DR O | SH A | CONTD. 0B | ELEMENTARY DIAGRAM 902M128CC

VALUTROL-AW STATIC FIELD WARD-LEONARD CONTROL EQUIPMENT FOR RUBBER TYRED GANTRY CRANE

ALLENEST REF. 502900

MANUFACTURED FOR -

HERBERT MORRIS LTD
NORTH ROAD
LOUGHBOROUGH
LEICS LE11 1RL

ORDER Nº 184257/57/11856

USER -

C.I.A.S.T.
IPSWICH

INDEX

NOTES	—	0B
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TROLLEY	—	2A - 2G

ASSOCIATED DIAGRAMS

TECHN. ENG. APPD.	TECHN. ENG. APPD.	DATE			
3 SEE SH 0C 11.2.86	4 SEE SH 0C 8/5/86	31/5/85 TECHN. ENG. NGM APPD.	ALLENWEST Simplex VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.	TITLE 3 INDEX	IDENT DR O SH A
				GO NUMBER 502900 ELEMENTARY DIAGRAM 902M128CC CONTD. 0B	

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DRIVE NUMBERING SYSTEM

1. TO BREAK THE ELEMENTARY DIAGRAM INTO EASY-TO-USE SECTIONS, A SERIES OF ARBITRARY "DRIVES" HAS BEEN ESTABLISHED, WITH THE ELEMENTARY SHEETS ALPHABETICALLY NUMBERED IN EACH DRIVE. FOR EXAMPLE:- SHEETS 3A, 3B AND 3C ARE THE FIRST THREE ELEMENTARY SHEETS IN DRIVE No.3.

2. THE DRIVE CONCEPT IS ESTABLISHED TO CONVENIENTLY SECTIONALIZE THE ELEMENTARY DIAGRAM, AND NOT NECESSARILY TO DENOTE SEPARATE PHYSICAL EQUIPMENTS. HOWEVER, ALL THE SYSTEM ELEMENTS INCLUDED IN A DRIVE WILL BEAR AN OBVIOUS FUNCTIONAL RELATIONSHIP; FOR EXAMPLE A NUMBER OF AUXILIARY MOTOR STARTERS MAY BE GROUPED TOGETHER AND REFERRED TO AS "DRIVE 1". THIS SHEET IS "0B", THE SECOND SHEET OF DRIVE "0", I.E. THE INTRODUCTORY MATERIAL.

~~WIRE NUMBERING SYSTEM~~

~~WIRE NUMBERS ARE SHOWN ON EACH SHEET AS TWO-DIGIT NUMBERS (E.G. 01, 02, 10, 42 ETC.) EXCEPT FOR WIRES ORIGINATING ON ANOTHER SHEET, WHICH ARE SHOWN AS 4-DIGIT OR 5-DIGIT NUMBERS. IN ALL CASES, THE COMPLETE WIRE NUMBER (WHICH APPEARS ON THE ACTUAL WIRES IN THE EQUIPMENT AND ON THE TERMINAL BOARDS) IS A 4-DIGIT OR 5-DIGIT NUMBER. THE FIRST TWO OR THREE DIGITS INDICATE THE NUMBER OF THE ELEMENTARY DIAGRAM SHEET ON WHICH THE WIRE ORIGINATES AND THE LAST TWO DIGITS INDICATE THE WIRE ON THAT SHEET. THUS 2A04 INDICATES WIRE NUMBER 04 ORIGINATING ON SHEET 2A OF THE DIAGRAM; AND 15C34 INDICATES WIRE NUMBER 34 ORIGINATING ON SHEET 15C.~~

LOCATING MAPPING SYSTEM

4 OR 5 DIGIT NUMBERS WITHIN BRACKETS, SUCH AS (15C35), ALWAYS INDICATE A LOCATION WITHIN THE ELEMENTARY DIAGRAMS. THE LAST TWO DIGITS OF THE BRACKETED NUMBER INDICATES THE LINE NUMBER ON A SHEET AND THE FIRST TWO OR THREE DIGITS INDICATE WHICH SHEET; THUS (15C35) INDICATES LINE 35 ON SHEET 15C.

RELAY MAPPING SYSTEM

1. UNDER EACH CONTACT (EXCEPT MAIN CONTACTS OF CONTACTORS AND STARTERS) A LOCATION MAPPING NUMBER INDICATES WHERE THE OPERATING COIL IS TO BE FOUND IN THE ELEMENTARY DIAGRAMS.

2. IN THE DIAGRAM MARGIN BESIDE EACH OPERATING COIL, LOCATION NUMBERS GIVE THE LOCATION OF DEVICE CONTACTS THAT ARE USED. LOCATION NUMBERS AT OPERATING COILS DIFFER FROM THE USUAL LOCATION NUMBERING SYSTEM IN THAT:-

A) THE BRACKETS ARE ELIMINATED, AND
B) UNDERSCORING INDICATES A NORMALLY CLOSED CONTACT AND LACK OF UNDERSCORING INDICATES A NORMALLY OPEN CONTACT.

THUS 3B56 INDICATES A NORMALLY OPEN CONTACT LOCATED ON LINE 56 OF SHEET 3B OF THE ELEMENTARY DIAGRAM, AND 13B48 INDICATES A NORMALLY CLOSED CONTACT LOCATED ON SHEET 13B, LINE 48.

AGAIN MAIN CONTACTS OF CONTACTORS AND STARTERS ARE NOT "MAPPED".

CONTACTS FOR PURCHASER'S USE

CONTACTS FOR PURCHASER'S USE WILL BE SHOWN ISOLATED, IN THE BODY OF THE DIAGRAM, AS NEAR AS CONVENIENT TO THE ASSOCIATED OPERATING COIL.

WIRE NUMBERS WILL BE SHOWN ON THE WIRES COMING OUT OF THE CONTACT WITH THE LABEL "FOR PURCHASER'S USE" OR SIMILAR WORDING; THE SYMBOL FOR TERMINALS FOR CUSTOMER'S USE IS SHOWN ON SHEET 0A.

THESE CONTACTS WILL ALSO BE "MAPPED" AT THE COIL LOCATION.

IN THE ACTUAL EQUIPMENT, THESE WIRES WILL BE RUN TO THE TERMINAL BOARD, WHICH WILL BE MARKED WITH THE WIRE NUMBERS.

WHEN KNOWN, PURCHASERS WIRE NUMBERS WILL BE USED.

CONTINUATION OF WIRES ON OTHER SHEETS

WHERE A WIRE IS CONTINUED FROM ONE SHEET TO ANOTHER, THE POINT OF ITS CONTINUATION IS INDICATED BY A BRACKETED LOCATION MAPPING NUMBER. THE FULL WIRE NUMBER MAY ALSO BE SHOWN E.G.

1A27 [1805]

TECHN.	ENG.	APPD.	TECHN.	ENG.	APPD.	DATE 31/5/85
						TECHN.
						ENG. NGM
						APPD.

ALLENWEST Simplex
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

NOTES

GO NUMBER	ELEMENTARY DIAGRAM	CONTD.	IDENT DR	IDENT SH
502900	902M128CC	0C	0	B

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902HM100CC SH3

DR 0 | SH C | CONTD. 1A | ELEMENTARY DIAGRAM 902M128CC

RECORD OF ELEMENTARY DIAGRAM CHANGES

SHEET No.	ISSUE	DATE	LOCATION AND DESCRIPTION OF CHANGE	ISSUED BY
ALL	2	28.8.85	AS SHIPPED	
1E	3	11.2.86	56K + 39K RES ADDED	
1H	3	11.2.86	R 31 R29 WERE 4K7	
1M	3	11.2.86	— — — —	
1E	3	11.2.86	HMT CONTACT RA1U CONTACT L24, L26 ADDED	
1G	3	11.2.86	RA 1U ADDED	
1A	4	8.5.86	MFC LPD -LPI ADDED	
1G	4	8.5.86	RELAY RB 1U ADDED	
1D	4	8.5.86	RES. 2Ω -27X L 30 ADDED	
1J	4	8.5.86	LPD -LP1 ADDED	
2A	4	8.5.86	2K7 RESISTOR ADDED	

THIS FORM ALSO USED FOR 'REPEAT' TYPE ORDERS WHEN DESCRIPTION OF CHANGE INCLUDES REFERENCE TO EARLIEST SERIAL NUMBER AFFECTED.

TECHN.	ENG.	APPD.	TECHN.	ENG.	APPD.	DATE 31/5/85
						TECHN.
						ENG. NGM
						APPD.

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VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

RECORD OF DIAGRAM CHANGES

GO NUMBER	ELEMENTARY DIAGRAM	CONTD.	IDENT DR	IDENT SH
502900	902M128CC	1A	O	C

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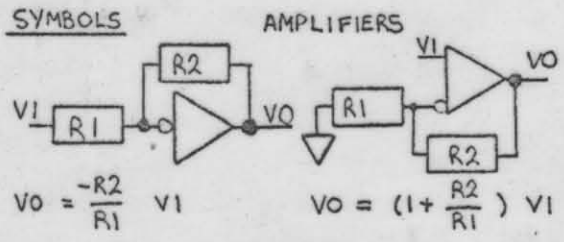
VOLTAGE POLARITIES SHOWN ARE FOR GF+

HARDWARE ABBREVIATIONS

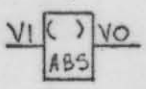
MCC	—	MAIN CONTROL CARD
IFC	—	INTERFACE CARD
PSC	—	POWER SUPPLY CARD
SCR	—	THYRISTOR ASSEMBLY
DGC	—	DIAGNOSTIC CARD
MFC	—	MOTOR FIELD CONTROL
MFE	—	MOTOR FIELD EXCITER
MDR	—	MODIFICATION RACK

SYMBOLS

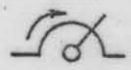
AMPLIFIERS



CASE GROUND



VO = SIGN ( ) X ABSOLUTE VALUE OF VI



POTENTIOMETER ARROWS ON THE CARD ELEMENTARY DIAGRAMS INDICATE THE WIPER DIRECTION AS THE POTENTIOMETER SHAFT IS ROTATED CLOCKWISE TO INCREASE FUNCTION.

