 2	THE SOFTWARE DEVELOPMENT AND PROGRAMMING WERE DONE BY ALH PRETORIUS & SJ STOLS	32

PB 34 — 00 BDE 01 Control

Segment 1

A F 101.7 BMA is Failed to Close
A F 20.1 Engine in "Test"
= F 36.7 00 BDE 01 OPEN Command.

DMS 1654
21/6/00. Done

Statement list

Block: PB 45 Symbol: Comment: Lib no.: Length: 27

Segment 1 0000 BMA12 SYNCHRONISE WITH B/B's						
Address	Oprt	Absolute/	Symbolic -	Operand	KT	Operand comment	Line comment
0000	:A	I	1.4	SW4BMA12		(1X19) SYNCH SWITCH (SW4) SET TO BMA12	
0001	:A	I	5.4	BMA12SYN		(2X19) SYNCH SWITCH (SW4) SET TO BMA12	
0002	:AN	F	102.3	12UNHEAL		(F102.3) BMA12 SWITCHGEAR UNHEALTHY	
0003	:=	F	5.1	FSYNCH12		(F5.1) SYNCH SELECT TO BMA12	SYNCH SELECTED TO BMA12
0004	:***						

Segment 2 000A BMA13 SYNCHRONISE WITH B/B's						
Address	Oprt	Absolute/	Symbolic -	Operand	KT	Operand comment	Line comment
0005	:A	I	1.5	SW4BMA13		(1X20) SYNCH SWITCH (SW4) SET TO BMA13	
0006	:A	I	5.5	BMA13SYN		(2X20) SYNCH SWITCH (SW4) SET TO BMA13	
0007	:AN	F	102.4	13UNHEAL		(F102.4) BMA13 SWITCHGEAR UNHEALTHY	
0008	:=	F	5.2	FSYNCH13		(F5.2) SYNCH SELECT TO BMA13	SYNCH SELECTED TO BMA13
0009	:***						

Segment 3 0014 BMA14 SYNCHRONISE WITH B/B						
Address	Oprt	Absolute/	Symbolic -	Operand	KT	Operand comment	Line comment
000A	:A	I	1.6	SW4BMA14		(1X21) SYNCH SWITCH (SW4) SET TO BMA14	
000B	:A	I	5.6	BMA14SYN		(2X21) SYNCH SWITCH (SW4) SET TO BMA14	
000C	:AN	F	102.5	14UNHEAL		(F102.5) BMA14 SWITCHGEAR UNHEALTHY	
000D	:=	F	5.3	FSYNCH14		(F5.3) SYNCH SELECT TO BMA14	SYNCH SELECTED TO BMA14
000E	:***						

Segment 4 001E BMA15 SYNCHRONISE WITH B/B						
Address	Oprt	Absolute/	Symbolic -	Operand	KT	Operand comment	Line comment
000F	:A	I	1.7	SW4BMA15		(1X22) SYNCH SWITCH (SW4) SET TO BMA15	
0010	:A	I	5.7	BMA15SYN		(2X22) SYNCH SWITCH (SW4) SET TO BMA15	
0011	:AN	F	101.1	15UNHEAL		(F101.1) BMA 15 SWITCHGEAR UNHEALTHY	
0012	:=	F	5.4	FSYNCH15		(F5.4) SYNCH SELECT TO BMA15	SYNCH SELECTED TO BMA15
0013	:***						

Segment 5 0028						
Address	Oprt	Absolute/	Symbolic -	Operand	KT	Operand comment	Line comment
0014	:STL						
0015	:BE						

Statement list

Block: PB 49 Symbol: PB 49 Comment: AUTO SYNCHRONISE Lib no.: Length: 37

Segment 1 0000 PRE LOAD CONDITION

Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
0000	:A	F 32.1	F15SERV		(F32.1) BMA15 BRKR IN SERVICE	
0001	:A	F 30.7	15CLOSE		(F30.7) BMA15 BRKR CLOSED	
0002	:A(					
0003	:A	F 31.0	F12SERV	01	(F31.0) BMA12 BRKR IN SERVICE	
0004	:A	F 30.1	12CLOSE	01	(F30.1) BMA12 BRKR CLOSED	
0005	:O			01		
0006	:A	F 31.3	F13SERV	01	(F31.3) BMA13 BRKR IN SERVICE	
0007	:A	F 30.3	13CLOSE	01	(F30.3) BMA13 BRKR CLOSED	
0008	:O			01		
0009	:A	F 31.6	F14SERV	01	(F31.6) BMA14 BRKR IN SERVICE	
000A	:A	F 30.5	14CLOSE	01	(F30.5) BMA14 BRKR CLOSED	
000B	:)			01		
000C	:=	F 5.7				
000D	:***					

Segment 2 001C PRE LOAD DIESEL GEN

Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
000E	:A	F 5.7				
000F	:AN	F 5.6				
0010	:=	F 5.5				
0011	:A	F 5.5				
0012	:S	F 5.6				
0013	:ON	F 5.7				
0014	:O	F 30.6	15OPEN		(F30.6) BMA15 BRKR OPENED	
0015	:R	F 5.6				
0016	:NOP	0				
0017	:***					

Segment 3 0030 RAISE WATT SET FLAG

Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
0018	:A	F 5.5				
0019	:S	F 6.0				
001A	:AN	F 17.0	WATT.<		(F17.0) GEN WATTS LOW	
001B	:R	F 6.0				
001C	:NOP	0				
001D	:***					

Segment 4 003C

Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
001E	:STL					
001F	:BE					

Statement list

Block: PB 50 Symbol: PB 50 Comment: ALARM Lib no.: Length: 264

Segment 1 0000 Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
0000	:C	DB 50	DB 50		ALARM DATA BLOCK	Call alarm DB
0001	:L	KB 0				
0002	:T	FY 200				Reset temp flag
0003	:					
0004	:AN	T 50	T50		(T50) TIMER 1 FOR FAST FLASHER	Generate a clock pulse
0005	:L	KT 030.0				every 300 milli seconds
0007	:SE	T 50	T50		(T50) TIMER 1 FOR FAST FLASHER	
0008	:CU	C 50				
0009	:					
000A	:L	C 50				
000B	:T	FY 200				
000C	:T	DR 1				
000D	:A	F 200.4				
000E	:R	C 50				
000F	:***					

Segment 2 0020 380V BRD BREAKERS LOCK-OUT Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
0010	:A	F 25.0	LVBRKRLO		(F25.0) CAG PROTECTION FLAG	
0011	:=	Q 19.4	SWLOCKOU		(5X43) 380V CONTROL LOCKOUT	380V CONTROL LOCKOUT
0012	:***					

Segment 3 0026 DG FAILED TO START Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
0013	:C	DB 50	DB 50		ALARM DATA BLOCK	ALARM DB
0014	:L	KF +3				
0016	:T	DW 0				
0017	:JU	FB 50	FB 50		ALARM FUNCTION BLOCK	
0018 Name	:ALARMS					
0019 ALRM	:	F 100.0	DGFAIL		(F100.0) DG GEN FAIL TO START	
001A OUTP	:	Q 19.3	DG.FAILS		(5X42) DG FAIL TO START	DG FAIL TO START
001B	:***					

Segment 4 0038 D.G. VOLTAGE UNHEALTHY Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
001C	:L	KF +5				
001E	:T	DW 0				
001F	:JU	FB 50	FB 50		ALARM FUNCTION BLOCK	
0020 Name	:ALARMS					
0021 ALRM	:	F 25.1	GENVLT		(F25.1) ALTERNATOR VOLTAGE SENSING	
0022 OUTP	:	Q 18.6	OUTVOLT		(5X33) 3,3KV VOLTAGE UNHEALTHY	3.3kV VOLTAGE UNHEALTHY
0023	:***					

Segment 5 0048 SWITCHGEAR DISCR.BMA 12 Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
0024	:L	KF +6				
0026	:T	DW 0				
0027	:JU	FB 50	FB 50		ALARM FUNCTION BLOCK	
0028 Name	:ALARMS					
0029 ALRM	:	F 100.2	12.DISCR		(F100.2) BMA12 SWITCHGEAR DISCREPANCY	
002A OUTP	:	Q 13.4	12-DISCR		(4X19) BMA12 S/G DISCP	BMA12 SWITCHGEAR DISCREPANCY
002B	:***					

Statement list

Block: PB 50 Symbol: PB 50 Comment: ALARM Lib no.: Length: 264

Segment 6 0058 BMA 13 SWITCHGEAR DISCREPANCY Address |Oprt| Absolute/ Symbolic - Operand	KT	Operand comment	Line comment
002C :L KF +7 002E :T DW 0 002F :JU FB 50 FB 50 0030 Name :ALARMS 0031 ALRM : F 100.3 13.DISCR 0032 OUTP : Q 13.5 13-DISCR 0033 :***		ALARM FUNCTION BLOCK (F100.3) BMA13 SWITCHGEAR DISCREPANCY (4X20) BMA13 S/G DISCP	BMA13 SWITCHGEAR DISCREPANCY
Segment 7 0068 BMA 14 SWITCHGEAR DISCREPANCY Address |Oprt| Absolute/ Symbolic - Operand	KT	Operand comment	Line comment
0034 :L KF +8 0036 :T DW 0 0037 :JU FB 50 FB 50 0038 Name :ALARMS 0039 ALRM : F 100.4 14.DISCR 003A OUTP : Q 13.6 14-DISCR 003B :***		ALARM FUNCTION BLOCK (F100.4) BMA14 SWITCHGEAR DISCREPANCY (4X21) BMA14 S/G DISCP	BMA14 SWITCHGEAR DISCREPANCY
ent 8 0078 BMA 15 SWITCHGEAR DISCREPANCY ddress |Oprt| Absolute/ Symbolic - Operand	KT	Operand comment	Line comment
003C :L KF +9 003E :T DW 0 003F :JU FB 50 FB 50 0040 Name :ALARMS 0041 ALRM : F 100.5 15.DISCR 0042 OUTP : Q 13.7 15-DISCR 0043 :***		ALARM FUNCTION BLOCK (F100.5) BMA15 SWITCHGEAR DISCREPANCY (4X22) BMA15 S/G DISCP	BMA15 SWITCHGEAR DISCREPANCY
Segment 9 0088 RADIATOR LOW WATER LEVEL Address |Oprt| Absolute/ Symbolic - Operand	KT	Operand comment	Line comment
0044 :L KF +10 0046 :T DW 0 0047 :JU FB 50 FB 50 0048 Name :ALARMS 0049 ALRM : F 21.1 WATER.LO 004A OUTP : Q 14.4 Q-RADLOW 004B :***		ALARM FUNCTION BLOCK (F21.1) WATER LEVEL LOW (4X31) RAD LOW WATER LEVEL	RADIATOR LOW WATER LEVEL
Segment 10 0098 LOW OIL PRESSURE STAGE 2 Address |Oprt| Absolute/ Symbolic - Operand	KT	Operand comment	Line comment
C :L KF +11 4B :T DW 0 004F :JU FB 50 FB 50 0050 Name :ALARMS 0051 ALRM : F 100.6 LOILP.S2 0052 OUTP : Q 14.5 Q-LOPTRP 0053 :***		ALARM FUNCTION BLOCK (F100.6) LOW OIL PRESSURE STAGE 2 (4X32) LOW OIL PRESSURE TRIP	LOW OIL PRESSURE STAGE 2
Segment 11 00A8 LOW OIL PRESSURE STAGE 1 Address |Oprt| Absolute/ Symbolic - Operand	KT	Operand comment	Line comment
0054 :L KF +12 0056 :T DW 0 0057 :JU FB 50 FB 50 0058 Name :ALARMS 0059 ALRM : F 100.7 LOILP.S1 005A OUTP : Q 14.6 OUTLOPA		ALARM FUNCTION BLOCK (F100.7) LOW OIL PRESSURE STAGE 1 (4X33) LOW OIL PRESSURE ALARM	LOW OIL PRESSURE STAGE 1

