

DEVICE REF	DESCRIPTION	TYPE
K4411	PROTECTION SUPPLY No 1 SUPERVISION RELAY	GECA MVA412
K4041	Q50 TRIP RELAY 1	GECA MVA416
K1481	Q50 BREAKER FAIL TIMER (0.001-1 seconds)	GECA MYT114
F481	Q50 BREAKER FAIL CURRENT RELAY	GECA MCT140
X11	Q50 BREAKER FAIL TEST BLOCK	GECA MMLG01
K1401	Q50 TRIP RELAY AUXILIARY RELAY	GECA MVA414
K4011	Q50 BREAKER FAIL LOCKOUT TRIP RELAY	GECA MVA453
K4421	PROTECTION SUPPLY No 2 SUPERVISION RELAY	GECA MVA412
K4042	Q50 TRIP RELAY 2	GECA MVA416
F251	Q50 SYNCHRO CHECK RELAY	GECA MAV501
X14	Q50 SYNCHRO CHECK TEST BLOCK	GECA MMLG01
K4051	Q51 TRIP RELAY 1	GECA MVA416
K1482	Q51 BREAKER FAIL TIMER (0.001-1 seconds)	GECA MYT114
F482	Q51 BREAKER FAIL CURRENT RELAY	GECA MCT139
X12	Q51 BREAKER FAIL TEST BLOCK	GECA MMLG01
K1402	Q51 TRIP RELAY AUXILIARY RELAY	GECA MVA414
K4021	Q51 BREAKER FAIL LOCKOUT TRIP RELAY	GECA MVA453
K4052	Q51 TRIP RELAY 2	GECA MVA416
K4061	Q52 TRIP RELAY 1	GECA MVA416
K1483	Q52 BREAKER FAIL TIMER (0.001-1 seconds)	GECA MYT114
F483	Q52 BREAKER FAIL CURRENT RELAY	GECA MCT140
X13	Q52 BREAKER FAIL TEST BLOCK	GECA MMLG01
K1403	TRIP RELAY AUXILIARY RELAY	GECA MVA414
K4031	BREAKER FAIL LOCKOUT TRIP RELAY	GECA MVA453
K4062	Q52 TRIP RELAY 2	GECA MVA416
F252	Q52 SYNCHRO CHECK RELAY	GECA MAV501
X15	Q52 SYNCHRO CHECK TEST BLOCK	GECA MMLG01
XEL1	EARTH LINK FOR F481	WEIDMULLER STL5
F401	FUSE AND HOLDER 10A, BREAKER FAIL SUPPLY No 1, 48Vdc	GECA SC32P
XL401	LINK AND HOLDER	GECA SC32P
F402	FUSE AND HOLDER 10A, BREAKER FAIL SUPPLY No 2, 48Vdc	GECA SC32P
XL402	LINK AND HOLDER	GECA SC32P
F403	FUSE AND HOLDER, 2A, CUBICLE LIGHTING SUPPLY, 240V, 50HZ	GECA SC32P
XL403	LINK AND HOLDER	GECA SC32P
F404	FUSE AND HOLDER, 16A, SUPPLY FOR TEST EQUIPMENT 16A SOCKET, 240V, 50HZ	GECA SC32P
XL404	LINK AND HOLDER	GECA SC32P
F405	FUSE AND HOLDER, 2A, FOR HAND LAMP SUPPLY 16A SOCKET, 240V, 50HZ	WEIDMULLER KSK3F
XL405	LINK AND HOLDER	WEIDMULLER KSK3F
X30	TEST EQUIPMENT SWITCHED SOCKET TO INDIAN STANDARD	
X41	HAND LAMP SWITCHED SOCKET TO INDIAN STANDARD	
E1	CUBICLE LIGHTING	
S121	CUBICLE LIGHTING DOOR SWITCH	
X1	48VDC TERMINALS	WEIDMULLER RSE1
X70	BUSWIRE TERMINALS (240V AC SUPPLIES)	WEIDMULLER SAK6H
X71	240VAC TERMINALS	WEIDMULLER RSE1
X101	CT INPUT TERMINALS	WEIDMULLER RSE1
X102	DTR TERMINALS	WEIDMULLER RSE1/RSE2
X107	=CWD10+Q50 TERMINALS	WEIDMULLER RSE1/RSE2
X108	=CWD10+Q51 TERMINALS	WEIDMULLER RSE1/RSE2
X109	=CWD10+Q52 TERMINALS	WEIDMULLER RSE1/RSE2
X110	=CM19+Q50 TERMINALS	WEIDMULLER RSE2
X111	JEPPORE LINE 2 REMOTE TERMINALS	WEIDMULLER RSE1
X112	BLOCK POLE MAIN 1 TERMINALS	WEIDMULLER RSE1
X113	BLOCK POLE MAIN 2 TERMINALS	WEIDMULLER RSE1
X114	SPARE RELAY CONTACTS TERMINALS	WEIDMULLER SAKR
X115	DTR TERMINALS	WEIDMULLER SAKR
X123	SEQUENCE OF EVENTS RECORDER TERMINALS	WEIDMULLER SAKR
X124	BACK UP ANNUNCIATOR TERMINALS	WEIDMULLER SAKR
X125	TRIP COIL 1 TERMINALS	WEIDMULLER RSE2
X128	TRIP COIL 2 TERMINALS	WEIDMULLER RSE2
X301	BUSWIRE TERMINALS (TRIP CIRCUIT 1 etc)	WEIDMULLER RSE1/RSE2
X302	BUSWIRE TERMINALS (TRIP CIRCUIT 2 etc)	WEIDMULLER RSE1/RSE2
X303	BUSWIRE TERMINALS (MISC)	WEIDMULLER RSE1/RSE2

FILE 7A1002

POWER GRID CORPORATION OF INDIA LIMITED
1 x 500MW HVDC BACK-TO-BACK PROJECT
VISAKHAPATNAM

GEC ALSTHOM
T&D

GEC ALSTHOM T&D
Power Electronic Systems Limited
Sturford, England

TITLE
VISAKHAPATNAM
=CWD10+EF4101 BREAKER FAIL PROTECTION
CUBICLE =CWD10+EF4101 EQUIPMENT & DEVICE LIST

DWG. No. 637EZ1Y04599 SHT 2
CURRENT ISSUE D

CUSTOMER POWERGRID ORDER No. CF0136

AS BUILT DWG
16 MAY 2003
VISAKHAPATNAM

GEC ALSTHOM T&D
Power Electronic Systems Limited
CERTIFIED FOR
MANUFACTURE
NAME: B T BARRETT
DEPT. 739 DATE: 14/3/97
SIGNED BTB

THIRD ANGLE
PROJECTION
IF IN DOUBT
ASK

ALL DIMENSIONS
IN MILLIMETRES
UNLESS OTHERWISE STATED
DRAWING TO BS308
UNLESS OTHERWISE STATED
FOR THE STANDARD OF
ACCURACY OF ALL
UNDIMENSIONED DIMENSIONS
SEE SPECN. STAND. 023/PROG

DRAWN JCP
CHKD PNS
APP'D RFR
SCALE
TRACED
DESKN PRJ
APP'D

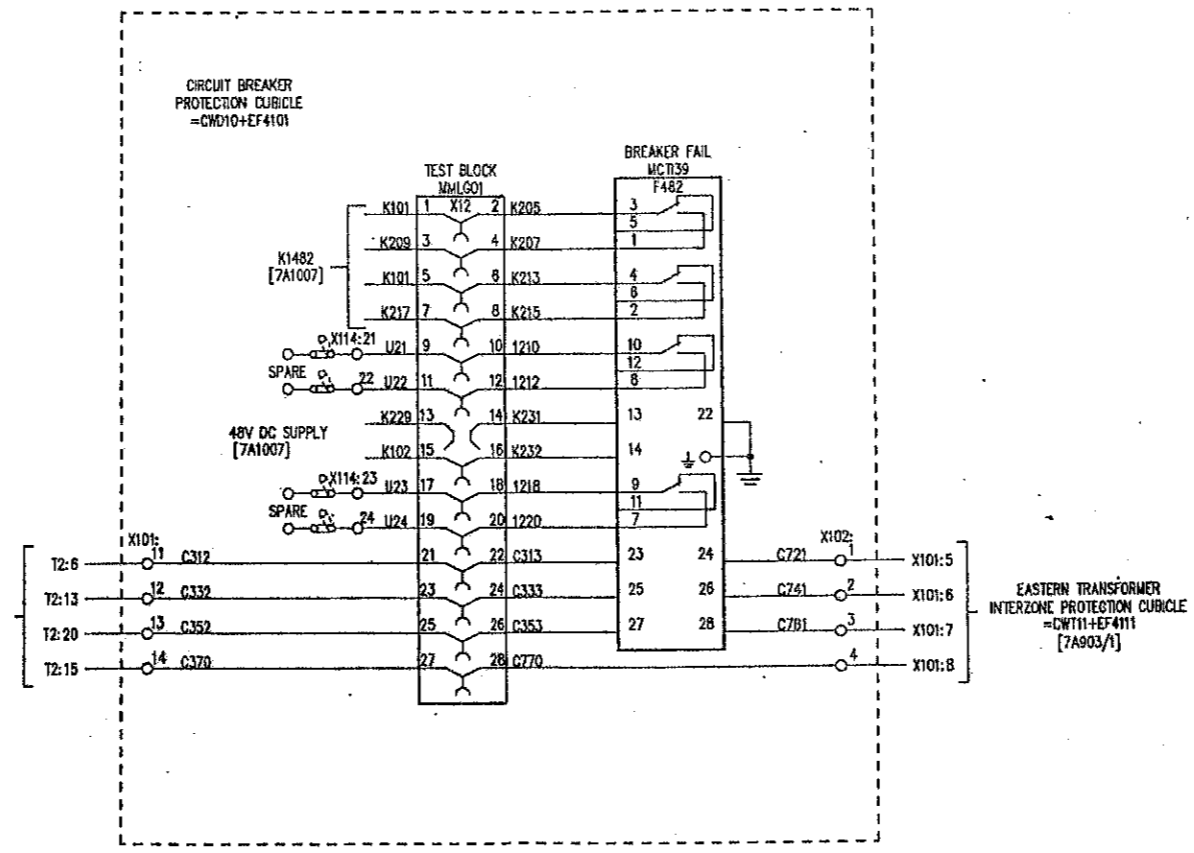
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[10NN] DENOTES FILE No 7A10NN SECTION REFER [1001] FOR FILE INDEX

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NAME	ISSUE	PNS	RFR	PREM
D	14/03/97	08/06/97	29/07/98	29/07/98

REVISIONS:
 X103-5 RE DELETED
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DRG. No. 637EZ1Y04599 SHT 4



NOTES:
 [10NN] DENOTES FILE No OF [7A10NN] SECTION
 REFER TO [1001] FOR FILE INDEX
 REFER TO [1102] FOR LOCATION & DEVICE LIST

FILE 7A1004

POWER GRID CORPORATION OF INDIA LIMITED
 1 x 500MW HVDC BACK-TO-BACK PROJECT
 VISAKHAPATNAM

GEC ALSTHOM
 T&D

GEC ALSTHOM T&D
 Power Electronic Systems Limited
 Shifnal, England

TITLE
 VISAKHAPATNAM
 CIRCUIT DIAGRAM FOR
 AC CIRCUITS OF BREAKER FAIL PROTECTION
 CIRCUIT BREAKER =CWD10+Q51

DRG. No. 637EZ1Y04599 SHT 4
 CURRENT ISSUE D

AS BUILT DWG
 16 MAY 2003
 VISAKHAPATNAM

GEC ALSTHOM TM
 Power Electronic Systems Limited
 CERTIFIED FOR
 MANUFACTURE
 NAME: B T BARRETT
 DEPT. 739 DATE 14/3/97
 SIGNED BTB

THIRD ANGLE
 PROJECTION
 IF IN DOUBT
 ASK

ALL DIMENSIONS
 IN MILLIMETRES
 UNLESS OTHERWISE STATED
 DRAWING TO BE308
 UNLESS OTHERWISE STATED
 FOR THE STANDARD OF
 ACCURACY OF ALL
 UNTOLERANCED DIMENSIONS
 SEE SPECH. STAND/023/PROC

DRAWN JCP
 CVD PNS
 APP'D RFR
 SCALE
 TRACED
 DESIGN APP'D PRJ

DO NOT SCALE PRINT
 WHEN QUOTING DRG. No. STATE CURRENT ISSUE
 CUSTOMER POWERGRID ORDER No. CF0136

ISSUE	PRJ	PRJ	PRJ	PRJ
D	A	B	C	F
NAME	ISSUE	PNS	RFR	PREM
LOCATION	DATE	VCP	PREM	PREM
VISA4197	14-03-97	08-08-97	29-07-98	29-07-98

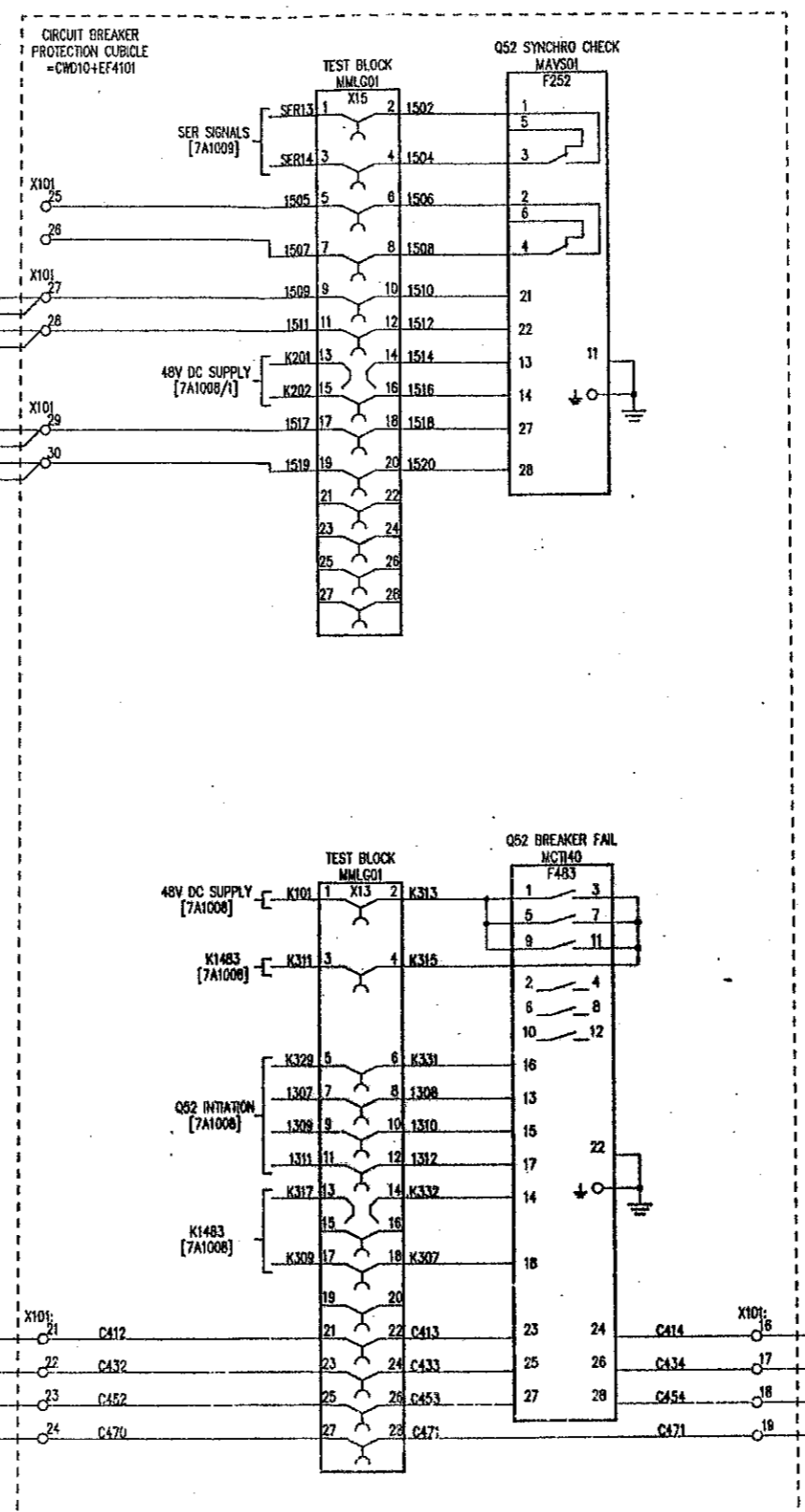
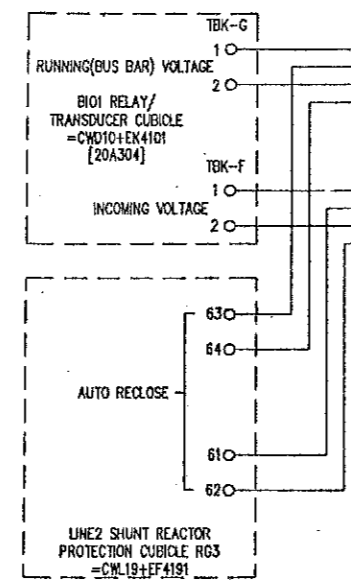
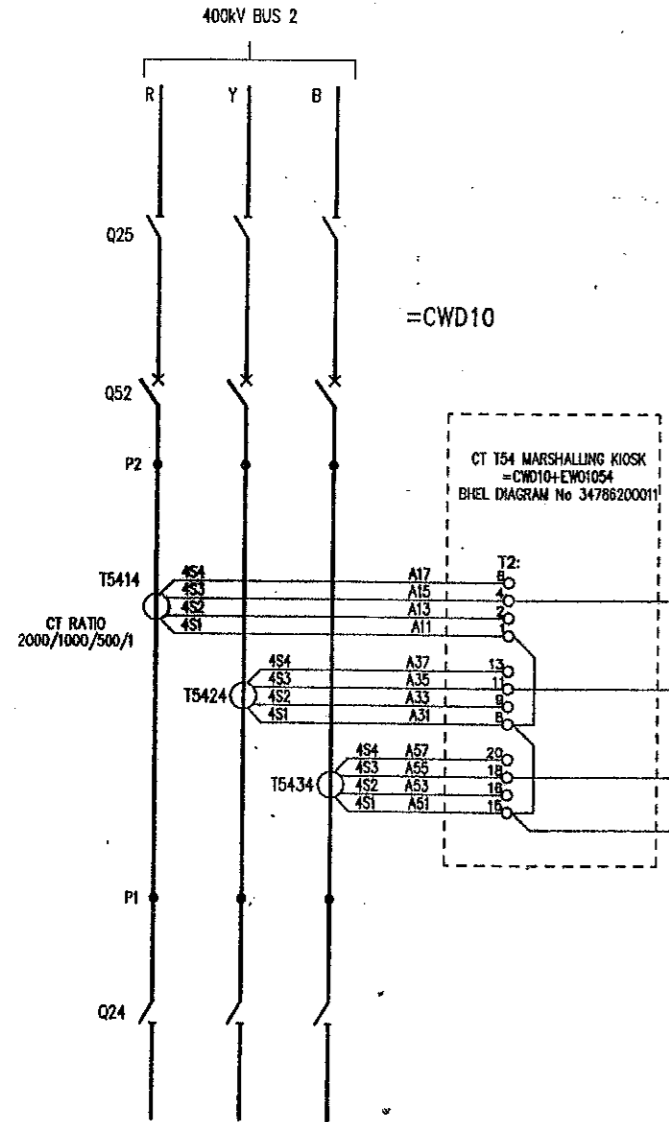
REVISED TO ECH8231--DTR
 CUBICLE ADDED, ALSO ECH8316-
 RELAY TYPES ADDED ALSO
 EARTH ON TERMINAL 22 OF
 MCT39 AND ECH8332--CT
 CIRCUIT EXTENDED TO SHOW ALL
 ASSOCIATED CUBICLES

REVISED TO ECH8424--
 REMOVED =CWD10 CT/AT KIOSK,
 SCADA, DTR & POLE CONTROL,
 CUBICLE INFO,
 ADDED REF TO =CWD10+EWD1051
 & =CWD11+EF4111
 CHANGED WIRE No'S FROM C314,
 C334, C354 & C371 TO C721
 C741, C761 & C770

REVISED TO ECH8623
 YEL2 DELETED.

DRG. No. 637EZ1Y04599 SHT 5

ONLY ITEMS RELEVANT TO THE OPERATION OF THIS PROTECTION ARE SHOWN (REFER [2A04] FOR SINGLE LINE DIAGRAM)



NOTES:
[100N] DENOTES FILE No OF [7A100N] SECTION REFER TO [1001] FOR FILE INDEX REFER TO [1102] FOR LOCATION & DEVICE LIST

SUPPLIED BY POWERGRID

FILE 7A1005

POWER GRID CORPORATION OF INDIA LIMITED
1 x 500MW HVDC BACK-TO-BACK PROJECT
VISAKHAPATNAM

GEC ALSTHOM
T&D

GEC ALSTHOM T&D
Power Electronic Systems Limited
Melkote, England

TITLE
VISAKHAPATNAM
CIRCUIT DIAGRAM FOR
AC CIRCUITS OF BREAKER FAIL PROTECTION
CIRCUIT BREAKER =CWD10+Q52

DRG. No. 637EZ1Y04599 SHT 5
CURRENT ISSUE F

WHEN QUOTING DRG. No. STATE CURRENT ISSUE
CUSTOMER POWERGRID ORDER No. CPO136

C.A.D. DATA
ISSUE F
NAME 63/EZ1Y04599
LOCATION VISA4351

PRJ	PRJ	PRJ	PRJ	PRJ	PRJ	PRJ	PRJ	PRJ	PRJ
A	B	C	D	E	F	G	H	I	J
ISSUE	PNS	RFR	JCP	REF	REF	REF	REF	REF	REF
DATE	DATE	DATE	DATE	DATE	DATE	DATE	DATE	DATE	DATE
14/03/97	08/08/97	28/07/98	07/09/99	07/09/99	07/09/99	07/09/99	07/09/99	07/09/99	07/09/99
REVISIONS: A: REVISED TO ECR0254 - WIRE No. K328 WAS ADDED ON X13-13. ALSO ECR0312 - RELAY TYPES ADDED. ALSO LENGTH ON TERMINAL 22 OF MCT159. B: REVISED TO ECR0473 - F252 ADDED. K483 CHANGED RELAY TYPE FROM MCT159 ALSO MODIFIED DCL. C: REVISED TO ECR0424 - ADDED =CWD10+EF4101. ADDED =CWL12+EF4123 & X100:16-19. D: REVISED TO ECR0645 - RELEVANT WAS "RELEVANT". B01 RELAY/TRANSDUCER CUBICLE - FILE REF 20A004 WAS 20A04. E: REVISED TO ECR0821 - X13 DELETED. LINE 2 SR DETAILS AMENDED. CT 154 MK. AMENDED. F: REVISED TO ECR0874 - AUTO RECLOSE TERMINAL WAS MODIFIED. G: REVISED TO ECR0874 - AUTO RECLOSE TERMINAL WAS MODIFIED. H: REVISED TO ECR0874 - AUTO RECLOSE TERMINAL WAS MODIFIED. I: REVISED TO ECR0874 - AUTO RECLOSE TERMINAL WAS MODIFIED. J: REVISED TO ECR0874 - AUTO RECLOSE TERMINAL WAS MODIFIED.									

AS BUILT DWG
16 MAY 2009
VISAKHAPATNAM

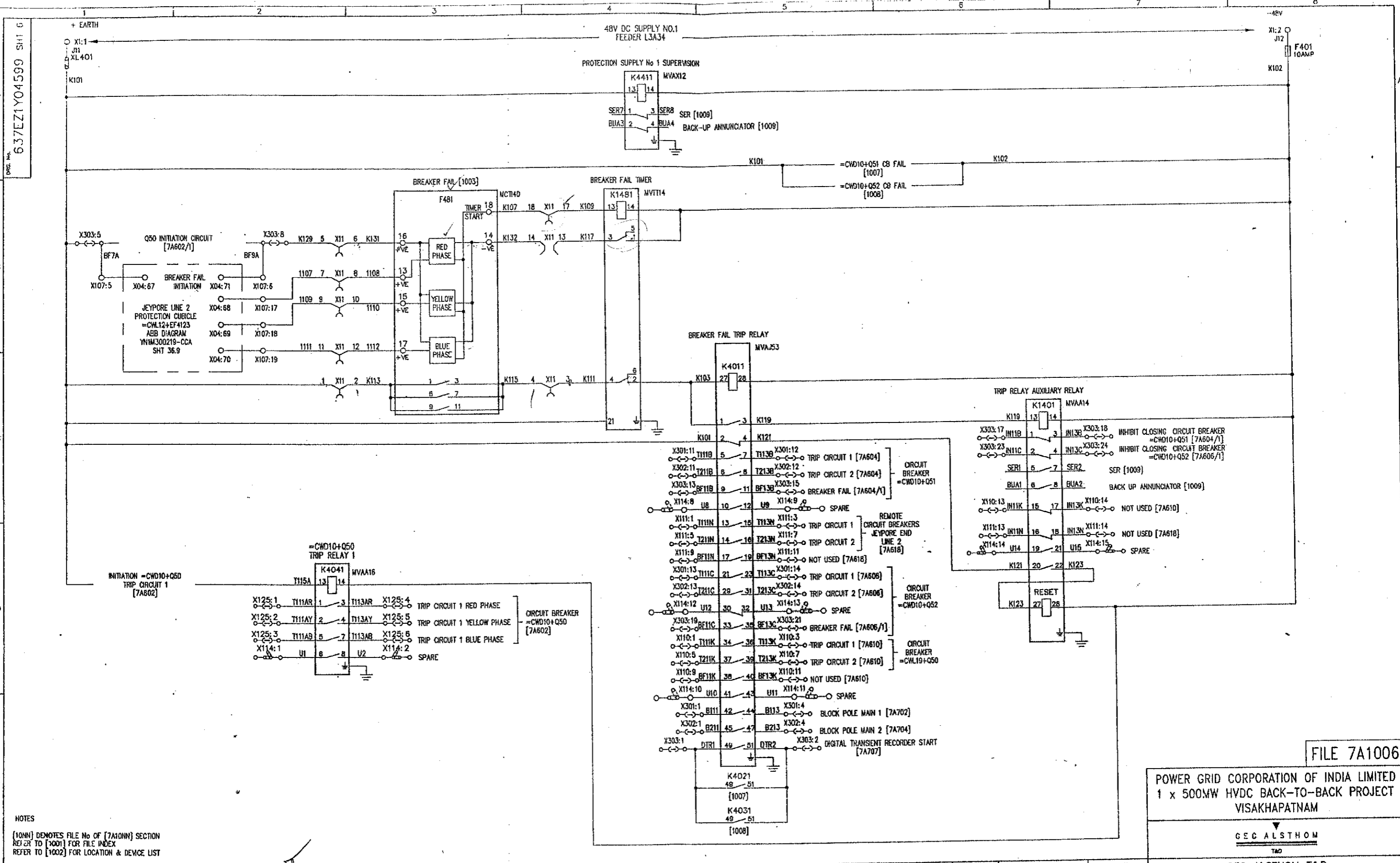
GEC ALSTHOM T&D
Power Electronic Systems Limited
CERTIFIED FOR MANUFACTURE
NAME: B T BARRETT
DEPT. 739 DATE: 14/3/97
SIGNED BTB

THIRD ANGLE PROJECTION
IF IN DOUBT ASK

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED
DRAWING TO 05308 UNLESS OTHERWISE STATED
FOR THE STANDARD OF ACCURACY OF ALL UNTOLERANCED DIMENSIONS SEE SPEC. STABD/023/PROG

DO NOT SCALE PRINT

DRAWN JCP
CHKD PNS
APP'D RFR
SCALE
TRACED
DESIGN PRJ
APP'D



NOTES
 (10NN) DEMOTES FILE No OF [7A10NN] SECTION
 REFER TO [1001] FOR FILE INDEX
 REFER TO [1002] FOR LOCATION & DEVICE LIST

ISSUE	A	B	C	D
DATE	14/03/97	08/08/97	29/07/98	07/01/99
NAME				
LOCATION	VISA3651			

AS BUILT DWG
 16 MAY 2003
 VISAKHAPATNAM

GEC ALSTHOM T&D Power Electronic Systems Limited CERTIFIED FOR MANUFACTURE		THIRD ANGLE PROJECTION	ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED	DRAWN JCP CHKD PNS
NAME: B T BARRETT	DEPT: 739	DATE: 14/3/97	DRAWING TO BS308 UNLESS OTHERWISE STATED	APP'D RFR
SIGNED BTB		IF IN DOUBT ASK	FOR THE STANDARD OF ACCURACY OF ALL UNTOLERANCED DIMENSIONS SEE SPECN. STANO/023/PR02	SCALE
			DO NOT SCALE PRINT	TRACED
				DESIGN PRJ
				APP'D

FILE 7A1006

POWER GRID CORPORATION OF INDIA LIMITED
 1 x 500MW HVDC BACK-TO-BACK PROJECT
 VISAKHAPATNAM

GEC ALSTHOM
 T&D

GEC ALSTHOM T&D
 Power Electronic Systems Limited
 Bedford, England

TITLE
 VISAKHAPATNAM
 CIRCUIT DIAGRAM FOR
 DC CIRCUITS OF PROTECTION No 1
 CIRCUIT BREAKER =CWD10+Q50

DRG. No.
 637EZ1Y04599 SHT 6

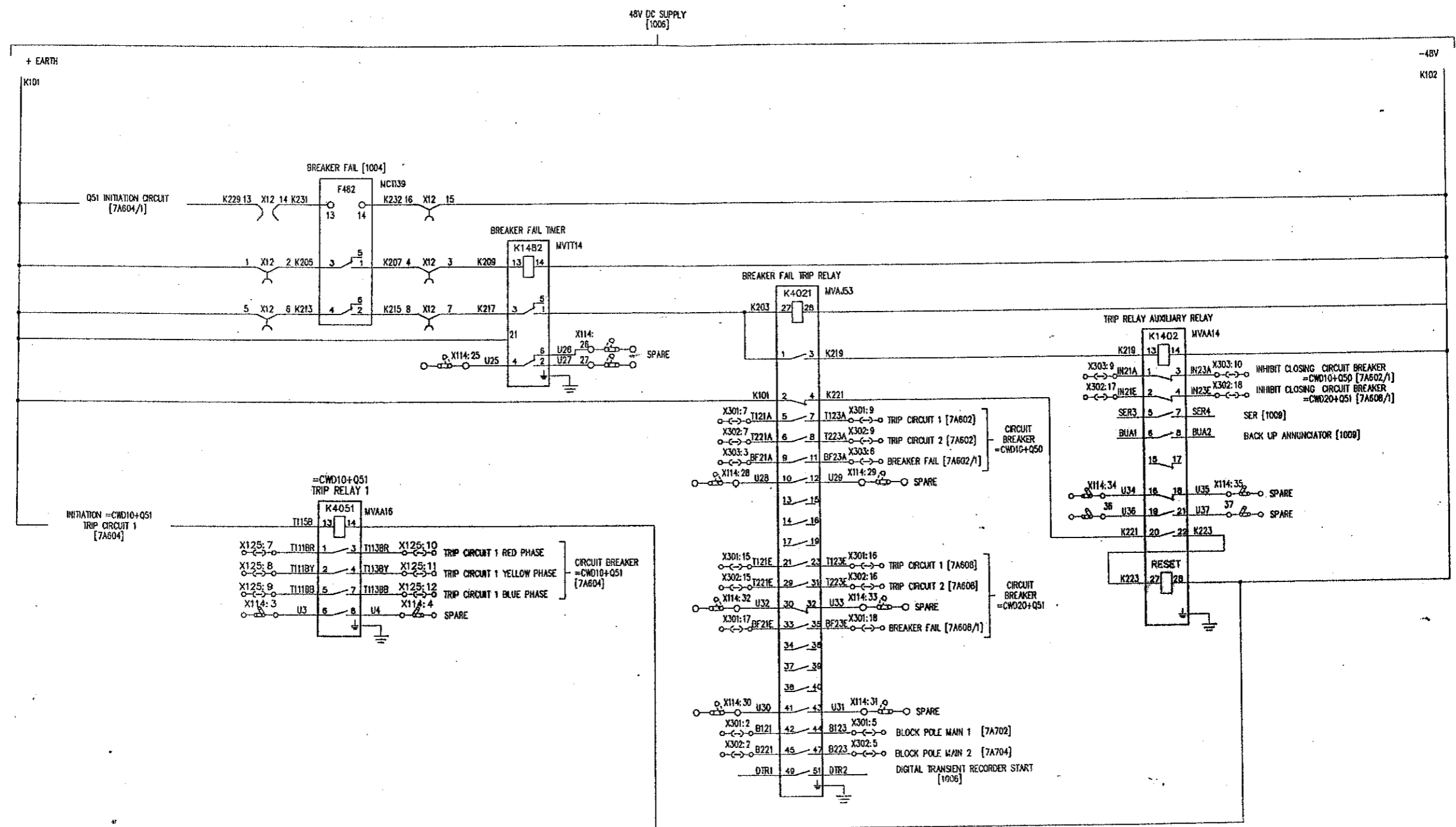
CURRENT
 ISSUE
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WHEN QUOTING DRG. No. STATE CURRENT ISSUE

CUSTOMER POWERGRID

ORDER No. CF0136

637EZ1Y04599 SHT 7



NOTES
 [10NN] DENOTES FILE NO OF [7A10NN] SECTION
 REFER TO [1001] FOR FILE INDEX
 REFER TO [1002] FOR LOCATION & DEVICE LIST

FILE 7A1007

POWER GRID CORPORATION OF INDIA LIMITED
 1 x 500MW HVDC BACK-TO-BACK PROJECT
 VISAKHAPATNAM

GEC ALSTHOM
 T&D

AS BUILT DWG
 16 MAY 2003
VISAKHAPATNAM

GEC ALSTHOM T&D
 Power Electronic Systems Limited
 CERTIFIED FOR
 MANUFACTURE
 NAME: B T BARRETT
 DEPT. 739 DATE: 14/3/97
 SIGNED: BTB

THIRD ANGLE
 PROJECTION
 IF IN DOUBT
 ASK

ALL DIMENSIONS
 IN MILLIMETRES
 UNLESS OTHERWISE STATED
 DRAWING TO BS308
 UNLESS OTHERWISE STATED
 FOR THE STANDARD OF
 ACCURACY OF ALL
 UNTOLERANCED DIMENSIONS
 SEE SPEC. STAND/023/PROC

DRAWN: JCP
 CTD: PNS
 APP'D: RFR
 SCALE:
 TRACED:
 DESIGN: PRJ
 APP'D:

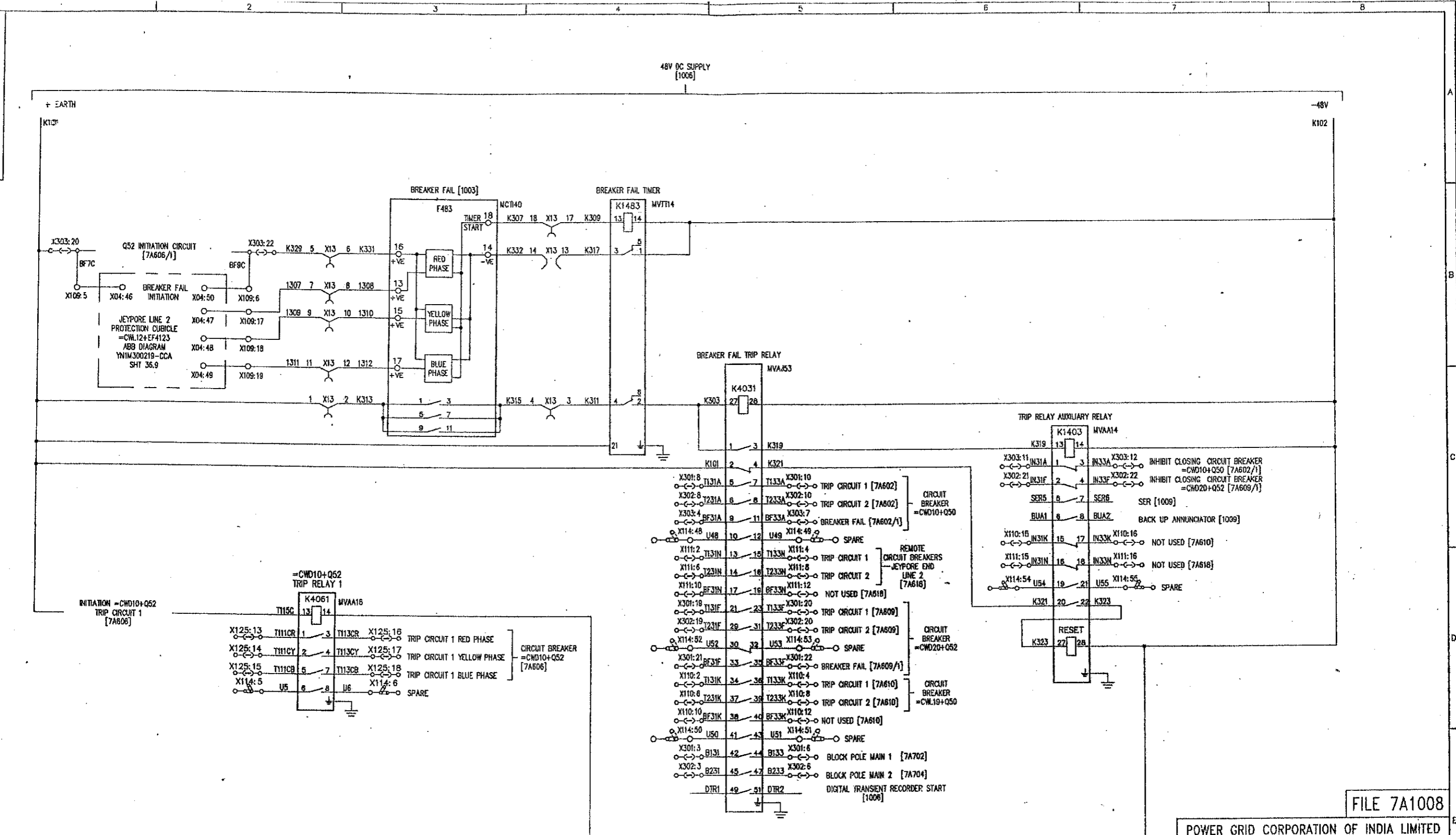
GEC ALSTHOM T&D
 Power Electronic Systems Limited
 VISAKHAPATNAM
 CIRCUIT DIAGRAM FOR
 DC CIRCUITS OF PROTECTION No 1
 CIRCUIT BREAKER =CWD10+Q51
 DRG. No. 637EZ1Y04599 SHT 7
 CURRENT ISSUE: C

G.A.D. DATA
 ISSUE: C
 NAME:
 LOCATION: VISA2122

PRJ	FILE NO
A	8473
B	8473
PNS	8473
JCP	8473
DATE	03/08/97

REVISIONS:
 1. REVISION TO ENDR402, 8464 & 8473 - KASST ADDED
 2. R121 REMOVED
 3. CHANGED FILE REF FROM 7A602 & 7A608 ON 4303.6, 10 & X301:18, X302:18

Dwg No. 637EZ1Y04599 SHT 8



NOTES
 [10NN] DENOTES FILE No. OF [7A10NN] SECTION
 REFER TO [1001] FOR FILE INDEX
 REFER TO [1002] FOR LOCATION & DEVICE LIST

ISSUE	PRJ	PRJ	PRJ	PRJ	PRJ
A	B	C	D	E	F
ISSUE	PNS	RFR	APPR	CHKD	DATE
17	08	29	07	01	99
03	08	07	01	01	99
97	97	98	98	99	99

REVISIONS:
 A: REVISED TO EMB851 - FILE No. ADDED FOR BLOCK POLE, ALSO EMB851 - RELAY TYPES ADDED
 B: REVISED TO EMB842 & 8472 - K4031 ADDED
 C: REVISED TO EMB848 - CDT BETWEEN F483 & K1483 CHANGED
 D: CHANGED FILE REF'S FROM 7A602 ON X303:7 & 12, FROM 7A609 ON X303:22 & X302:22, MADE NOT USED ON X110:12, 15, X110:12 & 16
 E: REVISED TO EMB848 - F483 - RED, YELLOW AND BLUE PHASES, -VE, +VE (+ PLACES) AND TIMER START ADDED.

AS BUILT DWG
 16 MAY 2000
VISAKHAPATNAM

GEC ALSTHOM T&D
 Power Electronic Systems Limited
 CERTIFIED FOR MANUFACTURE
 NAME: B T BARRETT
 DEPT: 739 DATE: 14/3/97
 SIGNED: BTB

THIRD ANGLE PROJECTION
 ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED
 DRAWING TO BS308 UNLESS OTHERWISE STATED
 FOR THE STANDARD OF ACCURACY OF ALL UNTOLERANCED DIMENSIONS SEE SPECN. STAND/023/PROC

DRAWN: JCP
 CHD: PNS
 APP'D: RFR
 SCALE:
 TRACED:
 DESIGN: PRJ
 APP'D:

FILE 7A1008

POWER GRID CORPORATION OF INDIA LIMITED
 1 x 500MW HVDC BACK-TO-BACK PROJECT
 VISAKHAPATNAM

GEC ALSTHOM
 T&D

GEC ALSTHOM T&D
 Power Electronic Systems Limited
 Staffed, England

TITLE
VISAKHAPATNAM
 CIRCUIT DIAGRAM FOR
 DC CIRCUITS OF BREAKER FAIL PROTECTION
 CIRCUIT BREAKER =CWD10+Q52

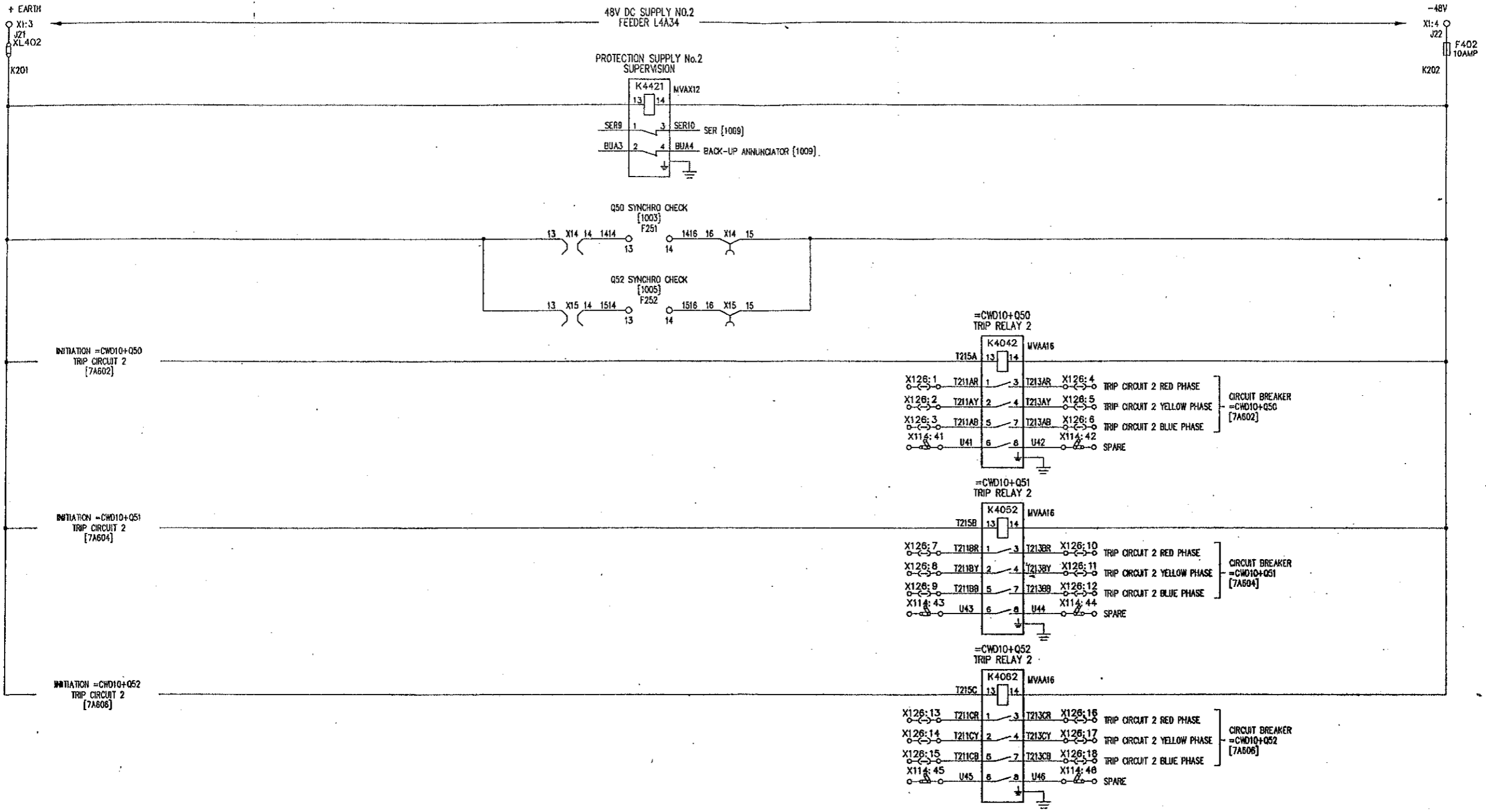
DRG. No. **637EZ1Y04599 SHT 8** CURRENT ISSUE **D**

DO NOT SCALE PRINT

WHEN CLOTHING DRG. No. STATE CURRENT ISSUE

CUSTOMER **POWERGRID** ORDER No. **CF0136**

DRG. No. 637EZ1Y04599 SHT 11



INITIATION =CWD10+Q50
TRIP CIRCUIT 2
[7A602]

INITIATION =CWD10+Q51
TRIP CIRCUIT 2
[7A604]

INITIATION =CWD10+Q52
TRIP CIRCUIT 2
[7A606]

NOTES:
[ICNN] DENOTES FILE NO OF 7A100N SECTION
REFER [1001] FOR FILE INDEX
REFER [1002] FOR LOCATION AND DEVICE LIST

FILE 7A1008/1

POWER GRID CORPORATION OF INDIA LIMITED
1 x 500MW HVDC BACK-TO-BACK PROJECT
VISAKHAPATNAM

GEC ALSTHOM
T&D

GEC ALSTHOM T&D
Power Electronic Systems Limited
Melford, England

TITLE
VISAKHAPATNAM
CIRCUIT DIAGRAM FOR
DC CIRCUITS OF PROTECTION No 2
CIRCUIT BREAKERS =CWD10+Q50, Q51 & Q52

DRG. No. 637EZ1Y04599 SHT 11
CURRENT ISSUE A

AS BUILT DWG
16 MAY 2000
VISAKHAPATNAM

GEC ALSTHOM T&D
Power Electronic Systems Limited
CERTIFIED FOR
MANUFACTURE
NAME: *DR Barrett*
DEPT: 739 DATE: 28/07/00
SIGNED: *DR Barrett*

THIRD ANGLE
PROJECTION
IF IN DOUBT
ASK

ALL DIMENSIONS
IN MILLIMETRES
UNLESS OTHERWISE STATED
DRAWING TO BE USED
UNLESS OTHERWISE STATED
FOR THE STANDARDS OF
ACCURACY OF ALL
UNTOLERANCED DIMENSIONS
SEE SPECN. STAND/023/PROC

DRAWN PREM
CHKD *RM*
APP'D *RM*
SCALE
TRACED
DESIGN
APP'D *RM*

DO NOT SCALE PRINT

CUSTOMER POWERGRID ORDER No. CF0138

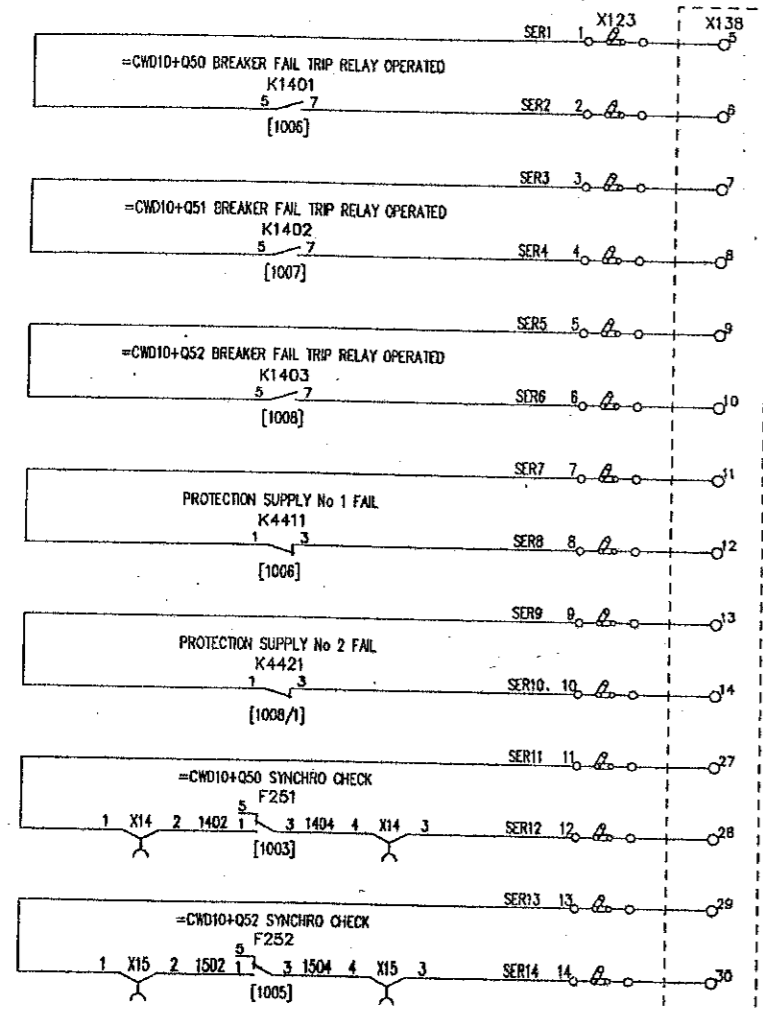
C.A.D. DATA
ISSUE A
NAME
LOCATION
VISA2124

ISSUE A
DATE 29/7/98

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DRG No. 637EZ1Y04599 SHT 9

SEQUENCE OF EVENTS RECORDER ALARM SIGNALS

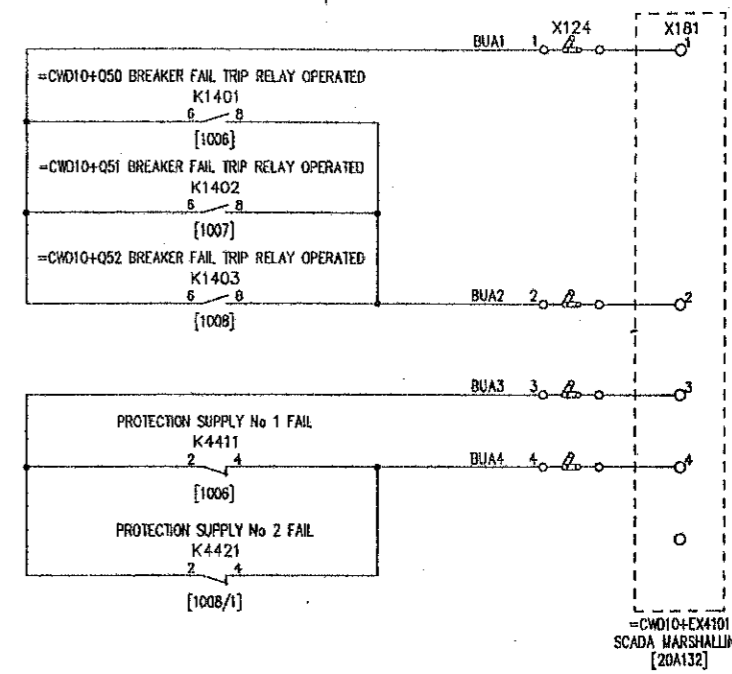


[20A135]

[20A208]

NOTE:
TERMINAL TO CONNECT
CABLE OVERALL SCREEN
AT THIS CUBICLE ONLY.
=CWD10+EX4101
SCADA MARSHALLING
[20A132]

BACK-UP ANNUNCIATOR ALARM SIGNALS



MAJOR ALARM

MINOR ALARM

NOTE:
TERMINAL TO CONNECT
CABLE OVERALL SCREEN
AT THIS CUBICLE ONLY.
=CWD10+EX4101
SCADA MARSHALLING
[20A132]

NOTES:
[10NN] DEMOTES FILE NO OF 7A10NN SECTION
REFER [100N] FOR FILE INDEX
REFER [1000Z] FOR LOCATION AND DEVCE LIST

FILE 7A1009

POWER GRID CORPORATION OF INDIA LIMITED
1 x 500MW HVDC BACK-TO-BACK PROJECT
VISAKHAPATNAM

GEC ALSTHOM

GEC ALSTHOM T&D
Power Electronic Systems Limited
Sturford, England
TITLE
=CWD10 BREAKER FAIL PROTECTION
CIRCUIT DIAGRAM FOR
SER & BACK-UP ANNUNCIATOR SIGNALS

G.A.D. DATA	PRJ	PRJ	PRJ	PRJ
	A	B	C	D
ISSUE	ISSUE	ISSUE	ISSUE	ISSUE
D	08	07	07	01
NAME	PNS	RFR	PREM	MCL
	JCP	PREM	PREM	PREM
LOCATION	REMOVED TO ENDSHIFT-SCADA MARSHALLING ADDED (FILE REF TO FOLLOW)	REMOVED TO ENDSHIFT-SCADA MARSHALLING ADDED (FILE REF TO FOLLOW)	REMOVED TO ENDSHIFT-SCADA MARSHALLING ADDED (FILE REF TO FOLLOW)	REMOVED TO ENDSHIFT-SCADA MARSHALLING ADDED (FILE REF TO FOLLOW)
WSA3653	17/03/97	29/07/98	29/07/98	07/01/99

AS BUILT DWG
16 MAY 2000
VISAKHAPATNAM

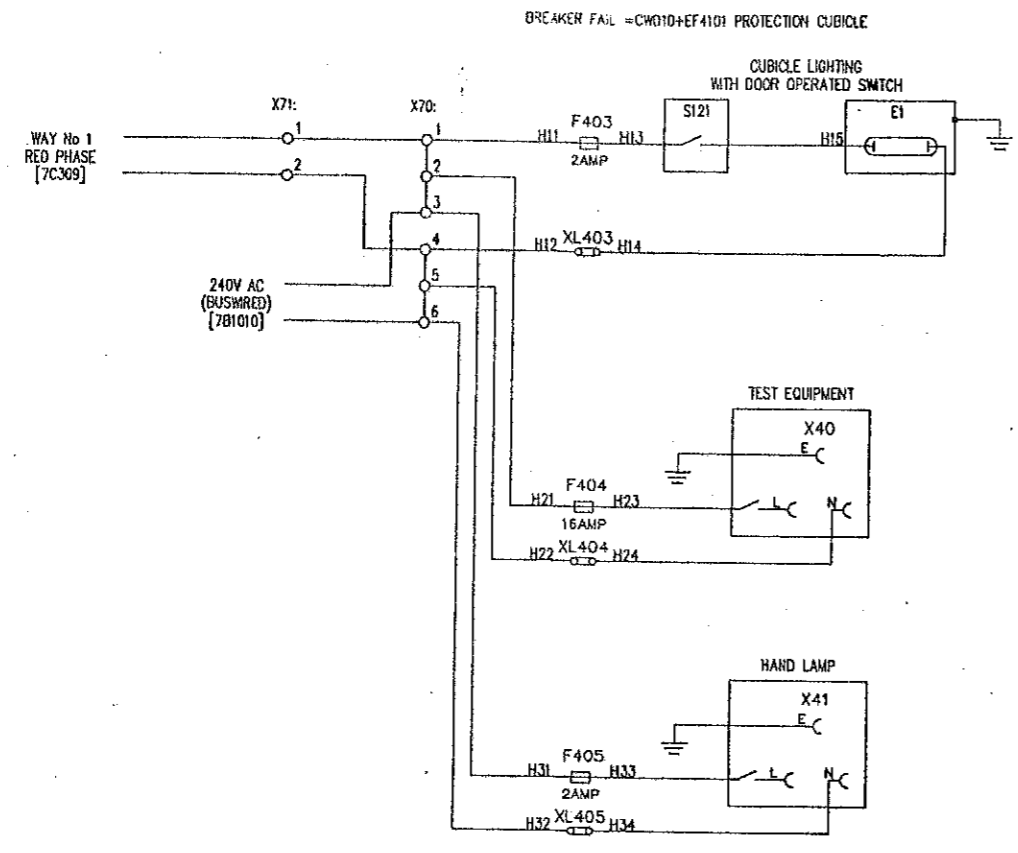
GEC ALSTHOM T&D
Power Electronic Systems Limited
CERTIFIED FOR MANUFACTURE
NAME: P T BARRETT
DEPT. 739 DATE: 14/3/97
SIGNED: BTB

THIRD ANGLE PROJECTION
IF IN DOUBT ASK
FOR THE STANDARD OF ACCURACY OF ALL UNTOLERANCED DIMENSIONS SEE SPECN. STAND/023/PROG

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED
DRAWING TO BS308 UNLESS OTHERWISE STATED
DO NOT SCALE PRINT

DRAWN: JCP
CHKD: PNS
APPRD: RFR
DESIGN APP'D: PRJ
DRG. No. 637EZ1Y04599 SHT 9
CURRENT ISSUE: D

Dwg No. 637EZ1Y04599 SHT 10



NOTES:
 [1000] DENOTES FILE NO OF 7A10NN SECTION
 REFER [1001] FOR FILE INDEX
 REFER [1002] FOR LOCATION AND DEVICE LIST

FILE 7A1010

POWER GRID CORPORATION OF INDIA LIMITED
 1 x 500MW HVDC BACK-TO-BACK PROJECT
 VISAKHAPATNAM

GEC ALSTHOM
 T&D

GEC ALSTHOM T&D
 Power Electronic Systems Limited
 Sharnah, England

TITLE
 VISAKHAPATNAM
 BREAKER FAIL PROTECTION
 CUBICLE =CWD10+EF4101
 AC SUPPLIES AND CUBICLE ILLUMINATION

DRG. No. 637EZ1Y04599 SHT 10
 CURRENT ISSUE D

C.A.B. DATA
 ISSUE D
 NAME
 LOCATION VISA3654

PRJ	PRJ	PRJ	PRJ
A	B	C	D
17-03-97	08-08-97	29-07-98	07-01-99
REMOVED TO ENHANCE - AUXILIARY SERVICES BOARD ADDED (PHASE & WAY NO TO FOLLOW) REMOVED TO ENHANCE - REMOVED AUX BOARD REPLACED WITH FILE REF 7C308 REMOVED TO ENHANCE - WAY NO.1 RED PHASE - FILE REF 7C309 WAS 7C308.			

AS BUILT DWG
 16 MAY 2001
 VISAKHAPATNAM

GEC ALSTHOM T&D
 Power Electronic Systems Limited
 CERTIFIED FOR MANUFACTURE
 NAME: B T BARRETT
 DEPT. 739 DATE: 14/3/97
 SIGNED

THIRD ANGLE PROJECTION

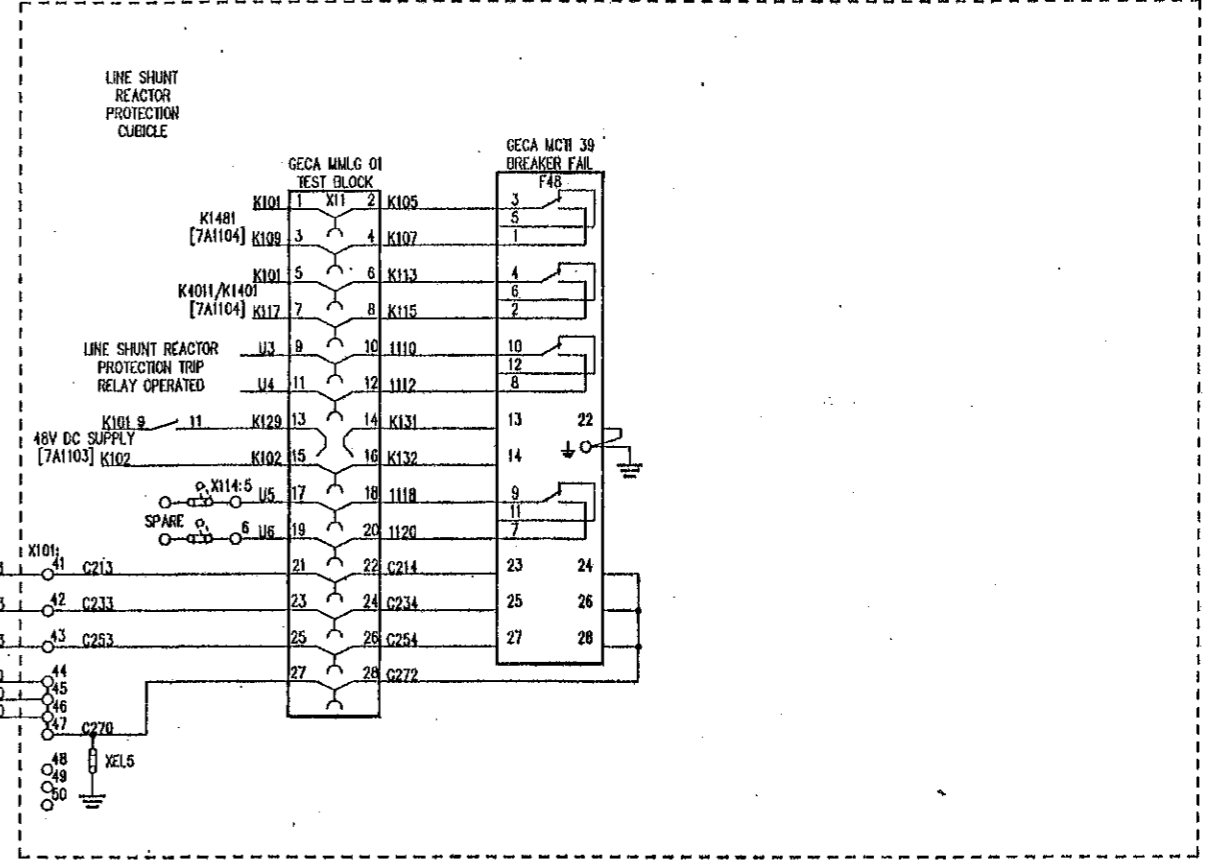
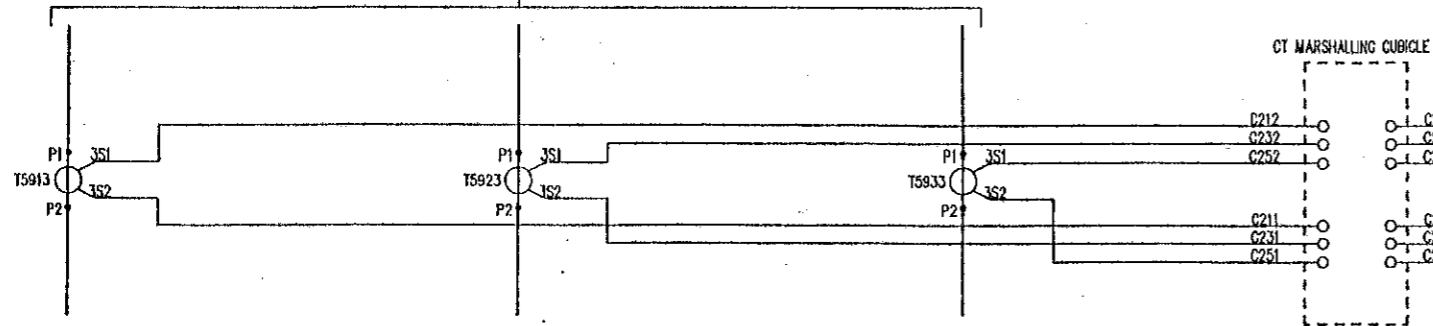
 IF IN DOUBT
 ASK

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED
 DRAWING TO BS308 UNLESS OTHERWISE STATED
 FOR THE STANDARD OF ACCURACY OF ALL UNTOLERANCED DIMENSIONS SEE SPECH. STAND/023/PROC

DRAWN JCP
 CH'D PNS
 APP'D RFR
 SCALE
 TRACED
 DESIGN APP'D PRJ

DWG. No. 637EZ1Y04632 SHT 2

SEE [2A04] FOR PROTECTION SINGLE LINE DIAGRAM



WIRE NUMBERS AND TERMINALS TYPICAL ONLY
REFER TO [7A1101] FOR FILE INDEX
[2A04] DENOTES FILE NUMBER OF 2A SECTION ETC.

FILE 7A1102

POWER GRID CORPORATION OF INDIA LIMITED
1 x 500MW HVDC BACK-TO-BACK PROJECT
VISAKHAPATNAM

GEC ALSTHOM
T&O

GEC ALSTHOM T&O
Power Electronic Systems Limited
Sheffield, England

VISAKHAPATNAM
TYPICAL CIRCUIT DIAGRAM FOR
AC CIRCUITS OF BREAKER FAIL PROTECTION
(LINE SHUNT REACTOR CIRCUIT BREAKERS)

DRG. No. 637EZ1Y04632 SHT 2
CURRENT ISSUE B

CAD. DATA	PRJ	ISSUE
ISSUE B	A B	DATE 25 10 96
NAME 637EZ1Y04632	PNS JCP	DATE 27 06 97
LOCATION VISA1207	POWERGRID TITLE BLOCK ADDED. TERMINAL 22 CONNECTION TO EARTH ADDED ON FAR SPARE TERMINAL C/O SIDE RE PERSED (27/4/5/0)	

AS BUILT DWG
14 APR 2000
VISAKHAPATNAM

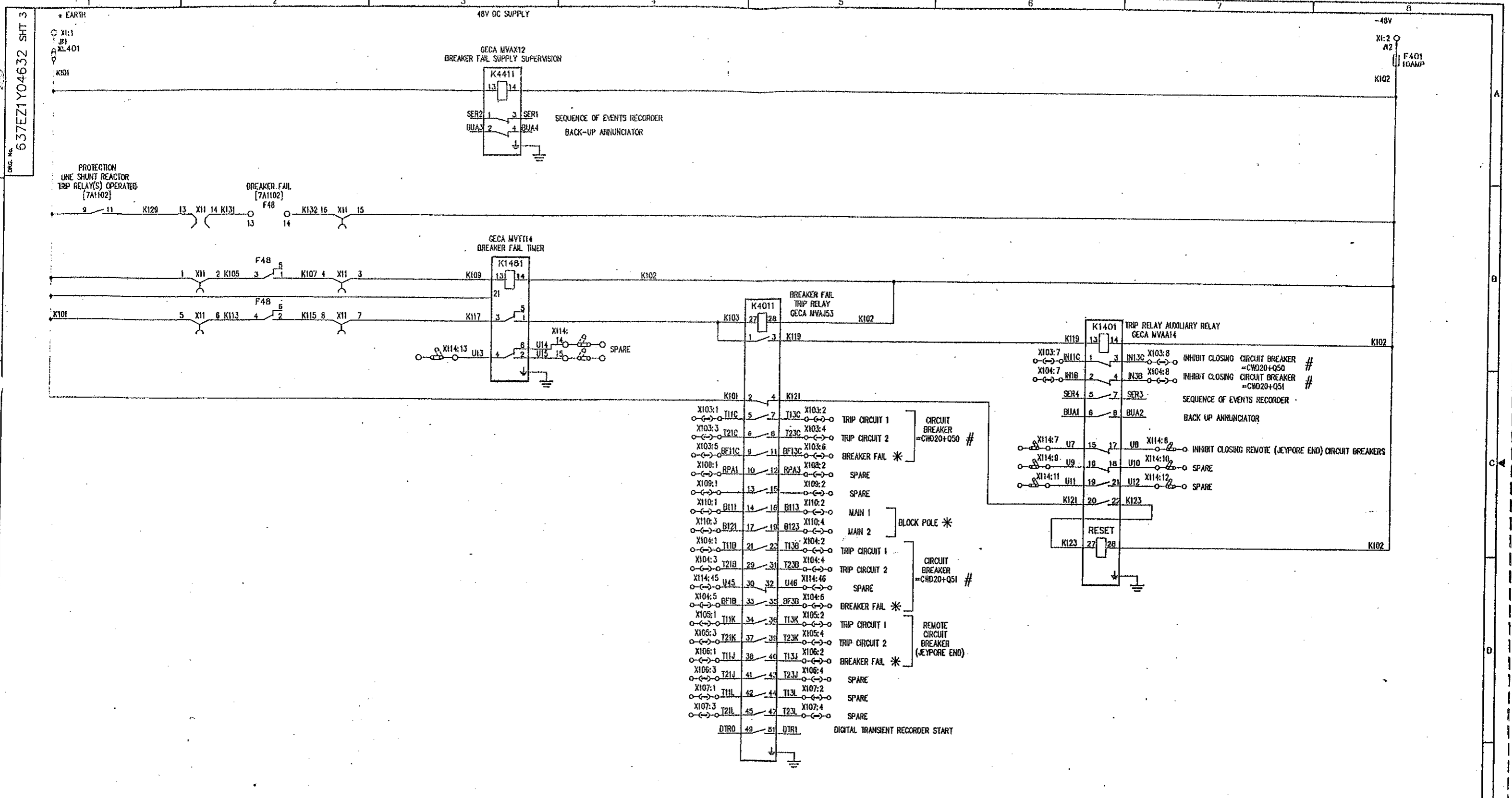
ALSTOM
Power Electronic Systems Ltd
CERTIFIED FOR
MANUFACTURE
NAME: N.M. KIRBY
DEPT. 611 DATE: 19/4/00
SIGNED: NMK

THIRD ANGLE PROJECTION
ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED
DRAWING TO BS308 UNLESS OTHERWISE STATED
FOR THE STANDARD OF ACCURACY OF ALL UNTOLEANCED DIMENSIONS SEE SPECN. STAND/023/PROG

DRAWN PSG
CHKD PNS
APP'D RFR
SCALE
TRACED
DESIGN APP'D PRJ

DO NOT SCALE PRINT

CUSTOMER POWERGRID ORDER No. CF0136



NOTE:- CONTACTS MARKED * ARE REQUIRED FOR GEC(A) CIRCUITS.
 # FOR LINE 2 SHUNT REACTOR, CIRCUIT BREAKERS
 BECOME =CWD10+Q50 AND =CWD10+Q52

FILE 7A1103

POWER GRID CORPORATION OF INDIA LIMITED
 1 x 500MW HVDC BACK-TO-BACK PROJECT
 VISAKHAPATNAM

GEC ALSTHOM

T&D
 GEC ALSTHOM T&D
 Power Electronic Systems Limited
 Sharnbrook, England

TITLE
 VISAKHAPATNAM
 TYPICAL CIRCUIT DIAGRAM FOR
 DC CIRCUITS OF BREAKER FAIL PROTECTION
 (LINE SHUNT REACTOR CIRCUIT BREAKERS)

DRG No.
 637EZ1Y04632 SHT 3

WIRE NUMBERS AND TERMINALS TYPICAL ONLY
 REFER TO (7A1101) FOR FILE INDEX

C.A.D. DATA	PRJ A	PRJ B	PRJ C
ISSUE C	ISSUE DATE 25/10/96	PNS JCP 27/06/97	PNS PREM 20/03/98
NAME 637EZ1Y04632	POWERGRID TITLE BLOCK ADDED. TRIP OUTPUT TO REACTIVE POWER CONTROL 'A' AND SECOND SET FOR JAYPORE END DELETED. # NOTE ADDED. CONTACT REQUIREMENTS FOR GEC(A) CIRCUITS AND WIRE NOS REVISED.		
LOCATION VISA2233	REVISED TO ECN#46- REMOVED RIT1 & KIT1 WIRE		

AS BUILT DWG
 14 APR 2000
 VISAKHAPATNAM

ALSTOM
 Power Electronic Systems Ltd
 CERTIFIED FOR MANUFACTURE
 NAME: N.M. KIRBY
 DEPT: 611 DATE: 18/4/00
 SIGNED: N.M.K.

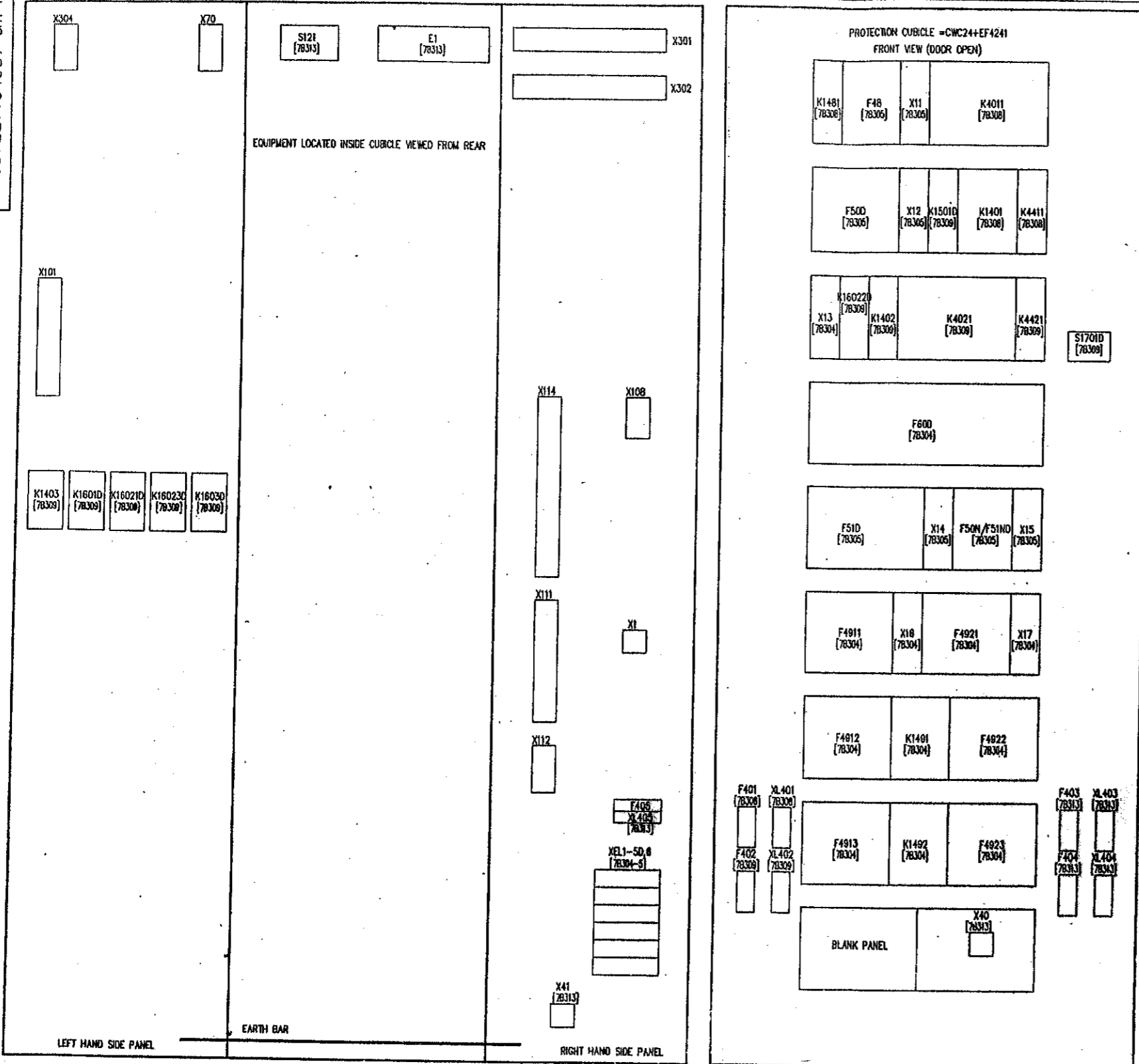
THIRD ANGLE PROJECTION
 IF IN DOUBT ASK

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED
 DRAWING TO BS308 UNLESS OTHERWISE STATED
 FOR THE STANDARD OF ACCURACY OF ALL UNTOLERANCE DIMENSIONS SEE SPECL. STAND/023/PROC

DRAWN PSG
 G'D PNS
 APP'D RFR
 SCALE
 TRACED
 DESIGN APP'D PRJ

CURRENT ISSUE C

DRG No. 637EZ1Y04657 SHT 1



DEVICE REF	DESCRIPTION	TYPE
K1481	BREAKER FAIL TIMER (0.001-1 seconds)	GECA MVTT14
F48	BREAKER FAIL CURRENT RELAY	GECA MCR39
X11	BREAKER FAIL TEST BLOCK	GECA MMLG01
K4011	BREAKER FAIL TRIP RELAY	GECA MVAXJ53
F500	INSTANTANEOUS OVERCURRENT RELAY	GECA MCAG39
X12	OVERCURRENT TEST BLOCK	GECA MMLG01
K1501D	TIMING RELAY (0.001-1 second)	GECA MVTT14
K1401	TRIP RELAY AUXILIARY RELAY	GECA MVAA14
K4411	BREAKER FAIL SUPPLY SUPERVISION RELAY	GECA MVAX12
X13	CAPACITOR UNBALANCE TEST BLOCK	GECA MMLG01
K16022D	CAPACITOR UNBALANCE TIMER (10-10,000 seconds)	GECA MVTT14
K1402	TRIP RELAY TIMER (0.01-10 seconds)	GECA MVTT14
K4021	LOCKOUT TRIP RELAY	GECA MVAXJ53
K4421	PROTECTION SUPPLY SUPERVISION RELAY	GECA MVAX12
S1701D	PUSHBUTTON CAPACITOR UNBALANCE TIMER RESET	HIGHLAND 704-0120
F600	CAPACITOR UNBALANCE RELAY	+704.910.4 COOPER SY
F51D	IDMT OVERCURRENT RELAY	ABB SPAJ 160C
X14	OVERCURRENT TEST BLOCK	MMLG01
F501/F51ND	EARTH FAULT RELAY	GECA MCGG22
X15	EARTH FAULT TEST BLOCK	GECA MMLG01
F4911	RESISTOR R1 OVERLOAD RELAY RED PHASE	P AND B SAWZA
X16	RESISTOR R1 OVERLOAD TEST BLOCK	GECA MMLG01
F4921	RESISTOR R2 OVERLOAD RELAY RED PHASE	P AND B SAWZA
X17	RESISTOR R2 OVERLOAD TEST BLOCK	GECA MMLG01
F4912	RESISTOR R1 OVERLOAD RELAY YELLOW PHASE	P AND B SAWZA
K1491	RESISTOR R1 OPEN CIRCUIT ALARM RELAY	GECA MCGG22
F4922	RESISTOR R2 OVERLOAD RELAY YELLOW PHASE	P AND B SAWZA
F4913	RESISTOR R1 OVERLOAD RELAY BLUE PHASE	P AND B SAWZA
K1492	RESISTOR R2 OPEN CIRCUIT ALARM RELAY	GECA MCGG22
F4923	RESISTOR R2 OVERLOAD RELAY BLUE PHASE	P AND B SAWZA
K1403	TRIP DELAY AUXILIARY RELAY	GECA PRIMA
K1601D	CAPACITOR UNBALANCE STAGE 1 AUXILIARY RELAY	GECA PRIMA
K16021D	CAPACITOR UNBALANCE STAGE 2 AUXILIARY RELAY	GECA PRIMA
K16023D	CAPACITOR UNBALANCE STAGE 2 TIMER AUXILIARY RELAY	GECA PRIMA
K1603D	CAPACITOR UNBALANCE STAGE 3 AUXILIARY RELAY	GECA PRIMA
X21D	EARTH LINK FOR F600	WEIDMULLER STL5
X21E	EARTH LINK FOR K1481	WEIDMULLER STL5
X21F	EARTH LINK FOR K1492	WEIDMULLER STL5
X21G	EARTH LINK FOR F50/F51D	WEIDMULLER STL5
X21H	EARTH LINK FOR F50M/F51ND	WEIDMULLER STL5
X21I	EARTH LINK FOR F48	WEIDMULLER STL5
F401	FUSE AND HOLDER 10A PROTECTION SUPPLY No. 1, 48Vdc.	GECA SC32P
X401	LINK AND HOLDER	GECA SC32P
F402	FUSE AND HOLDER 10A PROTECTION SUPPLY No. 2, 48Vdc.	GECA SC32P
X402	LINK AND HOLDER	GECA SC32P
F403	FUSE AND HOLDER 2A CUBICLE LIGHTING SUPPLY, 240V, 50HZ.	GECA SC32P
X403	LINK AND HOLDER	GECA SC32P
F404	FUSE AND HOLDER 2A SUPPLY FOR TEST EQUIPMENT 16A SOCKET, 240V, 50HZ.	GECA SC32P
X404	LINK AND HOLDER	GECA SC32P
F405	FUSE AND HOLDER 2A FOR HAND LAMP SUPPLY 16A SOCKET, 240V, 50HZ.	WEIDMULLER KSK3P
X405	LINK AND HOLDER	WEIDMULLER KSK3P
X40	TEST EQUIPMENT SWITCHED SOCKET TO INDIAN STANDARD	
X41	HAND LAMP SWITCHED SOCKET TO INDIAN STANDARD	
E1	CUBICLE LIGHTING	
S121	ACURBS ELECTRICAL DOOR SWITCH	
X101	BUSSBAR TERMINALS (240V AC SUPPLY)	WEIDMULLER RSE1
X102	BUSSBAR TERMINALS (240V AC SUPPLY)	WEIDMULLER RSE1
X103	BUSSBAR TERMINALS (240V AC SUPPLY)	WEIDMULLER RSE1
X104	BUSSBAR TERMINALS (240V AC SUPPLY)	WEIDMULLER RSE1
X105	BUSSBAR TERMINALS (240V AC SUPPLY)	WEIDMULLER RSE1
X106	BUSSBAR TERMINALS (240V AC SUPPLY)	WEIDMULLER RSE1
X107	BUSSBAR TERMINALS (240V AC SUPPLY)	WEIDMULLER RSE1
X108	BUSSBAR TERMINALS (240V AC SUPPLY)	WEIDMULLER RSE1
X109	BUSSBAR TERMINALS (240V AC SUPPLY)	WEIDMULLER RSE1
X110	BUSSBAR TERMINALS (240V AC SUPPLY)	WEIDMULLER RSE1
X111	BUSSBAR TERMINALS (240V AC SUPPLY)	WEIDMULLER RSE1
X112	BUSSBAR TERMINALS (240V AC SUPPLY)	WEIDMULLER RSE1
X113	BUSSBAR TERMINALS (240V AC SUPPLY)	WEIDMULLER RSE1
X114	BUSSBAR TERMINALS (240V AC SUPPLY)	WEIDMULLER RSE1
X301 & X302	BUSSBAR TERMINALS (TRIP COIL 1 ETO & TRIP COIL 2 ETO)	WEIDMULLER RSE1/2
X304	BUSSBAR TERMINALS (BUSSBAR & FILTER VT'S)	WEIDMULLER RSE1

FILE 7B302

POWER GRID CORPORATION OF INDIA LIMITED
1 x 500MW HVDC BACK-TO-BACK PROJECT
VISAKHAPATNAM

GEALSTHOM

GEALSTHOM T&D
Power Electronic Systems Limited

VISAKHAPATNAM
AC HARMONIC FILTER - CWC24
CUBICLE - CWC24+EF4241 EQUIPMENT & DEVICE LIST
(DOUBLE DAMPED PART OF FILTER)

DRG. No. 637EZ1Y04657 SHT 1
CURRENT ISSUE C

REFER 637EZ1Y04591 FOR FILE INDEX [7B301]