— STAB ON TERMINAL

□ — TERMINAL AT 2TB, 3TB, 4TB, 5TB, RTB
EX: 9 [2] - 2TB9; X2 [R] - RTBX2

(NS/PS/TS) PS - PAST SHEET
NS - NEXT SHEET
TS - THIS SHEET

▲ THESE RESISTORS ARE CRIMPED IN WIRE HARNESS.

FUNCTION	USE	LOC	JUMPERS
60HZ		MCC	X-Y
		MFC	ZA-ZB (IF USED)
50HZ	X		(NONE)
10C-400%	X		(NONE)
-500%		IFC	1-1HI
-300%		IFC	1-1LO
SR 5-9V	X		(NONE)
9-20V		MCC	SRH-COM
LT. .3-7SEC	X		(NONE)
1-25SEC		MCC	562Ω FROM LTI TO COM
CEMF REG	X	IFC	NT-CEMF, PT-COM
DC TACH			(NONE)
TACH FILT		IFC	TC-TC
TACH VOLTS			
18-49 VDC		IFC	NT-NT1, PT-PT1
46-123 VDC		IFC	NT-NT2, PT-PT2
85-232 VDC		IFC	NT-NT3, PT-PT3
G1,3,4 | G2,5,6			MFC OR MFE
.8 | 1.7		MFC	(NONE)
1.3 | 2.8		MFC	YB-YD
2.4 | 5.0		MFC	YA-YB
4.0 | 8.0		MFC	YA-YB, YC-YD
7.0 | 13.0		MFC	YA-YC
13.0 | 25.0	X	MFC	YA-YC, YB-YD.
L/R < .25S	X	MFC	QA-QB
INH RUN		DGC	D1-D2 (IF USED)
RFC AMPS			
.8-1.7			(NONE)
1.3-2.7		MCC	FB-FD, RB-RD
2.6-5.5		MCC	FA-FB, RA-RB
3.7-8.2		MCC	FA-FB, RA-RB FC-FD, RC-RD
7.4-15	X	MCC	FA-FC, RA-RC
12.3-25		MCC	FA-FC, RA-RC FB-FD, RB-RD
23-49		MCC	FA-FE, RA-RE
45-70		MCC	FA-FE, RA-RE FA-FC, RA-RC FB-FD, RB-RD
MCC REG	X	MCC	DR-GFR.
HOIST FIELD PROGRAMME	X	MFC	CRS-COM CMA-COM TF-DM22
GANTRY FIELD	X	MCC	DM3-TIR
CONTROL	X	IFC	DM12-IABS
TRX. IN	X	MCC	DM8-RJR

USE	LOC	JUMPERS
X	MCC	DM4-NRG
X	IFC	CMFA-IHI
X	MFC	LPD-LPI

*ALM	A CURRENT LIMIT SWITCH INPUT
*ALT	AUX LINEAR TIME SWITCH INPUT
*BLM	B CURRENT LIMIT SWITCH INPUT
*CEMF	COUNTER EMF
*CFB	CURRENT FEEDBACK
CMFA	ABSOLUTE VALUE CEMF
CRM	CROSSOVER MODIFY
DFP	DELAYED FIRING POWER
*DMAC	DIAGNOSTIC MAC INPUT
*DR	DRIVER REFERENCE
*EAO	ERROR AMP OUTPUT
EST	EXTERNAL FLT STOP INPUT
FALT	FAULT
*FC	FIELD CURRENT
FDR	FIELD DIAGNOSTIC REFERENCE
FEA	FIELD ECONOMY ADJUST
FF	FIELD FAULT
*FGC	FORWARD FIELD CURRENT FEEDBACK
IABS	MOTOR CURRENT ABSOLUTE
ILA	CURRENT LIMIT ADJUST
IMET	CURRENT SIGNAL FOR METER
*LR	LOCAL REF. FROM DGC
*LT2	LINEAR TIME INTEGRATOR SUMMING JUNCTION.
*MAC	MAX/MA CONTROL SIGNAL
OSC	OSCILLATOR
*PCR	PHASE CONTROL REF.
*PRE	DRIVE PRECONDITION
ØSEC	PHASE SEQUENCE
RERR	REGULATOR ERROR
*RGC	REVERSE FIELD CURRENT FEEDBACK
RIJ	INTEGRATOR SUMMING JUNCTION
RJ	REGULATOR SUMMING JUNCTION
RRA	REGULATOR RESPONSE ADJUST
RSET	RESET
*RSI-2	AC SYNCHRONIZING INPUT
*RTR	READY TO RUN
*RUN	RUN SWITCH INPUT
SA-C	PHASE SYN OUTPUT
*SFB	SPEED FEEDBACK
SMET	SPEED SIGNAL FOR METER
*SR	SYSTEM REFERENCE INPUT
*SYS	SYSTEM FAULT TRIP
TA	OUTPUT FOR TACHO TRIP ADJUST
TF	TACHO FAULT
*TFB	TACHOMETER FEEDBACK
TFR	AC TACHO FREQUENCY OUTPUT
*TR	TIMED REFERENCE
*VFB	VOLTAGE FEEDBACK
*WFR	WEAK FIELD REFERENCE

(* — TEST POINT ON DOOR FRONT AS ARE ALL MCC TERMINALS.)

3PH VAC	RT1, 2, 3R
380-420	2.64MΩ ✓
230	1.506MΩ
460	3.0MΩ
1PH VAC	RS1, 2
340	2.21MΩ
575	3.71MΩ
VDC	DCPR, DCNR
240	1.681MΩ
500	3.562MΩ ✓

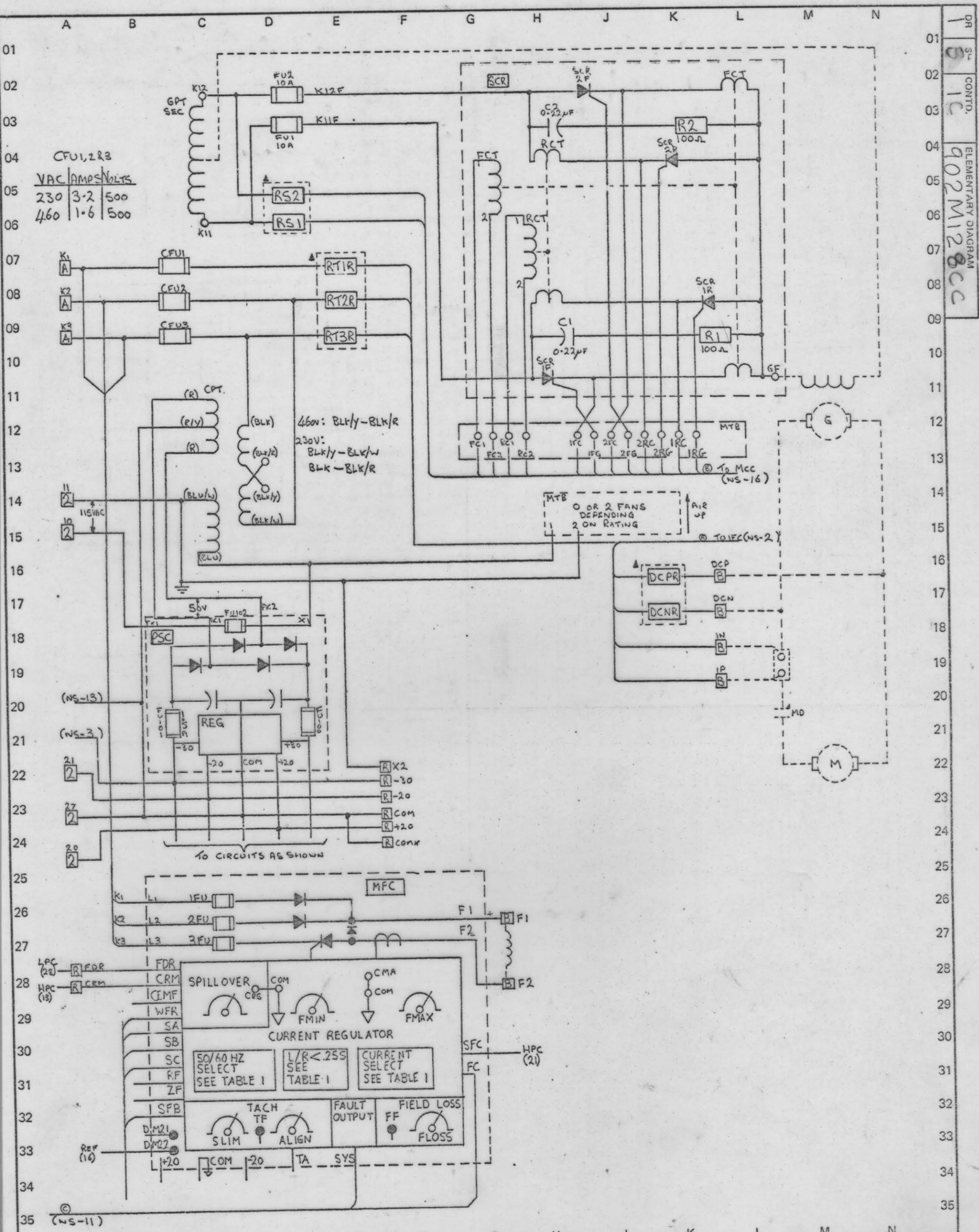
DR 1 | SH A | CONTD. 1B | ELEMENTARY DIAGRAM 902M128CC

TECHN.	ENG.	APPD.	TECHN.	ENG.	APPD.	DATE
						24/5/85
						TECHN.
			4			ENG. NGM
			SS. 86			APPD

ALLENWEST
Simplex
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

HOIST/GANTRY
REVERSING FIELD MODULE

GO NUMBER	ELEMENTARY DIAGRAM	CONTD.	IDENT	DR	SH
502900	902M128CC	1B		1	A


CFU1,2&3
VAC | AMPS | VOLTS
230 | 3·2 | 500
460 | 1·6 | 500
FU2 10A
FU1 10A
K12
K11
GPT SEC
K12F
K11F
RS2
RS1
CFU1
CFU2
CFU3
RT1R
RT2R
RT3R
(R) CPT.
(P1Y)
(R)
(BLK)
(BLK/R)
(BLK/Y)
(BLK/W)
460V: BLK/Y–BLK/R
230V: BLK/Y–BLK/W BLK–BLK/R
(BLU/W)
(BLU)
115VAC
50V
FU1&2
FC2
FC1
X1
PSC
REG
FCU-1
FCU-2
-30
-20
COM
+20
(NS-13)
(NS-3)
X2
-30
-20
COM
+20
COMX
TO CIRCUITS AS SHOWN
SCR
SCR 2F
SCR 2R
SCR 1R
SCR 1F
FCT
RCT
C2 0·22μF
C1 0·22μF
R2 100Ω
R1 100Ω
GF
FC1
RC1
FC2
RC2
1FC
1FG
2FC
2FG
2RC
2RG
1RC
1RG
MTB
TO MCC (NS-16)
MTB
0 OR 2 FANS DEPENDING 2 ON RATING
AIR UP
TO IEC (NS-2)
DCPR
DCNR
DCP
DCN
IN
IP
MD
G
M
MFC
K1 L1 1FU
K2 L2 2FU
K3 L3 3FU
F1
F2
LPC (22)
HPC (13)
FDR
CRM
CEMF
WFR
SA
SB
SC
RF
ZF
SFB
SPILL OVER
CRS
COM
FMIN
CMA
COM
FMAX
CURRENT REGULATOR
50/60 HZ SELECT SEE TABLE 1
L/R<.25S SEE TABLE 1
CURRENT SELECT SEE TABLE 1
TACH
TF
SLIM
ALIGN
FAULT OUTPUT
FIELD LOSS
FF
FLOSS
D.M21
D.M22
REF (16)
+20
COM
-20
TA
SYS
SFC
FC
HPC (21)
(NS-11)

| | | |

OPENED FOR SOME CONTROL OP.