Statement list

Block: PB 50 Symbol: PB 50 Comment: ALARM Lib no.: Length: 264

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005B      :***
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Segment 12 00B8 HIGH ENGINE TEMP STAGE 1

Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
005C	:L	KF +13				
005E	:T	DW 0				
005F	:JU	FB 50	FB 50		ALARM FUNCTION BLOCK	
0060 Name	:ALARMS					
0061 ALRM	:	F 21.2	ENGTEMP1		(F21.2) ENGINE TEMP STAGE 1 ALARM	
0062 OUTP	:	Q 14.7	OUTHETT		(4X34) HIGH ENGINE TEMP ALARM	HIGH ENGINE TEMP STAGE 1
0063	:***					

Segment 13 00C8 HIGH ENGINE TEMP STAGE 2

Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
0064	:L	KF +14				
0066	:T	DW 0				
0067	:JU	FB 50	FB 50		ALARM FUNCTION BLOCK	
0068 Name	:ALARMS					
0069 ALRM	:	F 21.3	ENGTEMP2		(F21.3) ENGINE TEMP STAGE 2 ALARM	
006A OUTP	:	Q 15.0	OUTHETA		(4X39) HIGH ENGINE TEMP TRIP	HIGH ENGINE TEMP STAGE 2
006B	:***					

Segment 14 00D8 EMERGENCY STOPS

Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
006C	:L	KF +15				
006E	:T	DW 0				
006F	:JU	FB 50	FB 50		ALARM FUNCTION BLOCK	
0070 Name	:ALARMS					
0071 ALRM	:	F 21.4	EMERGSTP		(F21.4) EMERGENCY STOP	
0072 OUTP	:	Q 15.1	OUTESTOP		(4X40) EMERGENCY STOP	EMERGENCY STOP
0073	:***					

Segment 15 00B8 EMERGENCY START

Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
0074	:L	KF +16				
0076	:T	DW 0				
0077	:JU	FB 50	FB 50		ALARM FUNCTION BLOCK	
0078 Name	:ALARMS					
0079 ALRM	:	F 29.0				
007A OUTP	:	Q 15.2	OUTESTAR		(4X41) EMERGENCY START	EMERGENCY START
007B	:***					

Segment 16 00F8 BATTERY CHARGER FAIL

Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
007C	:L	KF +17				
007E	:T	DW 0				
007F	:JU	FB 50	FB 50		ALARM FUNCTION BLOCK	
0080 Name	:ALARMS					
0081 ALRM	:	F 21.5	CHRGFAIL		(F21.5) CHARGER FAIL	
0082 OUTP	:	Q 15.3	OUTCHFAI		(4X42) BATTERY CHARGER FAIL	BATTERY CHARGER FAIL
0083	:***					

Segment 17 0108 3,3kV SWITCHGEAR UNHEALTHY

Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
0084	:L	KF +18				
0086	:T	DW 0				
0087	:JU	FB 50	FB 50		ALARM FUNCTION BLOCK	
0088 Name	:ALARMS					
0089 ALRM	:	F 102.1	BDE01UN		(F102.1) BDE 01 SWITCHGEAR UNHEALTHY	

DATE: 09.07.97 01-07-1997	ENQUIRIES ABOUT THE PROGRAM: ALBERT PRETORIUS: 0135 928679 JOHAN GROBLER 083 228 4536	SIEMENS AG S5 115 PLC 943 PROCESSOR	THIS PROGRAM CONTROL THE ENGINE FOR THE 3,3KV DIESEL GENERATOR AND THE 380V BREAKERS ON THE DIESEL GENERATOR BOARD Program file : Block: Segm : C:U1DG@@ST.S5D PB 50 11	THE PROGRAM WAS TESTED AND COMMISSIONED BY PT&M. THE SOFTWARE DEVELOPMENT AND PROGRAMMING WERE DONE BY ALH PRETORIUS & SJ STOLS	PAGE 37 +
MODIFICATION REV 2	AS MOD BY A&J CONTROL SOLUTIONS	SIMATIC S5			

Statement list

Block: PB 50 Symbol: PB 50 Comment: ALARM Lib no.: Length: 264

008A OUTP : Q 15.4 BDE01UNH		(4X43) 3.3KV SWITCHGEAR UNHEALTHY	3.3kV SWITCHGEAR UNHEALTHY
008B :***			

Segment 18 0118 BMA 15 SWITCHGEAR UNHEALTHY

Address	Oprt	Absolute/ Symbolic - Operand	KT	Operand comment	Line comment
008C	:L	KF +19			
008E	:T	DW 0			
008F	:JU	FB 50 FB 50		ALARM FUNCTION BLOCK	
0090 Name	:ALARMS				
0091 ALRM :		F 101.1 15UNHEAL		(F101.1) BMA 15 SWITCHGEAR UNHEALTHY	
0092 OUTP :		Q 15.5 15SWUNH		(4X44) BMA 15 380V DG SWITCHGEAR UNHEAL	BMA15 SWITCHGEAR UNHEALTHY
0093	:***				

Segment 19 0128 380V DG BRD DC FAIL

Address	Oprt	Absolute/ Symbolic - Operand	KT	Operand comment	Line comment
0094	:L	KF +20			
0096	:T	DW 0			
0097	:JU	FB 50 FB 50		ALARM FUNCTION BLOCK	
0098 Name	:ALARMS				
0099 ALRM :		F 101.2 BMA DCFL		(F101.2) 380V DG BOARD DC FAIL	
009A OUTP :		Q 15.6 CNTDCFAI		(4X45) 380V DG DC FAIL	380V DG BRD DC FAIL
009B	:***				

Segment 20 0138 TRANSFORMER WINDING TEMP

Address	Oprt	Absolute/ Symbolic - Operand	KT	Operand comment	Line comment
009C	:L	KF +21			
009E	:T	DW 0			
009F	:JU	FB 50 FB 50		ALARM FUNCTION BLOCK	
00A0 Name	:ALARMS				
00A1 ALRM :		I 6.5 WTEMPALM		(2X32) TRANSFORMER WINDING TEMP ALARM	
00A2 OUTP :		Q 15.7 TRF DCFA		(4X46) TRANSFORMER DC FAIL ALARM	TRANSFORMER WINDING TEMP
00A3	:***				

Segment 21 0148 BMA 12 BREAKER CLOSE FAIL

Address	Oprt	Absolute/ Symbolic - Operand	KT	Operand comment	Line comment
00A4	:L	KF +22			
00A6	:T	DW 0			
00A7	:JU	FB 50 FB 50		ALARM FUNCTION BLOCK	
00A8 Name	:ALARMS				
00A9 ALRM :		F 101.4 12CLSFLT		(F101.4) BMA 12 FAILED TO CLOSE	
00AA OUTP :		Q 17.2 12CLFAIL		(5X17) BMA12 BRKR CLOSE FAIL	BMA12 BREAKER CLOSE FAIL
00AB	:***				

Segment 22 0158 BMA 13 BREAKER CLOSE FAIL

Address	Oprt	Absolute/ Symbolic - Operand	KT	Operand comment	Line comment
00AC	:L	KF +23			
00AE	:T	DW 0			
00AF	:JU	FB 50 FB 50		ALARM FUNCTION BLOCK	
00B0 Name	:ALARMS				
00B1 ALRM :		F 101.5 13CLSFLT		(F101.5) BMA 13 FAILED TO CLOSE	
00B2 OUTP :		Q 17.3 13CLFAIL		(5X18) BMA13 BRKR CLOSE FAIL	BMA13 BREAKER CLOSE FAIL
00B3	:***				

Segment 23 0168 BMA 14 BREAKER CLOSE FAIL

Address	Oprt	Absolute/ Symbolic - Operand	KT	Operand comment	Line comment
00B4	:L	KF +24			
00B6	:T	DW 0			
00B7	:JU	FB 50 FB 50		ALARM FUNCTION BLOCK	
00B8 Name	:ALARMS				

Statement list

Block: PB 50 Symbol: PB 50 Comment: ALARM Lib no.: Length: 264

00B9	ALRM :	F	101.6	14CLSFLT		(F101.6) BMA 14 FAILED TO CLOSE	
00BA	OUTP :	Q	17.4	14CLFAIL		(5X19) BMA14 BRKR CLOSE FAIL	BMA14 BREAKER CLOSE FAIL
00BB	:***						

Segment 24 0178 BMA 15 BREAKER CLOSE FAIL

Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
00BC	:L	KF +25				
00BE	:T	DW 0				
00BF	:JU	FB 50	FB 50		ALARM FUNCTION BLOCK	
00C0	Name :ALARMS					
00C1	ALRM :	F	101.7	15CLSFLT	(F101.7) BMA 15 FAILED TO CLOSE	
00C2	OUTP :	Q	17.5	15CLFAIL	(5X20) BMA15 BRKR CLOSE FAIL	BMA15 BREAKER CLOSE FAIL
00C3	:***					

Segment 25 0188 380V DG BRD CABLE VOLTS UNH.

Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
00C4	:L	KF +26				
00C6	:T	DW 0				
00C7	:JU	FB 50	FB 50		ALARM FUNCTION BLOCK	
00C8	Name :ALARMS					
00C9	ALRM :	F	102.0	F102.0		
00CA	OUTP :	Q	17.6	CBLVOLTS	(5X21) 380V CABLE VOLTS UNHEALTHY	380V BRD CABLE VOLTAGR UNHEATHY
00CB	:***					

Segment 26 0198 PLC FAULT

Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
00CC	:AN	F	19.1	PLCERR	(F19.1) PLC ERROR FLAG	
00CD	:=	Q	17.7	PLCFAULT	(5X22) PLC FAULT	PLC FAULT
00CE	:***					

Segment 27 019E TRC FAULTY

Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
00CF	:L	KF +28				
00D1	:T	DW 0				
00D2	:A	I	6.6	BDE01TRC	(2X33) TRC FAULT (BDE01)	
00D3	:=	F	34.0			
00D4	:JU	FB 50	FB 50		ALARM FUNCTION BLOCK	
00D5	Name :ALARMS					
00D6	ALRM :	F	34.0			
00D7	OUTP :	Q	18.0	TRCFAULT	(5X27) TRC FAULT	BDE01 TRC FAULTY
00D8	:***					

Segment 28 01B2 3.3KV SYSTEM DC FAIL

Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
00D9	:L	KF +29				
00DB	:T	DW 0				
00DC	:A	I	2.7	BMY01DC	(1X34) BMY01 DC FAIL	
00DD	:=	F	34.1			
00DE	:JU	FB 50	FB 50		ALARM FUNCTION BLOCK	
00DF	Name :ALARMS					
00E0	ALRM :	F	34.1			
00E1	OUTP :	Q	18.1	01DCFAIL	(5X28) BMY 01 DC FAIL	3.3kV SYSTEM DC FAIL
00E2	:***					

Segment 29 01C6 FUEL <10%

Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
00E3	:L	KF +30				
00E5	:T	DW 0				
00E6	:JU	FB 50	FB 50		ALARM FUNCTION BLOCK	

Statement list

Block: PB 50 Symbol: PB 50 Comment: ALARM Lib no.: Length: 264

```
00E7 Name :ALARMS
00E8 ALRM :     F   21.0    FUEL<10%        (F21.0)  FUEL LOWER THAN 10 %
00E9 OUTP :     Q   18.3    OUTF10          (5X30) FUEL <10%            FUEL <10%
00EA      :***
```

Segment 30 01D6 FUEL <50%

Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
00EB	:L	KF +31				
00ED	:T	DW 0				
00EE	:JU	FB 50	FB 50		ALARM FUNCTION BLOCK	
00EF Name	:ALARMS					
00F0 ALRM	:	F 21.6	FUEL<50%		(F21.6) FUEL LOWER THAN 50 %	
00F1 OUTP	:	Q 18.4	OUTF50		(5X31) FUEL <50%	FUEL <50%
00F2	:***					

Segment 31 01E6 FUEL <95%

Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
00F3	:L	KF +32				
00F5	:T	DW 0				
00F6	:JU	FB 50	FB 50		ALARM FUNCTION BLOCK	
00F7 Name	:ALARMS					
00F8 ALRM	:	F 21.7	FUEL>95%		(F21.7) FUEL >95% DAY TANK	
00F9 OUTP	:	Q 18.5	OUTF95		(5X32) FUEL <95%	FUEL <95%
00FA	:***					

Segment 32 01F6 3,3KV DG FUEL LOW

Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
00FB	:L	KF +33				
00FD	:T	DW 0				
00FE	:JU	FB 50	FB 50		ALARM FUNCTION BLOCK	
00FF Name	:ALARMS					
0100 ALRM	:	F 21.6	FUEL<50%		(F21.6) FUEL LOWER THAN 50 %	
0101 OUTP	:	Q 18.4	OUTF50		(5X31) FUEL <50%	DG FUEL LOW
0102	:BE					

Statement list

Block: PB 51 Symbol: PB 51 Comment: FUNCTION RELAYS Lib no.: Length: 61

Segment 1 0000 UNDER VOLT & F BLOCK

Address	Oprt	Absolute/ Symbolic - Operand	KT	Operand comment	Line comment
0000	:ON	F 20.7 ENGRUNF		(F20.7) ENGINE RUNNING	
0001	:ON	Q 19.1 FUELSOL		(5X40) RELAY 1 FOR FUEL SOLENOIDE	
0002	:L	KT 020.2			
0004	:SF	T 80			
0005	:NOP	0			
0006	:NOP	0			
0007	:NOP	0			
0008	:A	T 80			
0009	:=	Q 13.3 Q-<U&<F		(4X18) RELAY 8 FOR <FREQ & <VOLT BLOCK	LV & LF BLOCK
000A	:***				

Segment 2 0016 COMMON FUEL ALARM TO STN CONTROL

Address	Oprt	Absolute/ Symbolic - Operand	KT	Operand comment	Line comment
000B	:AN	I 3.0 DTANK10		(1X39) DAY TANK <10%	
000C	:=	Q 14.0 C.FUELAL		(4X27) RELAY 9 FOR COMMOM FUEL ALARM	STATION CONTROL - FUEL ALARM
000D	:***				

Segment 3 001C 380 V CHOP/O UNHEALTHY (STN CNT)

Address	Oprt	Absolute/ Symbolic - Operand	KT	Operand comment	Line comment
000E	:O	Q 17.6 CBLVOLTS		(5X21) 380V CABLE VOLTS UNHEALTHY	
000F	:O	F 101.1 15UNHEAL		(F101.1) BMA 15 SWITCHGEAR UNHEALTHY	
0010	:O	F 102.5 14UNHEAL		(F102.5) BMA14 SWITCHGEAR UNHEALTHY	
0011	:O	F 102.4 13UNHEAL		(F102.4) BMA13 SWITCHGEAR UNHEALTHY	
0012	:O	F 102.3 12UNHEAL		(F102.3) BMA12 SWITCHGEAR UNHEALTHY	
0013	:O	F 19.1 PLCERR		(F19.1) PLC ERROR FLAG	
0014	:S	Q 14.1 Q-CHPUNH		(4X28) RELAY 11 FOR 380V CHOPOVER UNHEAL	
0015	:A	I 9.7 ALARMPB		(3X22) ALARM ACKNOWLEDGE PB	
0016	:R	Q 14.1 Q-CHPUNH		(4X28) RELAY 11 FOR 380V CHOPOVER UNHEAL	STATION CONTROL - 380V UNHEALTHY
0017	:NOP	0			
0018	:***				

Segment 4 0032 DIESEL/G SYSTEM UNHEAL (STN CNT)

Address	Oprt	Absolute/ Symbolic - Operand	KT	Operand comment	Line comment
0019	:O	Q 14.4 Q-RADLOW		(4X31) RAD LOW WATER LEVEL	
001A	:O	Q 14.5 Q-LOPTRP		(4X32) LOW OIL PRESSURE TRIP	
001B	:O	Q 14.6 OUTLOPA		(4X33) LOW OIL PRESSURE ALARM	
001C	:O	Q 14.7 OUTHETT		(4X34) HIGH ENGINE TEMP ALARM	
001D	:O	Q 15.0 OUTHETA		(4X39) HIGH ENGINE TEMP TRIP	
001E	:O	Q 15.1 OUTESTOP		(4X40) EMERGENCY STOP	
001F	:O	Q 15.2 OUTESTAR		(4X41) EMERGENCY START	
0020	:O	Q 15.3 OUTCHFAI		(4X42) BATTERY CHARGER FAIL	
21	:O	Q 15.4 BDE01UNH		(4X43) 3.3KV SWITCHGEAR UNHEALTHY	
22	:O	Q 15.7 TRF DCFA		(4X46) TRANSFORMER DC FAIL ALARM	
0023	:ON	Q 17.7 PLCFAULT		(5X22) PLC FAULT	
0024	:O	Q 18.0 TRCFAULT		(5X27) TRC FAULT	
0025	:O	Q 18.1 01DCFAIL		(5X28) BMY 01 DC FAIL	
0026	:O	Q 18.2 BDE03IPT		(5X29) BDE03 IPT RELAY	
0027	:O	Q 18.6 OUTVOLT		(5X33) 3,3KV VOLTAGE UNHEALTHY	
0028	:O	Q 19.3 DG.FAILS		(5X42) DG FAIL TO START	
0029	:O	Q 19.4 SWLOCKOU		(5X43) 380V CONTROL LOCKOUT	
002A	:S	Q 14.3 Q DG.UNH		(4X30) RELAY 10 FOR DIESEL GEN SYSTEM UN	
002B	:A	I 9.7 ALARMPB		(3X22) ALARM ACKNOWLEDGE PB	
002C	:R	Q 14.3 Q DG.UNH		(4X30) RELAY 10 FOR DIESEL GEN SYSTEM UN	STATION CONTROL - DG UNHEALTHY
002D	:NOP	0			
002E	:***				

DATE: 09.07.97 01-07-1997	ENQUIRIES ABOUT THE PROGRAM:		THIS PROGRAM CONTROL THE	THE PROGRAM WAS TESTED	
	ALBERT PRETORIUS: 0135 928679	SIEMENS AG S5 115 PLC	ENGINE FOR THE 3,3KV DIESEL GENERATOR AND THE 380V BREAKERS	AND COMMISSIONED BY PT&M.	
MODIFICATION REV 2	JOHAN GROBLER 083 228 4536	943 PROCESSOR	ON THE DIESEL GENERATOR BOARD	THE SOFTWARE DEVELOPMENT	PAGE
	AS MOD BY A&J CONTROL SOLUTIONS	SIMATIC S5	Program file : Block: Segm : C:U1DG@@ST.S5D PB 51 1	AND PROGRAMMING WERE DONE BY ALH PRETORIUS & SJ STOLS	41 +

Statement list

Block: PB 51 Symbol: PB 51 Comment: FUNCTION RELAYS Lib no.: Length: 61

Segment 5 005E D/G LAP ACTIVE Address	Oprt	Absolute/ Symbolic - Operand	KT	Operand comment	Line comment
002F	:C	DB 50 DB 50		ALARM DATA BLOCK	
0030	:L	DL 1			
0031	:T	FY 200			
0032	:A	F 200.0			
0033	:=	Q 19.6 LAP.ACTI		(5X45) D/G PLC LAP ACTIVE	STATION CONTROL - LAP ACTIVE
0034	:***				

Segment 6 006A 380V D/G BRD BB UNDERVOLTAGE Address	Oprt	Absolute/ Symbolic - Operand	KT	Operand comment	Line comment
0035	:A	F 17.2 BBVL.<		(F17.2) BUSBAR VOLTS LOW	
0036	:=	Q 19.7 BBUNDERV		(5X46) 380V DG BRD UNDERVOLTAGE TO STN C	STATION CONTROL - 380V UV
0037	:BE				

Segment 7 0016 A/GEN URGENT Alarms to Stn Control & Unit Control.