ISSUE	DATE	BY	REVISION
12	26		
08	08		
08	08		
97	97		

AS BUILT DWG
14 APR 2009
VISAKHAPATNAM

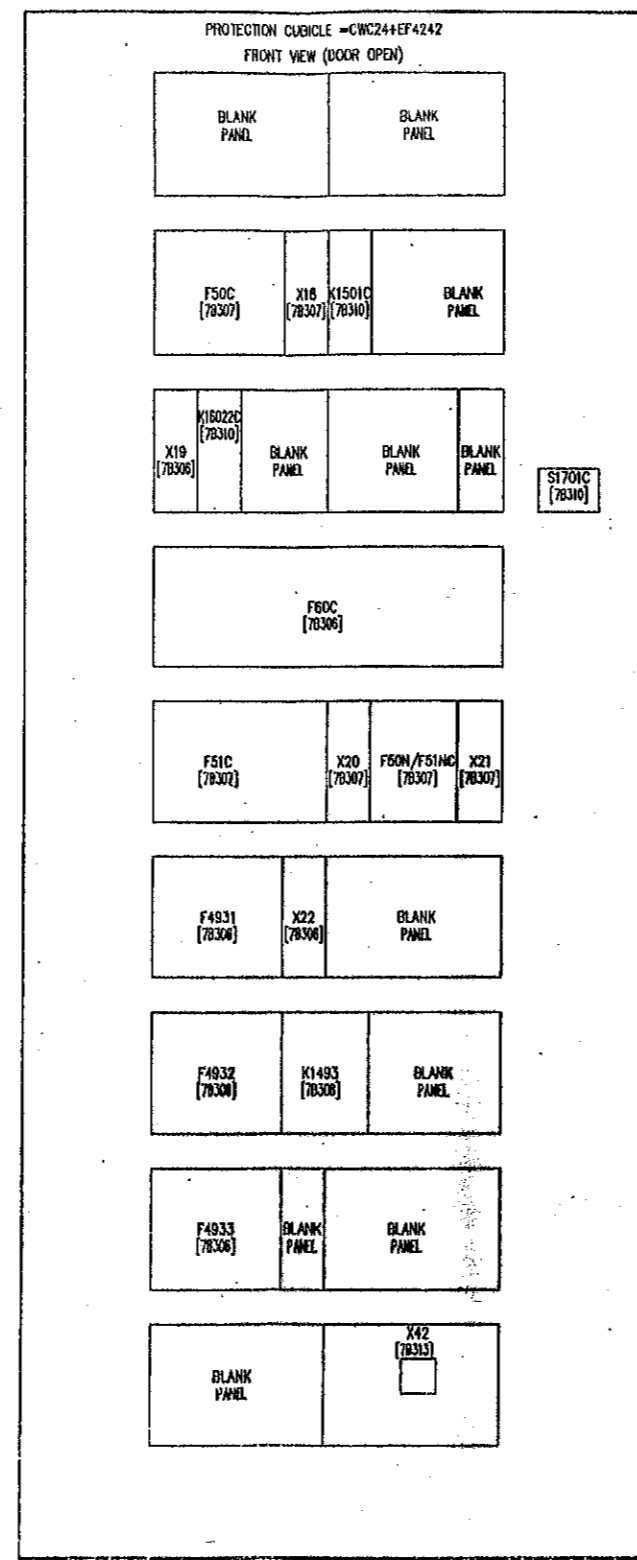
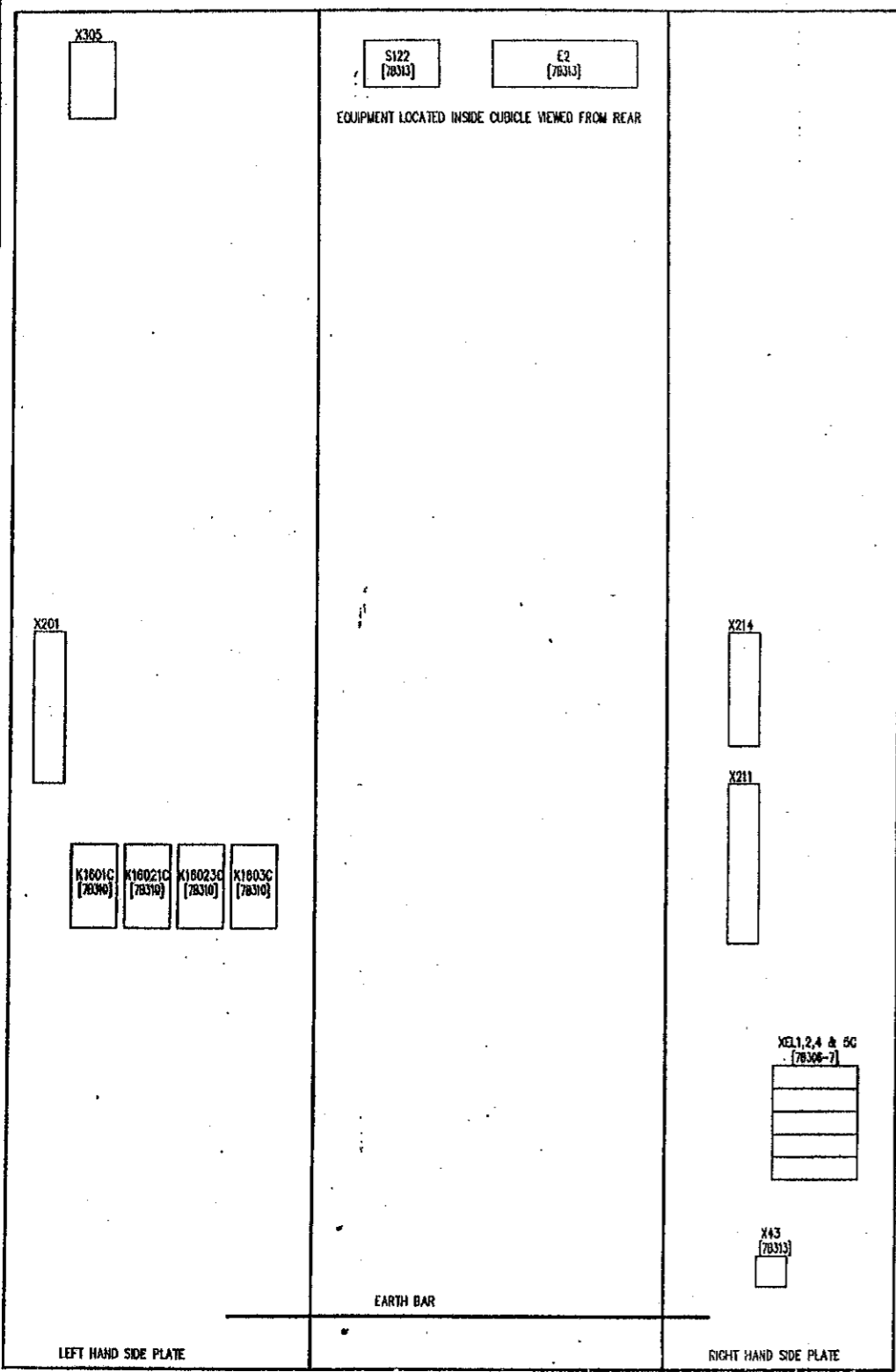
GEALSTHOM T&D
Power Electronic Systems Limited
CERTIFIED FOR MANUFACTURE
NAME: B T BARRETT
DEPT. 739 DATE: 5/8/97
SIGNED BTB

THIRD ANGLE PROJECTION
IF IN DOUBT ASK

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED
DRAWING TO BE USED FOR THE STANDARD OF ACCURACY OF ALL UNBALANCED DIMENSIONS SEE SPEC. STAND./023/PROC

DRAWN JCP
CHKD PNS
APP'D RFR
SCALE
TRACED
DESN PRJ
APP'D

DWG. No. 637EZ1Y04657 SHT 2



DEVICE REF	DESCRIPTION	TYPE
F50C	INSTANTANEOUS OVERCURRENT RELAY	GECA MCAG39
X18	OVERCURRENT TEST BLOCK	GECA MMLG01
K1501C	TIMING RELAY (0.001-1 second)	GECA MYT114
X19	CAPACITOR UNBALANCE TEST BLOCK	GECA MMLG01
K18022C	CAPACITOR UNBALANCE TIMER (10-10,000 seconds)	GECA MYT114
S1701C	PUSHBUTTON CAPACITOR UNBALANCE TIMER RESET	HIGHLAND 704-0120 +704.910.4
F80C	CAPACITOR UNBALANCE RELAY	COOPER SY
F51C	IDMT OVERCURRENT RELAY	ASEA SPAJ 160C
X20	OVERCURRENT TEST BLOCK	MMLG01
F50N/F51NC	EARTH FAULT RELAY	GECA KCGG122
X21	EARTH FAULT TEST BLOCK	GECA MMLG01
F4931	RESISTOR R3 OVERLOAD RELAY RED PHASE	P AND B SAW2A
X22	RESISTOR R3 OVERLOAD TEST BLOCK	GECA MMLG01
F4932	RESISTOR R3 OVERLOAD RELAY YELLOW PHASE	P AND B SAW2A
K1493	FILTER AUXILIARY CIRCUIT FAULTY ALARM RELAY	GECA KCGG122
F4933	RESISTOR R3 OVERLOAD RELAY BLUE PHASE	P AND B SAW2A
K1801C	CAPACITOR UNBALANCE STAGE 1 AUXILIARY RELAY	GECA PRIMA
K18021C	CAPACITOR UNBALANCE STAGE 2 AUXILIARY RELAY	GECA PRIMA
K18023C	CAPACITOR UNBALANCE STAGE 2 TIMER AUXILIARY RELAY	GECA PRIMA
K1803C	CAPACITOR UNBALANCE STAGE 3 AUXILIARY RELAY	GECA PRIMA
X21C	EARTH LINK FOR F80C	WEDMULLER STL5
X21D	EARTH LINK FOR K1493	WEDMULLER STL5
X21E	EARTH LINK FOR F50C/F51C	WEDMULLER STL5
X21F	EARTH LINK FOR F50N/F51NC	WEDMULLER STL5
X42	TEST EQUIPMENT SWITCHED SOCKET TO INDIAN STANDARD	
X43	HANDLAMP SWITCHED SOCKET TO INDIAN STANDARD	
E2	CUBICLE LIGHTING	
S122	CUBICLE LIGHTING DOOR SWITCH	
X201	CT/VT TERMINALS	WEDMULLER RSP1
X211	SEQUENCE OF EVENTS RECORDER TERMINALS	WEDMULLER RSP2
X214	SPARE RELAY CONTACTS TERMINALS	WEDMULLER SAKR
X305	BUSHING TERMINALS (BUSHING & FILTER VT'S)	WEDMULLER RSE2

FILE 7B303

POWER GRID CORPORATION OF INDIA LIMITED
1 x 500MW HVDC BACK-TO-BACK PROJECT
VISAKHAPATNAM

GEC ALSTHOM
T&D

GEC ALSTHOM T&D
Power Electronic Systems Limited
Balford, England

TITLE
VISAKHAPATNAM
AC HARMONIC FILTER =CWC24 PROTECTION
CUBICLE =CWC24+EF4242 EQUIPMENT & DEVICE LIST
'C' TYPE PART OF COMBINED FILTER

DWG. No. 637EZ1Y04657 SHT 2

CUSTOMER POWERGRID

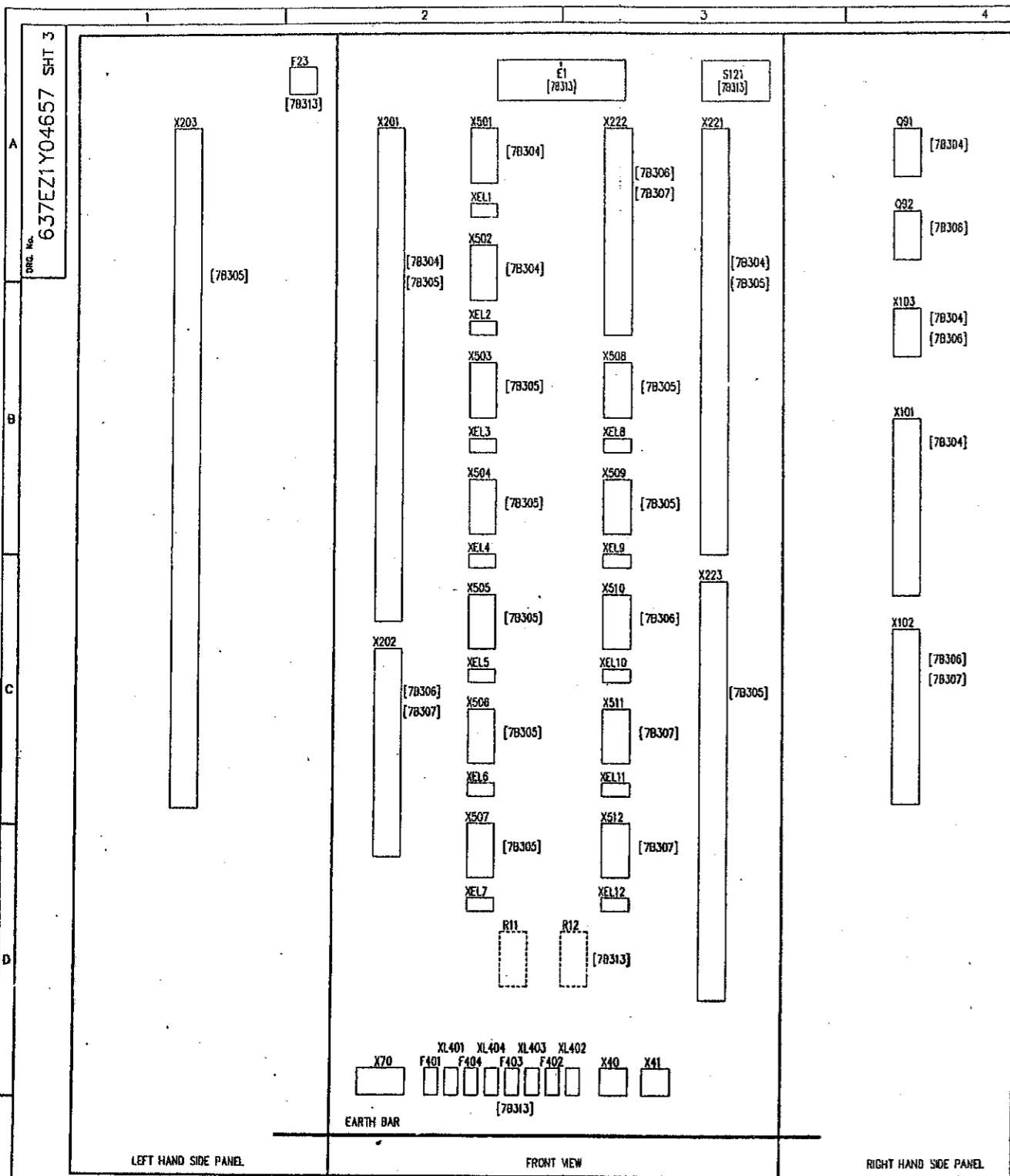
NAME	C
PRJ	A
RFR	B
PREM	C
ISSUE	12/08/97
DATE	31/07/98
REVISION	REVISED TO ENHANCE F50N/F51NC & K1493 TYPE MODIFIED.
DESIGN	BTB
APP'D	PRJ

AS BUILT DWG
14 APR 2000
VISAKHAPATNAM

GEC ALSTHOM T&D
Power Electronic Systems Limited
CERTIFIED FOR MANUFACTURE
NAME: B T BARRETT
DEPT. 738 DATE: 5/8/97
SIGNED BTB

THIRD ANGLE PROJECTION
ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED
DRAWING TO BS308 UNLESS OTHERWISE STATED
IF IN DOUBT ASK
FOR THE STANDARD OF ACCURACY OF ALL UNYOLANCED DIMENSIONS SEE SPECS. STAND/023/PR00

DO NOT SCALE PRINT
WHEN QUOTING DRG. No. STATE CURRENT ISSUE
ORDER No. CP0136

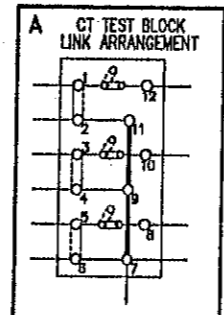
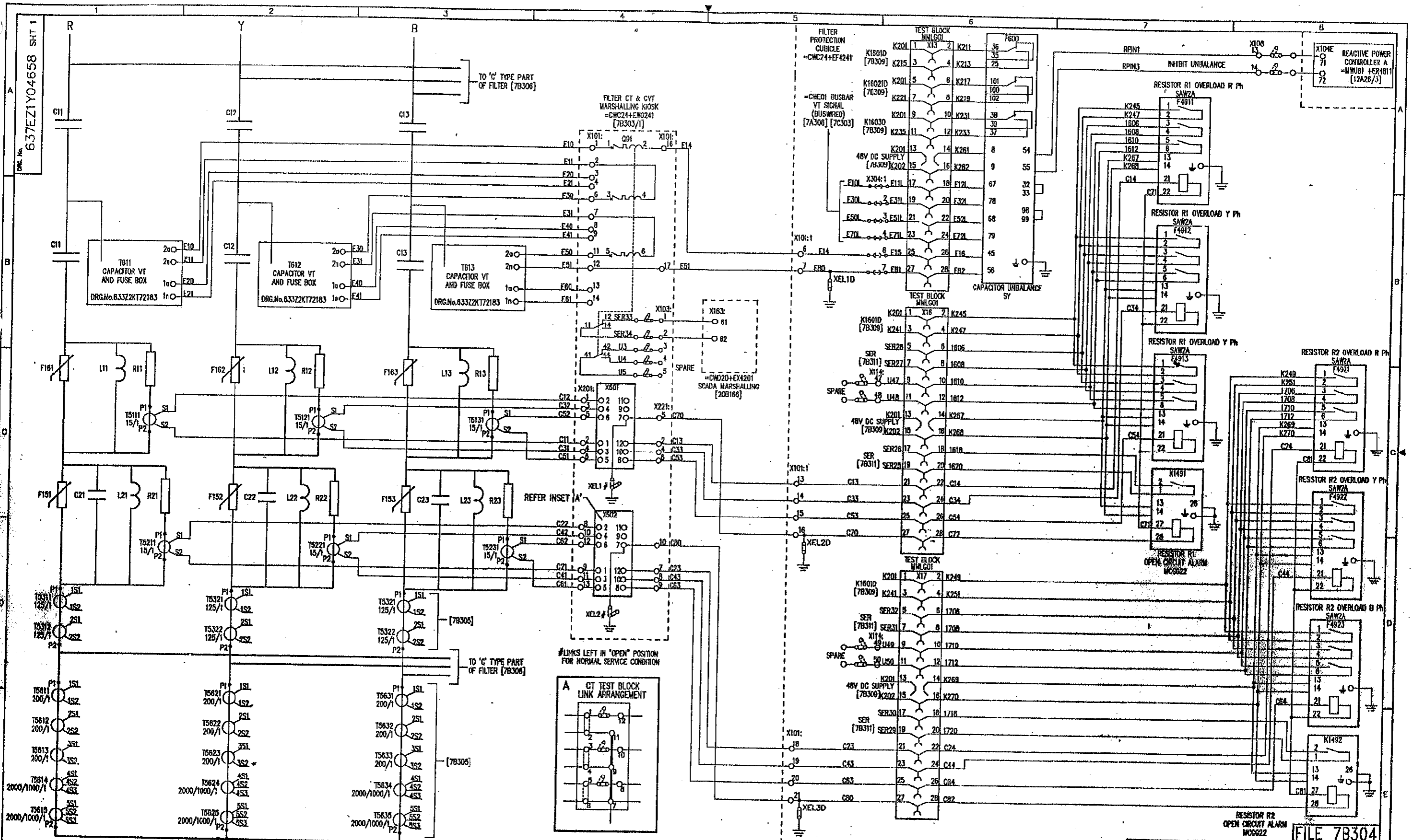


DEVICE REF	DESCRIPTION	TYPE	QTY
E1	CUBICLE LIGHTING		
S121	CUBICLE LIGHTING DOOR SWITCH		
Q91	CVT (D) MINIATURE CIRCUIT BREAKER 1A, SPOLE (AUX CONTACTS)	KLOCKNER MOELLER FA2N CI-3 KLOCKNER MOELLER NRHI 002-FA2	
Q92	CVT (C) MINIATURE CIRCUIT BREAKER 1A, SPOLE (AUX CONTACTS)	KLOCKNER MOELLER FA2N CI-3 KLOCKNER MOELLER NRHI 002-FA2	
X101	CVT (D) IN/OUT TERMINALS	WEIDMULLER RSF1	
X102	CVT (C) IN/OUT TERMINALS	WEIDMULLER RSF1	
X103	SER TERMINALS	WEIDMULLER SAKR	
X201	CT (D) IN TERMINALS	WEIDMULLER RSF1	
X202	CT (C) IN TERMINALS	WEIDMULLER RSF1	
X203	CT IN TERMINALS	WEIDMULLER RSF1	
X221	CT (D) OUT TERMINALS	WEIDMULLER RSF1	
X222	CT (C) OUT TERMINALS	WEIDMULLER RSF1	
X223	CT OUT TERMINALS	WEIDMULLER RSF1	
X501	CWC24+151.1 TEST BLOCK	WEIDMULLER SAKT2	
XEL1	EARTH LINK FOR 151.1	WEIDMULLER SIL5	
X502	CWC24+152.1 TEST BLOCK	WEIDMULLER SAKT2	
XEL2	EARTH LINK FOR 152.1	WEIDMULLER SIL5	
X503	CWC24+153.1 TEST BLOCK	WEIDMULLER SAKT2	
XEL3	EARTH LINK FOR 153.1	WEIDMULLER SIL5	
X504	CWC24+153.2 TEST BLOCK	WEIDMULLER SAKT2	
XEL4	EARTH LINK FOR 153.2	WEIDMULLER SIL5	
X505	CWC24+156.1 TEST BLOCK	WEIDMULLER SAKT2	
XEL5	EARTH LINK FOR 156.1	WEIDMULLER SIL5	
X506	CWC24+156.2 TEST BLOCK	WEIDMULLER SAKT2	
XEL6	EARTH LINK FOR 156.2	WEIDMULLER SIL5	
X507	CWC24+156.3 TEST BLOCK	WEIDMULLER SAKT2	
XEL7	EARTH LINK FOR 156.3	WEIDMULLER SIL5	
X508	CWC24+156.4 TEST BLOCK	WEIDMULLER SAKT2	
XEL8	EARTH LINK FOR 156.4	WEIDMULLER SIL5	
X509	CWC24+156.5 TEST BLOCK	WEIDMULLER SAKT2	
XEL9	EARTH LINK FOR 156.5	WEIDMULLER SIL5	
X510	CWC24+154.1 TEST BLOCK	WEIDMULLER SAKT2	
XEL10	EARTH LINK FOR 154.1	WEIDMULLER SIL5	
X511	CWC24+155.1 TEST BLOCK	WEIDMULLER SAKT2	
XEL11	EARTH LINK FOR 155.1	WEIDMULLER SIL5	
X512	CWC24+155.2 TEST BLOCK	WEIDMULLER SAKT2	
XEL12	EARTH LINK FOR 155.2	WEIDMULLER SIL5	
X70	240V AC SUPPLY TERMINALS	WEIDMULLER RSE1	
F401	FUSE AND HOLDER, 2A, CUBICLE LIGHTING SUPPLY, 240V, 50HZ.	WEIDMULLER KSKCP	
XL401	LINK AND HOLDER	WEIDMULLER KSKXL	
F402	FUSE AND HOLDER, 10A, SUPPLY FOR TEST EQUIPMENT 10A SOCKET, 240V, 50HZ.	DECA E.V.E. 503240	
XL402	LINK AND HOLDER	DECA E.V.E. 503240	
F403	FUSE AND HOLDER, 2A, FOR HAND LAMP SUPPLY 16A SOCKET, 240V, 50HZ.	WEIDMULLER KSKCP	
XL403	LINK AND HOLDER	WEIDMULLER KSKXL	
F404	FUSE AND HOLDER, 10A, FOR HEATER SUPPLY, 240V, 50HZ.	WEIDMULLER KSKCP	
XL404	LINK AND HOLDER	WEIDMULLER KSKXL	
R11, R12	CUBICLE HEATER THERMOSTATICALLY CONTROLLED (MID ON DOOR) THERMOSTAT	SABEL 17509 (90W) SABEL 17561	
X40	TEST EQUIPMENT SWITCHED SOCKET TO INDIAN STANDARD		
X41	HAND LAMP SWITCHED SOCKET TO INDIAN STANDARD		

(C) DENOTES 'C TYPE' PART OF COMBINED FILTER
 (D) DENOTES 'DOUBLE DAMPED' PART OF COMBINED FILTER

REFER 637EZ1Y04591 FOR FILE INDEX [78301]

C.A.D. DATA ISSUE A NAME 637EZ1Y04657 LOCATION VISA2614	A ISSUE DATE 22/05/98	AS BUILT DWG 14 APR 2000 VISAKHAPATNAM	GEC ALSTHOM T&D Power Electronic Systems Limited CERTIFIED FOR MANUFACTURE NAME: N.M. KRISHY DEPT: 611 DATE: 13/4/00 SIGNED: NMICK	THIRD ANGLE PROJECTION ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED DRAWING TO BS308 UNLESS OTHERWISE STATED FOR THE STANDARD OF ACCURACY OF ALL UNTOLERANCED DIMENSIONS SEE SPEC. STAND/023/PROG	DRAWN VJC CVD: FSS APP'D: [Signature] SCALE: TRACED: DESIGN APP'D: [Signature]	FILE 7B303/1
						POWER GRID CORPORATION OF INDIA LIMITED 1 x 500MW HVDC BACK-TO-BACK PROJECT VISAKHAPATNAM GEC ALSTHOM T&D Power Electronic Systems Limited VISAKHAPATNAM AC HARMONIC FILTER =CWC24 CT & CVT MARSHALLING KIOSK =CWC24+EW0241 EQUIPMENT & DEVICE LIST DRG. No. 637EZ1Y04657 SHT 3 CURRENT ISSUE A



ISSUE	PRJ	PRJ	PRJ
C	A	B	A
DATE	DATE	DATE	DATE
12/08/97	31/07/98	12/08/98	12/08/98
REVISIONS TO COMMENTS - ADDED FILE REF. C-26166			
REVISIONS TO COMMENTS - ADDED FILE REF. C-26166			
REVISIONS TO COMMENTS - ADDED FILE REF. C-26166			
REVISIONS TO COMMENTS - ADDED FILE REF. C-26166			

AS BUILT DWG
14 APR 2000
VISAKHAPATNAM

POWER GRID CORPORATION OF INDIA LIMITED
1 x 500MW HVDC BACK-TO-BACK PROJECT
VISAKHAPATNAM

GEC ALSTHOM
T&D
CERTIFIED FOR
MANUFACTURE
NAME: B T BARRETT
DEPT. 739 DATE: 5/8/97
SIGNED: BTB

GEC ALSTHOM
T&D
Power Electronic Systems Limited
VISAKHAPATNAM
AG HARMONIC FILTER - CWC24 PROTECTION
CIRCUIT DIAGRAM FOR AC CIRCUITS
(DOUBLE DAMPED PART OF COMBINED FILTER)

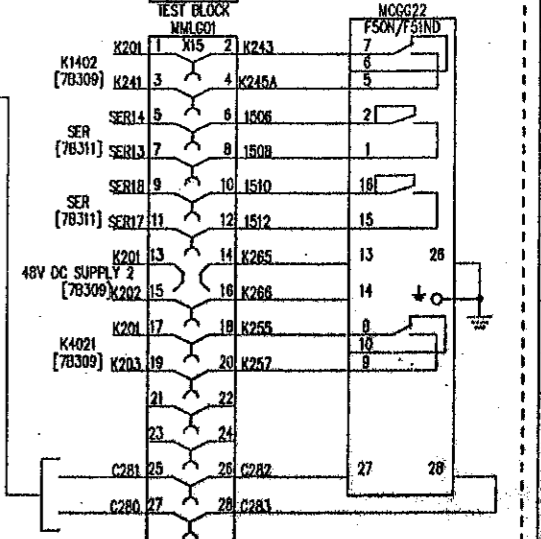
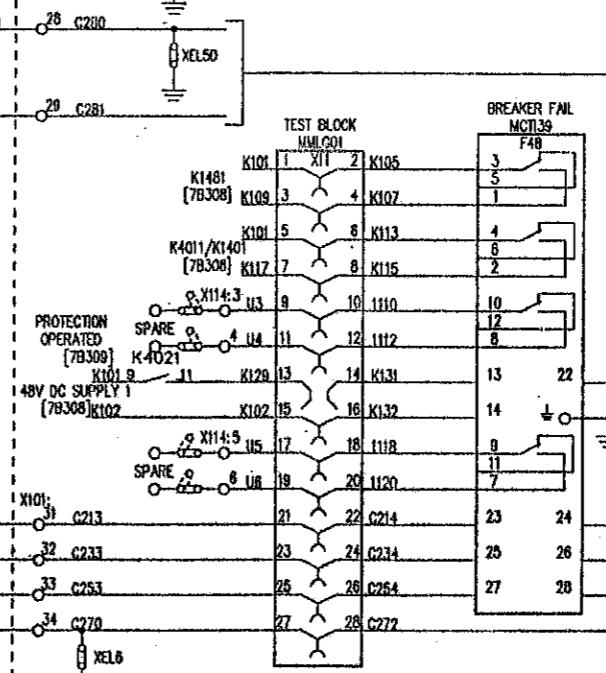
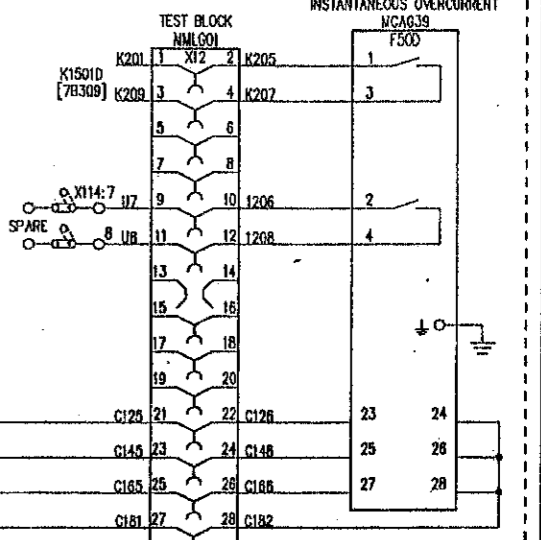
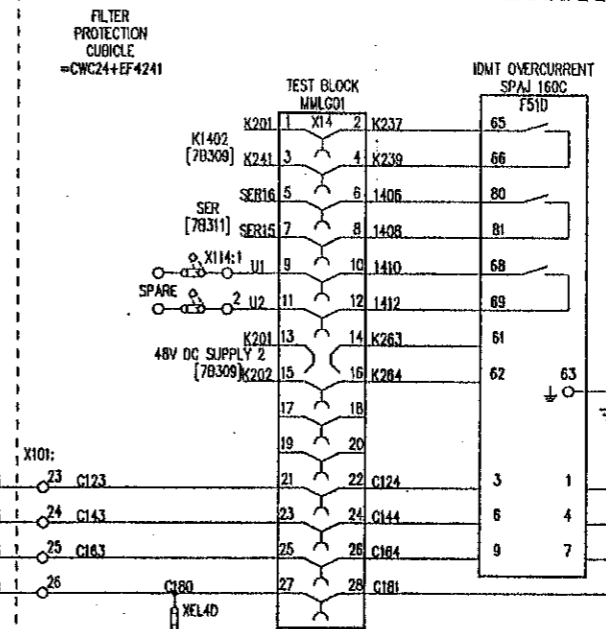
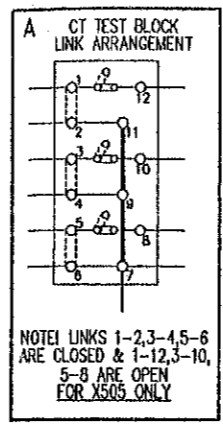
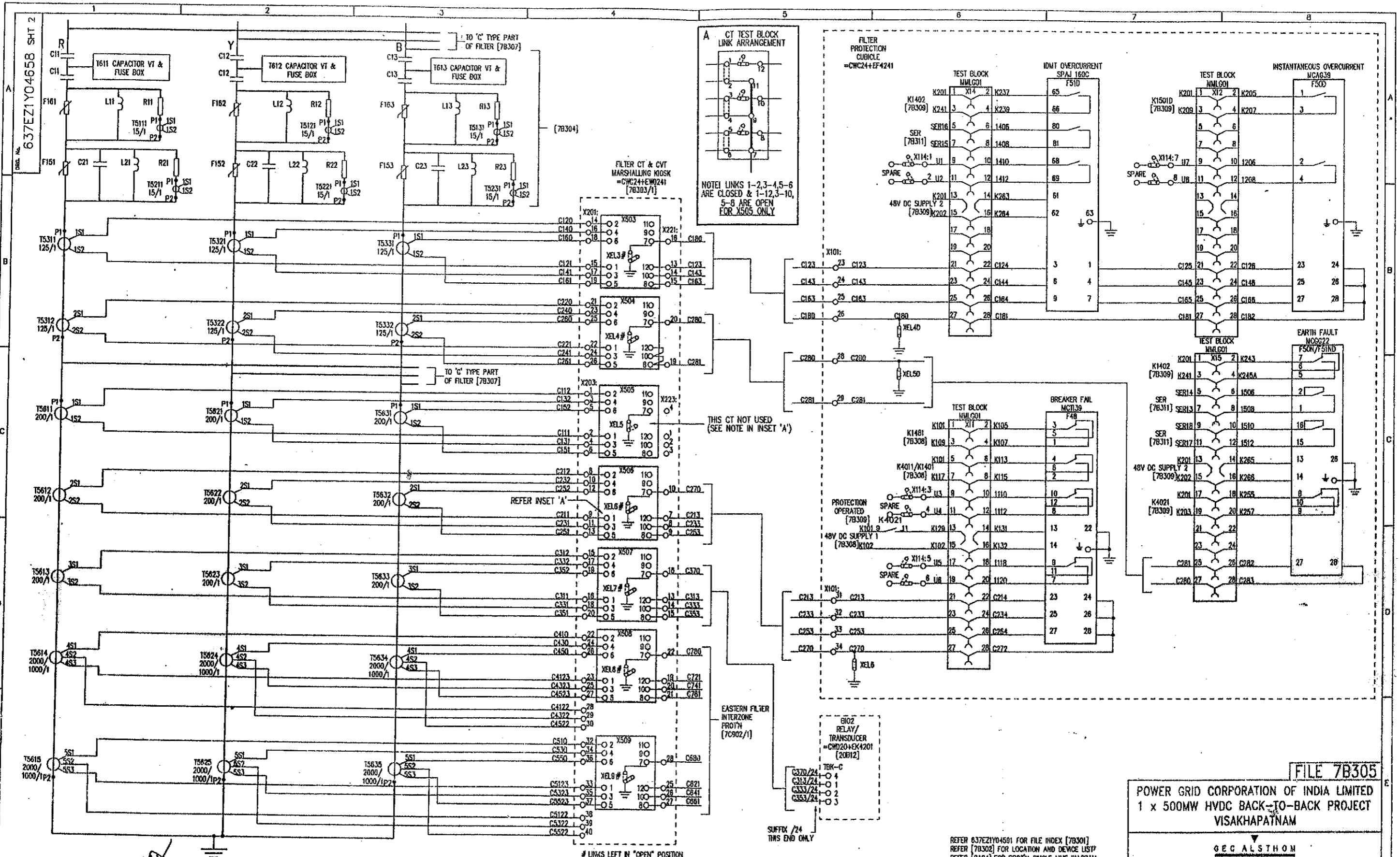
REFER [7B302] FOR LOCATION AND DEVICE LIST
REFER 637EZ1Y04591 FOR FILE INDEX [7B301]
REFER [2A04] FOR PROJ'N SINGLE LINE DIAGRAM

FILE 7B304

DO NOT SCALE PRINT

637EZ1Y04658 SHT 1

CUSTOMER: POWERGRID



G.A.D. DATA

ISSUE	A	PRJ	B
NAME	C	PNS	JCP
LOCATION	VSA2413	DATE	28/08/97

REVISIONS:

- REVISED TO EON 6354 - CWC20+EF4201 WAS SIGNAS AS -CWC20+EF4201
- PREM 31/09/98
- REVISED TO EON 6354 & 6354 - CHANGED CABLE CORE NO ON JAZZ19-21 & 25-28 FROM C441, 451, 479 & C511, 531, 551, 570 ALSO FILE REF FOR EASTERN FILTER INTER-FROM 70001
- ADDED TERMINAL NUMBERS TO -CWC20+EF4201
- REVISED TO EON 6354 - CHANGED WIRE NO ON X223:22 & 28 FROM C370 & C570.

AS BUILT DWG

14 APR 2000

VISAKHAPATNAM

LINKS LEFT IN "OPEN" POSITION FOR NORMAL SERVICE POSITION

GEC ALSTHOM T&D

Power Electronic Systems Limited

CERTIFIED FOR MANUFACTURE

NAME: B T BARRETT

DEPT: 739 DATE: 5/8/97

SIGNED: BTB

THIRD ANGLE PROJECTION

IF IN DOUBT ASK

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED

DO NOT SCALE PRINT

DRAWN: JCP

CHKD: PNS

APP'D: RFR

TRACED

DESIGN: PRJ

APP'D:

FILE 7B305

POWER GRID CORPORATION OF INDIA LIMITED

1 x 500MW HVDC BACK-TO-BACK PROJECT

VISAKHAPATNAM

GEC ALSTHOM T&D

Power Electronic Systems Limited

Maitland, England

VISAKHAPATNAM

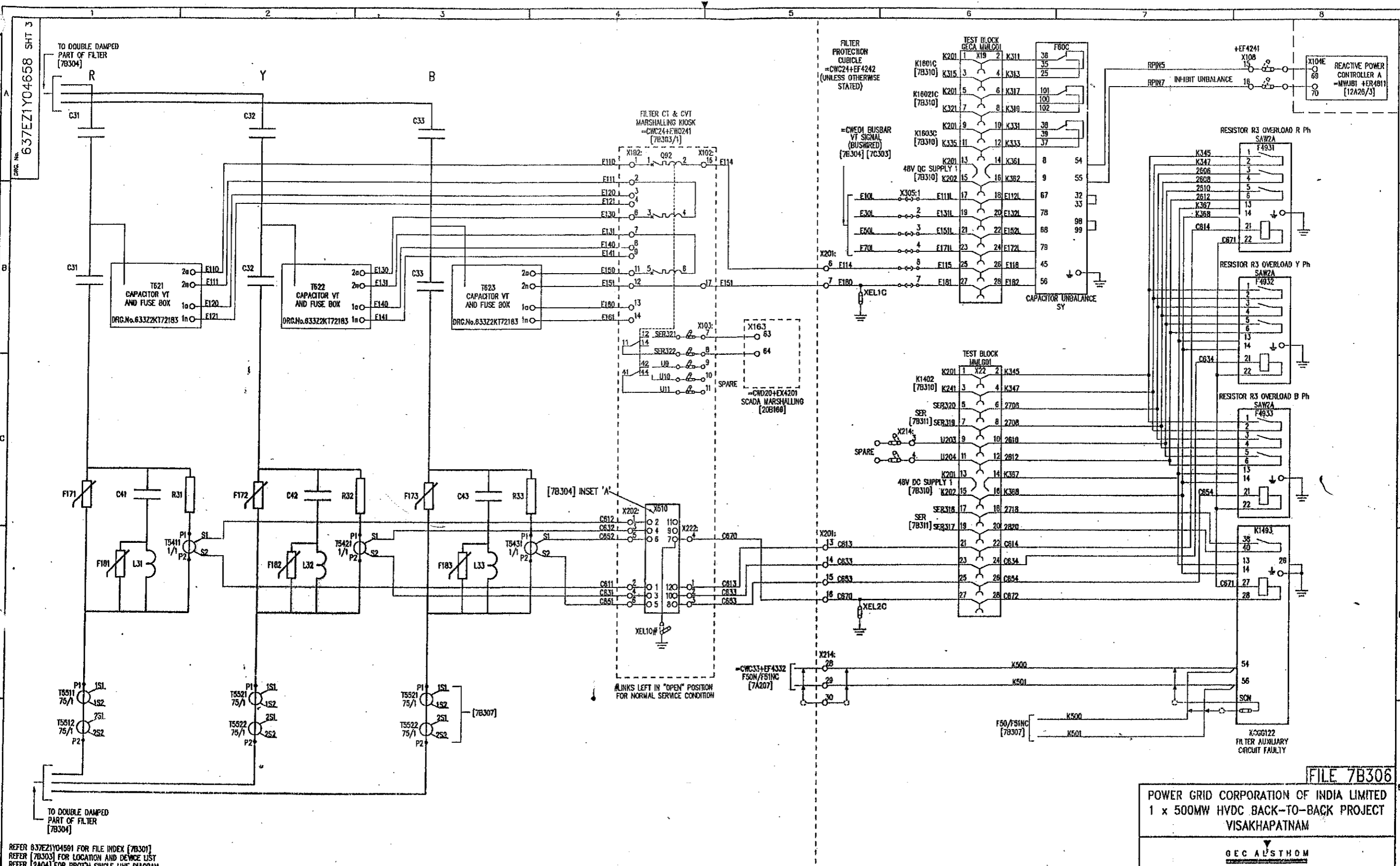
AC HARMONIC FILTER =CWC24 PROTECTION CIRCUIT DIAGRAM FOR AC CIRCUITS (DOUBLE DAMPED PART OF COMBINED FILTER)

DRG. No. 637EZ1Y04658 SHT 2

CURRENT ISSUE C

CUSTOMER: POWERGRID

ORDER No. GF0138



REFER 637EZ1Y04591 FOR FILE INDEX [7B301]
 REFER [7B303] FOR LOCATION AND DEVICE LIST
 REFER [2A04] FOR PROTN SINGLE LINE DIAGRAM

ISSUE	DATE	BY	CHKD	REASON FOR CHANGE
D	12/08/97	J1	J1	ISSUED FOR PROTN
C	07/07/98	J1	J1	ISSUED FOR PROTN
B	07/07/98	J1	J1	ISSUED FOR PROTN
A	07/07/98	J1	J1	ISSUED FOR PROTN

AS BUILT DWG
 14 APR 2000
VISAKHAPATNAM

GEC ALSTHOM
 T&D
 CERTIFIED FOR
 MANUFACTURE
 NAME: B T BARRETT
 DEPT. 739 DATE: 5/8/97
 SIGNED: BTB

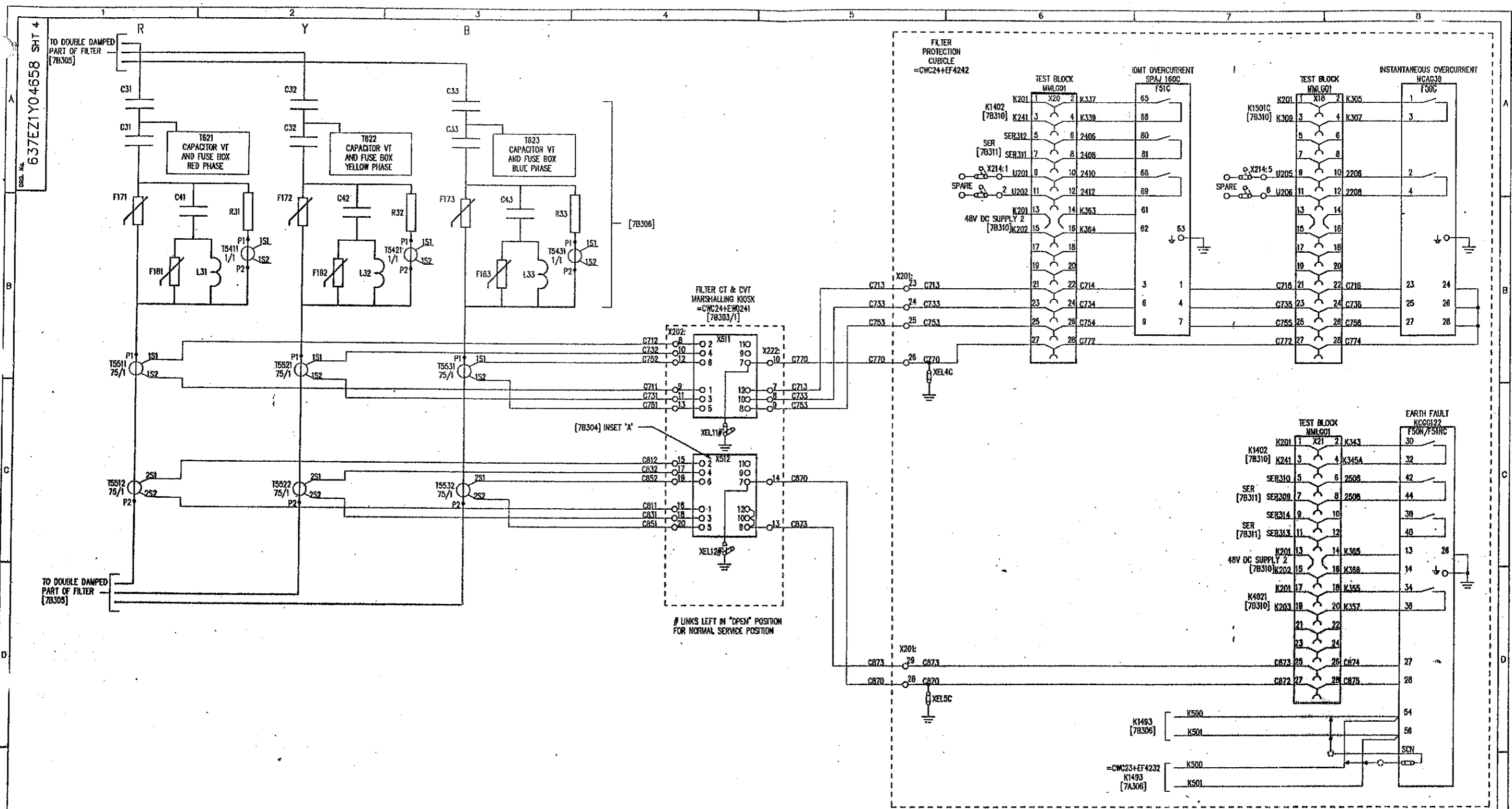
GEC ALSTHOM
 T&D
 ALL DIMENSIONS
 IN MILLIMETRES
 UNLESS OTHERWISE STATED
 DRAWING TO BE USED
 UNLESS OTHERWISE STATED
 FOR THE STANDARD OF
 ACCURACY OF ALL
 UNDIMENSIONED DIMENSIONS
 SEE SPECIAL STAND/023/PROC

POWER GRID CORPORATION OF INDIA LIMITED
 1 x 500MW HVDC BACK-TO-BACK PROJECT
 VISAKHAPATNAM

GEC ALSTHOM
 T&D
Power Electronic Systems Limited
 VISAKHAPATNAM
 AC HARMONIC FILTER -CWC24 PROTECTION
 CIRCUIT DIAGRAM FOR AC CIRCUITS
 ('C' TYPE PART OF COMBINED FILTER)

DRG. No. **637EZ1Y04658 SH 3**
 CUSTOMER: **POWERGRID**

FILE 7B306



REFER 637E21Y04658 FOR FILE INDEX [78301]
 REFER [78303] FOR LOCATION AND DEVICE LIST
 REFER [2A04] FOR PROT'N SINGLE LINE CHART

C.A.B. DATA	PRJ	ISSUE
A	B	C
ISSUE	DATE	DATE
12	08	08
97	97	97
LOCATION	VISA4178	

REVISION TO ECH 8705
 RELAY P50/P50NC CHANGED
 WIRE NUM 8300 & 8301 ADDED
 & 2510 & 2512 DELETED
 99
 REVISION TO ECH 8821
 CT REFERENCES AMENDED
 99

AS BUILT DWG
 14 APR 2000
VISAKHAPATNAM

GEC ALSTHOM T&D Power Electronics Systems Limited CERTIFIED FOR MANUFACTURE	THIRD ANGLE PROJECTION	ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED	DRAWN JOP GHD PNS
NAME: B T BARRETT	IF IN DOUBT ASK	DRAWING TO BE 300 UNLESS OTHERWISE STATED	APP'D RFR
DEPT. 739 DATE: 5 / 8 / 97		FOR THE STANDARD OF ACCURACY OF ALL UNITS/FRACED DIMENSIONS SEE SPECN. STAND/023/PRODU	SCALE
SIGNED BTB			TRACED
			DESIGN APP'D PRJ

FILE 78307

POWER GRID CORPORATION OF INDIA LIMITED
 1 x 500MW HVDC BACK-TO-BACK PROJECT
 VISAKHAPATNAM

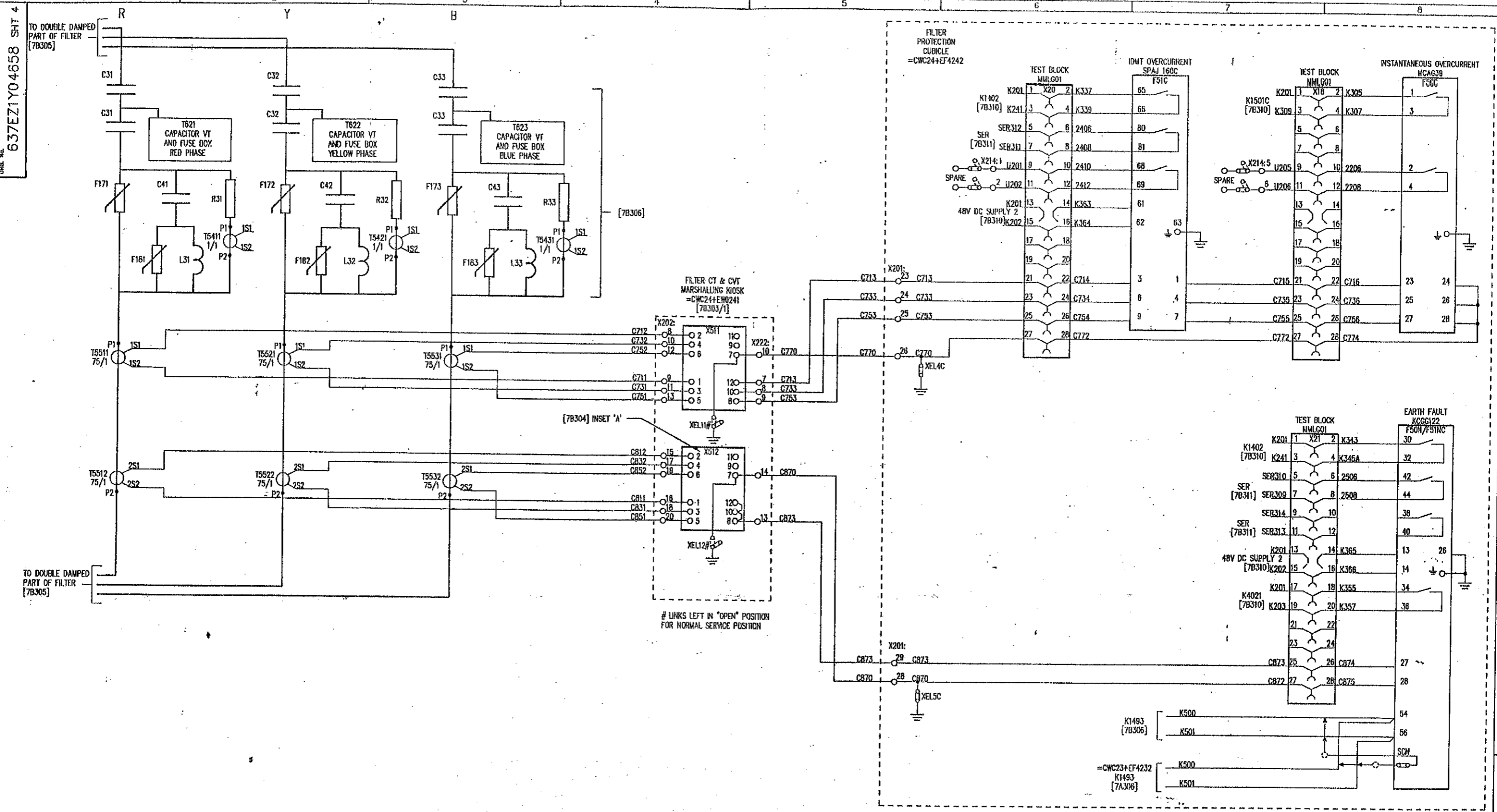
GEC ALSTHOM
 T&D

GEC ALSTHOM T&D
 Power Electronics Systems Limited
 Shelton, England

TITLE
 VISAKHAPATNAM
 AC HARMONIC FILTER =CWC24 PROTECTION
 CIRCUIT DIAGRAM FOR AC CIRCUITS
 (C TYPE PART OF COMBINED FILTER)

DRG. No. 637E21Y04658 SHT 4 OF 4
 CURRENT ISSUE C

DD NOT SCALE PRINT
 WHEN EXPIRES DRG. No. STATE CURRENT ISSUE
 CUSTOMER POWER GRID CORP OF INDIA ORDER No. CE0136



DRG. No. 637EZ1Y04658 SHT 4

REFER 637EZ1Y04591 FOR FILE INDEX (7B301)
 REFER (7B303) FOR LOCATION AND DEVICE LIST
 REFER (2A04) FOR PROTN SINGLE LINE DIAGRAM

C.A.O. DATA	PRJ	ISSUE	DATE	REVISIONS
A	B	A	12-08-97	REVISED TO EON BY05 RELAY F50/F50C CHANGED WIRE Nos 4500 & 4501 ADDED & 2510 & 2512 DELETED.
C	PSC	B	03-06-99	REVISED TO EON BY03 CT REFERENCES AMENDED.

AS BUILT DWG
 14 APR 2000
VISAKHAPATNAM

GEC ALSTHOM T&D
 Power Electronic Systems Limited
 CERTIFIED FOR MANUFACTURE
 NAME: B T BARRETT
 DEPT. 739 DATE: 5/8/97
 SIGNED: BTB

THIRD ANGLE PROJECTION
 ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED
 DRAWING TO BS308 UNLESS OTHERWISE STATED
 FOR THE STANDARD OF ACCURACY OF ALL UNTOLERANCED DIMENSIONS SEE SPEC. STAND. 025/PROD
 DRAWN: JCP
 CVD: PNS
 APP'D: RFR
 SCALE:
 TRACED:
 DESIGN: PRJ
 APP'D:

FILE 7B307

POWER GRID CORPORATION OF INDIA LIMITED
 1 x 500MW HVDC BACK-TO-BACK PROJECT
 VISAKHAPATNAM

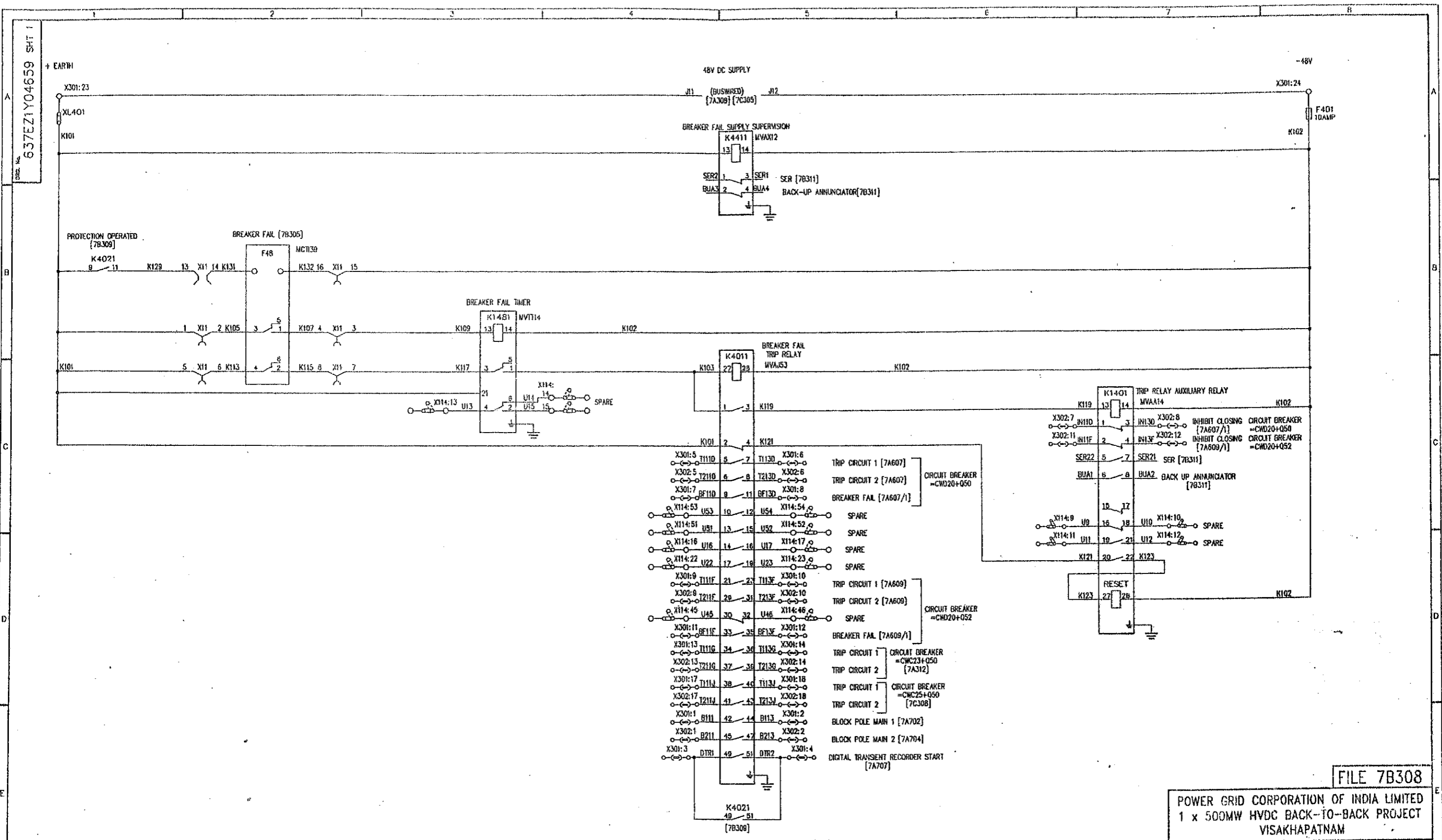
GEC ALSTHOM
 T&D

GEC ALSTHOM T&D
 Power Electronic Systems Limited
 Stirling, England

VISAKHAPATNAM
 AC HARMONIC FILTER =CWC24 PROTECTION
 CIRCUIT DIAGRAM FOR AC CIRCUITS
 (C TYPE PART OF COMBINED FILTER)

DRG. No. 637EZ1Y04658 SHT 4 OF 4
 CURRENT ISSUE: C

CUSTOMER: POWER GRID CORP OF INDIA ORDER No. GFO136



REFER 637E21Y04659 FOR FILE INDEX [7B301]
 REFER [7B302] FOR LOCATION AND DEVICE LIST

ALL EQUIPMENT IS LOCATED IN FILTER PROTECTION CUBICLE -CWC24-EF4241 EXCEPT WHERE INDICATED

FILE 7B308

POWER GRID CORPORATION OF INDIA LIMITED
 1 x 500MW HVDC BACK-TO-BACK PROJECT
 VISAKHAPATNAM

GEC ALSTHOM
 T&D

GEC ALSTHOM T&D
 Power Electronics Systems Limited

VISAKHAPATNAM
 AC HARMONIC FILTER -CWC24 PROTECTION
 CIRCUIT DIAGRAM FOR
 DC CIRCUITS (BREAKER FAIL PROTECTION)

DRW. No. 637E21Y04659 SHT 1
 CURRENT ISSUE B

ISSUE	A	PREM
DATE	12/08/97	31/07/98
LOCATION	VISA2229	

REMOVED TO ED08448 & B402 -
 REMOVED FROM FILE & WIRE LIST
 CHANGED FILE REF'S FROM 7A607
 & 7A609 ON X301:1, X302:8
 & X301:12, X302:12

AS BUILT DWG
 14 APR 2003
 VISAKHAPATNAM

GEC ALSTHOM T&D
 Power Electronics Systems Limited
 CERTIFIED FOR
 MANUFACTURE

NAME: B T BARRETT
 DEPT. 739 DATE: 5/8/97
 SIGNED: BTB

THIRD ANGLE
 PROJECTION

IF IN DOUBT
 ASK

ALL DIMENSIONS
 IN MILLIMETRE
 UNLESS OTHERWISE STATED

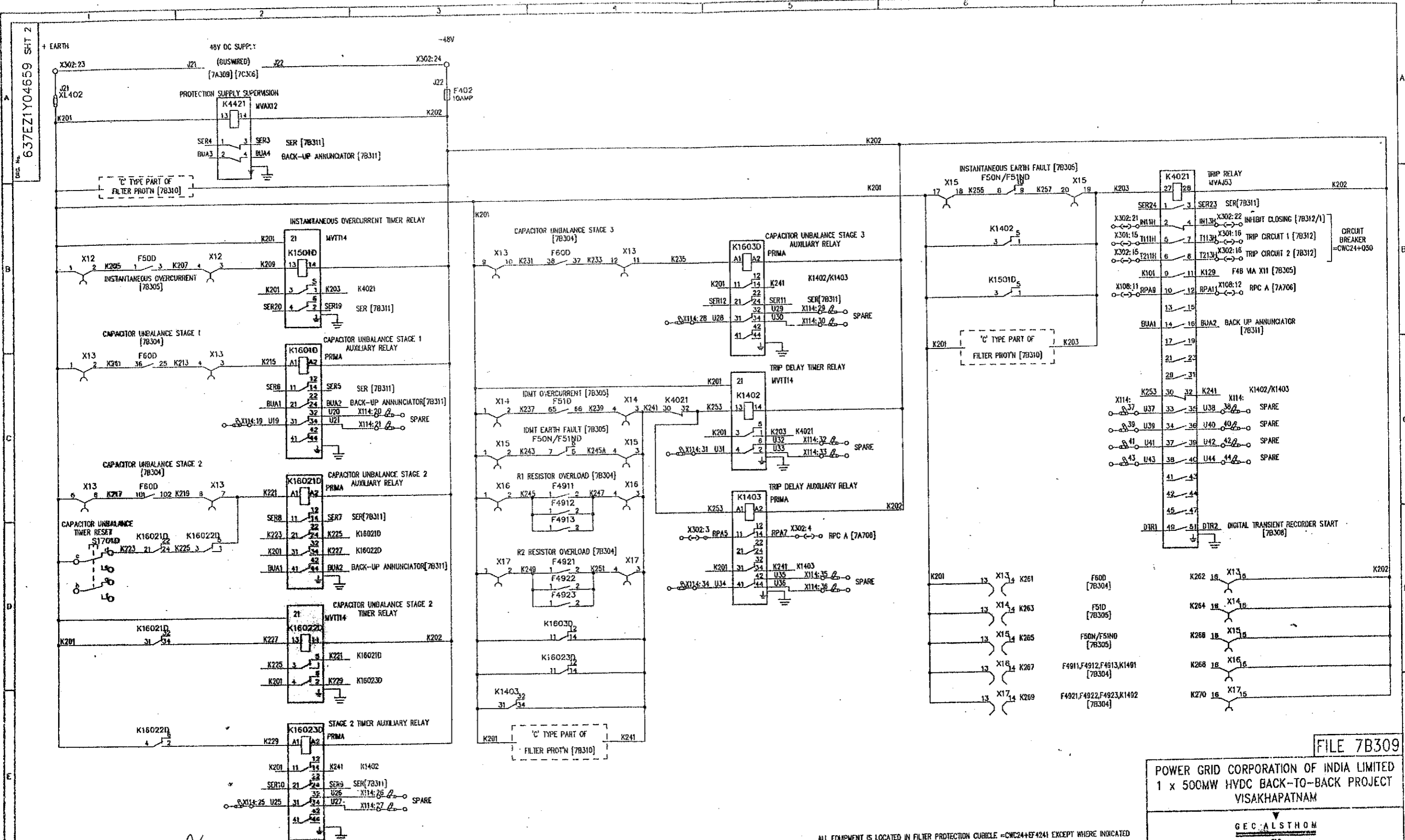
DRAWING TO BE USED
 UNLESS OTHERWISE STATED

FOR THE STANDARD OF
 ACCURACY OF ALL
 UNDIMENSIONED DIMENSIONS
 SEE SPEC. STAND./DSS/PROC

DRAWN: JCF
 CHD: PNS
 APP'D: RFR
 ADAME
 TRACED
 DESIGN: PRJ

DO NOT SCALE PRINT
 CUSTOMER: POWERGRID
 ORDER No. CF0136

Dwg. No. 637EZ1Y04659 SHT 2



REFER 637EZ1Y04591 FOR FILE INDEX [7B301]
REFER [7B302] FOR LOCATION AND DEVICE LIST

ISSUE C	A	B	REVISED TO ENR 1443 & 2486 -
			CHANGED FILE REF ON X302:22
			REMOVED R1240, 1309, 141 & WIPES K210, 228, 242
DATE	12	08	97
LOCATION	VISA4179		

98/12/97
REVISED TO ENR 8823
SERIAL4 WERE SERIAL2

AS BUILT DWG
14 APR 2000
VISAKHAPATNAM

GEC ALSTHOM T&D
Power Electronic Systems Limited
CERTIFIED FOR MANUFACTURE
NAME: B T BARRETT
DEPT. 739 DATE: 5/8/97
SIGNED: BTB

THIRD ANGLE PROJECTION
ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED
DRAWING TO BS308 UNLESS OTHERWISE STATED
FOR THE STANDARD OF ACCURACY OF ALL UNTOLEANCED DIMENSIONS SEE SPECK. STAND/023/PROC

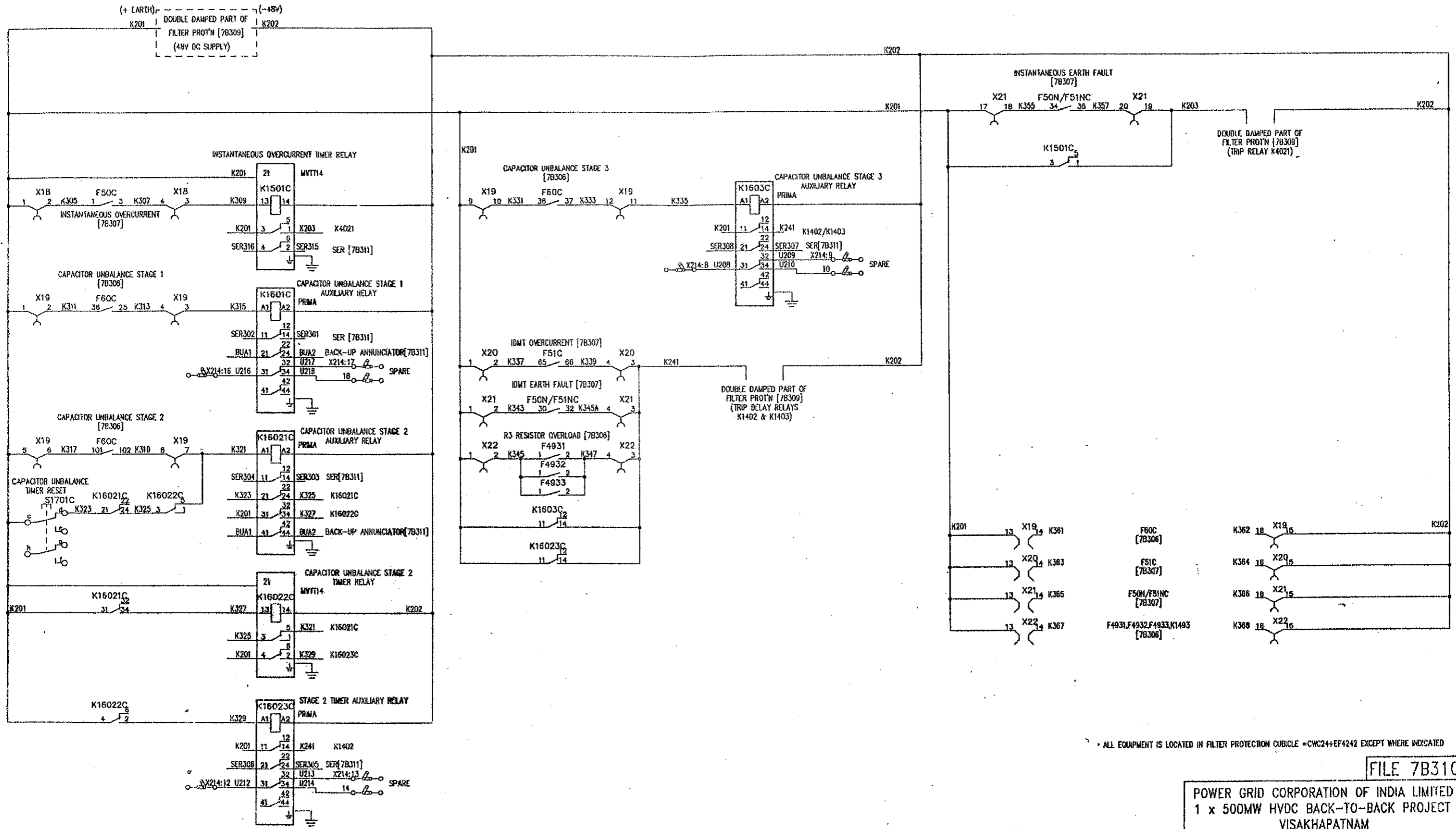
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DRAWN: JCP
CHKD: PNS
APP'D: RFR
SCALE:
TRACED:
DESIGN: PRJ
APP'D:
Dwg. No. 637EZ1Y04659 SHT 2
CURRENT ISSUE: C

POWER GRID CORPORATION OF INDIA LIMITED
1 x 500MW HVDC BACK-TO-BACK PROJECT
VISAKHAPATNAM
GEC ALSTHOM T&D
Power Electronic Systems Limited

FILE 7B309

ALL EQUIPMENT IS LOCATED IN FILTER PROTECTION CUBICLE =CWC244EF4241 EXCEPT WHERE INDICATED

637EZ1Y04659 SHT 3



ALL EQUIPMENT IS LOCATED IN FILTER PROTECTION CUBICLE =CWC24+EF4242 EXCEPT WHERE INDICATED

FILE 7B310

POWER GRID CORPORATION OF INDIA LIMITED
1 x 500MW HVDC BACK-TO-BACK PROJECT
VISAKHAPATNAM

GEC ALSTHOM
T&D

GEC ALSTHOM T&D
Power Electronic Systems Limited
Shillong, England

VISAKHAPATNAM
AC HARMONIC FILTER -CWC24 PROTECTION
CIRCUIT DIAGRAM FOR DC CIRCUITS (PROTECTION)
('C' TYPE PART OF COMBINED FILTER)

DRG. No. 637EZ1Y04659 SHT 3
CURRENT ISSUE D

REFER 637EZ1Y04659 FOR FILE INDEX [7B301]
REFER [7B303] FOR LOCATION AND DEVICE LIST

ISSUE	PRJ	PRJ	PRJ	REVISIONS
NAME	RFR	PREM	BVC	BY
D	A	B	C	1
	ISSUE	DATE	DATE	DATE
		12/08/97	31/07/98	03/06/99
		08/07/98	07/07/98	06/06/99
		97	98	99

REVISIONS:
 1. REVISED TO ENH402 & 8666 - ADDED X21:17-20 & F50N/F51NC DELETED R321C, R313C & WRES K210, K228.
 2. REVISED TO ENH205 FROM ENH402 & 8666 REPLACED BY 30.32.34 & 35.
 3. REVISED TO ENH203 BUVA2 WERE BUVA2K1.

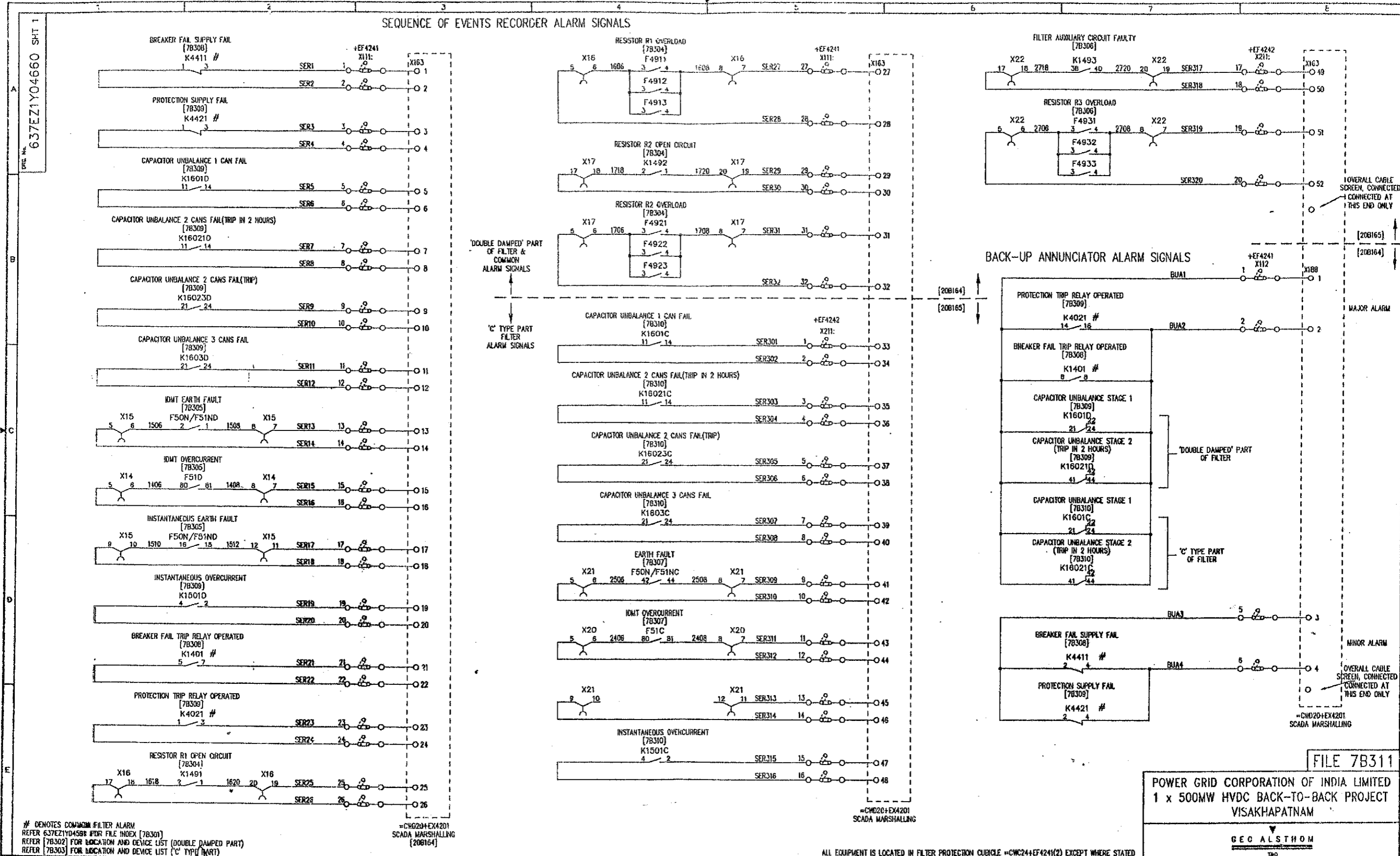
AS BUILT DWG
14 APR 2003
VISAKHAPATNAM

GEC ALSTHOM T&D
Power Electronic Systems Limited
CERTIFIED FOR MANUFACTURE
NAME: B T BARRETT
DEPT: 739 DATE: 5/8/97
SIGNED: BTB

THIRD ANGLE PROJECTION
IF IN DOUBT ASK
FOR THE STANDARD OF ACCURACY OF ALL UNTOLERANCED DIMENSIONS SEE SPEC. STAND/023/PROG

DO NOT SCALE PRINT
WHICH OF THE DRG. No. STATE CURRENT ISSUE
CUSTOMER: POWERGRID
ORDER No. CF0136

SEQUENCE OF EVENTS RECORDER ALARM SIGNALS



DENOTES COMMON FILTER ALARM
 REFER 637EZ1Y04660 FOR FILE INDEX [7B301]
 REFER [7B302] FOR LOCATION AND DEVICE LIST (DOUBLE DAMPED PART)
 REFER [7B303] FOR LOCATION AND DEVICE LIST ('C' TYPE PART)

=CWC20+EX4201
 SCADA MARSHALLING
 [20B164]

ALL EQUIPMENT IS LOCATED IN FILTER PROTECTION CUBICLE =CWC24+EF4241(2) EXCEPT WHERE STATED

DATE	12/08/97	PRJ	PREM	17/12/98	PRJ	JCP	GJJ	17/12/98	PRJ	PG	BUC	17/12/98
NAME	637EZ1Y04660	REVISION	1	1	REVISION	1	1	1	REVISION	1	1	1
LOCATION	VISA4040	REVISED TO	ADD TO EXHIBIT 1	ADD TO EXHIBIT 1	REVISED TO	ADD TO EXHIBIT 1	ADD TO EXHIBIT 1	ADD TO EXHIBIT 1	REVISED TO	ADD TO EXHIBIT 1	ADD TO EXHIBIT 1	ADD TO EXHIBIT 1

AS BUILT DWG
 14 APR 2009
VISAKHAPATNAM

NAME	B T BARRETT	DATE	5/8/97
DEPT.	739	SIGNED	BTB
IF IN DOUBT	ASK		

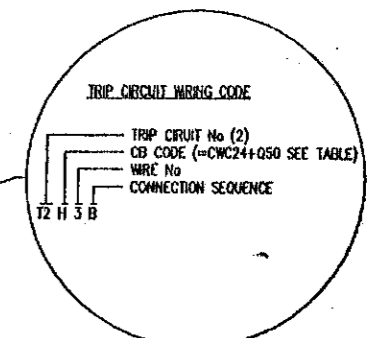
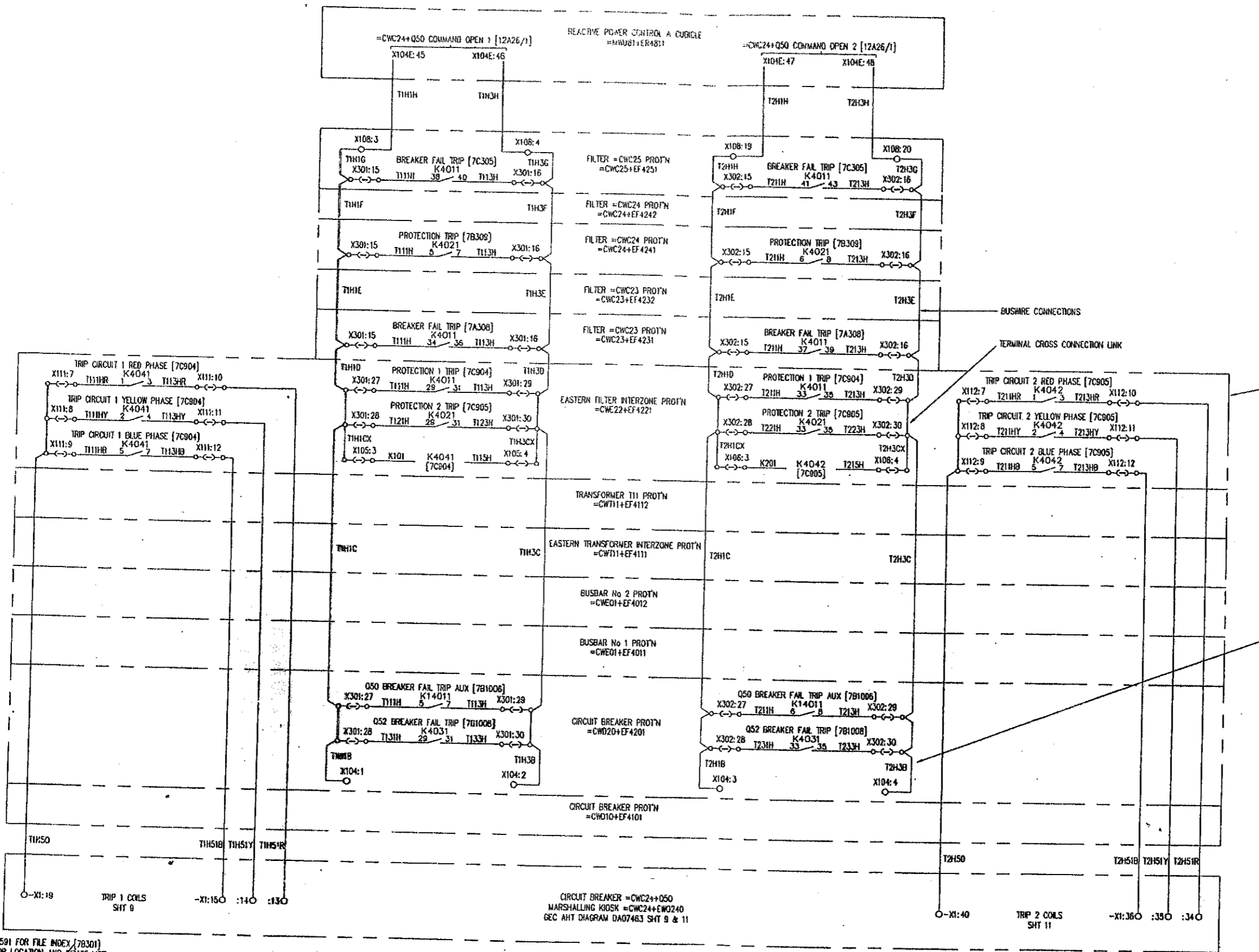
POWER GRID CORPORATION OF INDIA LIMITED
 1 x 500MW HVDC BACK-TO-BACK PROJECT
 VISAKHAPATNAM

GEC ALSTHOM T&D
 Power Electronic Systems Limited

DRWN	JCP	CHKD	PNS
APPD	RFR	SCALE	N/A
DRG. No.	637EZ1Y04660	SHT	1
CURRENT ISSUE	D		

637EZ1Y04661 SHT 1

CU	LETTER	BUS
=CWO10+Q50	A	EAST
=CWO10+Q51	B	
=CWO10+Q52	C	
=CWO20+Q50	D	
=CWO20+Q51	E	
=CWO20+Q52	F	
=CWC23+Q50	G	
=CWC24+Q50	H	
=CWC25+Q50	J	
=CWL19+Q50	K	
=CWL29+Q50	L	
PG REMOTE L1	M	SOUTH
PG REMOTE L2	N	
=CWO30+Q50	P	
=CWO30+Q51	R	
=CWO30+Q52	S	
=CWC33+Q50	T	
=CWC34+Q50	U	
=CWC35+Q50	V	
=CWC36+Q50	W	
PG EXISTING 001	X	
PG EXISTING 002	Y	



FILE 7B312
 POWER GRID CORPORATION OF INDIA LIMITED
 1 x 500MW HVDC BACK-TO-BACK PROJECT
 VISAKHAPATNAM

GEC ALSTHOM
 T&D
 Power Electronic Systems Limited
 VISAKHAPATNAM
 AC HARMONIC FILTER =CWC24 PROTECTION
 CIRCUIT DIAGRAM FOR
 SIGNALS TO CIRCUIT BREAKER =CWC24+Q50
 DRG. No. 637EZ1Y04661 SHT 1
 CURRENT ISSUE B

AS BUILT DWG
 14 APR 2003
VISAKHAPATNAM

REFER 637EZ1Y04591 FOR FILE INDEX (7B301)
 REFER (7B302) FOR LOCATION AND DEVICE LIST

ISSUE	B
NAME	
LOCATION	VISA2004
DATE	12/08/97
ISSUE	PREM
DATE	22/07/98
ISSUE	98
DATE	07/08/98

REVISED TO ENR443 & ENR444
 ADDED K4041 & K4042 CONTACTS
 ADDED K4041 & K4042 RELAY
 COT REF IN TRIP COT WIRING

GEC ALSTHOM T&D Power Electronic Systems Limited
 GEC ALSTHOM T&D
 Power Electronic Systems Limited
 CERTIFIED FOR MANUFACTURE
 NAME: B T BARRETT
 DEPT. 739 DATE: 5/8/97
 SIGNED: BTB

THIRD ANGLE PROJECTION
 ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED
 DRAWING IS TO BE USED UNLESS OTHERWISE STATED
 FOR THE STANDARD OF ACCURACY OF ALL UNTOLERANCED DIMENSIONS SEE SPEC. STAND/023/PROC
 DRAMN JCP
 CND PNS
 APP'D RFR
 SCALE
 TRACED
 DESIGN APP'D PRJ
 DO NOT SCALE PRINT