INSTRUMENT

LO

HI

CONTROL ON

-30V (PS-21)

© (PS-15)

MAX

IFC

RSTOP

+20V COM -20V PRE PRE COM RN RP

RT1 RT2 RT3 DCP DCN IN IP

ISOLATE & PHASE SHIFT

ISOLATE

ISOLATE

MAC

OR AND

(+) ABS

OA7

CMFA

ZSPD

(-) APPROX. 2·5V AT RATED IA

IARS

IMET

5K

(-) ABS

OA4

7·5V AT TOP SPEED

SPES SMET

10K

DM13

(-) ABS

OA5

OA6-2

TFR

18 PUL/REV

OSC 6KHZ

DM12

CMF

TACH V SCALING

150K TKN

150K TKP

TC

SEE TABLE 1

NT PT

47·5K

OA3

TACH

TO MFC (PS-35)

SVS

EST

FAULT TRIP FAULT

FALT dSCR

ILO IH1

RESET

RSET

REF (12X)

REF (23)

+20

RSET RTR FT1 FT2 SMAX TFB CEMF SA SB SC VFB DM11 CFB IPU OSC DM12

B FLT A

CFB

FLT

(PS-20)

COM C

OA6-1

MCC

MAC WFR FC SFB SVS

FET CONTROL LOGIC (SEE NOTE)

TO FETS

PRE RUN DMAC DP1 DP2 FEA DFP

REF (14)

Top (5)

READY TO RUN

RTR SMAX TFB CEMF VFB COMP CFB IRA(6) ALM ELM

TO MTB (PS-13)

SMR

MAX SPEED

39·2K

22·1K

OA3-2

FBI

1-0-1-1

20K

2·74K

C14

TL

R71

RJ

10V TOP SPEED

5·6V FOR RATED ARM VOLTS

OA3

121K

1K

CURR LIM

A LIM

B LIM

CURR LIMIT SELECT

SPILL OVER

ILA

CLF

CLR

COM

2·2K

SRH

3·3K

4·75K

4·0K

OA1-1

1M

REF SCALE 10K

SR

TIR

(2-60 Sec)

332Ω

4MFD

OA1-2

47·5K

221K

GAIN

FFBR

RJT

OA2-2

OA2-1

DR

C48

CL1

R227

CLJ

GEN. FLD. REGULATOR

GFR

IMAX

FLD CURR AND 50/60 HZ SCE

RCSP

50K

RRA

2·2K

4MFD

+10V FOR RATED ARM VOLTS

LIN TIME

AUX TIME

TIME RANGE SELECT

LTS

LT

THR

1-0-0-0

1-0-1-1

RJR

TIR

ALT

IRA(6)

+30 +20 COM -20 DM1 LR LT2 DM2 TR DM3 DM4 DM5 FRO DM6 DM7 DM8 DR

LPC(22)

TOP(11)

TOP(20) SLO-IP

MCC-DP2

TOP(21) REF(24)

DP2 DP1 PSET

LOC REF

CURR REF

FDR

DFDR

CFB

MONO STABLE PG

DIAG RUN

NORM

DIAG STATIC

IMAC

-20

D2

D1

-20V

CRM

DCRM

DGC

NOTE FIELD EFFECT TRANSISTOR

THE CLOSED/OPEN (1/0) STATE OF THESE SWITCHES FOR "PRECONDITION" – "RUN" – "DIAGNOSTIC STATIC" – "DIAGNOSTIC RUN" IS SHOWN BY A FOUR DIGIT WORD WITH STATE SEQUENCE AS LISTED ABOVE.

TECHN.	ENG.	APPD.	TECHN.	ENG.	APPD.	DATE 24/5/85
						TECHN.
						ENG. NOM
						APPD.

ALLENWEST Simplex

VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

HOIST / GANTRY

REVERSING FIELD MODULE

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502900	902M128CC	1D

IDENT

DR	SH
1	C

DR 1 SH C CONTD 1D ELEMENTARY DIAGRAM 902M128CC

RUN PERMISSIVE

TDR-1G

TIME DELAY ON DE-ENERGISATION

ZERO CEMF RELAY

SLD-1E

INSTRUCTIONS VSD1 211

D/O AT CEMF = ±0·3V

BRAKE RELAY

SLD-1E

INSTRUCTIONS VSD1 211

D/O AT CEMF = ± 0·7V

[IC17] MCC (CEMF)

+20V 2RC-IN 24 26 MCC (ALT) [IC28]

MCC (ALM) [IC17]

RB-1L [IC15] R RSET 18 20

HOIST/LEFT 4 5K

LOWER/RIGHT 5K

1 OR 3

POTENTIOMETER ON MASTER CONTROLLER

SP6 SP5 SP4 SP1 SP36 SP2 SP3

RA-1L

REF-1D

0·001 µF

22K1

10K

OA2

26X

[IE02]

-30V

-20V

+20V

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DR 1 | SH E | CONTD. 1F | ELEMENTARY DIAGRAM 902M128CC

[ID30] -Ve HOIST

MCC(DM7)

IRB-15 16 13 — MCC(SR) [IC26]

IRB-15 18/20 — 17

REF-ID — DIS 10 — 19X 30X 3X — MAXNEG 10K — NREF — 30 5X 3

8X X4 — 9 X3 — 8 X2 — 6X1 — ZERO ADJ 1K — T1 T2 — MAX POS 10K — PREF

SLOW 20K — 5

+30V 4/15

[IC18] MCC(PRE) — 14 PRE

MONITOR PRECONDITION — COMPARE

LATCH — 23 SYS — MCC(SYS) [IC17]

TRACKING ERROR OR OVERVOLTAGE

TF 16 — MFC(DM22) TF [IB33]

(H) 4/2 — 11 NSW — T1

(L) 4/3 — 13 PSW — T2

-30V — 10X -30V

+20V — 22.1K — FEA 18

[IC29] MCC(DR) — 29 DR — DR INVERT AND MONITOR IR COMP

28 CFB

21 — 10K — 26 11X 9X 12X 6X 18X 28X

56.2K — 56.2K — 4K7 — SFB SHAPING — 15K — ERR

56K 13X — 39K 16X — 22K 17X — 12

+20V COM -20V — 31 15 2

RAIU

[IC29] MCC(TR) 8/5 — 6

5 RS-IR 4K7 5X

MCC(SFB) [IC17]

TQP-1C — 20 TR — 29 ATR

[IC29] MCC(LT2) — 19 LT2 — T1 T2 T3 — OA1-1 — T6 — 10K — 12.1K — TRX 28 — MCC(DM8) RSR [IC29]

T7 — UTP2 6

+20V — LC HC

13

[IC14] R CFB — 30 CFB — ATR(+) AND CFB(+) — OR — AND — OR

27 — TG T7 T2 T3

14 REL — AND

12 — ATR(-) AND CFB(-) — OR — AND

10

3 PRE — PRE(-4V) OR DP2(+20V)

[IC21] MCC(DP2) — 5 DP2

8 UTP1

330Ω — ILR 9

BR 18 — 3/5 — A BPR B — 15K — BRAKE PROVING RELAY

OA1-2 — REF DELAY 25K — T1 — IMF — TBR — 3.92K — T17 — -30V 17 — 3/4 — -30V

+20V COM -20V — 31 15 2 — 22

HMT — 3/8 1 — 3/7 1 — 4 1/7 1 — 3/6 — 5/3 — 5/4

RAIU — 3/3 9 1 6 — 3/5

TECHN.	ENG.	APPD.	TECHN.	ENG.	APPD.	DATE 24/5/85
			3		11/2/86	TECHN.
						ENG. NGTM
						APPD.

ALLENWEST — Simplex — VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

HOIST/GANTRY

REFERENCE & TORQUE PROVING

GO NUMBER	ELEMENTARY DIAGRAM	CONTD.
502900	902M128CC	1F

IDENT — DR 1 — SH E

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HPC-1A

MCC (CEMF) [IC17]

[IC31] 5 DFDR

[IC17] (CFB) MCC

25 CEMF

26 FDR

17 CFB

23

DIRECTION SENSING

KL 28

KH 27

30

LV 29

47.5K

47.5K

.47MF

MFH

47.5K

0A1-2

10K

VOLTAGE PROGRAMMING

10K

2MF

10K

-20V

SFA

-1.4V

20K

47.5K

274K

MFL 10K

148K

SFC 21

MFC (SFC) [1B30]

27K

18K

182K

8K

HB

-20V

HB 10K

CURRENT PROGRAMMING

0A3-1

CRM 13

R CRM [1B28]

221K

475K

33.2K

68.1K

1MF

332K

681K

.15M

DMAC 3

5 DMAC [IC33]

LI 14

475K

20K

47.5K

24CFB

10K

0A2-1

22 CFB

2

0A2-2

274K

5

6

+20V COM -20V

31 15 2

LPC-1B

19

16CEMF 47.5K

17 FDR 47.5K

.47MF

0A1-1

47.5K

681K

681K

LV 25

0A1-2

2.21K

24

2.21K

21

VOLTAGE PROGRAMMING

2.21K

18

2.21K

22 KL 27K

20 2CFB 47.5K

0A2-1

20K

-20V

22.1K

SL1 10K

LB2 20K

LB2

2.74K

30

.1MF

26

150K

LI 6

1M

27K

0A3-1

20K

0A4-2

2.21K

8

47.5K

.1MF

-20V

47.5K

SL2 10K

LB3 20K

LB3

2.74K

2.21K

7

RED JUMPER

CURRENT PROGRAMMING

2.21K

10

2.21K

3

.4MF

27K

0A3-2

20K

1M

LCP

47.5K

.1MF

10K

DMAC29

SL3 10K

82.5K

FDR 28

R FDR [1B28]

T2

LR 27

MCC (LR) [IC29]

2.74K

+20V COM -20V

31 15 2

23

5

HOIST

MOTOR FIELD PROGRAMMING

TECHN.	ENG.	APPD.	DATE 24/5/85
			TECHN.
			ENG. NGM
			APPD.