AN I3.0	DTANK10	(6X39) DAYTANK <10 %	
A I2.0	RADLOW	(1X27) RADIATOR low level.	
AN F100.7	LOPA	(F100.7) Low Oil Pressure Alarm Stage 1	
A I2.4	HETA	(1X31) High ENGINE TEMP Alarm	
AN I6.5	WTEMPALM	(2X32) Transformer Winding Temp Alarm	
= Q16.0	URGENT ALARM	(4X27) Relay 9 for URGENT Alarm to Stn Control & Unit Control.	

DATE: 09.07.97 01-07-1997	ENQUIRIES ABOUT THE PROGRAM:	SIEMENS AG	THIS PROGRAM CONTROL THE ENGINE FOR THE 3,3KV DIESEL GENERATOR AND THE 380V BREAKERS ON THE DIESEL GENERATOR BOARD Program file : Block: Segm : C:U1DG@@ST.S5D PB 51 5	THE PROGRAM WAS TESTED AND COMMISSIONED BY PT&M.	
MODIFICATION REV 2	ALBERT PRETORIUS: 0135 928679 JOHAN GROBLER 083 228 4536	S5 115 PLC 943 PROCESSOR		THE SOFTWARE DEVELOPMENT AND PROGRAMMING WERE DONE BY ALH PRETORIUS & SJ STOLS	PAGE 42
	AS MOD BY A&J CONTROL SOLUTIONS	SIMATIC S5			

Statement list

Block: PB 70 Symbol: PB 70 Comment: ANALOG SCALING Lib no.: Length: 85

Segment 1 0000 ANALOG CONVERTIONS

Address	Oprt	Absolute/ Symbolic - Operand	KT	Operand comment	Line comment
0000	:C	DB 70			
0001	:JU	FB 250			
0002 Name	:RLG	:AE			
0003 BG	:	KF +128			
0004 KNKT	:	KY 0,4			CARD ADDRESS (PY128)
0005 OGR	:	KF +1500			GEN WATT ,UNIPOL
0006 UGR	:	KF +0			5mA = 1500 KW
0007 EINZ	:	F 1.0 DUMMY0		(F1.0) PERMANENT 0 SIGNAL	0 mA = 0 MW
0008 XA	:	DW 2			DUMMY 1
0009 FB	:	F 90.0			WATT OUTPUT
000A BU	:	F 91.0			CHANNEL ERROR BIT
000B TBIT	:	F 92.0			RANGE OVERFLOW
000C	:JU	FB 250			SAMPLING STILL ACTIVE
000D Name	:RLG	:AE			
000E BG	:	KF +128			
000F KNKT	:	KY 1,4			CARD ADDRESS (PY130)
0010 OGR	:	KF +5500			GEN FREQUENCY,UNIPOL
0011 UGR	:	KF +4500			5 mA=55 Hz
0012 EINZ	:	F 1.0 DUMMY0		(F1.0) PERMANENT 0 SIGNAL	0 mA=45 Hz
0013 XA	:	DW 4			DUMMY 1
0014 FB	:	F 90.1			GEN FREQUENCY OUTPUT
0015 BU	:	F 91.1			CHANNEL ERROR BIT
0016 TBIT	:	F 92.1			RANGE OVERFLOW
0017	:JU	FB 250			SAMPLING STILL ACTIVE
0018 Name	:RLG	:AE			
0019 BG	:	KF +128			
001A KNKT	:	KY 2,4			CARD ADDRESS (PY132)
001B OGR	:	KF +380			380V DG BRD BUSBAR VOLTS,UNIPOL
001C UGR	:	KF +0			5 mA =380 VOLT
001D EINZ	:	F 1.0 DUMMY0		(F1.0) PERMANENT 0 SIGNAL	0 mA =0 VOLT
001E XA	:	DW 6			DUMMY 1
001F FB	:	F 90.2			BB VOLT OUTPUT
0020 BU	:	F 91.2			CHANNEL ERROR BIT
0021 TBIT	:	F 92.2			RANGE OVERFLOW
0022	:JU	FB 250			SAMPLING STILL BUSY
0023 Name	:RLG	:AE			
0024 BG	:	KF +128			
0025 KNKT	:	KY 3,4			CARD ADDRESS (PY134)
0026 OGR	:	KF +380			BMA12 CABLE VOLTS,UNIPOL
0027 UGR	:	KF +0			5mA = 380 VOLT
0028 EINZ	:	F 1.0 DUMMY0		(F1.0) PERMANENT 0 SIGNAL	0 mA= 0 VOLT
0029 XA	:	DW 8			DUMMY 1 FLAG
002A FB	:	F 90.3			BMA12 CABLE VOLTS OUTPUT
002B BU	:	F 91.3			CHANNEL ERROR BIT
002C TBIT	:	F 92.3			RANGE OVERFLOW
002D	:JU	FB 250			SAMPLING STILL BUSY
002E Name	:RLG	:AE			
002F BG	:	KF +128			
0030 KNKT	:	KY 4,4			CARD ADDRESS (PY136)
0031 OGR	:	KF +380			BMA13 CABLE VOLTS,UNIPOL
0032 UGR	:	KF +0			5 mA=380 VOLT
0033 EINZ	:	F 1.0 DUMMY0		(F1.0) PERMANENT 0 SIGNAL	0 mA = 0 VOLT
0034 XA	:	DW 10			DUMMY 1
0035 FB	:	F 90.4			BMA13 CABLE VOLTS OUTPUT
0036 BU	:	F 91.4			CHANNEL ERROR BIT
0037 TBIT	:	F 92.4			RANGE OVERFLOW
0038	:JU	FB 250			SAMPLING STILL BUSY
0039 Name	:RLG	:AE			
003A BG	:	KF +128			
003B KNKT	:	KY 5,4			CARD ADDRESS (PY138)
003C OGR	:	KF +380			BMA14 CABLE VOLTS,UNIPOL
					5 mA=380 VOLT

Statement list

Block: PB 70 Symbol: PB 70 Comment: ANALOG SCALING Lib no.: Length: 85

```
003D UGR  :    KF +0
003E EINZ :    F    1.0   DUMMY0      (F1.0)   PERMANENT 0 SIGNAL
003F XA   :    DW  12                            0 mA =0 VOLT
0040 FB   :    F   90.5                          DUMMY 1
0041 BU   :    F   91.5                          BMA14 CABLE VOLTS OUTPUT
0042 TBIT :    F   92.5                          CHANNEL ERROR BIT
0043      :JU  FB 250                            RANGE OVERFLOW
0044 Name :RLG:AE                                SAMPLING STILL BUSY
0045 BG   :    KF +128
0046 KNKT :    KY 6,4                            CARD ADDRESS (PY140)
0047 OGR  :    KF +380                           BMA15 CABLE VOLTS,UNIPOL
0048 UGR  :    KF +0                             5 mA=380 VOLT
0049 EINZ :    F    1.0   DUMMY0      (F1.0)   PERMANENT 0 SIGNAL      0 mA = 0 VOLT
004A XA   :    DW  14                            DUMMY 1
004B FB   :    F   90.6                          BMA15 CABLE VOLTS OUTPUT
004C BU   :    F   91.6                          CHANNEL ERROR
004D TBIT :    F   92.6                          RANGE OVERFLOW
004E      :                                      SAMPLING STILL BUSY
004F      :BE
```

DATE: 09.07.97 01-07-1997	ENQUIRIES ABOUT THE PROGRAM: ALBERT PRETORIUS: 0135 928679 JOHAN GROBLER 083 228 4536	SIEMENS AG S5 115 PLC 943 PROCESSOR	THIS PROGRAM CONTROL THE ENGINE FOR THE 3,3KV DIESEL GENERATOR AND THE 380V BREAKERS ON THE DIESEL GENERATOR BOARD	THE PROGRAM WAS TESTED AND COMMISSIONED BY PT&M.
MODIFICATION REV 2	AS MOD BY A&J CONTROL SOLUTIONS	SIMATIC S5	Program file : Block: Segm : C:U1DG@@ST.S5D PB 70 1	THE SOFTWARE DEVELOPMENT AND PROGRAMMING WERE DONE BY ALH PRETORIUS & SJ STOLS

Statement list

Block: PB 71 Symbol: PB 71 Comment: ANALOG HEALTHY Lib no.: Length: 87

Segment 1 0000 GEN WATT BINARY SIGNALS				
Address |Oprt| Absolute/ Symbolic - Operand	KT	Operand comment		Line comment
0000 :JU FB 70				
0001 Name :ANAL				
0002 CNDB : DB 70				CONTROL DB
0003 CHAN : KF +0				CHAN 0 PY128
0004 TLEV : KF +950				TOP LIMIT
0005 BLEV : KF +200				BOTTOM LIMIT
0006 OUTF : F 16.0 WATT.OK		(F16.0)	GEN WATTS HEALTHY	HEALTHY OUTPUT
0007 LOUT : F 17.0 WATT.<		(F17.0)	GEN WATTS LOW	< OUTPUT
0008 HOUT : F 18.0 WATT.>		(F18.0)	GEN WATTS HIGH	> OUTPUT
0009 :***				

Segment 2 0014 FREQUENCY BINARY SIGNALS				
Address |Oprt| Absolute/ Symbolic - Operand	KT	Operand comment		Line comment
000A :JU FB 70				
000B Name :ANAL				
000C CNDB : DB 70				CONTROL DB
000D CHAN : KF +1				CHAN 1 PY 130
000E TLEV : KF +5150				TOP LIMIT
000F BLEV : KF +5000				BOTTOM LIMIT
0010 OUTF : F 16.1 FREQ.OK		(F16.1)	GEN FREQUENCY HEALTHY	HEALTHY OUTPUT
0011 LOUT : F 17.1 FREQ.<		(F17.1)	GEN FREQUENCY LOW	LOW
0012 HOUT : F 18.1 FREQ.>		(F18.1)	GEN FREQUENCY HIGH	HIGH
0013 :***				