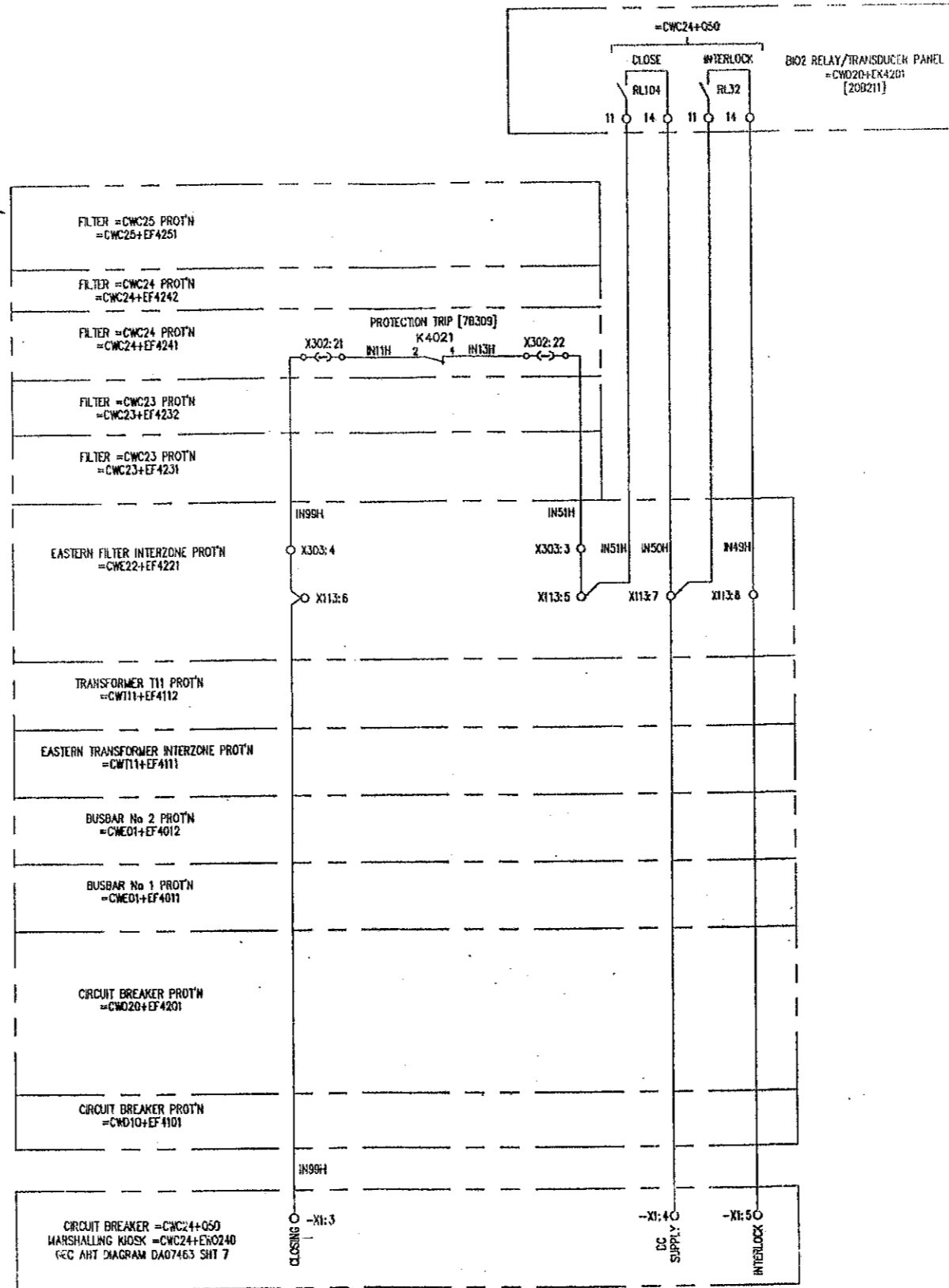
DO NOT SCALE PRINT
 WHICH QUOTING DRG. NO. STATE CURRENT ISSUE
 CUSTOMER POWERGRID

DO NOT SCALE PRINT

DO NOT SCALE PRINT

DWG. No. 637EZ1Y04661 SHT 2

EASTERN AC PROTECTION CUBICLE SUITE



CB	LETTER	BUS
=CWD10+Q50	A	
=CWD10+Q51	B	
=CWD10+Q52	C	
=CWD20+Q50	D	
=CWD20+Q51	E	
=CWC23+Q50	F	
=CWC23+Q51	G	EAST
=CWC24+Q50	H	
=CWC24+Q51	J	
=CWC19+Q50	K	
=CWC29+Q50	L	
PG REMOTE L1	M	
PG REMOTE L2	N	
=CWC30+Q50	P	
=CWC30+Q51	R	
=CWC30+Q52	S	
=CWC33+Q50	T	SOUTH
=CWC34+Q50	U	
=CWC35+Q50	V	
=CWC36+Q50	W	
PG EXISTING 001	X	
PG EXISTING 002	Y	

REFER 637EZ1Y04661 FOR FILE INDEX [7B301]
REFER [7B302] FOR LOCATION AND DEVICE LIST

C.A.D. DATA
ISSUE B
NAME 637EZ1Y04661
LOCATION VISA3579

ISSUE A
DATE 22/07/98
DUE TO ENBA43 & B466 - REMOVED X303:30, X1:40 & B FROM =CWC20+EF4101. ADDED TERMINALS IN =CWC24+EF4221. DUE TO ENBA48 - ADDED =CWC20+EF4201.
REMOVED TO ENBA45 - REMOVED =ANURH+HERBHT1 & TERMS X1:40-48 & 50 & REL. VANT CIRCUITRY. ADDED REL.2, RUM, TERMS 11 & 14, & FILE REF. [20B21]

AS BUILT DWG
14 APR 2000
VISAKHAPATNAM

GEC ALSTHOM T&D
Power Electronic Systems Limited
CERTIFIED FOR MANUFACTURE
NAME BT BARRETT
DEPT. 739 DATE 15/07/98
SIGNED BT BARRETT

THIRD ANGLE PROJECTION
IF IN DOUBT ASK

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED
DRAWING TO BS308 UNLESS OTHERWISE STATED
FOR THE STANDARD OF ACCURACY OF ALL UNTOLERANCED DIMENSIONS SEE SPEC. STAND./023/PROG

DRAMA PREM
CH'D RFR
APP'D RFR
SCALE
TRACED
DESIGN PRJ
APP'D

POWER GRID CORPORATION OF INDIA LIMITED
1 x 500MW HVDC BACK-TO-BACK PROJECT
VISAKHAPATNAM

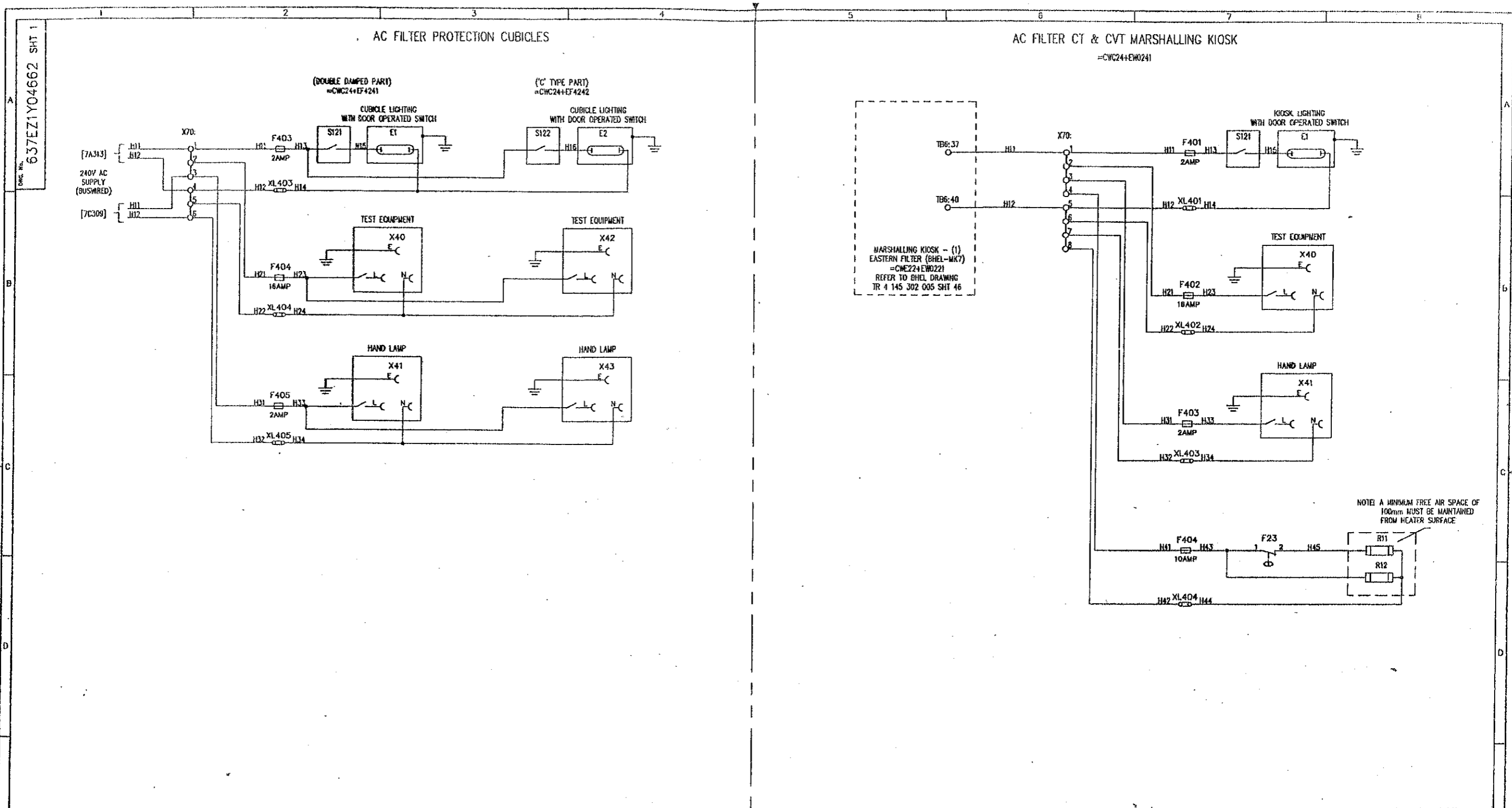
GEC ALSTHOM T&D

GEC ALSTHOM T&D
Power Electronic Systems Limited

TITLE VISAKHAPATNAM
AC HARMONIC FILTER =CWC24 PROTECTION
CIRCUIT DIAGRAM FOR
SIGNALS TO CIRCUIT BREAKER =CWC24+Q50

DWG. No. 637EZ1Y04661 SHT 2
CURRENT ISSUE B

WHEN QUOTING DRG. No. STATE CURRENT ISSUE
CUSTOMER POWERGRID
ORDER No. CF0136



REFER 637E21Y04661 FOR FILE INDEX [7B301]
 REFER [7B302] FOR LOCATION AND DEVICE LIST (DOUBLE DAMPED PART)
 REFER [7B303] FOR LOCATION AND DEVICE LIST ('C' TYPE PART)
 REFER [7B303/1] FOR LOCATION AND DEVICE LIST CT & CVT MARSHALLING KIOSK

ISSUE	C
NAME	637E21Y04662
LOCATION	VISA3580

ISSUE	DATE	BY	REVISION
A	12/08/97	31/07/98	REVISED TO ECN8446 - ADDED -CWC24-EMOZZI, REMOVED INSET A
B	31/07/98	31/07/98	REVISED TO ECN8445 - ADDED TERM NUM. TB6:37 & 40 & SHT No.45.
C	12/08/97	31/07/98	

AS BUILT DWG
 14 APR 2003
VISAKHAPATNAM

GEC ALSTHOM
 T&D
 CERTIFIED FOR
 MANUFACTURE
 NAME: B T BARRETT
 DEPT. 739 DATE: 5/8/97
 SIGNED: BTB

THIRD ANGLE PROJECTION
 ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED
 DRAWING TO BS308 UNLESS OTHERWISE STATED
 FOR THE STANDARD OF ACCURACY OF ALL UNTOLERANCED DIMENSIONS SEE SPEC. STAND/ISS/PROG
 IF IN DOUBT ASK
 DO NOT SCALE PRINT

DRAWN JCP
 DESIGNED PNS
 APPROVED RFR
 SCALE:
 TRACED:
 DESIGNED PRJ
 APPROVED:

FILE 7B313

POWER GRID CORPORATION OF INDIA LIMITED
 1 x 500MW HVDC BACK-TO-BACK PROJECT
 VISAKHAPATNAM

GEC ALSTHOM
 T&D
GEC ALSTHOM T&D
 Power Electronic Systems Limited
 Bedford, England

TITLE
VISAKHAPATNAM
AC FILTER - CWC24 PROTECTION
CIRCUIT DIAGRAM FOR
AC SUPPLIES AND CUBICLE ILLUMINATION

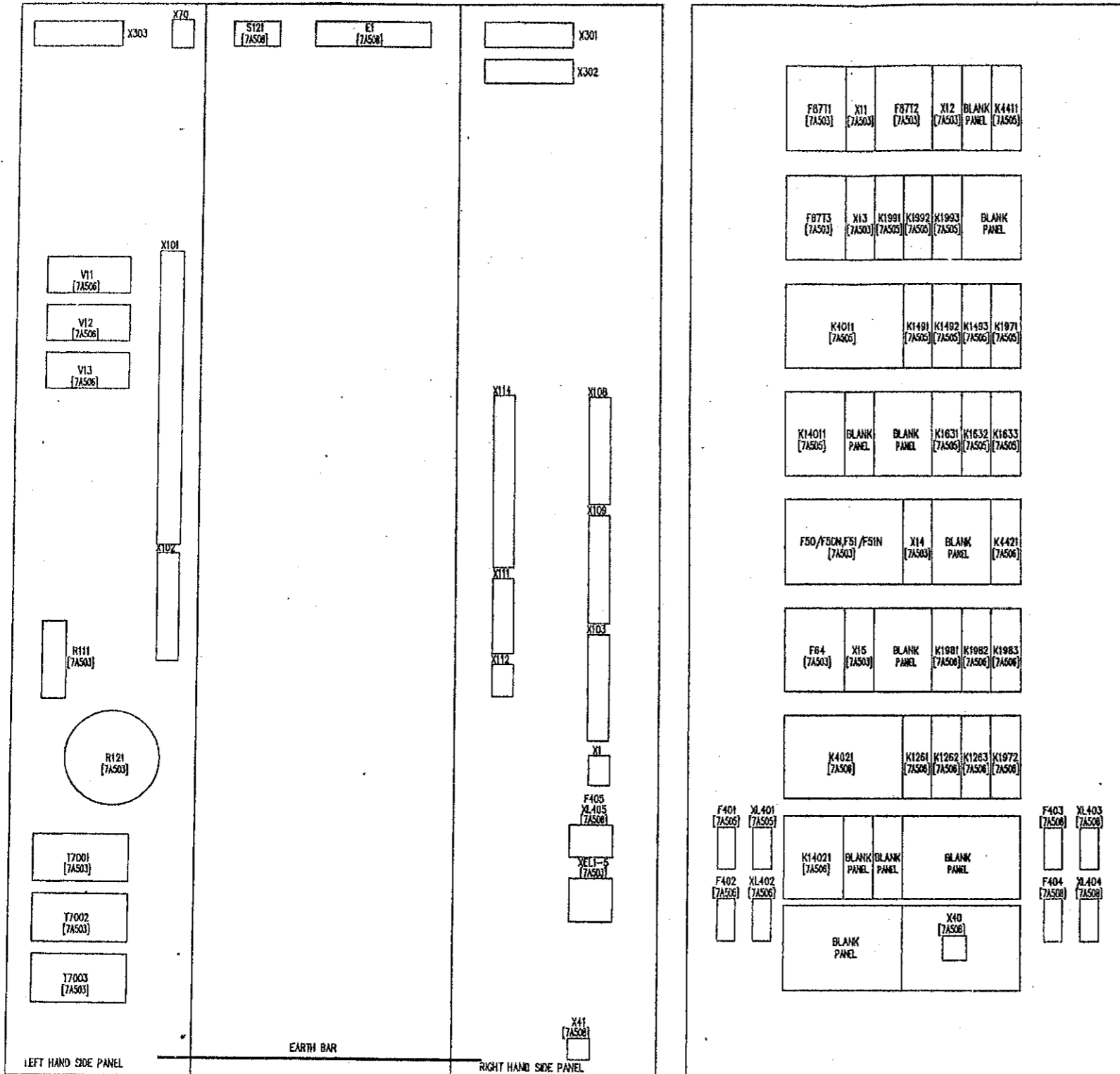
DRW. No. **637E21Y04662 SHT 1 OF 1**
 CURRENT ISSUE C

CUSTOMER **POWERGRID**

NOTE: A MINIMUM FREE AIR SPACE OF 100mm MUST BE MAINTAINED FROM HEATER SURFACE

Dwg. No. 637EZ1Y04626 SHT 1

PROTECTION CUBICLE = CWT31+EF4312



DEVICE REF	DESCRIPTION	TYPE
F8711	BIASED DIFFERENTIAL RELAY, RED PHASE	GECA M8C013
X11	BIASED DIFFERENTIAL TEST BLOCK, RED PHASE	GECA M1L001
F8712	BIASED DIFFERENTIAL RELAY, YELLOW PHASE	GECA M8C013
X12	BIASED DIFFERENTIAL TEST BLOCK, YELLOW PHASE	GECA M1L001
K4411	PROTECTION No.1 48Vdc SUPPLY SUPERVISION RELAY	GECA MVA112
F8713	BIASED DIFFERENTIAL RELAY, BLUE PHASE	GECA M8C013
X13	BIASED DIFFERENTIAL TEST BLOCK, BLUE PHASE	GECA M1L001
K1991	AUXILIARY RELAY - TAP CHANGER OIL SURGE, RED PHASE	GECA MCA011
K1992	AUXILIARY RELAY - TAP CHANGER OIL SURGE, YELLOW PHASE	GECA MCA011
K1993	AUXILIARY RELAY - TAP CHANGER OIL SURGE, BLUE PHASE	GECA MCA011
K4011	PROTECTION No.1 LOCKOUT TRIP RELAY	GECA MVA133
K1491	AUXILIARY RELAY - WINDING TEMPERATURE HIGH, RED PHASE	GECA MCA011
K1492	AUXILIARY RELAY - WINDING TEMPERATURE HIGH, YELLOW PHASE	GECA MCA011
K1493	AUXILIARY RELAY - WINDING TEMPERATURE HIGH, BLUE PHASE	GECA MCA011
K1971	AUXILIARY RELAY - FIRE PROTECTION	GECA MCA011
K14011	TRIP RELAY AUXILIARY RELAY	GECA MVA114
K1631	AUXILIARY RELAY - PRESSURE RELIEF DEVICE, RED PHASE	GECA MCA011
K1632	AUXILIARY RELAY - PRESSURE RELIEF DEVICE, YELLOW PHASE	GECA MCA011
K1633	AUXILIARY RELAY - PRESSURE RELIEF DEVICE, BLUE PHASE	GECA MCA011
F50/F50N/FS1/FSIN	OVERCURRENT AND EARTH FAULT RELAY	GECA MCG682
X14	OVERCURRENT AND EARTH FAULT TEST BLOCK	GECA M1L001
R4421	PROTECTION No.2 48Vdc SUPPLY SUPERVISION RELAY	GECA MVA112
F84	RESTRICTED EARTH FAULT RELAY	GECA MCA014
X15	RESTRICTED EARTH FAULT TEST BLOCK	GECA M1L001
K1981	AUXILIARY RELAY - BUSCHOLZ SURGE, RED PHASE	GECA MCA011
K1982	AUXILIARY RELAY - BUSCHOLZ SURGE, YELLOW PHASE	GECA MCA011
K1983	AUXILIARY RELAY - BUSCHOLZ SURGE, BLUE PHASE	GECA MCA011
K4021	PROTECTION No.2 LOCKOUT TRIP RELAY	GECA MVA133
K1261	AUXILIARY RELAY - OIL TEMPERATURE HIGH, RED PHASE	GECA MCA011
K1262	AUXILIARY RELAY - OIL TEMPERATURE HIGH, YELLOW PHASE	GECA MCA011
K1263	AUXILIARY RELAY - OIL TEMPERATURE HIGH, BLUE PHASE	GECA MCA011
K1872	AUXILIARY RELAY - FIRE PROTECTION	GECA MCA011
K14021	TRIP RELAY AUXILIARY RELAY	GECA MVA114
F401	FUSE AND HOLDER 10A, PROTECTION SUPPLY No. 1, 48Vdc.	GECA SC32P
X1401	LINK AND HOLDER	GECA SC32P
F402	FUSE AND HOLDER 10A, PROTECTION SUPPLY No. 2, 48Vdc.	GECA SC32P
X1402	LINK AND HOLDER	GECA SC32P
F403	FUSE AND HOLDER 2A, CUBICLE LIGHTING SUPPLY, 240V, 50HZ.	GECA SC32P
X1403	LINK AND HOLDER	GECA SC32P
F404	FUSE AND HOLDER 15A, SUPPLY FOR TEST EQUIPMENT 16A SOCKET, 240V, 50HZ.	GECA SC32P
X1404	LINK AND HOLDER	GECA SC32P
F405	FUSE AND HOLDER 2A, FOR HAND LAMP SUPPLY 16A SOCKET, 240V, 50HZ.	GECA SC32P
X1405	LINK AND HOLDER	GECA SC32P
X40	SWITCHED SOCKET	WEIDMULLER KSK3F1
X41	SWITCHED SOCKET	WEIDMULLER KSK3F1
E1	CUBICLE LIGHTING	WEIDMULLER KSK3F1
S121	CUBICLE LIGHTING DOOR SWITCH	WEIDMULLER KSK3F1
X1	48VDC SUPPLY TERMINALS	WEIDMULLER RSP1
X70	BUSWIRE TERMINALS (240V AC SUPPLIES)	WEIDMULLER SAK6N
X101	CT INPUT TERMINALS	WEIDMULLER RSP1
X102	PROT. SYSTEM 1 TERMINALS	WEIDMULLER RSP2
X103	PROT. SYSTEM 2 TERMINALS	WEIDMULLER RSP2
X108	-CHOLDOVA TERMINALS	WEIDMULLER RSP1
X109	-CHOLDOVA TERMINALS	WEIDMULLER RSE1
X111	SEQUENCE OF EVENTS RECORDER TERMINALS	WEIDMULLER SAKR
X112	BACK UP ANNUNCIATOR TERMINALS	WEIDMULLER SAKR
X114	SPARE RELAY CONTACTS TERMINALS	WEIDMULLER SAKR
X301	BUSWIRE TERMINALS (PROTECTION 1 etc)	WEIDMULLER RSP2
X302	BUSWIRE TERMINALS (PROTECTION 2 etc)	WEIDMULLER RSP2
X303	BUSWIRE TERMINALS (MISC)	WEIDMULLER RSP2
WELL-6	EARTH LINK FOR PROTECTION RELAYS	WEIDMULLER ST16
T7001-3	INTERPOSING CT FOR F8711-3	GECA 010
R111	SETTING RESISTOR FOR RELAY F84 (0-820 OHM)	MELVIN VD 1609
R121	METROSL RESISTOR FOR RELAY F84	P&G WEB RFA-04900
V1-13	DIODE UNIT	

FILE 7B502

POWER GRID CORPORATION OF INDIA LIMITED
1 x 500MW HVDC BACK-TO-BACK PROJECT
VISAKHAPATNAM

GEC ALSTHOM
T&D

GEC ALSTHOM T&D
Power Electronic Systems Limited

VISAKHAPATNAM
CONVERTER TRANSFORMER T31 PROTECTION
CUBICLE = CWT31+EF4312
EQUIPMENT LOCATION AND DEVICE LIST

DWG. No. 637EZ1Y04626 SHT 1
ISSUE B

C.A.D. DATA	A	B
ISSUE	11	21
DATE	06	12
YEAR	97	98

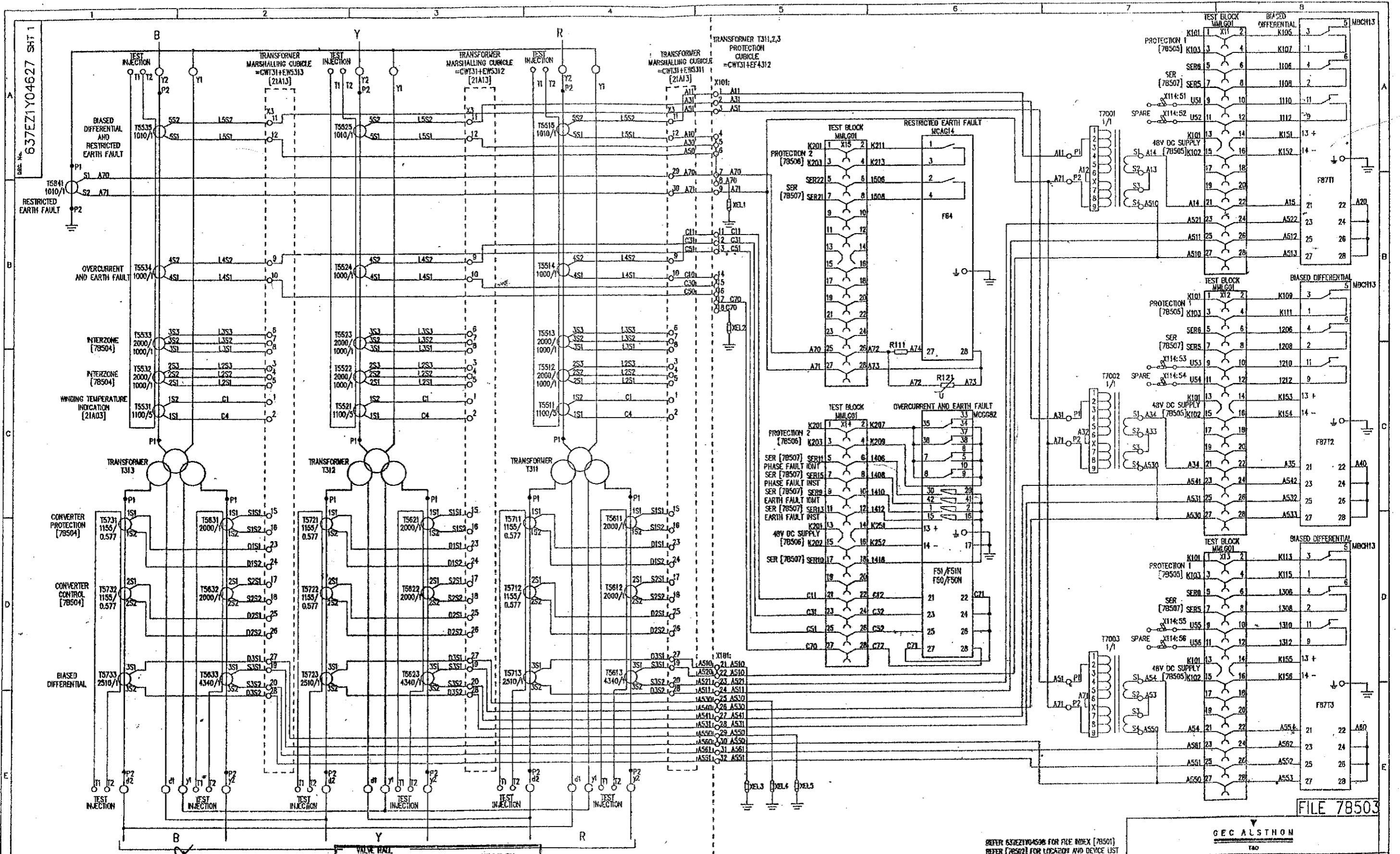
REMOVED TO CONFORM WITH IEC 60364-4-410
SETTING & CALIBRATION DATA ADDED
TO THIS DRAWING & TYPE
WAS SUPPLIED WITH RELAY.

AS BUILT DWG
14 APR 2000
VISAKHAPATNAM

GEC ALSTHOM T&D
Power Electronic Systems Limited
CERTIFIED FOR
MANUFACTURE
NAME: B T BARRETT
DEPT: 739 DATE: 9/6/97
SIGNED: BTB

THIRD ANGLE
PROJECTION
ALL DIMENSIONS
IN MILLIMETRES
UNLESS OTHERWISE STATED
DRAWING TO BE USED
UNLESS OTHERWISE STATED
FOR THE STANDARD OF
ACCURACY OF ALL
DIMENSIONS
SEE SPEC. STAND/D23/PROC
DRAWN JCP
CHK PNS
APP'D RFR
SCALE N/A
TRACED
DESIGN APP'D PRJ
DO NOT SCALE PRINT

CUSTOMER POWERGRID
ORDER No. CE0136



FILE 78503

ISSUE	PRJ	PRJ	PRJ
NAME	PNS	JCP	JCP
DATE	08	08	08
11	08	08	08
06	08	08	08
97	08	08	08
97	08	08	08
LOCATION	VISA2804		

AS BUILT DWG
14 APR 2000
VISAKHAPATNAM

POWER GRID CORPORATION OF INDIA LIMITED
1 x 500MW HVDC BACK-TO-BACK PROJECT
VISAKHAPATNAM

GEC ALSTHOM
Power Electronic Systems Limited
CERTIFIED FOR MANUFACTURE
NAME: B Y BARRETT
DEPT: T39 DATE: 9/8/97
SIGNED: BFB

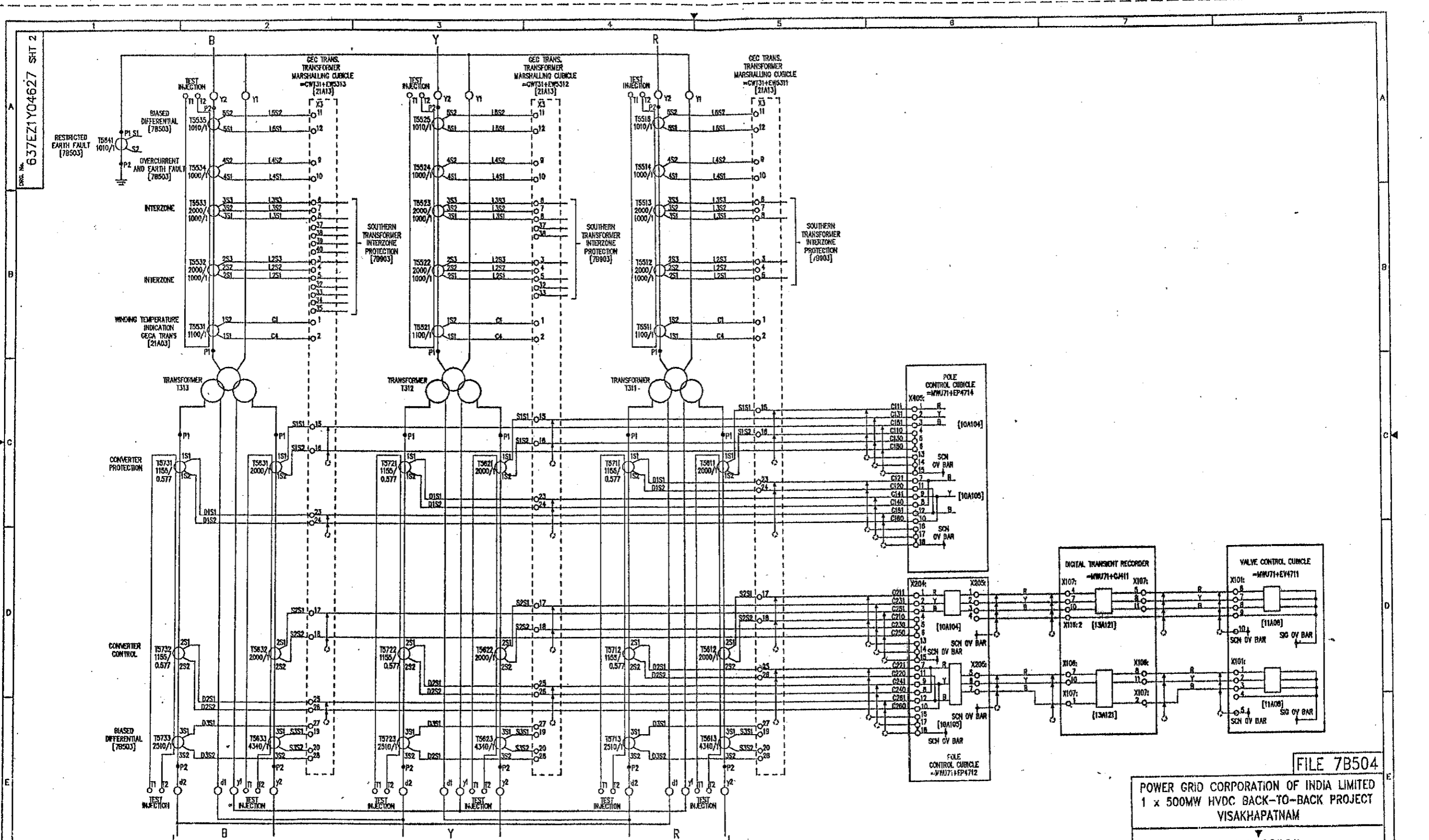
ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED
DRAWING TO BS3281 UNLESS OTHERWISE STATED
FOR THE SIGNATURE OF ACCURACY OF ALL DIMENSIONS DIMENSIONS SEE SPEC. STAFF/432/0100

GEC ALSTHOM
T&D
Power Electronic Systems Limited
Hillingdon, England

TITLE
**VISAKHAPATNAM
CONVERTER TRANSFORMER T31 PROTECTION
CIRCUIT DIAGRAM FOR
AC CIRCUITS**

DRW No. **637EZ1Y04627** SHT 1
CURRENT ISSUE **C**

CUSTOMER: POWERGRID ORDER No. CF0136



REFER 637EZ1Y04598 FOR FILE INDEX (78501)
REFER (78502) FOR LOCATION AND DEVICE LIST

ISSUE	DATE	BY	CHKD	REVISION
D	11/06/97	BTB	JCP	REVISED TO EC8424 & 8424- MODIFIED X3, 5, 6 & 8 ON POLE CONTROL CUBICLES CORRECTED C204 & 405-7-1206
	19/08/97	BTB	JCP	REVISED TO EC8424 & 8424- MODIFIED X3, 5, 6 & 8 ON ENGR1, ENGR2 & ENGR3 TO ALL
	23/07/98	BTB	JCP	ADDED TERMINAL NUMBERS TO X400, X401 & X402
	21/12/98	BTB	JCP	REVISED TO EC8424 & 8424- TERM REF. X116.2 & FILE REF. [X116.2] ADDED. X01 WAS X00.

AS BUILT DWG
14 APR 2000
VISAKHAPATNAM

GEC ALSTHOM T&D Power Electronic Systems Limited CERTIFIED FOR MANUFACTURE	THIRD ANGLE PROJECTION	ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED	DRAWN JCP CHKD PNS APP'D RFR SCALE N/A TRACED DESIGN PRJ APP'D
NAME: B T BARRETT DEPT: 739 DATE: 9/8/97 SIGNED: BTB	IF IN DOUBT ASK	FOR THE STANDARD OF ACCURACY OF ALL UNTOLERANCED DIMENSIONS SEE SPECN. STAND/033/PROG	DRAWN APP'D

FILE 7B504

POWER GRID CORPORATION OF INDIA LIMITED
1 x 500MW HVDC BACK-TO-BACK PROJECT
VISAKHAPATNAM

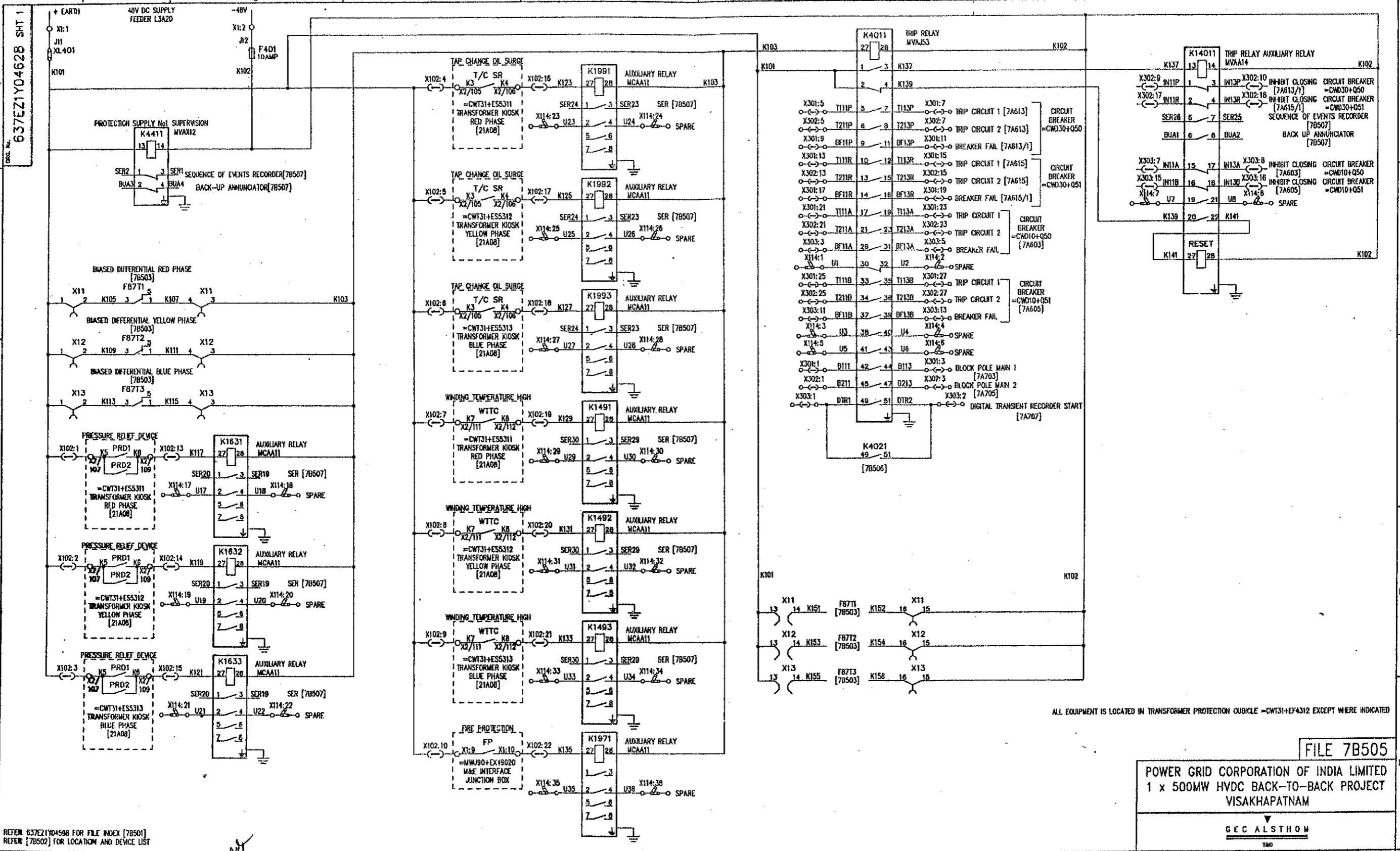
GEC ALSTHOM
T&D

GEC ALSTHOM T&D
Power Electronic Systems Limited
Delhi, India

TITLE: **VISAKHAPATNAM**
CONVERTER TRANSFORMER T313 PROTECTION
CIRCUIT DIAGRAM FOR AC CIRCUITS

DRAWN No. **637EZ1Y04627 SHT 2**
CURRENT ISSUE **D**

WHEN QUOTING DRG. NO. STATE CURRENT ISSUE
CUSTOMER: **POWERGRID** ORDER No. **CF0138**



ALL EQUIPMENT IS LOCATED IN TRANSFORMER PROTECTION CUBICLE -CWT31+EF4312 EXCEPT WHERE INDICATED

FILE 7B505

POWER GRID CORPORATION OF INDIA LIMITED
1 x 500MW HVDC BACK-TO-BACK PROJECT
VISAKHAPATNAM

GEC ALSTHOM
T&D

GEC ALSTHOM T&D
Power Electronic Systems Limited
TITLE
VISAKHAPATNAM
CONVERTER TRANSFORMER T31 PROTECTION
CIRCUIT DIAGRAM FOR
DC CIRCUITS (PROTECTION SYSTEM 1)

DRG. No. 637EZ1Y04628 SHT 1
CURRENT ISSUE D

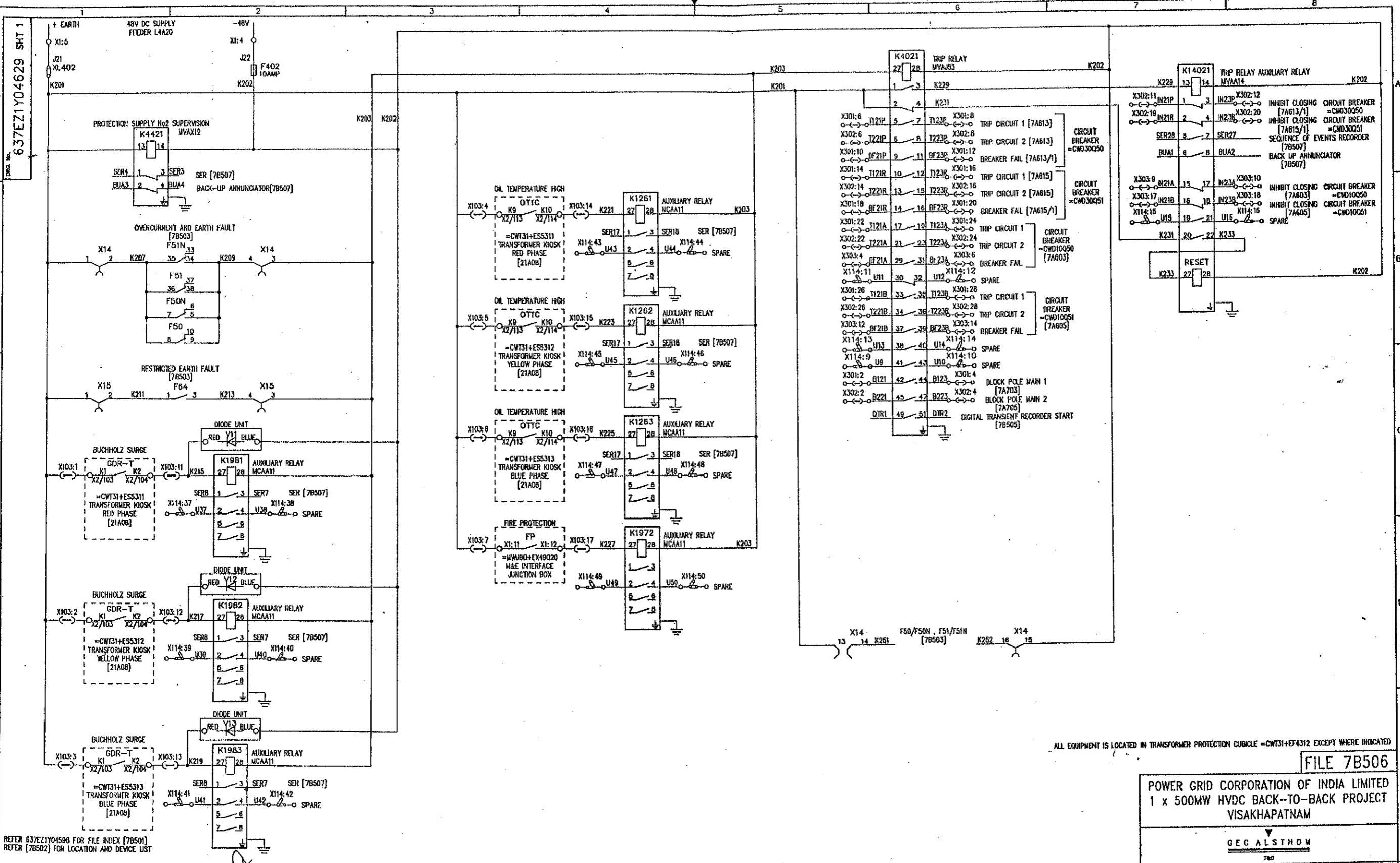
REFER 637EZ1Y04598 FOR FILE INDEX [7B501]
REFER [7B502] FOR LOCATION AND DEVICE LIST

ISSUE	DATE	BY	REASON
D	11/08	JCP	ISSUED FOR CONSTRUCTION
	06/08	JCP	REVISED TO ENDSAS - RELAY TYPES ADDED
	09/07	PREM	REMOVED TO ENDSAS & 8484 - CHANGED FILE REF'S FROM 74613 & 74615 ON X301:11, X302:10 & X301:18, X302:18, X301:18 & X301:18. CHANGED NAME OF K4411 FROM PROTECTION SUPPLY SUPERVISION.
	21/12/98	GGV	REVISED TO ENDSAS - 1. ITEM No. ADDED TO V & E INTERFACE JUNCTION BOX.

AS BUILT DWG
14 APR 2000
VISAKHAPATNAM

GEC ALSTHOM T&D Power Electronic Systems Limited CERTIFIED FOR MANUFACTURE	THIRD ANGLE PROJECTION	ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED	DRAWN JCP CHKD PNS
NAME: B T BARRETT DEPT. 739 DATE: 9/8/07 SIGNED: BTB	IF IN DOUBT ASK	DRAWING TO BE SHOWN UNLESS OTHERWISE STATED	APP'D RFR SCALE N/A TRACED
		FOR THE STANDARD OF ACCURACY OF ALL UNDIMENSIONED DIMENSIONS SEE SPEC. STAND/023/PROG	DESIGN APP'D PRJ

DRG. No. 637EZ1Y04629 SHT 1



ALL EQUIPMENT IS LOCATED IN TRANSFORMER PROTECTION CUBICLE =CWT31+EF4312 EXCEPT WHERE INDICATED

REFER 637EZ1Y04598 FOR FILE INDEX [78501]
REFER [78502] FOR LOCATION AND DEVICE LIST

FILE 7B506

POWER GRID CORPORATION OF INDIA LIMITED
1 x 500MW HVDC BACK-TO-BACK PROJECT
VISAKHAPATNAM

GEC ALSTHOM
T&D

GEC ALSTHOM T&D
Power Electronic Systems Limited
Sharnbrook, England

TITLE
CONVERTER TRANSFORMER T31 PROTECTION
CIRCUIT DIAGRAM FOR
DC CIRCUITS (PROTECTION SYSTEM 2)

DRG. No. 637EZ1Y04629 SHT 1
CURRENT ISSUE D

ISSUE	DATE	BY	REVISION
D	11/06/97	BTB	ISSUED FOR CONSTRUCTION
C	07/07/98	BTB	REVISION TO ECR8446 & 8458 - CHANGED FILE REF'S FROM 7A613 & 7A615 ON X301:12, X302:12 & X301:20, X302:20. CHANGED K4021 TITLE FROM PROTECTION SUPPLY 2 SUPERVISION
B	08/08/97	BTB	REVISION TO ECR8446 & 8458 - CHANGED FILE REF'S FROM 7A613 & 7A615 ON X301:12, X302:12 & X301:20, X302:20. CHANGED K4021 TITLE FROM PROTECTION SUPPLY 2 SUPERVISION
A	11/06/97	BTB	ISSUED FOR CONSTRUCTION

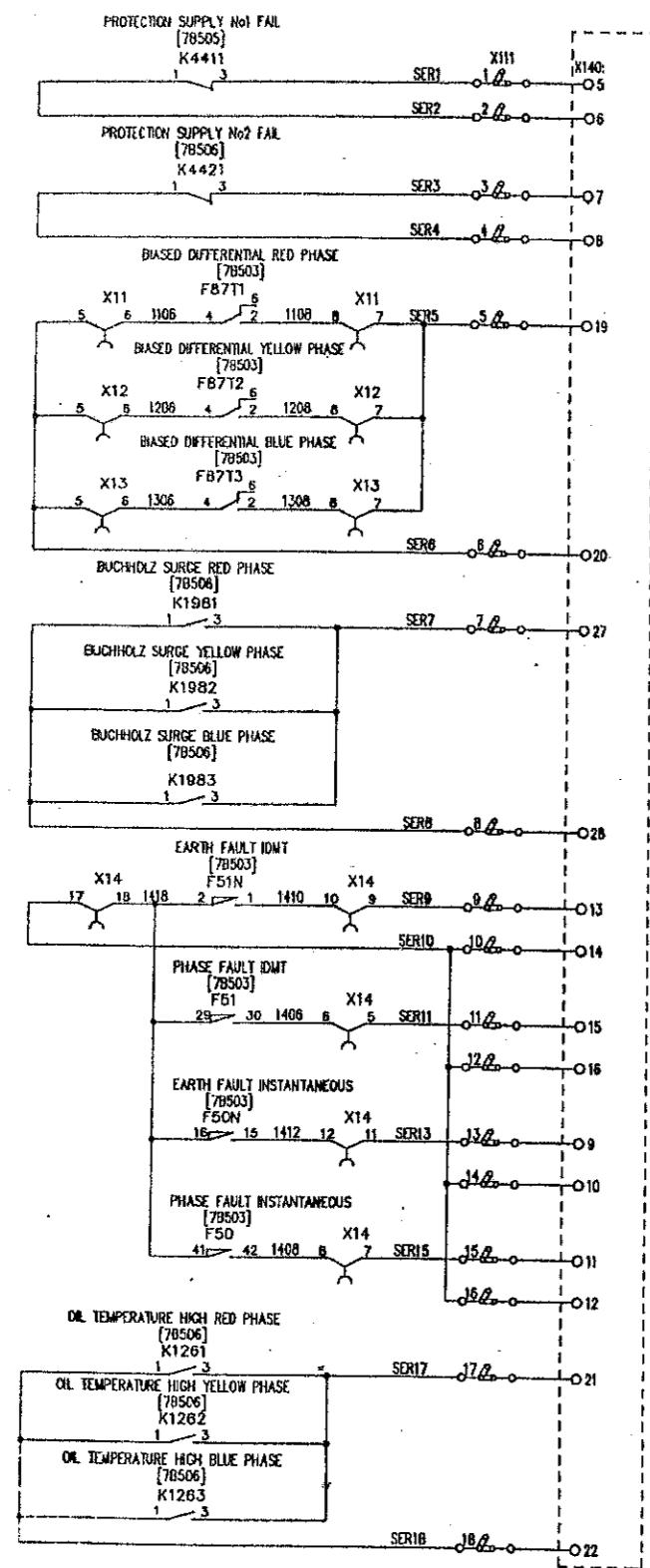
AS BUILT DWG
14 APR 2000
VISAKHAPATNAM

GEC ALSTHOM T&D Power Electronic Systems Limited CERTIFIED FOR MANUFACTURE	THIRD ANGLE PROJECTION	ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED	DRAWN JCP DWD PNS
NAME: B T BARRETT DEPT. 739 DATE: 9/6/97 SIGNED BTB	IF IN DOUBT ASK	DRAWING TO BS308 UNLESS OTHERWISE STATED	APP'D RFR SCALE N/A TRACED
DESIGN PRJ		FOR THE STANDARD OF ACCURACY OF ALL UNTOLERANCED DIMENSIONS SEE SPEC. STAND/003/PROG	DESIGN PRJ

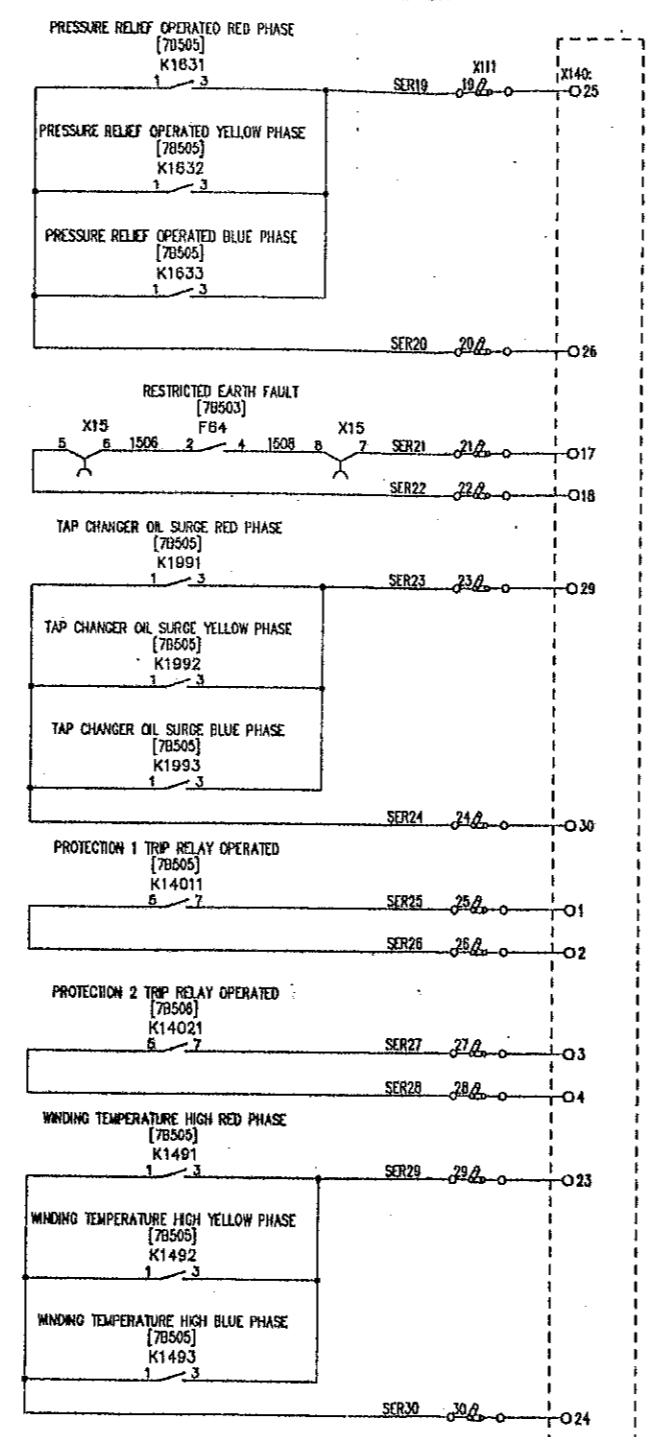
DO NOT SCALE PRINT
CUSTOMER POWERGRID
ORDER No. CF0136

DWG No. 637EZ1Y04630 SH 1

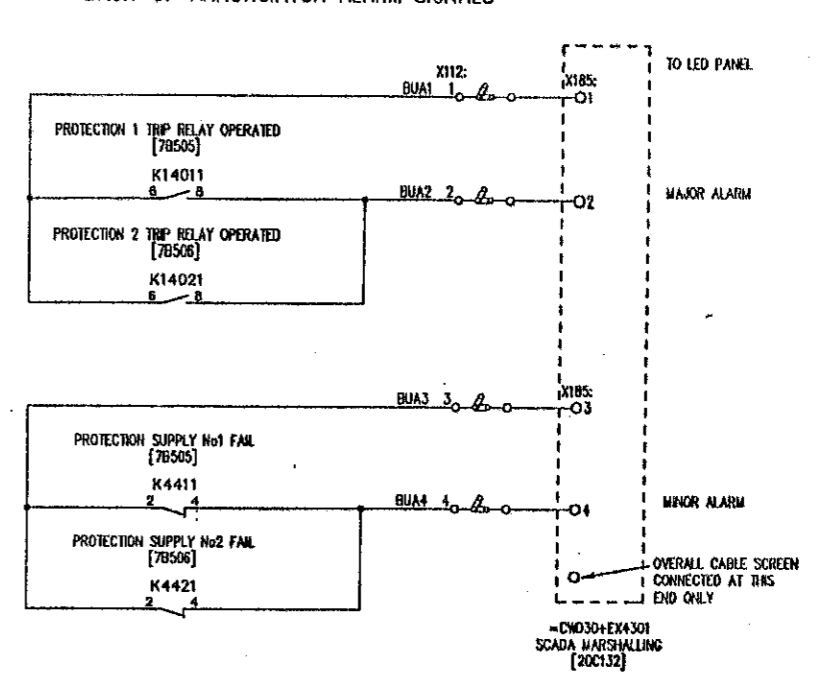
SEQUENCE OF EVENTS RECORDER ALARM SIGNALS



SEQUENCE OF EVENTS RECORDER ALARM SIGNALS



BACK-UP ANNUNCIATOR ALARM SIGNALS



REFER 637EZ1Y04598 FOR FILE INDEX [78501]
REFER [78502] FOR LOCATION AND DEVICE LIST

OVERALL CABLE SCREEN CONNECTED AT THIS END ONLY

FILE 78507

POWER GRID CORPORATION OF INDIA LIMITED
1 x 500MW HVDC BACK-TO-BACK PROJECT
VISAKHAPATNAM

GEC ALSTHOM

GEC ALSTHOM T&D
Power Electronic Systems Limited
Dorset, England

VISAKHAPATNAM
CONVERTER TRANSFORMER T31 PROTECTION
CIRCUIT DIAGRAM FOR
SIGNALS TO SER AND BACK-UP ANNUNCIATOR

DWG No. 637EZ1Y04630 SH 1

ISSUE	PRJ	REVISED TO
C	A	REVISION TO CONFORM TO
NAME	B	ADDED TERMINAL NUMBERS TO
637EZ1Y04630	RFR	CWO30+EX4301
LOCATION	PREM	CHANGED TITLE OF K4411 FROM
VISA3614	98	PROTECTION 1 SUPPLY FAIL &
	97	K4421 FROM PROTECTION 2
		SUPPLY FAIL
		REVISION TO CONFORM TO
		ADDED FILE REFS. [20C124] &
		[20C132]

AS BUILT DWG
14 APR 2000
VISAKHAPATNAM

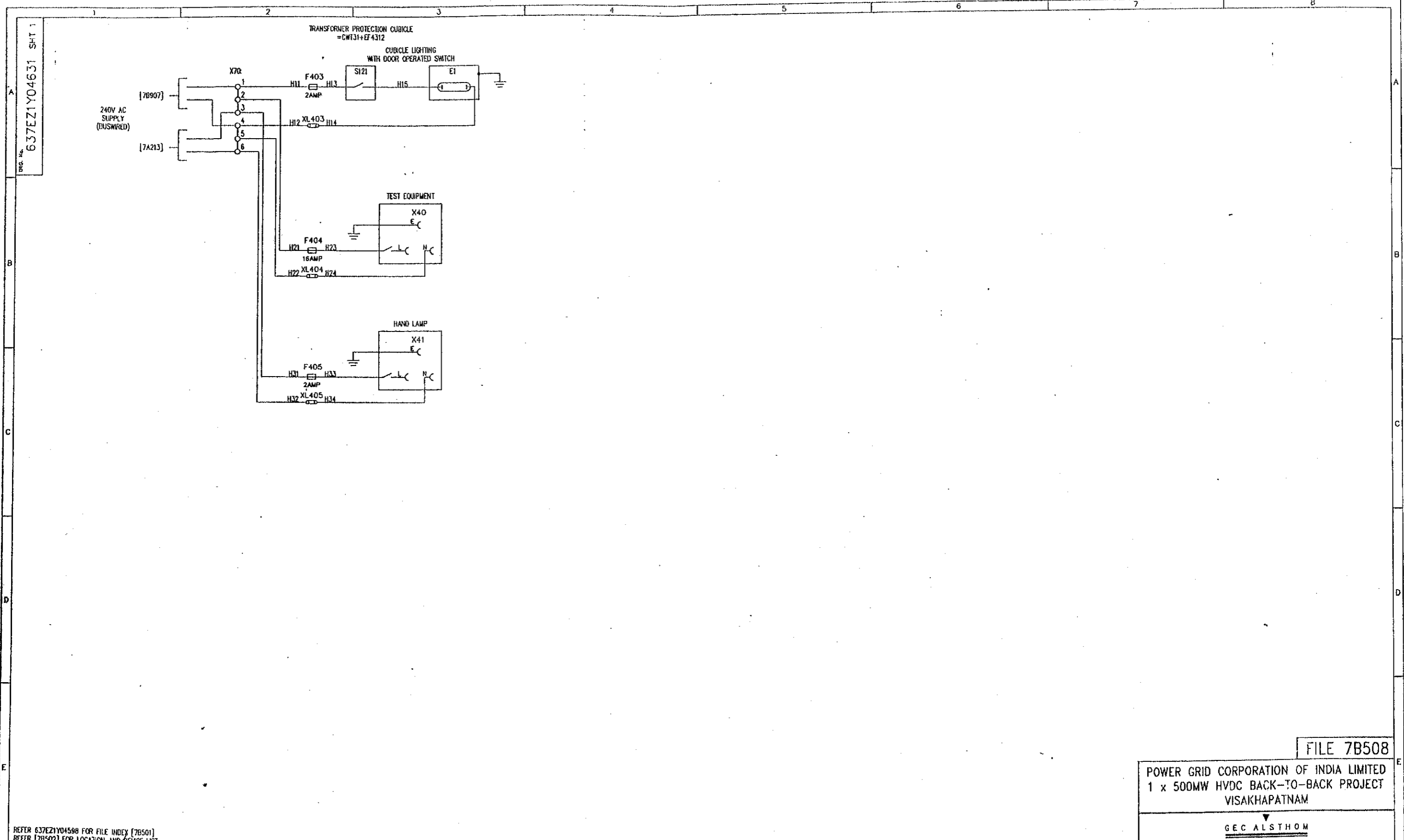
GEC ALSTHOM T&D
Power Electronic Systems Limited
CERTIFIED FOR
MANUFACTURE
NAME: B T BARRETT
DEPT. 739 DATE: 9/6/97
SIGNED: BTB

THIRD ANGLE
PROJECTION
IF IN DOUBT
ASK

ALL DIMENSIONS
IN MILLIMETRES
UNLESS OTHERWISE STATED
DRAWING TO BS308
UNLESS OTHERWISE STATED
FOR THE STANDARD OF
ACCURACY OF ALL
UNCOLLATERATED DIMENSIONS
SEE SPEC. STAND/023/PROO

DRAWN: JCP
CHKD: PNS
APP'D: RFR
SCALE: N/A
TRACED
DESIGN: PRJ
APP'D:

CURRENT
ISSUE
C



REFER 637EZ1Y04598 FOR FILE INDEX [7B501]
REFER [7B502] FOR LOCATION AND DEVICE LIST

FILE 7B508

POWER GRID CORPORATION OF INDIA LIMITED
1 x 500MW HVDC BACK-TO-BACK PROJECT
VISAKHAPATNAM

GEC ALSTHOM
T&D

GEC ALSTHOM T&D
Power Electronic Systems Limited
Milton, England

TITLE
VISAKHAPATNAM
CONVERTER TRANSFORMER T31 PROTECTION
CIRCUIT DIAGRAM FOR
AC SUPPLIES AND CUBICLE ILLUMINATION

DRG. No. 637EZ1Y04631 SHT 1
CURRENT ISSUE B

C.A.B. DATA
ISSUE B
NAME
LOCATION VISA2B18

ISSUE A
DATE 11/06/97
PREM
CHANGED TO ENCL 637EZ1Y04598 -
CHANGED REF [70907] TO [7A213]

AS BUILT DWG
14 APR 2000
VISAKHAPATNAM

GEC ALSTHOM T&D
Power Electronic Systems Limited
CERTIFIED FOR MANUFACTURE
NAME: B T BARRETT
DEPT. 739 DATE 9/6/97
SIGNED BTB

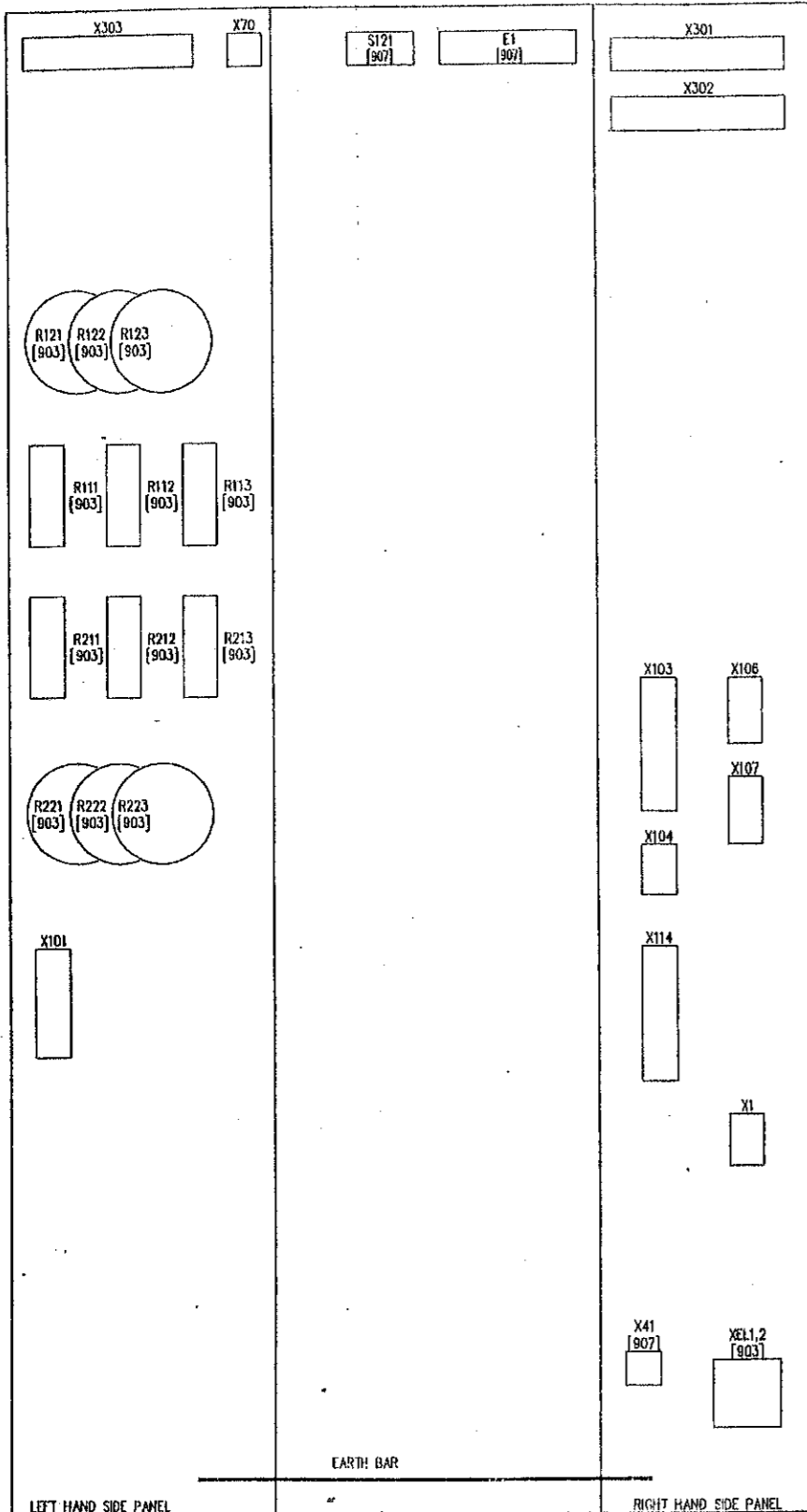
THIRD ANGLE PROJECTION
IF IN DOUBT ASK
ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED
DRAWING TO BS308 UNLESS OTHERWISE STATED
FOR THE STANDARD OF ACCURACY OF ALL UNTOLERANCED DIMENSIONS SEE SPECN. STAND/023/PROG

DRAWN JCP
CHKD PNS
APP'D RFR
SCALE
TRACED
DESIGN APP'D PRJ

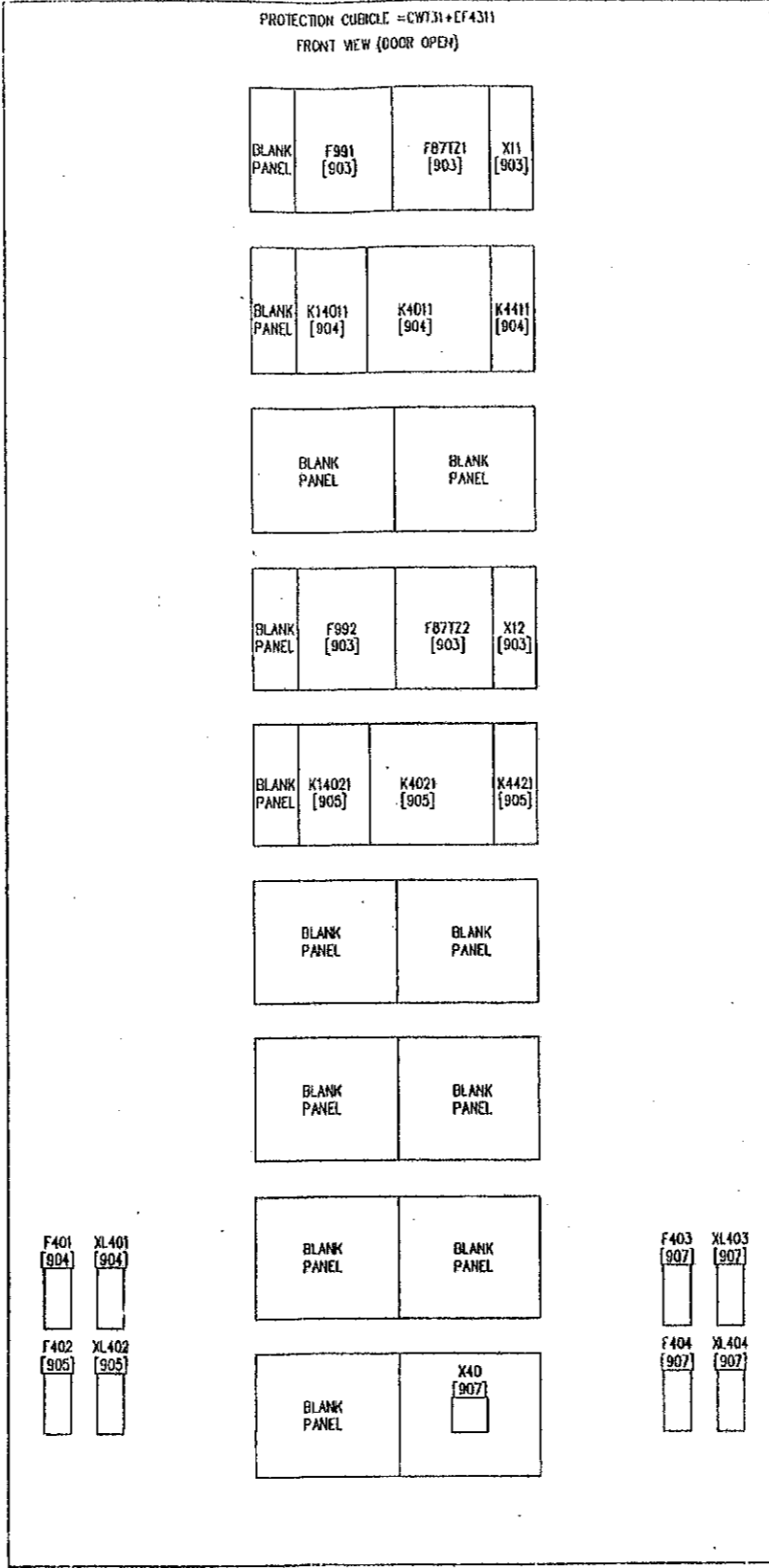
DO NOT SCALE PRINT
WHICH GLOBING ORG. No. STATE CURRENT ISSUE
CUSTOMER: POWERGRID ORDER No. CF0136

637EZ1Y04587 SHT 2

EQUIPMENT LOCATED INSIDE CUBICLE VIEWED FROM REAR



PROTECTION CUBICLE = CWT31+EF4311
FRONT VIEW (DOOR OPEN)



DEVICE REF	DESCRIPTION	TYPE
F901	PROTECTION No 1 BUSHWRE SUPERVISION RELAY	GECA MVTIP31
F87T21	PROTECTION No 1 CIRCULATING CURRENT RELAY	GECA MCAG34
X11	PROTECTION No 1 CIRCULATING CURRENT TEST BLOCK	GECA MML601
K14011	PROTECTION No 1 TRIP RELAY AUXILIARY RELAY	GECA MVA414
K4011	PROTECTION No 1 LOCKOUT TRIP RELAY	GECA MVAJ53
K4411	PROTECTION SUPPLY NO.1 SUPERVISION RELAY	GECA MVA112
F992	PROTECTION No 2 BUSHWRE SUPERVISION RELAY	GECA MVTIP31
F87T22	PROTECTION No 2 CIRCULATING CURRENT RELAY	GECA MCAG34
X12	PROTECTION No 2 CIRCULATING CURRENT TEST BLOCK	GECA MML601
K14021	PROTECTION No 2 TRIP RELAY AUXILIARY RELAY	GECA MVA414
K4021	PROTECTION No 2 LOCKOUT TRIP RELAY	GECA MVAJ53
K4421	PROTECTION SUPPLY NO.2 SUPERVISION RELAY	GECA MVA112
E1	CUBICLE LIGHTING	
F401	FUSE AND HOLDER 10A, PROTECTION SUPPLY No. 1, 48Vdc.	GECA SC32P
XL401	LINK AND HOLDER	GECA SC32P
F402	FUSE AND HOLDER 10A, PROTECTION SUPPLY No. 2, 48Vdc.	GECA SC32P
XL402	LINK AND HOLDER	GECA SC32P
F403	FUSE AND HOLDER, 2A, CUBICLE LIGHTING SUPPLY, 240V, 50HZ.	GECA SC32P
XL403	LINK AND HOLDER	GECA SC32P
F404	FUSE AND HOLDER, 16A, SUPPLY FOR TEST EQUIPMENT 16A SOCKET, 240V, 50HZ.	GECA SC32P
XL404	LINK AND HOLDER	GECA SC32P
F405	FUSE AND HOLDER, 2A, FOR HAND LAMP SUPPLY 16A SOCKET, 240V, 50HZ.	WEIDMULLER KSK3F
XL405	LINK AND HOLDER	WEIDMULLER KSK3FL
R111,R112,R113	SETTING RESISTOR FOR RELAY F87T21 (0-5.6K Ohm)	HELWYN VB1609
R211,R212,R213	SETTING RESISTOR FOR RELAY F87T22 (0-5.6K Ohm)	HELWYN VB1609
R121,R122,R123	METROSL RESISTOR FOR RELAY F87T21	GECA TYPE 600A
R221,R222,R223	METROSL RESISTOR FOR RELAY F87T22	GECA TYPE 600A
S121	CUBICLE LIGHTING DOOR SWITCH	
X1	48VDC SUPPLY TERMINALS	WEIDMULLER RSE1
X70	BUSHWRE TERMINALS (240VAC SUPPLY)	WEIDMULLER SAKN
X101	CT INPUT TERMINALS	WEIDMULLER RSE1
X103	SEQUENCE OR EVENTS RECORDER TERMINALS	WEIDMULLER SAKN
X104	BACK UP ANNUNCIATOR TERMINALS	WEIDMULLER SAKN
X106	=CHDIO+QSO TERMINALS	WEIDMULLER RSE1
X107	=CHDIO+QSO TERMINALS	WEIDMULLER RSE1
X114	SPARE RELAY CONTACTS TERMINALS	WEIDMULLER SAKN
X301	BUSHWRE TERMINALS (TRIP COIL 1 etc)	WEIDMULLER RSE2
X302	BUSHWRE TERMINALS (TRIP COIL 2 etc)	WEIDMULLER RSE2
X303	BUSHWRE TERMINALS (MISC)	WEIDMULLER RSE2
X40	TEST EQUIPMENT SWITCHED SOCKET.	
X41	HAND LAMP SWITCHED SOCKET.	
XEL1,2	EARTH LINK FOR PROTECTION RELAYS	KLIPPON S1L5

FILE 7B902

POWER GRID CORPORATION OF INDIA LIMITED
1 x 500MW HVDC BACK-TO-BACK PROJECT
VISAKHAPATNAM

GEC ALSTHOM
T&D

Power Electronic Systems Limited
Stullend, England

VISAKHAPATNAM
SOUTHERN TRANSFORMER INTERZONE PROTECTION
CUBICLE = CWT31+EF4311
EQUIPMENT LOCATION AND DEVICE LIST

DRG. No. 637EZ1Y04587 SHT 2

CUSTOMER POWERGRID

NOTES:
REFER [78901] FOR FILE INDEX

ISSUE NAME	C.A.D. DATA		PRJ RFR PREM	DATE	REVISED TO CORRECT - REMOVED VALUE 2285 OHM FROM SETTING RESISTORS.	REVISED TO CORRECT - VALUE OF SETTING RESISTORS ADDED. SETTING RESISTORS WERE SUPPLIED WITH RELAYS.
	A	B				
C	11	13	15	06	08	01
	97	98	99			

AS BUILT DWG
14 APR 2000
VISAKHAPATNAM

GEC ALSTHOM T&D
Power Electronic Systems Limited
CERTIFIED FOR MANUFACTURE

NAME: B T BARRETT
DEPT. 739 DATE: 9/6/97
SIGNED BTB

THIRD ANGLE PROJECTION

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED

DRAWING TO BS308 UNLESS OTHERWISE STATED

FOR THE STANDARD OF ACCURACY OF ALL UNTOLERANCED DIMENSIONS SEE SPECH. STAND./023/PROG

DO NOT SCALE PRINT

DRG. No. 637EZ1Y04587 SHT 2

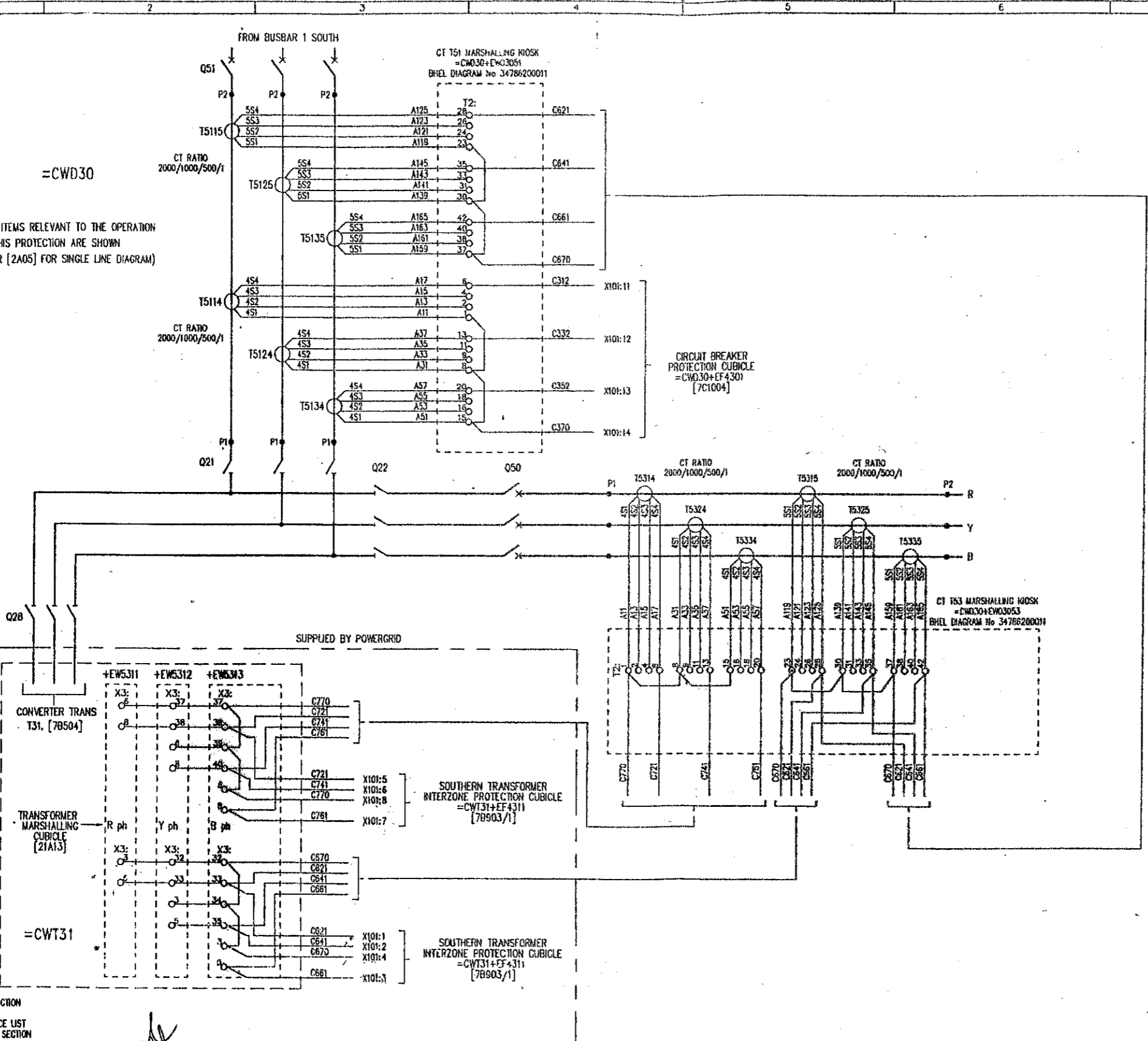
CURRENT ISSUE C

WHEN QUOTING DRG. No. STATE CURRENT ISSUE

ORDER No. CF0136

DREL. NO. 637EZ1Y04587 SHT 3

ONLY ITEMS RELEVANT TO THE OPERATION OF THIS PROTECTION ARE SHOWN (REFER [2A05] FOR SINGLE LINE DIAGRAM)



NOTES:
 [9NN] DENOTES FILE NO OF 789NN SECTION
 REFER [901] FOR FILE INDEX
 REFER [902] FOR LOCATION AND DEVICE LIST
 [7ANN] DENOTES FILE NO OF 7ANN SECTION

ISSUE	DATE	BY	CHKD	REVISION
A	11/08/97	JCP	MCL	ISSUED FOR CONSTRUCTION
B	08/08/97	JCP	MCL	REVISED TO CORRECT EARTH CONNECTIONS
C	13/08/98	JCP	MCL	REVISED TO CORRECT EARTH CONNECTIONS
D	01/01/99	JCP	MCL	REVISED TO CORRECT EARTH CONNECTIONS
E	02/02/99	JCP	MCL	REVISED TO CORRECT EARTH CONNECTIONS

AS BUILT DWG
 14 APR 2000
VISAKHAPATNAM

GEC ALSTHOM Power Electronic Systems Limited CERTIFIED FOR MANUFACTURE NAME: G. T. BARRETT DESIGNED BY: T30 DATE: 8/16/97 SIGNED: BTB	THIRD-Angle PROJECTION IF IN DOUBT ASK FOR THE STANDARD OF ACCURACY OF ALL UNDIMENSIONED DIMENSIONS SEE SPEC. STAND/223/AVOC	ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED DRAWING TO BS308 UNLESS OTHERWISE STATED
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FILE 7B903

POWER GRID CORPORATION OF INDIA LIMITED
 1 x 500MW HVDC BACK-TO-BACK PROJECT
 VISAKHAPATNAM

GEC ALSTHOM
 T&D

GEC ALSTHOM T&D
 Power Electronic Systems Limited
 Bedford, England

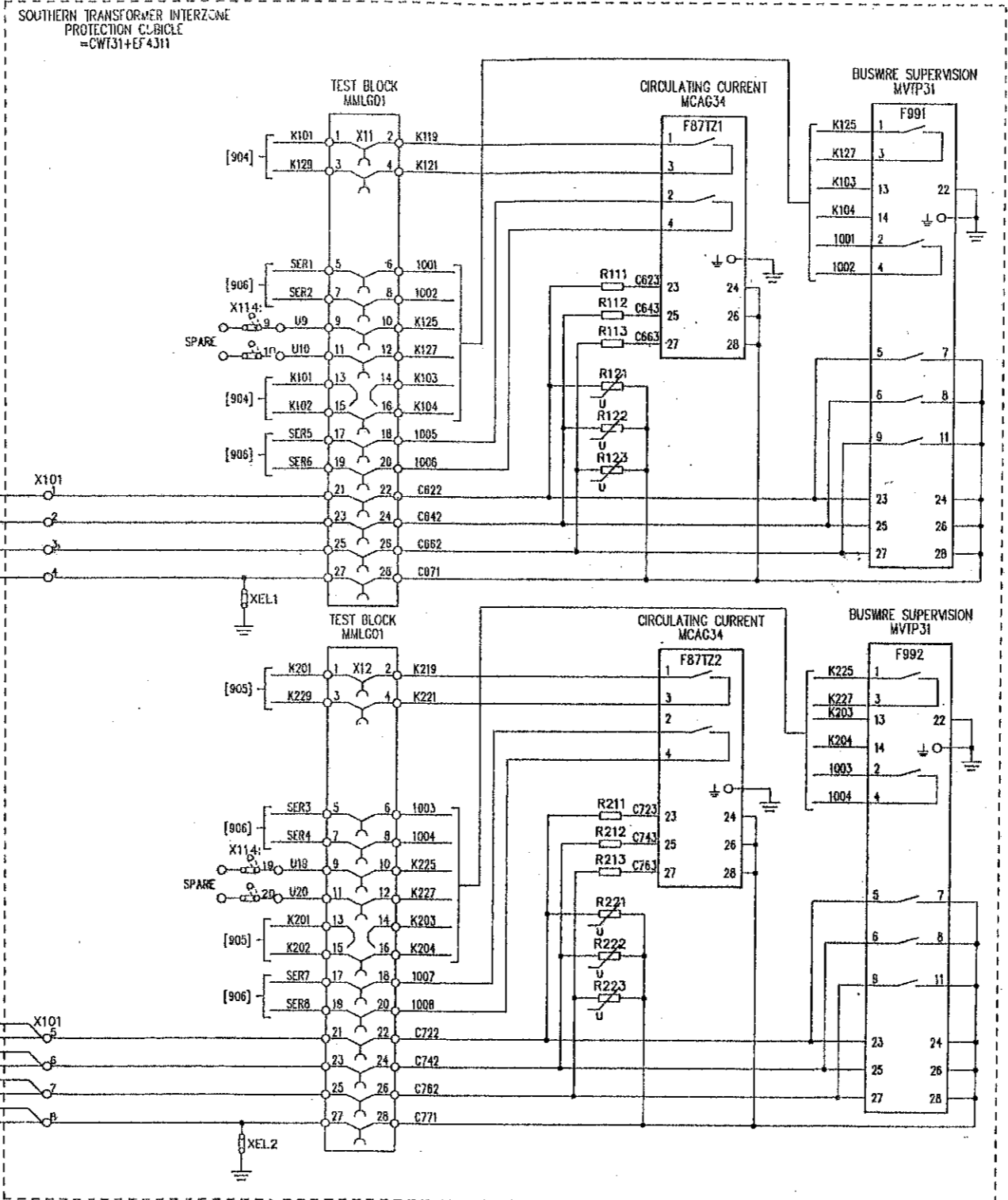
VISAKHAPATNAM
 SOUTHERN TRANSFORMER INTERZONE PROTECTION CUBICLE =CWT31+EF4311
 AC CIRCUITS

DRWN: JCP
 CHTD: PHS
 APP'D: RFR
 SCALE:
 TRACED:
 DESGN: PRJ
 APP'D:

ORDER No. **637EZ1Y04587 SHT 3**
 CURRENT ISSUE: **E**

WHEN QUOTING ORG. No. STATE CURRENT ISSUE
 CUSTOMER: POWERGRID
 ORDER No. CF0136

DRG. No. 637EZ1Y04587 SHT 8



TRANSFORMER MARSHALLING KIOSK =CWT31+EW5313 [78903]

CIRCUIT BREAKER PROTECTION CUBICLE =CWT30+EF4301 [7C1004]

NOTES:
 [9NN] DENOTES FILE NO OF 789NN SECTION
 REFER [901] FOR FILE INDEX
 REFER [902] FOR LOCATION AND DEVICE LIST
 [7ANN] DENOTES FILE NO OF 7ANN SECTION

FILE 78903/1

POWER GRID CORPORATION OF INDIA LIMITED
 1 x 500MW HVDC BACK-TO-BACK PROJECT
 VISAKHAPATNAM

GEC ALSTHOM
 T&D

GEC ALSTHOM T&D
 Power Electronic Systems Limited
 Hildesheim, England

TITLE
 VISAKHAPATNAM
 SOUTHERN TRANSFORMER INTERZONE PROTECTION
 CUBICLE = CWT31-EF4311
 AC CIRCUITS

DRG. No. 637EZ1Y04587 SHT 8
 CURRENT ISSUE B

AS BUILT DWG
 14 APR 2003
 VISAKHAPATNAM

GEC ALSTHOM T&D
 Power Electronic Systems Limited
 CERTIFIED FOR MANUFACTURE
 NAME: NM KIRBY
 DEPT. 736 DATE: 12/08/98
 SIGNED: NM KIRBY

THIRD ANGLE PROJECTION
 IF IN DOUBT ASK

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED
 DRAWING TO BE USED UNLESS OTHERWISE STATED
 FOR THE STANDARD OF ACCURACY OF ALL UNTOLERANCED DIMENSIONS SEE SPEC. STAND/023/PROC

DRAWN PREM
 CHD RFR
 APP'D RFR
 SCALE
 TRACED
 DESIGN APP'D PRJ

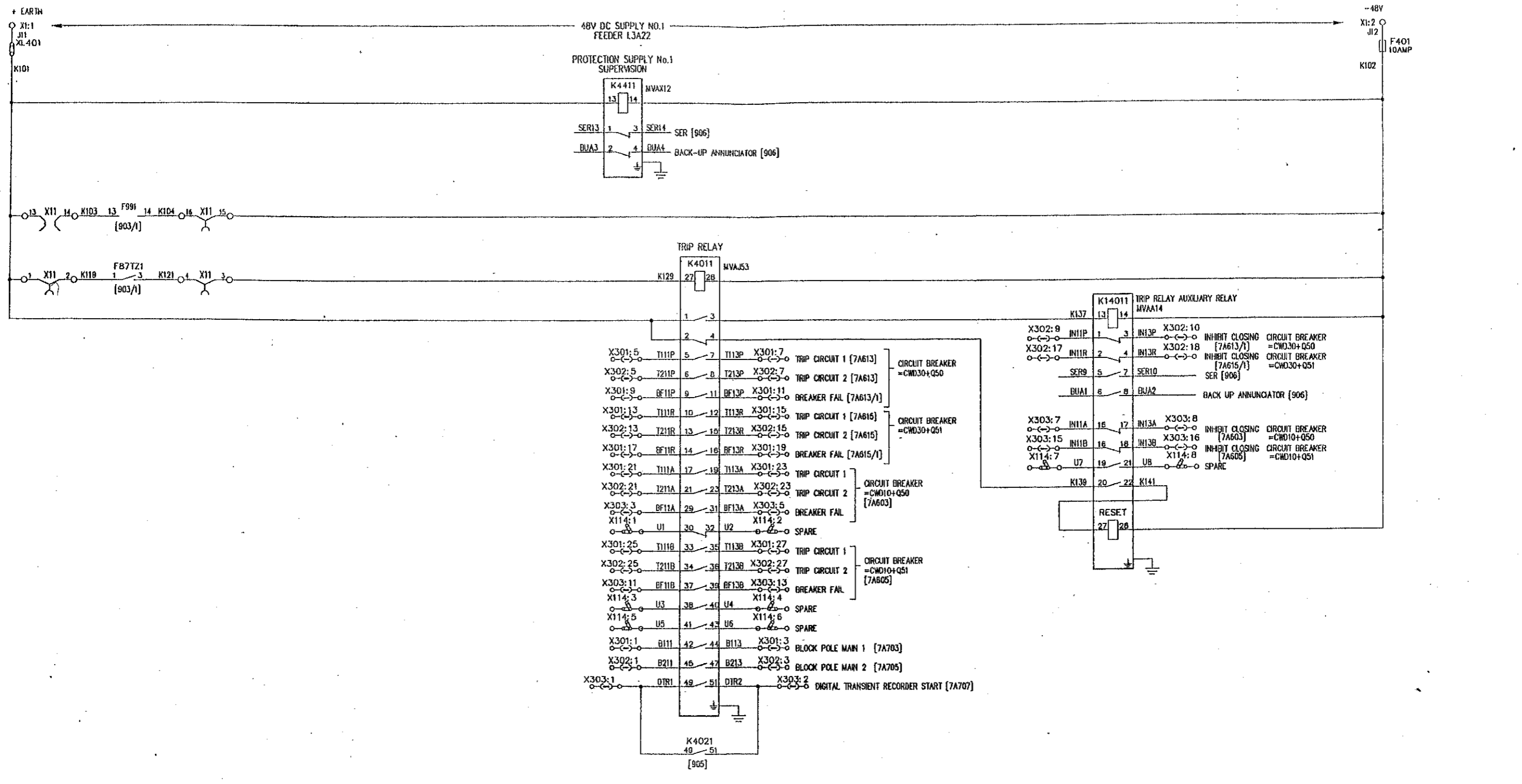
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WHEN QUOTING DRG. No. STATE CURRENT ISSUE
 CUSTOMER POWERGRID ORDER No. CF0136

C.A.D. DATA
 ISSUE B
 NAME
 LOCATION VISA4192

ISSUE A
 DATE 13/08/98
 REVISIONS:
 BUC 25/08/98
 REVISOR: ECH 8003
 CHECKED: ECH 8003
 DRAWN: ECH 8003
 REVISED TO ECH 8003
 WITH TERMINALS ADDED.
 US 10/15/2000 WERE
 USED.