ALLENWEST

Simplex

VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

CO NUMBER	ELEMENTARY DIAGRAM	CONTD.	IDENT DR	IDENT SH
502900	902M128CC	1G	1	F

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DR 1 | SH G | CONTD. 1H | ELEMENTARY DIAGRAM 902M128CC

[1C17] MCC (VFB) −Ve FORWARD

8 10K
9 10K
11
12
HPC-1A 0·001MF
OA3
10
20K

R4-15 100K 4X
4

D7-15 7X
7

+Ve FORWARD REGEN.
−Ve REVERSE REGEN.
+15V FORWARD
−15V REVERSE

SLD-1Q — SLA

TP1 15K
TP2 15K
23
22
39K
3.9K
.47 MF
COM
HYSTERESIS
+20V 31
20
SLA
29
25
30
26
28
27
A LEVEL ADJ.
SP7 2 24
[1G34]
1 D COM
32
INSTRUCTIONS VSD1 211
24 18 21 −Ve POLARISED
P/U REVERSE REGENERATION

SLD-1Q — SLB

TP3 15K
TP4 15K
12
39K
3.9K
10K
11
.47 MF
COM
HYSTERESIS
+20V 31
18
SLB
9
3
10
5
8
6
B LEVEL ADJ.
SP8 2 25
1 DCOM
32
INSTRUCTIONS VSD1 211
14 13 17 +Ve POLARISED
P/U FORWARD REGENERATION

[1C17] MCC (CFB) +Ve FORWARD REGEN

11 10K
12 10K
LPC-1B 0·001MF
14
13
OA4
9
20K

R5-1S 100K 5X
5

D9-1S 9X
9

MCC (DM1)
MCC (DM2)

LOR 2 8
29 RC -1L 23
REGENERATION RELAY

SP39 4 9
RC-1L
22 25
24
LLR 1 RC -1J 25 23
GANTRY FIELD WEAKEN No.1 RELAY

SP40 4 10
RC-1L
30 28
27
LLR 2 RA -1N 11 3
GANTRY FIELD WEAKEN No.2 RELAY

SP41 4 5
LOR RB -1L 19 13
RESET RELAY

SP37 4 7
LLR
LLR 25
LLR 2 RC -1N 23
GANTRY SELECT RELAY GSR 2
LLR 11 3 RA1U

SP38 4 8
LLR 1 RB -1J 21 14
SLOWDOWN RELAY

[1G07] 3 9
RA-1L 8X 11X
2RC-1N 28 30
LLR 1 RA -1S 11 3
GANTRY FIELD ECONOMY RELAY

TECHN. ENG. APPD.	TECHN. ENG. APPD.	DATE			
1 — 7.5.86	3 — 11.2.86	29/5/85	TECHN.		
			ENG. NGM		
			APPD.		

ALLENWEST
Simplex
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

GANTRY
FIELD CONTROL & REGENERATION DETECTOR

GO NUMBER	ELEMENTARY DIAGRAM	CONTD.	IDENT DR	IDENT SH
502900	902M128CC	1H	1	G

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DR 1 | SH H | CONTD. 13 | ELEMENTARY DIAGRAM 902M128CC

ACCEL/DECEL RELAY

SLD-1P

SLA

[IC30] TIR MCC(DM3)

TP1 15K

TP2 15K

23 39K 22 3.9K .47 MF COM

HYSTERESIS

+20V 31 20

SLA 29 25 30 26 28 27

A LEVEL ADJ.

1 D COM 32

INSTRUCTIONS VSD1 211 24 18 21

P/U ON ACCEL & DECEL (TIR=±10V)

ARMATURE CURRENT RELAY

SLD-1P

SLB

[IC14] IABS IFC(DM12)

TP3 15K

TP4 15K

12 39K 11 10K .47 MF COM 3.9K

HYSTERESIS

+20V 31 18

SLB 9 3 10 5 8 6

B LEVEL ADJ

1 DCOM 32

INSTRUCTIONS VSD1 211 14 13 17

R10-1R 100K 10 10X

NOT CONNECTED (FIELD ALWAYS FORCED EXCEPT FOR STEERING)

4 11 SP41

4 12 SP42

RD-1L 2X 7X

32 RD -1L 1

2 RB -1N 14 21

GANTRY FIELD FORCING RELAYS

-20V 16X 17 16

SP5-1R 10K LEVEL B DROP OUT

SET B LEVEL ADJ TO P/U AT 180% FLC FOR GANTRY (CFB=±45V)

SET SP5-1R FOR D/O AT 80% FLC FOR GANTRY (CFB=± 2 V)

-20V 2 R2-1R 4K7 2X 32X

1K SP1-1R GANTRY FIELD No.1 FORCING 32 30X

2RB-1N 13 16

1RC-1J 28 30

+20V 31 R31-1R 6K8 31X 27X

2K SP2-1R GANTRY FIELD No.1 WEAKENING 30 29 27 15X

R15-1R 1K5 15

+20V 9 R9-1R 10K 9X

R7-1R 7X 825R 7

FIELD ECON.

1RA-1J 6 8 5

MCC(DM5) SP43 [IJ12] 4 GFC1 13

-20V 28 R28-1R 4K7 28X 25

1K SP3-1R GANTRY FIELD No.2 FORCING 25X 22

2RB-1N 19 20

2RA-1N 8 5

1RA-1J 10

MCC(DM6) 9 1 12 SP44 [IJ25] A GFC2 14

+20V 29 R29-1R 6K8 29X 19

2K SP4-1R GANTRY FIELD No.2 WEAKENING 22X 6 19X 13

R13-1R 1K5 13X

[IJ11] IFC(SYS) 2 26

TECHN.	ENG.	APPD.	TECHN.	ENG.	APPD.	DATE 28/5/85
4			3		11.2.86	TECHN.
						ENG. NGM
						APPD.

ALLENWEST

Simplex

VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

GANTRY

MOTOR FIELD CONTROL

GO NUMBER	ELEMENTARY DIAGRAM	CONTD.	IDENT	DR	SH
502900	902M128CC	13		1	H

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DR 1 | SH 5 | CONTD 1K | ELEMENTARY DIAGRAM 902M128CC

[1B08]

K1 K2 K3

MFC1

+20V
[1B23] COM
-20V

+20V
COM
-20V
WFR

L1 L2 L3

PANEL MOUNTED
MOTOR FIELD CONTROL
331W367AAG04

JUMPERS			
	ZA-ZB		QA-QB
	YB-YD		YA-YC
X	YA-YB	X	YC-YD
	RFR-COM		
X	TF-COM	X	LPD-LPI

F1 F2

F1
GANTRY MOTOR No. 1
SHUNT FIELD
F2

SYS [1H35]

[1H24] GFC1

DM22
221K
PJ

228

[1B08]

K1 K2 K3

MFC2

221

+20V
COM
-20V
WFR

L1 L2 L3

PANEL MOUNTED
MOTOR FIELD CONTROL
331W367AAG04

JUMPERS			
	ZA-ZB		QA-QB
	YB-YD		YA-YC
X	YA-YB	X	YC-YD
	RFR-COM		
X	TF-COM	X	LPD-LPI

F1 F2 SYS

F1
GANTRY MOTOR No. 2
SHUNT FIELD
F2

222

[1H28] GFC2

DM22
221K
PJ

TECHN.	ENG.	APPD.	TECHN.	ENG.	APPD.	DATE
			4		85-86	2A/5/85

TECHN.
ENG. NGM
APPD.

ALLENWEST
Simplex
VARIABLE SPEED
DRIVES OPERATION,
BRIGHTON, ENGLAND.

GANTRY
MOTOR FIELD CONTROL

GO NUMBER	ELEMENTARY DIAGRAM	CONTD.	IDENT	DR	SH
502900	902M128CC	1K		1	5

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902HM100EA

DR	SH	CONTD.	ELEMENTARY DIAGRAM
1	K	1L	902M128CC

A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	
HPC	LPC	TQP	REF	ISLD		TDR		1LLR		LOR		2LLR	2SLD	3SLD	1CC	2CC				
193W 547 A-601	193W 548 A-601	193W 545 A-601	193W 546 A-601	193W 277 A-602		193W 543 A-602		193W 279 A-603		193W 265 A-604		193W 279 A-603	193W 277 A-602	193W 277 A-602	909W 317 ABG58	909W 317 ABG60				
HOIST PROGRAM	LOWER PROGRAM	TORQUE PROVE	REFER-ENCE	SIG. LEVEL DET.		TIME DELAY RELAY		LOW LEVEL RELAY		LOGIC RELAY		LOW LEVEL RELAY	SIG. LEVEL DET.	SIG. LEVEL DET.	SELECT COMP.	SELECT COMP				

ON PRINTED CIRCUIT CARDS USED IN THIS RACK THE LETTERS 'AA' AFTER BASIC CATOLOGUE NUMBER INDICATES ORIGINAL DESIGN. SUBSEQUENT DESIGNS WITH THE SAME BASIC NUMBERS AND GROUP NUMBER WITH THE SECOND LETTER CHANGED, SUCH AS: AB, AC, AD, ETC., ARE DIRECTLY INTERCHANGEABLE AND MAY BE SUPPLIED IN PLACE OF THE 'AA' CARDS.