Segment 3 0028 BMA BUSBAR VOLTAGE BINARY SIGNAL				
Address |Oprt| Absolute/ Symbolic - Operand	KT	Operand comment		Line comment
0014 :JU FB 70				
0015 Name :ANAL				
0016 CNDB : DB 70				CONTROL DB
0017 CHAN : KF +2				CHAN 2 PY132
0018 TLEV : KF +600				TOP LIMIT
0019 BLEV : KF +300				BOTTOM LIMIT
001A OUTF : F 16.2 BBVL.OK		(F16.2)	BUSBAR VOLTS HEALTHY	HEALTHY OUTPUT
001B LOUT : F 17.2 BBVL.<		(F17.2)	BUSBAR VOLTS LOW	LOW
001C HOUT : F 18.2 BBVL.>		(F18.2)	BUSBAR VOLTS HIGH	HIGH
001D :***				

Segment 4 003C BMA12 CABLE VOLTS BINARY SIGNALS				
Address |Oprt| Absolute/ Symbolic - Operand	KT	Operand comment		Line comment
001E :JU FB 70				
001F Name :ANAL				
0020 CNDB : DB 70				CONTROL DB
0021 CHAN : KF +3				CHAN 3 PY134
0022 TLEV : KF +600				TOP LIMIT
0023 BLEV : KF +300				BOTTOM LIMIT
0024 OUTF : F 16.3 BMA12.OK		(F16.3)	BMA12 CABLE VOLTS HEALTHY	HEALTHY OUTPUT
0025 LOUT : F 17.3 BMA12.<		(F17.3)	BMA12 CABLE LOW	LOW
0026 HOUT : F 18.3 BMA12.>		(F18.3)	BMA12 CABLE VOLTS HIGH	HIGH
0027 :***				

Segment 5 0050 BMA13 CABLE VOLTS BINARY SIGNALS				
Address |Oprt| Absolute/ Symbolic - Operand	KT	Operand comment		Line comment
0028 :JU FB 70				
0029 Name :ANAL				
002A CNDB : DB 70				CONTROL DB
002B CHAN : KF +4				CHAN 4 PY136
002C TLEV : KF +600				TOP LIMIT

Statement list

Block: PB 71 Symbol: PB 71 Comment: ANALOG HEALTHY Lib no.: Length: 87

002D BLEV :	KF +300				BOTTOM LIMIT
002E OUTF :	F 16.4	BMA13.OK	(F16.4)	BMA13 CABLE VOLTS HEALTHY	HEALTHY OUTPUT
002F LOUT :	F 17.4	BMA13.<	(F17.4)	BMA13 CABLE VOLTS LOW	LOW
0030 HOUT :	F 18.4	BMA13.>	(F18.4)	BMA13 CABLE VOLTS HIGH	HIGH
0031	:***				

Segment 6 0064 BMA14 CABLE VOLTS BINARY SIGNALS

Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
0032	:JU	FB 70				
0033 Name	:ANAL					
0034 CNDB :	DB 70					CONTROL DB
0035 CHAN :	KF +5					CHAN 5 PY138
0036 TLEV :	KF +600					TOP LIMIT
0037 BLEV :	KF +300					BOTTOM LIMIT
0038 OUTF :	F 16.5	BMA14.OK	(F16.5)	BMA14 CABLE VOLTS HEALTHY		HEALTHY OUTPUT
0039 LOUT :	F 17.5	BMA14.<	(F17.5)	BMA14 CABLE VOLTS LOW		LOW
003A HOUT :	F 18.5	BMA14.>	(F18.5)	BMA14 CABLE VOLTS HIGH		HIGH
003B	:***					

Segment 7 0078 BMA15 CABLE VOLTS BINARY SIGNALS

Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
[illegible]	:JU	FB 70				
003D Name	:ANAL					
003E CNDB :	DB 70					CONTROL DB
003F CHAN :	KF +6					CHAN 6 PY 140
0040 TLEV :	KF +600					TOP LIMIT
0041 BLEV :	KF +300					BOTTOM LIMIT
0042 OUTF :	F 16.6	BMA15.OK	(F16.6)	BMA15 CABLE VOLTS HEALTHY		HEALTHY OUTPUT
0043 LOUT :	F 17.6	BMA15.<	(F17.6)	BMA15 CABLE VOLTS LOW		LOW
0044 HOUT :	F 18.6	BMA15.>	(F18.6)	BMA15 CABLE VOLTS HIGH		HIGH
0045	:***					

Segment 8 008C START CHOP OVER (BMA15 CLOSE)

Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
0046	:JU	FB 70				
0047 Name	:ANAL					
0048 CNDB :	DB 70					CONTROL DB
0049 CHAN :	KF +6					CHAN 6 PY142
004A TLEV :	KF +410					TOP LIMIT
004B BLEV :	KF +375					BOTTOM LIMIT
004C OUTF :	F 27.0	15VLT=	(F27.0)	GEN VOLTS HEALTHY TO SUPPLY BB		HEALTHY OUTPUT
004D LOUT :	F 27.1	15VLT<	(F27.1)	GEN VOLTS LOW		LOW
004E HOUT :	F 27.2	15VLT>	(F27.2)	GEN VOLTS HIGH		HIGH
004F	:***					

Segment 9 00A0

Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
0050	:STL					
0051	:BE					

Statement list

Block: PB 72 Symbol: PB 72 Comment: VOLTAGE UNHEALTHY Lib no.: Length: 16

Segment 1 0000 VOLTAGE UNHEALTHY FLAG

Address	Oprt	Absolute/ Symbolic - Operand	KT	Operand comment	Line comment
0000	:ON	F 16.3 BMA12.OK		(F16.3) BMA12 CABLE VOLTS HEALTHY	
0001	:ON	F 16.4 BMA13.OK		(F16.4) BMA13 CABLE VOLTS HEALTHY	
0002	:ON	F 16.5 BMA14.OK		(F16.5) BMA14 CABLE VOLTS HEALTHY	
0003	:=	F 102.0 F102.0			380V CABLE VOLTAGE UNHEALTHY
0004	:***				

Segment 2 000A BMA15 CABLE VOLTS TO LOW

Address	Oprt	Absolute/ Symbolic - Operand	KT	Operand comment	Line comment
0005	:AN	F 16.6 BMA15.OK		(F16.6) BMA15 CABLE VOLTS HEALTHY	
0006	:A	F 20.7 ENGRUNF		(F20.7) ENGINE RUNNING	
0007	:=	F 100.1 DGV.UNH		(F100.1) DG VOLTAGE UNHEALTY	BMA15 CABLE VOLTAGE LOW
0008	:***				

Segment 3 0012

Address	Oprt	Absolute/ Symbolic - Operand	KT	Operand comment	Line comment
0009	:STL				
000A	:BE				

Statement list

Block: PB 80 Symbol: PB 80 Comment: BREAKER COMMANDS Lib no.: Length: 39

Segment 1 0000 CLOSE PULSE TO BMA12 Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
0000	:A	F	40.0	12CCOMM		(F40.0) BMA12 CLOSE COMMAND	
0001	:=	Q	12.6	12IPC1		(4X9) BMA12 IPC1	
0002	:=	Q	16.6	12IPC2		(5X9) BMA12 IPC2	BMA12 CLOSE COMMAND
0003	:***						
Segment 2 0008 BMA13 CLOSE PULSE Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
0004	:A	F	40.1	13CCOMM		(F40.1) BMA13 CLOSE COMMAND	
0005	:=	Q	12.7	13IPC1		(4X10) BMA13 IPC1	
0006	:=	Q	16.7	13IPC2		(5X10) BMA13 IPC2	BMA13 CLOSE COMMAND
0007	:***						
Segment 3 0010 BMA14 CLOSE PULSE Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
0008	:A	F	40.2	14CCOMM		(F40.2) BMA14 CLOSE COMMAND	
0009	:=	Q	13.0	14IPC1		(4X15) BMA14 IPC1	
000A	:=	Q	17.0	14IPC2		(5X15) BMA14 IPC2	BMA14 CLOSE COMMAND
000B	:***						
Segment 4 0018 BMA15 CLOSE PULSE Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
000C	:A	F	40.3	15CCOMM		(F40.3) BMA15 CLOSE COMMAND	
000D	:=	Q	13.1	15IPC1		(4X16) BMA15 IPC1	
000E	:=	Q	17.1	15IPC2		(5X16) BMA15 IPC2	BMA15 CLOSE COMMAND
000F	:***						
Segment 5 0020 BMA12 OPEN PULSE Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
0010	:A	F	40.4	12OCOMM		(F40.4) BMA12 OPEN COMMAND	
0011	:=	Q	12.2	12IPT1		(4X5) BMA12 IPT1	
0012	:=	Q	16.2	12IPT2		(5X5) BMA12 IPT2	BMA12 OPEN COMMAND
0013	:***						
Segment 6 0028 BMA13 OPEN PULSE Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
0014	:A	F	40.5	13OCOMM		(F40.5) BMA13 OPEN COMMAND	
0015	:=	Q	12.3	13IPT1		(4X6) BMA13 IPT1	
0016	:=	Q	16.3	13IPT2		(5X6) BMA13 IPT2	BMA13 OPEN COMMAND
0017	:***						
Segment 7 0030 BMA14 OPEN PULSE Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
0018	:A	F	40.6	14OCOMM		(F40.6) BMA14 OPEN COMMAND	
0019	:=	Q	12.4	14IPT1		(4X7) BMA14 IPT1	
001A	:=	Q	16.4	14IPT2		(5X7) BMA14 IPT2	BMA14 OPEN COMMAND
001B	:***						
Segment 8 0038 BMA15 OPEN PULSE Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
001C	:A	F	40.7	15OCOMM		(F40.7) BMA15 OPEN COMMAND	
001D	:=	Q	12.5	15IPT1		(4X8) BMA15 IPT1	
001E	:=	Q	16.5	15IPT2		(5X8) BMA15 IPT2	BMA15 OPEN COMMAND
001F	:***						

DATE: 09.07.97 01-07-1997	ENQUIRIES ABOUT THE PROGRAM: ALBERT PRETORIUS: 0135 928679 JOHAN GROBLER 083 228 4536	SIEMENS AG S5 115 PLC 943 PROCESSOR	THIS PROGRAM CONTROL THE ENGINE FOR THE 3,3KV DIESEL GENERATOR AND THE 380V BREAKERS ON THE DIESEL GENERATOR BOARD Program file : Block: Segm : C:U1DG@@ST.S5D PB 80 1	THE PROGRAM WAS TESTED AND COMMISSIONED BY PT&M. THE SOFTWARE DEVELOPMENT AND PROGRAMMING WERE DONE BY ALH PRETORIUS & SJ STOLS
MODIFICATION REV 2	AS MOD BY A&J CONTROL SOLUTIONS	SIMATIC S5		PAGE 48 +

Statement list

Block: PB 80 Symbol: PB 80 Comment: BREAKER COMMANDS Lib no.: Length: 39

Segment 9 10 0040 Address	Oprt	Absolute/ Symbolic - Operand	KT	Operand comment	Line comment
0020	:STL				
0021	:BE				

Segment 9 BDE 01 OPEN PULSE

A F36.7 BDE01OCOMM (F36.7)BDE01 OPEN COMMAND

= Q 19.5 BDE01 IPT (SX29) BDE01 IPT 00 BDE01 OPEN Command.