Dwg. No. 637EZ1Y04587 SHT 4



NOTES:
 [Dwn] DENOTES FILE NO OF 789NN SECTION
 REFER [901] FOR FILE INDEX
 REFER [902] FOR LOCATION AND DEVICE LIST
 [7ANN] DENOTES FILE NO OF 7ANNW SECTION

FILE 7B904

POWER GRID CORPORATION OF INDIA LIMITED
 1 x 500MW HVDC BACK-TO-BACK PROJECT
 VISAKHAPATNAM
 GEC ALSTHOM
 T&D

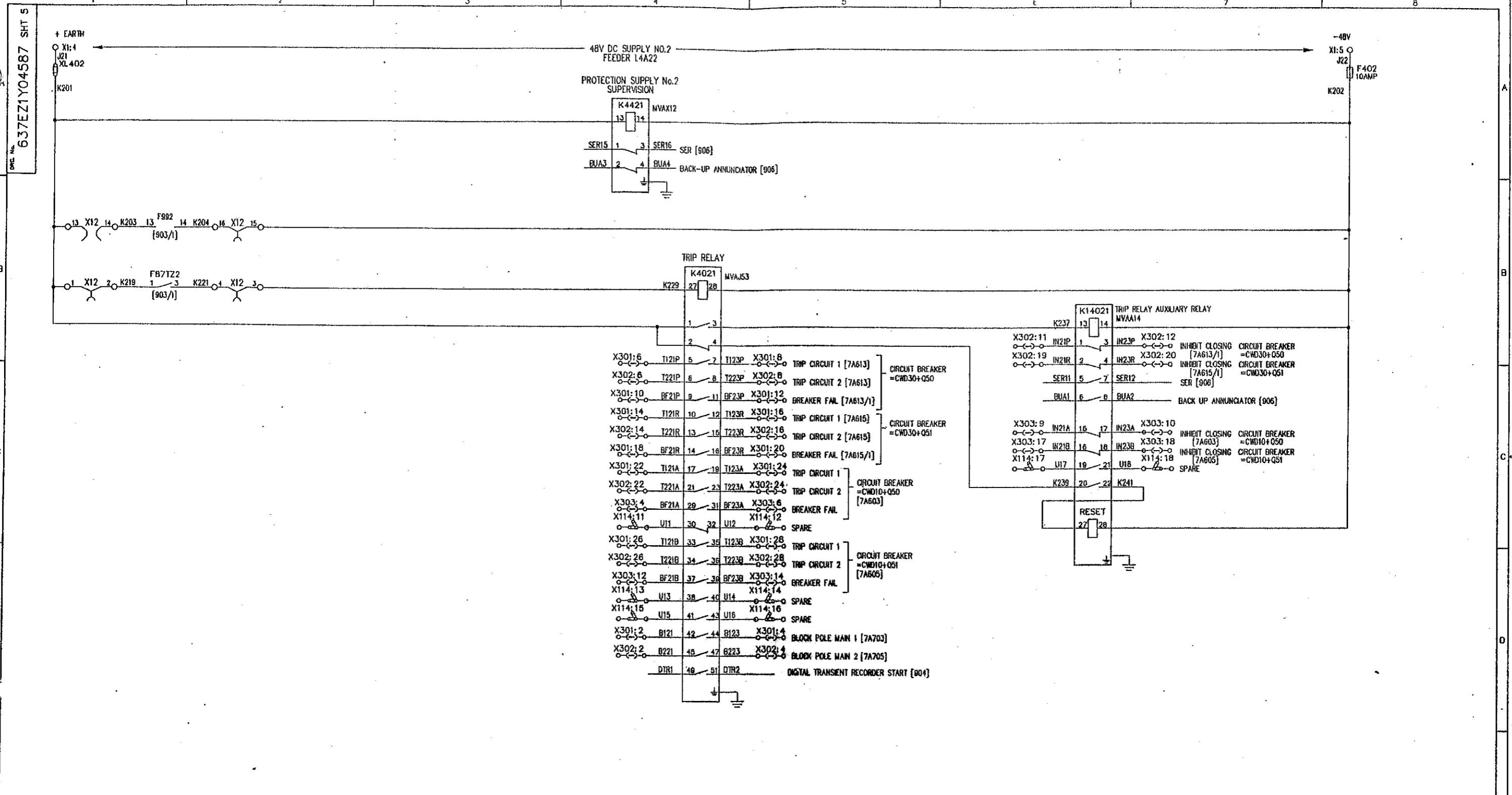
CAB. DATA
 ISSUE D
 NAME
 LOCATION VISA3664

PRJ	PRJ	PRJ	PRJ
A	B	C	D
ISSUE	PNS	RFR	PREM
DATE	DATE	DATE	DATE
11/06/97	08/08/97	13/08/98	15/01/99
REVISIONS TO CONNECTIONS - RELAY TYPES ADDED CHANGED TO COMBINATION OF RELAYS FROM 7A613 & 7A615 ON X301:11, X302:10 & X301:18, X302:18 REVISIONS TO CONNECTIONS - RELAY TYPES ADDED FILE REF 903/1 WAS 903 - 2 PLACES			

AS BUILT DWG
 14 APR 2000
VISAKHAPATNAM

GEC ALSTHOM 100
 Power Electronic Systems Limited
 CERTIFIED FOR MANUFACTURE
 NAME: B T BARRETT
 DEPT. 739 DATE: 9/6/97
 SIGNED BTB
 THIRD ANGLE PROJECTION
 IF IN DOUBT ASK
 ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED
 DRAWING TO BS008 UNLESS OTHERWISE STATED
 FOR THE STANDARD OF ACCURACY OF ALL UNTOLERANCED DIMENSIONS SEE SPECN. STAND/023/PROC
 DRAWN JCP
 CH'D PNS
 APP'D RFR
 SCALE
 TRACED
 DESIGN PRJ
 APP'D

GEC ALSTHOM T&D
 Power Electronic Systems Limited
 Sullford, England
 TITLE
 VISAKHAPATNAM
 SOUTHERN TRANSFORMER INTERZONE PROTECTION CUBICLE =CWT31+EF4311
 DC CIRCUITS (PROTECTION SYSTEM 1)
 DRG. No. 637EZ1Y04587 SHT 4
 CURRENT ISSUE D
 DO NOT SCALE PRINT
 WHEN QUOTING DRG. No. STATE CURRENT ISSUE
 CUSTOMER POWERGRID
 ORDER No. CF0136



NOTES:
 [999] DENOTES FILE NO OF 7899N SECTION
 REFER [901] FOR FILE INDEX
 REFER [902] FOR LOCATION AND DEVICE LIST
 [7ANN] DENOTES FILE NO OF 7ANNN SECTION

FILE 7B905

POWER GRID CORPORATION OF INDIA LIMITED
 1 x 500MW HVDC BACK-TO-BACK PROJECT
 VISAKHAPATNAM

GEC ALSTHOM
 T&D

GEC ALSTHOM T&D
 Power Electronic Systems Limited
 Bedford, England

TITLE
 VISAKHAPATNAM
 SOUTHERN TRANSFORMER INTERZONE PROTECTION
 CUBICLE = CWT31+EF4.311
 DC CIRCUITS (PROTECTION SYSTEM 2)

DRG. No. 637EZ1Y04587 SHT 5
 CURRENT ISSUE D

AS BUILT DWG
 14 APR 2009
 VISAKHAPATNAM

GEC ALSTHOM T&D
 Power Electronic Systems Limited
 CERTIFIED FOR
 MANUFACTURE

NAME: B T BARRETT
 DEPT: 739 DATE: 9/6/97
 SIGNED: BTB

BIRD ANGLE
 PROJECTION

IF IN DOUBT
 ASK

ALL DIMENSIONS
 IN MILLIMETRES
 UNLESS OTHERWISE STATED

DRAWING TO BS308
 UNLESS OTHERWISE STATED

DRAWN JCP
 CHD PNS

APP'D RFR
 SCALE
 TRACED
 DESIGN APP'D PRJ

WHEN QUOTING DRG. No. STATE CURRENT ISSUE
 CUSTOMER POWERGRID ORDER No. CF0136

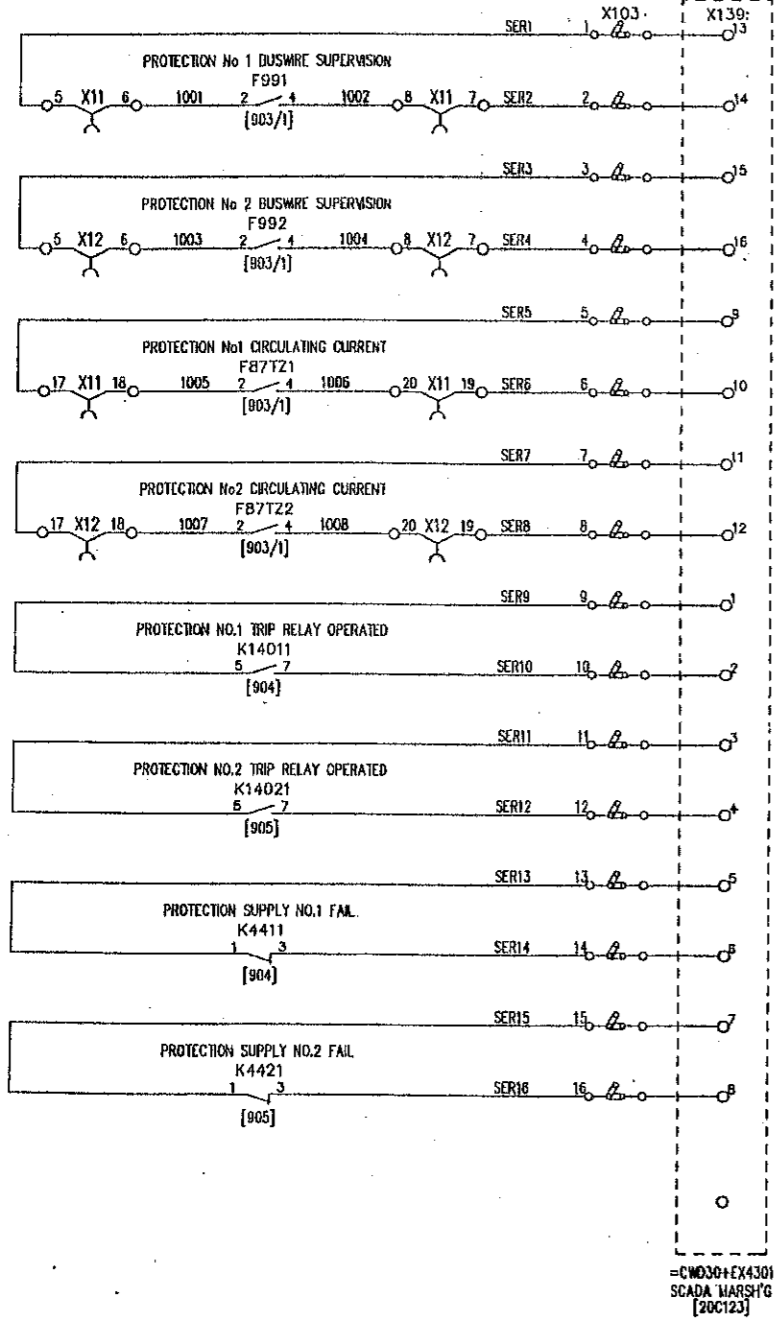
C.A.B. DATA
 ISSUE D
 NAME
 LOCATION VSA3665

PRJ	PRJ	PRJ
A	B	C
11/08/97	08/08/97	13/08/98
ISSUE	PNS	RFR
DATE	JCP	PREM
11/08/97	08/08/97	13/08/98
ISSUE	JCP	PREM

REVISED TO ECN8348 - RELAY TYPES ADDED
 REVISED TO ECN8448 - CHANGED FILE REF'S FROM 7A613 & 7A615 ON X301:12, X302:12 & X301:20, X302:20
 M.C.W.
 15
 01/01/99
 REVISED TO ECN8448 - FILE REF 903/1 WAS 903 - 2 PLACES.

DRG. No. 637EZ1Y04587 SHT 6

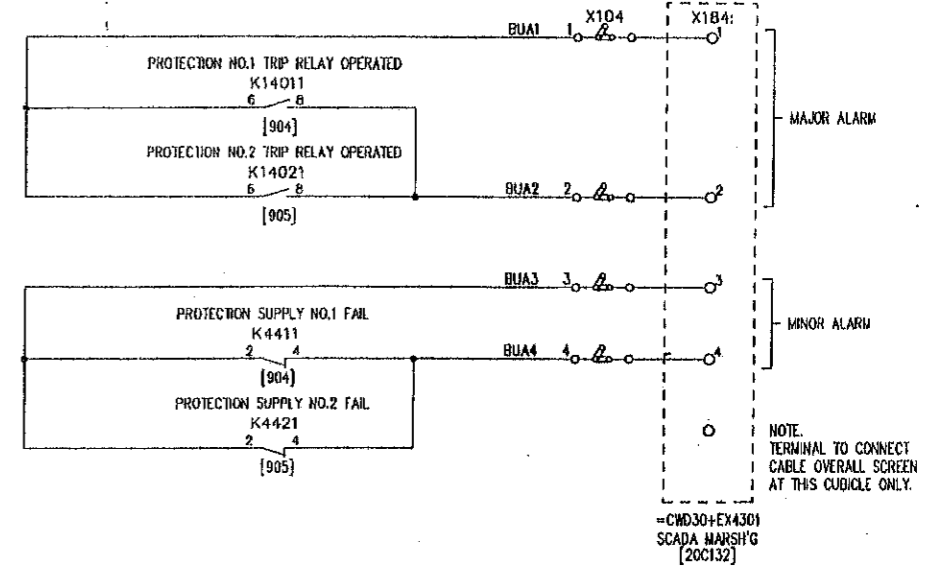
SEQUENCE OF EVENTS RECORDER ALARM SIGNALS



NOTE:
TERMINAL TO CONNECT
CABLE OVERALL SCREEN
AT THIS CUBICLE ONLY.

=CWD30+EX4301
SCADA MARSH'G
[20C123]

BACK-UP ANNUNCIATOR ALARM SIGNALS



NOTE:
TERMINAL TO CONNECT
CABLE OVERALL SCREEN
AT THIS CUBICLE ONLY.

=CWD30+EX4301
SCADA MARSH'G
[20C132]

NOTES:
[5NNN] DENOTES FILE NO OF 788NN SECTION
REFER [901] FOR FILE INDEX
REFER [902] FOR LOCATION AND DEVICE LIST
[7ANNN] DENOTES FILE NO OF 7ANNN SECTION

FILE 7B906

POWER GRID CORPORATION OF INDIA LIMITED
1 x 500MW HVDC BACK-TO-BACK PROJECT
VISAKHAPATNAM

GEC ALSTHOM
T&O

GEC ALSTHOM T&O
Power Electronic Systems Limited
Stilton, England

TITLE
VISAKHAPATNAM
SOUTHERN TRANSFORMER INTERZONE PROTECTION
CUBICLE =CWT31+EF4311
SER AND BUA SIGNALS

DRG. No. 637EZ1Y04587 SHT 6
CURRENT ISSUE D

AS BUILT DWG
14 APR 2000
VISAKHAPATNAM

GEC ALSTHOM T&O
Power Electronic Systems Limited
CERTIFIED FOR
MANUFACTURE
NAME: B T BARRETT
DEPT. 739 DATE: 9 / 6 / 97
SIGNED BTB

THIRD ANGLE
PROJECTION
IF IN DOUBT
ASK

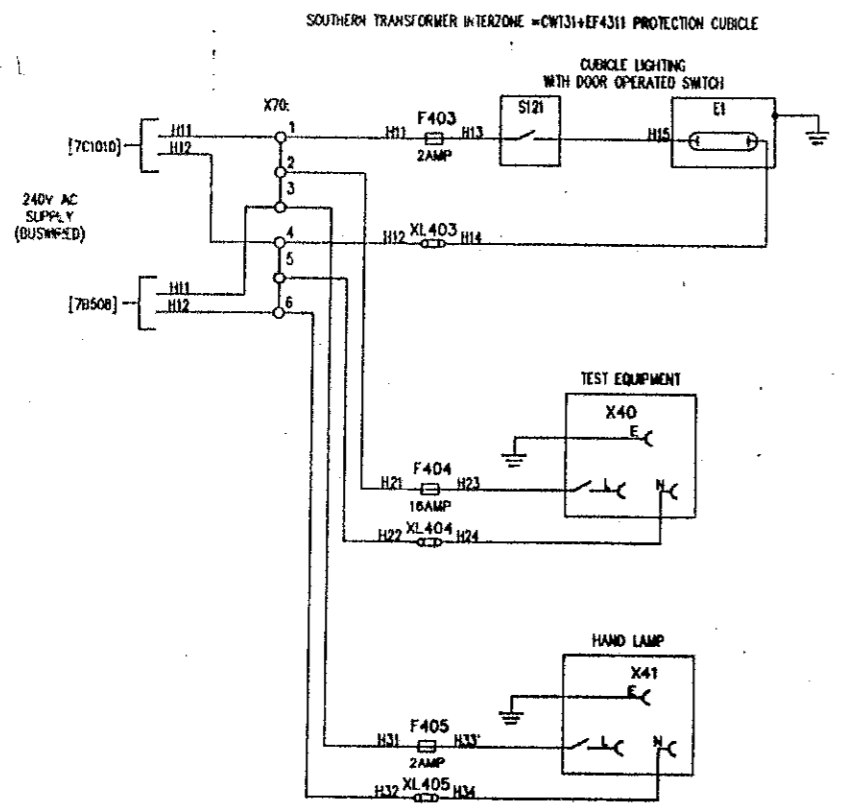
ALL DIMENSIONS
IN MILLIMETRES
UNLESS OTHERWISE STATED
DRAWING TO BS308-
UNLESS OTHERWISE STATED
FOR THE STANDARD OF
ACCURACY OF ALL
UNBALANCED DIMENSIONS
SEE SPEC. STAND/023/PRDC

DRAWN JCP
CHKD PNS
APP'D RFR
SCALE
TRACED
DESIGN
APP'D PRJ

DO NOT SCALE PRINT
WHEN QUOTING DRG. NO. STATE CURRENT ISSUE
CUSTOMER POWERGRID
ORDER No. CF0136

ISSUE D	C.A.D. DATA	PRJ A	PRJ B	PRJ C	REVISIONS TO ENGRS. FILE REFS 20C123 & 20C132 WERE 20A. SER 901, 902, 903, 904, 905 [903/1] WAS [905]
		RFR	JCP	MCL	
		PREM	MCL	MCL	
DATE	11-08-97	13-08-98	15-01-99	15-01-99	

637EZ1Y04587 SHT 7



NOTES:
 [500] DENOTES FILE NO OF 78900 SECTION
 REFER [801] FOR FILE INDEX
 REFER [802] FOR LOCATION AND DEVICE LIST
 [78900] DENOTES FILE NO OF 78900 SECTION

FILE 78907

POWER GRID CORPORATION OF INDIA LIMITED
 1 x 500MW HVDC BACK-TO-BACK PROJECT
 VISAKHAPATNAM

GEC ALSTHOM
 T&D

GEC ALSTHOM T&D
 Power Electronic Systems Limited
 Shillong, England

TITLE
 VISAKHAPATNAM
 SOUTHERN TRANSFORMER INTERZONE PROTECTION
 CUBICLE = CWT31+EF4311
 AC SUPPLIES AND CUBICLE ILLUMINATION

DRG. No.
 637EZ1Y04587 SHT 7

CURRENT ISSUE
 A

C.A.B. DATA
 NAME A
 DATE 11/06/97
 LOCATION WISA0323

AS BUILT DWG
 14 APR 2000
 VISAKHAPATNAM

GEC ALSTHOM T&D
 Power Electronic Systems Limited
 CERTIFIED FOR MANUFACTURE

NAME: BT Barrett
 DEPT. 739 DATE 9/16/97
 SIGNED: BT Barrett

THIRD ANGLE PROJECTION

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED

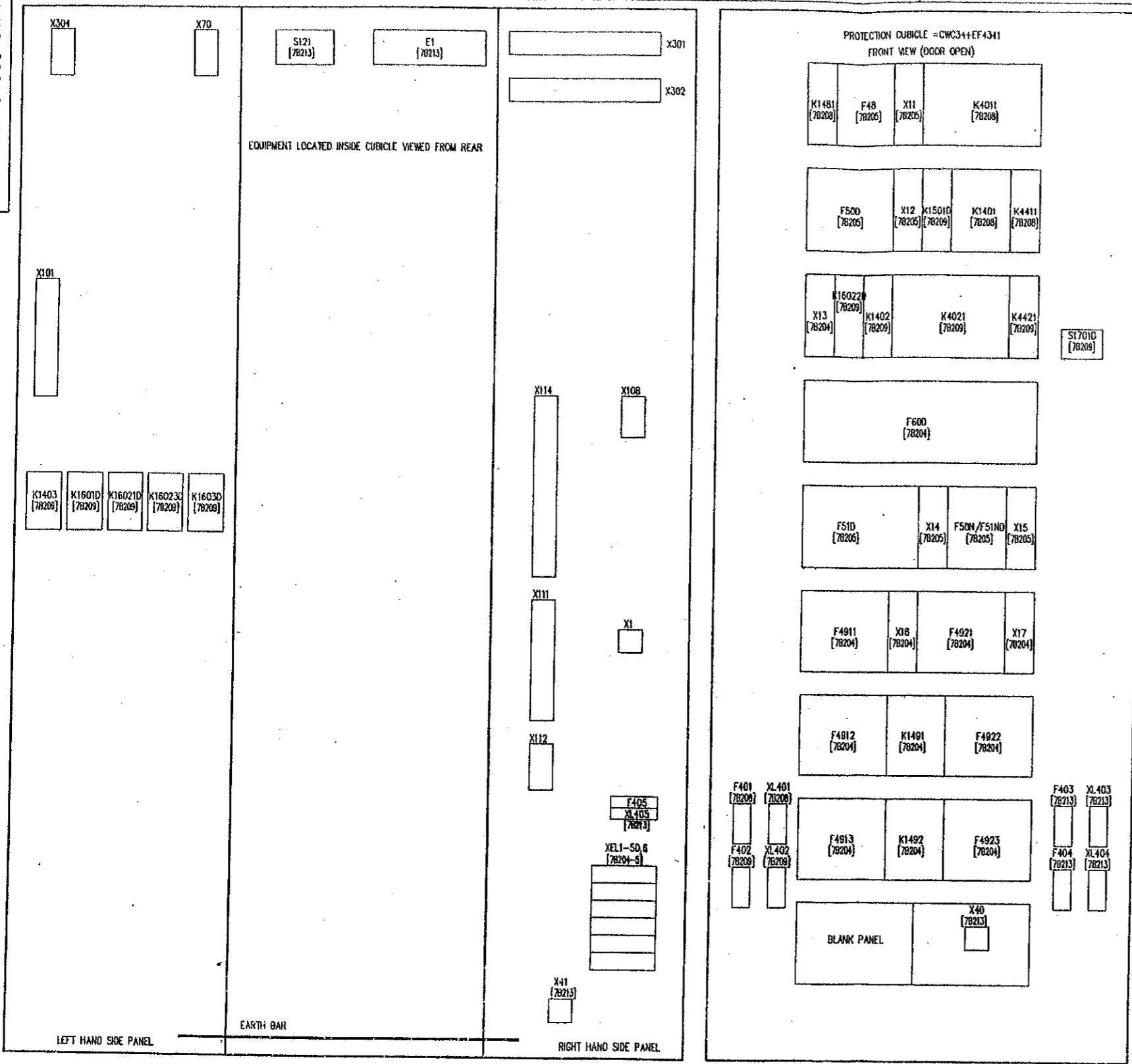
DRAWING TO BS308 UNLESS OTHERWISE STATED

FOR THE STANDARD OF ACCURACY OF ALL UNTOLERANCED DIMENSIONS SEE SPEC. STAND/SOL/PROC

DO NOT SCALE PRINT

CUSTOMER POWERGRID
 ORDER No. CF0136

Dwg. No. 637EZ1Y04669 SHT 1



DEVICE REF	DESCRIPTION	TYPE
K1481	BREAKER FAIL TIMER (0.001-1 seconds)	GECA MVT114
F48	BREAKER FAIL CURRENT RELAY	GECA MCL139
X11	BREAKER FAIL TEST BLOCK	GECA MVLG01
K4011	BREAKER FAIL TRIP RELAY	GECA MVAJ53
F500	INSTANTANEOUS OVERCURRENT RELAY	GECA MCA639
X12	OVERCURRENT TEST BLOCK	GECA MMLG01
K1501D	TIMING RELAY (0.001-1 second)	GECA MVT114
K1401	TRIP RELAY AUXILIARY RELAY	GECA MVAJ14
K4411	BREAKER FAIL SUPPLY SUPERVISION RELAY	GECA MVAJ12
X13	CAPACITOR UNBALANCE TEST BLOCK	GECA MMLG01
K16022D	CAPACITOR UNBALANCE TIMER (10-10,000 seconds)	GECA MVT114
K1402	TRIP RELAY TIMER (0.01-10 seconds)	GECA MVT114
K4021	LOCKOUT TRIP RELAY	GECA MVAJ53
K4421	PROTECTION SUPPLY SUPERVISION RELAY	GECA MVAJ12
S1701D	PUSHBUTTON CAPACITOR UNBALANCE TIMER RESET	HIGHLAND 704-0120 +704.B10.4 COOPER SY
F600	CAPACITOR UNBALANCE RELAY	
F50	IDMT OVERCURRENT RELAY	ABB SPAJ 160C
X14	OVERCURRENT TEST BLOCK	MMLG01
F50N/F51ND	EARTH FAULT RELAY	GECA MCG622
X15	EARTH FAULT TEST BLOCK	GECA MMLG01
F4911	RESISTOR R1 OVERLOAD RELAY RED PHASE	P AND B SAWZA
X16	RESISTOR R1 OVERLOAD TEST BLOCK	GECA MMLG01
F4921	RESISTOR R2 OVERLOAD RELAY RED PHASE	P AND B SAWZA
X17	RESISTOR R2 OVERLOAD TEST BLOCK	GECA MMLG01
F4912	RESISTOR R1 OVERLOAD RELAY YELLOW PHASE	P AND B SAWZA
X1491	RESISTOR R1 OPEN CIRCUIT ALARM RELAY	GECA MCG622
F4922	RESISTOR R2 OVERLOAD RELAY YELLOW PHASE	P AND B SAWZA
F4913	RESISTOR R1 OVERLOAD RELAY BLUE PHASE	P AND B SAWZA
X1492	RESISTOR R2 OPEN CIRCUIT ALARM RELAY	GECA MCG622
F4923	RESISTOR R2 OVERLOAD RELAY BLUE PHASE	P AND B SAWZA
K1403	TRIP DELAY AUXILIARY RELAY	GECA PRIMA
K1601D	CAPACITOR UNBALANCE STAGE 1 AUXILIARY RELAY	GECA PRIMA
K1602D	CAPACITOR UNBALANCE STAGE 2 AUXILIARY RELAY	GECA PRIMA
K16023D	CAPACITOR UNBALANCE STAGE 2 TIMER AUXILIARY RELAY	GECA PRIMA
K1603D	CAPACITOR UNBALANCE STAGE 3 AUXILIARY RELAY	GECA PRIMA
XELD	EARTH LINK FOR F600	WEIDMULLER STL5
XEL2D	EARTH LINK FOR K1491	WEIDMULLER STL5
XEL3D	EARTH LINK FOR K1492	WEIDMULLER STL5
XEL4D	EARTH LINK FOR F50/F51D	WEIDMULLER STL5
XEL5D	EARTH LINK FOR F50N/F51ND	WEIDMULLER STL5
XEL6	EARTH LINK FOR F48	WEIDMULLER STL5
F401	FUSE AND HOLDER 10A, PROTECTION SUPPLY No. 1, 48Vdc	GECA SC32P
XL401	LINK AND HOLDER	GECA SC32P
F402	FUSE AND HOLDER 10A, PROTECTION SUPPLY No. 2, 48Vdc	GECA SC32P
XL402	LINK AND HOLDER	GECA SC32P
F403	FUSE AND HOLDER, 2A, CUBICLE LIGHTING SUPPLY, 240V, 50HZ	GECA SC32P
XL403	LINK AND HOLDER	GECA SC32P
F404	FUSE AND HOLDER, 16A, SUPPLY FOR TEST EQUIPMENT 16A SOCKET, 240V, 50HZ	GECA SC32P
XL404	LINK AND HOLDER	GECA SC32P
F405	FUSE AND HOLDER, 2A, FOR HAND LAMP SUPPLY 16A SOCKET, 240V, 50HZ	WEIDMULLER KSK3F
XL405	LINK AND HOLDER	WEIDMULLER KSK3F
X40	TEST EQUIPMENT SWITCHED SOCKET TO INDIAN STANDARD	
X41	HAND LAMP SWITCHED SOCKET TO INDIAN STANDARD	
E1	CUBICLE LIGHTING	
S121	CUBICLE LIGHTING DOOR SWITCH	
X101	CT/VT TERMINALS	WEIDMULLER RSE1
X70	BUSWIRE TERMINALS (240V AC SUPPLIES)	WEIDMULLER SAKEN
X1	48V DC SUPPLY TERMINALS	WEIDMULLER RSE1
X108	RPC TERMINALS	WEIDMULLER RSE2
X111	SEQUENCE OF EVENTS RECORDER TERMINALS	WEIDMULLER SAKR
X112	BACK UP ANNUNCIATOR TERMINALS	WEIDMULLER SAKR
X114	SPARE RELAY CONTACTS TERMINALS	WEIDMULLER SAKR
X301 & X302	BUSWIRE TERMINALS (TRIP COIL 1 ETC & TRIP COIL 2 ETC)	WEIDMULLER RSE1/2
X304	BUSWIRE TERMINALS (BUSBAR & FILTER VT'S)	WEIDMULLER RSE2

FILE 7B202

POWER GRID CORPORATION OF INDIA LIMITED
1 x 500MW HVDC BACK-TO-BACK PROJECT
VISAKHAPATNAM

GEC ALSTHON

GEC ALSTHON T&D
Power Electronic Systems Limited
Shefford, England

VISAKHAPATNAM
AC HARMONIC FILTER =CWC34 PROTECTION
CUBICLE =CWC34+EF431 EQUIPMENT & DEVICE LIST
(DOUBLE DAMPED PART OF FILTER)

REFER 637EZ1Y04594 FOR FILE INDEX [7B201]

ISSUE	A	B	PRJ
NAME	ISSUE	PNS	JCP
LOCATION	DATE	REVISED TO ENHANCE - X121 & X122 DELETED	PREM
VISA2453	13-08-97	13-07-98	

REVISED TO ENHANCE - DELETED R11, R12D, R13D, R14

AS BUILT DWG
14 APR 2000
VISAKHAPATNAM

GEC ALSTHON T&D
Power Electronic Systems Limited
CERTIFIED FOR MANUFACTURE

NAME: B T BARRETT
DEPT. 739 DATE: 5/8/97
SIGNED: BTB

THIRD ANGLE PROJECTION

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED

DRAWING TO BS308 UNLESS OTHERWISE STATED

FOR THE STANDARD OF ACCURACY OF ALL UNTOLERANCED DIMENSIONS SEE SPEC. STAND/023/PROC

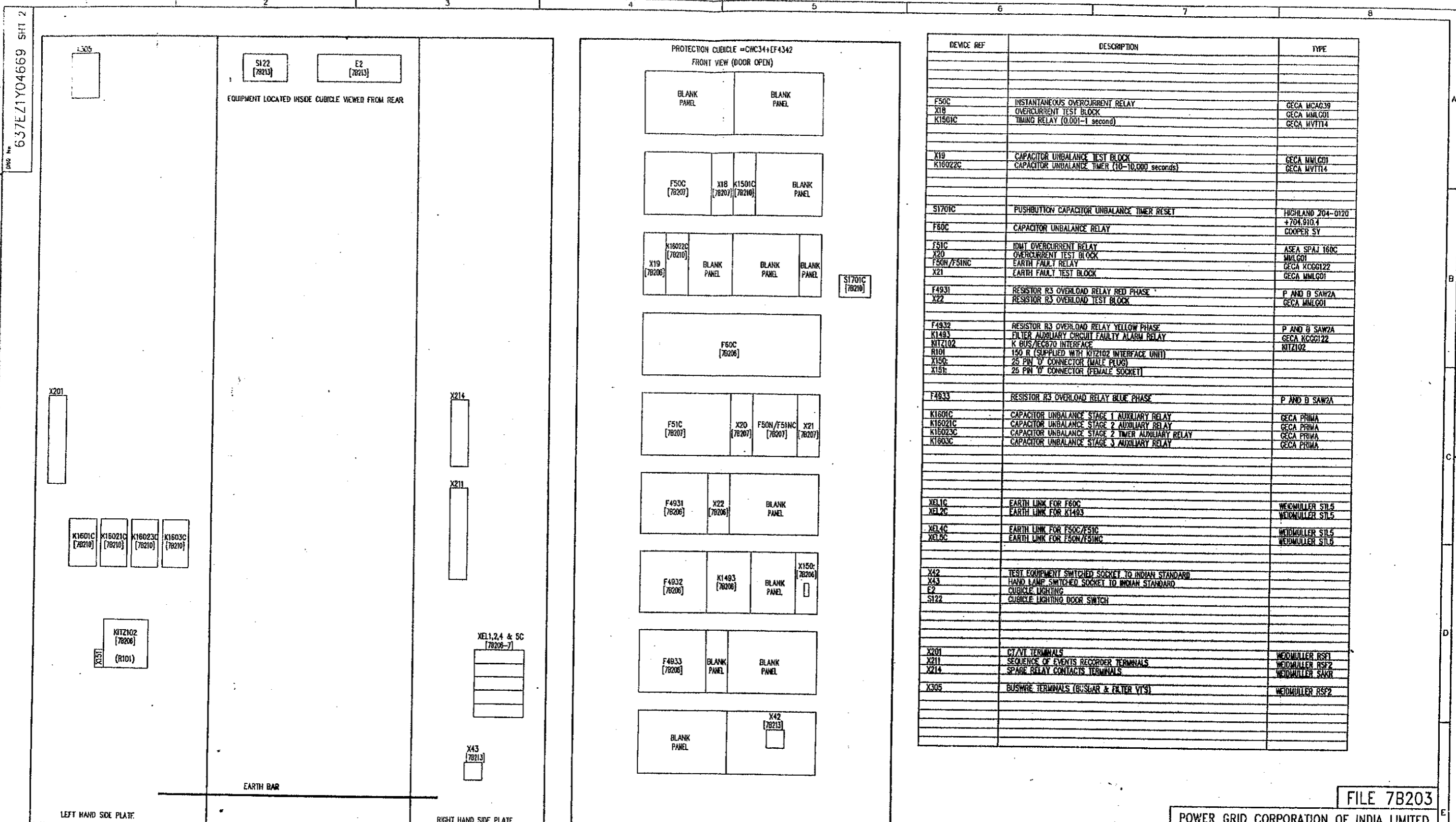
IF IN DOUBT ASK

DO NOT SCALE PRINT

DWG. No. 637EZ1Y04669 SHT 1
CURRENT ISSUE C

WHEN QUOTING DRG. No. STATE CURRENT ISSUE

CUSTOMER POWERGRID ORDER No. CF0136



DEVICE REF	DESCRIPTION	TYPE
F50C	INSTANTANEOUS OVERCURRENT RELAY	GECA MCA039
X18	OVERCURRENT TEST BLOCK	GECA MMLG01
K1501C	TIMING RELAY (0.001-1 second)	GECA MVT114
X19	CAPACITOR UNBALANCE TEST BLOCK	GECA MMLG01
K16022C	CAPACITOR UNBALANCE TIMER (10-10,000 seconds)	GECA MVT114
S1701C	PUSHBUTTON CAPACITOR UNBALANCE TIMER RESET	HIGHLAND 204-0120 + 704.910.4
F60C	CAPACITOR UNBALANCE RELAY	COOPER SV
F51C	IDMT OVERCURRENT RELAY	ASEA SPAJ 160C
X20	OVERCURRENT TEST BLOCK	MMLG01
F50N/F51NC	EARTH FAULT RELAY	GECA KCGG122
X21	EARTH FAULT TEST BLOCK	GECA MMLG01
F4931	RESISTOR R3 OVERLOAD RELAY RED PHASE	P AND B SAW2A
X22	RESISTOR R3 OVERLOAD TEST BLOCK	GECA MMLG01
F4932	RESISTOR R3 OVERLOAD RELAY YELLOW PHASE	P AND B SAW2A
K1493	FILTER AUXILIARY CIRCUIT FAULTY ALARM RELAY	GECA KCGG122
KIT2102	K BUS/ECB70 INTERFACE	KIT2102
R101	150 R (SUPPLIED WITH KIT2102 INTERFACE UNIT)	
X150:	25 PIN 'D' CONNECTOR (MALE PLUG)	
X151:	25 PIN 'D' CONNECTOR (FEMALE SOCKET)	
F4933	RESISTOR R3 OVERLOAD RELAY BLUE PHASE	P AND B SAW2A
K1601C	CAPACITOR UNBALANCE STAGE 1 AUXILIARY RELAY	GECA PRMA
K16021C	CAPACITOR UNBALANCE STAGE 2 AUXILIARY RELAY	GECA PRMA
K16023C	CAPACITOR UNBALANCE STAGE 2 TIMER AUXILIARY RELAY	GECA PRMA
K1603C	CAPACITOR UNBALANCE STAGE 3 AUXILIARY RELAY	GECA PRMA
XEL1C	EARTH LINK FOR F60C	WEIDMULLER STL5
XEL2C	EARTH LINK FOR K1493	WEIDMULLER STL5
XEL4C	EARTH LINK FOR F50C/F51C	WEIDMULLER STL5
XEL5C	EARTH LINK FOR F50N/F51NC	WEIDMULLER STL6
X42	TEST EQUIPMENT SWITCHED SOCKET TO INDIAN STANDARD	WEIDMULLER RSE1
X43	HAND LAMP SWITCHED SOCKET TO INDIAN STANDARD	WEIDMULLER RSE2
E2	CUBICLE LIGHTING	WEIDMULLER SAVR
S122	CUBICLE LIGHTING DOOR SWITCH	
X201	CT/VT TERMINALS	WEIDMULLER RSE1
X211	SEQUENCE OF EVENTS RECORDER TERMINALS	WEIDMULLER RSE2
X214	SPARE RELAY CONTACTS TERMINALS	WEIDMULLER SAVR
X305	BUSHING TERMINALS (BUSBAR & FILTER VT'S)	WEIDMULLER RSE2

REFER 637E21Y04594 FOR FILE INDEX [78201]

ISSUE	PRJ	DATE	BY	REASON
A	PRJ	13-08-97	PSG	REVISION TO EMBARK-DELETED R121C, R131C
B	RFR	13-07-98	PSG	REVISION TO EMBARK-DELETED R121C, R131C
C	PSG	13-08-99	PSG	REVISION TO EMBARK-DELETED R121C, R131C, R150, X151 & R151 ADDED, F50N/F51NC & K1493 CHANGED TO K06012Z

AS BUILT DWG
14 APR 2000
VISAKHAPATNAM

GEC ALSTHOM T&D Power Electronic Systems Limited CERTIFIED FOR MANUFACTURE NAME: B T BARRETT DEPT: 739 DATE: 5/8/97 SIGNED: BTB	THIRD ANGLE PROJECTION 	ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED DRAWING TO BS308 UNLESS OTHERWISE STATED FOR THE STANDARD OF ACCURACY OF ALL UNDIMENSIONED DIMENSIONS SEE SPECN. STAND/023/PRD/C	DRAWN: JCP CPO: PNS APP'D: RFR SCALE: TRACED: DESIGN: PRJ
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FILE 78203

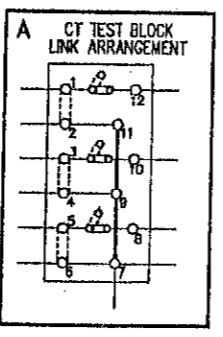
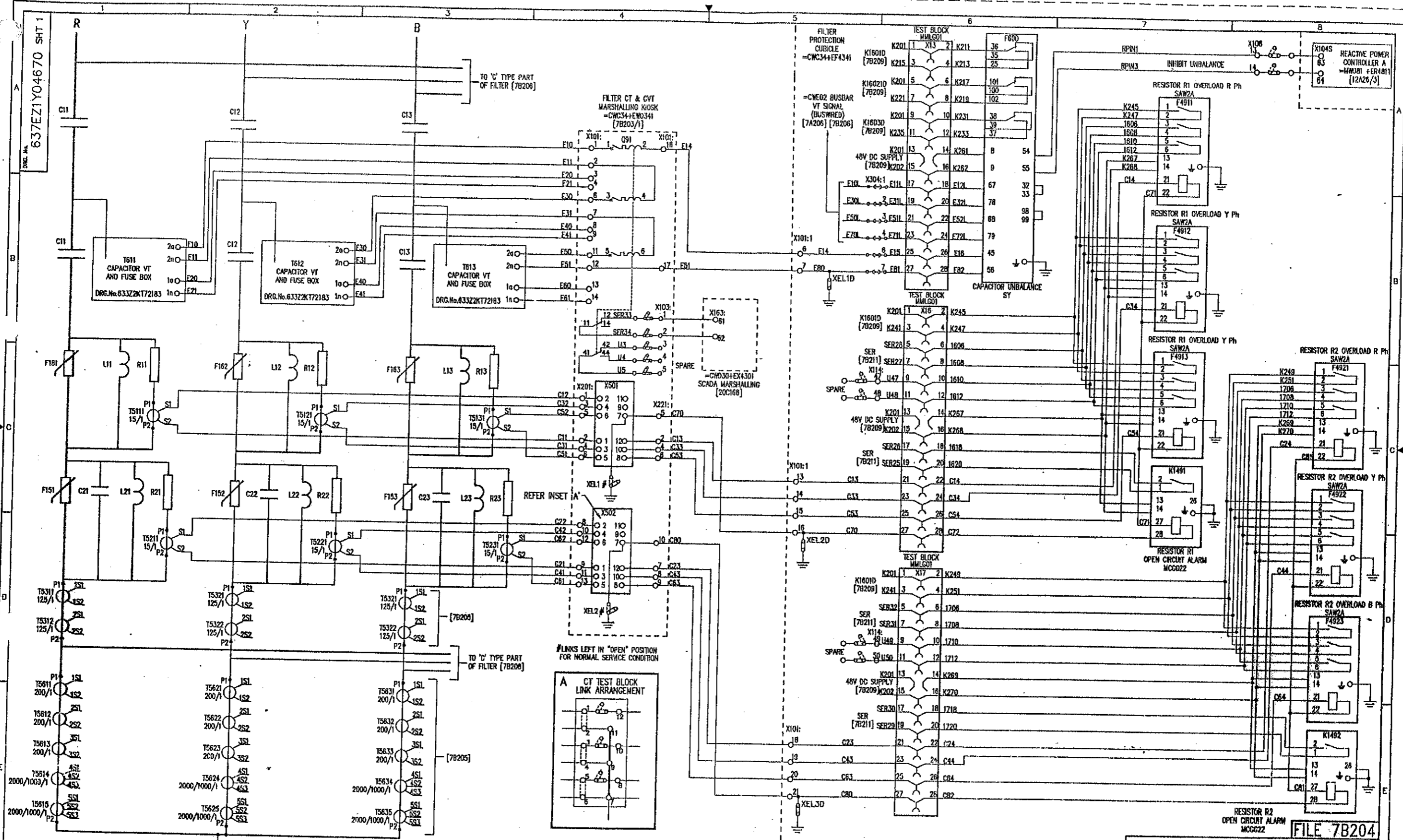
POWER GRID CORPORATION OF INDIA LIMITED
1 x 500MW HVDC BACK-TO-BACK PROJECT
VISAKHAPATNAM

GEC ALSTHOM T&D
Power Electronic Systems Limited
North, England

VISAKHAPATNAM
AC HARMONIC FILTER =CWC34 PROTECTION CUBICLE =CWC34+EF4342 EQUIPMENT & DEVICE LIST 'C' TYPE PART OF COMBINED FILTER

DRG. No. **637E21Y04669** SHT 2

CUSTOMER: **POWERGRID**



C.A.D. DATA	PRJ A	PRJ B	PRJ C
ISSUE C	ISSUE 13	ISSUE 08	ISSUE 97
NAME Z1Y04690	DATE 13/08/97	DATE 07/07/98	DATE 11/12/98
LOCATION VSA3524	REVISION TO ENCL 444 - ADDED TERMINAL NUMBERS TO =CWC34+EX301	REVISION TO ENCL 444 - ADDED FILE REF. [20C166]	REVISION TO ENCL 444 - ADDED FILE REF. [20C166]

AS BUILT DWG
 14 APR 2003
VISAKHAPATNAM

POWER GRID CORPORATION OF INDIA LIMITED
 1 x 500MW HVDC BACK-TO-BACK PROJECT
 VISAKHAPATNAM

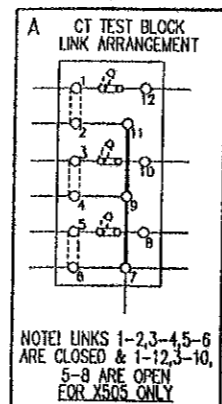
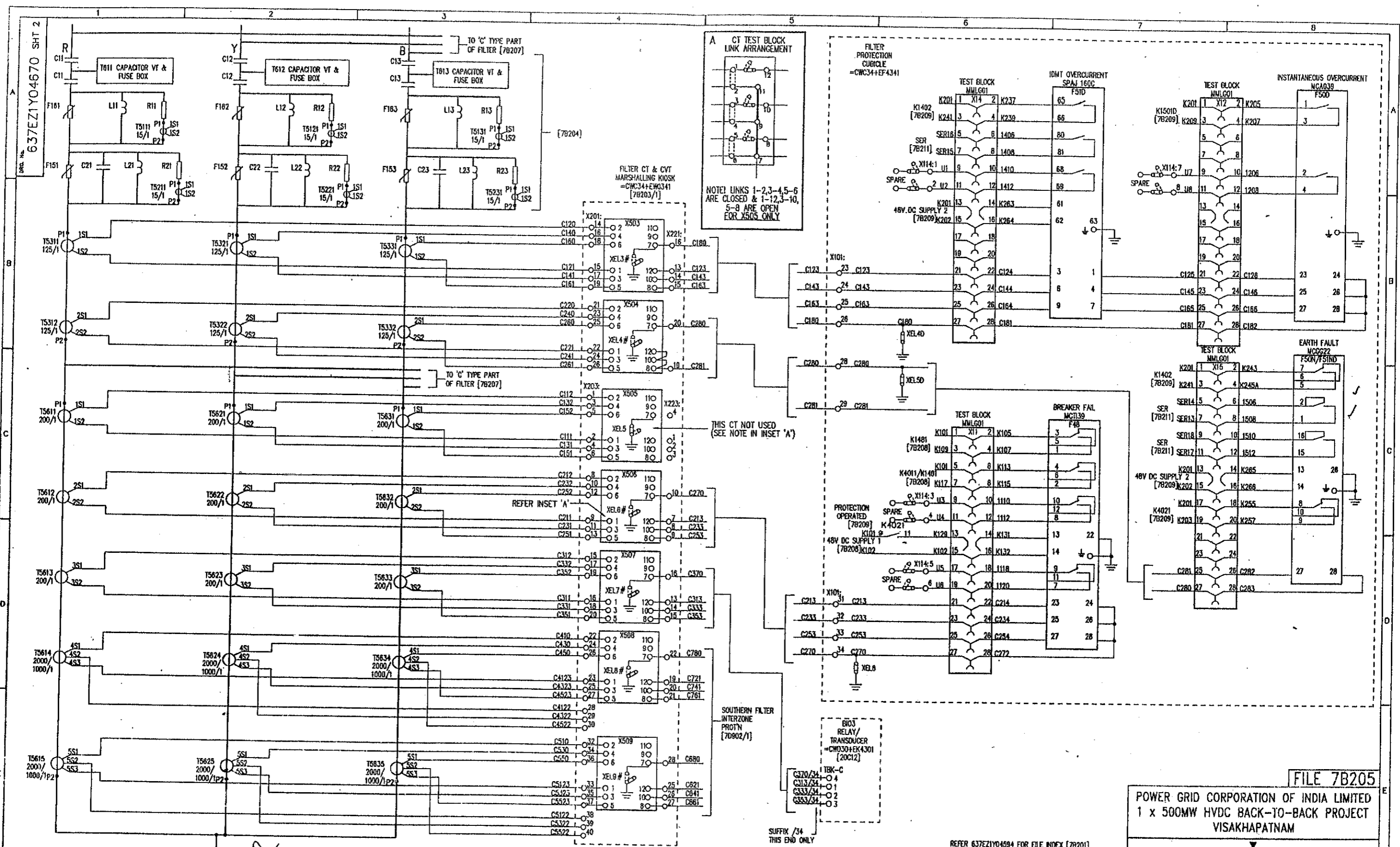
GEC ALSTHOM
 T&D
 CERTIFIED FOR MANUFACTURE
 NAME: B T BARRETT
 DEPT. 739 DATE: 5/8/97
 SIGNED: BTB

THIRD ANGLE PROJECTION
 ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED
 DRAWING TO BS308 UNLESS OTHERWISE STATED
 FOR THE STANDARD OF ACCURACY OF ALL UNTOLERANCED DIMENSIONS SEE SPEC. STABO/023/PR00
 IF IN DOUBT ASK
 DO NOT SCALE PRINT

GEC ALSTHOM
 T&D
GEC ALSTHOM T&D
 Power Electronic Systems Limited
 Weybridge, England
 TITLE: VISAKHAPATNAM AC HARMONIC FILTER =CWC34 PROTECTION CIRCUIT DIAGRAM FOR AC CIRCUITS (DOUBLE DAMPED PART OF COMBINED FILTER)
 Dwg. No. 637EZ1Y04670 SH 1
 CURRENT ISSUE C

REFER [7B202] FOR LOCATION AND DEVICE LIST
 REFER 637EZ1Y04594 FOR FILE INDEX [7B201]
 REFER [2A05] FOR PROT N SINGLE LINE DIAGRAM

FILE 7B204



THIS CT NOT USED (SEE NOTE IN INSET 'A')

SOUTHERN FILTER INTERZONE PROTIN [70902/1]

SUFFIX /34 THIS END ONLY

LINKS LEFT IN "OPEN" POSITION FOR NORMAL SERVICE POSITION

FILE 7B205

POWER GRID CORPORATION OF INDIA LIMITED
1 x 500MW HVDC BACK-TO-BACK PROJECT
VISAKHAPATNAM

GEC ALSTHOM

GEC ALSTHOM T&D
Power Electronics Systems Limited
Visakhapatnam
AC HARMONIC FILTER = CWC34 PROTECTION
CIRCUIT DIAGRAM FOR AC CIRCUITS
(DOUBLE DAMPED PART OF COMBINED FILTER)

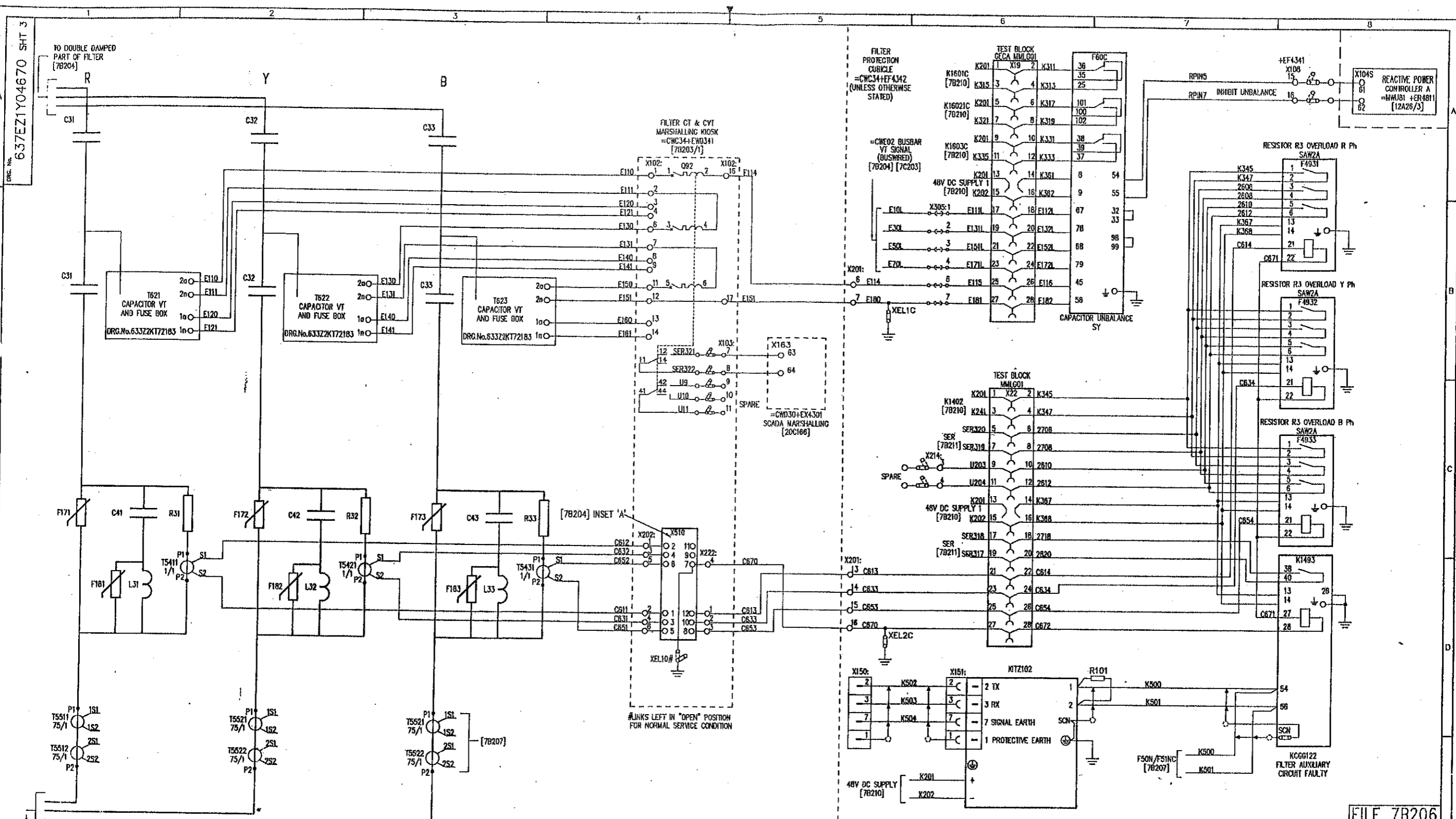
PRJ A	PNP	13
	JCP	26
PRJ B	PNP	08
	JCP	08
PRJ C	PNP	07
	JCP	07
PRJ D	PNP	08
	JCP	08
PRJ E	PNP	07
	JCP	07

AS BUILT DWG
14 APR 2009
VISAKHAPATNAM

GEC ALSTHOM T&D
Power Electronics Systems Limited
CERTIFIED FOR MANUFACTURE
NAME: B T BARRETT
DEPT: 739 DATE: 5/8/97
SIGNED: BTB

THIRD ANGLE PROJECTION
ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED
DRAWING TO BS308 UNLESS OTHERWISE STATED
FOR THE STANDARD OF ACCURACY OF ALL UNDIMENSIONED DIMENSIONS SEE SPEC. STAND./023/PROG
IF IN DOUBT ASK

DRG. No. 637EZ1Y04670 SHT 2
CURRENT ISSUE D



REFER 637EZ1Y04584 FOR FILE INDEX [7B201]
 REFER [7B203] FOR LOCATION AND DEVICE LIST
 REFER [2A05] FOR PROT'N SINGLE LINE DIAGRAM

ISSUE	DATE	BY	REASON
E	13/08/97	JCP	REVISED TO ENDSHOW - CWC34+EF4342
D	11/12/98	JCP	REVISED TO ENDSHOW - ADDED X150, X151, X152, X153, X154, X155, X156, X157, X158, X159, X160, X161, X162, X163, X164, X165, X166, X167, X168, X169, X170, X171, X172, X173, X174, X175, X176, X177, X178, X179, X180, X181, X182, X183, X184, X185, X186, X187, X188, X189, X190, X191, X192, X193, X194, X195, X196, X197, X198, X199, X200, X201, X202, X203, X204, X205, X206, X207, X208, X209, X210, X211, X212, X213, X214, X215, X216, X217, X218, X219, X220, X221, X222, X223, X224, X225, X226, X227, X228, X229, X230, X231, X232, X233, X234, X235, X236, X237, X238, X239, X240, X241, X242, X243, X244, X245, X246, X247, X248, X249, X250, X251, X252, X253, X254, X255, X256, X257, X258, X259, X260, X261, X262, X263, X264, X265, X266, X267, X268, X269, X270, X271, X272, X273, X274, X275, X276, X277, X278, X279, X280, X281, X282, X283, X284, X285, X286, X287, X288, X289, X290, X291, X292, X293, X294, X295, X296, X297, X298, X299, X300

AS BUILT DWG
 14 APR 2000
VISAKHAPATNAM

GEC ALSTHOM
 T&D
 CERTIFIED FOR
 MANUFACTURE
 NAME: B T BARRETT
 DEPT: 739 DATE: 5/8/97
 BTB

THIRD ANGLE PROJECTION
 ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED
 DRAWING TO BS308 UNLESS OTHERWISE STATED
 FOR THE STANDARDS OF ACCURACY OF ALL UNTOLERANCED DIMENSIONS SEE SPECK. STAND/023/PROC
 IF IN DOUBT ASK
 DO NOT SCALE PRINT

FILE 7B206

POWER GRID CORPORATION OF INDIA LIMITED
 1 x 500MW HVDC BACK-TO-BACK PROJECT
 VISAKHAPATNAM

GEC ALSTHOM
 T&D

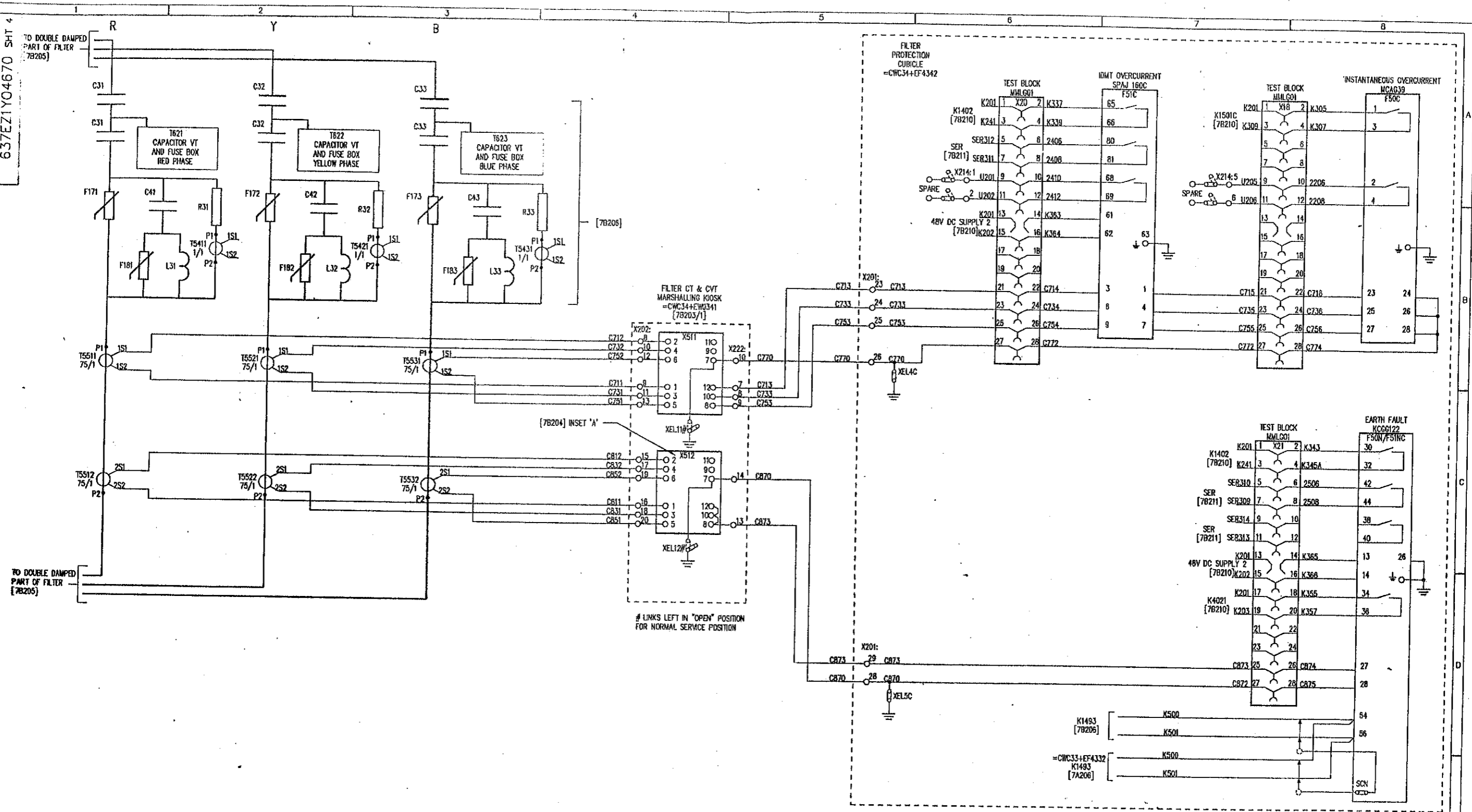
GEC ALSTHOM T&D
 Power Electronic Systems Limited
 Stratford, England

VISAKHAPATNAM
 AC HARMONIC FILTER - CWC34 PROTECTION
 CIRCUIT DIAGRAM FOR AC CIRCUITS
 ('C' TYPE PART OF COMBINED FILTER)

DRG. No. **637EZ1Y04670 SH 3** CURRENT ISSUE **E**

WHEN DUDGING DRG. No. STATE CURRENT ISSUE
 CUSTOMER: POWERGRID
 CHECKED No. CF0138

DRG. No. 637EZ1Y04670 SHT 4



REFER 637EZ1Y04594 FOR FILE INDEX (7B201)
 REFER (7B203) FOR LOCATION AND DEVICE LIST
 REFER (2A025) FOR PROTN SINGLE LINE DIAGRAM

ISSUE C	PRJ A	PSG B	DATE 13-08-97	REVISION TO EXISTING RELAY FROM PS/INC CHANGED. WIRE NOS 4500 & 4501 ADDED. WIRE NOS 2610 & 2612 DELETED. 98 99
	ISSUE B	DATE 06-08-97		
	ISSUE A	DATE 13-08-97		
LOCATION VISA4173	REVISED TO ENDBOX. CT REFERENCES AMENDED.			

AS BUILT DWG
 14 APR 2000
VISAKHAPATNAM

GEC ALSTHOM T&D
 Power Electronic Systems Limited
 CERTIFIED FOR MANUFACTURE
 NAME: B T BARRETT
 DEPT. 738 DATE: 5/8/97
 SIGNED BTB

THIRD ANGLE PROJECTION
 ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED
 DRAWING TO BS308 UNLESS OTHERWISE STATED
 FOR THE STANDARD OF ACCURACY OF ALL UNDIMENSIONED DIMENSIONS SEE SPECN. STAND/023/PROO
 IF IN DOUBT ASK
 DRAWN JCP
 CVD PNS
 APP'D RFR
 TRACED
 DESIGN APP'D PRJ

FILE 7B207

POWER GRID CORPORATION OF INDIA LIMITED
 1 x 500MW HVDC BACK-TO-BACK PROJECT
 VISAKHAPATNAM

GEC ALSTHOM
 T&D

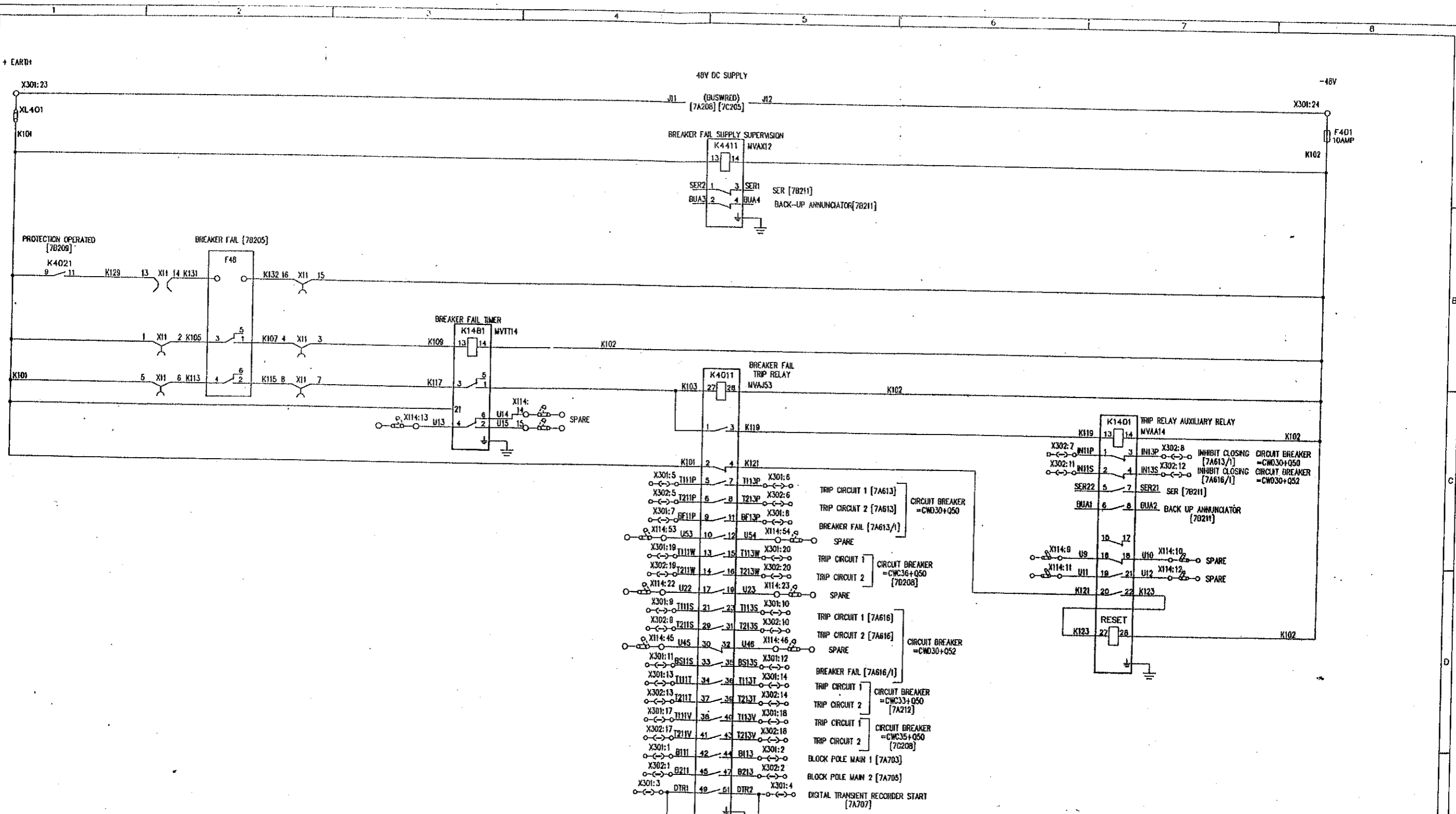
GEC ALSTHOM T&D
 Power Electronic Systems Limited
 Sharnbrook, England

TITLE
VISAKHAPATNAM AC HARMONIC FILTER =CWC34 PROTECTION CIRCUIT DIAGRAM FOR AC CIRCUITS (C TYPE PART OF COMBINED FILTER)

DRG. No. 637EZ1Y04670 SHT 4 OF 4
 CURRENT ISSUE C

WHEN QUOTING DRG. No. STATE CURRENT ISSUE
 CUSTOMER POWERGRID CORP OF INDIA ORDER No. CF01_6

Dwg. No. 637EZ1Y04671 SHT 1



REFER 637EZ1Y04594 FOR FILE INDEX [70201]
REFER [70202] FOR LOCATION AND DEVICE LIST

ALL EQUIPMENT IS LOCATED IN FILTER PROTECTION CUBICLE =CWC34+EF3341 EXCEPT WHERE INDICATED

C.A.D. DATA	ISSUE	DATE	BY	CHKD	PREM
B	13	08	BT	BT	BT
LOCATION	VISA2261				

REVISED TO ECR39422 & 8446-
REMOVED R111 FROM K1481/14
CHANGED FILE REF'S FROM 7A613
& 7A616 ON X301:8, X302:8
& X301:12, X302:12

AS BUILT DWG
14 APR 2000
VISAKHAPATNAM

GEC ALSTHOM 100
Power Electronics, Systems Limited
CERTIFIED FOR
MANUFACTURE

NAME: B T BARRETT
DEPT: 739 DATE: 5/8/97
SIGNED: BTB

THIRD ANGLE
PROJECTION

IF IN DOUBT
ASK

ALL DIMENSIONS
IN MILLIMETRES
UNLESS OTHERWISE STATED

DRAWING TO ESSOB
UNLESS OTHERWISE STATED

FOR THE STANDARD OF
ACCURACY OF ALL
DIMENSIONS
SEE SPECN. STAND/023/PROC

DRAWN JCP
CHKD PNS
APP'D RFR
SCALE
TRACED
DESIGN APP'D PRJ

FILE 7B208

POWER GRID CORPORATION OF INDIA LIMITED
1 x 500MW HVDC BACK-TO-BACK PROJECT
VISAKHAPATNAM

GEC ALSTHOM
T&D

GEC ALSTHOM T&D
Power Electronic Systems Limited
Sharnbrook, England

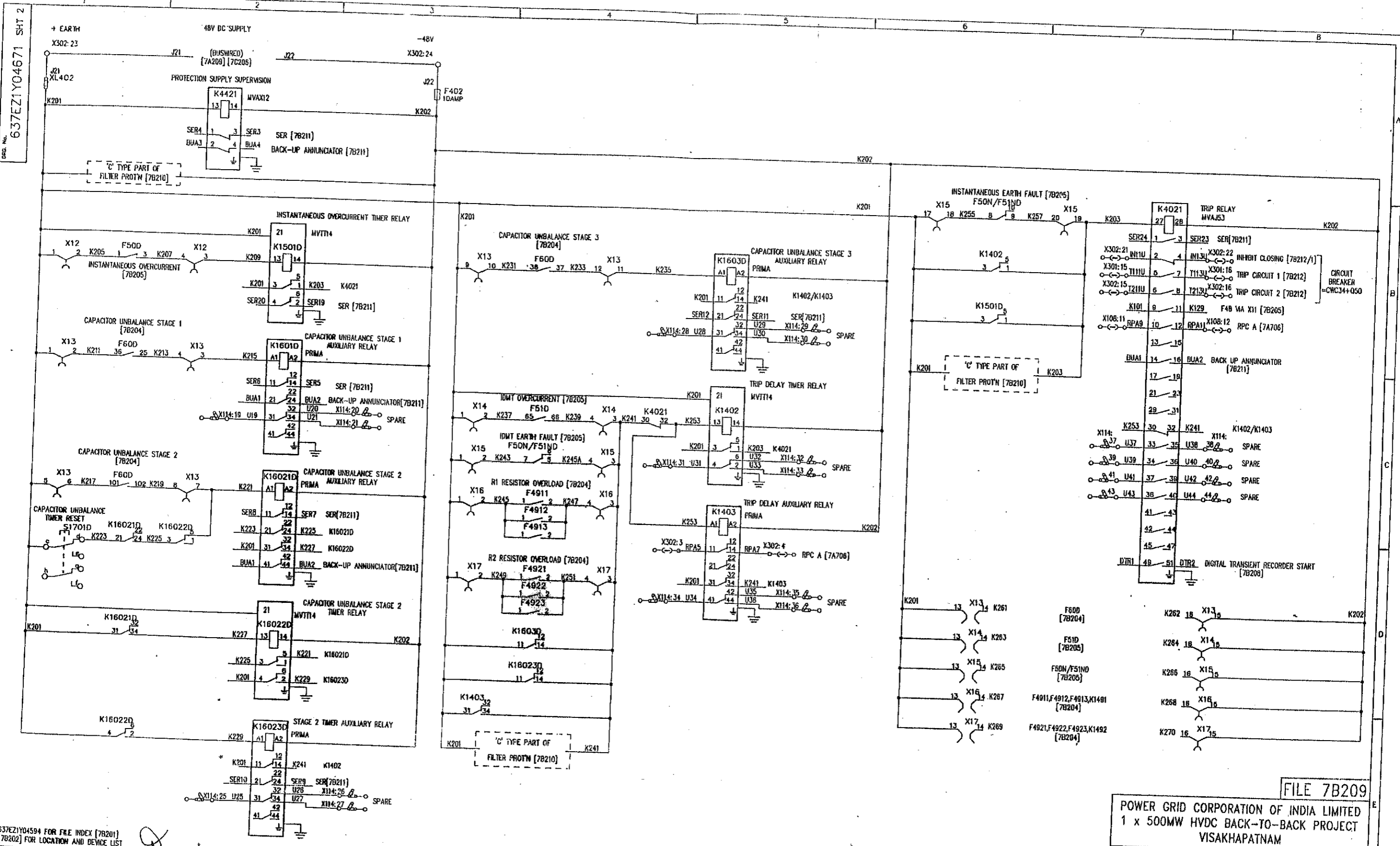
VISAKHAPATNAM
AC HARMONIC FILTER =CWC34 PROTECTION
CIRCUIT DIAGRAM FOR
DC CIRCUITS (BREAKER FAIL PROTECTION)

DRG. No. 637EZ1Y04671 SHT 1
CURRENT ISSUE B

DO NOT SCALE PRINT

WHEN QUOTING DRG. No. STATE CURRENT ISSUE

CUSTOMER POWERGRID ORDER No. CF0136



REFER 637E21Y04594 FOR FILE INDEX [7B201]
REFER [7B202] FOR LOCATION AND DEVICE LIST

ISSUE	A	B	PRJ
DATE	13	13	RFR
TIME	08	07	PBCM
LOCATION	97	98	

REVISOR: BJC
DATE: 25/08/99
REASON: TO ENHANCE SERVA WERE SERVED.

AS BUILT DWG
14 APR 2000
VISAKHAPATNAM

GEC ALSTHOM T&D Power Electronic Systems Limited CERTIFIED FOR MANUFACTURE	THIRD ANGLE PROJECTION	ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED	DRAWN JCP
NAME: B T BARRETT	IF IN DOUBT ASK	DRAWING TO BS308 UNLESS OTHERWISE STATED	CHKD PNS
DEPT. 739 DATE: 5/8/97		FOR THE STANDARD OF ACCURACY OF ALL UNFINISHED DIMENSIONS SEE SPEC. STAND/023/PROC	APP'D RFR
DRAWN BTB			SCALE
			TRACED
			DESIGN APP'D PRJ

FILE 7B209

POWER GRID CORPORATION OF INDIA LIMITED
1 x 500MW HVDC BACK-TO-BACK PROJECT
VISAKHAPATNAM

GEC ALSTHOM
T&D

GEC ALSTHOM T&D
Power Electronic Systems Limited
Milton, England

VISAKHAPATNAM
AC HARMONIC FILTER - CWC34 PROTECTION
CIRCUIT DIAGRAM FOR DC CIRCUITS (PROTECTION)
(DOUBLE DAMPED PART OF COMBINED FILTER)

DRG. No. **637E21Y04671** SHT 2

CURRENT ISSUE **C**

WHEN QUOTING DRG. NO. STATE CURRENT ISSUE

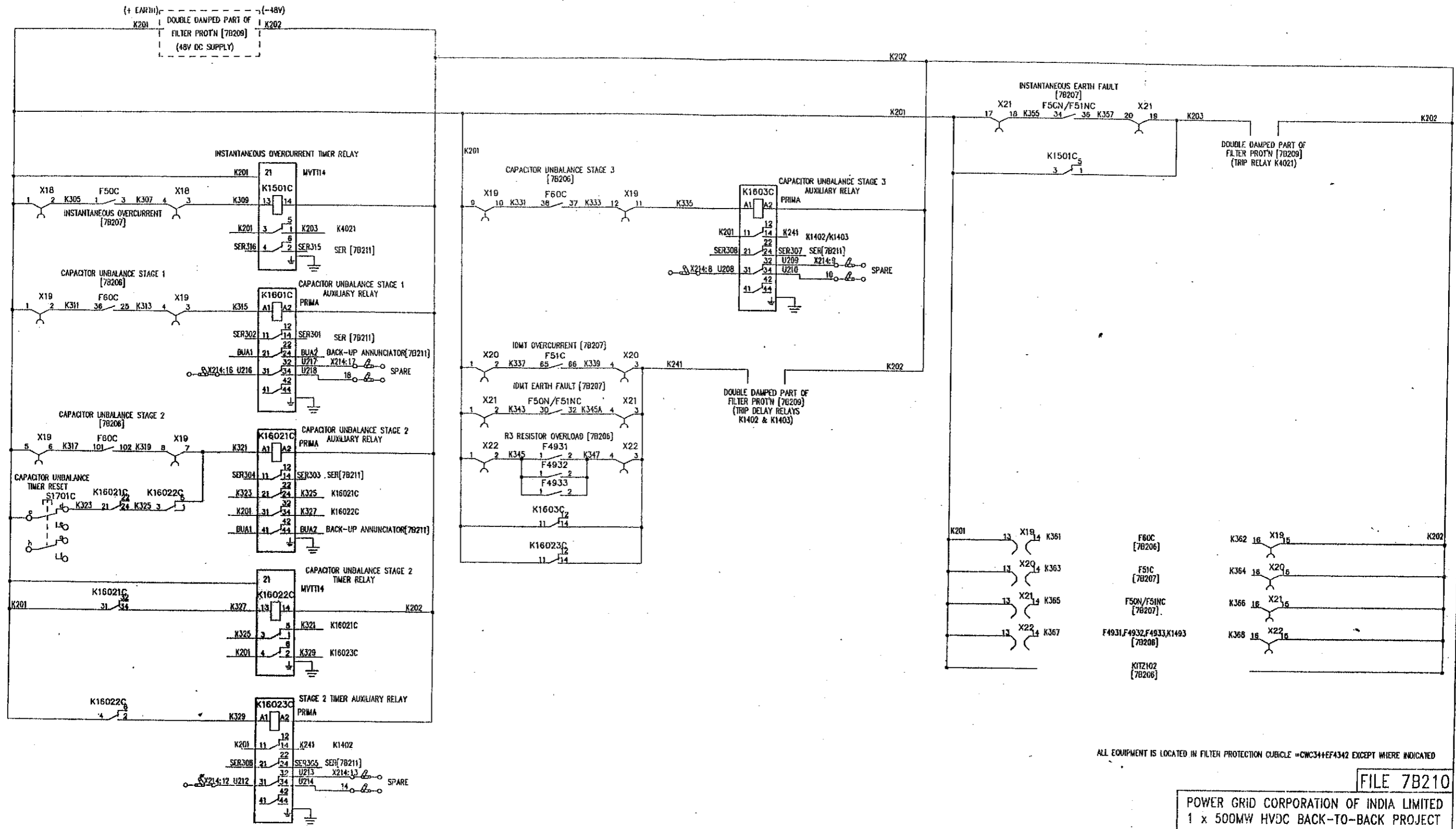
CUSTOMER: POWERGRID

ORDER No. CF0136

ALL EQUIPMENT IS LOCATED IN FILTER PROTECTION CUBICLE -CWC34+EF4341 EXCEPT WHERE INDICATED

DO NOT SCALE PRINT

Doc. No. 637EZ1Y04671 SHT 3



ALL EQUIPMENT IS LOCATED IN FILTER PROTECTION CUBICLE =CWC34+EF4342 EXCEPT WHERE INDICATED

FILE 7B210

POWER GRID CORPORATION OF INDIA LIMITED
 1 x 500MW HVDC BACK-TO-BACK PROJECT
 VISAKHAPATNAM

GEC ALSTHOM

GEC ALSTHOM T&D
 Power Electronic Systems Limited
 Skelton, England

TITLE
 VISAKHAPATNAM
 AC HARMONIC FILTER =CWC34 PROTECTION
 CIRCUIT DIAGRAM FOR DC CIRCUITS (PROTECTION)
 ('C' TYPE PART OF COMBINED FILTER)

REFER 637EZ1Y04594 FOR FILE INDEX [7B201]
 REFER [7B203] FOR LOCATION AND DEVICE LIST

ISSUE	PRJ	PRJ	PRJ
D	A	B	C
DATE	ISSUE	RFR	PREM
13/08/97	13/07/98	03/06/99	03/06/99
REVISD TO ENR402 & 85866 - ADDED X21:17-20 & F50N/F51NC DELETED R32C, R33C & WRES X210, K228. REVISD TO ENR402 RELAY F50N/F51NC TERMINALS 5, 6, 7, 8 AND REPLACED BY 30, 32 VALVES WRES Nos K201 & K202 MODIFIED. REVISD TO ENR823, BUA1&2 WERE BLANK.			