THE PRINTED CIRCUIT CARD SHOULD ALWAYS BE REMOVED WITH THE CARD EXTRACTOR WHICH IS ATTACHED ON TOP OF THE CARD RACK. SOME CARDS CONTAIN PARTS WHICH WILL BE THERMALLY HOT AFTER BEING IN OPERATION. CARE SHOULD BE EXERCISED IN HANDLING ALL CARDS AFTER REMOVAL UNTIL THESE PARTS HAVE COOLED. DO NOT REMOVE OR INSERT CARDS WITH POWER APPLIED.

FRONT VIEW OF 64 PIN RECEPTACLE AS SEEN IN RACK CLOSED POSITION.

32	64
31	63
30	62
29	61
28	60
27	59
26	58
25	57
24	56
23	55
22	54
21	53
20	52
19	51
18	50
17	49
16	48
15	47
14	46
13	45
12	44
11	43
10	42
9	41
8	40
7	39
6	38
5	37
4	36
3	35
2	34
1	33

32	32X
31	31X
30	30X
29	29X
28	28X
27	27X
26	26X
25	25X
24	24X
23	23X
22	22X
21	21X
20	20X
19	19X
18	18X
17	17X
16	16X
15	15X
14	14X
13	13X
12	12X
11	11X
10	10X
9	9X
8	8X
7	7X
6	6X
5	5X
4	4X
3	3X
2	2X
1	1X

NOTE: RECEPTACLE PINS MAY BE NUMBERED AS SHOWN IN EITHER SKETCH. (PIN 33 CORRESPONDS TO PIN 1X, 34 TO 2X, ETC.)

SYMBOLS:

● TEST POST ⊘ POT ADJUSTMENT ⌘ INDICATING LIGHT

CARD RACK WIRE JUMPER TABLE

RTB(COM)-1A15	5TB(DMAC)-1A03	4TB4-1G05X	MCC(DM4)-MCC(DP2)
RTB(+20)-1A31	SP1-1E30	4TB5-1L19	MCC(DM7)-1D19X
RTB(-20)-1A02	SP2-1E05	SP36-1E09	MCC(DM5)-1J05
RTB(CFB)-1C30	SP3-1E08	SP37-1N25	MCC(DM6)-1J12
RTB(-30)-1L05	SP4-1S31X	SP38-1J21	3TB9-1N28
MCC(SFB)-1D12X	SP5-1S27X	SP39-1L22	IFC(DM12)-1P11
MCC(TR)-1C20	SP6-1D27X	SP40-1L30	
MCC(SR)-1J13	SP7-1Q25	SP41-1P29	
MCC(SYS)-1D23	SP8-1Q10	SP42-1L32	
MCC(DR)-1D29	2TB26-IFC(SYS)	SP43-MCC(DM5)	
MCC(CEMF)-1E11	3TB1-1G12	SP44-MCC(DM6)	
MCC(DM8)-1C28	3TB2-1L10	SP45-MCC(+30)	
MCC(LT2)-1C19	3TB3-	2TB3-1G11X	
MCC(DP2)-1C05	3TB4-1C17	MCC(TFB)-5TB4	
MCC(PRO)-1D14	3TB5-1C18	MCC(ALT)-MCC(ALM)	
MFC(DM22)-1D16	3TB6-	MCC(ALM)-1N26	
RTB(FDR)-1B28	3TB7-1L03X	RTB(RSET)-1L18	
MCC(LR)-1B27	3TB8-	MCC(VFB)-1A09	
MFC(SFC)-1A21	4TB1-1L03	MCC(DM3)-1P22	BUS PINS 02 1A-1G, 1P-1S
RTB(CRM)-1A13	4TB2-1D11	MCC(DM1)-1B09	BUS PINS 1S 1A-1S, 1N-1S
5TB(DFDR)-1B17	4TB3-1D13	MCC(DM2)-1A10	BUS PINS 31 1A-1G, 1P-1S

TECHN.	ENG.	APPD.	TECHN.	ENG.	APPD.	DATE
						30/5/85
						TECHN.
						ENG. NGM
						APPD.

ALLENWEST
Simplex
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

HOIST/GANTRY

MDR RACK LAYOUT & WIRE JUMPER TABLE

GO NUMBER	ELEMENTARY DIAGRAM	CONTD.
502900	902M128CC	1L

IDENT

DR	SH
1	K

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902HM100CT SH.16

DR 1 | SH L | CONTD. 1M | ELEMENTARY DIAGRAM 902M128CC

CARD RACK WIRE JUMPER TABLE

1L20 – 1S20	1P13 – 1P14	1R07 – 1R13X		
1L17 – 1S15X	1P29 – 1P09	1L04 – 1L01		
1S20X – 1S15	1P03 – 1N21	1L01 – 1L23		
1S27X – 1S30	1N21 – 1L07X	1L23 – 1N23		
1S27 – 1S02X	1L07X – 1L32	1N23 – 1N14		
1D26X – 1D19X	1P25 – 1L02X	1N14 – 1N03		
1D29 – 1R05	1P12 – 1R10			
1R05X – 1D18X	1R10X – 1P08			
1D28 – 1D11X	1P05 – 1R17			
1D11X – 1B13	1R02 – 1R16X			
1B12 – 1B15	1R15 – 1R16			
1B09 – 1B11	1R02X – 1R32X			
1B11 – 1S04	1R30X – 1R16			
1S04 – 1S05	1R32 – 1N13			
1A10 – 1S09X	1N16 – 1J28			
1S09X – 1S07	1R31X – 1R27X			
1S04X – 1Q23	1R27 – 1R15X			
1S07X – 1Q22	1R30 – 1J29			
1S05X – 1Q12	1J30 – 1J08			
1S09 – 1Q11	1R16X – 1R28			
1Q19 – 1Q24	1R28X – 1R25			
1Q30 – 1Q03	1R22 – 1R30X			
1N28 – 1L08X	1R25X – 1N19			
1L08X – 1Q26	1N20 – 1N08			
1Q26 – 1Q05	1R31 – 1R29			
1Q28 – 1Q08	1R29X – 1R19			
1Q08 – 1L29	1R19X – 1R13			
1L28 – 1L25	1R13X – 1R22			
1L25 – 1J25	1R22X – 1N06			
1L27 – 1L24	1N05 – 1J09			
1L24 – 1N11	1R29 – 1R09			
1N30 – 1L11X	1R09X – 1R07X			
1L11X – 1J11	1R07X – 1J06			
1P19 – 1P21	1J06 – 1J10			

TECHN.	ENG.	APPD.	TECHN.	ENG.	APPD.	DATE 30/5/85
						TECHN.
						ENG. NGM
						APPD.

ALLENWEST Simplex GE
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

HOIST/GANTRY
WIRE JUMPER TABLE

GO NUMBER	ELEMENTARY DIAGRAM	CONTD.	IDENT DR	IDENT SH
502900	902M128CC	1M	1	L

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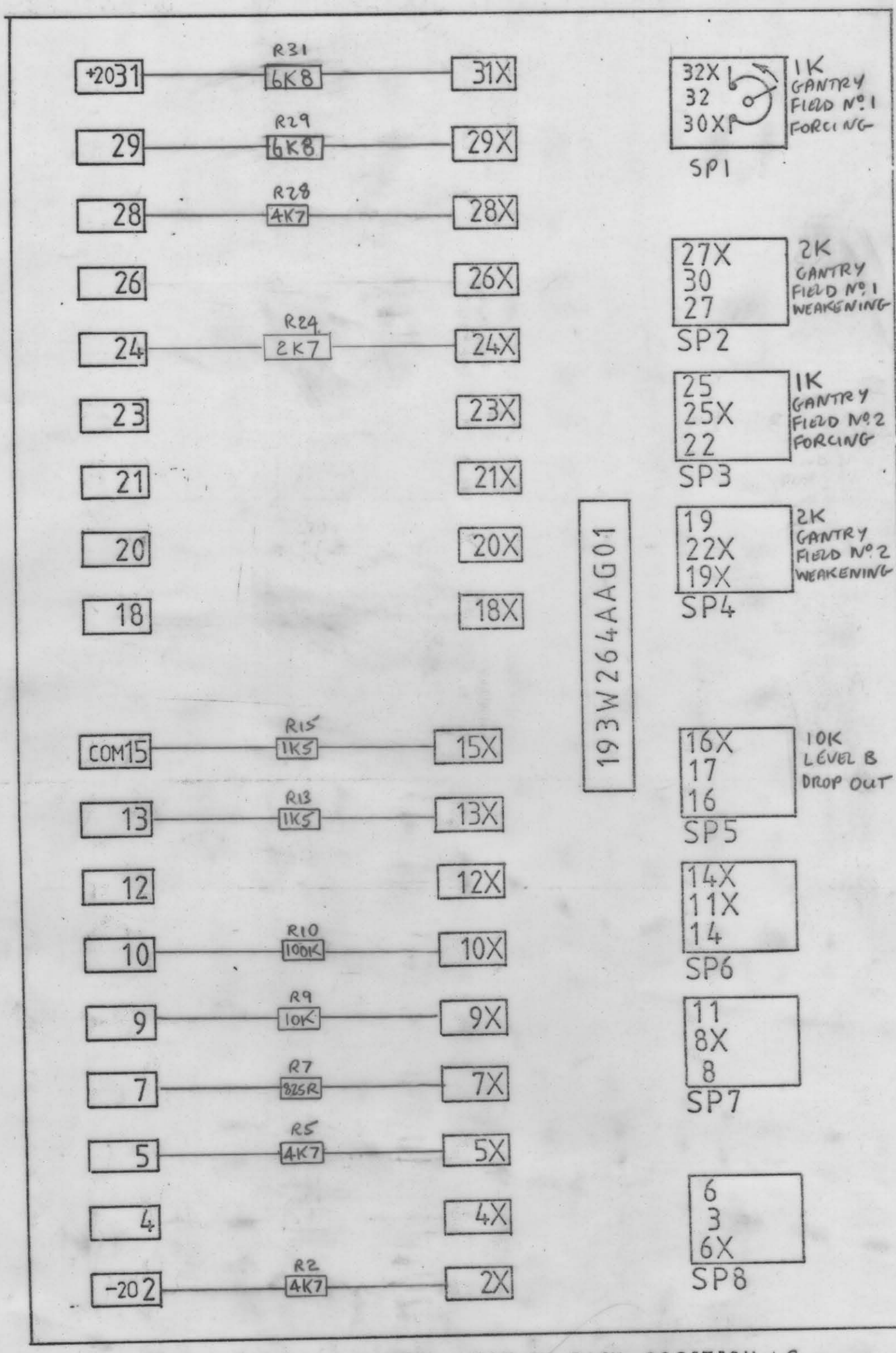

CARD PART NO. 909W317ABG58 FIT IN RACK POSITION 1R

TECHN.	ENG.	APPD.	TECHN.	ENG.	APPD.	DATE				
4		8.5.86	3		11.2.86	29/5/85	TECHN.	ENG. NGM	APPD.	