DATE: 09.07.97 01-07-1997	ENQUIRIES ABOUT THE PROGRAM:	SIEMENS AG	THIS PROGRAM CONTROL THE ENGINE FOR THE 3,3KV DIESEL	THE PROGRAM WAS TESTED AND COMMISSIONED BY PT&M.
MODIFICATION REV 2	ALBERT PRETORIUS: 0135 928679 JOHAN GROBLER 083 228 4536	S5 115 PLC 943 PROCESSOR	GENERATOR AND THE 380V BREAKERS ON THE DIESEL GENERATOR BOARD	THE SOFTWARE DEVELOPMENT AND PROGRAMMING WERE DONE BY ALH PRETORIUS & SJ STOLS
	AS MOD BY A&J CONTROL SOLUTIONS	SIMATIC S5	Program file : Block: Segm : C:U1DG@@ST.S5D PB 80 9	PAGE 49

Statement list

Block: PB 85 Symbol: PB 85 Comment: BREAKER FAIL Lib no.: Length: 63

Segment 1 0000 BMA12 FAIL TO CLOSE

Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
0000	:A	F 40.0	12CCOMM		(F40.0) BMA12 CLOSE COMMAND	
0001	:A	F 30.0	12OPEN		(F30.0) BMA12 BRKR OPENED	
0002	:L	KT 080.0				
0004	:SD	T 55	T55		(T55) BMA12 BRKR FAIL TO CLOSE	
0005	:NOP	0				
0006	:NOP	0				
0007	:NOP	0				
0008	:A	T 55	T55		(T55) BMA12 BRKR FAIL TO CLOSE	
0009	:S	F 101.4	12CLSFLT		(F101.4) BMA 12 FAILED TO CLOSE	
000A	:A	I 9.7	ALARMPB		(3X22) ALARM ACKNOWLEDGE PB	
000B	:R	F 101.4	12CLSFLT		(F101.4) BMA 12 FAILED TO CLOSE	BMA12 FAIL TO CLOSE
000C	:NOP	0				
000D	:***					

Segment 2 001C BMA13 FAIL TO CLOSE

Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
000E	:A	F 40.1	13CCOMM		(F40.1) BMA13 CLOSE COMMAND	
000F	:A	F 30.2	13OPEN		(F30.2) BMA13 BRKR OPENED	
0010	:L	KT 080.0				
0012	:SD	T 56	T56		(T56) BMA13 BRKR FAIL TO CLOSE	
0013	:NOP	0				
0014	:NOP	0				
0015	:NOP	0				
0016	:A	T 56	T56		(T56) BMA13 BRKR FAIL TO CLOSE	
0017	:S	F 101.5	13CLSFLT		(F101.5) BMA 13 FAILED TO CLOSE	
0018	:A	I 9.7	ALARMPB		(3X22) ALARM ACKNOWLEDGE PB	
0019	:R	F 101.5	13CLSFLT		(F101.5) BMA 13 FAILED TO CLOSE	BMA13 FAIL TO CLOSE
001A	:NOP	0				
001B	:***					

Segment 3 0038 BMA14 FAIL TO CLOSE

Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
001C	:A	F 40.2	14CCOMM		(F40.2) BMA14 CLOSE COMMAND	
001D	:A	F 30.4	14OPEN		(F30.4) BMA14 BRKR OPENED	
001E	:L	KT 080.0				
0020	:SD	T 57	T57		(T57) BMA14 BRKR FAIL TO CLOSE	
0021	:NOP	0				
0022	:NOP	0				
0023	:NOP	0				
0024	:A	T 57	T57		(T57) BMA14 BRKR FAIL TO CLOSE	
0025	:S	F 101.6	14CLSFLT		(F101.6) BMA 14 FAILED TO CLOSE	
0026	:A	I 9.7	ALARMPB		(3X22) ALARM ACKNOWLEDGE PB	
0027	:R	F 101.6	14CLSFLT		(F101.6) BMA 14 FAILED TO CLOSE	BMA14 FAIL TO CLOSE
0028	:NOP	0				
0029	:***					

Segment 4 0054 BMA15 FAIL TO CLOSE

Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
002A	:A	F 40.3	15CCOMM		(F40.3) BMA15 CLOSE COMMAND	
002B	:A	F 30.6	15OPEN		(F30.6) BMA15 BRKR OPENED	
002C	:L	KT 080.0				
002E	:SD	T 58	T58		(T58) BMA15 BRKR FAIL TO CLOSE	
002F	:NOP	0				
0030	:NOP	0				
0031	:NOP	0				
0032	:A	T 58	T58		(T58) BMA15 BRKR FAIL TO CLOSE	
0033	:S	F 101.7	15CLSFLT		(F101.7) BMA 15 FAILED TO CLOSE	
0034	:A	I 9.7	ALARMPB		(3X22) ALARM ACKNOWLEDGE PB	

Statement list

Block: PB 85 Symbol: PB 85 Comment: BREAKER FAIL Lib no.: Length: 63

0035	:R F 101.7 15CLSFLT		(F101.7) BMA 15 FAILED TO CLOSE	BMA15 FAIL TO CLOSE
0036	:NOP 0			
0037	:***			

Segment 5 0070

Address	Oprt	Absolute/ Symbolic - Operand	KT	Operand comment	Line comment
0038	:STL				
0039	:BE				

Statement list

Block: PB 100 Symbol: PB 100 Comment: ERROR PROCESSING Lib no.: Length: 35

Segment 1 0000 ERROR PB Address	Oprt	Absolute/ Symbolic - Operand	KT	Operand comment	Line comment
0000	:STL				
0001	:A F 210.0				OB23 ERROR
0002	:JC FB 75	FB 75		ERROR FUNCTION BLOCK	TIME OUT DURING DIRECT ACCESS
0003 Name	:ERROR				
0004 MASK	: KY 1,0				STOP PLC
0005	:A F 210.1				OB24 ERROR
0006	:JC FB 75	FB 75		ERROR FUNCTION BLOCK	TIME DURING PROCESS UPDATE
0007 Name	:ERROR				
0008 MASK	: KY 1,0				STOP PLC
0009	:A F 210.2				OB27 ERROR
000A	:JC FB 75	FB 75		ERROR FUNCTION BLOCK	TIME DUE TO SUBSTITUTION ERROR
000B Name	:ERROR				
000C MASK	: KY 1,0				STOP PLC
000D	:A F 210.3				OB32 ERROR
000E	:JC FB 75	FB 75		ERROR FUNCTION BLOCK	TRANSFER ERROR
000F Name	:ERROR				
0010 MASK	: KY 1,0				STOP PLC
0011	:A F 210.4				OB34 ERROR
0012	:JC FB 75	FB 75		ERROR FUNCTION BLOCK	BATTERY LOW ALARM
( ) Name	:ERROR				
0024 MASK	: KY 0,1				ONLY GIVE ALARM
0015	:L FW 210	SCRAT210		(FW210) SCRATCH PAD FLAG WORD	
0016	:L KF +0				
0018	:!=F				
0019	:R F 19.1	PLCERR		(F19.1) PLC ERROR FLAG	
001A	:L KH 0000				
001C	:T FW 210	SCRAT210		(FW210) SCRATCH PAD FLAG WORD	
001D	:BE				

Statement list

Block: PB 255 Symbol: Comment: Lib no.: Length: 9

Segment 1 0000

Address	Oprt	Absolute/ Symbolic - Operand	KT	Operand comment	Line comment
0000	:STL				
0001	:L	PY 128			
0002	:T	FW 254			
0003	:BE				

Statement list

Block: FB 7 Symbol: FB 7 Comment: OIL PRIMING PUMP FUNCTION BLOCK Lib no.: Length: 33

Segment 1 0000

Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
		Name :OIL PRIM				
0005	:L	FW	52			
0006	:L	KY	7,0			
0008	:!=F					
0009	:L	KT	720.3			
000B	:SE	T	92			
000C	:L	FW	52			
000D	:L	KY	19,0			
000F	:!=F					
0010	:L	KT	720.3			
0012	:SE	T	94			
0013	:AN	F	20.7 ENGRUNF		(F20.7) ENGINE RUNNING	
0014	:A(					
0015	:O	T	92	01		
0016	:O	T	94	01		
0017	:)			01		
0018	:=	Q	19.0 OUTPRIMP		(5X39) RELAY 3 FOR OIL PRIMING PUMP	
0019	:					
001A	:					
001B	:BE					

DATE: 09.07.97	ENQUIRIES ABOUT THE PROGRAM:		THIS PROGRAM CONTROL THE	THE PROGRAM WAS TESTED	
01-07-1997		SIEMENS AG	ENGINE FOR THE 3,3KV DIESEL	AND COMMISSIONED BY PT&M.	
	ALBERT PRETORIUS: 0135 928679	S5 115 PLC	GENERATOR AND THE 380V BREAKERS		PAGE
MODIFICATION	JOHAN GROBLER 083 228 4536	943 PROCESSOR	ON THE DIESEL GENERATOR BOARD	THE SOFTWARE DEVELOPMENT	
REV 2			Program file : Block: Segm :	AND PROGRAMMING WERE DONE	1
	AS MOD BY A&J CONTROL SOLUTIONS	SIMATIC S5	C:U1DG@@ST.S5D FB 7 1	BY ALH PRETORIUS & SJ STOLS	