AS BUILT DWG
 14 APR 2000
VISAKHAPATNAM

GEC ALSTHOM T&D
 Power Electronic Systems Limited
 CERTIFIED FOR MANUFACTURE

NAME: B T BARRETT
 DEPT: 739 DATE: 5/8/97
 SIGNED: BTB

THIRD ANGLE PROJECTION

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED

DRAWING TO BS308 UNLESS OTHERWISE STATED

FOR THE STANDARD OF ACCURACY OF ALL UNTOLERANCED DIMENSIONS SEE SPEC. STAND/023/PRCC

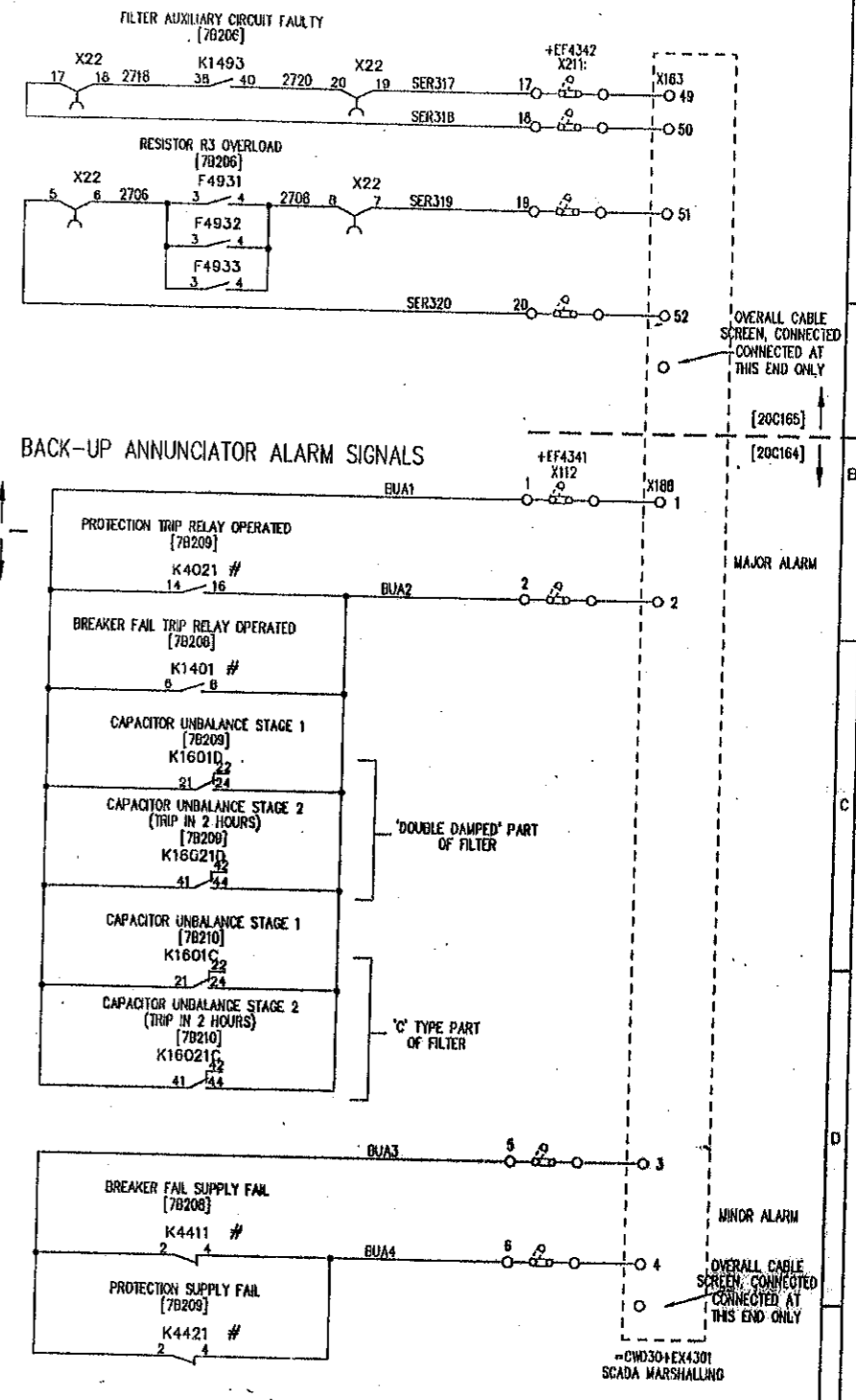
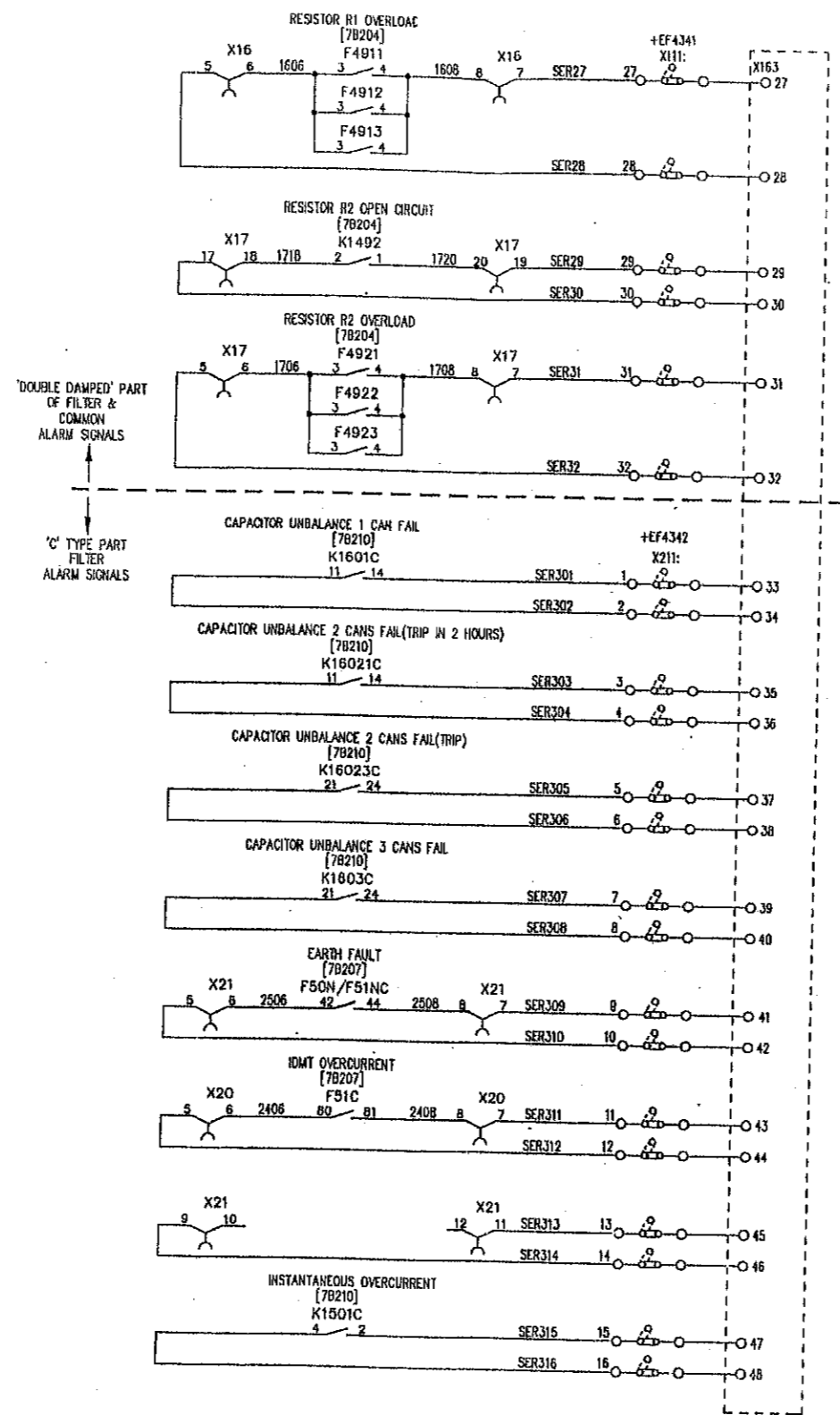
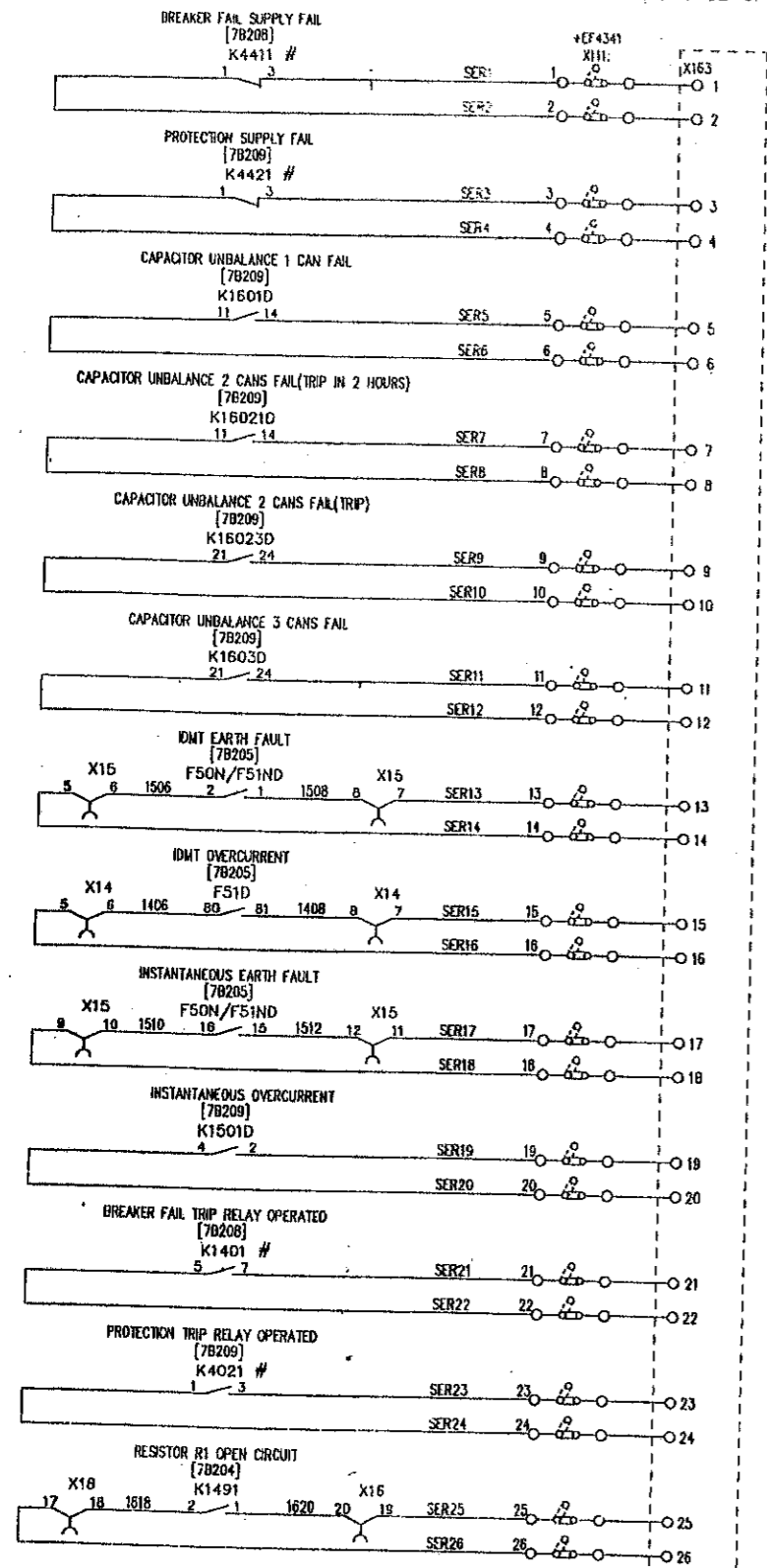
IF IN DOUBT ASK

DRAWN JCP
 CH'D PNS
 APP'D RFR
 SCALE
 TRACED
 DESGN PRJ
 APP'D

DRG. No. 637EZ1Y04671 SHT 3
 CURRENT ISSUE D

Dwg No. 637EZ1Y04672 SHT 1

SEQUENCE OF EVENTS RECORDER ALARM SIGNALS



DENOTES COMMON FILTER ALARM
 REFER 637EZ1Y04594 FOR FILE INDEX (7B201)
 REFER (7B202) FOR LOCATION AND DEVICE LIST (DOUBLE DAMPED PART)
 REFER (7B203) FOR LOCATION AND DEVICE LIST ('C' TYPE PART)

=CWD30+EX4301
 SCADA MARSHALLING
 [20C164]

=CWD30+EX4301
 SCADA MARSHALLING
 [20C165]

FILE 7B211

POWER GRID CORPORATION OF INDIA LIMITED
 1 x 500MW HVDC BACK-TO-BACK PROJECT
 VISAKHAPATNAM

GEC ALSTHOM
 T&D

GEC ALSTHOM T&D
 Power Electronic Systems Limited
 VISAKHAPATNAM
 AC HARMONIC FILTER - CWC34 PROTECTION
 CIRCUIT DIAGRAM FOR SER &
 BACK-UP ANNUNCIATOR SIGNALS

ISSUE	DATE	BY	REVISION
D	13/08/97	BTB	ISSUED FOR CONSTRUCTION
A	13/07/98	BTB	REVISED TO CONFORM WITH IEC 60384-1
B	07/07/98	BTB	REVISED TO CONFORM WITH IEC 60384-1
C	11/12/98	BTB	REVISED TO CONFORM WITH IEC 60384-1
D	03/01/99	BTB	REVISED TO CONFORM WITH IEC 60384-1

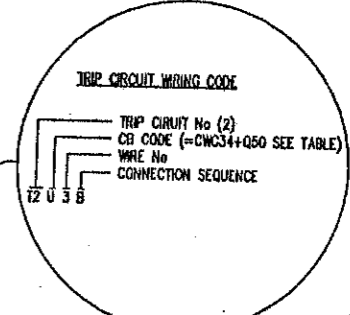
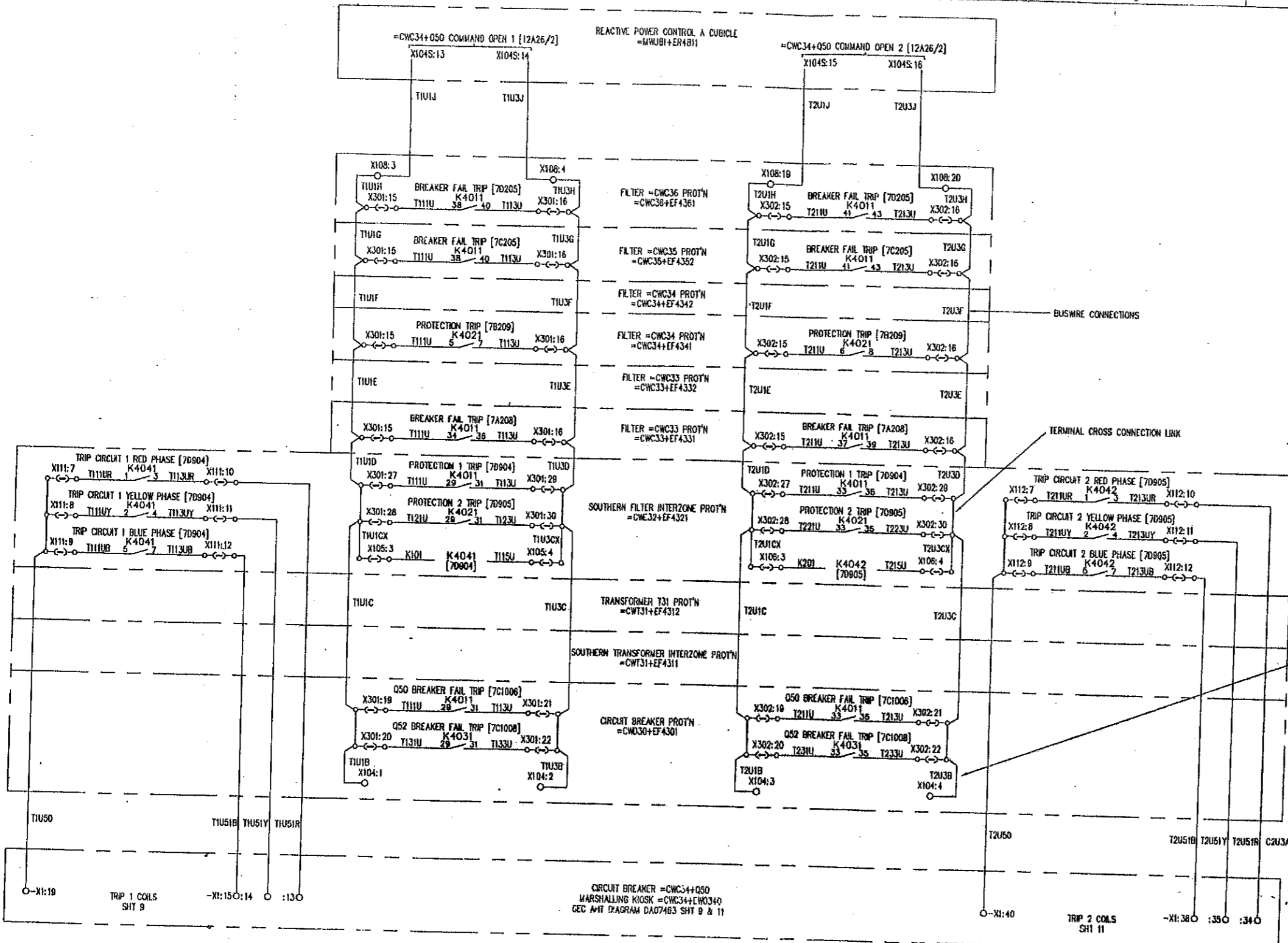
AS BUILT DWG
 14 APR 2000
 VISAKHAPATNAM

GEC ALSTHOM T&D Power Electronic Systems Limited CERTIFIED FOR MANUFACTURE	THIRD ANGLE PROJECTION	ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED	DRAWN JCP
NAME: B T BARRETT	IF IN DOUBT ASK	DRAWING TO BS308 UNLESS OTHERWISE STATED	CHECKED PNS
DEPT. 730 DATE: 5/8/97	SIGNED BTB	FOR THE STANDARD OF ACCURACY OF ALL UNDIMENSIONED DIMENSIONS SEE SPEC. STAND/023/PROG	APP'D RFR
			SCALE
			TRACED
			DESIGN PRJ
			APP'D

DWG. No. 637EZ1Y04672 SHT 1
 WHICH QUOTING DWG. No. STATE CURRENT ISSUE
 CUSTOMER POWERGRID
 ORDER No. CF0136

637E21Y04673 SHT 1

CB CIRCUIT CODE LETTER		
CB	LETTER	BUS
=CWD10+Q50	A	EAST
=CWD10+Q51	B	
=CWD10+Q52	C	
=CWD20+Q50	D	
=CWD20+Q51	E	
=CWD20+Q52	F	
=CWC23+Q50	G	
=CWC24+Q50	H	
=CWC25+Q50	J	
=CWC18+Q50	K	
=CWC29+Q50	L	SOUTH
PG REMOTE L1	M	
PG REMOTE L2	N	
=CWD30+Q50	P	
=CWD30+Q51	R	
=CWD30+Q52	S	
=CWC33+Q50	T	
=CWC34+Q50	U	
=CWC35+Q50	V	
=CWC36+Q50	W	
PG EXISTING BB1	Y	
PG EXISTING BB2	Z	



REFER 637E21Y04594 FOR FILE INDEX (78201)
REFER (78202) FOR LOCATION AND DEVICE LIST

ISSUE	DATE	BY	REVISION
A	13/08/97	JCP	ISSUED FOR CONSTRUCTION
B	26/08/97	JCP	REVISED TO CORRECT TSI WAS SHOWN AS T11 IN REFAS12
C	13/07/98	RFR	REVISED TO CORRECTS & 8468. ADDED K404 & K402 CONTACTS ADDED K404 & K402 RELAY CCT REF IN TRIP COT WIRING.
D	11/12/98	JCP	REVISED TO CORRECTS GEC ANT DIAGRAM WAS DAD2706.
E	20/01/99	JCP	REVISED TO CORRECTS TERMINATIONS MODIFIED IN LINE WITH MARKED UP PRINT.

AS BUILT DWG
14 APR 2000
VISAKHAPATNAM

GEC ALSTHOM IND Power Electronic Systems Limited CERTIFIED FOR MANUFACTURE	THIRD ANGLE PROJECTION	ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED
NAME: B T BARRETT DEPT: 739 DATE: 5/8/97 SIGNED: BTB	IF IN DOUBT ASK	DRAWING TO BS308 UNLESS OTHERWISE STATED
FOR THE STANDARD OF ACCURACY OF ALL UNTOLERANCED DIMENSIONS SEE SPECN. STAND/023/PROG		DRAWN: JCP CHKD: PNS APP'D: RFR SCALE: TRACED: DESIGN: PRJ APP'D: PRJ

FILE 7B212

POWER GRID CORPORATION OF INDIA LIMITED
1 x 500MW HVDC BACK-TO-BACK PROJECT
VISAKHAPATNAM

GEC ALSTHOM
TAG
GEC ALSTHOM T&D
Power Electronic Systems Limited
Salford, England

TITLE: **VISAKHAPATNAM AC HARMONIC FILTER =CWC34 PROTECTION CIRCUIT DIAGRAM FOR SIGNALS TO CIRCUIT BREAKER =CWC34+Q50**

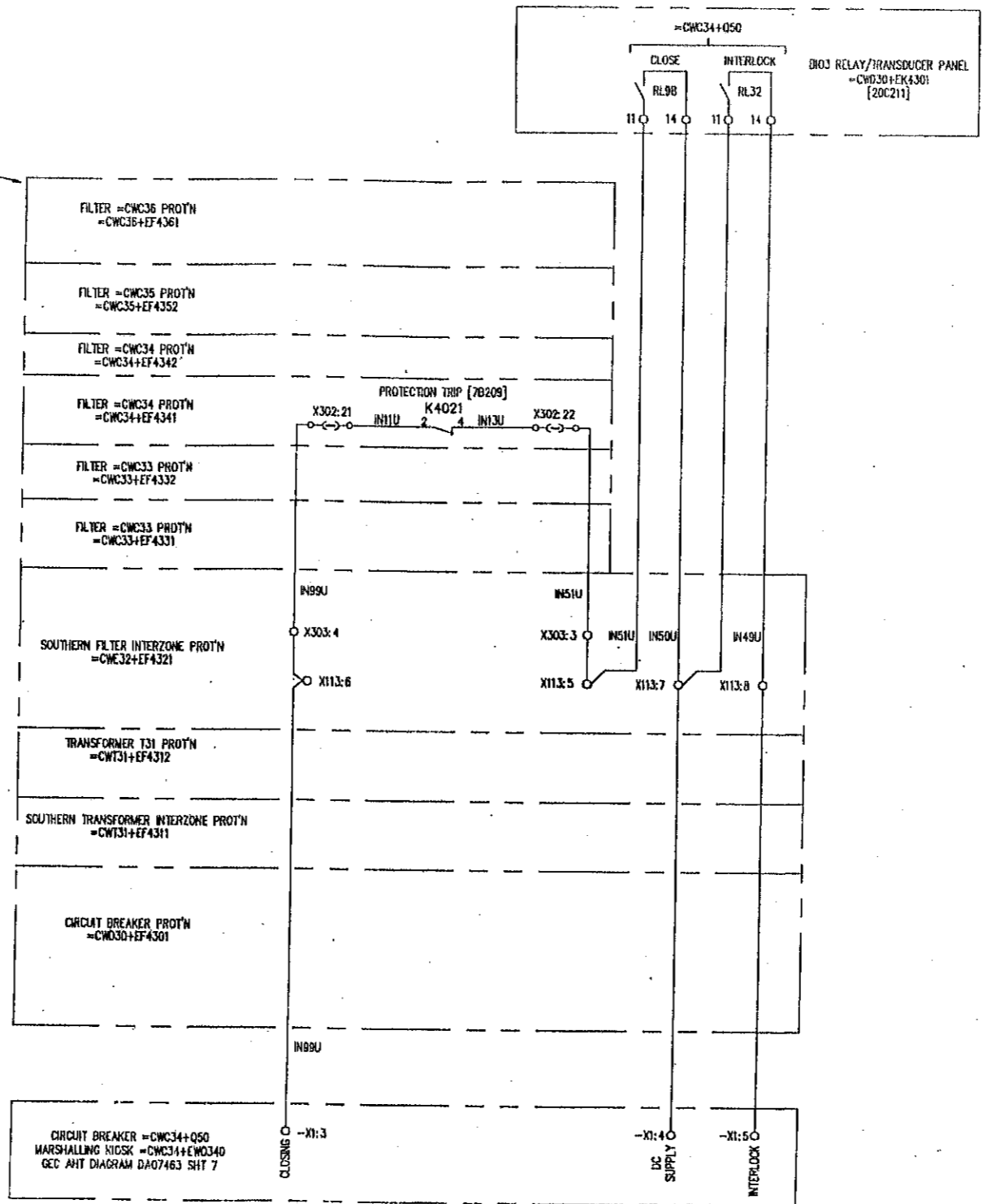
DRG. No. **637E21Y04673 SHT 1**

CUSTOMER POWERGRID

DRG. No. 637EZ1Y04673 SHT 2

CB	LETTER	BUS
=CWD10+Q50	A	
=CWD10+Q51	B	
=CWD10+Q52	C	
=CWD20+Q50	D	
=CWD20+Q51	E	
=CWD20+Q52	F	
=CWD23+Q50	G	
=CWD24+Q50	H	
=CWD25+Q50	J	
=CWD19+Q50	K	
=CWD29+Q50	L	
PG REMOTE L1	M	
PG REMOTE L2	N	
=CWD30+Q50	P	
=CWD30+Q51	R	
=CWD30+Q52	S	
=CWD33+Q50	T	
=CWD34+Q50	U	
=CWD35+Q50	V	
=CWD36+Q50	W	
PG EXISTING 001	Z	
PG EXISTING 002	Y	

SOUTHERN AC PROTECTION CUBICLE SLATE



CIRCUIT BREAKER =CWC34+Q50
MARSHALLING MDSK =CWC34+Q50340
GEC AHT DIAGRAM DA07463 SHT 7

CLOSING O -X1:3
DC SUPPLY -X1:4
INTERLOCK -X1:50

FILE 7B212/1

POWER GRID CORPORATION OF INDIA LIMITED
1 x 500MW HVDC BACK-TO-BACK PROJECT
VISAKHAPATNAM

GEC ALSTHOM
T&D

GEC ALSTHOM T&D
Power Electronic Systems Limited
Visakhapatnam
TITLE
VISAKHAPATNAM
AC HARMONIC FILTER =CWC34 PROTECTION
CIRCUIT DIAGRAM FOR
SIGNALS TO CIRCUIT BREAKER =CWC34+Q50
DRG. No.
637EZ1Y04673 SHT 2
CURRENT
ISSUE
B

REFER 637EZ1Y04594 FOR FILE INDEX (7B201)
REFER [7B202] FOR LOCATION AND DEVICE LIST

ISSUE	DATE	DESCRIPTION
B	13/07/98	DUE TO ECR8443 & BAGE- REMOVED X302:30, 31, X104-5 & 6 FROM =CWC34+EF4301. ADDED TERMINALS IN =CWC32+EF4321. DUE TO ECR8448: ADDED =CWD30+EK4301
A	13/07/98	REMOVED TO ECR8645: REMOVED =MNR81+ER4801 & TERMS X104:17 & 18. GEC AHT DIAGRAM WAS DASTOBE. FILE REF. [20C211] ADDED.

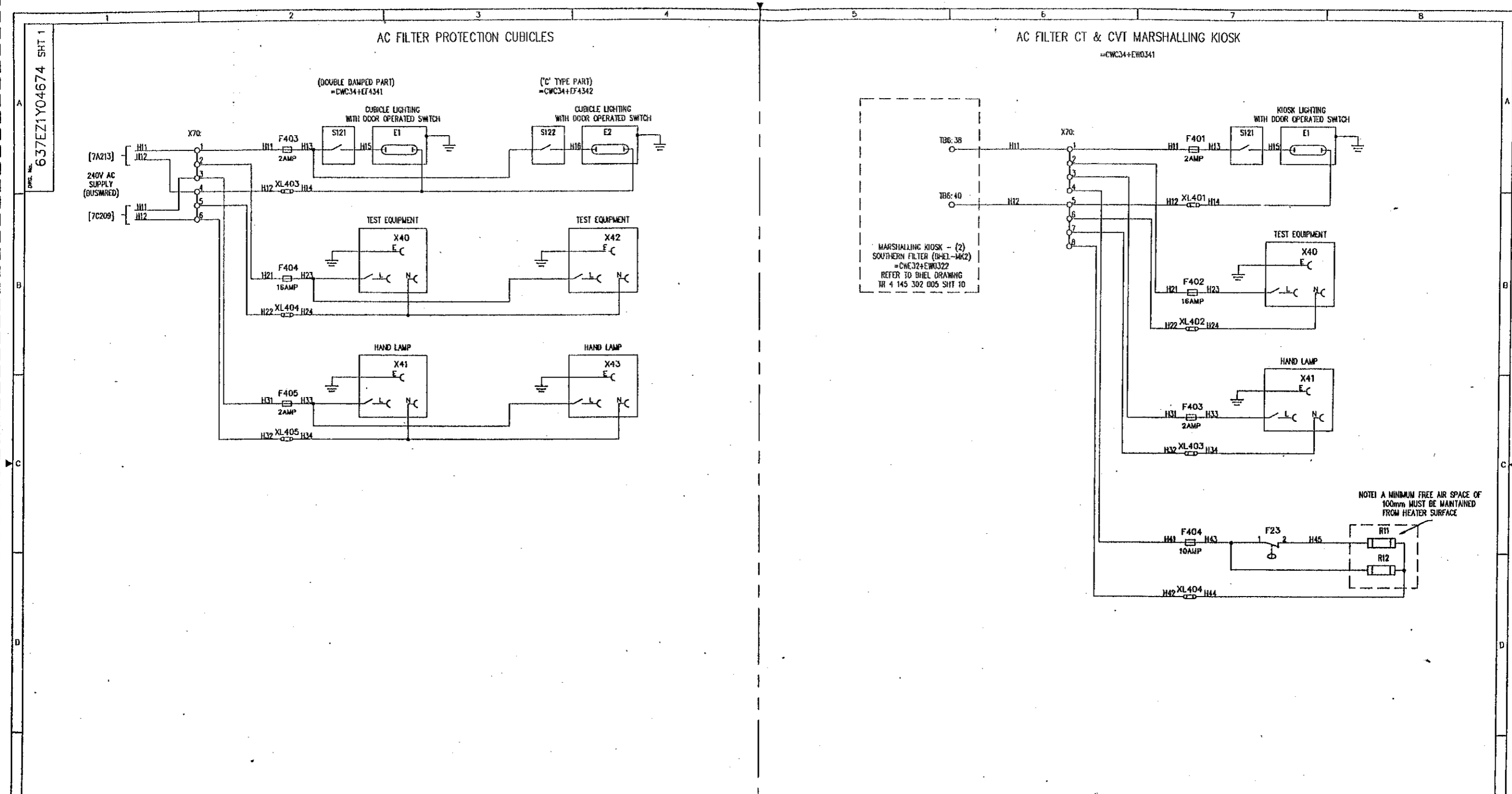
AS BUILT DWG
14 APR 2000
VISAKHAPATNAM

GEC ALSTHOM Ltd
Power Electronic Systems Limited
CERTIFIED FOR MANUFACTURE
NAME: BT BARRETT
DEPT. 739 DATE: 15/07/98
SIGNED BT BARRETT

THIRD ANGLE PROJECTION
ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED
DRAWING TO BE USED UNLESS OTHERWISE STATED
FOR THE STANDARD OF ACCURACY OF ALL UNTOLERANCED DIMENSIONS SEE SPECH. STAND/023/PROC
IF IN DOUBT ASK

DRAWN PREM
GHD RFR
APP'D RFR
SCALE
TRACES
DESIGN APP'D PRJ

DO NOT SCALE PRINT
WHEN QUOTING DRG. No. STATE CURRENT ISSUE
CUSTOMER POWERGRID
ORDER No. CF0136



REFER 637EZ1Y04594 FOR FILE INDEX (70201)
 REFER (70202) FOR LOCATION AND DEVICE LIST (DOUBLE DAMPED PART)
 REFER (70203) FOR LOCATION AND DEVICE LIST (C TYPE PART)
 REFER (70203/1) FOR LOCATION AND DEVICE LIST CT & CVT MARSHALLING KIOSK

FILE 7B213

POWER GRID CORPORATION OF INDIA LIMITED
 1 x 500MW HVDC BACK-TO-BACK PROJECT
 VISAKHAPATNAM

GEC ALSTHOM
 T&D

GEC ALSTHOM T&D
 Power Electronic Systems Limited
 Stafford, England

TITLE
 VISAKHAPATNAM
 AC FILTER =CWC34 PROTECTION
 CIRCUIT DIAGRAM FOR
 AC SUPPLIES AND CUBICLE ILLUMINATION

DRG. No.
 637EZ1Y04674 SHT 1

CURRENT ISSUE
 C

CUSTOMER POWERGRID

ORDER No. CFD136

ISSUE
 C

PRJ	A	B	C
RFR	13	13	11
PREM	08	07	12
DATE	97	98	98

REMOVED TO ENCL 634-4-1
 ADDED - ENCL 634-4-1
 REMOVED INSET A

REMOVED TO ENCL 634-4-1
 TERM Nos. 105, 35 & 40 & SHT
 No. ADDED.

AS BUILT DWG
 14 APR 2000
 VISAKHAPATNAM

GEC ALSTHOM
 T&D
 CERTIFIED FOR
 MANUFACTURE
 NAME: B T BARRETT
 DEPT. 730 DATE: 5/8/97
 SIGNED BTB

THIRD ANGLE
 PROJECTION
 IF IN DOUBT
 ASK

ALL DIMENSIONS
 IN MILLIMETRES
 UNLESS OTHERWISE STATED
 DRAWING TO BS308
 UNLESS OTHERWISE STATED
 FOR THE STANDARD OF
 ACCURACY OF ALL
 UNTOLERANCED DIMENSIONS
 SEE SPECIAL STAND/023/PROC

DRAWN JCP
 CHD PNS
 APP'D RFR
 SCALE
 TRACED
 DESIGN APP'D PRJ

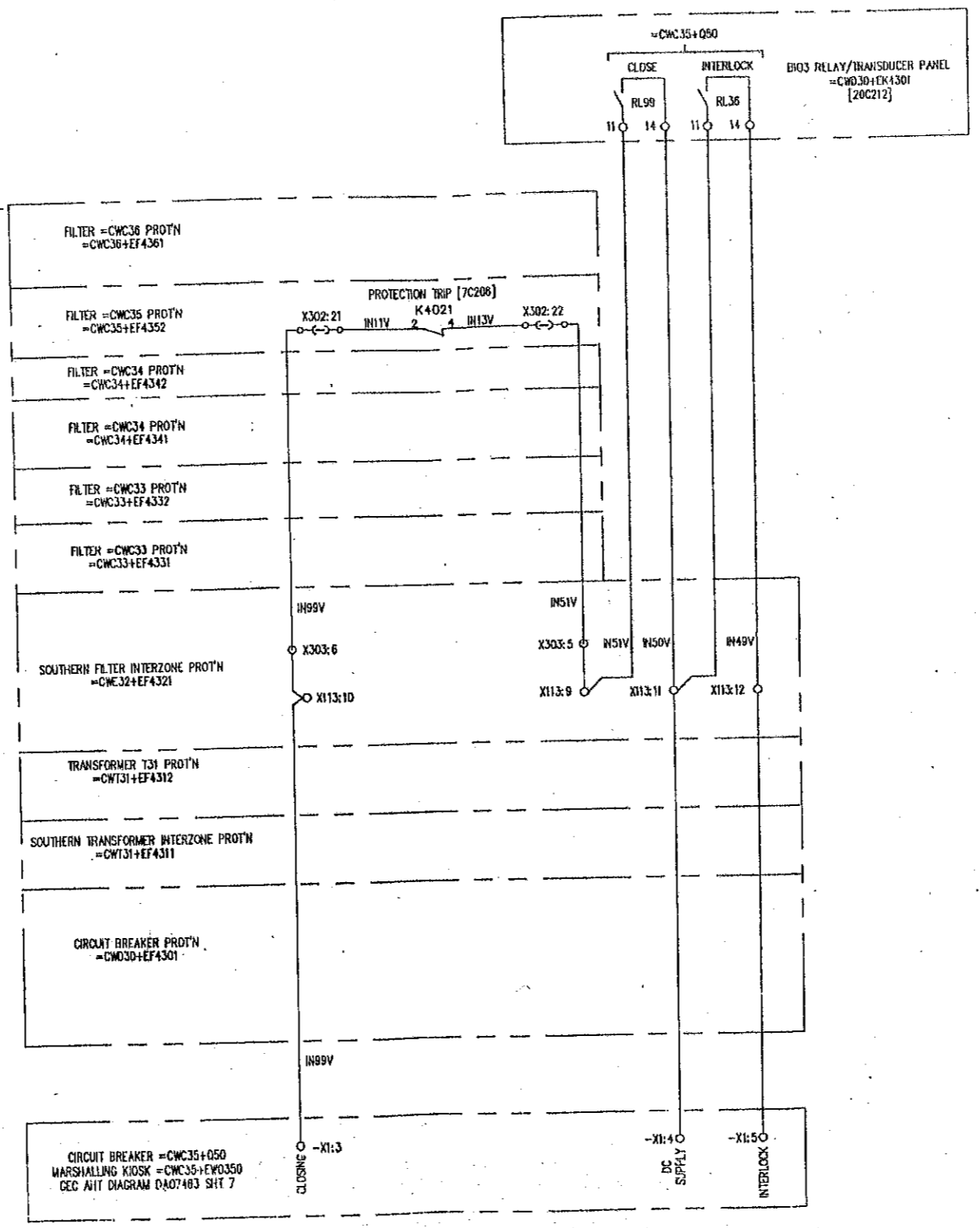
DO NOT SCALE PRINT

1 2 3 4 5 6 7 8

DRG. No. 637EZ1Y04643 SHT 2

CB	LETTER	BUS
=CWO10+050	A	
=CWO10+051	B	
=CWO10+052	C	
=CWO20+050	D	
=CWO20+051	E	
=CWO20+052	F	
=CWO23+050	G	EAST
=CWO24+050	H	
=CWO25+050	I	
=CWO19+050	J	
=CWO29+050	K	
=CWO29+050	L	
PG REMOTE L1	M	
PG REMOTE L2	N	
=CWO30+050	P	
=CWO30+051	R	
=CWO30+052	S	
=CWO33+050	T	
=CWO34+050	U	SOUTH
=CWO35+050	V	
=CWO36+050	W	
PG EXISTING DB1	X	
PG EXISTING DB2	Y	

SOUTHERN AC PROTECTION CUBICLE SUITE



REFER 637EZ1Y04595 FOR FILE INDEX [7C201]
REFER [7C202] FOR LOCATION AND DEVICE LIST

ISSUE	DATE	DESCRIPTION
A	13/07/98	ISSUE TO ECR843 & 8486 - REMOVED X303:22, X113:5 & 6 FROM =CWO30+EF4301. ADDED TERMINALS IN =CWC34+EF4321. DUE TO ECR848 - ADDED =CWO30+EK4301
B	14/07/98	REVISED TO ECR845 - REMOVED MW181-EP4811 & RELE WANT CHGRTY. RELAYS RL99 & RL36 & TERM Nos. IDENTIFIED. REC. INT. DIAGRAM WAS DA03705. ADDED FILE REF. [7C212]

AS BUILT DWG
14 APR 2000
VISAKHAPATNAM

GEC ALSTHOM T&D
Power Electronic Systems Limited
CERTIFIED FOR MANUFACTURE
NAME: BT BARRETT
DEPT: 739 DATE: 16/07/98
SIGNED: BT BARRETT

THIRD ANGLE PROJECTION
IF IN DOUBT ASK

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED
DRAWING TO BS308 UNLESS OTHERWISE STATED
FOR THE STANDARD OF ACCURACY OF ALL UNTOLERANCED DIMENSIONS SEE SPECH. STAH0/023/PROG

DRAWN PREM
CHKD RFR
APP'D RFR
SCALE
TRACED
DESIGN PRJ
APP'D

POWER GRID CORPORATION OF INDIA LIMITED
1 x 500MW HVDC BACK-TO-BACK PROJECT
VISAKHAPATNAM

GEC ALSTHOM T&D

Power Electronic Systems Limited
Surrey, England

VISAKHAPATNAM
AC HARMONIC FILTER =CWC35 PROTECTION
CIRCUIT DIAGRAM FOR
SIGNALS TO CIRCUIT BREAKER =CWC35+Q50

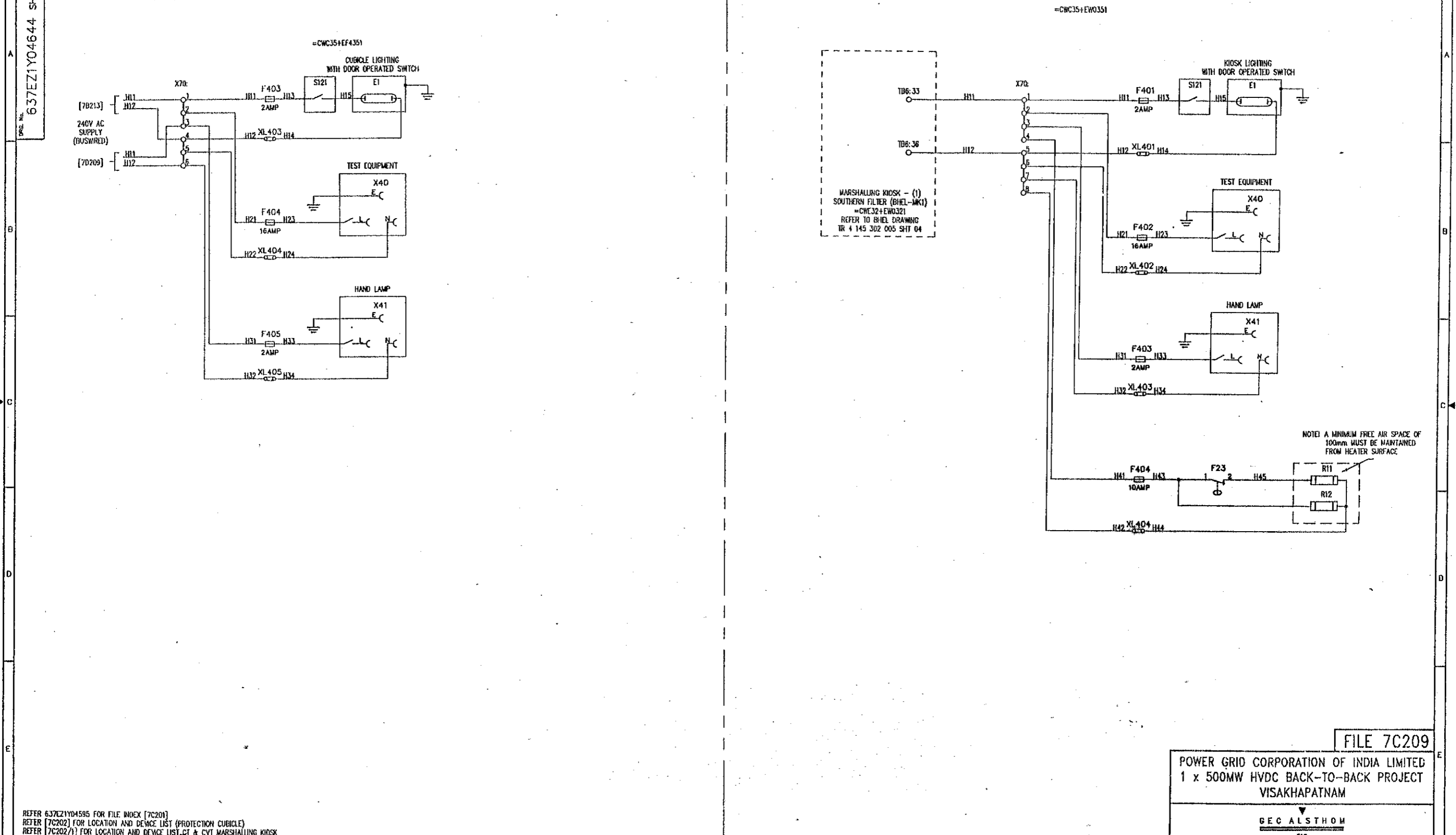
DRG. No. 637EZ1Y04643 SHT 2
CURRENT ISSUE B

WHEN QUOTING DRG. No. STATE CURRENT ISSUE
CUSTOMER POWERGRID ORDER No. CF0138

DO NOT SCALE PRINT

FILE 7C208/1

AC FILTER PROTECTION CUBICLE AC FILTER CT & CVT MARSHALLING KIOSK
=CWC35+EW0351



REFER 637EZ1Y04595 FOR FILE INDEX [7C201]
REFER [7C202] FOR LOCATION AND DEVICE LIST (PROTECTION CUBICLE)
REFER [7C202/1] FOR LOCATION AND DEVICE LIST CT & CVT MARSHALLING KIOSK

ISSUE C	PRJ A	REVISED TO ECR00484- ADDED =CWC35+EW0351 REMOVED INSET A	REVISED TO ECR00484- ADDED TERM Nos. TD6:33 & 36 ADDED TERM No. 04 P. SHT No. 04
	RFR B	DATE 12-08-97	DATE 13-07-98
NAME 637EZ1Y04644			
LOCATION VISA 3552			

AS BUILT DWG
14 APR 2000
VISAKHAPATNAM

GEC ALSTHOM
T&D
CERTIFIED FOR
MANUFACTURE

NAME: B T BARRETT
DEPT: 739 DATE: 5/8/97
SIGNED: BTB

THIRD ANGLE PROJECTION

IF IN DOUBT
ASK

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED
DRAWING TO BS308 UNLESS OTHERWISE STATED

FOR THE STANDARD OF ACCURACY OF ALL UNTOLERANCED DIMENSIONS SEE SPEC. STAND/023/PMOC

DRAWN: JCP
CHKD: PNS
APP'D: RFR
SCALE:
TRACED:
DESIGN: PRJ
APP'D:

DO NOT SCALE PRINT

FILE 7C209

POWER GRID CORPORATION OF INDIA LIMITED
1 x 500MW HVDC BACK-TO-BACK PROJECT
VISAKHAPATNAM

GEC ALSTHOM
T&D

GEC ALSTHOM T&D
Power Electronic Systems Limited
Builth, England

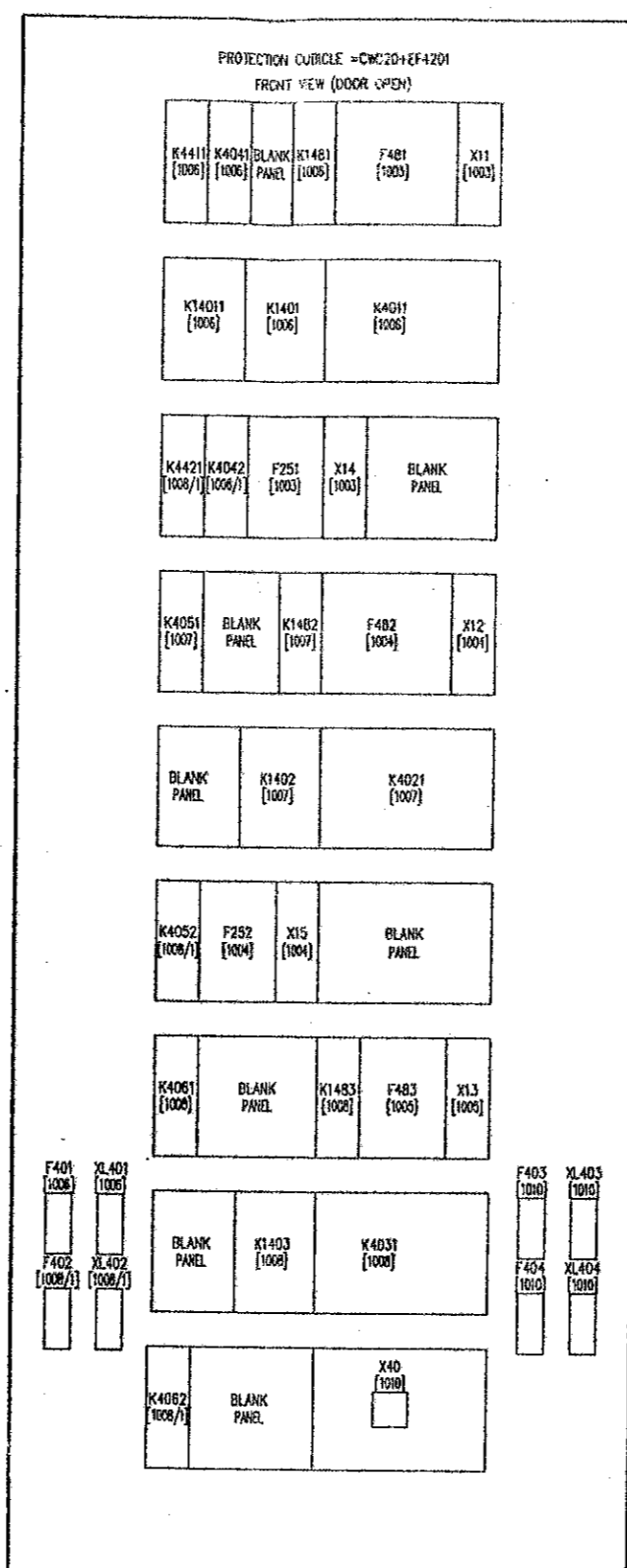
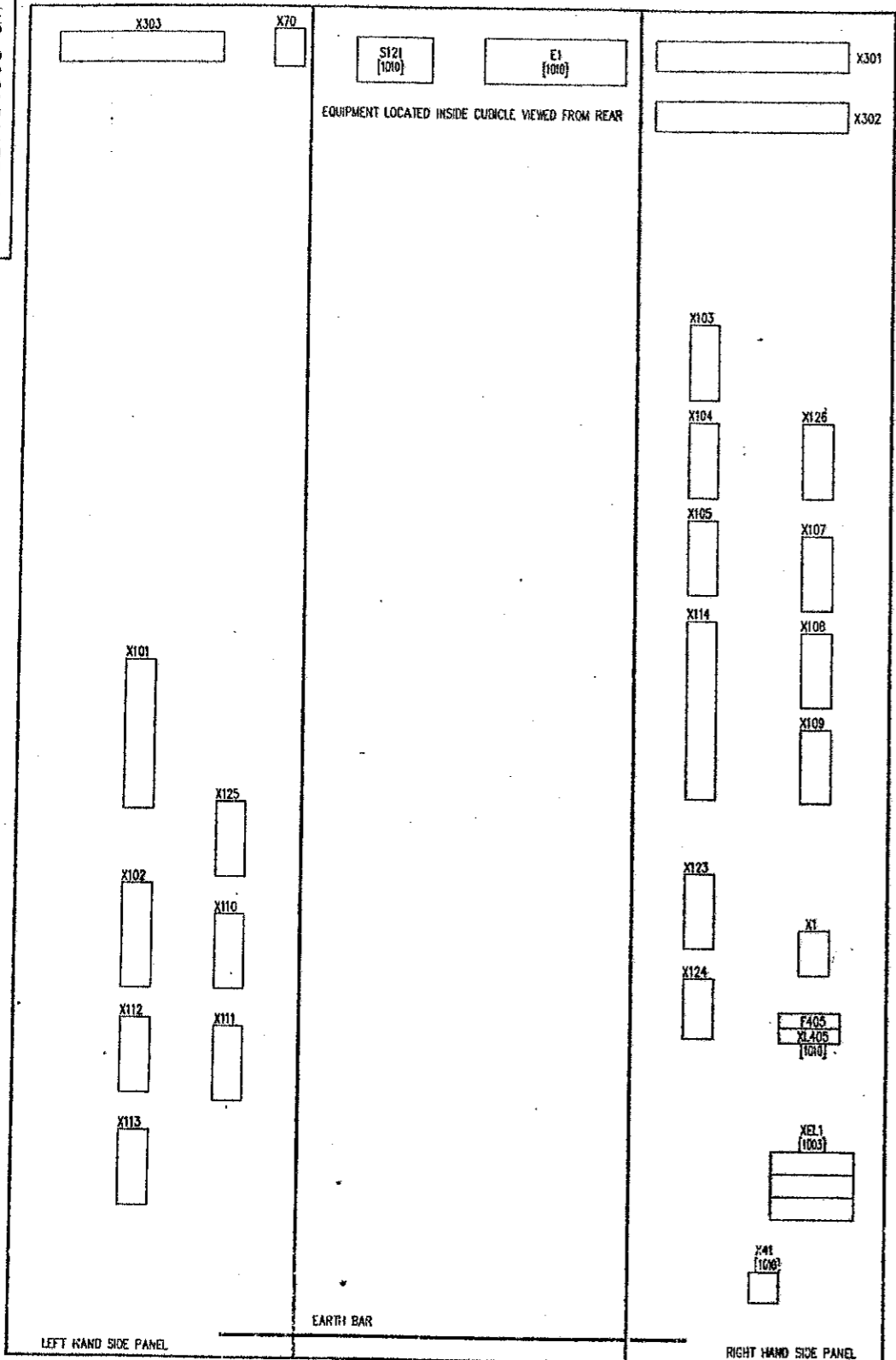
TITLE
VISAKHAPATNAM
AC FILTER =CWC35 PROTECTION
CIRCUIT DIAGRAM FOR
AC SUPPLIES AND CUBICLE ILLUMINATION

DRG. No. **637EZ1Y04644 SHT 1** CURRENT ISSUE **C**

WHEN QUOTING DRG. No. STATE CURRENT ISSUE

CUSTOMER **POWERGRID** ORDER No. **CF0136**

Dwg No. 637EZ1Y04600 SHT 2



DEVICE REF	DESCRIPTION	TYPE
K4411	BREAKER FAIL SUPPLY No 1 SUPERVISION RELAY	GECA MVAX12
K4041	Q50 TRIP RELAY 1	GECA MVA116
K1481	Q50 BREAKER FAIL TIMER (0.001-1 seconds)	GECA MYT114
F481	Q50 BREAKER FAIL CURRENT RELAY	GECA MCT140
X11	Q50 BREAKER FAIL TEST BLOCK	GECA MMLG01
K14011	Q50 TRIP RELAY AUXILIARY RELAY (FILTER)	GECA MVA114
K1401	Q50 TRIP RELAY AUXILIARY RELAY	GECA MVA114
K14011	Q50 BREAKER FAIL LOCKOUT TRIP RELAY	GECA MVAJ53
K4421	BREAKER FAIL SUPPLY No 2 SUPERVISION RELAY	GECA MVAX12
K4042	Q50 TRIP RELAY 2	GECA MVA116
F251	Q50 SYNCHRO CHECK RELAY	GECA MAVS01
X14	Q50 SYNCHRO CHECK TEST BLOCK	GECA MMLG01
K4051	Q51 TRIP RELAY 1	GECA MVA116
K1482	Q51 BREAKER FAIL TIMER (0.001-1 seconds)	GECA MYT114
F482	Q51 BREAKER FAIL CURRENT RELAY	GECA MCT140
X12	Q51 BREAKER FAIL TEST BLOCK	GECA MMLG01
K1402	Q51 TRIP RELAY AUXILIARY RELAY	GECA MVA114
K14021	Q51 BREAKER FAIL LOCKOUT TRIP RELAY	GECA MVAJ53
K4052	Q51 TRIP RELAY 2	GECA MVA116
F252	Q51 SYNCHRO CHECK RELAY	GECA MAVS01
X15	Q51 SYNCHRO CHECK TEST BLOCK	GECA MMLG01
K4081	Q52 TRIP RELAY 1	GECA MVA116
K1483	Q52 BREAKER FAIL TIMER (0.001-1 seconds)	GECA MYT114
F483	Q52 BREAKER FAIL CURRENT RELAY	GECA MCT140
X13	Q52 BREAKER FAIL TEST BLOCK	GECA MMLG01
K1403	Q52 TRIP RELAY AUXILIARY RELAY	GECA MVA114
K14031	Q52 BREAKER FAIL LOCKOUT TRIP RELAY	GECA MVAJ53
K4082	Q52 TRIP RELAY 2	GECA MVA116
XEL1	EARTH LINK FOR F481	WEIDMULLER SIL5
F401	FUSE AND HOLDER 10A, BREAKER FAIL SUPPLY No 1, 48Vdc.	GECA SC32P
XL401	LINK AND HOLDER	GECA SC32P
F402	FUSE AND HOLDER 10A, BREAKER FAIL SUPPLY No 2, 48Vdc.	GECA SC32P
XL402	LINK AND HOLDER	GECA SC32P
F403	FUSE AND HOLDER, 2A, CUBICLE LIGHTING SUPPLY, 240V, 50HZ.	GECA SC32P
XL403	LINK AND HOLDER	GECA SC32P
F404	FUSE AND HOLDER, 16A, SUPPLY FOR TEST EQUIPMENT 16A SOCKET, 240V, 50HZ.	GECA SC32P
XL404	LINK AND HOLDER	GECA SC32P
F405	FUSE AND HOLDER, 2A, FOR HAND LAMP SUPPLY 16A SOCKET, 240V, 50HZ.	WEIDMULLER KSK3P
XL405	LINK AND HOLDER	WEIDMULLER KSK3P
X40	TEST EQUIPMENT SWITCHED SOCKET TO INDIAN STANDARD	
X41	HAND LAMP SWITCHED SOCKET TO INDIAN STANDARD	
E1	CUBICLE LIGHTING	
S121	CUBICLE LIGHTING DOOR SWITCH	
X1	48VDC TERMINALS	WEIDMULLER RSE1
X70	BUSWIRE TERMINALS (240V AC SUPPLIES)	WEIDMULLER SAKON
X101	CT INPUT TERMINALS	WEIDMULLER RSE1
X102	DTR TERMINALS	WEIDMULLER RSE1
X103	=CWD20-000 TERMINALS	WEIDMULLER RSE1
X104	=CWD24-000 TERMINALS	WEIDMULLER RSE1
X105	=CWD25-000 TERMINALS	WEIDMULLER RSE1
X107	=CWD20-000 TERMINALS	WEIDMULLER RSE1
X108	=CWD20-001 TERMINALS	WEIDMULLER RSE2
X109	=CWD20-002 TERMINALS	WEIDMULLER RSE2
X110	=CWD29-000 TERMINALS	WEIDMULLER RSE2
X111	NEUTRAL LINE 1 REMOTE TERMINALS	WEIDMULLER RSE2
X112	BLOCK POLE MAIN 1 TERMINALS	WEIDMULLER RSE1
X113	BLOCK POLE MAIN 2 TERMINALS	WEIDMULLER RSE1
X114	SPARE RELAY CONTACTS TERMINALS	WEIDMULLER SAKR
X123	SEQUENCE OF EVENTS RECORDER TERMINALS	WEIDMULLER SAKR
X124	BACK UP ANNUNCIATOR TERMINALS	WEIDMULLER SAKR
X125	TRIP COIL 1 TERMINALS	WEIDMULLER RSP2
X126	TRIP COIL 2 TERMINALS	WEIDMULLER RSP2
X301	BUSWIRE TERMINALS (TRIP COIL 1 etc)	WEIDMULLER RSP2
X302	BUSWIRE TERMINALS (TRIP COIL 2 etc)	WEIDMULLER RSP2
X303	BUSWIRE TERMINALS (MISC)	WEIDMULLER RSP1/RSP2

FILE 7B1002

POWER GRID CORPORATION OF INDIA LIMITED
1 x 500MW HVDC BACK-TO-BACK PROJECT
VISAKHAPATNAM

GEC ALSTHOM
T&D

GEC ALSTHOM T&D
Power Electronic Systems Limited
Sharnbrook, England

TITLE
VISAKHAPATNAM
=CWD20 BREAKER FAIL PROTECTION
CUBICLE =CWD20+EF4201 EQUIPMENT & DEVICE LIST

DRG. No. 637EZ1Y04600 SHT 2
CURRENT ISSUE D

[1000] DENOTES FILE No 7B1000 SECTION
REFER [1001] FOR FILE INDEX

ISSUE	DATE	BY	REASON
A	11/06/97	JCP	ISSUED TO EMB/44 & 4472 - RIT/14721 & 1473 DELETED
B	12/08/97	JCP	REVISIONS TO EMB/44 & 4472 - RIT/14721 & 1473 DELETED
C	29/07/98	JCP	REVISIONS TO EMB/44 & 4472 - RIT/14721 & 1473 DELETED
D	06/08/98	JCP	REVISIONS TO EMB/44 & 4472 - RIT/14721 & 1473 DELETED
E	09/08/98	JCP	REVISIONS TO EMB/44 & 4472 - RIT/14721 & 1473 DELETED

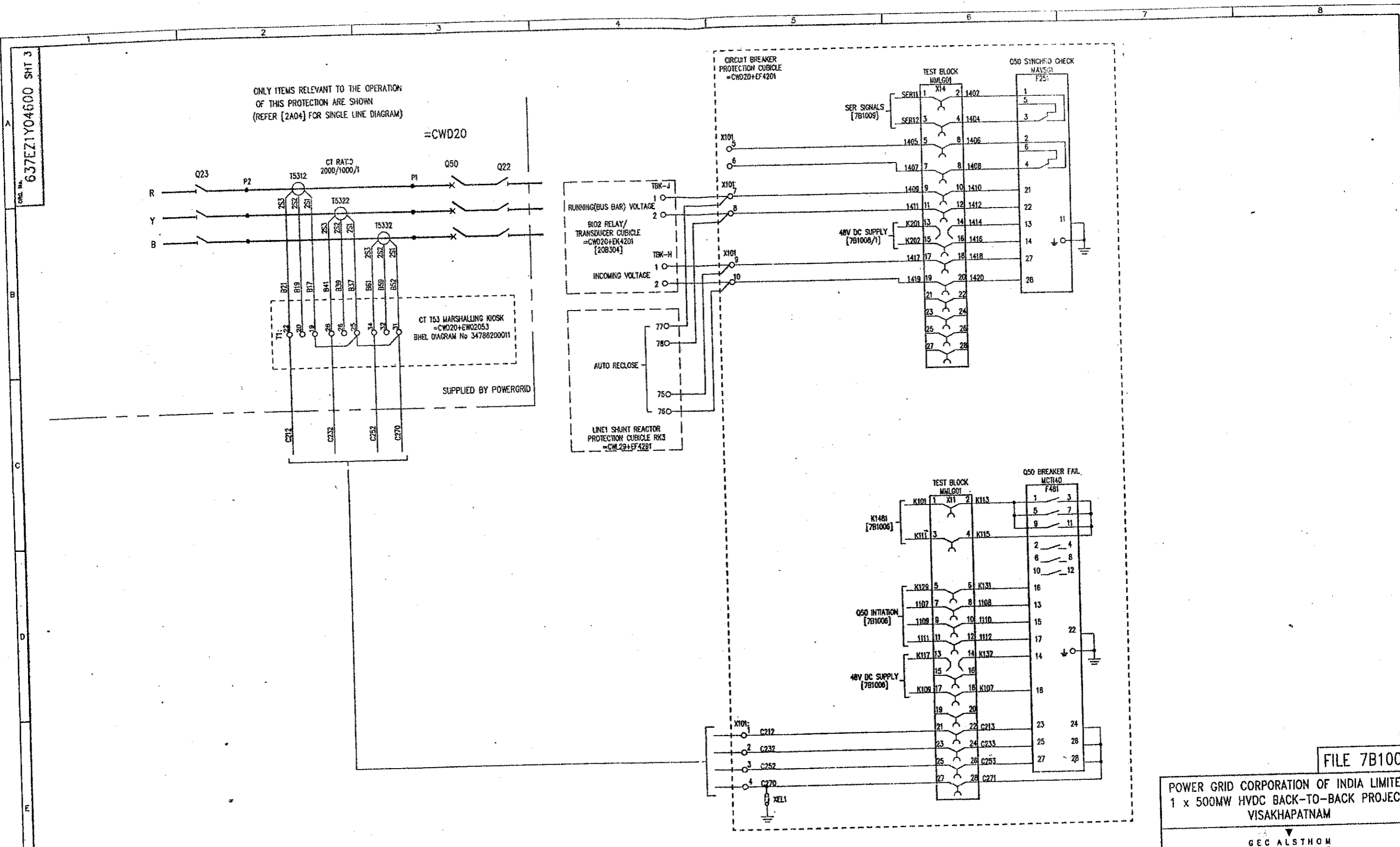
AS BUILT DWG
16 MAY 2000
VISAKHAPATNAM

GEC ALSTHOM T&D
Power Electronic Systems Limited
CERTIFIED FOR MANUFACTURE
NAME: B T BARRETT
DEPT. 739 DATE: 9/5/97
SIGNED: BTB

THIRD ANGLE PROJECTION
IF IN DOUBT ASK

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED
DRAWING TO BS308 UNLESS OTHERWISE STATED
FOR THE STANDARD OF ACCURACY OF ALL UNDIMENSIONED DIMENSIONS SEE SPECIAL STAND/003/PROG

DRAWN JCP
CHKD PMS
APP'D RFR
TRACED
DESIGN APP'D PRJ



NOTES:
 [XXXX] DENOTES FILE No OF [7B10XX] SECTION
 REFER TO [1001] FOR FILE INDEX
 REFER TO [1102] FOR LOCATION & DEVICE LIST

ISSUE	DATE	BY	CHKD	APP'D	REVISION
F	11/06/97	JCP			REVISED TO COMBAT:- 7261 ADDED 7261 CHANGED RELAY TYPE FROM K1481 TO K1481 MCT103 ALSO MODIFIED CCL REVISED TO ECH424K- ADDED =CWD20+EF4203
	12/08/97	JCP			REVISED TO E.C.N. 8645 RELEVANT WAS SPILT INCORRECTLY RELEVANT WAS SPILT INCORRECTLY WIRE WAS REVISION ON CABLE CONNECTED TO TERMINAL T1-28 FILE REF REVISED ON BRK3 R/T CUBICLE
	28/07/98	PREM			REFER TO E.C.N. 8623 LINE1 SR DETAILS AMENDED.
	05/08/98	PREM			REFER TO E.C.N. 8674 AUTO RECLOSE TERMINAL NUMBERS MODIFIED.

AS BUILT DWG
 16 MAY 2000
 VISAKHAPATNAM

GEC ALSTHOM T&D Power Electronic Systems Limited CERTIFIED FOR MANUFACTURE	THIRD ANGLE PROJECTION	ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED	DRAWN JCP CHKD PNS
NAME: B T BARRETT DEPT: 739 DATE: 9/8/97 SIGNED: BTB	IF IN DOUBT ASK	DRAWING TO BS508 UNLESS OTHERWISE STATED	APP'D RFR SCALE TRACED DESIGN PRJ APP'D

GEC ALSTHOM T&D Power Electronic Systems Limited		DRAWN JCP CHKD PNS	
GEC ALSTHOM T&D Power Electronic Systems Limited		APP'D RFR SCALE TRACED DESIGN PRJ APP'D	
TITLE VISAKHAPATNAM CIRCUIT DIAGRAM FOR AC CIRCUITS OF BREAKER FAIL PROTECTION CIRCUIT BREAKER =CWD20+Q50		CURRENT ISSUE F	
DRG. No. 637EZ1Y04600 SHT 3		ORDER No. CF0136	

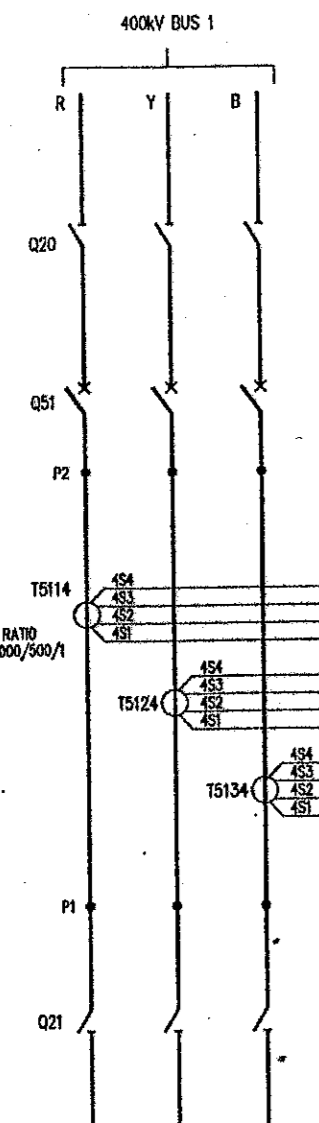
FILE 7B1003

POWER GRID CORPORATION OF INDIA LIMITED
 1 x 500MW HVDC BACK-TO-BACK PROJECT
 VISAKHAPATNAM

GEC ALSTHOM
 T&D
 GEC ALSTHOM T&D
 Power Electronic Systems Limited

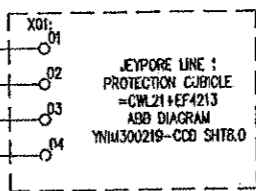
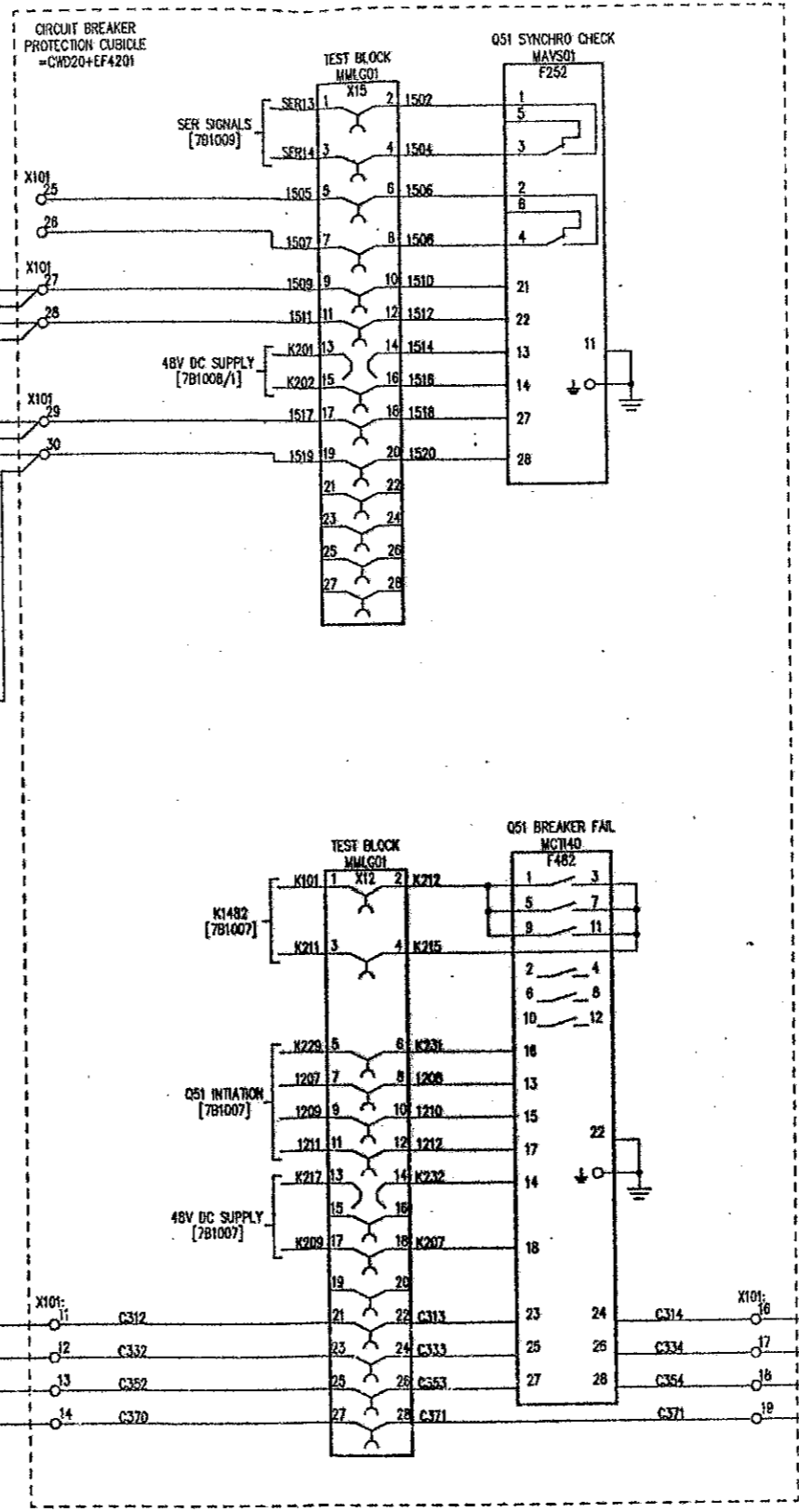
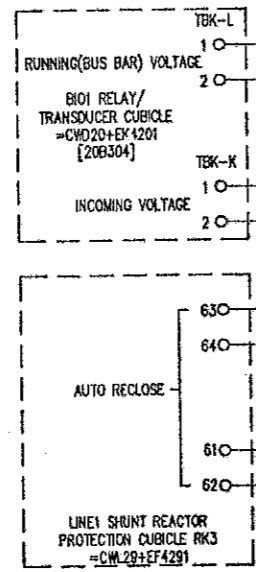
Dwg. No. 637EZ1Y04600 SHT 4

ONLY ITEMS RELEVANT TO THE OPERATION OF THIS PROTECTION ARE SHOWN (REFER [2A04] FOR SINGLE LINE DIAGRAM)



=CWD20

CT T51 MARSHALLING KOSK
=CWD20+EW02051
[SHEL DIAGRAM No 34786200011]



NOTES:
[100N] DENOTES FILE No OF [7B100N] SECTION
REFER TO [100I] FOR FILE INDEX
REFER TO [1102] FOR LOCATION & DEVICE LIST

ISSUE	PRJ	REVISED TO	PRJ	REVISED TO	PRJ	REVISED TO	PRJ	REVISED TO
F	A B C D E	CONSTRUCTION - RELAY TYPE ADDED, ALSO EARTH ADDED TO MCT109	CONSTRUCTION - RELAY TYPE FROM K482Z CHANGED RELAY TYPE FROM MCT109 ALSO MODIFIED CCT.	CONSTRUCTION - RELAY TYPE FROM K482Z CHANGED RELAY TYPE FROM MCT109 ALSO MODIFIED CCT.	CONSTRUCTION - RELAY TYPE FROM K482Z CHANGED RELAY TYPE FROM MCT109 ALSO MODIFIED CCT.	CONSTRUCTION - RELAY TYPE FROM K482Z CHANGED RELAY TYPE FROM MCT109 ALSO MODIFIED CCT.	CONSTRUCTION - RELAY TYPE FROM K482Z CHANGED RELAY TYPE FROM MCT109 ALSO MODIFIED CCT.	CONSTRUCTION - RELAY TYPE FROM K482Z CHANGED RELAY TYPE FROM MCT109 ALSO MODIFIED CCT.
DATE	11/06/97	12/08/97	23/07/98	05/01/99	05/01/99	05/01/99	25/08/99	25/08/99
NAME	JCP	JCP	JCP	JCP	JCP	JCP	JCP	JCP
LOCATION								

AS BUILT DWG
16 MAY 2000
VISAKHAPATNAM

GEC ALSTHOM IND
Power Electronic Systems Limited
CERTIFIED FOR MANUFACTURE
NAME: B T BARRETT
DEPT: 739 DATE: 9/8/97
SIGNED: BTB

THIRD ANGLE PROJECTION
IF IN DOUBT ASK
FOR THE STANDARD OF ACCURACY OF ALL UNTOLERANCED DIMENSIONS SEE SPEC. STAND/023/PROO

DRAWN JCP
CHKD PNS
APP'D RFR
SCALE
TRACED
DESIGN PRJ
APP'D

POWER GRID CORPORATION OF INDIA LIMITED
1 x 500MW HVDC BACK-TO-BACK PROJECT
VISAKHAPATNAM

GEC ALSTHOM T&D
Power Electronic Systems Limited

VISAKHAPATNAM
CIRCUIT DIAGRAM FOR
AC CIRCUITS OF BREAKER FAIL PROTECTION
CIRCUIT BREAKER =CWD20+Q51

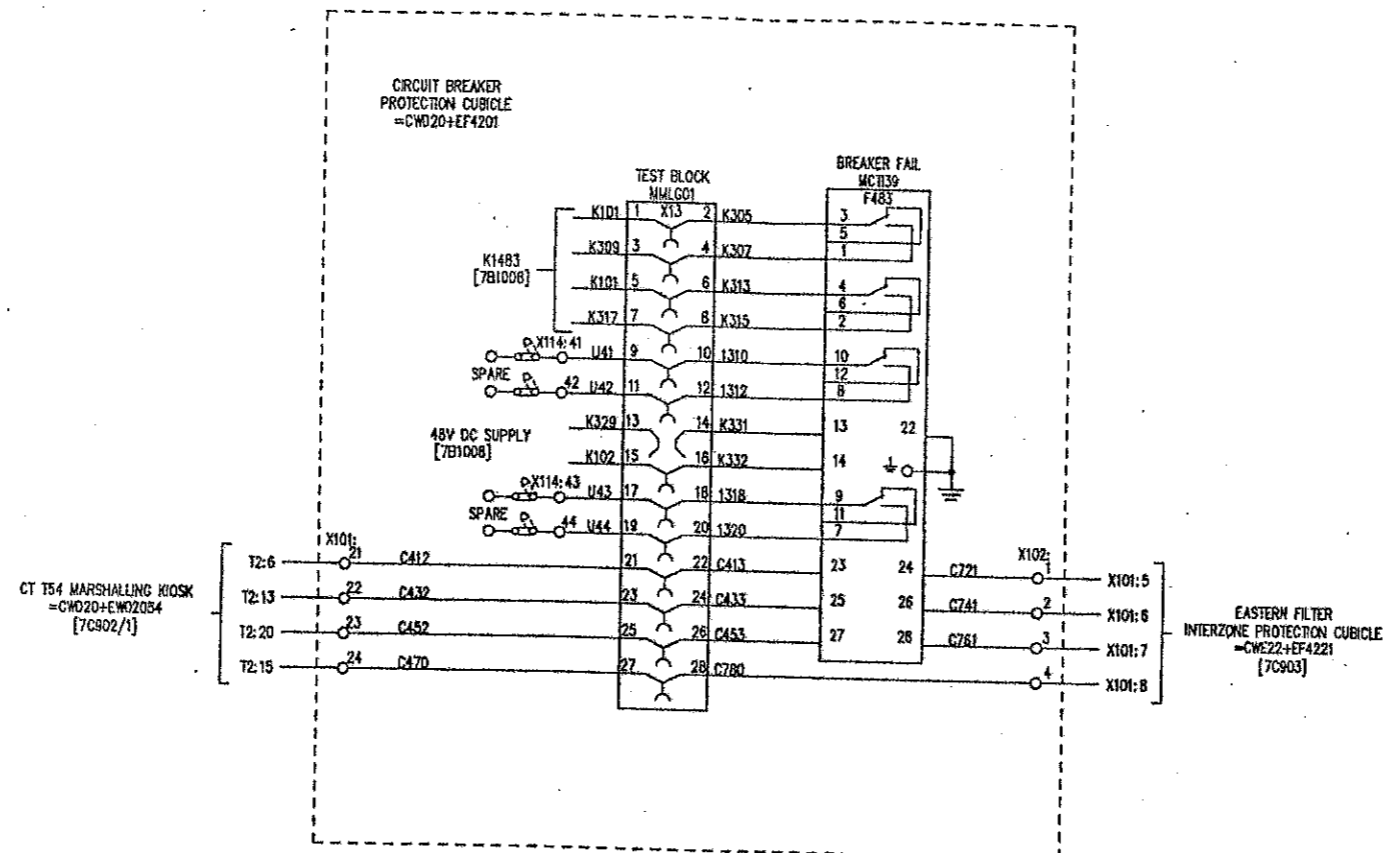
DRG. No. 637EZ1Y04600 SHT 4
CURRENT ISSUE F

FILE 7B1004

VISA4349

DO NOT SCALE PRINT

DRG. No. 637EZ1Y04600 SHT 5



NOTES:
 [1000] DENOTES FILE No. OF (7B1000) SECTION
 REFER TO [1001] FOR FILE INDEX
 REFER TO [1102] FOR LOCATION & DEVICE LIST

FILE 7B1005

POWER GRID CORPORATION OF INDIA LIMITED
 1 x 500MW HVDC BACK-TO-BACK PROJECT
 VISAKHAPATNAM

GEC ALSTHOM

GEC ALSTHOM T&D
 Power Electronic Systems Limited
 Shiford, England

VISAKHAPATNAM
 CIRCUIT DIAGRAM FOR
 AC CIRCUITS OF BREAKER FAIL PROTECTION
 CIRCUIT BREAKER =CWD20+Q52

DRG. No. 637EZ1Y04600 SHT 5
 CURRENT ISSUE D

ISSUE	PRJ	PRJ	PRJ	REVISIONS
	A	B	C	
NAME	PNS	JCP	RFR	REVISIONS
	DATE	DATE	DATE	
LOCATION	11	12	12	REVISIONS
	06	08	07	
VISA4202	97	97	98	REVISIONS

AS BUILT DWG
 16 MAY 2000
 VISAKHAPATNAM

GEC ALSTHOM T&D
 Power Electronic Systems Limited
 CERTIFIED FOR
 MANUFACTURE
 NAME: B T BARRETT
 DEPT. 739 DATE: 9/6/97
 SIGNED BTB

THIRD ANGLE PROJECTION
 ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED
 DRAWING TO BS308 UNLESS OTHERWISE STATED
 FOR THE STANDARD OF ACCURACY OF ALL UNTOLERANCED DIMENSIONS SEE SPEC. STAND/023/PROG

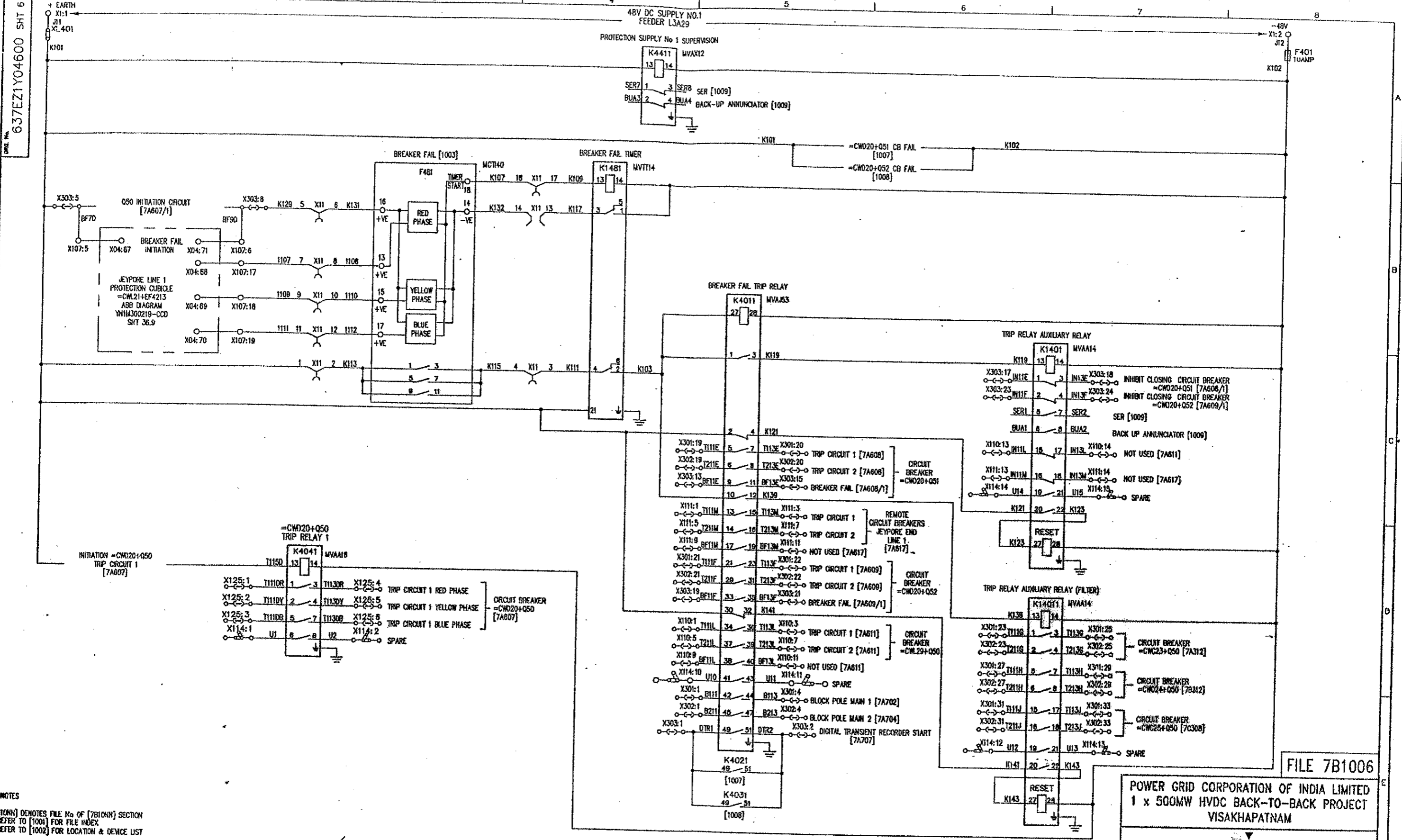
IF IN DOUBT ASK

DO NOT SCALE PRINT

DRG. No. 637EZ1Y04600 SHT 5

CURRENT ISSUE D

WHEN QUOTING DRG. No. STATE CURRENT ISSUE
 CUSTOMER POWERGRID
 ORDER No. CPO136



NOTES
 [100N] DENOTES FILE No OF [7810NN] SECTION
 REFER TO [1001] FOR FILE INDEX
 REFER TO [1002] FOR LOCATION & DEVICE LIST

FILE 7B1006

POWER GRID CORPORATION OF INDIA LIMITED
 1 x 500MW HVDC BACK-TO-BACK PROJECT
 VISAKHAPATNAM

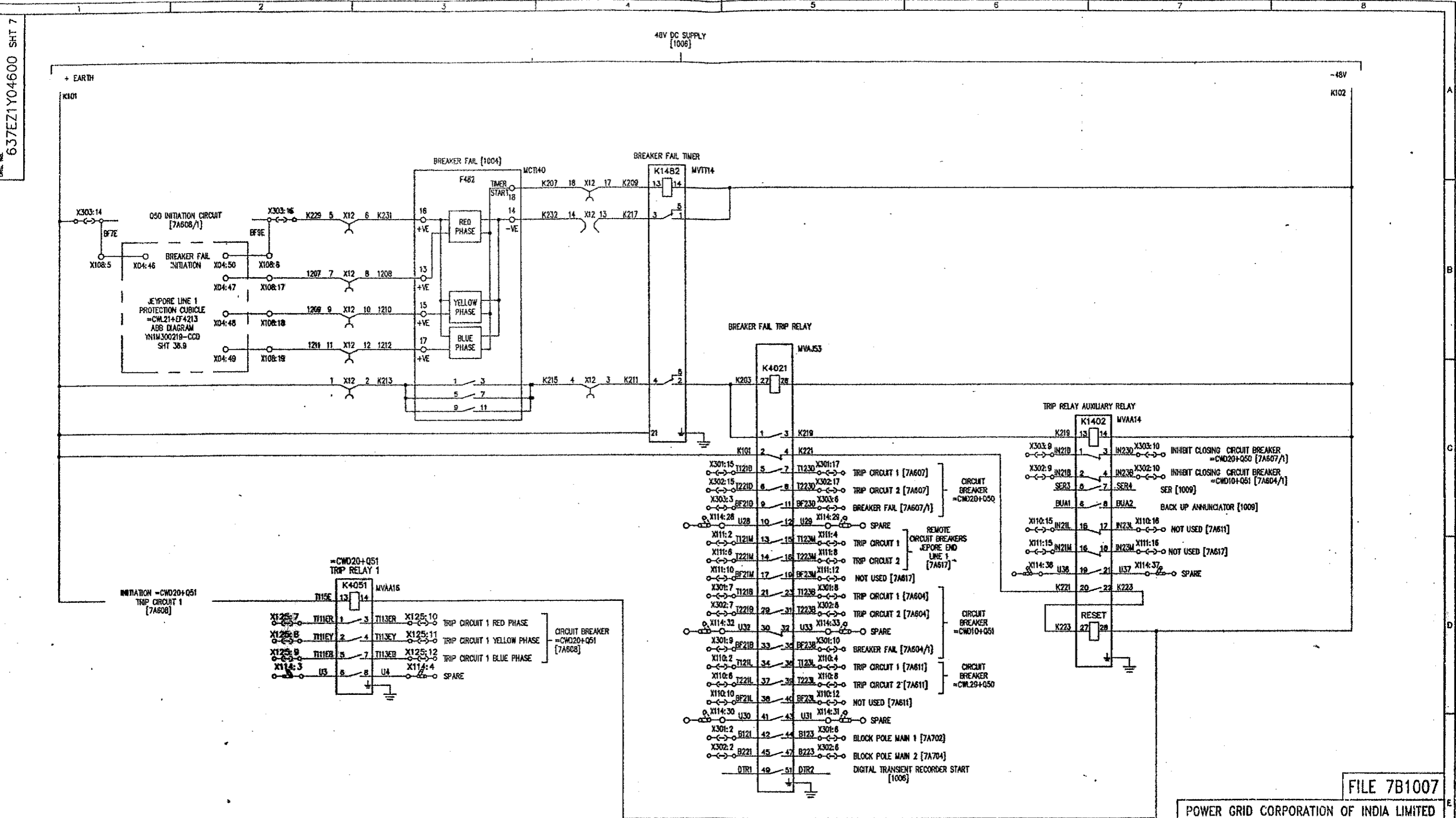
GEC ALSTHOM
 T&D

GEC ALSTHOM T&D
 Power Electronic Systems Limited
 VISAKHAPATNAM
 CIRCUIT DIAGRAM FOR
 DC CIRCUITS OF PROTECTION No 1
 CIRCUIT BREAKER =CWD20+Q50

ISSUE E	C.A.D. DATA	PRJ A	PRJ B	PRJ C	PRJ D	PRJ E	PRJ F	GEC ALSTHOM T&D Power Electronic Systems Limited CERTIFIED FOR MANUFACTURE	THIRD ANGLE PROJECTION	ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED	DRAWING TO BS508 UNLESS OTHERWISE STATED	DRAWN JCP CHK PNS APPD RFR SCALE TRACED DESIGN PRJ APPD	TITLE VISAKHAPATNAM CIRCUIT DIAGRAM FOR DC CIRCUITS OF PROTECTION No 1 CIRCUIT BREAKER =CWD20+Q50	DWA No. 637EZ1Y04600 SHT 6	CURRENT ISSUE E
		ISSUE DATE 11/06/97	PNS JCP 12/08/97	RFR PREM 29/07/98	RFR PREM 29/07/98	RFR PREM 29/07/98	RFR PREM 29/07/98								

AS BUILT DWG
 16 MAY 2000
 VISAKHAPATNAM

Dwg. No. 637E21Y04600 SHT 7



NOTES
 [1000] DENOTES FILE No. OF [781000] SECTION
 REFER TO [1001] FOR FILE INDEX
 REFER TO [1002] FOR LOCATION & DEVICE LIST

ISSUE	PRJ	PRJ	PRJ	PRJ	PRJ
A	B	C	D	E	F
DATE	ISSUE	DATE	DATE	DATE	DATE
11/08/97	12/08/97	29/07/98	13/08/98	05/01/99	01/01/99
REVISIONS - RELAY TYPES ADDED K4051 ADDED R21 BELMOPED COT BETWEEN F482 & K1482 CHANGED CHANGED TO ENBA48- CHANGED FILE REF'S FROM 7A604 & 7A605 ON X301:10, X302:10, X303:6 & 10, MADE NOT USED X110:12, 15, X111:12 & 15. CHANGED TO DIMOSTOR- CHANGED K4022:42, 44, 45 & 47 FROM SPARE US40USJ58 & US41 REFER TO E.CAL 8645 BREAKER FAIL F482 DETAIL REVISED.					