ALLENWEST Simplex
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

HOIST 1 GANTRY
SELECT COMPONENT PCB, 1CC

GO NUMBER	ELEMENTARY DIAGRAM	CONTD.	IDENT DR	IDENT SH
502900	902M128CC	1N	1	M

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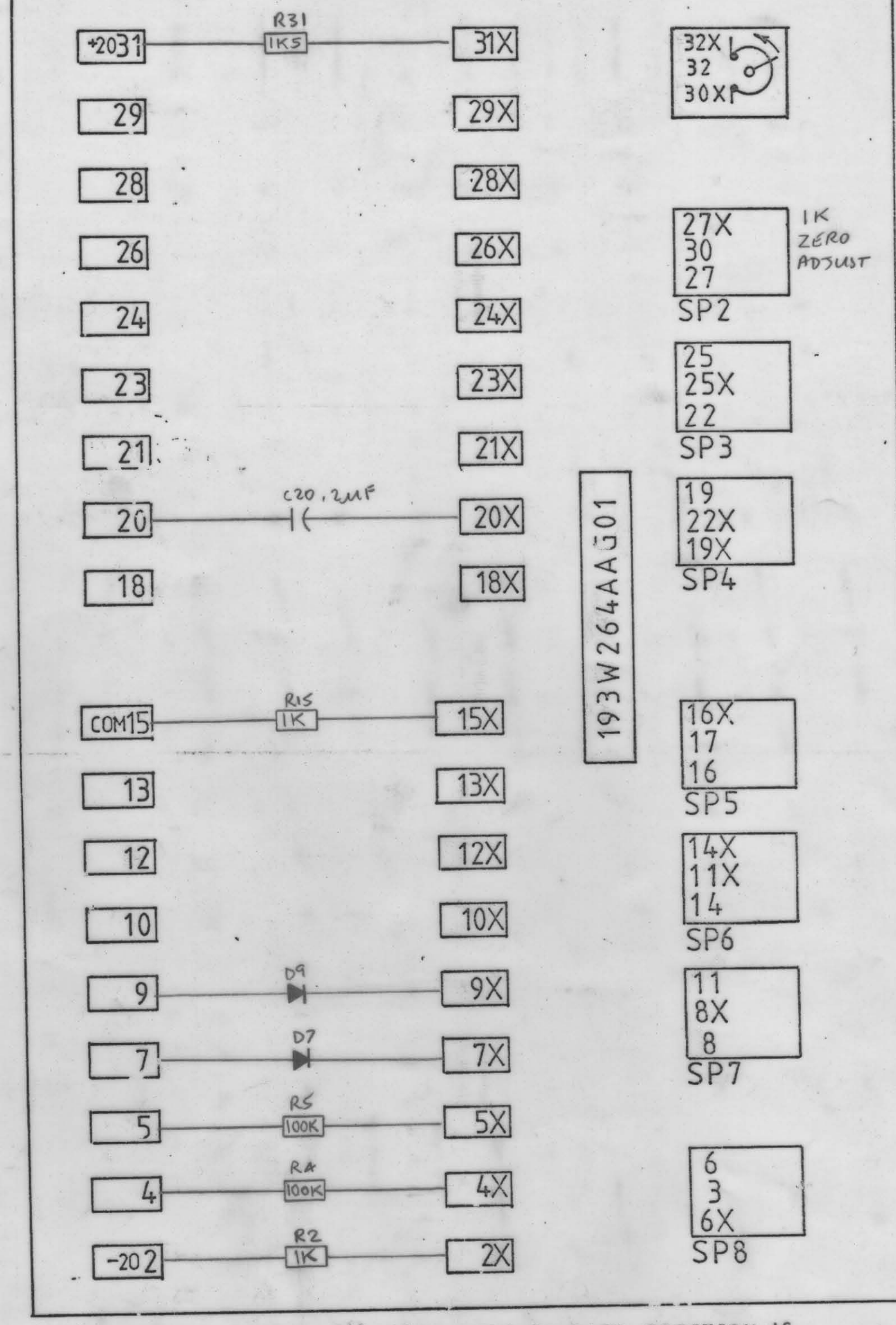

1K ZERO ADJUST

CARD PART NO. 909W317ABG60 FIT IN RACK POSITION IS

TECHN.	ENG.	APPD.	TECHN.	ENG.	APPD.	DATE 29/5/85
						TECHN.
						ENG. NGM
						APPD.

ALLENWEST Simplex
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

HOIST/GANTRY
SELECT COMPONENT PCB, 2CC

GO NUMBER	ELEMENTARY DIAGRAM	CONTD.	IDENT	DR	SH
502900	902M128CC	2A		1	N

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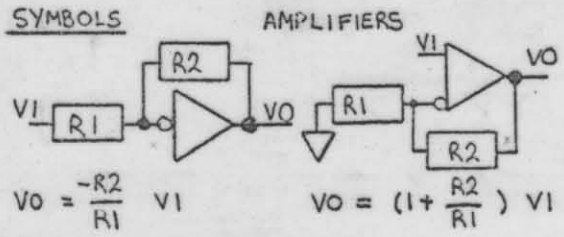
VOLTAGE POLARITIES SHOWN ARE FOR GF+

HARDWARE ABBREVIATIONS

MCC	—	MAIN CONTROL CARD
IFC	—	INTERFACE CARD
PSC	—	POWER SUPPLY CARD
SCR	—	THYRISTOR ASSEMBLY
DGC	—	DIAGNOSTIC CARD
MFC	—	MOTOR FIELD CONTROL
MFE	—	MOTOR FIELD EXCITER
MDR	—	MODIFICATION RACK

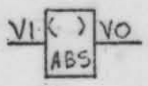
SYMBOLS

AMPLIFIERS



$VO = \frac{-R2}{R1} VI$ $VO = (1 + \frac{R2}{R1}) VI$

CASE GROUND



VO = SIGN ( ) X ABSOLUTE VALUE OF VI

POTENTIOMETER ARROWS ON THE CARD ELEMENTARY DIAGRAMS INDICATE THE WIPER DIRECTION AS THE POTENTIOMETER SHAFT IS ROTATED CLOCKWISE TO INCREASE FUNCTION.

● — STAB ON TERMINAL

□ — TERMINAL AT 2TB, 3TB, 4TB, 5TB, RTB
EX: 9 [2] - 2TB9; X2 [R] - RTBX2

(NS/PS/TS) PS - PAST SHEET
NS - NEXT SHEET
TS - THIS SHEET

▲ THESE RESISTORS ARE CRIMPED IN WIRE HARNESS.

FUNCTION	USE	LOC	JUMPERS
60HZ		MCC	X-Y
		MFC	ZA-ZB (IF USED)
50HZ	X		(NONE)
10C-400%	X		(NONE)
-500%		IFC	1-1HI
-300%		IFC	1-1LO
SR 5-9V	X		(NONE)
9-20V		MCC	SRH-COM
LT. 3-7SEC	X		(NONE)
1-25SEC		MCC	562Ω FROM LTI TO COM
CEMF REG	X	IFC	NT-CEMF, PT-COM
DC TACH			(NONE)
TACH FILT		IFC	TC-TC
TACH VOLTS			
18-49 VDC		IFC	NT-NT1, PT-PT1
46-123 VDC		IFC	NT-NT2, PT-PT2
85-232 VDC		IFC	NT-NT3, PT-PT3.
G1,3,④ | G2,5,6			MFC OR MFE
.8 | 1.7		MFC	(NONE)
1.3 | 2.8		MFC	YB-YD
2.4 | 5.0	X	MFC	YA-YB
4.0 | 8.0		MFC	YA-YB, YC-YD
7.0 | 13.0		MFC	YA-YC
13.0 | 25.0		MFC	YA-YC, YB-YD.
L/R < .255		MFC	QA-QB
INH RUN		DGC	D1-D2 (IF USED)
RFC AMPS			
.8-1.7			(NONE)
1.3-2.7		MCC	FB-FD, RB-RD
2.6-5.5	X	MCC	FA-FB, RA-RB
3.7-8.2		MCC	FA-FB, RA-RB FC-FD, RC-RD
7.4-15		MCC	FA-FC, RA-RC
12.3-25		MCC	FA-FC, RA-RC FB-FD, RB-RD
23-49		MCC	FA-FE, RA-RE
45-70		MCC	FA-FE, RA-RE FA-FC, RA-RC FB-FD, RB-RD
MCC RCG	X	MCC	DR-GFR.
INHIBIT CROSSOVER	X	MFC	CMA-COM
OVERVOLTAGE	X	MFC	TF-DM22
INH. RSTOP	X	IFC	CMFA-1HI
	X	MCC	DM4-NRG
		MFC	LPD-LPI