Statement list

Block: FB 10 Symbol: Comment: Lib no.: Length: 127

Segment 1 0000

Address	Oprt	Absolute/ Symbolic - Operand	KT	Operand comment	Line comment
		Name :TIME115			
0005	:C	DB 10			
0006	:L	DW 1			
0007	:L	T 0			
0008	:-F				
0009	:T	DW 2			
000A	:AN	F 13.3			
000B	:L	KT 999.0			
000D	:SE	T 0			
000E	:NOP	0			
000F	:A	T 0			
0010	:=	F 13.3			
0011	:L	T 0			NEW TIME ENTRY
0012	:T	DW 1			RESTART
0013	:O	F 12.0			RELOAD FLAG
0014	:O	F 12.1			
0015	:S	F 12.2			NEW TIME ENTRY
0016	:A	F 12.0			
0017	:JC	=M001			RESTART
0018	:A	F 12.1			
0019	:JC	=M002			TIME UPDATE FROM STN CNT
001A	:A	I 10.5 DGE_OFF		(3X32) D/G CABLE EARTH OFF	SECONDS COUNTER
001B	:JC	=M003			
001C	:AN	T 2			
001D	:L	KT 050.0			
001F	:SD	T 1			PRESET COUNTER TO CORRECT VALUE
0020	:NOP	0			
0021	:NOP	0			
0022	:A	T 1			
0023	:L	KT 050.0			
0025	:SD	T 2			
0026	:A	T 1			
0027	:CU	C 1			
0028	:A	F 12.2			
0029	:L	DW 15			
002A	:S	C 1			
002B	:A	F 12.3			
002C	:R	C 1			
002D	:L	C 1			
002E	:L	KF +59			
0030	:>=F				
0031	:=	F 12.3			
0032	:NOP	0			
0033	:A	F 12.3			
0034	:CU	C 2			
0035	:A	F 12.2			
0036	:L	DW 16			
0037	:S	C 2			
0038	:A	F 12.4			
0039	:R	C 2			
003A	:L	C 2			
003B	:L	KF +59			
003D	:>=F				
003E	:=	F 12.4			
003F	:NOP	0			
0040	:A	F 12.4			
0041	:CU	C 3			
0042	:A	F 12.2			

Statement list

Block: FB 10 Symbol: Comment: Lib no.: Length: 127

```
0043       :L   DW  17
0044       :S   C    3
0045       :A   F   12.5
0046       :R   C    3
0047       :L   C    3
0048       :L   KF +23
004A       :>=F
004B       :=   F   12.5
004C       :L   C    1
004D       :T   DR   7                  SECONDS
004E       :L   C    2
004F       :T   DL   7
0050       :L   C    3                  MINUTES
0051       :T   DW   8                  HOURS
0052       :A   F   12.2
0053       :R   F   12.2
0054       :BEU
0055 M001  :A   F   12.2
0056       :L   DR   5
0057       :T   DW  10
0058       :L   DL   5                  BCD SECONDS
0059       :T   DW  11
005A       :L   DW   6
   B       :T   DW  12
005C M004  :JU  FB 241
005D Name  :COD:16
005E DUAL  :    DW  10                  BCD MINUTES
005F SBCD  :    F  150.0
0060 BCD2  :    FY 200
0061 BCD1  :    DW  15
0062       :JU  FB 241
0063 Name  :COD:16
0064 DUAL  :    DW  11                  BCD HOURS
0065 SBCD  :    F  150.1
0066 BCD2  :    FY 200
0067 BCD1  :    DW  16
0068       :JU  FB 241
0069 Name  :COD:16                      SECONDS BEFORE POWER FAIL
006A DUAL  :    DW  12
006B SBCD  :    F  150.2
006C BCD2  :    FY 200                  MINUTES BEFORE POWER FAIL
006D BCD1  :    DW  17
006E       :R   F   12.0                HOURS
006F       :R   F   12.1
0070       :BEU
0071 M002  :A   F   12.2
0072       :L   DR   7
0073       :T   DW  10
   4       :L   DL   7
   5       :T   DW  11
0076       :L   DW   8
0077       :T   DW  12
0078       :JU  =M004
0079 M003  :BE
```

DATE: 09.07.97 01-07-1997	ENQUIRIES ABOUT THE PROGRAM: ALBERT PRETORIUS: 0135 928679 JOHAN GROBLER 083 228 4536	SIEMENS AG S5 115 PLC 943 PROCESSOR	THIS PROGRAM CONTROL THE ENGINE FOR THE 3,3KV DIESEL GENERATOR AND THE 380V BREAKERS ON THE DIESEL GENERATOR BOARD	THE PROGRAM WAS TESTED AND COMMISSIONED BY PT&M.
MODIFICATION REV 2	AS MOD BY A&J CONTROL SOLUTIONS	SIMATIC S5	Program file : Block: Segm : C:U1DG@@ST.S5D FB 10 1	THE SOFTWARE DEVELOPMENT AND PROGRAMMING WERE DONE BY ALH PRETORIUS & SJ STOLS

Statement list

Block: FB 13 Symbol: Comment: Lib no.: Length: 13

Segment 1 0000

Address	Oprt	Absolute/ Symbolic - Operand	KT	Operand comment	Line comment
		Name :TIME			
0005	:L	KB 100			
0006	:T	RS 97			100 x 10 mSEC
0007	:BE				

Statement list

Block: FB 50 Symbol: FB 50 Comment: ALARM FUNCTION BLOCK Lib no.: Length: 69

Segment 1 0000

Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
		Name :ALARMS				
		Decl :ALRM	I/Q/D/B/T/C: I BI/BY/W/D: BI			
		Decl :OUTP	I/Q/D/B/T/C: Q BI/BY/W/D: BI			
000B	:JU	=M001				
000C	:L	KY 0,1				Revision number
000E M001	:***					As modified 03/02/97

Segment 2 001E Main program loop

Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
000F	:C	DB 50	DB 50		ALARM DATA BLOCK	Call alarm DB
0010	:L	KH 0000				
0012	:T	FW 220	SCRATCH		(FW220) SCRATCH PAD FLAG WORD	Reset FW 220
0013	:L	DW 1				Timer flashing bits
0014	:T	FW 200	SCRAT200		(FW200) SCRATCH PAD FLAG WORD	Temp flag for flashing
0015	:					
0016	:DO	DW 0				Load alarm DW pointed to
0017	:L	DW 0				
0018	:T	FW 220	SCRATCH		(FW220) SCRATCH PAD FLAG WORD	Transfer alarm info to temp flag
0019	:					
001A	:A	=ALRM				Alarm input
001B	:S	F 220.0				New alarm
001C	:					
001D	:A	F 220.0				New alarm
001E	:S	F 200.0				LAP active
001F	:					
0020	:A	I 9.7	ALARMPB		(3X22) ALARM ACKNOWLEDGE PB	Alarm reset PB
0021	:S	F 220.3				Acknowledged flag
0022	:					
0023	:AN	=ALRM				Alarm input
0024	:A	F 220.3				Alarm acknowledged
0025	:R	F 220.0				Reset new alarm
0026	:R	F 220.3				Reset acknowledgement
0027	:R	F 200.0				Reset LAP active
0028	:					
0029	:A	F 220.3				Sustained acknowledged alarm
002A	:O					
002B	:A	=ALRM				New alarm
002C	:AN	F 220.3				Alarm not acknowledged
002D	:A	F 201.0				New alarm (300 mSec)
002E	:O					
002F	:AN	=ALRM				Alarm input
0030	:AN	F 220.3				Alarm not acknowledged
0031	:A	F 220.0				New alarm
0032	:A	F 201.3				Going alarm (2.4 Sec)
0033	:=	=OUTP				Alarm output
0034	:					
0035	:L	FW 220	SCRATCH		(FW220) SCRATCH PAD FLAG WORD	Load temp alarm data
0036	:DO	DW 0				
0037	:T	DW 0				Transfer to relevant DW
0038	:L	FY 200				LAP active flag
0039	:T	DL 1				
003A	:L	KH 0000				Reset temp flag
003C	:T	FW 200	SCRAT200		(FW200) SCRATCH PAD FLAG WORD	Reset FW 200
003D	:T	FW 220	SCRATCH		(FW220) SCRATCH PAD FLAG WORD	Reset FW220
003E	:***					

Statement list

Block: FB 50 Symbol: FB 50 Comment: ALARM FUNCTION BLOCK Lib no.: Length: 69

Segment 3 007E Block end Address	Oprt	Absolute/ Symbolic - Operand	KT	Operand comment	Line comment
003F	:BE				Block end 03/02/97 A&J Control

Statement list

Block: FB 70 Symbol: Comment: Lib no.: Length: 65

Segment 1 0000 CHECK IF ANALOG IS WITHIN RANGE

```
 Name :ANAL
 Decl :CNDB      I/Q/D/B/T/C: B
 Decl :CHAN      I/Q/D/B/T/C: D  KM/KH/KY/KS/KF/KT/KC/KG: KF
 Decl :TLEV      I/Q/D/B/T/C: D  KM/KH/KY/KS/KF/KT/KC/KG: KF
 Decl :BLEV      I/Q/D/B/T/C: D  KM/KH/KY/KS/KF/KT/KC/KG: KF
 Decl :OUTF      I/Q/D/B/T/C: Q  BI/BY/W/D: BI
 Decl :LOUT      I/Q/D/B/T/C: Q  BI/BY/W/D: BI
 Decl :HOUT      I/Q/D/B/T/C: Q  BI/BY/W/D: BI
```