AS BUILT DWG
 16 MAY 2000
VISAKHAPATNAM

GEC ALSTHOM T&D
 Power Electronics, Systems Limited
 CERTIFIED FOR MANUFACTURE
 NAME: B T BARRETT
 DEPT: 739 DATE: 9/6/97
 SIGNED: BTB

THIRD ANGLE PROJECTION
 ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED
 DRAWING TO BS308 UNLESS OTHERWISE STATED
 FOR THE STANDARD OF ACCURACY OF ALL UNTOUCHED DIMENSIONS SEE SPEC. STAND. 023/PROC
 DRAWN: JCP
 CWD: PNS
 APP'D: RFR
 SCALE:
 TRACED:
 DESIGN: PRJ
 APP'D:

FILE 7B1007

POWER GRID CORPORATION OF INDIA LIMITED
 1 x 500MW HVDC BACK-TO-BACK PROJECT
 VISAKHAPATNAM

GEC ALSTHOM
 T&D

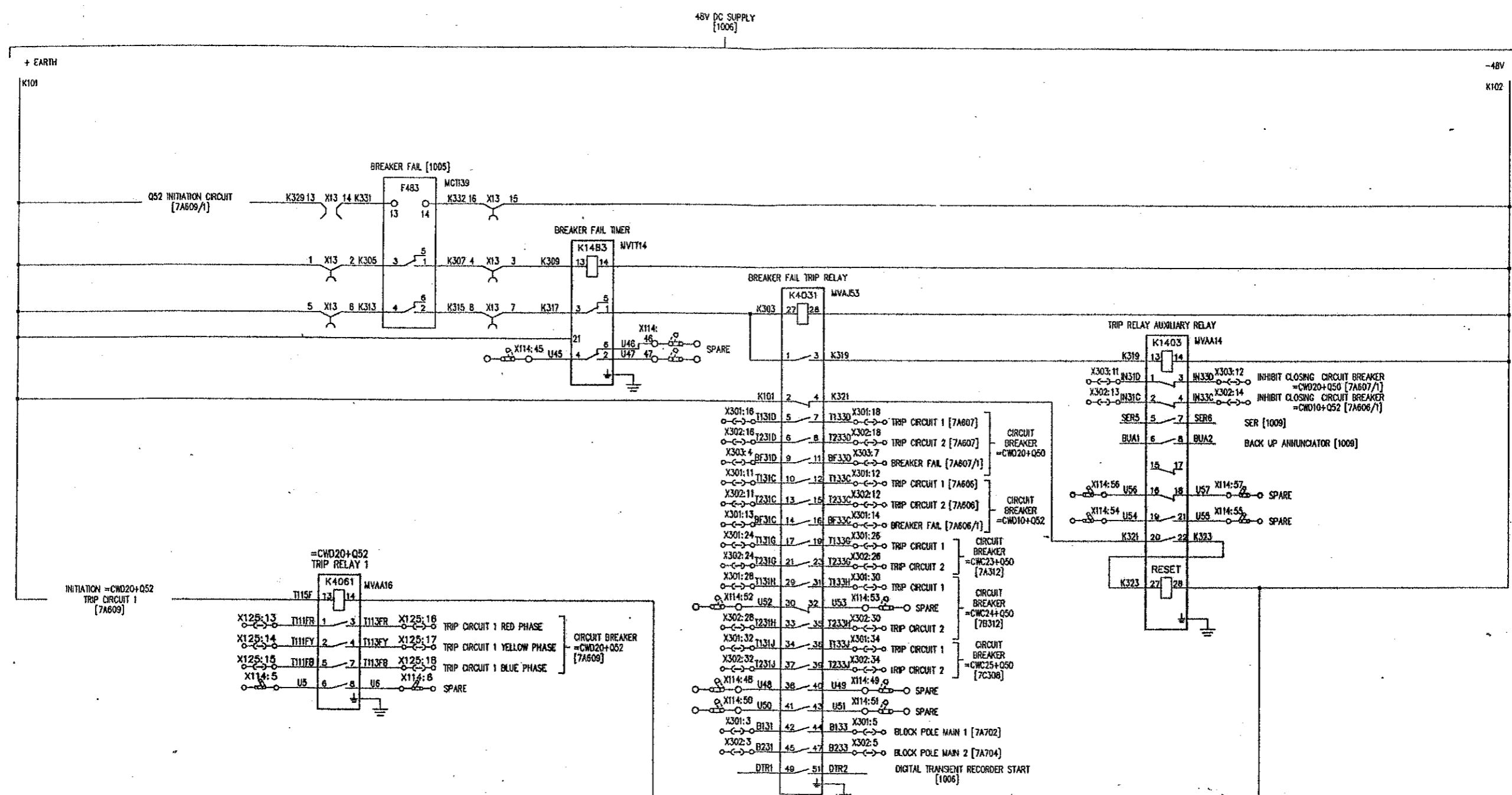
GEC ALSTHOM T&D
 Power Electronics Systems Limited
 Sharnah, England

TITLE
VISAKHAPATNAM
 CIRCUIT DIAGRAM FOR
 DC CIRCUITS OF PROTECTION No 1
 CIRCUIT BREAKER =CWD20+Q51

Dwg. No. **637E21Y04600 SHT 7**
 CURRENT ISSUE **E**

WHEN QUOTING DRG. No. STATE CURRENT ISSUE
 ORDER No. **CF0136**

637EZ1Y04600 SHT 8



NOTES
 [1000] DENOTES FILE No OF [781000] SECTION
 REFER TO [1001] FOR FILE INDEX
 REFER TO [1002] FOR LOCATION & DEVICE LIST

FILE 7B1008

POWER GRID CORPORATION OF INDIA LIMITED
 1 x 500MW HVDC BACK-TO-BACK PROJECT
 VISAKHAPATNAM

GEC ALSTHOM
 T&D

GEC ALSTHOM T&D
 Power Electronic Systems Limited
 Sharnbrook, England

VISAKHAPATNAM
 CIRCUIT DIAGRAM FOR
 DC CIRCUIT BREAKERS OF PROTECTION No 1
 CIRCUIT BREAKER =CWD20+Q52

DRG. No. 637EZ1Y04600 SHT 8
 CURRENT ISSUE: D

C.A.D. DATA	PRJ A	PRJ B	PRJ C
ISSUE D	PNS JCP	RFR PRM	RFR PRM
NAME	DATE 11/06/97	DATE 28/07/98	DATE 28/07/98
LOCATION VISA3045	REVISIONS - RELAY TYPES ADDED	REVISIONS TO EMBARC & 8473- K4061 ADDED R31 REMOVED	REVISIONS TO EMBARC - CHANGED FILE REF'S FROM 7A606 & 7A607 ON X301:14, X302:14 & X303:7, 12

REVISIONS TO EMBARC & 8473- K4061 ADDED R31 REMOVED	REVISIONS TO EMBARC - CHANGED FILE REF'S FROM 7A606 & 7A607 ON X301:14, X302:14 & X303:7, 12	REVISIONS TO DIMASTOK - CHANGED X301:5 & X302:5 TO X301:5 & X302:5
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AS BUILT DWG
 16 MAY 2000
 VISAKHAPATNAM

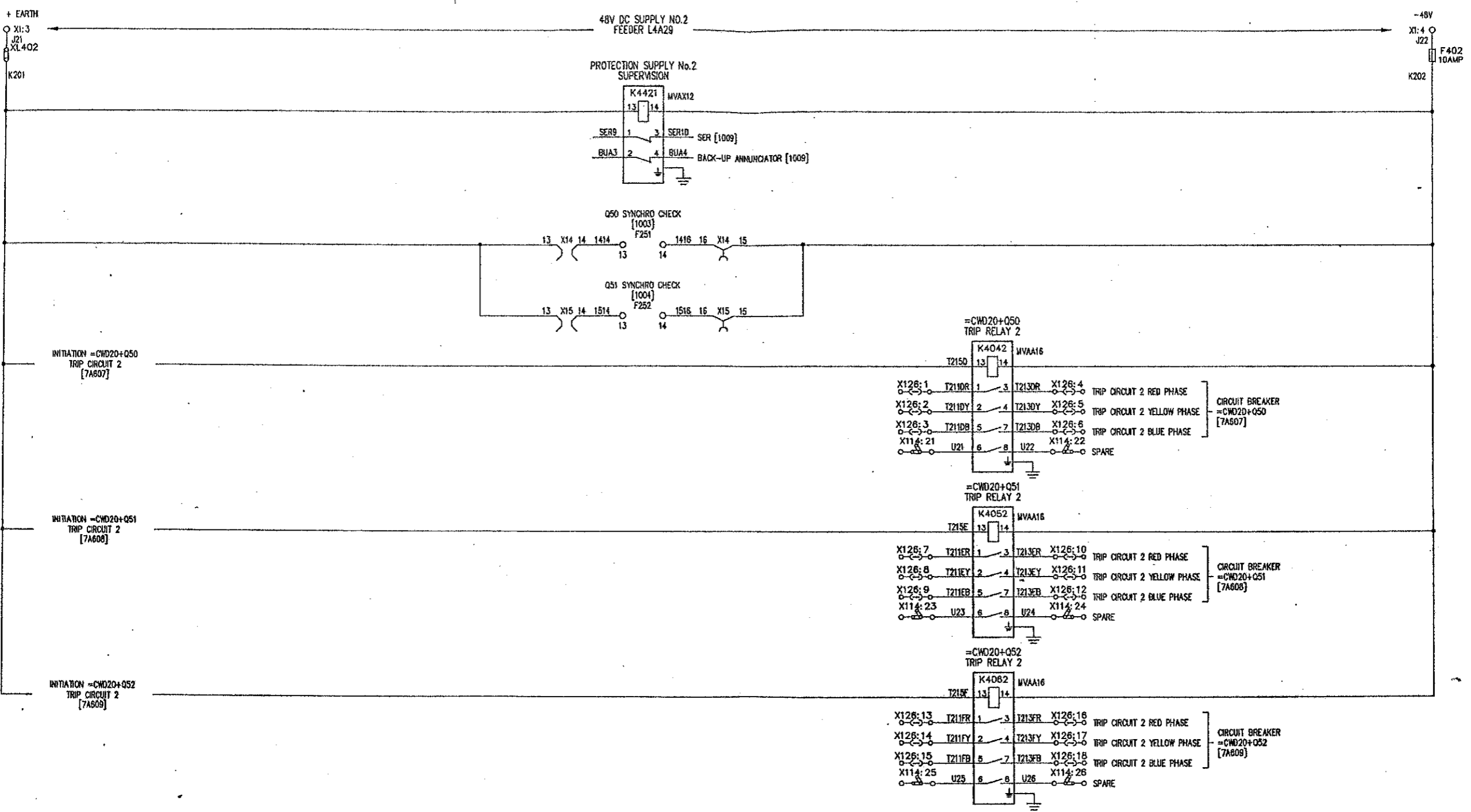
GEC ALSTHOM T&D
 Power Electronic Systems Limited
 CERTIFIED FOR MANUFACTURE
 NAME: B T BARRETT
 DEPT. 739 DATE: 9/8/97
 SIGNED: BTB

THIRD ANGLE PROJECTION
 ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED
 DRAWING TO BS308 UNLESS OTHERWISE STATED
 FOR THE STANDARD OF ACCURACY OF ALL UNTOLERANCED DIMENSIONS SEE SPEC. STAND/023/PROC
 IF IN DOUBT ASK

DRAWN JCP
 CWD PNS
 APP'D RFR
 SCALE
 TRACED
 DESIGN PRJ
 APP'D

DO NOT SCALE PRINT
 WHEN QUOTING DRG. No. STATE CURRENT ISSUE
 CUSTOMER POWERGRID
 Dwg. No. CF0136

637EZ1Y04600 SHT 11



INITIATION =CWD20+Q50
TRIP CIRCUIT 2
[7A507]

INITIATION =CWD20+Q51
TRIP CIRCUIT 2
[7A508]

INITIATION =CWD20+Q52
TRIP CIRCUIT 2
[7A509]

NOTES:
[XXXX] DENOTES FILE NO OF 7610NN SECTION
REFER [1001] FOR FILE INDEX
REFER [1002] FOR LOCATION AND DEVICE LIST

FILE 7B1008/1

POWER GRID CORPORATION OF INDIA LIMITED
1 x 500MW HVDC BACK-TO-BACK PROJECT
VISAKHAPATNAM

GEC ALSTHOM

GEC ALSTHOM T&D
Power Electronic Systems Limited

VISAKHAPATNAM
CIRCUIT DIAGRAM FOR
DC CIRCUITS OF PROTECTION No 2
CIRCUIT BREAKERS =CWD20+Q50, Q51 & Q52

DRG. No. 637EZ1Y04600 SHT 11
CURRENT ISSUE A

C.A.B. DATA	A
ISSUE	A
NAME	BT
LOCATION	VISA2140

AS BUILT DWG
16 MAY 2000
VISAKHAPATNAM

GEC ALSTHOM T&D
Power Electronic Systems Limited
CERTIFIED FOR
MANUFACTURE
NAME: BT BARRETT
DEPT. 789 DATE 28/05/00
SIGNED BT Barrett

THIRD ANGLE
PROJECTION
IF IN DOUBT
ASK

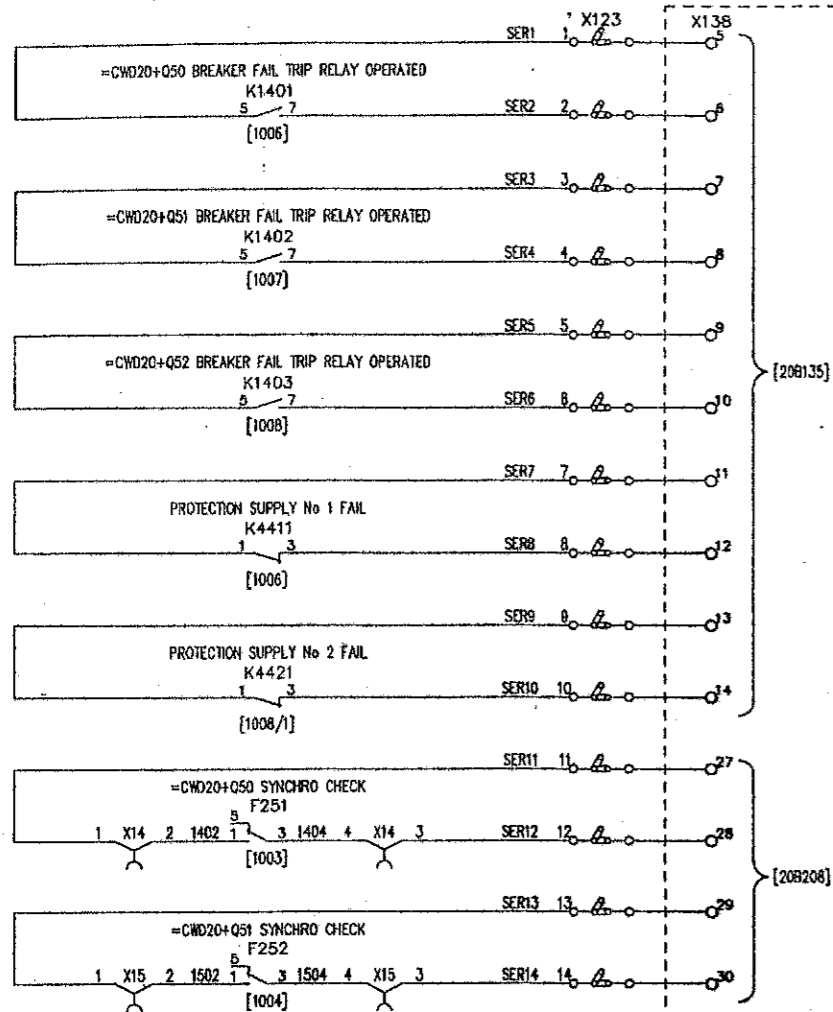
ALL DIMENSIONS
IN MILLIMETRES
UNLESS OTHERWISE STATED
DRAWING TO BS308
UNLESS OTHERWISE STATED
FOR THE STANDARD OF
ACCURACY OF ALL
DIMENSIONS
SEE SPECIAL STAND/013/PROC

DRAWN PREM
GHT
APPO
SCALE
TRACED
DESIGN
APP'D

ORDER No. CF0136

DRG. No. 637EZ1Y04600 SHT 9

SEQUENCE OF EVENTS RECORDER ALARM SIGNALS



NOTE:
TERMINAL TO CONNECT
CABLE OVERALL SCREEN
AT THIS CUBICLE ONLY.

=CWD20+EX4201
SCADA MARSHALLING
[20B135]

[20B208]

[1008/1]

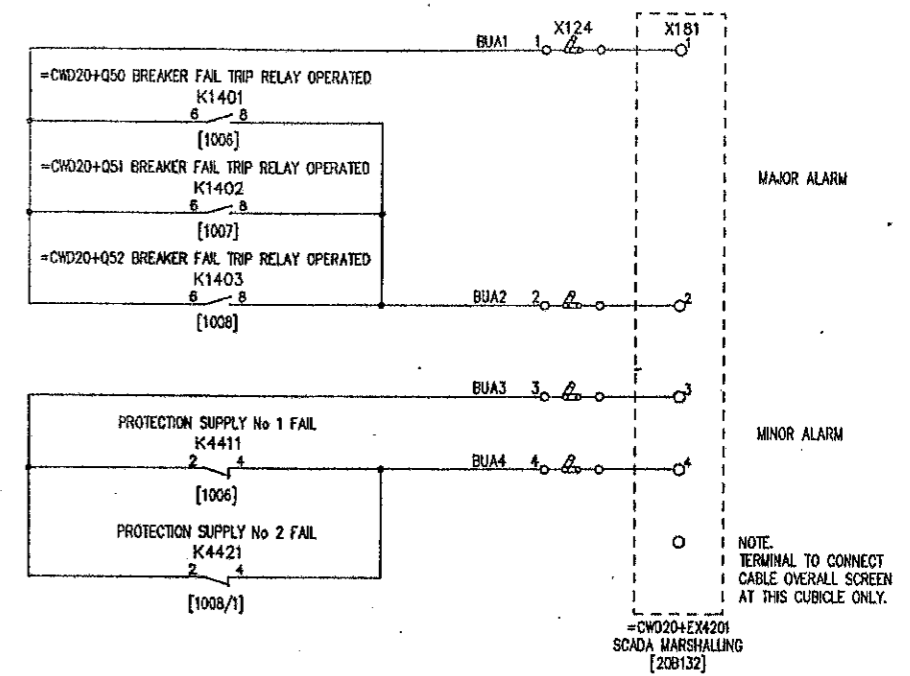
[1006]

[1008]

[1007]

[1006]

BACK-UP ANNUNCIATOR ALARM SIGNALS



MAJOR ALARM

MINOR ALARM

NOTE:
TERMINAL TO CONNECT
CABLE OVERALL SCREEN
AT THIS CUBICLE ONLY.

=CWD20+EX4201
SCADA MARSHALLING
[20B132]

[1008/1]

[1006]

[1006]

[1007]

[1006]

NOTES:
[100N] DENOTES FILE NO OF 7B100N SECTION
REFER [100N] FOR FILE INDEX
REFER [1002] FOR LOCATION AND DEVICE LIST

FILE 7B1009

POWER GRID CORPORATION OF INDIA LIMITED
1 x 500MW HVDC BACK-TO-BACK PROJECT
VISAKHAPATNAM

GEC ALSTHOM
T&D

GEC ALSTHOM T&D
Power Electronic Systems Limited
Slotted, England

TITLE
VISAKHAPATNAM
=CWD20 BREAKER FAIL PROTECTION
CIRCUIT DIAGRAM FOR
SER & BACK-UP ANNUNCIATOR SIGNALS

DRG. No. 637EZ1Y04600 SHT 9

CURRENT
ISSUE
D

C.A.D. DATA

ISSUE D

LOCATION
VSA3655

PRJ A	PRJ B	PRJ C	PRJ D
ISSUE 11	RFR 29	JCP 05	JCP 07
DATE 06	PREM 07	JIB 01	JIB 01
97	98	98	99

REVISIONS TO ENGRS & B484:-
X138 & X181 ADDED
K4421/251 & F252 ADDED
RELAY K4411 NAME CHANGED
FROM BREAKER FAIL SUPPLY FAIL
TO PROTECTION SUPPLY FAIL

REFER TO E.C.N. 8645
FILE REFERENCES REVISED ON
SCADA TERMINALS

REFER TO ENGRS:-
TERMINAL NUMBERS 27 - 28
HERE 1-4 RESPECTIVELY.

AS BUILT DWG
16 MAY 2000
VISAKHAPATNAM

GEC ALSTHOM T&D
Power Electronic Systems Limited
CERTIFIED FOR
MANUFACTURE

NAME: B T BARRETT
DEPT: 739 DATE: 9 / 6 / 97
SIGNED: BTB

THIRD ANGLE
PROJECTION

IF IN DOUBT
ASK

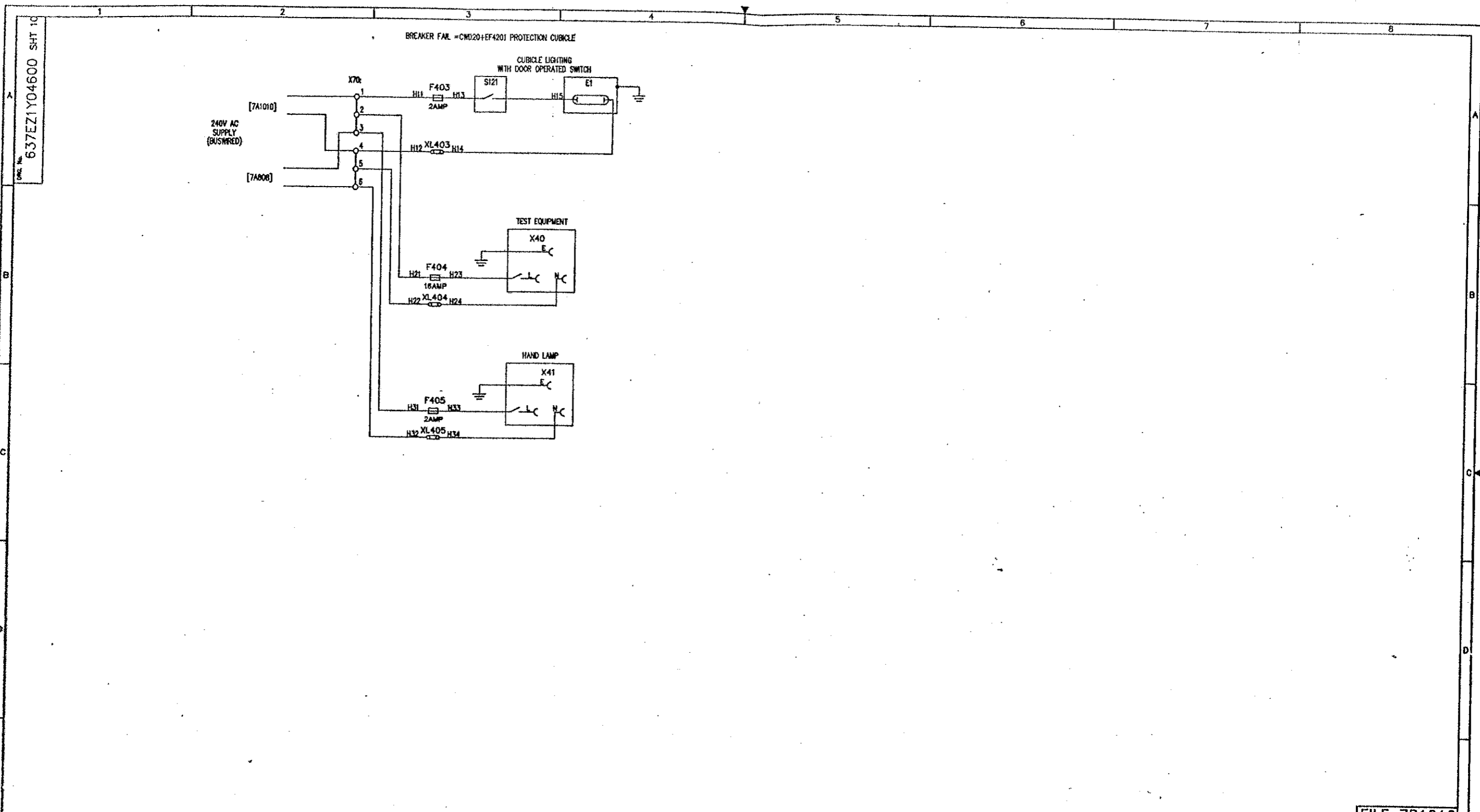
ALL DIMENSIONS
IN MILLIMETRES
UNLESS OTHERWISE STATED

DRAWING TO BS308
UNLESS OTHERWISE STATED

FOR THE STANDARD OF
ACCURACY OF ALL
UNTOLERANCED DIMENSIONS
SEE SPECN. STAND/023/PROG

DRAWN JCP
CHKD PNS
APP'D RFR
SCALE
TRACED
DESIGN PRJ
APP'D

DO NOT SCALE PRINT
WHEN QUOTING DRG. No. STATE CURRENT ISSUE
CUSTOMER POWERGRID ORDER No. CF0136



NOTES:
 [1000] DENOTES FILE NO OF 7B1000 SECTION
 REFER [1001] FOR FILE INDEX
 REFER [1002] FOR LOCATION AND DEVICE LIST

FILE 7B1010

POWER GRID CORPORATION OF INDIA LIMITED
 1 x 500MW HVDC BACK-TO-BACK PROJECT
 VISAKHAPATNAM

GEC ALSTHOM
 T&D

GEC ALSTHOM T&D
 Power Electronic Systems Limited
 Bedford, England

VISAKHAPATNAM
 BREAKER FAIL PROTECTION
 CUBICLE - CWD20+EF4201
 AC SUPPLIES AND CUBICLE ILLUMINATION

DRG. No. 637EZ1Y04600 SHT 10
 CURRENT ISSUE A

C.A.D. DATA
 ISSUE A
 DATE 11 06 97
 LOCATION VISA0927

AS BUILT DWG
 16 MAY 2003
 VISAKHAPATNAM

GEC ALSTHOM 88
 Power Electronic Systems Limited
 CERTIFIED FOR
 MANUFACTURE
 NAME: B.T. Barrett
 DEPT. 739 DATE 9/16/97
 SIGNED: B.T. Barrett

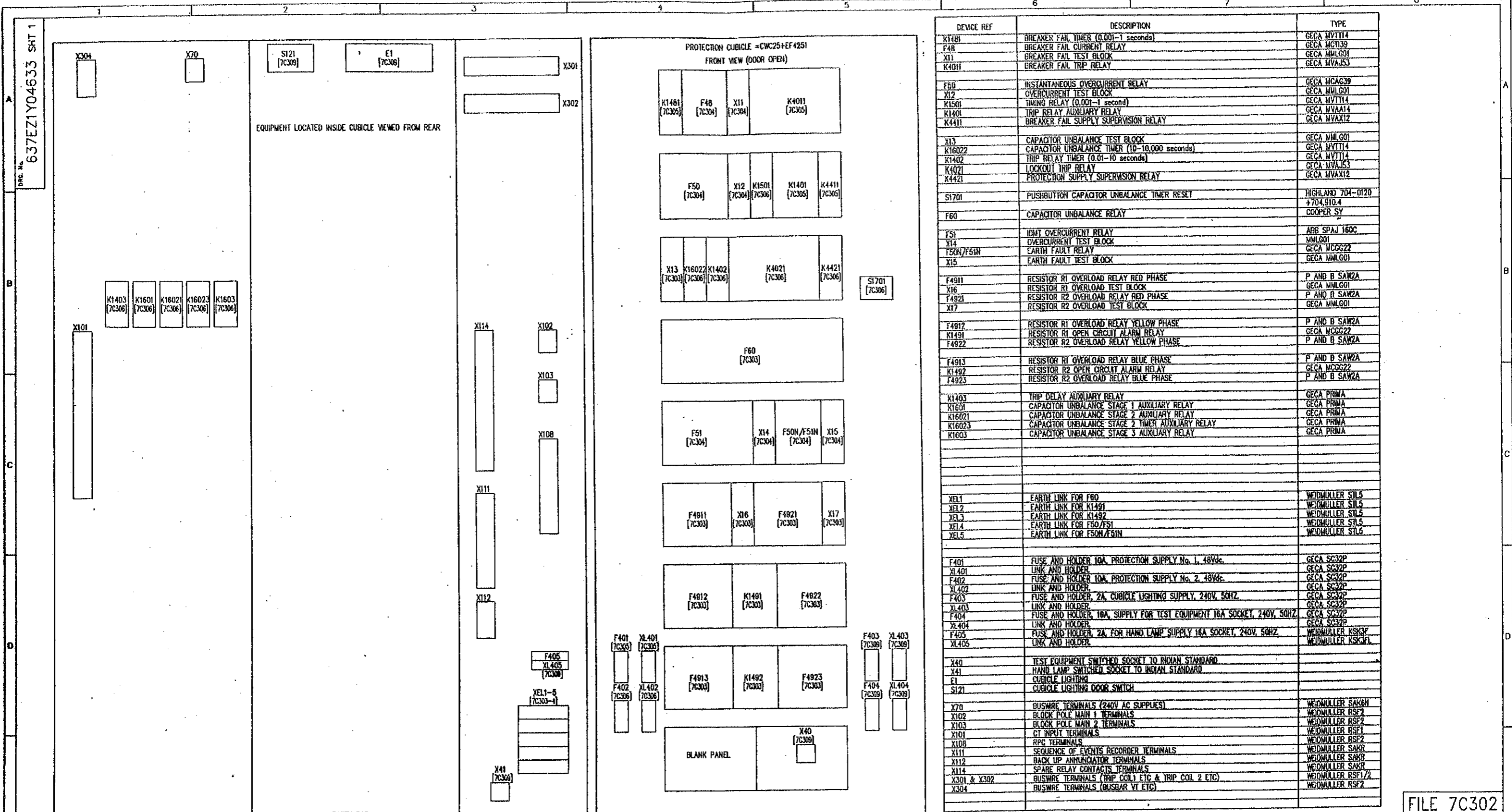
3RD ANGLE
 PROJECTION
 IF IN DOUBT
 ASK

ALL DIMENSIONS
 IN MILLIMETRES
 UNLESS OTHERWISE STATED
 DRAWING TO BE FOR
 UNLESS OTHERWISE STATED
 FOR THE STANDARD OF
 ACCURACY OF ALL
 UNLESS OTHERWISE STATED
 SEE SPECIAL STANDARDS/PROG

DRAWN JCP
 CHD
 APPD
 SCALE
 TRACED
 DESGN
 APPD

DO NOT SCALE PRINT

CUSTOMER POWERGRID
 ORDER No. CF0138



DEVICE REF	DESCRIPTION	TYPE
K1481	BREAKER FAIL TIMER (0.001-1 seconds)	GECA MVT114
F48	BREAKER FAIL CURRENT RELAY	GECA MCT139
X11	BREAKER FAIL TEST BLOCK	GECA MMLG01
K4011	BREAKER FAIL TRIP RELAY	GECA MVAJ53
F50	INSTANTANEOUS OVERCURRENT RELAY	GECA MCAG39
X12	OVERCURRENT TEST BLOCK	GECA MMLG01
K1501	TIMING RELAY (0.001-1 second)	GECA MVT114
K1401	TRIP RELAY AUXILIARY RELAY	GECA MVAJ53
K4411	BREAKER FAIL SUPPLY SUPERVISION RELAY	GECA MVAJ53
X13	CAPACITOR UNBALANCE TEST BLOCK	GECA MMLG01
K16022	CAPACITOR UNBALANCE TIMER (10-10,000 seconds)	GECA MVT114
K1402	TRIP RELAY TIMER (0.01-10 seconds)	GECA MVT114
K4021	LOCKOUT TRIP RELAY	GECA MVAJ53
K4421	PROTECTION SUPPLY SUPERVISION RELAY	GECA MVAJ53
S1701	PUSHBUTTON CAPACITOR UNBALANCE TIMER RESET	HIGHLAND 704-0120 +704,910.4
F60	CAPACITOR UNBALANCE RELAY	COOPER SY
F51	100% OVERCURRENT RELAY	ABB SPAJ 160C
X14	OVERCURRENT TEST BLOCK	MMLG01
F50N/F51N	EARTH FAULT RELAY	GECA MCGG22
X15	EARTH FAULT TEST BLOCK	GECA MMLG01
F4911	RESISTOR R1 OVERLOAD RELAY RED PHASE	P AND B SAWZA
X16	RESISTOR R1 OVERLOAD TEST BLOCK	GECA MMLG01
F4921	RESISTOR R2 OVERLOAD RELAY RED PHASE	P AND B SAWZA
X17	RESISTOR R2 OVERLOAD TEST BLOCK	GECA MMLG01
F4912	RESISTOR R1 OVERLOAD RELAY YELLOW PHASE	P AND B SAWZA
K1491	RESISTOR R1 OPEN CIRCUIT ALARM RELAY	GECA MCGG22
F4922	RESISTOR R2 OVERLOAD RELAY YELLOW PHASE	P AND B SAWZA
F4913	RESISTOR R1 OVERLOAD RELAY BLUE PHASE	P AND B SAWZA
K1492	RESISTOR R2 OPEN CIRCUIT ALARM RELAY	GECA MCGG22
F4923	RESISTOR R2 OVERLOAD RELAY BLUE PHASE	P AND B SAWZA
K1403	TRIP DELAY AUXILIARY RELAY	GECA PRIMA
K1601	CAPACITOR UNBALANCE STAGE 1 AUXILIARY RELAY	GECA PRIMA
K16021	CAPACITOR UNBALANCE STAGE 2 AUXILIARY RELAY	GECA PRIMA
K16023	CAPACITOR UNBALANCE STAGE 2 TIMER AUXILIARY RELAY	GECA PRIMA
K1603	CAPACITOR UNBALANCE STAGE 3 AUXILIARY RELAY	GECA PRIMA
XEL1	EARTH LINK FOR F60	WEIDMULLER STL5
XEL2	EARTH LINK FOR K1491	WEIDMULLER STL5
XEL3	EARTH LINK FOR K1492	WEIDMULLER STL5
XEL4	EARTH LINK FOR F50/F51N	WEIDMULLER STL5
XEL5	EARTH LINK FOR F50N/F51N	WEIDMULLER STL5
F401	FUSE AND HOLDER 10A, PROTECTION SUPPLY No. 1, 48Vdc.	GECA SC32P
XL401	LINK AND HOLDER	GECA SC32P
F402	FUSE AND HOLDER 10A, PROTECTION SUPPLY No. 2, 48Vdc.	GECA SC32P
XL402	LINK AND HOLDER	GECA SC32P
F403	FUSE AND HOLDER, 2A, CUBICLE LIGHTING SUPPLY, 240V, 50HZ.	GECA SC32P
XL403	LINK AND HOLDER	GECA SC32P
F404	FUSE AND HOLDER, 16A, SUPPLY FOR TEST EQUIPMENT 16A SOCKET, 240V, 50HZ.	GECA SC32P
XL404	LINK AND HOLDER	GECA SC32P
F405	FUSE AND HOLDER, 2A, FOR HAND LAMP SUPPLY 16A SOCKET, 240V, 50HZ.	WEIDMULLER KSK37
XL405	LINK AND HOLDER	WEIDMULLER KSK37
X40	TEST EQUIPMENT SWITCHED SOCKET TO INDIAN STANDARD	
X41	HAND LAMP SWITCHED SOCKET TO INDIAN STANDARD	
E1	CUBICLE LIGHTING	
S121	CUBICLE LIGHTING DOOR SWITCH	
X70	BUSHWIRE TERMINALS (240V AC SUPPLIES)	WEIDMULLER SAK6H
X102	BLOCK POLE MAIN 1 TERMINALS	WEIDMULLER RSE2
X103	BLOCK POLE MAIN 2 TERMINALS	WEIDMULLER RSE2
X101	DT INPUT TERMINALS	WEIDMULLER RSE1
X108	RPC TERMINALS	WEIDMULLER RSE2
X111	SEQUENCE OF EVENTS RECORDER TERMINALS	WEIDMULLER SAKR
X112	BACK UP ANNUNCIATOR TERMINALS	WEIDMULLER SAKR
X114	SPARE RELAY CONTACTS TERMINALS	WEIDMULLER SAKR
X301 & X302	BUSHWIRE TERMINALS (TRIP COIL 1 ETC & TRIP COIL 2 ETC)	WEIDMULLER RSE1/2
X304	BUSHWIRE TERMINALS (BUSBAR VT ETC)	WEIDMULLER RSE2

FILE 7C302

POWER GRID CORPORATION OF INDIA LIMITED
1 x 500MW HVDC BACK-TO-BACK PROJECT
VISAKHAPATNAM

GEC ALSTHOM
T&D

GEC ALSTHOM T&D
Power Electronic Systems Limited
Sharnah, England

TITLE
VISAKHAPATNAM
AC HARMONIC FILTER =CWC25 PROTECTION
CUBICLE =CWC25+EF4251
EQUIPMENT AND DEVICE LIST

DRG. No. 637EZ1Y04633 SHT 1
CURRENT ISSUE C

C.A.D. DATA
ISSUE C
NAME
LOCATION VISA2464

PRJ	B	REVISED TO ENDS: - VT	REVISED TO ENDS: -
PNS	08	FUSES/BNBS REPLACED BY X304	DELETED R111, R121, R131, R141
JCP	08	ALSO X1023 ADDED	
DATE	03	PREM	
06	08	31	
97	08	07	
97	09	18	

AS BUILT DWG
14 APR 2000
VISAKHAPATNAM

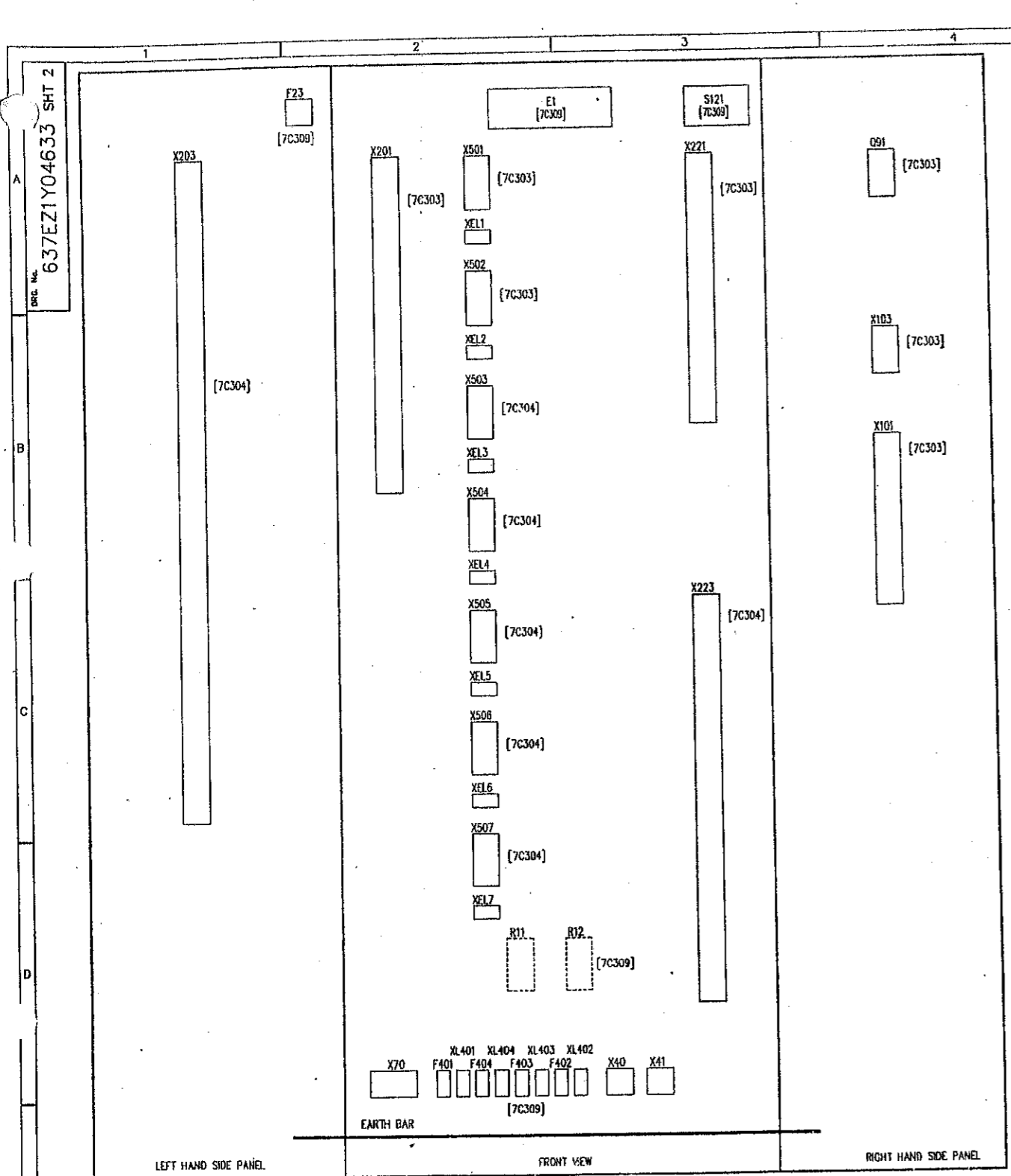
GEC ALSTHOM T&D
Power Electronic Systems Limited
CERTIFIED FOR MANUFACTURE
NAME: B T BARRETT
DEPT. 739 DATE: 25/02/97
SIGNED: BTB

THIRD ANGLE PROJECTION
IF IN DOUBT ASK

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED
DRAWING TO BS308 UNLESS OTHERWISE STATED
FOR THE STANDARD OF ACCURACY OF ALL UNDIMENSIONED DIMENSIONS SEE SPEC. STAND/023/PROC

DRAWN JCP
c/d: PNS
APP'D RFR
SCALE
TRACED
DESIGN PRJ
APP'D

DO NOT SCALE PRINT
WHEN QUOTING DRG. No. STATE CURRENT ISSUE
CUSTOMER POWERGRID
ORDER No. CF0136



DEVICE REF	DESCRIPTION	TYPE	QTY
E1	CUBICLE LIGHTING		
S121	CUBICLE LIGHTING DOOR SWITCH		
O91	CVT MINATURE CIRCUIT BREAKER 1A, 3POLE (AUX CONTACTS)	KLOCKNER MOELLER FAZN CI-3 KLOCKNER MOELLER NRHI 002-FAZ	
X101	CVT IN/OUT TERMINALS	WEIDMULLER RSF1	
X103	SER TERMINALS	WEIDMULLER SAKR	
X201	CT IN TERMINALS	WEIDMULLER RSF1	
X203	CT IN TERMINALS	WEIDMULLER RSF1	
X221	CT OUT TERMINALS	WEIDMULLER RSF1	
X223	CT OUT TERMINALS	WEIDMULLER RSF1	
X501	CWC25+TS1.1 TEST BLOCK	WEIDMULLER SAKT2	
XEL1	EARTH LINK FOR TS1.1	WEIDMULLER STL5	
X502	CWC25+TS2.1 TEST BLOCK	WEIDMULLER SAKT2	
XEL2	EARTH LINK FOR TS2.1	WEIDMULLER STL5	
X503	CWC25+TS3.1 TEST BLOCK	WEIDMULLER SAKT2	
XEL3	EARTH LINK FOR TS3.1	WEIDMULLER STL5	
X504	CWC25+TS3.2 TEST BLOCK	WEIDMULLER SAKT2	
XEL4	EARTH LINK FOR TS3.2	WEIDMULLER STL5	
X505	CWC25+TS3.3 TEST BLOCK	WEIDMULLER SAKT2	
XEL5	EARTH LINK FOR TS3.3	WEIDMULLER STL5	
X506	CWC25+TS3.4 TEST BLOCK	WEIDMULLER SAKT2	
XEL6	EARTH LINK FOR TS3.4	WEIDMULLER STL5	
X507	CWC25+TS3.5 TEST BLOCK	WEIDMULLER SAKT2	
XEL7	EARTH LINK FOR TS3.5	WEIDMULLER STL5	
X70	240V AC SUPPLY TERMINALS	WEIDMULLER RSF1	
F401	FUSE AND HOLDER, 2A, CUBICLE LIGHTING SUPPLY, 240V, 50HZ.	WEIDMULLER KSK3F	
XL401	LINK AND HOLDER,	WEIDMULLER KSK3FL	
F402	FUSE AND HOLDER, 16A, SUPPLY FOR TEST EQUIPMENT 16A SOCKET, 240V, 50HZ.	GECA L.V.E. SC32HD	
XL402	LINK AND HOLDER,	GECA L.V.E. SC32HD	
F403	FUSE AND HOLDER, 2A, FOR HAND LAMP SUPPLY 16A SOCKET, 240V, 50HZ.	WEIDMULLER KSK3F	
XL403	LINK AND HOLDER,	WEIDMULLER KSK3FL	
F404	FUSE AND HOLDER, 10A, FOR HEATER SUPPLY, 240V, 50HZ.	WEIDMULLER KSK3F	
XL404	LINK AND HOLDER,	WEIDMULLER KSK3FL	
R11,12	CUBICLE HEATER THERMOSTATICALLY CONTROLLED (MTD ON DOOR)	SAREL 17509 (90W)	
F23	THERMOSTAT	SAREL 17561	
X40	TEST EQUIPMENT SWITCHED SOCKET TO INDIAN STANDARD		
X41	HAND LAMP SWITCHED SOCKET TO INDIAN STANDARD		

REFER 637EZ1Y04592 FOR FILE INDEX [7C301]

C.A.O. DATA	A
ISSUE	A
NAME	637EZ1Y04633
DATE	22 05 98
LOCATION	VSA2620

AS BUILT DWG
14 APR 2000
VISAKHAPATNAM

GEC ALSTHOM T&D
Power Electronic Systems Limited
CERTIFIED FOR MANUFACTURE
NAME: N.M. KIRBY
DEPT: 611 DATE: 18/4/00
SIGNED: N.M.K.

THIRD ANGLE PROJECTION
ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED
DRAWING TO USOR UNLESS OTHERWISE STATED
FOR THE STANDARD OF ACCURACY OF ALL UNTOLERANCED DIMENSIONS SEE SPEC. STAND/023/PRDC
DRAWN: VJC
CHKD: [Signature]
APP'D: [Signature]
SCALE: [Signature]
TRACED: [Signature]
DESIGN: [Signature]
APP'D: [Signature]

FILE 7C302/1

POWER GRID CORPORATION OF INDIA LIMITED
1 x 500MW HVDC BACK-TO-BACK PROJECT
VISAKHAPATNAM

GEC ALSTHOM
T&D

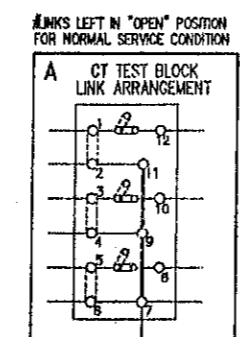
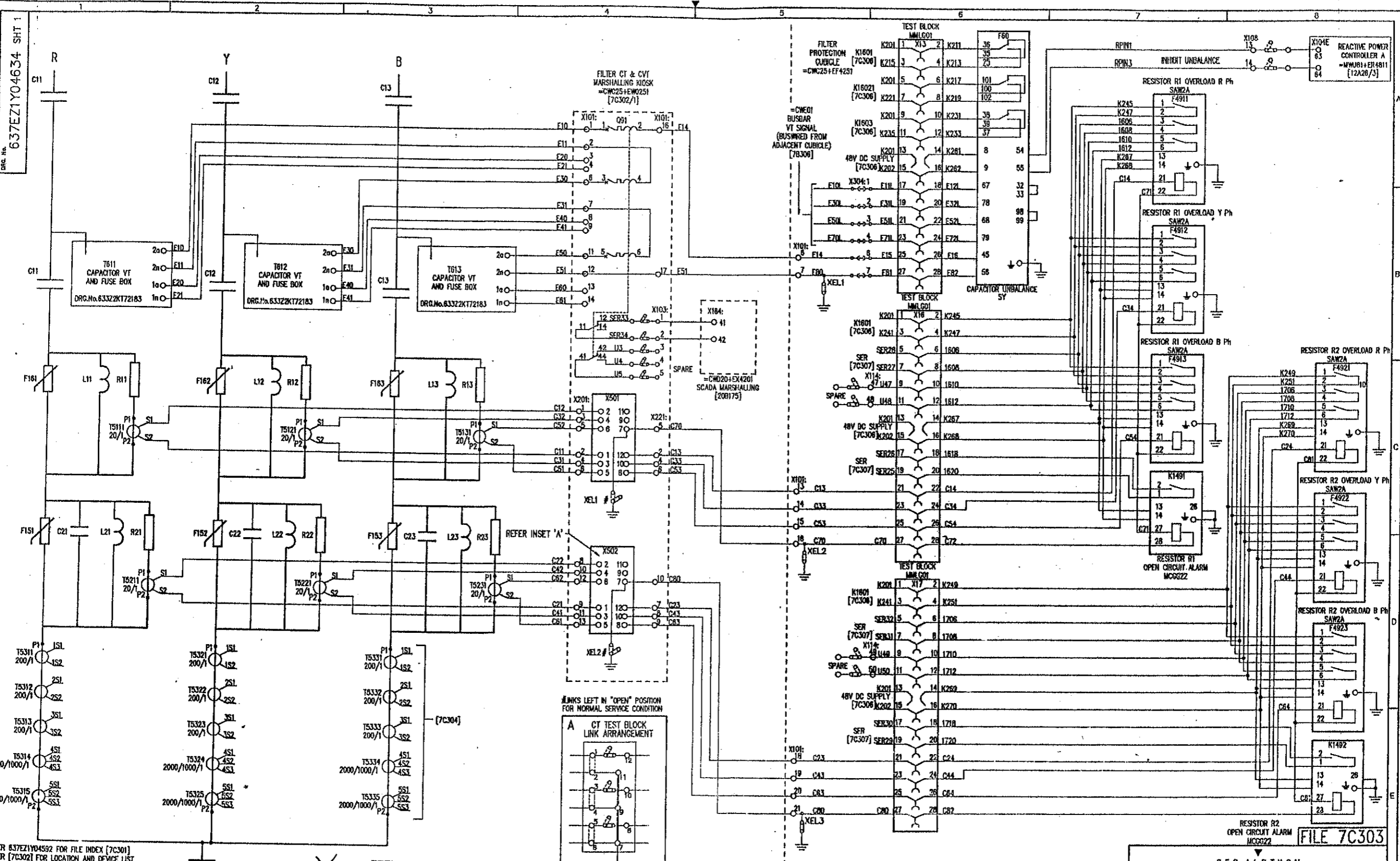
GEC ALSTHOM T&D
Power Electronic Systems Limited
Sharnbrook, England

TITLE
VISAKHAPATNAM
AC HARMONIC FILTER = CWC25
CT & CVT MARSHALLING KIOSK = CWC25+EWO251
EQUIPMENT & DEVICE LIST

DRG. No. 637EZ1Y04633 SHT 2
CURRENT ISSUE: A

WHEN QUOTING DRG. NO. STATE CURRENT ISSUE
CUSTOMER POWER GRID CORP OF INDIA ORDER No. CF0136

DO NOT SCALE PRINT



REFER 637EZ1Y04634 FOR FILE INDEX [7C301]
 REFER [7C302] FOR LOCATION AND DEVICE LIST
 REFER [2A04] FOR PROTIN SINGLE LINE DIAGRAM

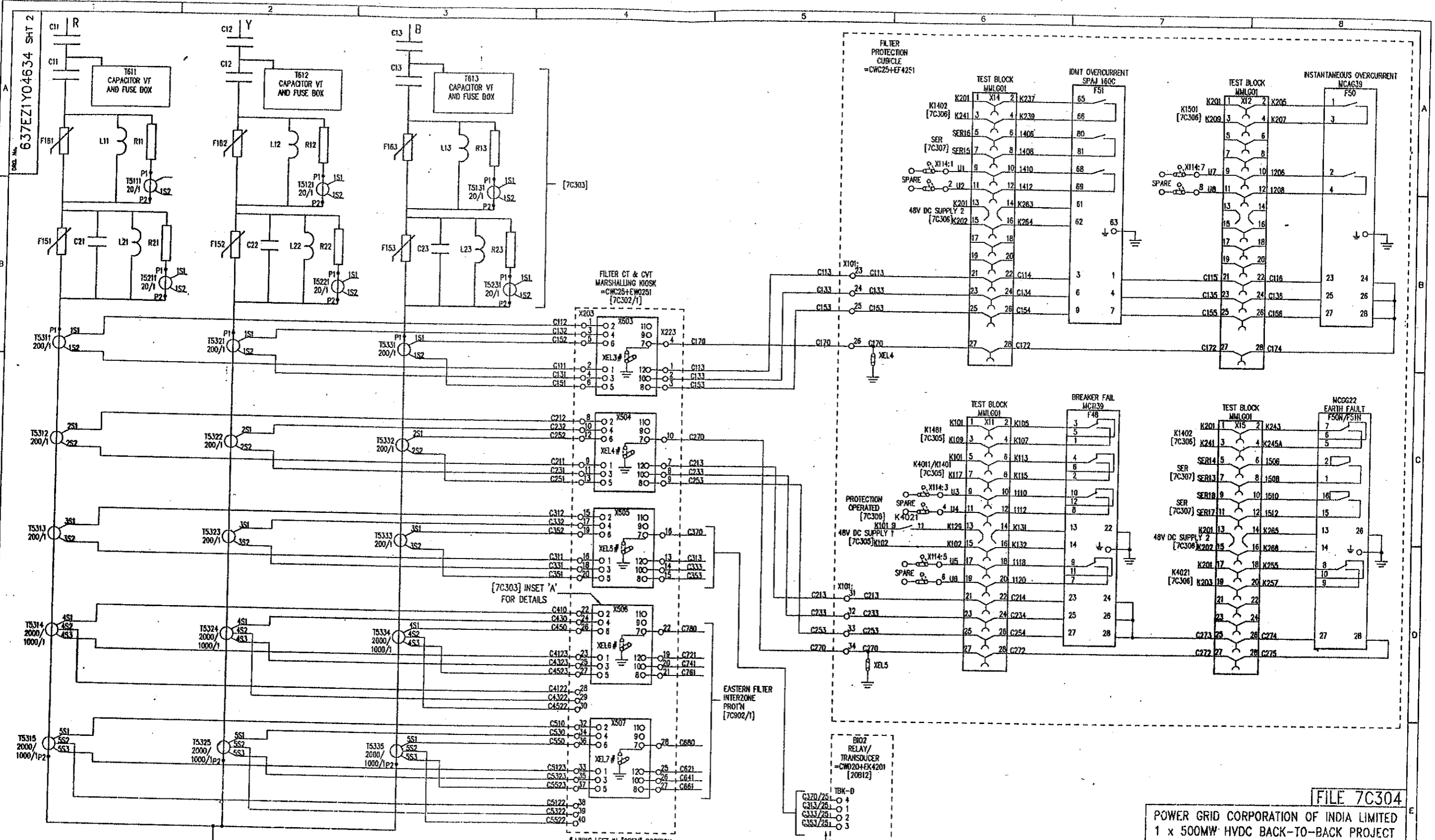
AS BUILT DWG
 14 APR 2003
VISAKHAPATNAM
 POWER GRID CORPORATION OF INDIA LIMITED
 500MW HVDC BACK-TO-BACK PROJECT
 VISAKHAPATNAM

GEC ALSTHOM
 T&D
 CERTIFIED FOR
 MANUFACTURE
 NAME: B. T. BARRETT
 DEPT. 739 DATE: 27/02/97
 SIGNED: BTB

THIRD ANGLE
 PROJECTION
 ALL DIMENSIONS
 IN MILLIMETRES
 UNLESS OTHERWISE STATED
 DRAWING TO ISSUE
 UNLESS OTHERWISE STATED
 FOR THE STANDARD OF
 ACCURACY OF ALL
 UNTOLERANCED DIMENSIONS
 SEE SPECIAL STAND/DWG/PROC
 IF IN DOUBT
 ASK
 DO NOT SCALE PRINT

GEC ALSTHOM
 T&D
Power Electronic Systems Limited
 200 Park Road, London
 W12 0PL, England
 TITLE
VISAKHAPATNAM
AC HARMONIC FILTER =CWC25 PROTECTION
CIRCUIT DIAGRAM FOR
AC CIRCUITS
 DRG. No. **637EZ1Y04634 SH 1**
 CURRENT ISSUE
D
 CUSTOMER POWERGRID
 ORDER No. **CF0138**

ISSUE	PRJ	PRJ	PRJ
D	A	B	C
NAME	ISSUE	DATE	DATE
637EZ1Y94634	08/03/97	08/03/97	08/03/97
LOCATION	REVISION	REVISION	REVISION
VISA3589	1	2	3



REFER 637EZ1Y04592 FOR FILE INDEX [7C301]
 REFER [7C302] FOR LOCATION AND DEVICE LIST
 REFER [2A04] FOR PROT'M SINGLE LINE DIAGRAM

ISSUE	DATE	BY	REVISION
A	08/08/97	PNS	REVISION TO EN 8251- TERMINALS 80/81 & 82/89 INTERCHANGED ON F51. DEVICE No FOR MARSH'G KIOSK CHANGED.
B	08/08/97	PNS	EDM315 - RELAY TYPES ADDED & ENTR. ADDED TO TERMINAL Z2 OF MCT129 & Z6 OF MCG222. EDM322 - X101(EF4251) TERMINAL WAS REVISED.
C	26/08/97	PNS	REVISED TO EN 8350 - SMC201(EK4201) WAS SHOWN AS SMC201(EK4201)
D	03/09/97	PNS	REVISED TO EN 8424 & 8424 - CHANGED CABLE CORE No ON X222-19-21 & 25-28 FROM C411, C431, C451, C47 & C511, C411, C431, C451, C47 & C511. SEE 500. ALSO FILE REF FOR EASTERN FILTER INTER FROM 705011. ADDED TERMINAL NUMBERS TO CMC201(EK4201). REVISED TO EN 8585 - CHANGED WIP No ON X223-22 & 28 FROM C770 & C870.

AS BUILT DWG
 14 APR 2000
VISAKHAPATNAM

GEC ALSTHOM IND
 Power Electronics Systems Limited
 CERTIFIED FOR MANUFACTURE
 NAME: B T BARRETT
 DEPT. 739 DATE: 25/02/97
 SIGNED BTB

THIRD ANGLE PROJECTION
 ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED
 DRAWING TO BS308 UNLESS OTHERWISE STATED
 FOR THE STANDARD OF ACCURACY OF ALL UNTOLERANCED DIMENSIONS SEE SPECS. STAND/023/1/00C
 IF IN DOUBT ASK

DRAWN JCP
 CVD PNS
 APP'D RFR
 SCALE
 TRACED
 DESIGN PRJ
 APP'D

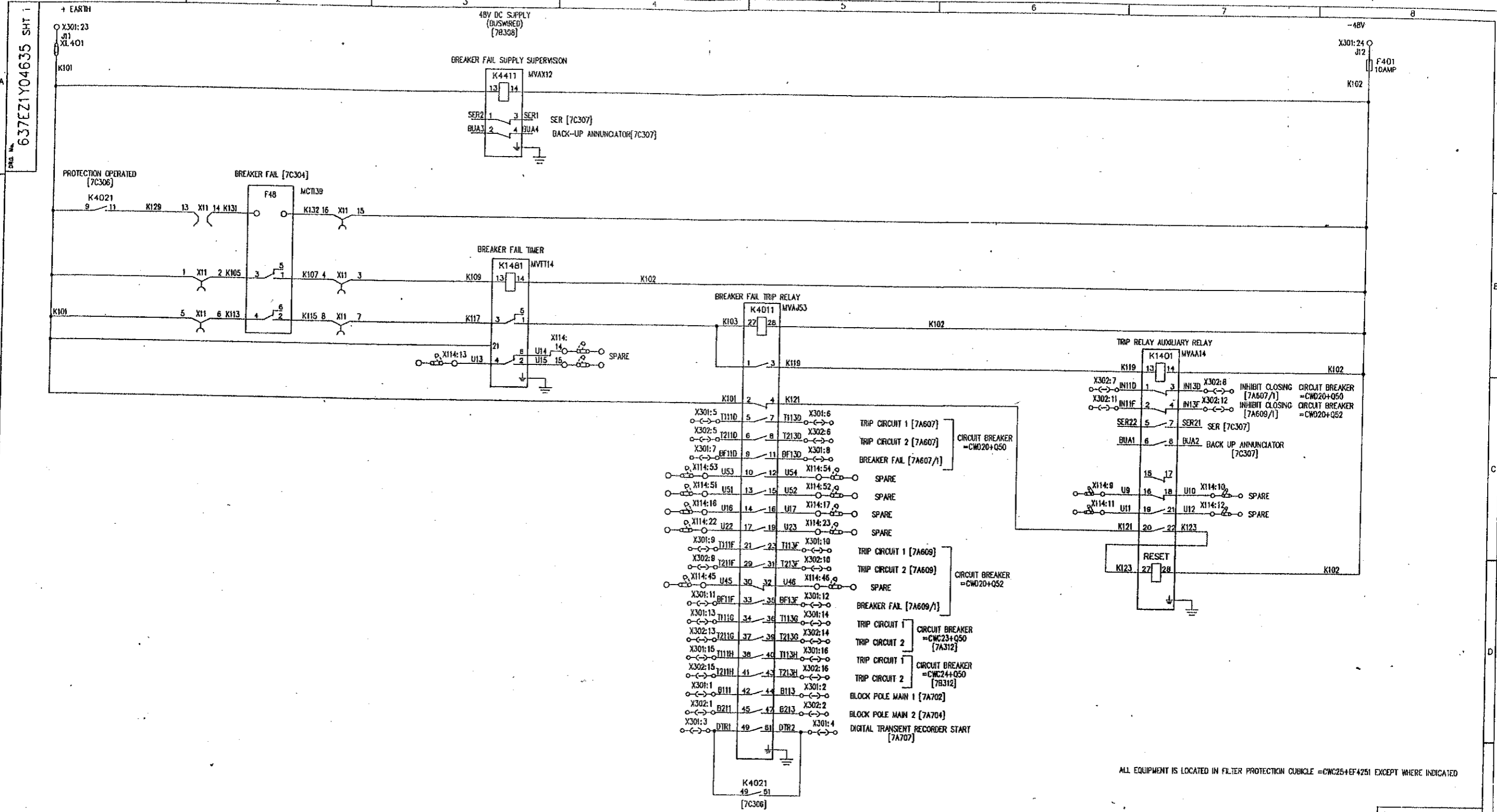
FILE 7C304

GEC ALSTHOM
 T&D

Power Electronics Systems Limited
(London, England)

VISA KHAPATNAM
 AC HARMONIC FILTER =CWC25 PROTECTION
 CIRCUIT DIAGRAM FOR
 AC CIRCUITS

DRG. No. 637EZ1Y04634 SHT 2
 CURRENT ISSUE D



ALL EQUIPMENT IS LOCATED IN FILTER PROTECTION CUBICLE =CWC25+EF4251 EXCEPT WHERE INDICATED

REFER 637E21Y04592 FOR FILE INDEX [7C301]
REFER [7C302] FOR LOCATION AND DEVICE LIST

ISSUE	PRJ	FILE NO	REVISION
A	BNS	06	08
B	JCP	03	08
C	JCP	03	08
		97	97

REVISIONS:
 01/09/97: REVISED TO CORRECT & B448-ADDED FOR BLOCK POLE ALSO X301:23,24 WAS 24,25 AND EDWARDS - RELAY TYPES ADDED
 02/09/97: REVISED TO CORRECT & B448-ADDED FOR BLOCK POLE ALSO X301:23,24 WAS 24,25 AND EDWARDS - RELAY TYPES ADDED
 03/09/97: CHANGED FILE REF'S FROM 7A607 & 7A609 ON X301:8, X302:8 & X301:12, X302:12

AS BUILT DWG
14 APR 2000
VISAKHAPATNAM

GEC ALSTHOM T&D
Power Electronic Systems Limited
CERTIFIED FOR MANUFACTURE
NAME: B T BARRETT
DEPT: 739 DATE: 25/02/97
SIGNED: BTB

THIRD ANGLE PROJECTION
ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED
DRAWING TO BS308 UNLESS OTHERWISE STATED
FOR THE STANDARD OF ACCURACY OF ALL UNTOLERANCED DIMENSIONS SEE SPECN. STAND/023/PP/OC
DRAWN: JCP
CHKD: PNS
APP'D: RFR
SCALE:
TRACED:
DESIGN: PRJ
APP'D:

FILE 7C305

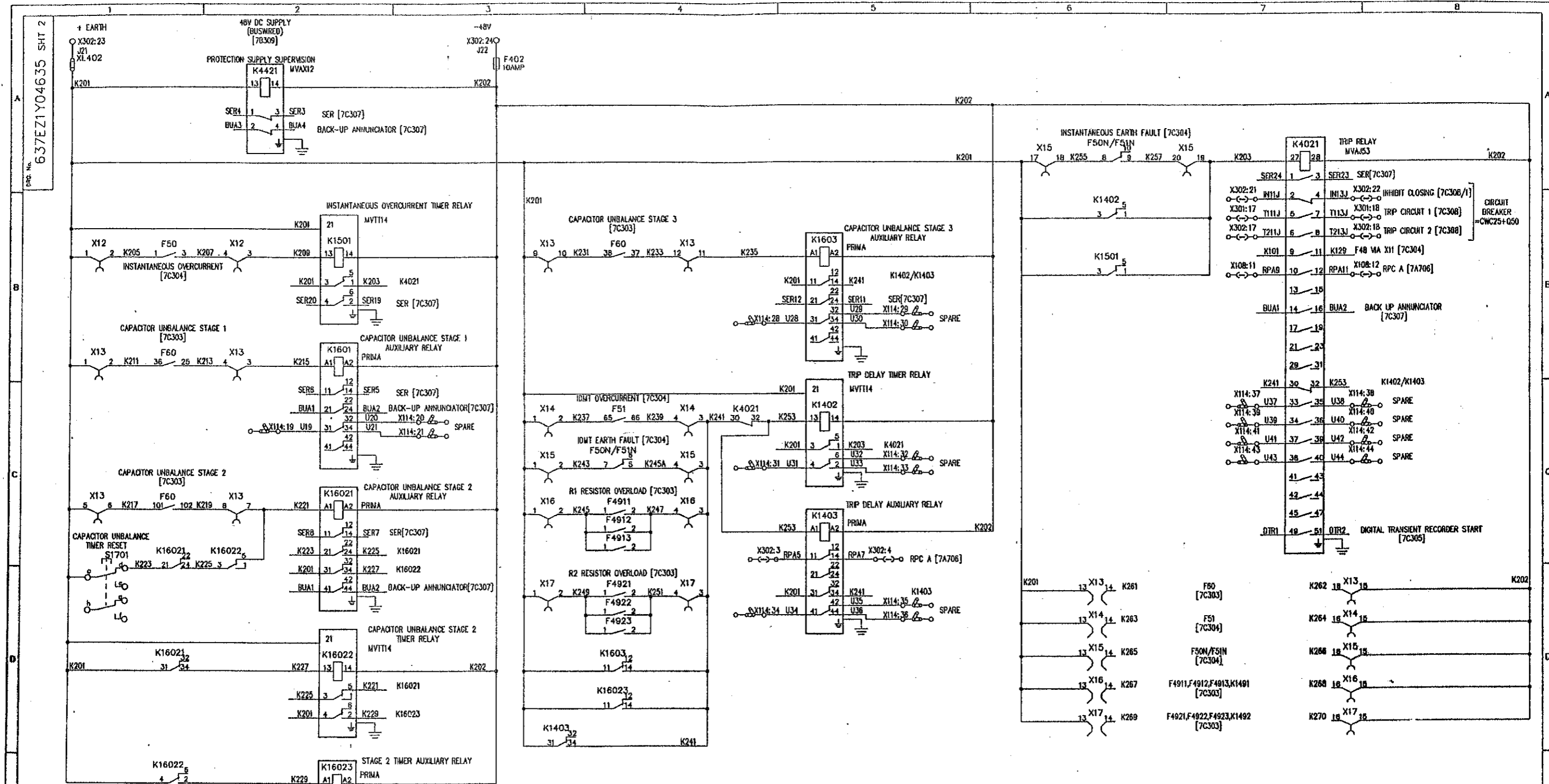
POWER GRID CORPORATION OF INDIA LIMITED
1 x 500MW HVDC BACK-TO-BACK PROJECT
VISAKHAPATNAM

GEC ALSTHOM T&D
Power Electronic Systems Limited
Sheffield, England

VISAKHAPATNAM
AC HARMONIC FILTER =CWC25 PROTECTION
CIRCUIT DIAGRAM FOR
DC CIRCUITS (BREAKER FAIL PROTECTION)

DRG. No. 637E21Y04635 SHT 1
CURRENT ISSUE C

CUSTOMER: POWERGRID ORDER No. CF0136



ALL EQUIPMENT IS LOCATED IN FILTER PROTECTION CUBICLE =CWC25+EF4251 EXCEPT WHERE INDICATED

FILE 7C306

POWER GRID CORPORATION OF INDIA LIMITED
1 x 500MW HVDC BACK-TO-BACK PROJECT
VISAKHAPATNAM

GEC ALSTHOM
T&D

GEC ALSTHOM T&D
Power Electronic Systems Limited
Bullfinch, England

VISAKHAPATNAM
AC HARMONIC FILTER =CWC25 PROTECTION
CIRCUIT DIAGRAM FOR
DC CIRCUITS (PROTECTION)

DRG. No. 637EZ1Y04635 SHT 2
CURRENT ISSUE C

REFER 637EZ1Y04592 FOR FILE INDEX [7C301]
REFER [7C302] FOR LOCATION AND DEVICE LIST

C.A.D. DATA	PRJ	A
	PNS	B
	JCP	C
	ISSUE	12
NAME	DATE	08
	03	08
	09	08
	97	08
LOCATION	VISA2022	

REMOVED TO EN843 & 846E -
CHANGED FILE REF ON X302:22
X302:21,24 WAS 24,25 ALSO
EN8315 - RELAY TYPES ADDED
REMOVED TO EN840Z -
REMOVED R1Z1, 131, 141 & WIRES
K210, 228, 242.

AS BUILT DWG
14 APR 2001
VISAKHAPATNAM

GEC ALSTHOM IND
Power Electronic Systems Limited
CERTIFIED FOR
MANUFACTURE
NAME: B T BARRETT
DEPT. 739 DATE: 25/3 /97
SIGNED BTB

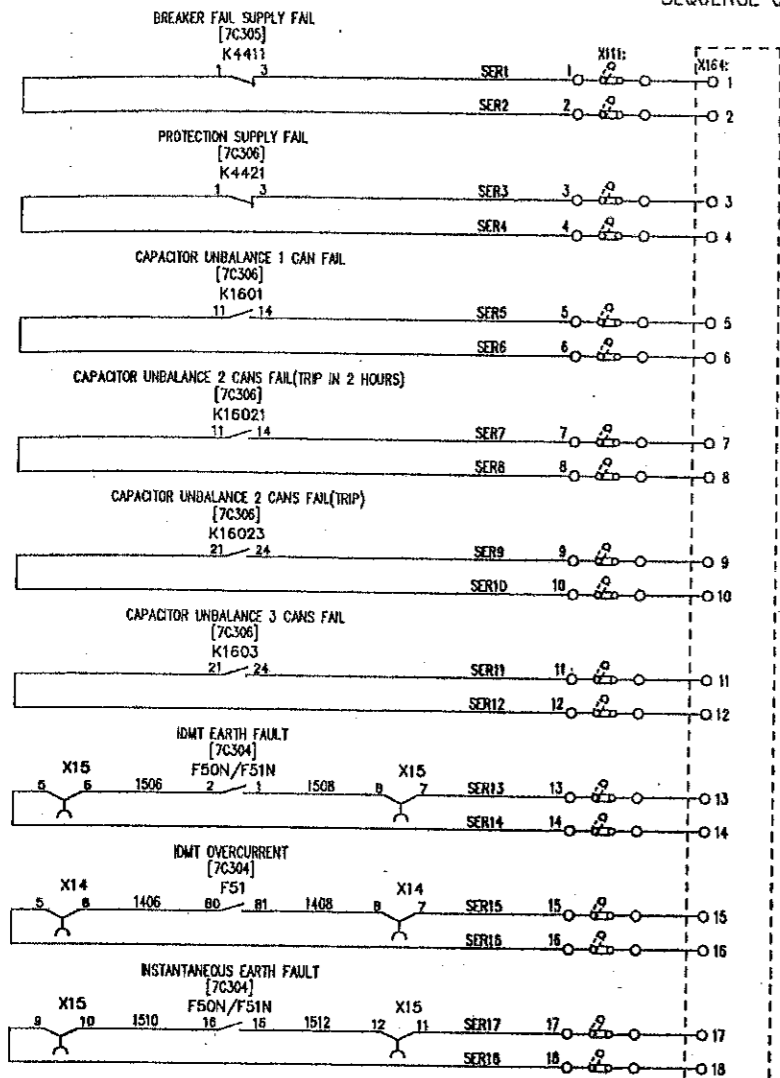
THIRD ANGLE
PROJECTION
IF IN DOUBT
ASK

ALL DIMENSIONS
IN MILLIMETRES
UNLESS OTHERWISE STATED
DRAWING TO BS308
UNLESS OTHERWISE STATED
FOR THE STANDARD OF
ACCURACY OF ALL
UNTOLERANCED DIMENSIONS
SEE SPECL. STAND./023/PROG

DRAWN JCP
CHKD PNS
APP'D RFR
SCALE
TRACED
DESIGN PRJ
APP'D

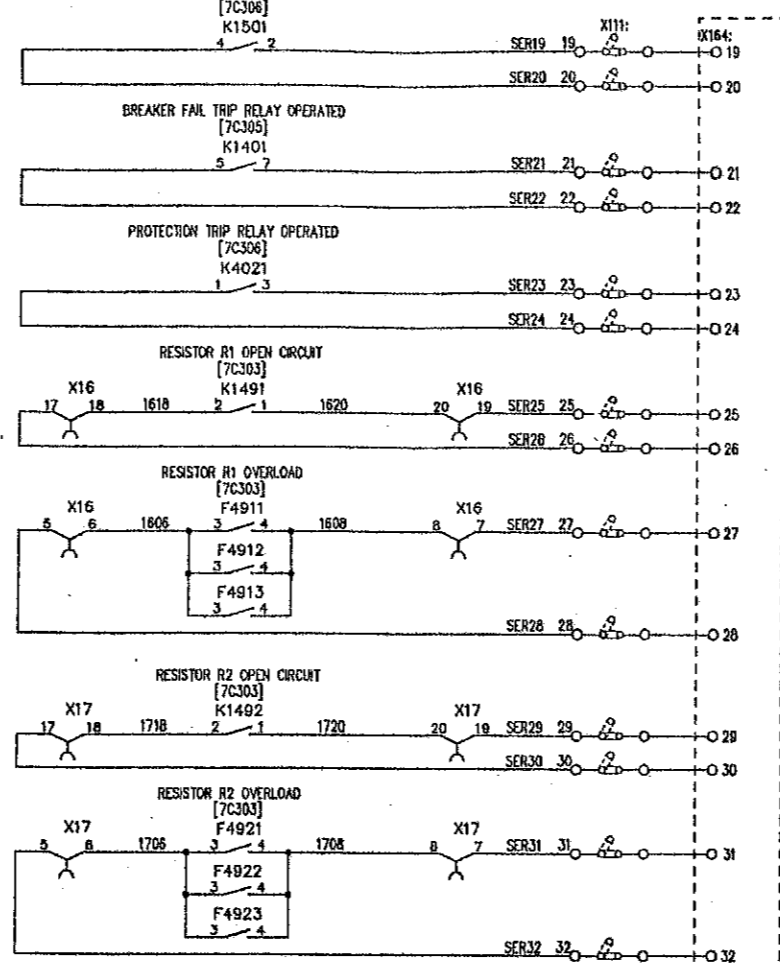
637EZ1Y04636-SHT 1

SEQUENCE OF EVENTS RECORDER ALARM SIGNALS



=CWC20+EX4201
SCADA MARSHALLING
(208174)

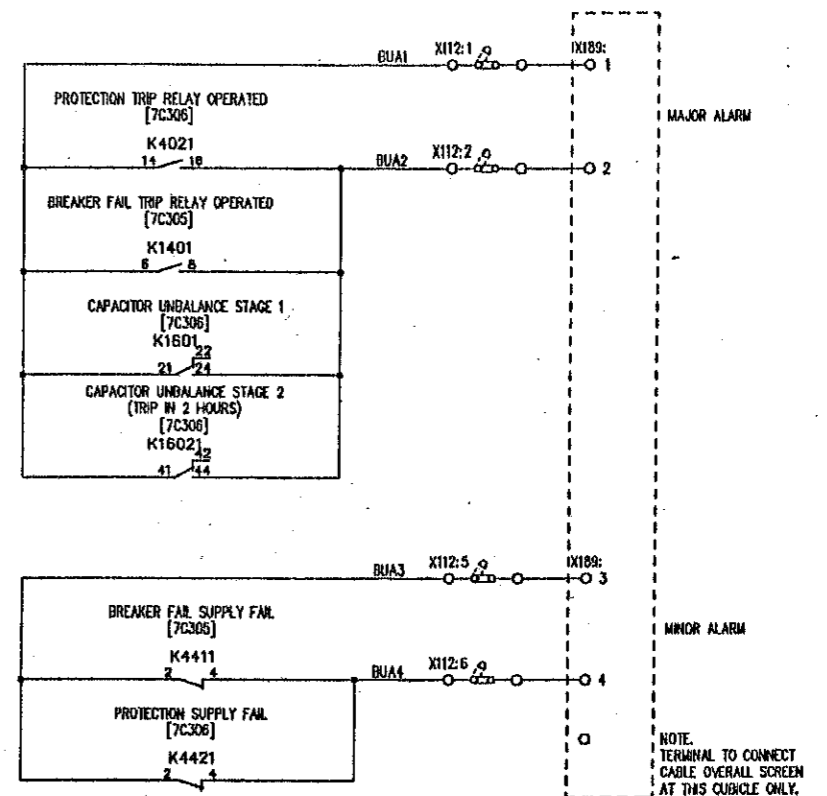
INSTANTANEOUS OVERCURRENT



NOTE:
TERMINAL TO CONNECT
CABLE OVERALL SCREEN
AT THIS CUBICLE ONLY.