*ALM	A CURRENT LIMIT SWITCH INPUT
*ALT	AUX LINEAR TIME SWITCH INPUT
*BLM	B CURRENT LIMIT SWITCH INPUT
*CEMF	COUNTER EMF
*CFB	CURRENT FEEDBACK
CMFA	ABSOLUTE VALUE CEMF
CRM	CROSSOVER MODIFY
DFP	DELAYED FIRING POWER
*DMAC	DIAGNOSTIC MAC INPUT
*DR	DRIVER REFERENCE
*EAO	ERROR AMP OUTPUT
EST	EXTERNAL FLT STOP INPUT
FALT	FAULT
*FC	FIELD CURRENT
FDR	FIELD DIAGNOSTIC REFERENCE
FEA	FIELD ECONOMY ADJUST
FF	FIELD FAULT
*FGC	FORWARD FIELD CURRENT FEEDBACK
IABS	MOTOR CURRENT ABSOLUTE
ILA	CURRENT LIMIT ADJUST
IMET	CURRENT SIGNAL FOR METER
*LR	LOCAL REF. FROM DGC
*LT2	LINEAR TIME INTEGRATOR SUMMING JUNCTION.
*MAC	MAX/MA CONTROL SIGNAL
OSC	OSCILLATOR
*PCR	PHASE CONTROL REF.
*PRE	DRIVE PRECONDITION
ØSEC	PHASE SEQUENCE
RERR	REGULATOR ERROR
*RGC	REVERSE FIELD CURRENT FEEDBACK
RIJ	INTEGRATOR SUMMING JUNCTION
RJ	REGULATOR SUMMING JUNCTION
RRA	REGULATOR RESPONSE ADJUST
RSET	RESET
*RSI-2	AC SYNCHRONIZING INPUT
*RTR	READY TO RUN
*RUN	RUN SWITCH INPUT
SA-C	PHASE SYN OUTPUT
*SFB	SPEED FEEDBACK
SMET	SPEED SIGNAL FOR METER
*SR	SYSTEM REFERENCE INPUT
*SYS	SYSTEM FAULT TRIP
TA	OUTPUT FOR TACHO TRIP ADJUST
TF	TACHO FAULT
*TFB	TACHOMETER FEEDBACK
TFR	AC TACHO FREQUENCY OUTPUT
*TR	TIMED REFERENCE
*VFB	VOLTAGE FEEDBACK
*WFR	WEAK FIELD REFERENCE

(* — TEST POINT ON DOOR FRONT AS ARE ALL MCC TERMINALS.)

3PH VAC	RT1, 2, 3R
380-420	2.64MΩ
230	1.506MΩ
460	3.0MΩ
1PH VAC	RS1, 2
340	2.21MΩ
575	3.71MΩ
VDC	DCPR, DCNR
240	1.681MΩ
500	3.562MΩ

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						ENG. NGM
						APPD.

ALLENWEST
Simplex
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

TROLLEY

REVERSING FIELD MODULE

GO NUMBER	ELEMENTARY DIAGRAM	CONTD.	DR	SH
502900	902M128CC	2B	2	A

IDENT

DR 2 | SH B | CONTD 2C | ELEMENTARY DIAGRAM 902M128CC

CFU1,2&3

VAC	AMPS	VOLTS
230	3·2	500
460	1·6	500

460v: BLK/Y–BLK/R

230V: BLK/Y–BLK/W, BLK–BLK/R

115VAC

50V

REG

PSC

MFC

SPILLOVER

CURRENT REGULATOR

50/60 HZ SELECT SEE TABLE 1

L/R<.25S SEE TABLE 1

CURRENT SELECT SEE TABLE 1

TACH

FAULT OUTPUT

FIELD LOSS

0 OR 2 FANS DEPENDING 2 ON RATING

TO CIRCUITS AS SHOWN

TO MCC (NS-16)

TO IFC (NS-2)

OPENED FOR SOME CONTROL OD.

INSTRUMENT

CONTROL ON

-30V (PS-21)

IFC

RSTOP

MAC

ABS (+)

OA7

CMFA

ZSPD

OR

AND

+20V COM -20V PRE COM RN RP

RT1 RT2 RT3 DCP DCN IN IP

ISOLATE & PHASE SHIFT

ISOLATE

ISOLATE

(-) APPROX. 2·5V AT RATED IA

IABS

IMET

5K

ABS (-)

OA4

7·5V AT TOP SPEED

SMET

10K

ABS (-)

OA5

DM13

OA6-2

TFB

18 PUL/REV

OSC 6KHZ

DM12

TACH

TO MFC (PS-35)

SYS

EST

FAULT TRIP FAULT FALT dSEQ

+20

ILO IHI

RESET

RSET R

REF(12X)

REF(23)

B FLT A

5 4

SR SC VFB DM11 CFB IPU OSC

R CFB

3 2 5 FLT 7 2 4

TO MTB (PS-13)

MCC

MAC WFR FC SFB SYS RTR SMAX TFB CEMF VFB COMP CFB ALM BLM

READY TO RUN

5·6V FOR RATED ARM VOLTS

REF(14)

FET CONTROL LOGIC (SEE NOTE)

PRE RUN DMAX DPI DP2 FEA DFP

TO FETS

150K TKN

150K TKP

TACH V SCALING

NT PT

47·5K

SEE TABLE I

OA3 (-)

39·2K

22·1K

OA3-2

SMR

MAX SPEED

FBI

1-0-1-1

20K

274K

C14

TL

R71

RJ

10V @ TOP SPEED

SFB

121K

OA3

12K

CURR LIM

A LIM

B LIM

CURR LIMIT SELECT

SPILL OVER

ILA CLF CLR

COM C

OA6-1

2·2K

20K

SRH

3·3K

4·75K

4·0K

1M

REF SCALE 10K (-)

LIN TIME

AUX TIME

TIME RANGE SELECT

LT

T&R

1-0-0-0

1-0-1-1

(2-60 Sec)

332K

4MFD

OA1-1

OA1-2

47·5K

OA2-2

OA2-1

221K

GAIN

FFRR

RJT

DR C48 CL1 R227 CL3

GEN. FLD. REGULATOR

GFR

IMAX

FLD CURR AND 50/60 HZ SCR TRIGGER

PCB FGC KAC FC1 FC2 1FC 1FG 2FC 2FG 1RC 1RG 2RC 2RG RC1 RC2

RESP

50K RRA

4MFD

2·2K

RJT

RSET

+10V FOR RATED ARM VOLTS

REF(29)

ALT

+30 +20 COM -20 DM1 LR LT2 DM2 TR DM3 DM4 DM5 ERO DM6 DM7 DM8 DR

DP2 DP1 RSET LOC REF LR

MCC-DP2 FDR 28

FDP DFDR

MONO STABLE PG

CURR REF

CDS

ANG FUNC +20 NORM ANG STATIC

COMD IMAC -20 +20 COM -20 D2 D1 -20V

CRM DCRM

DGC

NOTE FIELD EFFECT TRANSISTOR

THE CLOSED/OPEN (1/0) STATE OF THESE SWITCHES FOR "PRECONDITION" – "RUN" – "DIAGNOSTIC STATIC" – "DIAGNOETIC RUN" IS SHOWN BY A FOUR DIGIT WORD WITH STATE SEQUENCE AS LISTED ABOVE.

TECHN.	ENG.	APPD.	TECHN.	ENG.	APPD.	DATE 24/5/85
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						ENG. NGM
						APPD.

ALLENWEST Simplex

VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

TROLLEY REVERSING FIELD MODULE

GO NUMBER	ELEMENTARY DIAGRAM	CONTD
502900	902M128CC	2D

IDENT

DR	SH
2	C

RUN PERMISSIVE

TPR-1G

13
14 — 15K — TIA — REF — +20V
12 — 56K — 56K — 22K — 10K — 0·47 µF — COM
TMA
LCA LTA FTA FSA +20V
DOA TDA PUA
RCA
RLA
5X 3X 6X 9X 10X 8X
-20V +20V
2 15 31 1 32

TIME DELAY ON DE-ENERGISATION

ZERO CEMF RELAY

SLD-1E — SLA

[2C17] MCC (CEMF)

TP1 15K — TP2 15K
23 — 33K — 22 — 3.9K — .47 MF — COM
HYSTERESIS +20V 31 / 20
SLA
29 25 30
A LEVEL ADJ.
1 D COM
32
INSTRUCTIONS VSD1 211
24 18 21
D/O AT CEMF = ±0·3V

SP1 2 13

RA-1L 9 11 10 RA-1L 4

BRAKE RELAY

SLD-1E — SLB

-30V RA-1L 5 3 4 1

TP3 15K — TP4 15K
12 — 33K — 11 — 3.9K — 10K — .47 MF — COM
HYSTERESIS +20V 31 / 18
SLB
9 3 10
B LEVEL ADJ.
5 5 6
1 D COM
32
INSTRUCTIONS VSD1 211
14 13 17
D/O AT CEMF = ±0·6V

SP36 4 6

RA-1L 5X 3X 3 7

31 +20V
1K R31-1M
31X
SP4 2 17

REF-1D
0·001 µF
22K1
22K1
0A2
10K
27X
26X
[2E02]

IN ↑ 5K OUT ↓
1 OR 3
5K
5
2
1 OR 3
7.5V.
2 19 SP6

2 18 SP5
POTENTIOMETER ON MASTER CONTROLLER
1K ZERO ADJUST SP2-1M
27X 30 27
2X
1K R2-1M
-20V 2

4 5
19 RB-1L 13 RESET RELAY

R8-1L
[2C15] R RSET
18 120
18
17 15X
18X C18-1M 2µF
1K R15-1M
15

TECHN.	ENG.	APPD.	TECHN.	ENG.	APPD.	DATE 24/5/85
						TECHN.
						ENG. NGM
						APPD.

ALLENWEST
Simplex
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

TROLLEY
MDR CONTROL

GO NUMBER	ELEMENTARY DIAGRAM	CONTD.	IDENT DR	IDENT SH
502900	902M128CC	2E	2	D

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SP38 4/8

[2D30]

MCC(DM1)

RB-1J 21 14

TRB-1J 16 13

MCC(SR) [2C26]

TRB-1S 18 20 17

REF-1D DIS 10

8X X4 9 X3 8 X2 6 X1

ZERO ADJ 1K

+30V 4/15

19X 30X 3X T1 T2

MAXNEG 10K MAXPOS 10K NREF PREF

30 5X 3 SLOW 20K 5

MFC TB32 [2B33]

MCC(SYS) [2C17]

[2C19] MCC(PRE) 14 PRE

MONITOR PRECONDITION COMPARE

LATCH TRACKING ERROR OR OVERVOLTAGE 23 SYS TF16

11 NSW T1 4/2

13 PSW T2 4/3

-30V 10X -30V

+20V 22.1K FEA 18

56.2K 56.2K

56K 13X 39K 16X 22K 17X 12

[2C29] MCC(DR) 29 DR

[2C14] R CFB 28 CFB

DR INVERT AND MONITOR IR COMP

SFB SHAPING

1.5K ERR

21 10K

+20V COM -20V 31 15 2

26 11X 9X 12X 6X 18X 28X

MCC(SFB) [2C17]

RS-1M 5 4K7 5X

TOP-1C 20 TR 29 ATR

19 LT2 T1 T3 OA1-1 T6 10K 12.1K TRX 28

T2 T7 UTP2 6

+20V LC HC

13

ATR(+) AND CFB(+) 30 CFB 27

ATR(-) AND CFB(-)

14 REL 12

OR AND OR AND OR AND

T6 T7 T2 T3

10

3 PRE PRE(-4V) OR DP2(+20V) 5 DP2

8 UTP1

330Ω ILR 9

BR 18

OA1-2

REF DELAY 25K T1 IMF TBR

3.92K T17 17 -30V -30V

+20V COM -20V 31 15 2 22

EDGE CONNECTOR PART WIRED BUT TORQUE PROVING PCB NOT FITTED

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						TECHN.
						ENG. NGM
						APPD.