Address	Oprt	Absolute/ Symbolic - Operand	KT	Operand comment	Line comment
001A	:L	KH 0000			
001C	:T	FW 200 SCRAT200		(FW200) SCRATCH PAD FLAG WORD	
001D	:DO	=CNDB			CALL CONTROL DB
001E	:LW	=CHAN			LOAD CHANNEL
001F	:SLW	1			MULTIPLY WITH 2
0020	:L	KF +2			LOAD KF2
0022	:+F				ADD
0023	:T	DW 0			
24	:DO	DW 0			USE VALUE IN DW0
0025	:L	DW 0			AND LOAD THAT DATA WORD
0026	:LW	=BLEV			LOAD MIN LEVEL
0027	:<F				IF ANAL < MIN LEVEL THEN
0028	:JC	=M001			JUMP TO M001
0029	:TAK				SWAP ACC1 AND 2
002A	:LW	=TLEV			LOAD MAX LEVEL
002B	:>F				IF ANAL > MAX LEVEL THEN
002C	:JC	=M002			JUMP TO M002
002D	:=	F 200.0			SET ANAL HEALTHY FLAG
002E	:JU	=M003			JMP TO FINAL STAGE
002F M001	:=	F 200.1			SET ANAL <MIN LEVEL FLAG
0030	:JU	=M003			
0031 M002	:=	F 200.2			SET ANAL >MAX LEVEL FLAG
0032 M003	:A	F 200.0			
0033	:=	=OUTF			OUTPUT ANAL HEALTHY FLAG
0034	:A	F 200.1			
0035	:=	=LOUT			OUTPUT ANAL <MIN LEVEL FLAG
0036	:A	F 200.2			
0037	:=	=HOUT			OUTPUT ANAL >MAX LEVEL FLAG
0038	:L	KH 0000			
003A	:T	FW 200 SCRAT200		(FW200) SCRATCH PAD FLAG WORD	
003B	:BE				

Statement list

Block: FB 75 Symbol: FB 75 Comment: ERROR FUNCTION BLOCK Lib no.: Length: 45

Segment 1 0000 ERROR CONDITION CONTROL

Name :ERROR
Decl :MASK I/Q/D/B/T/C: D KM/KH/KY/KS/KF/KT/KC/KG: KY

Address	Oprt	Absolute/ Symbolic -	Operand	KT	Operand comment	Line comment
0008	:L	KH 0000				
000A	:T	FW 200	SCRAT200		(FW200) SCRATCH PAD FLAG WORD	
000B	:LW	=MASK				
000C	:L	KY 0,0				
000E	:!=F					
000F	:JC	=M001				NO ALARM NO STOP
0010	:TAK					
0011	:L	KY 0,1				
0013	:!=F					
0014	:JC	=M002				ALARM NO STOP
0015	:TAK					
0016	:L	KY 1,0				
0018	:!=F					
0019	:JC	=M003				STOP PLC
lA	:BEU					
001B M001	:=	F 200.0				
001C	:JU	=M004				ALL HEALTHY
001D M002	:=	F 200.1				
001E	:JU	=M004				FLAG FOR ALARM
001F M003	:=	F 200.2				
0020 M004	:A	F 200.0				STOP FLAG
0021	:BEC					
0022	:A	F 200.1				ALL HEALTHY
0023	:=	F 19.1	PLCERR		(F19.1) PLC ERROR FLAG	
0024	:BEC					PLC FAULT
0025	:A	F 200.2				
0026	:STP					
0027	:BE					

Statement list

Block: FB 244 Symbol: Comment: Lib no.: Length: 35

Segment 1 0000

Address	Oprt	Absolute/ Symbolic - Operand	KT	Operand comment	Line comment
		Name :SEND			
		Decl :SSNR I/Q/D/B/T/C: D KM/KH/KY/KS/KF/KT/KC/KG: KY			
		Decl :A-NR I/Q/D/B/T/C: D KM/KH/KY/KS/KF/KT/KC/KG: KY			
		Decl :ANZW I/Q/D/B/T/C: I BI/BY/W/D: W			
		Decl :QTYP I/Q/D/B/T/C: D KM/KH/KY/KS/KF/KT/KC/KG: KS			
		Decl :DBNR I/Q/D/B/T/C: D KM/KH/KY/KS/KF/KT/KC/KG: KY			
		Decl :QANF I/Q/D/B/T/C: D KM/KH/KY/KS/KF/KT/KC/KG: KF			
		Decl :QLAE I/Q/D/B/T/C: D KM/KH/KY/KS/KF/KT/KC/KG: KF			
		Decl :PAFE I/Q/D/B/T/C: Q BI/BY/W/D: BY			
001D	:BE				

Statement list

Block: FB 245 Symbol: Comment: Lib no.: Length: 35

Segment 1 0000 Address	Oprt	Absolute/ Symbolic - Operand	KT	Operand comment	Line comment
		Name :RECEIVE			
		Decl :SSNR I/Q/D/B/T/C: D KM/KH/KY/KS/KF/KT/KC/KG: KY			
		Decl :A-NR I/Q/D/B/T/C: D KM/KH/KY/KS/KF/KT/KC/KG: KY			
		Decl :ANZW I/Q/D/B/T/C: I BI/BY/W/D: W			
		Decl :ZTYP I/Q/D/B/T/C: D KM/KH/KY/KS/KF/KT/KC/KG: KS			
		Decl :DBNR I/Q/D/B/T/C: D KM/KH/KY/KS/KF/KT/KC/KG: KY			
		Decl :ZANF I/Q/D/B/T/C: D KM/KH/KY/KS/KF/KT/KC/KG: KF			
		Decl :ZLAE I/Q/D/B/T/C: D KM/KH/KY/KS/KF/KT/KC/KG: KF			
		Decl :PAFE I/Q/D/B/T/C: Q BI/BY/W/D: BY			
001D	:BE				

Statement list

Block: FB 246 Symbol: Comment: Lib no.: Length: 35

Segment 1 0000

Address	Oprt	Absolute/ Symbolic - Operand	KT	Operand comment	Line comment
		Name :FBTCH			
		Decl :SSNR I/Q/D/B/T/C: D KM/KH/KY/KS/KF/KT/KC/KG: KY			
		Decl :A-NR I/Q/D/B/T/C: D KM/KH/KY/KS/KF/KT/KC/KG: KY			
		Decl :ANZW I/Q/D/B/T/C: I BI/BY/W/D: W			
		Decl :ZTYP I/Q/D/B/T/C: D KM/KH/KY/KS/KF/KT/KC/KG: KS			
		Decl :DBNR I/Q/D/B/T/C: D KM/KH/KY/KS/KF/KT/KC/KG: KY			
		Decl :ZANF I/Q/D/B/T/C: D KM/KH/KY/KS/KF/KT/KC/KG: KF			
		Decl :ZLAE I/Q/D/B/T/C: D KM/KH/KY/KS/KF/KT/KC/KG: KF			
		Decl :PAFE I/Q/D/B/T/C: Q BI/BY/W/D: BY			
001D	:BE				

Statement list

Block: FB 247 Symbol: Comment: Lib no.: Length: 23

Segment 1 0000

Address	Oprt	Absolute/ Symbolic - Operand	KT	Operand comment	Line comment
		Name :CONTROL			
		Decl :SSNR I/Q/D/B/T/C: D KM/KH/KY/KS/KF/KT/KC/KG: KY			
		Decl :A-NR I/Q/D/B/T/C: D KM/KH/KY/KS/KF/KT/KC/KG: KY			
		Decl :ANZW I/Q/D/B/T/C: I BI/BY/W/D: W			
		Decl :PAFE I/Q/D/B/T/C: Q BI/BY/W/D: BY			
0011	:BE				

Statement list

Block: FB 248 Symbol: Comment: Lib no.: Length: 20

Segment 1 0000

Address	Oprt	Absolute/ Symbolic - Operand	KT	Operand comment	Line comment
		Name :RESET			
		Decl :SSNR I/Q/D/B/T/C: D KM/KH/KY/KS/KF/KT/KC/KG: KY			
		Decl :A-NR I/Q/D/B/T/C: D KM/KH/KY/KS/KF/KT/KC/KG: KY			
		Decl :PAFE I/Q/D/B/T/C: Q BI/BY/W/D: BY			
000E	:BE				

Statement list

Block: FB 249 Symbol: Comment: Lib no.: Length: 20

Segment 1 0000

Address	Oprt	Absolute/ Symbolic - Operand	KT	Operand comment	Line comment
		Name :SYNCHRON			
		Decl :SSNR I/Q/D/B/T/C: D KM/KH/KY/KS/KF/KT/KC/KG: KY			
		Decl :BLGR I/Q/D/B/T/C: D KM/KH/KY/KS/KF/KT/KC/KG: KY			
		Decl :PAFE I/Q/D/B/T/C: Q BI/BY/W/D: BY			
000E	:BE				

Statement list

Block: FB 250 Symbol: Comment: Lib no.: Length: 38

Segment 1 0000

Address	Oprt	Absolute/ Symbolic - Operand	KT	Operand comment	Line comment
		Name :RLG:AR			
		Decl :BG I/Q/D/B/T/C: D KM/KH/KY/KS/KF/KT/KC/KG: KF			
		Decl :KNKT I/Q/D/B/T/C: D KM/KH/KY/KS/KF/KT/KC/KG: KY			
		Decl :OGR I/Q/D/B/T/C: D KM/KH/KY/KS/KF/KT/KC/KG: KF			
		Decl :UGR I/Q/D/B/T/C: D KM/KH/KY/KS/KF/KT/KC/KG: KF			
		Decl :EINZ I/Q/D/B/T/C: I BI/BY/W/D: BI			
		Decl :XA I/Q/D/B/T/C: Q BI/BY/W/D: W			
		Decl :FB I/Q/D/B/T/C: Q BI/BY/W/D: BI			
		Decl :BU I/Q/D/B/T/C: Q BI/BY/W/D: BI			
		Decl :TBIT I/Q/D/B/T/C: Q BI/BY/W/D: BI			
0020	:BE				

Statement list

Block: FB 251 Symbol: Comment: Lib no.: Length: 32

Segment 1 0000

Address	Oprt	Absolute/ Symbolic - Operand	KT	Operand comment	Line comment
		Name :RLG:AA			
		Decl :XE I/Q/D/B/T/C: I BI/BY/W/D: W			
		Decl :BG I/Q/D/B/T/C: D KM/KH/KY/KS/KF/KT/KC/KG: KF			
		Decl :KNKT I/Q/D/B/T/C: D KM/KH/KY/KS/KF/KT/KC/KG: KY			
		Decl :OGR I/Q/D/B/T/C: D KM/KH/KY/KS/KF/KT/KC/KG: KF			
		Decl :UGR I/Q/D/B/T/C: D KM/KH/KY/KS/KF/KT/KC/KG: KF			
		Decl :FEH I/Q/D/B/T/C: Q BI/BY/W/D: BI			
		Decl :BU I/Q/D/B/T/C: Q BI/BY/W/D: BI			
001A	:BE				