=CWC20+EX4201
SCADA MARSHALLING
(208174)

BACK-UP ANNUNCIATOR ALARM SIGNALS



NOTE:
TERMINAL TO CONNECT
CABLE OVERALL SCREEN
AT THIS CUBICLE ONLY.

=CWC20+EX4201
SCADA MARSHALLING
(208174)

ALL EQUIPMENT IS LOCATED IN FILTER PROTECTION CUBICLE =CWC25+EF4251 EXCEPT WHERE STATED

FILE 7C307

POWER GRID CORPORATION OF INDIA LIMITED
1 x 500MW HVDC BACK-TO-BACK PROJECT
VISAKHAPATNAM

GEC ALSTHOM

GEC ALSTHOM T&D
Power Electronic Systems Limited

VISAKHAPATNAM
AC HARMONIC FILTER =CWC25 PROTECTION
CIRCUIT DIAGRAM FOR SER &
BACK-UP ANNUNCIATOR SIGNALS

637EZ1Y04636 SHT 1

D

AS BUILT DWG
14 APR 2003
VISAKHAPATNAM

GEC ALSTHOM T&D
Power Electronic Systems Limited
CERTIFIED FOR
MANUFACTURE

NAME: B T BARRETT
DEPT: 739 DATE: 25/02/97
SIGNED: BTB

THIRD ANGLE
PROJECTION

IF IN DOUBT
ASK

ALL DIMENSIONS
IN MILLIMETRES
UNLESS OTHERWISE STATED

DRAWING TO BS5000
UNLESS OTHERWISE STATED

FOR THE STANDARD OF
ACCURACY OF ALL
UNTOLERANCED DIMENSIONS
SEE SPEC. STAND/023/PROG

DRAWN JCP
CHKD PNS
APP'D RFR
SCALE N/A
TRACED
DESIGN APP'D PRJ

DO NOT SCALE PRINT

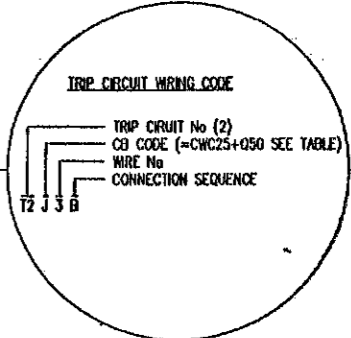
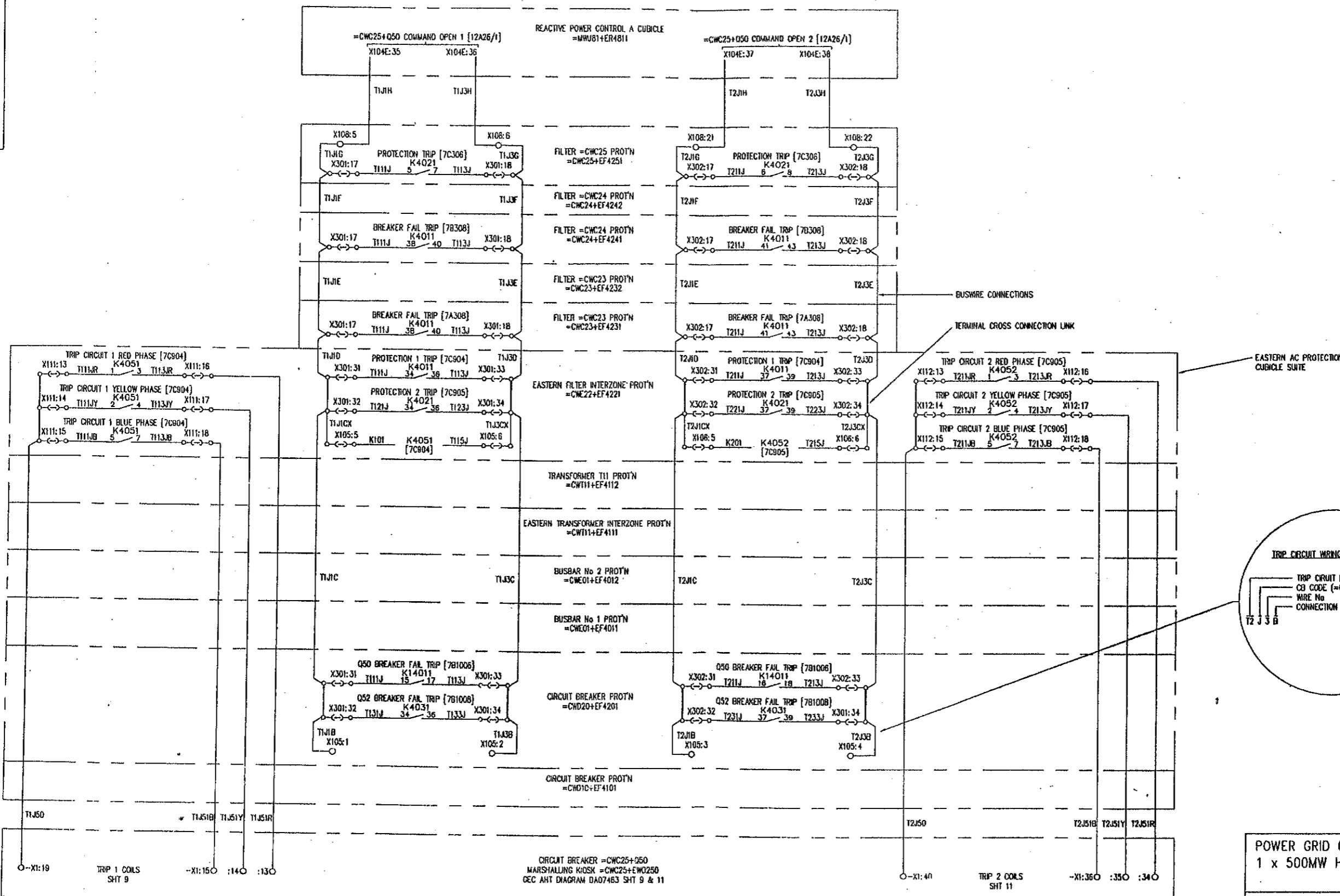
CUSTOMER POWERGRID ORDER No. CF0136

REFER 637EZ1Y04592 FOR FILE INDEX [7C301]
REFER [7C302] FOR LOCATION AND DEVICE LIST

ISSUE	A	PRJ	B	PRJ	C
NAME	D	PNB	JCP	RFR	PREM
DATE	08/03/97	DATE	08/08/97	DATE	31/07/98
LOCATION	VISA3590	REVISION	REVISED TO ECN0845 - SCADA MARSHALLING ADDED (FILE REF TO FOLLOW)		
		REVISION	ADDED TERMINAL NUMBERS TO =CWC20+EX4201		
		REVISION	ADDED TO ECN0845 - SCADA MARSHALLING ADDED (FILE REF 208174) X189 WAS X188		

637EZ1Y04637 SHT 1

CB	LETTER	BUS
=CWD10+Q50	A	
=CWD10+Q51	B	
=CWD10+Q52	C	
=CWD20+Q50	D	
=CWD20+Q51	E	
=CWD20+Q52	F	
=CWC23+Q50	G	
=CWC24+Q50	H	
=CWC25+Q50	J	
=CWL19+Q50	K	
=CWL20+Q50	L	
PG REMOTE L1	M	
PG REMOTE L2	N	
=CWD30+Q50	P	
=CWD30+Q51	R	
=CWD30+Q52	S	
=CWC33+Q50	T	
=CWC34+Q50	U	
=CWC35+Q50	V	
=CWC36+Q50	W	
PG EXISTING 8B1	X	
PG EXISTING 8B2	Y	



FILE 7C308
 POWER GRID CORPORATION OF INDIA LIMITED
 1 x 500MW HVDC BACK-TO-BACK PROJECT
 VISAKHAPATNAM

GEC ALSTHOM T&D
 Power Electronic Systems Limited
 VISAKHAPATNAM
 AC HARMONIC FILTER =CWC25 PROTECTION
 CIRCUIT DIAGRAM FOR
 SIGNALS TO CIRCUIT BREAKER =CWC25+Q50

AS BUILT DWG
 14 APR 2000
VISAKHAPATNAM

REFER 637EZ1Y04502 FOR FILE INDEX [7C301]
 REFER [7C302] FOR LOCATION AND DEVICE LIST

ISSUE	A	B	PRJ
DATE	06	08	08
ISSUE	03	01	07
ISSUE	97	07	07

REVISIONS:
 1. REVISED TO COMPLY WITH K4011 & K4052 CONTACTS ADDED IN SEP 2001 & [7C308] WAS [7B305] IN E4251 & E4241
 2. REVISED TO COMPLY WITH K4011 & K4052 CONTACTS ADDED IN SEP 2001 & K4052 RELAY OCT REF IN TRIP CWT WIRING

GEC ALSTHOM T&D
 Power Electronic Systems Limited
 CERTIFIED FOR MANUFACTURE
 NAME: B T BARRETT
 DEPT: 739 DATE: 25/02/98
 SIGNED: BTB

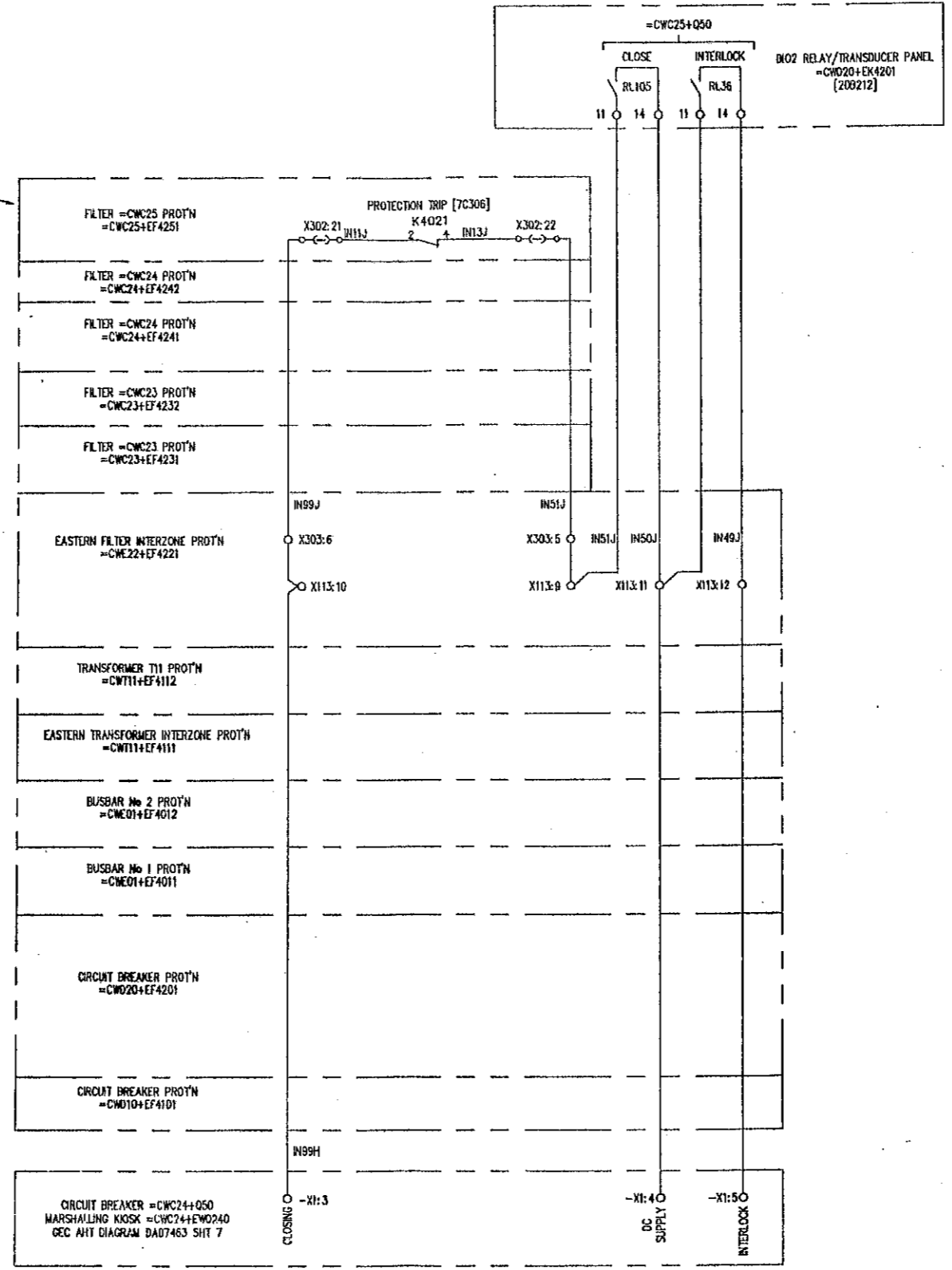
THIRD ANGLE PROJECTION
 ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED
 DRAWING TO BS308 UNLESS OTHERWISE STATED
 FOR THE STANDARD OF ACCURACY OF ALL UNTOLERANCED DIMENSIONS SEE SPEC. STAND/023/PROC

DRAWN: JCP
 CWD: PNS
 APP'D: RFR
 SCALE:
 TRACED:
 DESIGN: PRJ
 DTD No: 637EZ1Y04637 SHT 1
 CURRENT ISSUE: C

DWG. No. 637EZ1Y04637 SHT 2

CB CIRCUIT CODE LETTER		
CB	LETTER	BUS
=CWD10+Q50	A	EAST
=CWD10+Q51	B	
=CWD10+Q52	C	
=CWD20+Q50	D	
=CWD20+Q51	E	
=CWD20+Q52	F	
=CWC23+Q50	G	
=CWC24+Q50	H	
=CWC25+Q50	J	
=CWL19+Q50	K	
=CWL29+Q50	L	
PG REMOTE L1	M	SOUTH
PG REMOTE L2	N	
=CWD30+Q50	P	
=CWD30+Q51	R	
=CWD30+Q52	S	
=CWC33+Q50	T	
=CWC34+Q50	U	
=CWC35+Q50	V	
=CWC36+Q50	W	
PG EXISTING 001	X	
PG EXISTING 002	Y	

EASTERN AC PROTECTION CUBICLE SUITE



FILE 7C308/1

POWER GRID CORPORATION OF INDIA LIMITED
1 x 500MW HVDC BACK-TO-BACK PROJECT
VISAKHAPATNAM

GEC ALSTHOM
T&D

GEC ALSTHOM T&D
Power Electronic Systems Limited
Wulfrun, England

TITLE
VISAKHAPATNAM
AC HARMONIC FILTER =CWC25 PROTECTION
CIRCUIT DIAGRAM FOR
SIGNALS TO CIRCUIT BREAKER =CWC25+Q50

DRG. No. 637EZ1Y04637 SHT 2
CURRENT ISSUE B

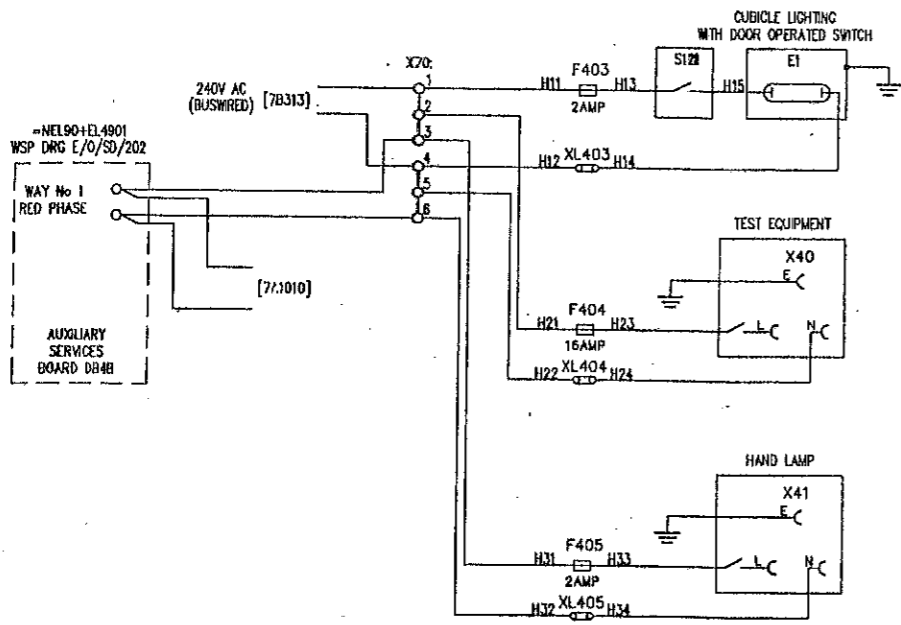
REFER 637EZ1Y04592 FOR FILE INDEX (7C301)
REFER (7C302) FOR LOCATION AND DEVICE LIST

ISSUE B
NAME 637EZ1Y04637
LOCATION VISA3591

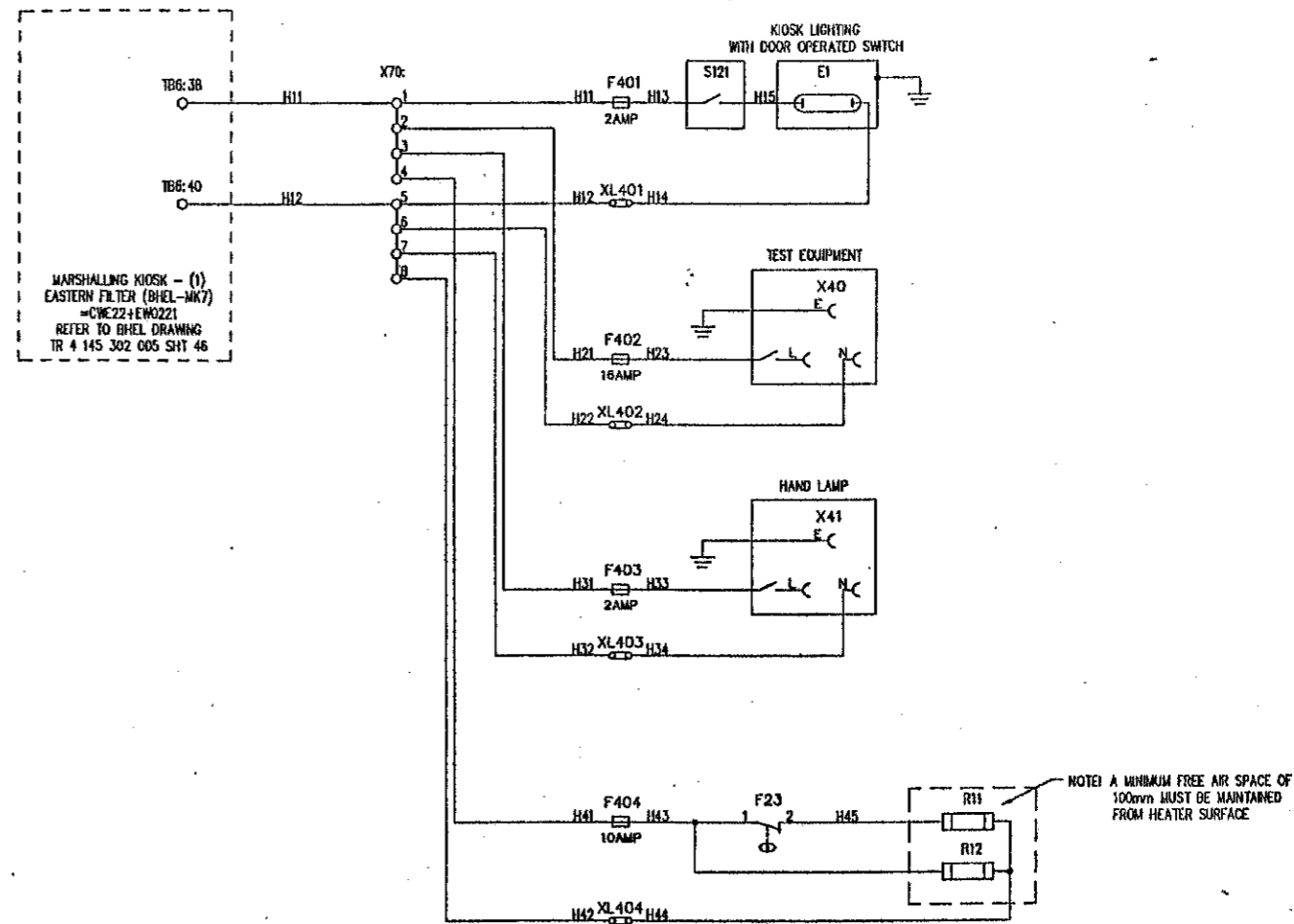
ISSUE A
DATE 22/07/98
DUE TO ECR443 & BARR:-
REMOVED X302.32, 33, X102.5
& 6 FROM =CWD20+EF401L
ADDED TERMINALS IN =CWE24
S17, S18, S19, S20, S21, S22, S23, S24, S25, S26, S27, S28, S29, S30, S31, S32, S33, S34, S35, S36, S37, S38, S39, S40, S41, S42, S43, S44, S45, S46, S47, S48, S49, S50, S51, S52, S53, S54, S55, S56, S57, S58, S59, S60, S61, S62, S63, S64, S65, S66, S67, S68, S69, S70, S71, S72, S73, S74, S75, S76, S77, S78, S79, S80, S81, S82, S83, S84, S85, S86, S87, S88, S89, S90, S91, S92, S93, S94, S95, S96, S97, S98, S99, S100, S101, S102, S103, S104, S105, S106, S107, S108, S109, S110, S111, S112, S113, S114, S115, S116, S117, S118, S119, S120, S121, S122, S123, S124, S125, S126, S127, S128, S129, S130, S131, S132, S133, S134, S135, S136, S137, S138, S139, S140, S141, S142, S143, S144, S145, S146, S147, S148, S149, S150, S151, S152, S153, S154, S155, S156, S157, S158, S159, S160, S161, S162, S163, S164, S165, S166, S167, S168, S169, S170, S171, S172, S173, S174, S175, S176, S177, S178, S179, S180, S181, S182, S183, S184, S185, S186, S187, S188, S189, S190, S191, S192, S193, S194, S195, S196, 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637E21Y04638 SHT 1

AC FILTER PROTECTION CUBICLE
=CWC25+EF4251



AC FILTER CT & CVT MARSHALLING KIOSK
=CWC25+EWO251



REFER 637E21Y04592 FOR FILE INDEX (7C301)
REFER (7C302) FOR LOCATION AND DEVICE LIST
REFER (7C302/1) FOR LOCATION AND DEVICE LIST CVT & VT MARSHALLING KIOSK

ISSUE	DATE	BY	CHKD	PRJ	PRJ	PRJ
A	B	C	D	PREM	PREM	PREM
D	03/09/97	08/08/97	08/08/97	31/07/96	31/07/96	31/07/96

REVISIONS:
 REVISED TO ECH 8254 - MARSHALLING KIOSK CIRCUIT AND AUXILIARY SERVICES BOARD ADDED (PHASE & WAY No TO FOLLOW)
 REVISED TO ECH8486 -
 ADDED =CWC25+EWO221 & TERMINAL INFORMATION ON =NELSO+EL4801.
 REMOVED INSET A
 98/12/17
 REVISED TO ECH8645 -
 ADDED TERMS TB8:3B & 40 & SHT No. 46.

AS BUILT DWG
14 APR 2000
VISAKHAPATNAM

GEC ALSTHOM
T&D
CERTIFIED FOR MANUFACTURE
NAME: B T BARRETT
DEPT. 739 DATE: 25/03/97
SIGNED: BTB

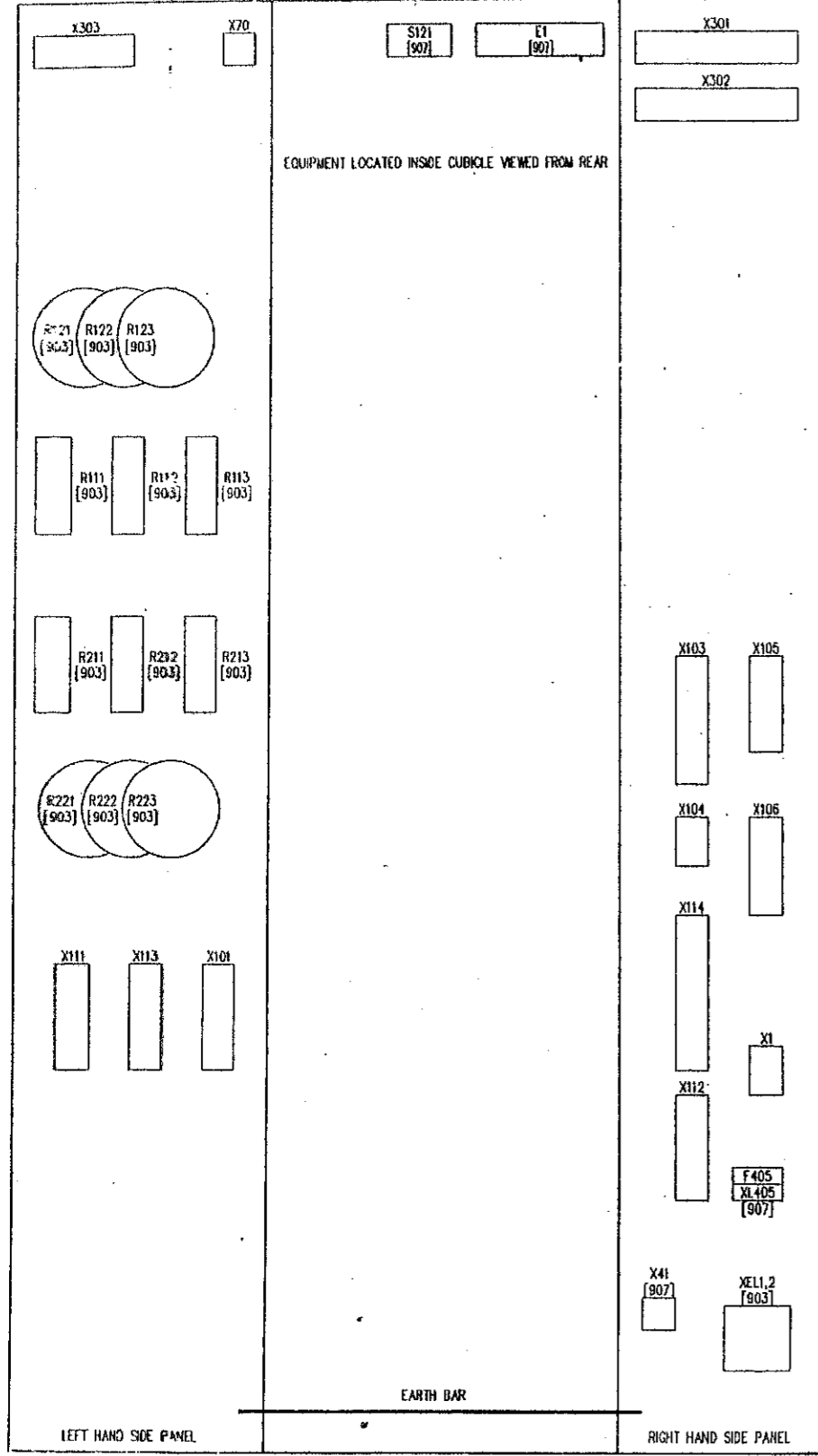
THIRD ANGLE PROJECTION
ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED
DRAWING TO BE MADE UNLESS OTHERWISE STATED
FOR THE STANDARD OF ACCURACY OF ALL UNTOLERANCED DIMENSIONS SEE SPECIAL STAND/023/P400
DO NOT SCALE PRINT

POWER GRID CORPORATION OF INDIA LIMITED
1 x 500MW HVDC BACK-TO-BACK PROJECT
VISAKHAPATNAM
GEC ALSTHOM
T&D
GEC ALSTHOM T&D
Power Electronic Systems Limited
VISAKHAPATNAM
AC FILTER =CWC25 PROTECTION
CIRCUIT DIAGRAM FOR
AC SUPPLIES AND CUBICLE ILLUMINATION
ORG. No. 637E21Y04638 SHT 1
CLIENT ISSUE D

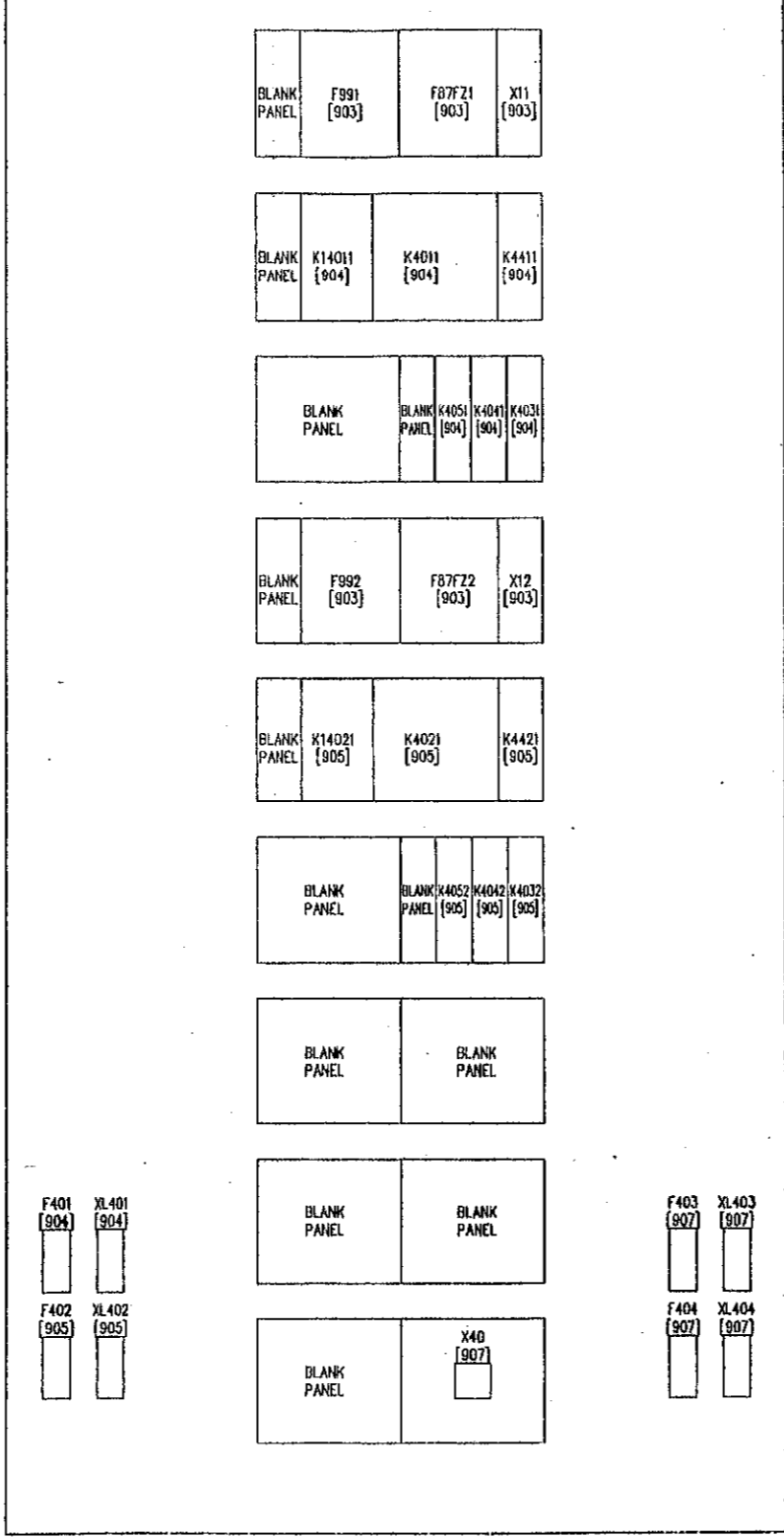
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DRG. No. 637EZ1Y04588 SHT 2

EQUIPMENT LOCATED INSIDE CUBICLE VIEWED FROM REAR



PROTECTION CUBICLE =CWE22+EF4221
FRONT VIEW (DOOR OPEN)



DEVICE REF	DESCRIPTION	TYPE
F091	PROTECTION No 1 BUSWIRE SUPERVISION RELAY	GECA MVIP31
F87F21	PROTECTION No 1 CIRCULATING CURRENT RELAY	GECA MCAG34
X11	PROTECTION No 1 CIRCULATING CURRENT TEST BLOCK	GECA WMLG01
X1401	PROTECTION No 1 TRIP RELAY AUXILIARY RELAY	GECA MVA114
K4011	PROTECTION No 1 LOCKOUT TRIP RELAY	GECA MVAJ53
K4411	PROTECTION SUPPLY NO.1 SUPERVISION RELAY	GECA MVAX12
K4031	=CWC23+Q50 TRIP RELAY 1	GECA MVA116
K4041	=CWC24+Q50 TRIP RELAY 1	GECA MVA116
K4051	=CWC25+Q50 TRIP RELAY 1	GECA MVA116
F092	PROTECTION No 2 BUSWIRE SUPERVISION RELAY	GECA MVIP31
F87F22	PROTECTION No 2 CIRCULATING CURRENT RELAY	GECA MCAG34
X12	PROTECTION No 2 CIRCULATING CURRENT TEST BLOCK	GECA WMLG01
K14021	PROTECTION No 2 TRIP RELAY AUXILIARY RELAY	GECA MVA114
K4021	PROTECTION No 2 LOCKOUT TRIP RELAY	GECA MVAJ53
K4421	PROTECTION SUPPLY NO.2 SUPERVISION RELAY	GECA MVAX12
K4032	=CWC23+Q50 TRIP RELAY 2	GECA MVA116
K4042	=CWC24+Q50 TRIP RELAY 2	GECA MVA116
K4052	=CWC25+Q50 TRIP RELAY 2	GECA MVA116
E1	CUBICLE LIGHTING	
F401	FUSE AND HOLDER 10A, PROTECTION SUPPLY No. 1, 48Vdc.	GECA SC32P
XL401	LINK AND HOLDER	GECA SC32P
F402	FUSE AND HOLDER 10A, PROTECTION SUPPLY No. 2, 48Vdc.	GECA SC32P
XL402	LINK AND HOLDER	GECA SC32P
F403	FUSE AND HOLDER, 2A, CUBICLE LIGHTING SUPPLY, 240V, 50HZ.	GECA SC32P
XL403	LINK AND HOLDER	GECA SC32P
F404	FUSE AND HOLDER, 16A, SUPPLY FOR TEST EQUIPMENT 16A SOCKET, 240V, 50HZ.	GECA SC32P
XL404	LINK AND HOLDER	GECA SC32P
F405	FUSE AND HOLDER, 2A, FOR HAND LAMP SUPPLY 16A SOCKET, 240V, 50HZ.	WEIDMULLER KSK3F
XL405	LINK AND HOLDER	WEIDMULLER KSK3FL
R111,R112,R113	SETTING RESISTOR FOR RELAY F87F21 (0-5.6K Ohm)	WELWYN VB1609
R211,R212,R213	SETTING RESISTOR FOR RELAY F87F22 (0-5.6K Ohm)	WELWYN VB1609
R121,R122,R123	METHOSIL RESISTOR FOR RELAY F87F21	GECA TYPE 600A
R221,R222,R223	METHOSIL RESISTOR FOR RELAY F87F22	GECA TYPE 600A
S121	CUBICLE LIGHTING DOOR SWITCH	
X1	48VDC SUPPLY TERMINALS	WEIDMULLER RSF1
X70	BUSWIRE TERMINALS (240VAC SUPPLY)	WEIDMULLER SAK6N
X101	CONTACT TERMINALS	WEIDMULLER RS1
X103	SEQUENCE OF EVENTS RECORDER TERMINALS	WEIDMULLER SAKR
X104	DIAGNOSTIC TERMINALS	WEIDMULLER SAKR
X105	TRIP CIRCUIT 1 TERMINALS	WEIDMULLER RSF2
X106	TRIP CIRCUIT 2 TERMINALS	WEIDMULLER RSF2
X111	TRIP COIL 1 TERMINALS	WEIDMULLER RSF2
X112	TRIP COIL 2 TERMINALS	WEIDMULLER RSF2
X113	INHIBIT CLOSING TERMINALS	WEIDMULLER RS1
X114	SPARE RELAY CONTACTS TERMINALS	WEIDMULLER SAKR
X301	BUSWIRE TERMINALS (TRIP CIRCUIT 1 etc)	WEIDMULLER RSF2
X302	BUSWIRE TERMINALS (TRIP CIRCUIT 2 etc)	WEIDMULLER RSF2
X303	BUSWIRE TERMINALS (INHIBIT CLOSING etc)	WEIDMULLER RSF2
X40	TEST EQUIPMENT SWITCHED SOCKET.	
X41	HAND LAMP SWITCHED SOCKET.	
XEL1,2	EARTH LINK FOR PROTECTION RELAYS	KUPPON STL5

NOTES:
REFER [7C901] FOR FILE INDEX

ISSUE	PRJ	PRJ	PRJ
DATE	PNR	REF	PREM
12/03/97	08/08/97	22/07/98	01/09/98

REVISIONS:
 01: REVISED TO CORRECT VALUE OF SETTING RESISTORS ADDED. SETTING RESISTORS WERE SUPPLIED WITH RELAYS.
 02: REVISED TO CORRECT VALUE OF SETTING RESISTORS ADDED. SETTING RESISTORS WERE SUPPLIED WITH RELAYS.
 03: REVISED TO CORRECT VALUE OF SETTING RESISTORS ADDED. SETTING RESISTORS WERE SUPPLIED WITH RELAYS.
 04: REVISED TO CORRECT VALUE OF SETTING RESISTORS ADDED. SETTING RESISTORS WERE SUPPLIED WITH RELAYS.
 05: REVISED TO CORRECT VALUE OF SETTING RESISTORS ADDED. SETTING RESISTORS WERE SUPPLIED WITH RELAYS.
 06: REVISED TO CORRECT VALUE OF SETTING RESISTORS ADDED. SETTING RESISTORS WERE SUPPLIED WITH RELAYS.
 07: REVISED TO CORRECT VALUE OF SETTING RESISTORS ADDED. SETTING RESISTORS WERE SUPPLIED WITH RELAYS.
 08: REVISED TO CORRECT VALUE OF SETTING RESISTORS ADDED. SETTING RESISTORS WERE SUPPLIED WITH RELAYS.
 09: REVISED TO CORRECT VALUE OF SETTING RESISTORS ADDED. SETTING RESISTORS WERE SUPPLIED WITH RELAYS.
 10: REVISED TO CORRECT VALUE OF SETTING RESISTORS ADDED. SETTING RESISTORS WERE SUPPLIED WITH RELAYS.
 11: REVISED TO CORRECT VALUE OF SETTING RESISTORS ADDED. SETTING RESISTORS WERE SUPPLIED WITH RELAYS.
 12: REVISED TO CORRECT VALUE OF SETTING RESISTORS ADDED. SETTING RESISTORS WERE SUPPLIED WITH RELAYS.
 13: REVISED TO CORRECT VALUE OF SETTING RESISTORS ADDED. SETTING RESISTORS WERE SUPPLIED WITH RELAYS.
 14: REVISED TO CORRECT VALUE OF SETTING RESISTORS ADDED. SETTING RESISTORS WERE SUPPLIED WITH RELAYS.
 15: REVISED TO CORRECT VALUE OF SETTING RESISTORS ADDED. SETTING RESISTORS WERE SUPPLIED WITH RELAYS.

AS BUILT DWG
14 APR 2000
VISAKHAPATNAM

GEC ALSTHOM T&D
Power Electronic Systems Limited
CERTIFIED FOR MANUFACTURE
NAME: B T BARRETT
DEPT: 739 DATE: 5/3/97
SIGNED: BTB

THIRD ANGLE PROJECTION
ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED
DRAWING TO BE 300 UNLESS OTHERWISE STATED
FOR THE STANDARD OF ACCURACY OF ALL UNTOLERANCED DIMENSIONS SEE SPECN. STAMP/223/PROC
DO NOT SCALE PRINT

DRAWN: JOP
CHKD: PNS
APP'D: RFR
SCALE:
TRACED:
DESIGN: PRJ
APP'D:

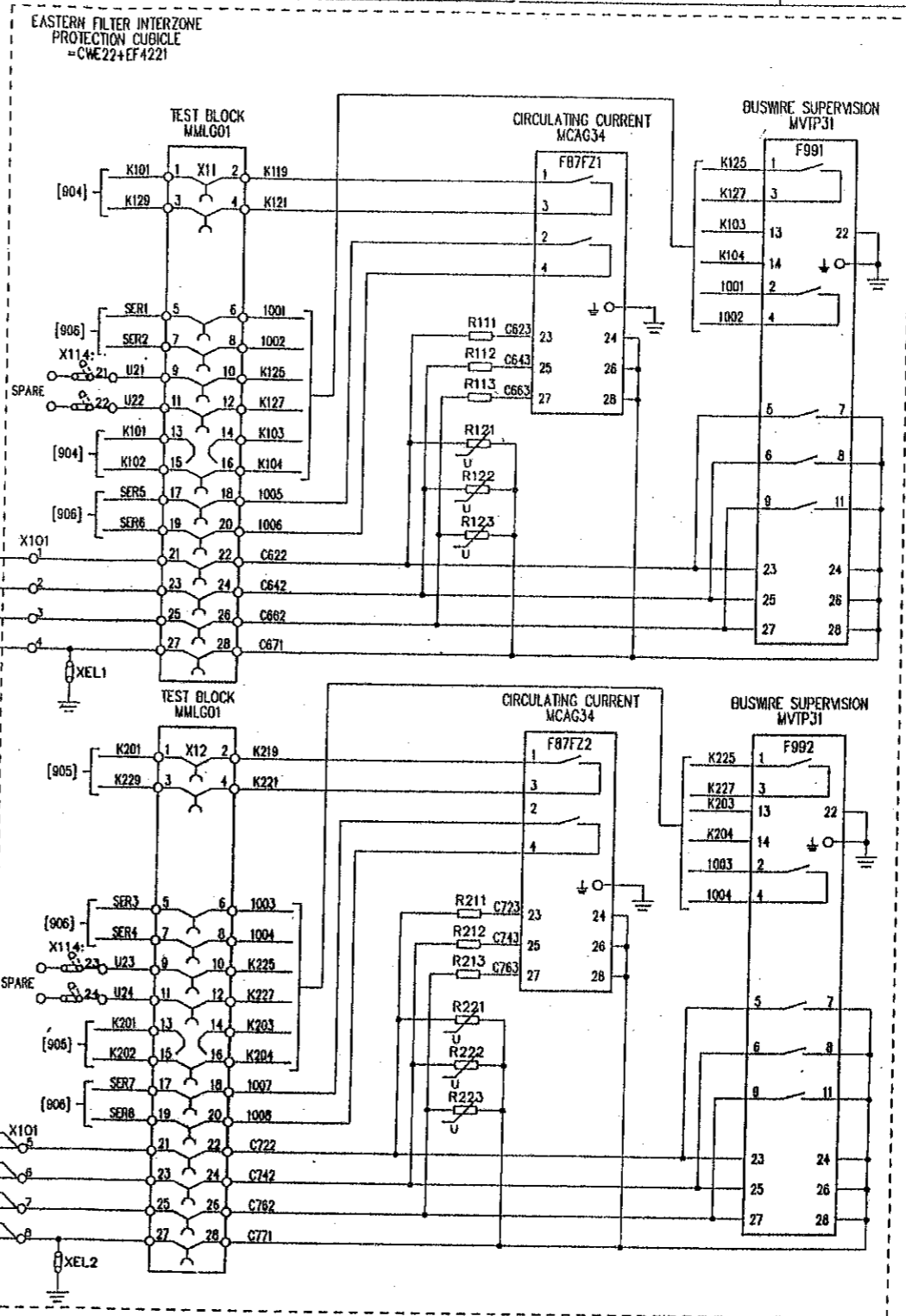
GEC ALSTHOM T&D
Power Electronic Systems Limited
Shelford, England
TITLE: VISAKHAPATNAM EASTERN FILTER INTERZONE PROTECTION CUBICLE =CWE22+EF4221 EQUIPMENT LOCATION AND DEVICE LIST
DRG. No. 637EZ1Y04588 SHT 2
CURRENT ISSUE: D

FILE 7C902

POWER GRID CORPORATION OF INDIA LIMITED
1 x 500MW HVDC BACK-TO-BACK PROJECT
VISAKHAPATNAM

GEC ALSTHOM T&D

DRG. No. 637EZ1Y04588 SHT 3



FILTER CT/CVT
MARSHALLING KIOSK
=CWC23+EW0231
(7C902/1)

CIRCUIT BREAKER
PROTECTION CUBICLE
=CWC20+EF4201
(7B1005)

NOTES:
[SMM] DENOTES FILE NO OF 7C900 SECTION
REFER [901] FOR FILE INDEX
REFER [902] FOR LOCATION AND DEVICE LIST
[7AMNN] DENOTES FILE NO OF 7AMNN SECTION

FILE 7C903

POWER GRID CORPORATION OF INDIA LIMITED
1 x 500MW HVDC BACK-TO-BACK PROJECT
VISAKHAPATNAM

GEC ALSTHOM
T&D

GEC ALSTHOM T&D
Power Electronic Systems Limited

TITLE
VISAKHAPATNAM
EASTERN FILTER INTERZONE PROTECTION
CUBICLE =CWE22+EF4221
AC CIRCUITS

DRG. No. 637EZ1Y04588 SHT 3

CURRENT
ISSUE
D

ISSUE	PRJ A	PRJ B	PRJ C
D	08	08	22
	03	08	07
	97	97	98

REVISIONS:
REVISED TO ED8842A - TERMINALS 11 & 11 ON TEST BLOCKS NOW USED FOR SPARES, ALSO ED8842A RELAY TYPES ADDED & EARTH ADDED TO TERMINAL 22 OF MVIP31
REVISED TO ED8842A - ADDED FILTER SIGNALS FROM =CWC23+EW0231 & SIGNALS TO =CWC20+EF4201
REVISED TO ED8842A - CHANGED WIRE NO'S C670 & C780 TO C680 & C780.

AS BUILT DWG
14 APR 2000
VISAKHAPATNAM

GEC ALSTHOM T&D
Power Electronic Systems Limited
CERTIFIED FOR
MANUFACTURE
NAME: B T BARRETT
DEPT. 739 DATE: 12/03/97
SIGNED BTB

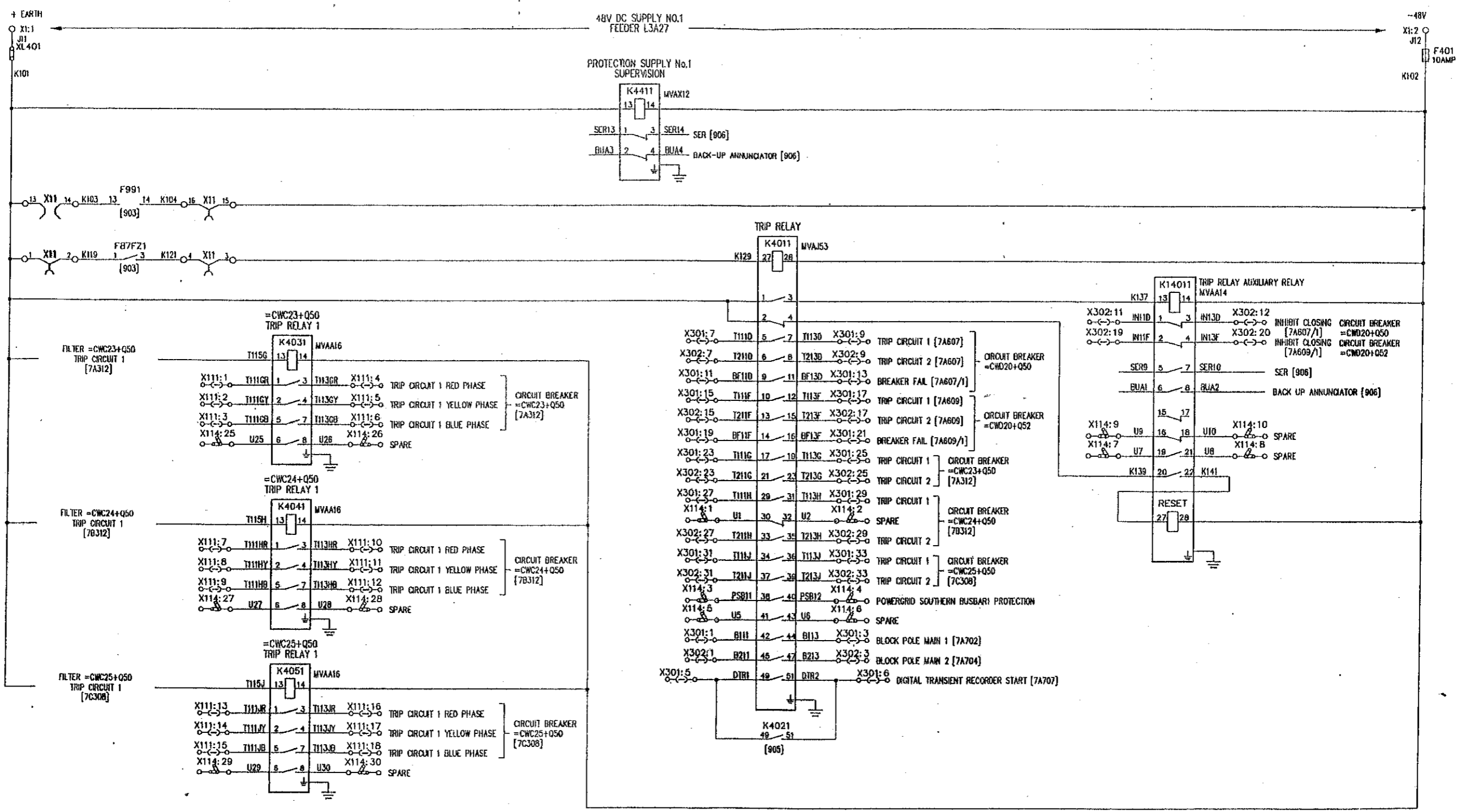
THIRD ANGLE
PROJECTION
IF IN DOUBT
ASK

ALL DIMENSIONS
IN MILLIMETRES
UNLESS OTHERWISE STATED
DRAWING TO BE
USED UNLESS OTHERWISE STATED
FOR THE STANDARD OF
ACCURACY OF ALL
DIMENSIONS SEE SPECN. STAND. 023/PROC

DRAWN JCP
CHKD PNS
APP'D RFR
SCALE
TRACED
DESIGN
APP'D PRJ

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CUSTOMER POWERGRID
ORDER No. CF0136

637EZ1Y04588 SHT 4



NOTES:
 [99NN] DENOTES FILE NO OF 709NN SECTION
 REFER [901] FOR FILE INDEX
 REFER [902] FOR LOCATION AND DEVICE LIST
 [7ANN] DENOTES FILE NO OF 7ANN SECTION

ISSUE	DATE	BY	REVISION
A	12/08/97	JCP	ISSUED FOR CONSTRUCTION
B	08/08/97	JCP	FOR BLOCK POLE CHANGED FROM 198T TO 198R
C	03/09/97	JCP	DELETED FROM K4011 COIL
	07/09/98	JCP	REMOVED TO EDCN443 & B466 -
	22/09/98	JCP	ADDED K4031, K4041, K4051 & NEW SIGNAL ON X114:3 & 4
	07/09/98	JCP	ALSO CHANGED WIRE NO FROM US & U4
	07/09/98	JCP	REMOVED TO EDCN448 -
	07/09/98	JCP	CHANGED FILE REF'S FROM 7A507 & 7A609 ON X301:13, X302:12 & X301:21, X302:20

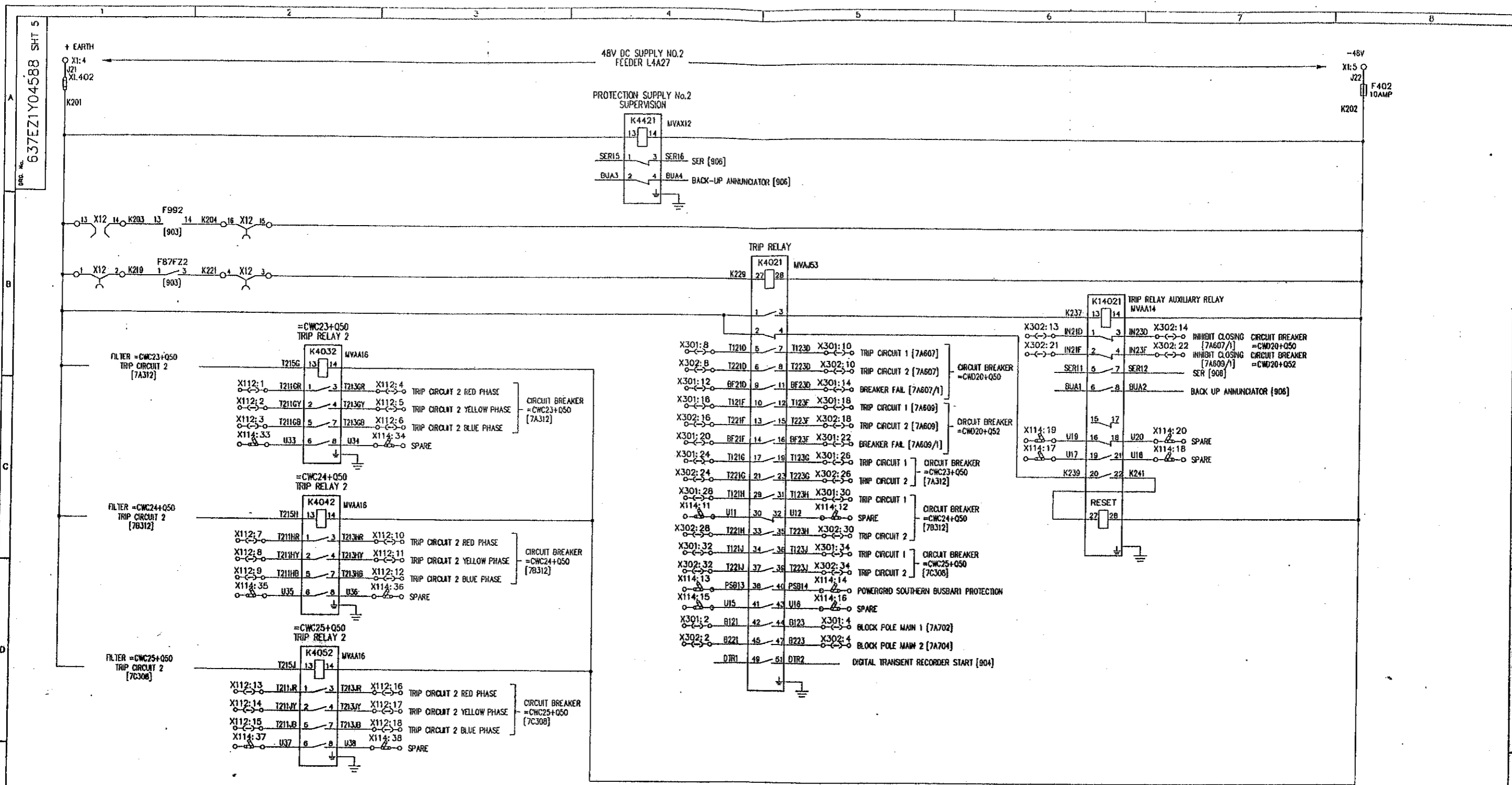
AS BUILT DWG
 14 APR 2000
VISAKHAPATNAM

GEC ALSTHOM LTD
 Power Electronic Systems Limited
 CERTIFIED FOR MANUFACTURE
 NAME: B T BARRETT
 DEPT: 739 DATE: 5/3/97
 SIGNED: BTB

THIRD ANGLE PROJECTION
 ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED
 DRAWN TO BS308 UNLESS OTHERWISE STATED
 FOR THE STANDARD OF ACCURACY OF ALL UNDIMENSIONED DIMENSIONS SEE SPEC. STAND/023/PROC

POWER GRID CORPORATION OF INDIA LIMITED
 1 x 500MW HVDC BACK-TO-BACK PROJECT
 VISAKHAPATNAM
 GEC ALSTHOM T&D
 Power Electronic Systems Limited
 VISAKHAPATNAM
 EASTERN FILTER INTERZONE PROTECTION CUBICLE =CWC22+EF4221
 DC CIRCUITS (PROTECTION SYSTEM 1)
 Dwg. No. 637EZ1Y04588 SHT 4
 CURRENT ISSUE C

FILE 7C904



NOTES:
 [9NN] DENOTES FILE NO OF 7CSNN SECTION
 REFER [901] FOR FILE INDEX
 REFER [902] FOR LOCATION AND DEVICE LIST
 [7ANN] DENOTES FILE NO OF 7ANN SECTION

C.A.D. DATA	PRJ	FILE NOS
ISSUE	A	B
NAME	ISSUE	PNS
LOCATION	DATE	JCP
VISA2001	12-03-97	08-08-97

REVISED TO ECR9443-34866 -
 FOR BLOCK POLE CHANGED 1992
 DELETED FROM K4021 COIL
 CIRCUIT, ALSO ECR9443-34866
 TYPES ADDED
 22-07-98
 REVISED TO ECR9443-34866 -
 ADDED K4032, K4042 & K4052
 NEW SIGNAL ON X114:13 & 14
 ALSO CHANGED WIRE NO FROM
 U15 & U14
 REVISED TO ECR9448-
 CHANGED FILE REF'S FROM 7A607
 & 7A609 ON X301:14, X302:14
 & X301:22, X302:22

AS BUILT DWG
 14 APR 2000
VISAKHAPATNAM

GEC ALSTHOM T&D
 Power Electronic Systems Limited
 CERTIFIED FOR
 MANUFACTURE
 NAME: B T BARRETT
 DEPT: 739 DATE: 5/3/97
 SIGNED: BTB

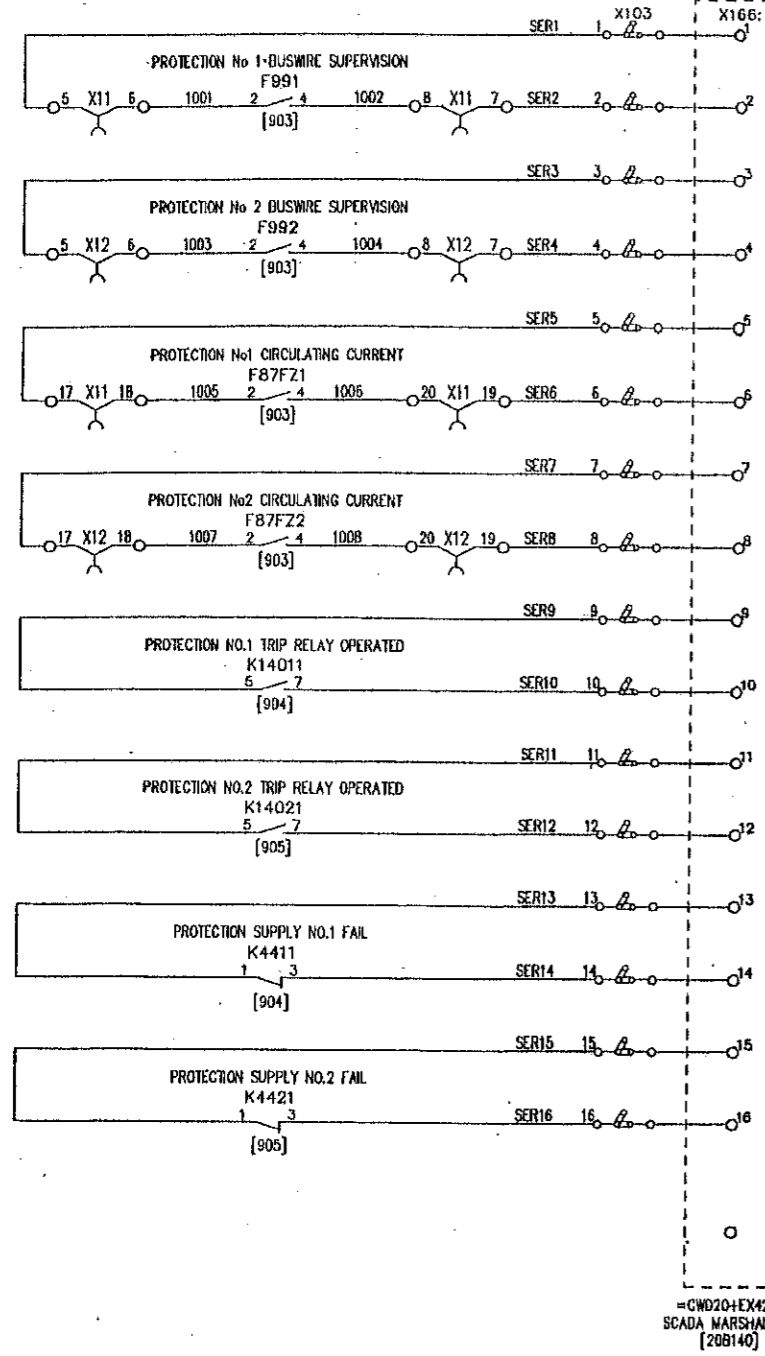
THIRD ANGLE
 PROJECTION
 ALL DIMENSIONS
 IN MILLIMETRES
 UNLESS OTHERWISE STATED
 DRAWING TO BS308
 UNLESS OTHERWISE STATED
 FOR THE STANDARD OF
 ACCURACY OF ALL
 UNTOLERANCED DIMENSIONS
 SEE SPEC. STAND/023/PHDC

POWER GRID CORPORATION OF INDIA LIMITED
 1 x 500MW HVDC BACK-TO-BACK PROJECT
 VISAKHAPATNAM
GEC ALSTHOM
 T&D
GEC ALSTHOM T&D
 Power Electronic Systems Limited
 VISAKHAPATNAM
 EASTERN FILTER INTERZONE PROTECTION
 CUBICLE =CWE22+EF4221
 DC CIRCUITS (PROTECTION SYSTEM 2)
 DRG. No. 637EZ1Y04588 SHT 5
 CURRENT ISSUE C

FILE 7C905

DRG. No. 637EZ1Y04588 SHT 6

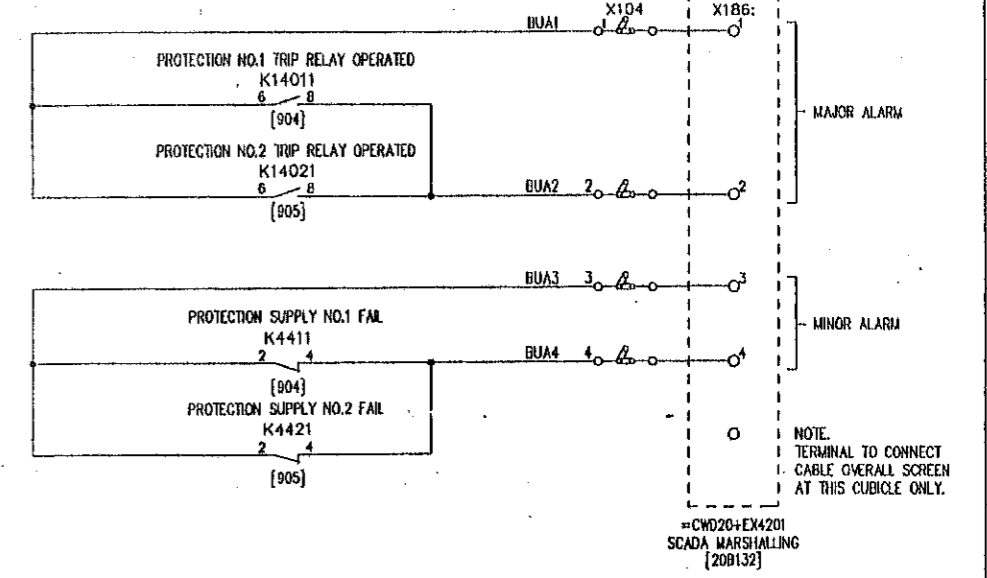
SEQUENCE OF EVENTS RECORDER ALARM SIGNALS



NOTE.
TERMINAL TO CONNECT
CABLE OVERALL SCREEN
AT THIS CUBICLE ONLY.

=CWD20+EX4201
SCADA MARSHALLING
[208140]

BACK-UP ANNUNCIATOR ALARM SIGNALS



NOTES:
[99N] DENOTES FILE NO OF 7C99N SECTION
REFER [901] FOR FILE INDEX
REFER [902] FOR LOCATION AND DEVICE LIST
[7ANN] DENOTES FILE NO OF 7ANN SECTION

FILE 7C906

POWER GRID CORPORATION OF INDIA LIMITED
1 x 500MW HVDC BACK-TO-BACK PROJECT
VISAKHAPATNAM

GEC ALSTHOM
T&D

GEC ALSTHOM T&D
Power Electronic Systems Limited
Shiford, England

TITLE
VISAKHAPATNAM
EASTERN FILTER INTERZONE PROTECTION
CUBICLE =CWE22+EF4221
SER AND BUA SIGNALS

DRG. No. 637EZ1Y04588 SHT 6
CURRENT ISSUE D

C.A.D. DATA
ISSUE D
NAME
LOCATION VISA3669

PRJ A	PRJ B	PRJ C	PRJ D
ISSUE	PNS	RFR	PREM
DATE	DATE	DATE	DATE
12/03/97	08/08/97	22/07/98	09/05/99
REVISED TO EGNB4K- SCADA MARSHALLING ADDED (FILE REF TO FOLLOW)			
REVISED TO EGNB4K- ADDED TERMINAL NUMBERS TO =CWD20+EX4201 CHANGED RELAY REV FROM F87FZ1 & 2 TO F87FZ1 & 2.			
REVISED TO EGNB4K- FILE REF'S 208132 & 208140 WERE 20A.			

AS BUILT DWG
14 APR 2000
VISAKHAPATNAM

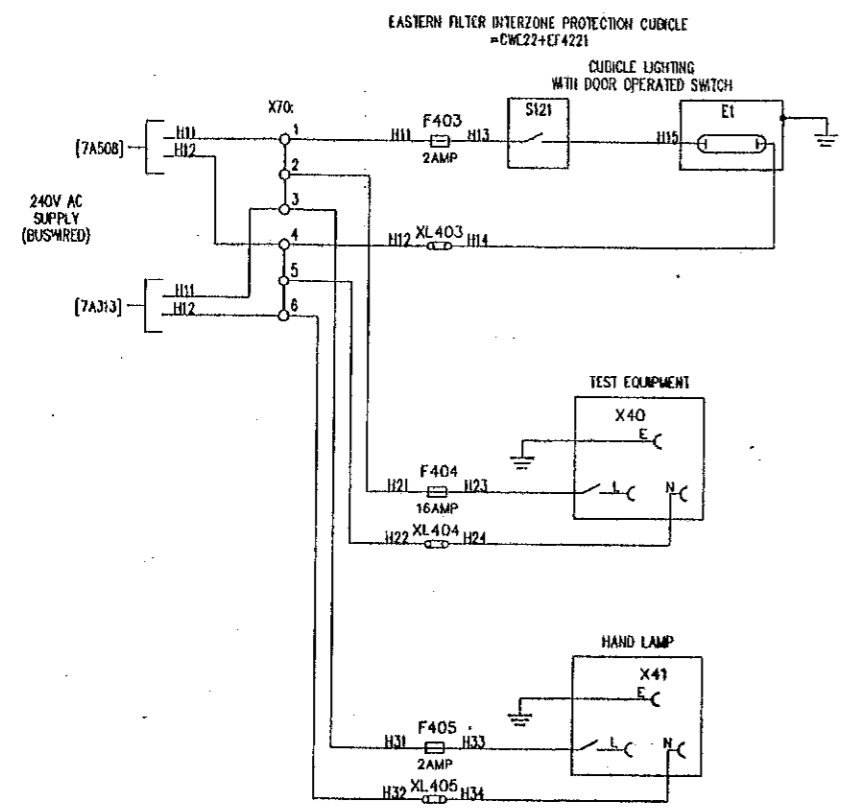
GEC ALSTHOM T&D
Power Electronic Systems Limited
CERTIFIED FOR MANUFACTURE
NAME B T BARRETT
DEPT. 739 DATE 5/3/97
SIGNED BTB

THIRD ANGLE PROJECTION
ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED
DRAWING TO BS308 UNLESS OTHERWISE STATED
FOR THE STANDARD OF ACCURACY OF ALL UNTOLERANCED DIMENSIONS SEC SPEC. STAND/023/PROC
IF IN DOUBT ASK
DO NOT SCALE PRINT

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C/D PNS
APP'D
SCALE
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DESIGN PRJ
APP'D

CUSTOMER POWERGRID ORDER No. CF0136

1 2 3 4 5 6 7 8



NOTES:
 [99N] DENOTES FILE NO OF 7C99N SECTION
 REFER [901] FOR FILE INDEX
 REFER [902] FOR LOCATION AND DEVICE LIST
 [7ANN] DENOTES FILE NO OF 7ANNH SECTION

FILE 7C907

POWER GRID CORPORATION OF INDIA LIMITED
 1 x 500MW HVDC BACK-TO-BACK PROJECT
 VISAKHAPATNAM

GEC ALSTHOM
 T&D

GEC ALSTHOM T&D
 Power Electronic Systems Limited
 Sharnford, England

TITLE
 VISAKHAPATNAM
 EASTERN FILTER INTERZONE PROTECTION
 CUBICLE =CWE22+EF4221
 AC SUPPLIES AND CUBICLE ILLUMINATION

DRG. No. 637EZ1Y04588 SHT 7
 CURRENT ISSUE B

AS BUILT DWG
 14 APR 2000
 VISAKHAPATNAM

GEC ALSTHOM T&D
 Power Electronic Systems Limited
 CERTIFIED FOR
 MANUFACTURE
 NAME: B T BARRETT
 DEPT. 739 DATE: 5/3/07
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THIRD ANGLE
 PROJECTION
 IF IN DOUBT
 ASK

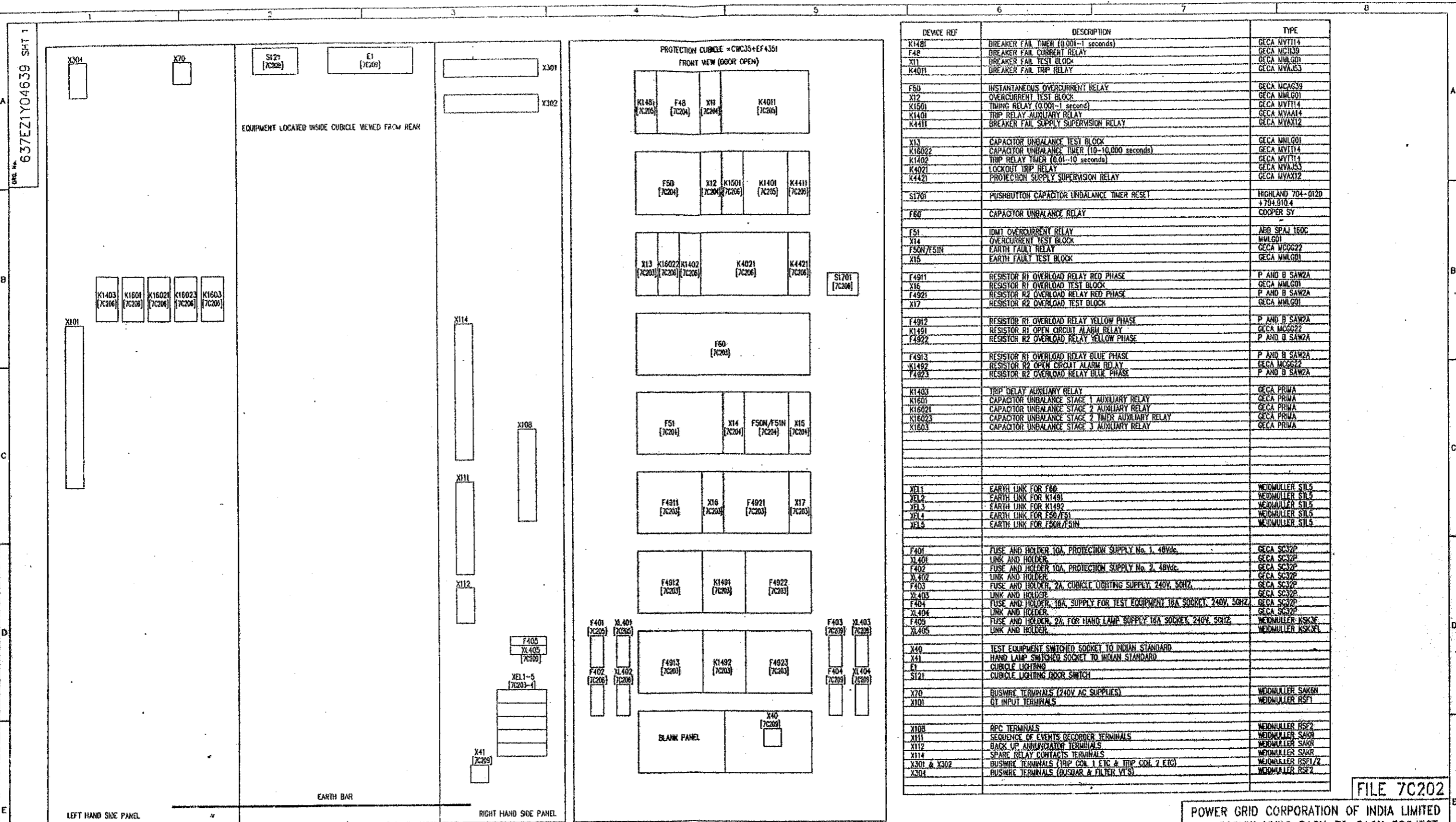
ALL DIMENSIONS
 IN MILLIMETRES
 UNLESS OTHERWISE STATED
 DRAWING TO BS308
 UNLESS OTHERWISE STATED
 FOR THE STANDARD OF
 ACCURACY OF ALL
 UNTOLERANCED DIMENSIONS
 SEE SPECN. STAND/021/PROC

DRAWN JCP
 CHD PNS
 APP'D RFR
 SCALE
 TRACED
 DESIGN APP'D PRJ

CUSTOMER POWERGRID ORDER No. CF0136

C.A.D. DATA	ISSUE	A	B
	NAME	JCP	JCP
LOCATION	DATE	12/03/97	08/03/97
	ISSUE	03/97	08/97

REMOVED TO CONFORM WITH
 CUBICLE TITLE REVISION



DEVICE REF	DESCRIPTION	TYPE
K1481	BREAKER FAIL TIMER (0.001-1 seconds)	GECA MVT114
F48	BREAKER FAIL CURRENT RELAY	GECA MCT139
X11	BREAKER FAIL TEST BLOCK	GECA MMLG01
K4011	BREAKER FAIL TRIP RELAY	GECA MVAJ53
F50	INSTANTANEOUS OVERCURRENT RELAY	GECA MCGS39
X12	OVERCURRENT TEST BLOCK	GECA MMLG01
K1501	TIMING RELAY (0.001-1 second)	GECA MVT114
K1401	TRIP RELAY AUXILIARY RELAY	GECA MVAI14
K4411	BREAKER FAIL SUPPLY SUPERVISION RELAY	GECA MVAJ12
X13	CAPACITOR UNBALANCE TEST BLOCK	GECA MMLG01
K1602	CAPACITOR UNBALANCE TIMER (10-10,000 seconds)	GECA MVT114
K1402	TRIP RELAY TIMER (0.01-10 seconds)	GECA MVT114
K4021	LOCKOUT TRIP RELAY	GECA MVAJ53
K4421	PROTECTION SUPPLY SUPERVISION RELAY	GECA MVAJ12
S1701	PUSHBUTTON CAPACITOR UNBALANCE TIMER RESET	HIGHLAND 704-0120 +704.010.4
F60	CAPACITOR UNBALANCE RELAY	COOPER SY
F51	IDMT OVERCURRENT RELAY	ABB SPAJ 160G
X14	OVERCURRENT TEST BLOCK	MMLG01
F50N/F51N	EARTH FAULT RELAY	GECA MCGG22
X15	EARTH FAULT TEST BLOCK	GECA MMLG01
F4911	RESISTOR R1 OVERLOAD RELAY RED PHASE	P AND B SAW2A
X16	RESISTOR R1 OVERLOAD TEST BLOCK	GECA MMLG01
F4921	RESISTOR R2 OVERLOAD RELAY RED PHASE	P AND B SAW2A
X17	RESISTOR R2 OVERLOAD TEST BLOCK	GECA MMLG01
F4912	RESISTOR R1 OVERLOAD RELAY YELLOW PHASE	P AND B SAW2A
K1491	RESISTOR R1 OPEN CIRCUIT ALARM RELAY	GECA MCGG22
F4922	RESISTOR R2 OVERLOAD RELAY YELLOW PHASE	P AND B SAW2A
F4913	RESISTOR R1 OVERLOAD RELAY BLUE PHASE	P AND B SAW2A
K1492	RESISTOR R2 OPEN CIRCUIT ALARM RELAY	GECA MCGG22
F4923	RESISTOR R2 OVERLOAD RELAY BLUE PHASE	P AND B SAW2A
K1403	TRIP DELAY AUXILIARY RELAY	GECA PRMA
K1601	CAPACITOR UNBALANCE STAGE 1 AUXILIARY RELAY	GECA PRMA
K1602	CAPACITOR UNBALANCE STAGE 2 AUXILIARY RELAY	GECA PRMA
K1603	CAPACITOR UNBALANCE STAGE 3 AUXILIARY RELAY	GECA PRMA
X18	EARTH LINK FOR F60	WEIDMULLER STL5
X19	EARTH LINK FOR K1481	WEIDMULLER STL5
X20	EARTH LINK FOR K1492	WEIDMULLER STL5
X21	EARTH LINK FOR F50/F51	WEIDMULLER STL5
X22	EARTH LINK FOR F50N/F51N	WEIDMULLER STL5
F401	FUSE AND HOLDER 10A, PROTECTION SUPPLY No. 1, 48Vdc	GECA SC37P
X1401	LINK AND HOLDER	GECA SC37P
F402	FUSE AND HOLDER 10A, PROTECTION SUPPLY No. 2, 48Vdc	GECA SC37P
X1402	LINK AND HOLDER	GECA SC37P
F403	FUSE AND HOLDER, 2A, CUBICLE LIGHTING SUPPLY, 240V, 50HZ	GECA SC37P
X1403	LINK AND HOLDER	GECA SC37P
F404	FUSE AND HOLDER, 16A, SUPPLY FOR TEST EQUIPMENT 16A SOCKET, 240V, 50HZ	GECA SC37P
X1404	LINK AND HOLDER	GECA SC37P
F405	FUSE AND HOLDER, 2A, FOR HAND LAMP SUPPLY 16A SOCKET, 240V, 50HZ	WEIDMULLER KSK3E
X1405	LINK AND HOLDER	WEIDMULLER KSK3E
X40	TEST EQUIPMENT SWITCHED SOCKET TO INDIAN STANDARD	
X41	HAND LAMP SWITCHED SOCKET TO INDIAN STANDARD	
E1	CUBICLE LIGHTING	
S121	CUBICLE LIGHTING DOOR SWITCH	
X70	BUSWIRE TERMINALS (240V AC SUPPLIES)	WEIDMULLER SAK6N
X101	GT INPUT TERMINALS	WEIDMULLER RSP1
X108	RPC TERMINALS	WEIDMULLER RSP2
X111	SEQUENCE OF EVENTS RECORDER TERMINALS	WEIDMULLER SAKR
X112	BACK UP ANNUNCIATION TERMINALS	WEIDMULLER SAKR
X114	SPARE RELAY CONTACTS TERMINALS	WEIDMULLER SAKR
X301 & X302	BUSWIRE TERMINALS (TRIP COIL 1 ETC & TRIP COIL 2 ETC)	WEIDMULLER RSE1/2
X304	BUSWIRE TERMINALS (BUSBAR & FILTER VTS)	WEIDMULLER RSE2

FILE 7C202

POWER GRID CORPORATION OF INDIA LIMITED
1 x 500MW HVDC BACK-TO-BACK PROJECT
VISAKHAPATNAM

GEC ALSTHOM

GEC ALSTHOM T&D
Power Electronic Systems Limited
Barnet, England

TITLE
VISAKHAPATNAM
AC HARMONIC FILTER =CWC35+EF4351
EQUIPMENT AND DEVICE LIST

DRG. No. 637EZ1Y04639 SHT 1
CURRENT ISSUE C

REFER 637EZ1Y04595 FOR FILE INDEX [7C201]

C.A.D. DATA	PRJ	PNS	JCP	ISSUE	DATE	BY	REVISION
A	B			13	07	PREM	REVISED TO ENDSPEC - X102 & X103 DELETED
				13	07	PREM	REVISED TO ENDSPEC - DELETED R11, R12, R13, R14
				13	07	PREM	REVISED TO ENDSPEC - DELETED R11, R12, R13, R14

AS BUILT DWG
14 APR 2000
VISAKHAPATNAM

GEC ALSTHOM T&D
Power Electronic Systems Limited
CERTIFIED FOR MANUFACTURE
NAME: B T BARRETT
DEPT: 739 DATE: 5/8/07
SIGNED: BTB

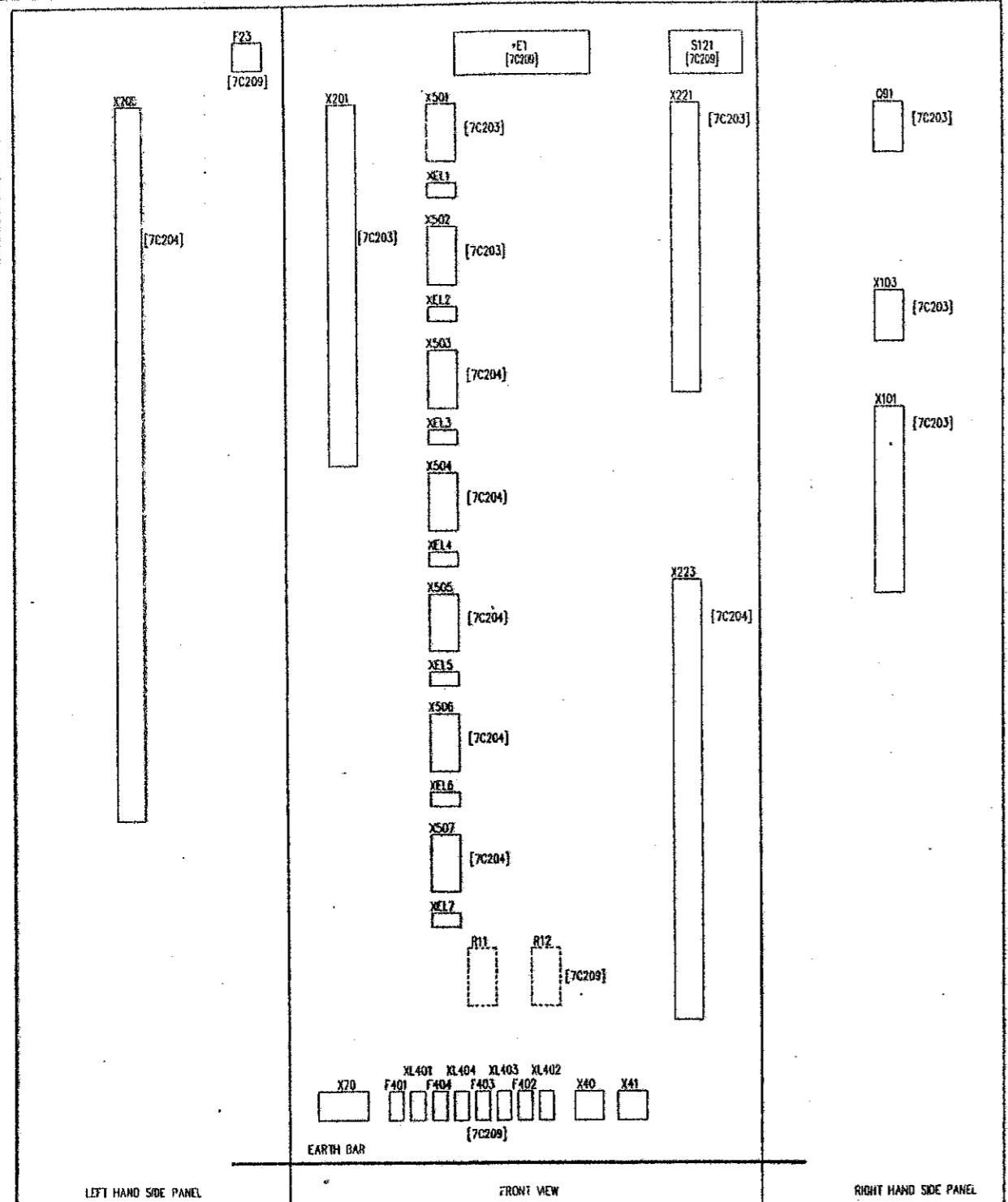
THIRD ANGLE PROJECTION
IF IN DOUBT ASK

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED
DRAWING TO BS308 UNLESS OTHERWISE STATED
FOR THE STANDARD OF ACCURACY OF ALL UNTOLERANCED DIMENSIONS SEE SPEC. STAND. 023/PROG.