ALLENWEST Simplex

VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

TROLLEY REFERENCE

GO NUMBER	ELEMENTARY DIAGRAM	CONTD.	IDENT DR	IDENT SH
502900	902M128CC	2F	2	E

DR 2 | SH E | CONTD 2F | ELEMENTARY DIAGRAM 902M128CC

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902HM100EA

A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V
			REF	ISLD		TDR		ILLR		LOR	CC								
			193W	193W		193W		193W		193W	909W								
			546	277		543		279		265	317								
			A-G01	A-G02		A-G02		A-G03		A-G04	ABG59								
			REFER-ENCE	SIG. LEVEL DET.		TIME DELAY RELAY		LOW LEVEL RELAY		LOGIC RELAY	SELECT COMP.								

ON PRINTED CIRCUIT CARDS USED IN THIS RACK THE LETTERS 'AA' AFTER BASIC CATOLOGUE NUMBER INDICATES ORIGINAL DESIGN. SUBSEQUENT DESIGNS WITH THE SAME BASIC NUMBERS AND GROUP NUMBER WITH THE SECOND LETTER CHANGED, SUCH AS: AB, AC, AD, ETC., ARE DIRECTLY INTERCHANGEABLE AND MAY BE SUPPLIED IN PLACE OF THE 'AA' CARDS.

THE PRINTED CIRCUIT CARD SHOULD ALWAYS BE REMOVED WITH THE CARD EXTRACTOR WHICH IS ATTACHED ON TOP OF THE CARD RACK. SOME CARDS CONTAIN PARTS WHICH WILL BE THERMALLY HOT AFTER BEING IN OPERATION. CARE SHOULD BE EXERCISED IN HANDLING ALL CARDS AFTER REMOVAL UNTIL THESE PARTS HAVE COOLED. DO NOT REMOVE OR INSERT CARDS WITH POWER APPLIED.

FRONT VIEW OF 64 PIN RECEPTACLE AS SEEN IN RACK CLOSED POSITION.

SYMBOLS:

● TEST POST ⊘ POT ADJUSTMENT ☼ INDICATING LIGHT

32	64
31	63
30	62
29	61
28	60
27	59
26	58
25	57
24	56
23	55
22	54
21	53
20	52
19	51
18	50
17	49
16	48
15	47
14	46
13	45
12	44
11	43
10	42
9	41
8	40
7	39
6	38
5	37
4	36
3	35
2	34
1	33

32	32X
31	31X
30	30X
29	29X
28	28X
27	27X
26	26X
25	25X
24	24X
23	23X
22	22X
21	21X
20	20X
19	19X
18	18X
17	17X
16	16X
15	15X
14	14X
13	13X
12	12X
11	11X
10	10X
9	9X
8	8X
7	7X
6	6X
5	5X
4	4X
3	3X
2	2X
1	1X

NOTE: RECEPTACLE PINS MAY BE NUMBERED AS SHOWN IN EITHER SKETCH. (PIN 33 CORRESPONDS TO PIN 1X, 34 TO 2X, ETC.)

CARD RACK WIRE JUMPER TABLE

RTB(COM) – 1D15	3TB2 – 1L10	SP44 –	1L20 – 1M18
RTB(+20) – 1D31	3TB3 –	SP45 – MCC(+30)	1M18X – 1M15
RTB(-20) – 1D02	3TB4 –	2TB3 – 1G11X	1L17 – 1M15X
RTB(CFB) – 1D28	3TB5 –	MCC(TFB)	1M27X – 1M30
RTB(-30) – 1L05	3TB6 –	5TB(DFOR) – RTB(FDR)	1M27 – 1M02X
MCC(SFB) – 1D12X	3TB7 – 1L03X	RTB(RSET) – 1L18	1D26X – 1D19X
MCC(SR) – 1J13	3TB8 –	MCC(DM7) – 1D19X	1D28 – 1D11X
MCC(SYS) – 1D23	3TB9 –	MCC(DM4) – MCC(DP2)	1D29 – 1M05
MCC(DR) – 1D29	4TB1 – 1L03		1M05X – 1D18X
MCC(CEMF) – 1E11	4TB2 – 1D11		
MCC(PRE) – 1D14	4TB3 – 1D13		
MFC(DM22) – 1D16	4TB4 – 1G05X		
SP1 – 1E30	4TB5 – 1L19		
SP2 –	SP36 – 1E09		
SP3 –	SP37 –		
SP4 – 1M31X	SP38 – 1J21	1G02 – 1M02	
SP5 – 1M27X	SP39 –	1J15 – 1M15	
SP6 – 1D27X	SP40 –	1G31 – 1M31	
SP7 –	SP41 –	BUS PINS 02 1D – 1G	
SP8 –	SP42 –	BUS PINS 15 1D – 1J	
3TB1 – 1G12	SP43 –	BUS PINS 31 1D – 1G	

DR 2 SH F CONTD. 2G ELEMENTARY DIAGRAM 902M128CC

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						TECHN.
						ENG. NOM
						APPD.

ALLENWEST Simplex VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

TROLLEY

MDR RACK LAYOUT & WIRE JUMPER TABLE

GO NUMBER	ELEMENTARY DIAGRAM	CONTD.	IDENT	DR	SH
502900	902M128CC	2G	△	2	F

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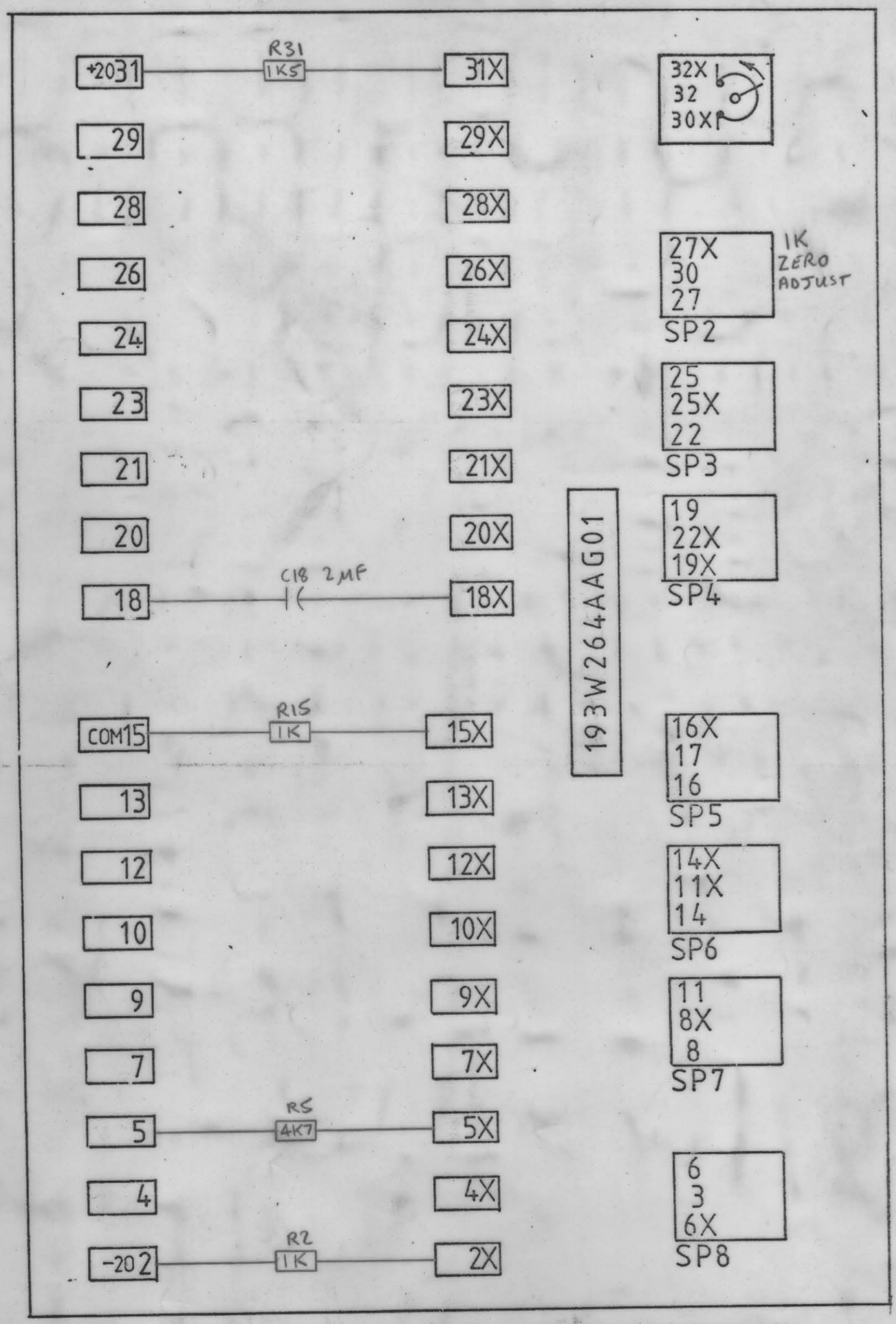

CARD PART NO. 909W317ABG59 FIT IN RACK POSITION 1M.

TECHN.	ENG.	APPD.	TECHN.	ENG.	APPD.	DAT 30/5/85
						TECHN.
						ENG. NCM
						APPD.

ALLENWEST Simplex
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

TROLLEY
SELECT COMPONENT PCB

GO NUMBER	ELEMENTARY DIAGRAM	CONTD.	IDENT	DR	SH
502900	902M128CC	FL		2	G