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CITY: PNS
APP'D: RFR
SCALE:
TRACED:
DESIGN: PRJ

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CUSTOMER: POWERGRID
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Dwg. No. 637EZ1Y04639 SHT 2



DEVICE REF	DESCRIPTION	TYPE	QTY
E1	CUBICLE LIGHTING		
S121	CUBICLE LIGHTING DOOR SWITCH		
O91	CVT MINIMUM CIRCUIT BREAKER 1A, 3POLE (AUX CONTACTS)	KLOCKNER MOELLER FAZN C1-3 KLOCKNER MOELLER MRLH D02-FAZ	
X101	CVT IN/OUT TERMINALS	WEIDMULLER RSF1	
X103	SER TERMINALS	WEIDMULLER SAKR	
X201	CT IN TERMINALS	WEIDMULLER RSF1	
X203	CT IN TERMINALS	WEIDMULLER RSF1	
X221	CT OUT TERMINALS	WEIDMULLER RSF1	
X223	CT OUT TERMINALS	WEIDMULLER RSF1	
X501	CWC35+151.1 TEST BLOCK	WEIDMULLER SAKT2	
XEL1	EARTH LINK FOR 151.1	WEIDMULLER STL5	
X502	CWC35+152.1 TEST BLOCK	WEIDMULLER SAKT2	
XEL2	EARTH LINK FOR 152.1	WEIDMULLER STL5	
X503	CWC35+153.1 TEST BLOCK	WEIDMULLER SAKT2	
XEL3	EARTH LINK FOR 153.1	WEIDMULLER STL5	
X504	CWC35+153.2 TEST BLOCK	WEIDMULLER SAKT2	
XEL4	EARTH LINK FOR 153.2	WEIDMULLER STL5	
X505	CWC35+153.3 TEST BLOCK	WEIDMULLER SAKT2	
XEL5	EARTH LINK FOR 153.3	WEIDMULLER STL5	
X506	CWC35+153.4 TEST BLOCK	WEIDMULLER SAKT2	
XEL6	EARTH LINK FOR 153.4	WEIDMULLER STL5	
X507	CWC35+153.5 TEST BLOCK	WEIDMULLER SAKT2	
XEL7	EARTH LINK FOR 153.5	WEIDMULLER STL5	
X70	240V AC SUPPLY TERMINALS	WEIDMULLER RSF1	
F401	FUSE AND HOLDER, 2A, CUBICLE LIGHTING SUPPLY, 240V, 50HZ.	WEIDMULLER KSK3E	
XL401	LINK AND HOLDER	WEIDMULLER KSK3E	
F402	FUSE AND HOLDER, 16A, SUPPLY FOR TEST EQUIPMENT 16A SOCKET, 240V, 50HZ.	GECA L.V.C. SC3210	
XL402	LINK AND HOLDER	GECA L.V.C. SC3210	
F403	FUSE AND HOLDER, 2A, FOR HAND LAMP SUPPLY 16A SOCKET, 240V, 50HZ.	WEIDMULLER KSK3E	
XL403	LINK AND HOLDER	WEIDMULLER KSK3E	
F404	FUSE AND HOLDER, 10A, FOR HEATER SUPPLY, 240V, 50HZ.	WEIDMULLER KSK3E	
XL404	LINK AND HOLDER	WEIDMULLER KSK3E	
R11, R12	CUBICLE HEATER THERMOSTATICALLY CONTROLLED (MID ON DOOR)	SAREL 17509 (90W)	
F23	THERMOSTAT	SAREL 17561	
X40	TEST EQUIPMENT SWITCHED SOCKET TO INDIAN STANDARD		
X41	HAND LAMP SWITCHED SOCKET TO INDIAN STANDARD		

FILE 7C202/1

POWER GRID CORPORATION OF INDIA LIMITED
1 x 500MW HVDC BACK-TO-BACK PROJECT
VISAKHAPATNAM

GEC ALSTHOM
T&D

GEC ALSTHOM T&D
Power Electronic Systems Limited
Widford, England

TITLE
VISAKHAPATNAM
AC HARMONIC FILTER =CWC35
CT & CVT MARSHALLING KIOSK =CWC35+EWO351
EQUIPMENT & DEVICE LIST

ORG. No. 637EZ1Y04639 SHT 2
CURRENT ISSUE A

C.A.B. DATA
ISSUE A
NAME 637EZ1Y04639
LOCATION VISA2622

ISSUE DATE 22 05 98

AS BUILT DWG
14 APR 2000
VISAKHAPATNAM

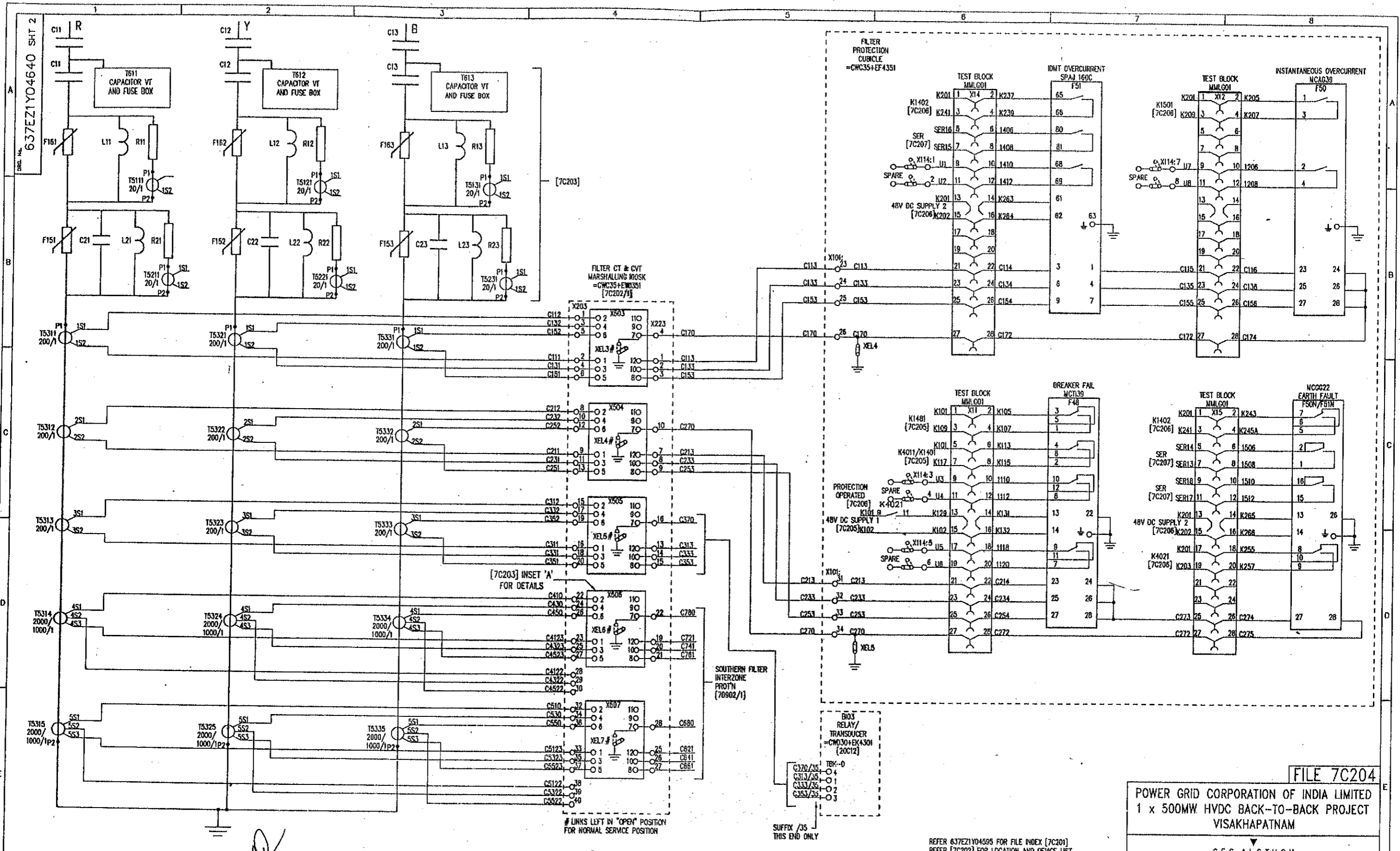
GEC ALSTHOM T&D
Power Electronic Systems Limited
CERTIFIED FOR MANUFACTURE

THIRD ANGLE PROJECTION
IF IN DOUBT ASK

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED
DRAWING TO BS308 UNLESS OTHERWISE STATED
FOR THE STANDARD OF ACCURACY OF ALL UNDIMENSIONED DIMENSIONS SEE SPEC. STANDARDS/PROC

DRAWN VJC
CHKD PAB
APP'D PAB
SCALE
BRACED
DESIGN APP'D

DO NOT SCALE PRINT
WHEN QUOTING DRG. No. STATE CURRENT ISSUE
CUSTOMER POWER GRID CORP OF INDIA ORDER No. CF0136



AS BUILT DWG
14 APR 2003
VISAKHAPATNAM

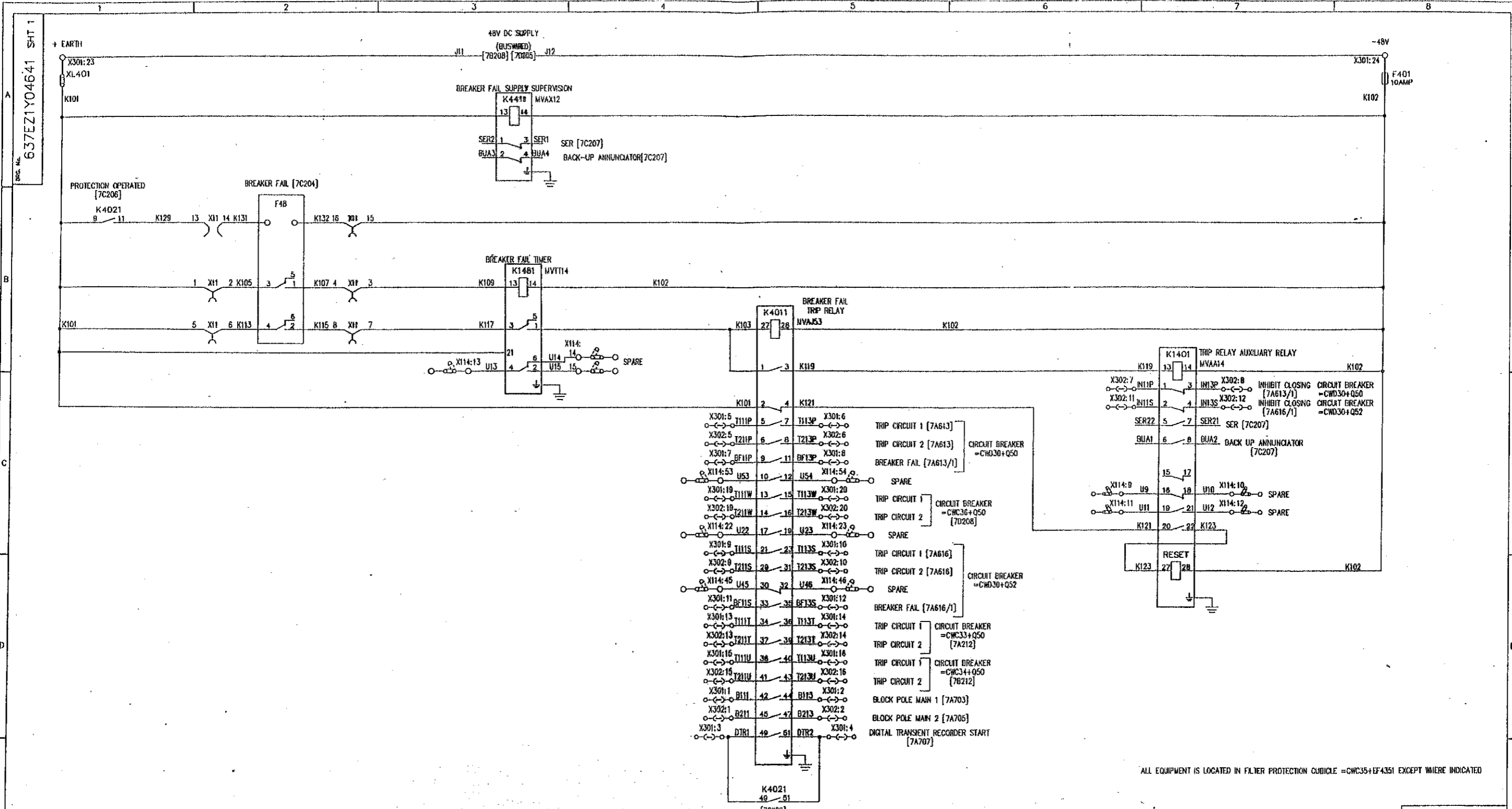
FILE 7C204
POWER GRID CORPORATION OF INDIA LIMITED
1 x 500MW HVDC BACK-TO-BACK PROJECT
VISAKHAPATNAM

C.A.B. DATA	PRJ A	PRJ B	PRJ C	PRJ D	PRJ E
ISSUE D	PNS JCP	RFR PREM	RFR PREM	RFR PREM	RFR PREM
NAME	DATE 12/08/97	DATE 26/08/97	DATE 13/07/97	DATE 13/07/97	DATE 13/07/97
LOCATION VISA3091	REVISIONS: 1. REVISION TO ENH. BAZA & PARK-CHANGED CABLE CODE NO ON X223-18-21 & 25-28 FROM C411, C43, C51, 470 & C514, C53, C55, 570. ALSO FILE REF FOR SOUTHERN FILTER INTERZONE FROM 70902. 2. ADDED TERMINALS NUMBERS TO C410, C430, C450, C4123, C4323, C4523, C4122, C4322, C4522, C510, C530, C550, C5123, C5323, C5523, C5122, C5322, C5522.				

AS BUILT DWG	
14 APR 2003	
VISAKHAPATNAM	
# LINKS LEFT IN "OPEN" POSITION FOR NORMAL SERVICE POSITION	
SUFFIX /35 THIS END ONLY	
REFER 637EZ1Y04640 FOR FILE INDEX (7C201) REFER (7C202) FOR LOCATION AND DEVICE LIST REFER (2A05) FOR PROT'N SINGLE LINE DIAGRAM	

GEC ALSTHOM T&D Power Electronics Systems Limited CERTIFIED FOR MANUFACTURE NAME: B T BARRETT DEPT: 739 DATE: 5/8/97 SIGNED: BTB	THIRD ANGLE PROJECTION IF IN DOUBT ASK	ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED DRAWING TO BS308 UNLESS OTHERWISE STATED FOR THE STANDARD OF ACCURACY OF ALL UNTOLERANCED DIMENSIONS SEE SPEC. STAND./933/PROC	DRAWN: JCP CVD: PNS APP'D: RFR SCALE: TRACED: DESIGN: PRJ APP'D:
--	---	--	--

GEC ALSTHOM	
T&D	
GEC ALSTHOM T&D Power Electronic Systems Limited Milton Keynes, England	
TITLE VISAKHAPATNAM AC HARMONIC FILTER =CWC35 PROTECTION CIRCUIT DIAGRAM FOR AC CIRCUITS	
DRG. No. 637EZ1Y04640 SHT 2	CURRENT ISSUE D



ALL EQUIPMENT IS LOCATED IN FILTER PROTECTION CUBICLE =CWC35+EF4351 EXCEPT WHERE INDICATED

FILE 7C205

POWER GRID CORPORATION OF INDIA LIMITED
1 x 500MW HVDC BACK-TO-BACK PROJECT
VISAKHAPATNAM

GEC ALSTHOM
T&D

GEC ALSTHOM T&D
Power Electronic Systems Limited
Stalford, England

TITLE
VISAKHAPATNAM
AC HARMONIC FILTER =CWC35 PROTECTION
CIRCUIT DIAGRAM FOR
DC CIRCUITS (BREAKER FAIL PROTECTION)

DRG. No. 637EZ1Y04641 SHT 1
CURRENT ISSUE B
CUSTOMER POWERGRID ORDER No. CF0136

REFER 637EZ1Y04592 FOR FILE INDEX [7C201]
REFER [7C202] FOR LOCATION AND DEVICE LIST

C.A.D. DATA	A	PREM	REMOVED TO ECN8402 & 8448- CHANGED FROM K1481:14 REMOVED FILE REF'S FROM 7A613 & 7A616 ON X301:8, X302:8 & X301:12, X302:12
ISSUE	B	PREM	
NAME			
DATE	13	07	
	08	98	
LOCATION			
VSA2258			

AS BUILT DWG
14 APR 2000
VISAKHAPATNAM

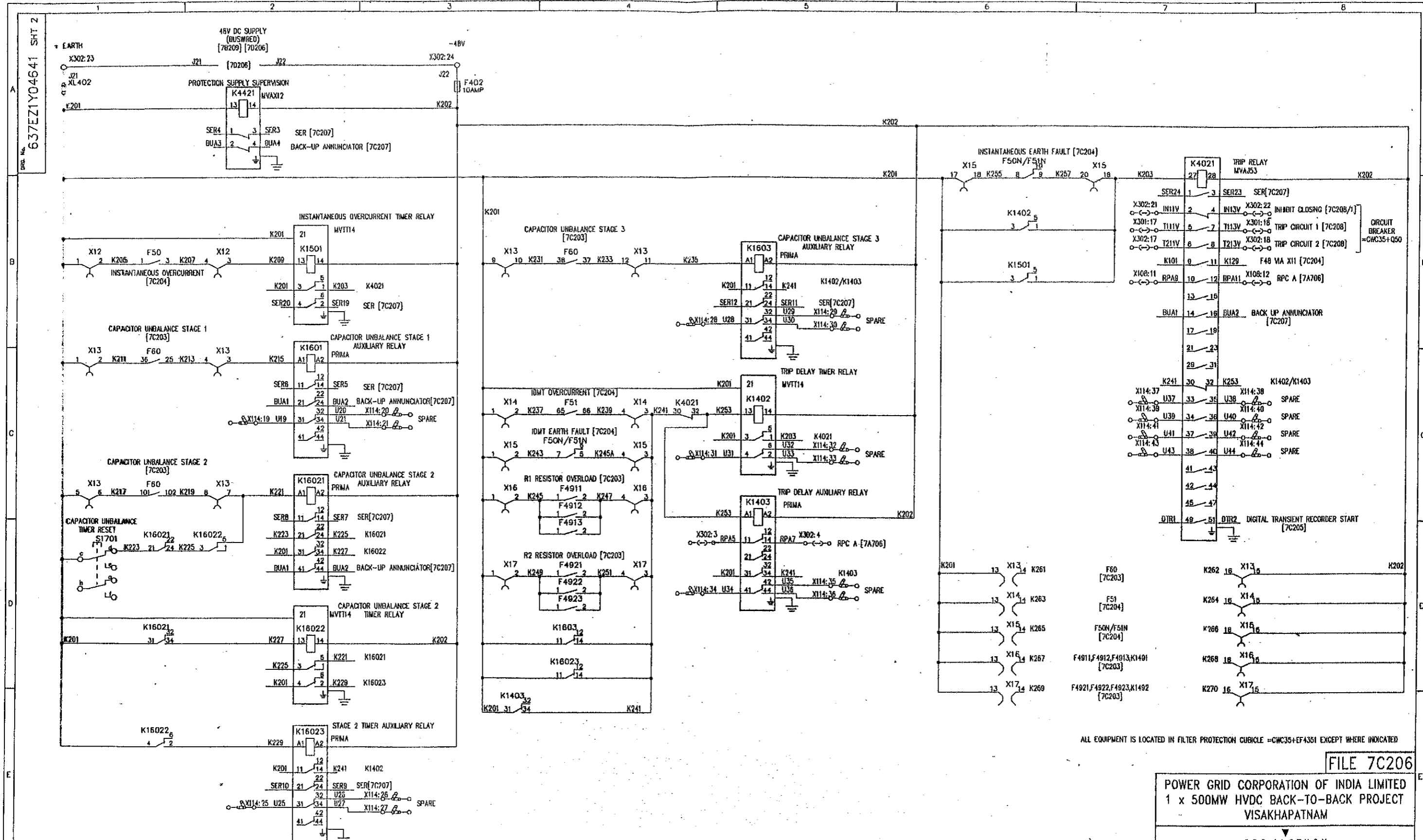
GEC ALSTHOM T&D
Power Electronic Systems Limited
CERTIFIED FOR
MANUFACTURE
NAME: B T BARRETT
DEPT. 739 DATE: 5 / 8 / 97
SIGNED BTB

THIRD ANGLE
PROJECTION
IF IN DOUBT
ASK

ALL DIMENSIONS
IN MILLIMETRES
UNLESS OTHERWISE STATED
DRAWING TO BS308
UNLESS OTHERWISE STATED
FOR THE STANDARD OF
ACCURACY OF ALL
UNTOLERANCED DIMENSIONS
SEE SPECH. STAND./023/PR02

DRAWN JCP
CVD PNS
APP'D RFR
SCALE
TRACED
DESIGN PRJ
APP'D

DO NOT SCALE PRINT



ALL EQUIPMENT IS LOCATED IN FILTER PROTECTION CUBICLE =CWC35+EF4351 EXCEPT WHERE INDICATED

FILE 7C206

POWER GRID CORPORATION OF INDIA LIMITED
1 x 500MW HVDC BACK-TO-BACK PROJECT
VISAKHAPATNAM

GEC ALSTHOM
T&O

GEC ALSTHOM T&D
Power Electronic Systems Limited
Bedford, England

TITLE
VISAKHAPATNAM
AC HARMONIC FILTER =CWC35 PROTECTION
CIRCUIT DIAGRAM FOR
DC CIRCUITS (PROTECTION)

DRG. No. 637EZ1Y04641 SHT 2
CURRENT ISSUE B

REFER 637EZ1Y04592 FOR FILE INDEX [7C201]
REFER [7C202] FOR LOCATION AND DEVICE LIST

ISSUE	A
NAME	PREM
LOCATION	VISA2083

DATE	12/08/97
ISSUE	13/09/98
PREM	13/09/98

REVISED TO ECHS443 & 446-2
CHANGED FILE REF ON X302:22
FROM 7C208
REMOVED R1210, 1310, 141 &
WIRES K210, 228, 242

AS BUILT DWG
14 APR 2000
VISAKHAPATNAM

GEC ALSTHOM T&D
Power Electronic Systems Limited
CERTIFIED FOR
MANUFACTURE
NAME: B T BARRETT
DEPT. 739 DATE: 5/8/97
SIGNED BTB

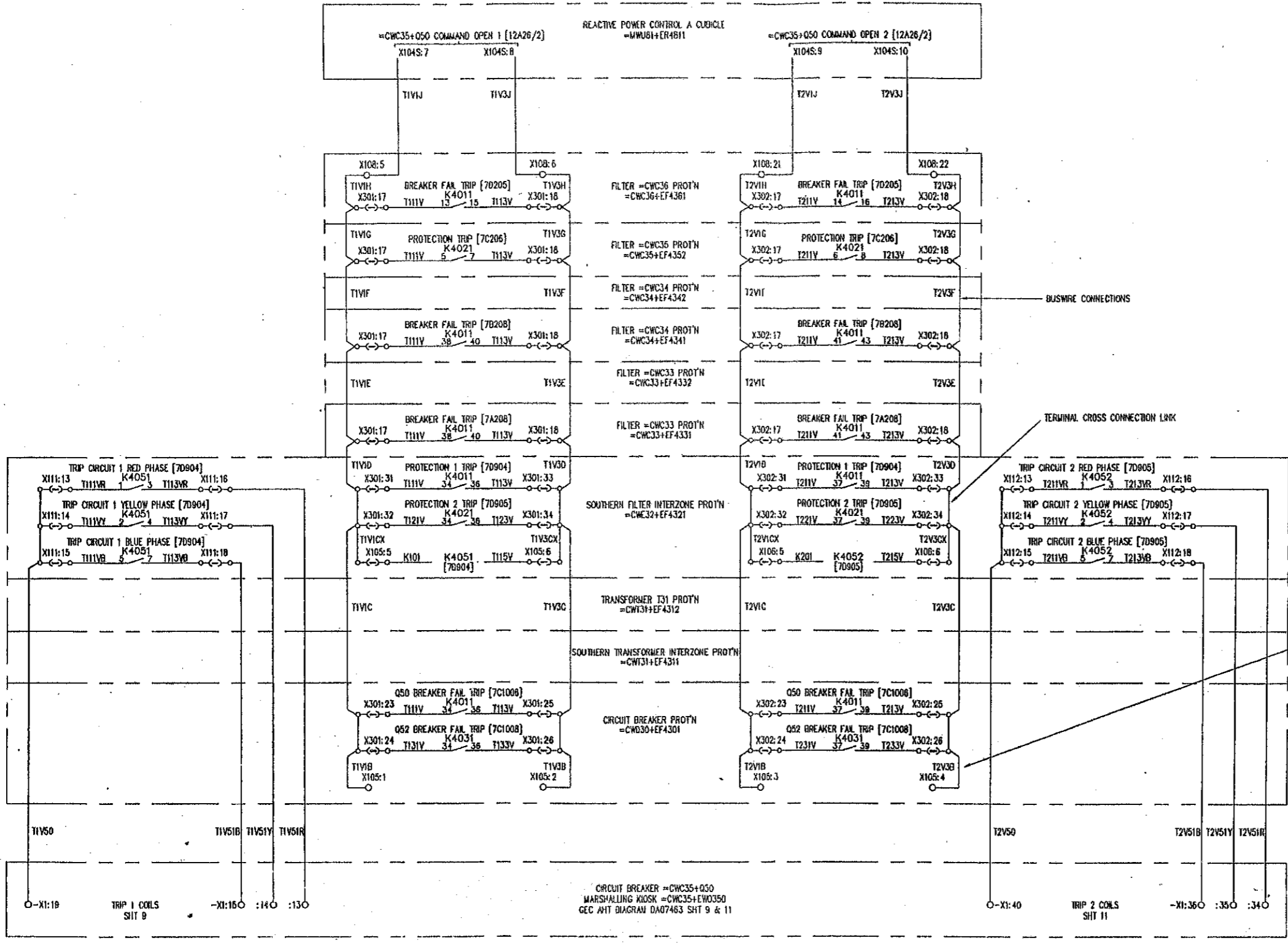
THIRD ANGLE
PROJECTION
IF IN DOUBT
ASK

ALL DIMENSIONS
IN MILLIMETRES
UNLESS OTHERWISE STATED
DRAWING TO BS308
UNLESS OTHERWISE STATED
FOR THE STANDARD OF
ACCURACY OF ALL
UNTOLERANCED DIMENSIONS
SEE SPEC. STAND/923/PROC

DRAWN JCP
CHK PNS
APP'D RFR
SCALE
TRACED
DESIGN PRJ
JPP'D

DWG No. 637EZ1Y04643 SHT 1

CB CIRCUIT CODE LETTER	LETTER	BUS
=CWD10+Q50	A	EAST
=CWD10+Q51	B	
=CWD10+Q52	C	
=CWD20+Q50	D	
=CWD20+Q51	E	
=CWD20+Q52	F	
=CWC23+Q50	G	
=CWC24+Q50	H	
=CWC25+Q50	J	
=CWL19+Q50	K	
=CWL29+Q50	L	
PG REMOTE L1	M	SOUTH
PG REMOTE L2	N	
=CWC30+Q50	P	
=CWC30+Q51	R	
=CWC30+Q52	S	
=CWC33+Q50	T	
=CWC34+Q50	U	
=CWC35+Q50	V	
=CWC36+Q50	W	
PG EXISTING BB1	X	
PG EXISTING BB2	Y	



CIRCUIT BREAKER =CWC35+Q50
MARSHALLING KIOSK =CWC35+EW0350
GEC AHT DIAGRAM DA07463 SHT 9 & 11

FILE 7C208

REFER 637EZ1Y04595 FOR FILE INDEX [7C201]
REFER [7C202] FOR LOCATION AND DEVICE LIST

ISSUE	PRJ	PRJ	PRJ	PRJ	PRJ
A	B	C	D	E	F
ISSUE	PNS	RFR	JCP	GGJ	MCL
DATE	DATE	DATE	DATE	DATE	DATE
12/08/97	26/08/97	13/07/98	14/12/98	12/12/98	20/01/99
REVISIONS TO ENDS: - TO WAS SHOWN AS TH IN EF4312 REVISIONS TO ENDS: - TO WAS REVISIONS TO ENDS: - TO WAS REVISIONS TO ENDS: - TO WAS REVISIONS TO ENDS: - TO WAS REVISIONS TO ENDS: - TO WAS ADD'D K4051 & K4052 CONTACTS ADD'D K4051 & K4052 RELAY CWT REF IN TRIP CWT WIRING GEC AHT DIAGRAM WAS DIAGNOSTIC REVISIONS TO ENDS: - TO WAS REVISIONS TO ENDS: - TO WAS REVISIONS TO ENDS: - TO WAS REVISIONS TO ENDS: - TO WAS REVISIONS TO ENDS: - TO WAS TERMINATIONS MODIFIED IN LINE WITH MARKED UP PRINT.					

AS BUILT DWG
14 APR 2000
VISAKHAPATNAM

GEC ALSTHOM T&D Power Electronic Systems Limited CERTIFIED FOR MANUFACTURE	THIRD ANGLE PROJECTION	ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED	DRAWN JCP CHKD PNS APP'D RFR SCALE TRACED DESIGN PRJ APP'D
NAME: B T BARRETT DEPT: 739 DATE: 5/8/97 SIGNED: BTB	IF IN DOUBT ASK	DRAWING TO BS508 UNLESS OTHERWISE STATED FOR THE STANDARD OF ACCURACY OF ALL UNTOLERANCED DIMENSIONS SEE SPEC. STAND/023/PROC	

POWER GRID CORPORATION OF INDIA LIMITED
1 x 500MW HVDC BACK-TO-BACK PROJECT
VISAKHAPATNAM

GEC ALSTHOM
T&D

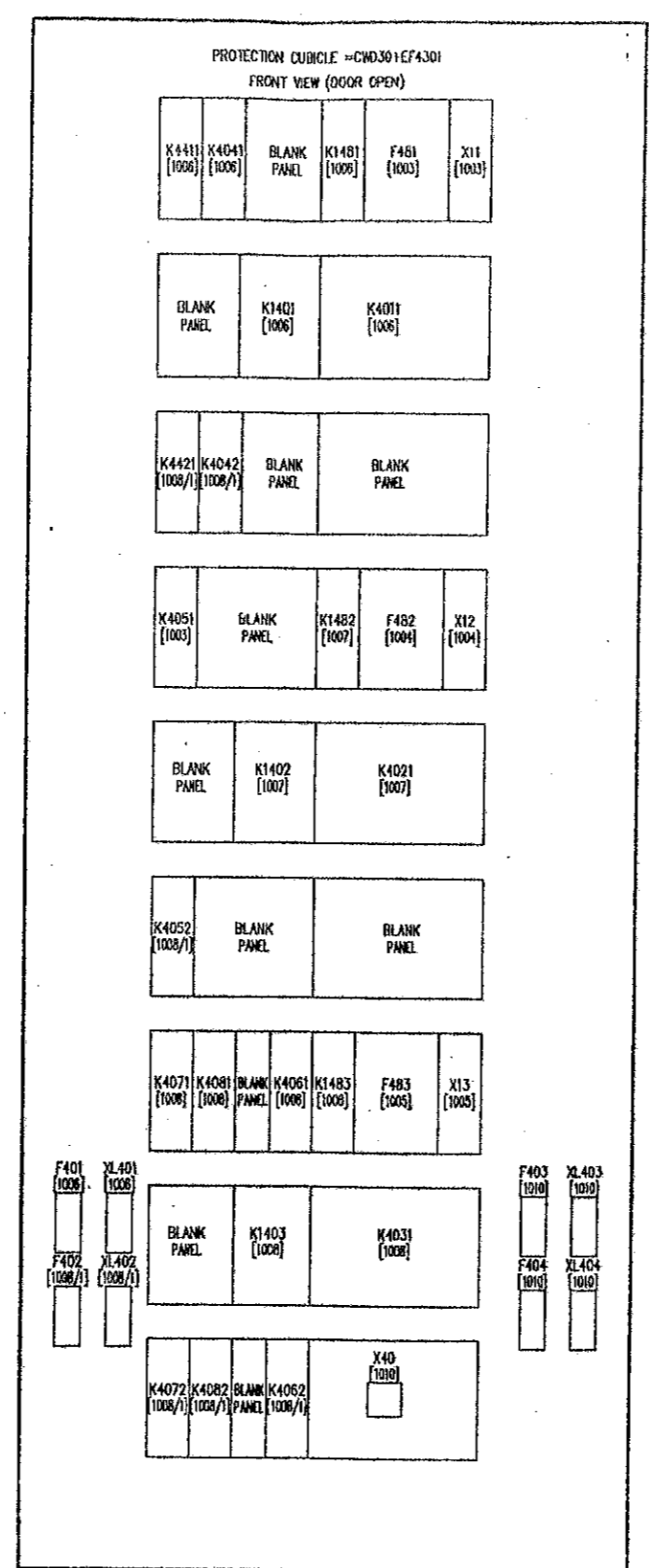
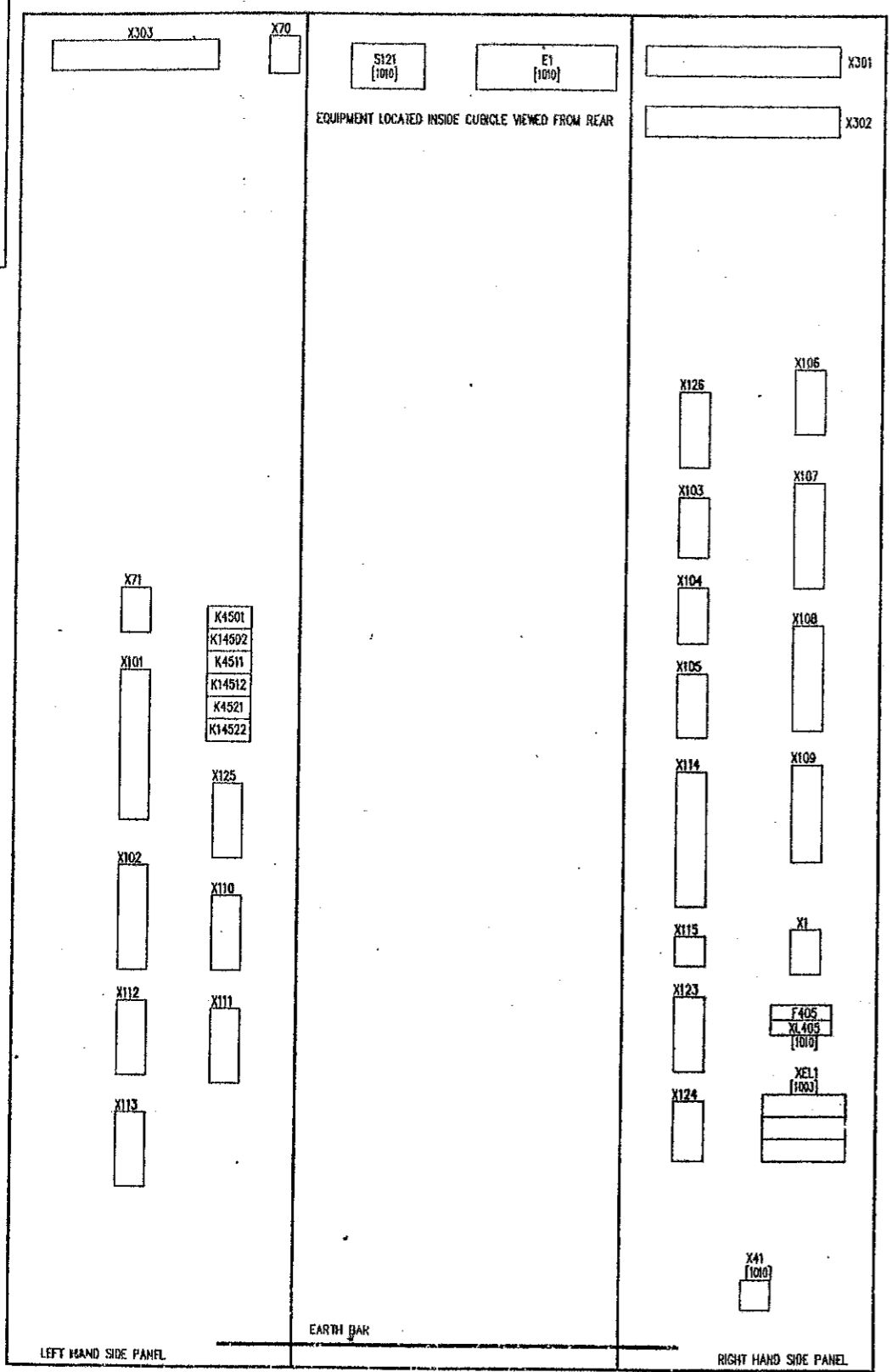
GEC ALSTHOM T&D
Power Electronic Systems Limited
Shillong, England

TITLE
VISAKHAPATNAM
AC HARMONIC FILTER =CWC35 PROTECTION
CIRCUIT DIAGRAM FOR
SIGNALS TO CIRCUIT BREAKER =CWC35+Q50

DWG No. 637EZ1Y04643 SHT 1
CURRENT ISSUE E

CUSTOMER POWERGRID
ORDER No. CF0136

Dwg. No. 637EZ1Y04601 SHT 2



DEVICE REF	DESCRIPTION	TYPE
K4411	BREAKER FAIL SUPPLY No1 SUPERVISION RELAY	GECA MVA112
K4041	Q50 TRIP RELAY 1	GECA MVA116
K1481	Q50 BREAKER FAIL TIMER (0.001-1 seconds)	GECA MVT114
F481	Q50 BREAKER FAIL CURRENT RELAY	GECA MCT139
X11	Q50 BREAKER FAIL TEST BLOCK	GECA MML001
K1401	Q50 TRIP RELAY AUXILIARY RELAY	GECA MVA114
K4011	Q50 BREAKER FAIL LOCKOUT TRIP RELAY	GECA MVA153
K4421	BREAKER FAIL SUPPLY No2 SUPERVISION RELAY	GECA MVA112
K4042	Q50 TRIP RELAY 2	GECA MVA116
K4051	Q51 TRIP RELAY 1	GECA MVA116
K1482	Q51 BREAKER FAIL TIMER (0.001-1 seconds)	GECA MVT114
F482	Q51 BREAKER FAIL CURRENT RELAY	GECA MCT139
X12	Q51 BREAKER FAIL TEST BLOCK	GECA MML001
K1402	Q51 TRIP RELAY AUXILIARY RELAY	GECA MVA114
K4021	Q51 BREAKER FAIL LOCKOUT TRIP RELAY	GECA MVA153
K4052	Q51 TRIP RELAY 2	GECA MVA116
K4071	SOUTHERN BUSBAR 1 TRIP RELAY 1 AUXILIARY RELAY	GECA MVA111
K4081	SOUTHERN BUSBAR 2 TRIP RELAY 1 AUXILIARY RELAY	GECA MVA111
K4061	Q52 TRIP RELAY 1	GECA MVA116
K1483	Q52 BREAKER FAIL TIMER (0.001-1 seconds)	GECA MVT114
F483	Q52 BREAKER FAIL CURRENT RELAY	GECA MCT139
X13	Q52 BREAKER FAIL TEST BLOCK	GECA MML001
K1403	Q52 TRIP RELAY AUXILIARY RELAY	GECA MVA114
K4031	Q52 BREAKER FAIL LOCKOUT TRIP RELAY	GECA MVA153
K4072	SOUTHERN BUSBAR 1 TRIP RELAY 2 AUXILIARY RELAY	GECA MVA111
K4082	SOUTHERN BUSBAR 2 TRIP RELAY 2 AUXILIARY RELAY	GECA MVA111
K4062	Q52 TRIP RELAY 2	GECA MVA116
XEL1	EARTH LINK FOR F481	WEIDMULLER SRS5
F401	FUSE AND HOLDER 10A, BREAKER FAIL SUPPLY No 1, 48Vdc.	GECA SC32P
X1401	LINK AND HOLDER.	GECA SC32P
F402	FUSE AND HOLDER 10A, BREAKER FAIL SUPPLY No 2, 48Vdc.	GECA SC32P
X1402	LINK AND HOLDER.	GECA SC32P
F403	FUSE AND HOLDER, 2A, CUBICLE LIGHTING SUPPLY, 240V, 50HZ.	GECA SC32P
X1403	LINK AND HOLDER.	GECA SC32P
F404	FUSE AND HOLDER, 16A, SUPPLY FOR TEST EQUIPMENT 16A SOCKET, 240V, 50HZ.	GECA SC32P
X1404	LINK AND HOLDER.	GECA SC32P
F405	FUSE AND HOLDER, 2A, FOR HAND LAMP SUPPLY 16A SOCKET, 240V, 50HZ.	WEIDMULLER KSK3F
X1405	LINK AND HOLDER.	WEIDMULLER KSK3F
K4501	Q50 RELAY R4 AUXILIARY RELAY	PRIMA
K14502	Q50 RELAY R14 AUXILIARY RELAY	PRIMA
K4511	Q51 RELAY R4 AUXILIARY RELAY	PRIMA
K14512	Q51 RELAY R14 AUXILIARY RELAY	PRIMA
K4521	Q52 RELAY R4 AUXILIARY RELAY	PRIMA
K14522	Q52 RELAY R14 AUXILIARY RELAY	PRIMA
E1	CUBICLE LIGHTING	
S121	CUBICLE LIGHTING DOOR SWITCH	
X10	TEST EQUIPMENT SWITCHED SOCKET TO INDIAN STANDARD	
X41	HAND LAMP SWITCHED SOCKET TO INDIAN STANDARD	
X1	48VDC TERMINALS	WEIDMULLER RSE1
X70	BUSWIRE TERMINALS (240V AC SUPPLIES)	WEIDMULLER SAK6N
X71	240VAC TERMINALS	WEIDMULLER RSE1
X101	CT INPUT TERMINALS	WEIDMULLER RSE1
X102	DTR TERMINALS (ANALOGUE)	WEIDMULLER RSE1
X103	=CHC34+050 TERMINALS	WEIDMULLER RSE1
X104	=CHC34+050 TERMINALS	WEIDMULLER RSE1
X105	=CHC34+050 TERMINALS	WEIDMULLER RSE1
X106	=CHC34+050 TERMINALS	WEIDMULLER RSE1
X107	=CHC34+050 TERMINALS	WEIDMULLER RSE1/RSE2
X108	=CHC34+051 TERMINALS	WEIDMULLER RSE1/RSE2
X109	=CHC34+052 TERMINALS	WEIDMULLER RSE1/RSE2
X110	EXISTING BUS(SOUTH)	WEIDMULLER RSE2
X111	EXISTING BUS(SOUTH)	WEIDMULLER RSE2
X112	BLOCK POLE MAIN 1	WEIDMULLER RSE1
X113	BLOCK POLE MAIN 2	WEIDMULLER RSE1
X114	SPARE RELAY CONTACTS TERMINALS	WEIDMULLER SAKR
X115	DTR TERMINALS (DIGITAL)	WEIDMULLER SAKR
X123	SEQUENCE OF EVENTS RECORDER TERMINALS	WEIDMULLER SAKR
X124	BACK UP ANNUNCIATOR TERMINALS	WEIDMULLER SAKR
X125	TRIP COIL 1 TERMINALS	WEIDMULLER RSE2
X126	TRIP COIL 2 TERMINALS	WEIDMULLER RSE2
X301	BUSWIRE TERMINALS (TRIP COIL 1 etc)	WEIDMULLER RSE2
X302	BUSWIRE TERMINALS (TRIP COIL 2 etc)	WEIDMULLER RSE2
X303	BUSWIRE TERMINALS (MISC)	WEIDMULLER RSE1/RSE2

[X111] DENOTES FILE No 7C10111N SECTION REFER [1001] FOR FILE INDEX

ISSUE	DATE	BY	REVISION
A	11/08/97	BT	ISSUED FOR CONSTRUCTION
B	12/08/97	BT	REVISED TO ECN8232 - R121 WAS R113
C	29/07/98	BT	REVISED TO ECN8484 & 8473 - R113Z1 & R131 DELETED
D	07/07/98	BT	REVISED TO ECN8526 - R121 WAS R113
E	07/07/98	BT	REVISED TO ECN8526 - R121 WAS R113
F	07/07/98	BT	REVISED TO ECN8526 - R121 WAS R113
G	07/07/98	BT	REVISED TO ECN8526 - R121 WAS R113
H	07/07/98	BT	REVISED TO ECN8526 - R121 WAS R113
I	07/07/98	BT	REVISED TO ECN8526 - R121 WAS R113
J	07/07/98	BT	REVISED TO ECN8526 - R121 WAS R113
K	07/07/98	BT	REVISED TO ECN8526 - R121 WAS R113
L	07/07/98	BT	REVISED TO ECN8526 - R121 WAS R113
M	07/07/98	BT	REVISED TO ECN8526 - R121 WAS R113
N	07/07/98	BT	REVISED TO ECN8526 - R121 WAS R113
O	07/07/98	BT	REVISED TO ECN8526 - R121 WAS R113
P	07/07/98	BT	REVISED TO ECN8526 - R121 WAS R113
Q	07/07/98	BT	REVISED TO ECN8526 - R121 WAS R113
R	07/07/98	BT	REVISED TO ECN8526 - R121 WAS R113
S	07/07/98	BT	REVISED TO ECN8526 - R121 WAS R113
T	07/07/98	BT	REVISED TO ECN8526 - R121 WAS R113
U	07/07/98	BT	REVISED TO ECN8526 - R121 WAS R113
V	07/07/98	BT	REVISED TO ECN8526 - R121 WAS R113
W	07/07/98	BT	REVISED TO ECN8526 - R121 WAS R113
X	07/07/98	BT	REVISED TO ECN8526 - R121 WAS R113
Y	07/07/98	BT	REVISED TO ECN8526 - R121 WAS R113
Z	07/07/98	BT	REVISED TO ECN8526 - R121 WAS R113

AS BUILT DWG
16 MAY 2000
VISAKHAPATNAM

GEC ALSTHOM T&D Power Electronic Systems Limited CERTIFIED FOR MANUFACTURE		THIRD ANGLE PROJECTION	ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED	DRAWN JCP CHKD PNS
NAME: B T BARRETT	DEPT: 739	DATE: 9/8/97	IF IN DOUBT ASK	APP'D RFR
SIGNED BTB				SCALE
				TRACED
				DESIGN PRJ
				APP'D

FILE 7C1002

POWER GRID CORPORATION OF INDIA LIMITED
1 x 500MW HVDC BACK-TO-BACK PROJECT
VISAKHAPATNAM

GEC ALSTHOM
T&D
Power Electronic Systems Limited
Shifnal, England

VISAKHAPATNAM
=CWD30 BREAKER FAIL PROTECTION
CUBICLE =CWD30+EF4301 EQUIPMENT & DEVICE LIST

Dwg. No. **637EZ1Y04601** SHT 2

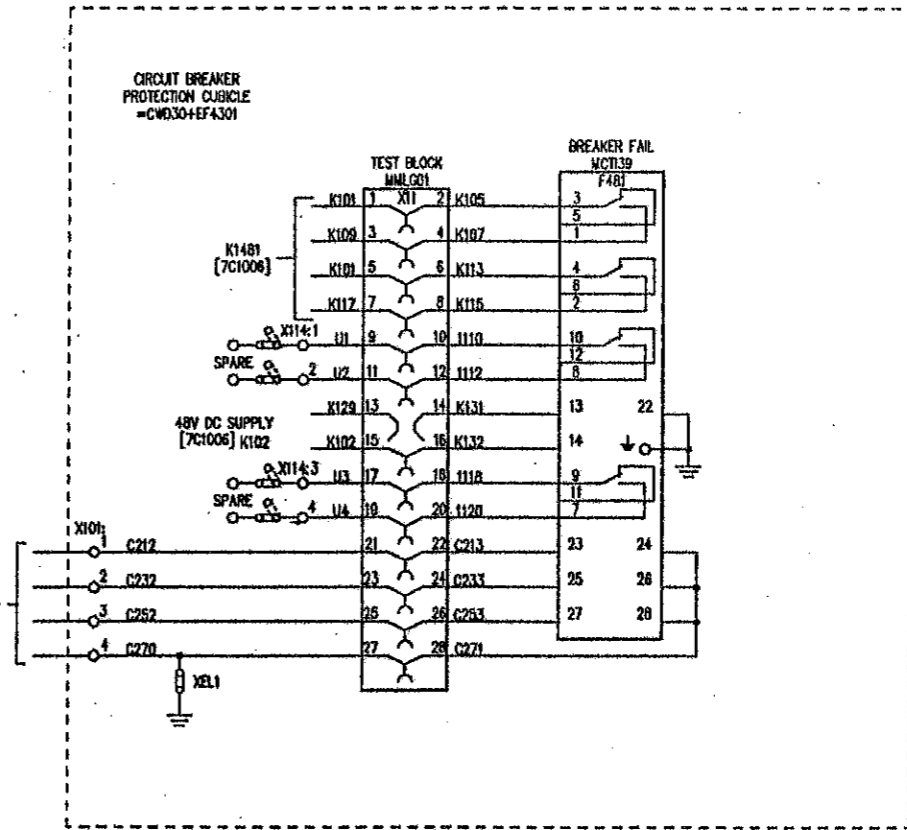
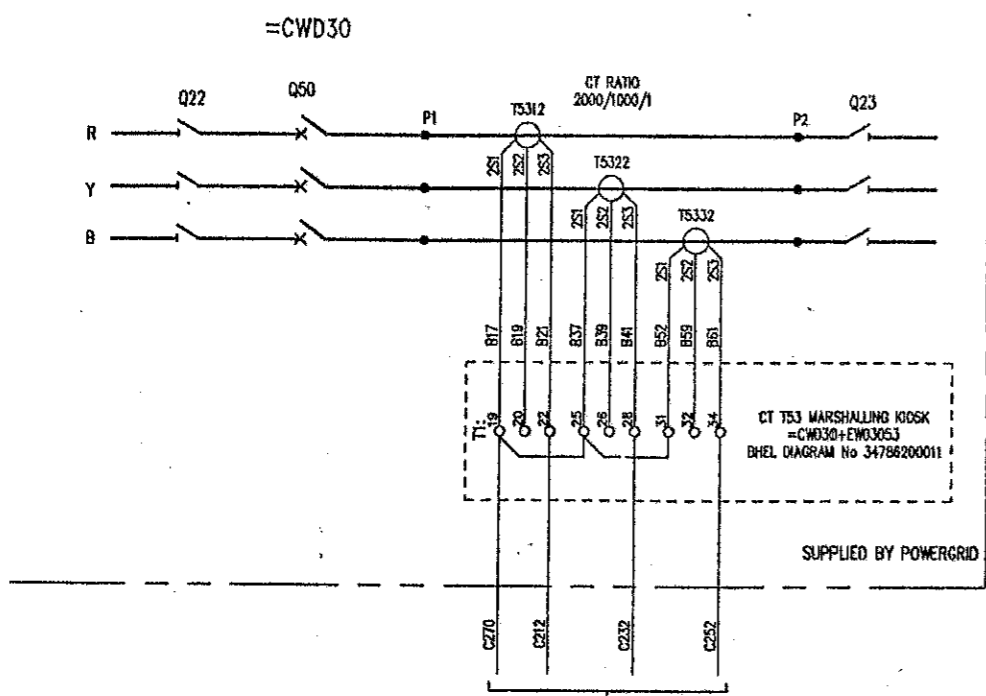
CURRENT ISSUE **D**

WHEN QUOTING DRG. No. STATE CURRENT ISSUE

CUSTOMER POWERGRID ORDER No. CF0136

DRG. No. 637EZ1Y04601 SHT 3

ONLY ITEMS RELEVANT TO THE OPERATION
OF THIS PROTECTION ARE SHOWN
(REFER [2A05] FOR SINGLE LINE DIAGRAM)



NOTES:
[10NN] DENOTES FILE No OF [7C10NN] SECTION
REFER TO [1001] FOR FILE INDEX
REFER TO [1102] FOR LOCATION & DEVICE LIST

FILE 7C1003

POWER GRID CORPORATION OF INDIA LIMITED
1 x 500MW HVDC BACK-TO-BACK PROJECT
VISAKHAPATNAM

GEC ALSTHOM
T&D

GEC ALSTHOM T&D
Power Electronic Systems Limited

VISAKHAPATNAM
CIRCUIT DIAGRAM FOR
AC CIRCUITS OF BREAKER FAIL PROTECTION
CIRCUIT BREAKER =CWD30+Q50

DRG. No. 637EZ1Y04601 SHT 3
CURRENT ISSUE: D

ISSUE	A	B	C
D	11/06/97	12/08/97	29/07/98
NAME	JCP	JCP	PREM
LOCATION	VISA3623		

REVISIONS:
REVISED TO CORRECTS - RELAY TYPE ADDED, ALSO EARTH ADDED TO MCH39
REVISED TO ECR824 - ADDED =CWD30+ENG05
9/01/05
REFER TO E.C.N. 8845
RELEVANT WAS SPILT INCORRECTLY.

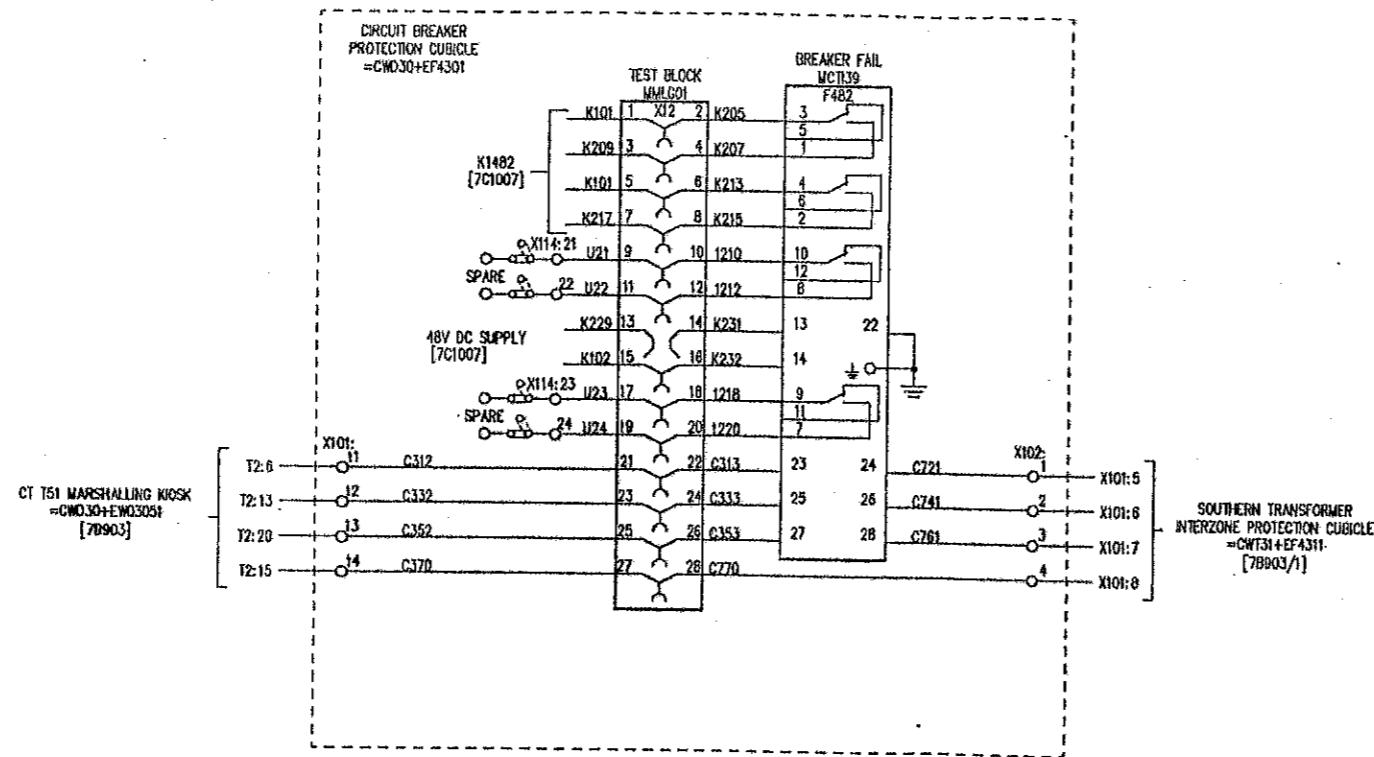
AS BUILT DWG
16 MAY 2003
VISAKHAPATNAM

GEC ALSTHOM T&D
Power Electronic Systems Limited
CERTIFIED FOR MANUFACTURE
NAME: B T BARRETT
DEPT. 739 DATE: 9/8/97
SIGNED: DTB

THIRD ANGLE PROJECTION
IF IN DOUBT ASK
ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED
DRAWING TO BE USED UNLESS OTHERWISE STATED
FOR THE STANDARD OF ACCURACY OF ALL UNTOLERANCED DIMENSIONS SEE SPECIAL STAND/D23/PROC

DRAWN: JCP
CHKD: PNS
APP'D: RFR
SCALE:
TRACED:
DESIGN: PRJ
APP'D:
DO NOT SCALE PRINT

DRW. No. 637EZ1Y04601 SHT 4



NOTES:
 [1000] DENOTES FILE No OF [7C1000] SECTION
 REFER TO [1001] FOR FILE INDEX
 REFER TO [1102] FOR LOCATION & DEVICE LIST

ISSUE	PRJ	PRJ	PRJ
D	A	B	C
11/08/97	PNS/JCP	RFR/PRM	RFR/PRM
12/08/97	JCP	PRM	PRM
06/08/97	JCP	PRM	PRM
08/08/97	JCP	PRM	PRM
09/08/97	JCP	PRM	PRM
11/08/97	JCP	PRM	PRM
12/08/97	JCP	PRM	PRM
01/09/97	JCP	PRM	PRM
02/09/97	JCP	PRM	PRM
03/09/97	JCP	PRM	PRM
04/09/97	JCP	PRM	PRM
05/09/97	JCP	PRM	PRM
06/09/97	JCP	PRM	PRM
07/09/97	JCP	PRM	PRM
08/09/97	JCP	PRM	PRM
09/09/97	JCP	PRM	PRM
10/09/97	JCP	PRM	PRM
11/09/97	JCP	PRM	PRM
12/09/97	JCP	PRM	PRM
01/10/97	JCP	PRM	PRM
02/10/97	JCP	PRM	PRM
03/10/97	JCP	PRM	PRM
04/10/97	JCP	PRM	PRM
05/10/97	JCP	PRM	PRM
06/10/97	JCP	PRM	PRM
07/10/97	JCP	PRM	PRM
08/10/97	JCP	PRM	PRM
09/10/97	JCP	PRM	PRM
10/10/97	JCP	PRM	PRM
11/10/97	JCP	PRM	PRM
12/10/97	JCP	PRM	PRM
01/11/97	JCP	PRM	PRM
02/11/97	JCP	PRM	PRM
03/11/97	JCP	PRM	PRM
04/11/97	JCP	PRM	PRM
05/11/97	JCP	PRM	PRM
06/11/97	JCP	PRM	PRM
07/11/97	JCP	PRM	PRM
08/11/97	JCP	PRM	PRM
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07/12/97	JCP	PRM	PRM
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09/12/97	JCP	PRM	PRM
10/12/97	JCP	PRM	PRM
11/12/97	JCP	PRM	PRM
12/12/97	JCP	PRM	PRM

AS BUILT DWG
 16 MAY 2003
VISAKHAPATNAM

GEC ALSTHOM T&D Power Electronic Systems Limited CERTIFIED FOR MANUFACTURE		THIRD ANGLE PROJECTION	ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED	DRAWN JCP CHKD PNS
NAME: B T BARRETT	DEPT. 739	DATE: 9/8/97	IF IN DOUBT ASK	APPR'D RFR
SIGNED BTB	FOR THE STANDARD OF ACCURACY OF ALL UNSTATED DIMENSIONS SEE SPECIAL STANDARDS		SCALE	TRACED
DESIGN APP'D PRJ		DO NOT SCALE PRINT		DESIGN APP'D PRJ

FILE 7C1004

POWER GRID CORPORATION OF INDIA LIMITED
 1 x 500MW HVDC BACK-TO-BACK PROJECT
 VISAKHAPATNAM

GEC ALSTHOM
 T&D

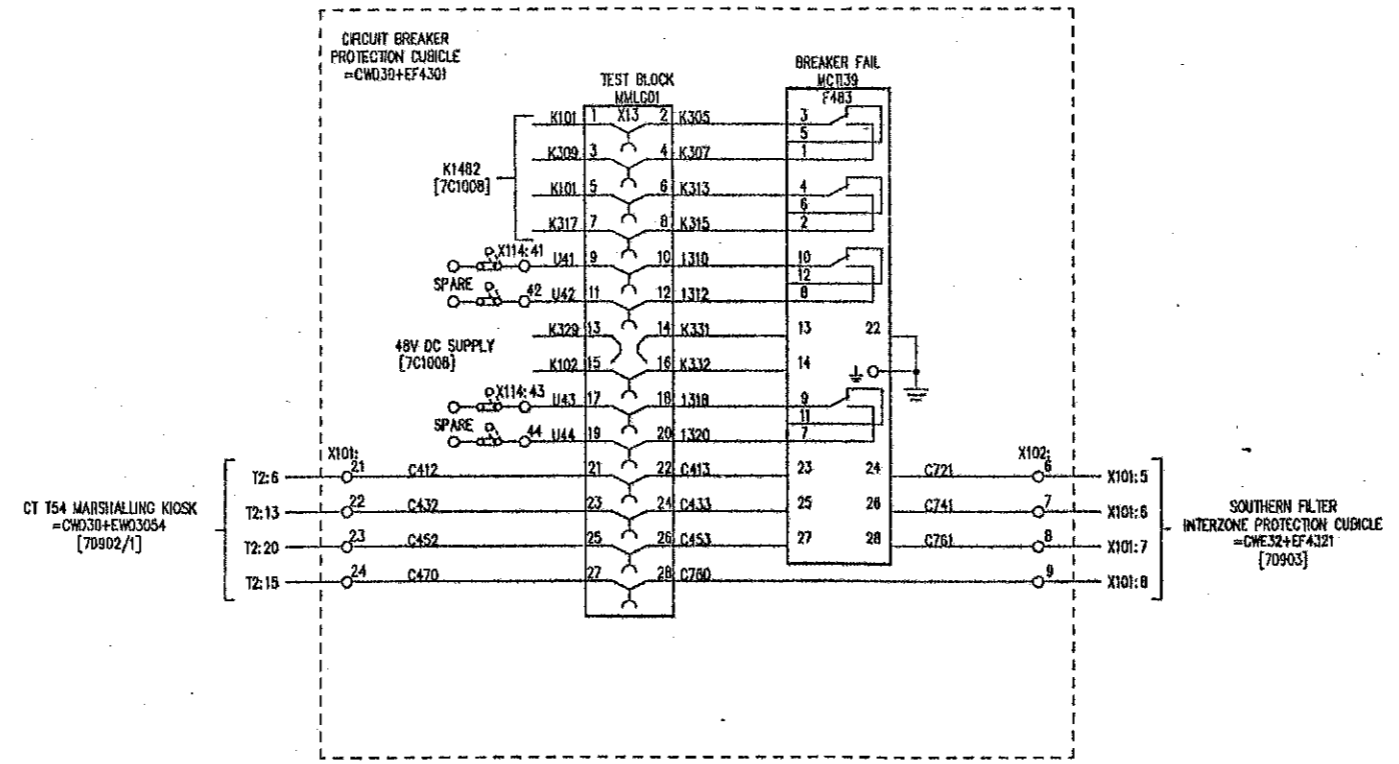
GEC ALSTHOM T&D
 Power Electronic Systems Limited
 Sharnbrook, England

TITLE
VISAKHAPATNAM
 CIRCUIT DIAGRAM FOR
 AC CIRCUITS OF BREAKER FAIL PROTECTION
 CIRCUIT BREAKER =CWD30+Q51

DRW. No. 637EZ1Y04601 SHT 4
 CURRENT ISSUE D

CUSTOMER POWERGRID ORDER No. CF0136

Doc. No. 637EZ1Y04601 SHT 5



NOTES:
 [1000] DENOTES FILE No OF [7C1000] SECTION
 REFER TO [1001] FOR FILE INDEX
 REFER TO [1102] FOR LOCATION & DEVICE LIST

FILE 7C1005

POWER GRID CORPORATION OF INDIA LIMITED
 1 x 500MW HVDC BACK-TO-BACK PROJECT
 VISAKHAPATNAM

GEC ALSTHOM
 T&D

GEC ALSTHOM T&D
 Power Electronic Systems Limited
 Sharnah, England

VISAKHAPATNAM
 CIRCUIT DIAGRAM FOR
 AC CIRCUITS OF BREAKER FAIL PROTECTION
 CIRCUIT BREAKER =CWD30+Q52

DRG. No. 637EZ1Y04601 SHT 5
 CURRENT ISSUE D

ISSUE	A	B	C
NAME	PNS	JCP	RFR
DATE	11/06/97	12/08/97	29/07/98
LOCATION	VISA4205		

REVISED TO ENR324 - RELAY TYPES ADDED ALSO EARTH ON TERMINAL 22 OF MCT139 AND X101 TERMINAL NOS CHANGED. ENR324 - CT CIRCUIT EXTENDED TO SHOW ALL ASSOCIATED CUBICLES

REVISED TO ENR424 & ENR555 - REMOVED =CWD30 CT/VT KIOSK, SCADA, RPC A, ENERGY METERING & RELAY/TRANSUCER INFO. ADDED REF TO =CWD30+FEW03054 & =CWE32+EF4321 CHANGED WIRE NOS FROM C414, C434, C454 & C471 TO C721, C741, C761 & C780.

98 [Signature]

REVISED TO ENR823 XEL3 DELETED.

AS BUILT DWG
 16 MAY 2000
 VISAKHAPATNAM

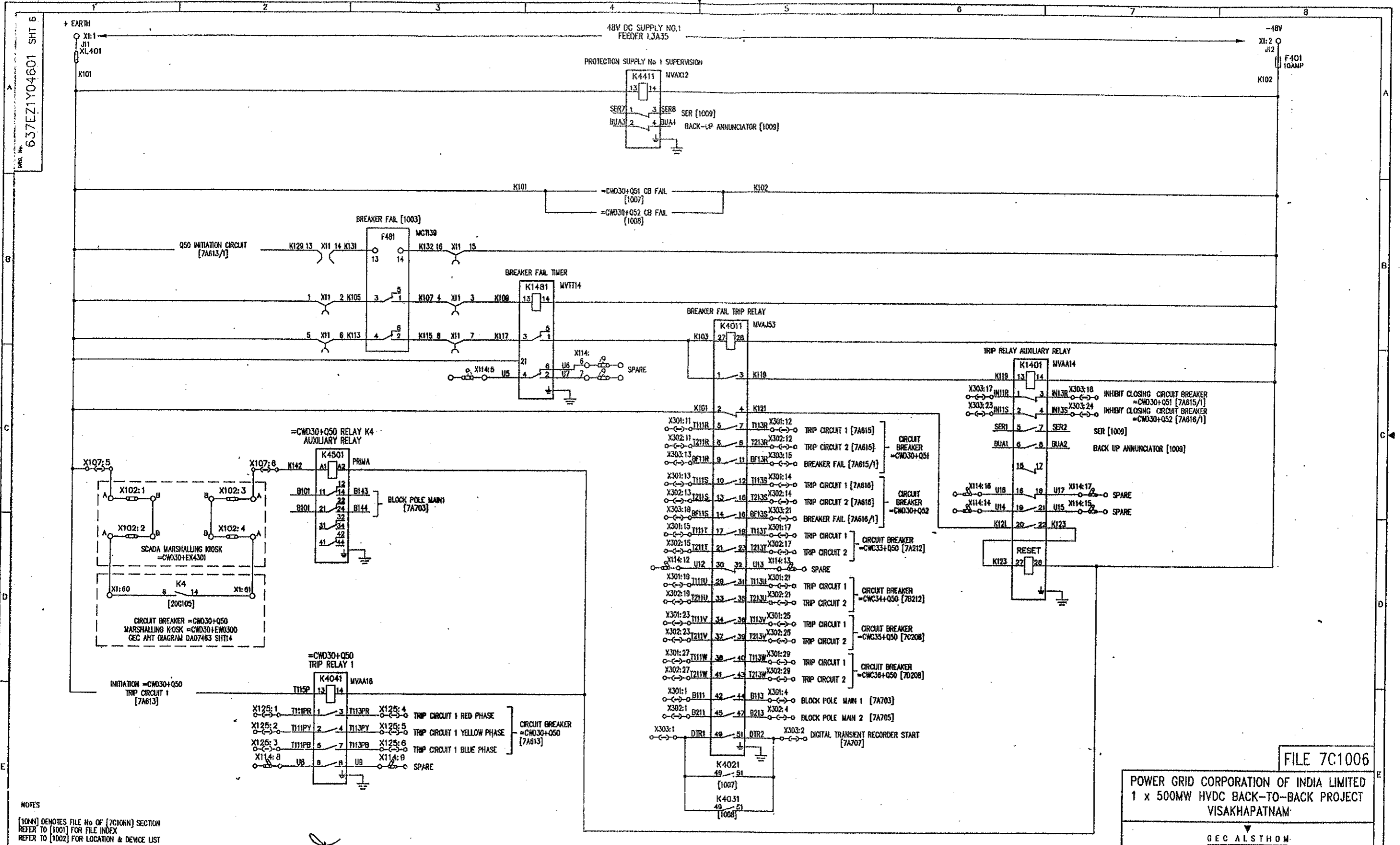
GEC ALSTHOM T&D
 Power Electronic Systems Limited
 CERTIFIED FOR MANUFACTURE
 NAME: B T BARRETT
 DEPT. 739 DATE: 9/8/97
 SIGNED BTB

THIRD ANGLE PROJECTION
 IF IN DOUBT ASK

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED
 DRAWING TO BS308 UNLESS OTHERWISE STATED
 FOR THE STANDARD OF ACCURACY OF ALL UNDIMENSIONED DIMENSIONS SEE SPECN STAND/023/PROC

DRAWN JCP
 CTD PNS
 APP'D RFR
 SCALE
 TRACED
 DESIGN APP'D PRJ

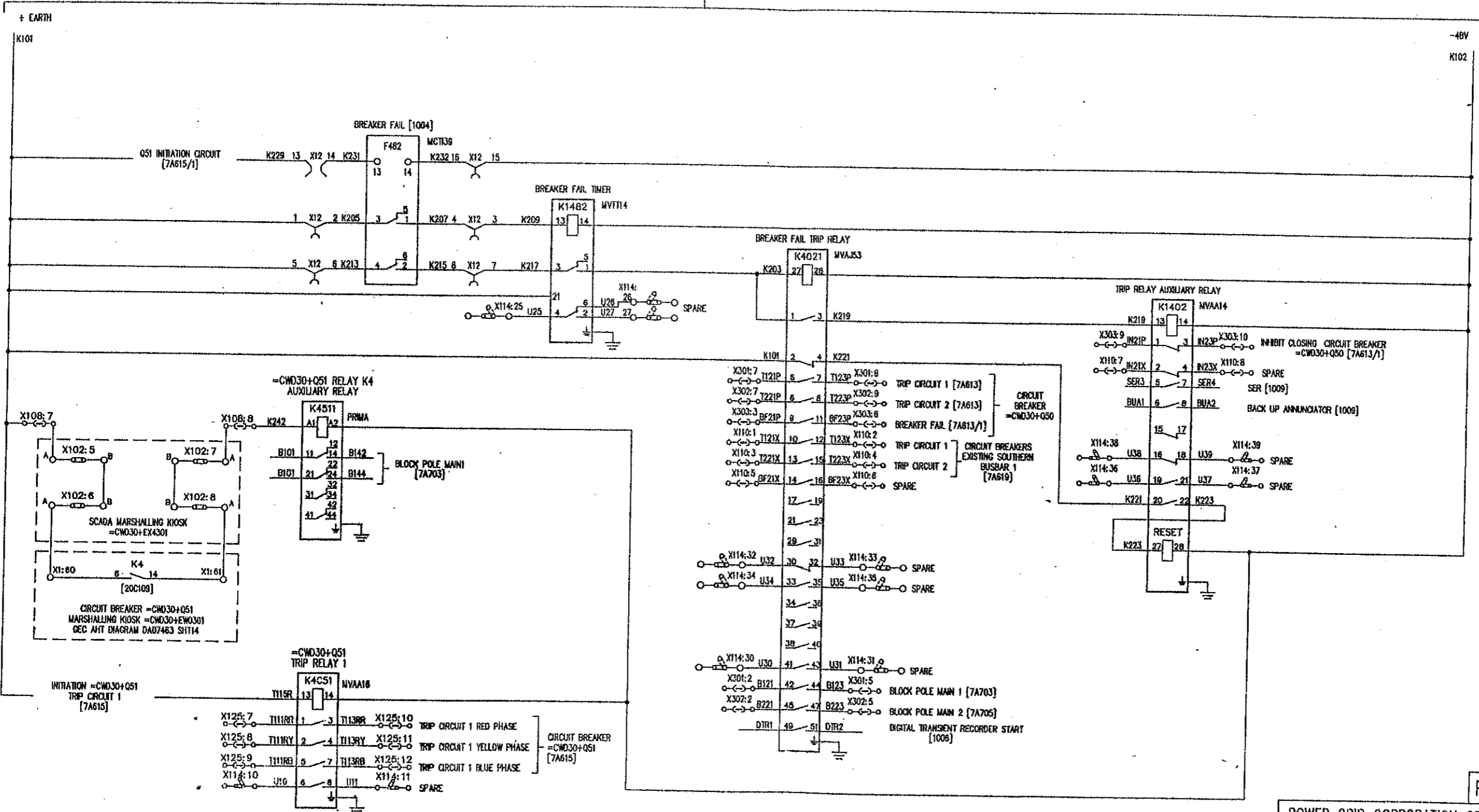
DO NOT SCALE PRINT
 WHEN QUOTING DRG. No. STATE CURRENT ISSUE
 CUSTOMER POWERGRID ORDER No. CF0136



ISSUE DATE: 11/08/97 NAME: FSA3947		PRJ A DATE: 12/08/97 NAME: PMS JCP		PRJ B DATE: 29/07/96 NAME: RFR PREM		PRJ C DATE: 07/01/99 NAME: JCP MCLW		PRJ D DATE: 01/01/99 NAME: JCP MCLW		AS BUILT DWG 16 MAY 2000 VISAKHAPATNAM		POWER GRID CORPORATION OF INDIA LIMITED 1 x 500MW HVDC BACK-TO-BACK PROJECT VISAKHAPATNAM		GEC ALSTHOM Power Electronic Systems Limited VISAKHAPATNAM DC CIRCUITS OF PROTECTION No 1 CIRCUIT BREAKER =CWD30+Q50		FILE 7C1006									
NOTES [10NN] DENOTES FILE NO OF [7C10NN] SECTION REFER TO [1001] FOR FILE INDEX REFER TO [1002] FOR LOCATION & DEVICE LIST										AS BUILT DWG 16 MAY 2000 VISAKHAPATNAM		POWER GRID CORPORATION OF INDIA LIMITED 1 x 500MW HVDC BACK-TO-BACK PROJECT VISAKHAPATNAM		GEC ALSTHOM Power Electronic Systems Limited VISAKHAPATNAM DC CIRCUITS OF PROTECTION No 1 CIRCUIT BREAKER =CWD30+Q50		FILE 7C1006									
ISSUE DATE: 11/08/97 NAME: FSA3947										PRJ A DATE: 12/08/97 NAME: PMS JCP		PRJ B DATE: 29/07/96 NAME: RFR PREM		PRJ C DATE: 07/01/99 NAME: JCP MCLW		PRJ D DATE: 01/01/99 NAME: JCP MCLW		AS BUILT DWG 16 MAY 2000 VISAKHAPATNAM		POWER GRID CORPORATION OF INDIA LIMITED 1 x 500MW HVDC BACK-TO-BACK PROJECT VISAKHAPATNAM		GEC ALSTHOM Power Electronic Systems Limited VISAKHAPATNAM DC CIRCUITS OF PROTECTION No 1 CIRCUIT BREAKER =CWD30+Q50		FILE 7C1006	
ISSUE DATE: 11/08/97 NAME: FSA3947										PRJ A DATE: 12/08/97 NAME: PMS JCP		PRJ B DATE: 29/07/96 NAME: RFR PREM		PRJ C DATE: 07/01/99 NAME: JCP MCLW		PRJ D DATE: 01/01/99 NAME: JCP MCLW		AS BUILT DWG 16 MAY 2000 VISAKHAPATNAM		POWER GRID CORPORATION OF INDIA LIMITED 1 x 500MW HVDC BACK-TO-BACK PROJECT VISAKHAPATNAM		GEC ALSTHOM Power Electronic Systems Limited VISAKHAPATNAM DC CIRCUITS OF PROTECTION No 1 CIRCUIT BREAKER =CWD30+Q50		FILE 7C1006	

637EZ1Y04601 SHT 7

48V DC SUPPLY [1066]



NOTES
 [10NN] DENOTES FILE No OF [7C10NN] SECTION
 REFER TO [1001] FOR FILE INDEX
 REFER TO [1002] FOR LOCATION & DEVICE LIST

FILE 7C1007

POWER GRID CORPORATION OF INDIA LIMITED
 1 x 500MW HVDC BACK-TO-BACK PROJECT
 VISAKHAPATNAM

GEC ALSTHOM

GEC ALSTHOM T&D
 Power Electronic Systems Limited

VISAKHAPATNAM
 CIRCUIT DIAGRAM FOR
 DC CIRCUITS OF PROTECTION No 1
 CIRCUIT BREAKER -CW030+Q51

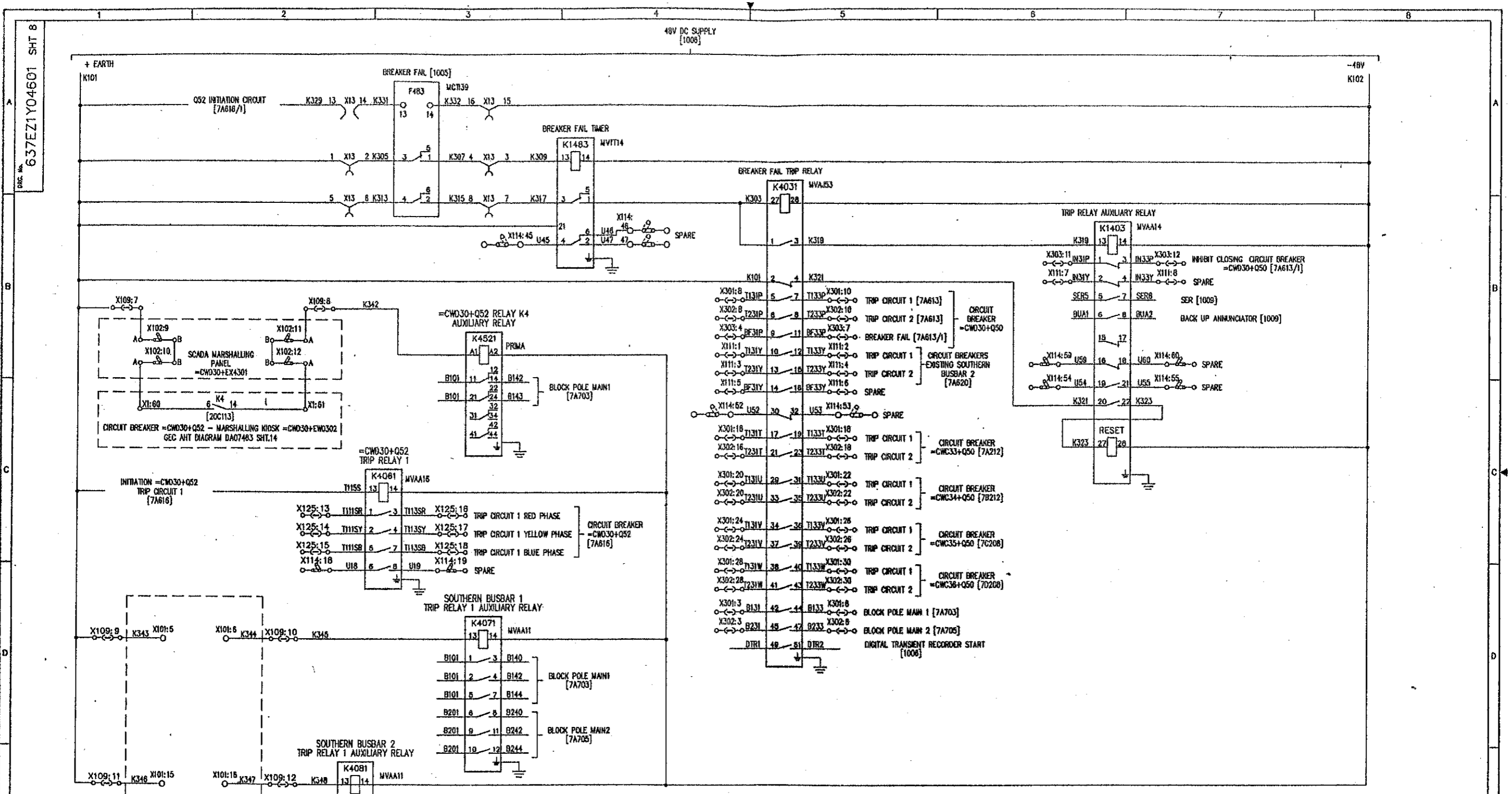
ISSUE	PRJ	PRJ	PRJ	PRJ	PRJ	PRJ	PRJ
NAME	A	B	C	D	E	F	G
LOCATION	ISSUE	JCP	RFR	JCP	JCP	JCP	JCP
VISA3948	11/08/97	12/08/97	29/07/98	07/01/99	07/01/99	07/01/99	07/01/99
	RELAY TYPES ADDED	REVIS TO EDN0402, B473 & B526 - K4511 & K4511 ADDED RFRZ REMOVED	REVIS TO EDN0448 - MADE SPARE X.10:6 & X.10:7 CHANGED FILE REF'S FROM 7A613 TO X303.6 & X.10:6	MODIFIED AS REQUESTED ON EDN0684E - SCADA MARSHALLING KIOSK AND X10:5 - X10:8 ADDED. K4AND FILE REF 20C109 ADDED.	REVIS TO EDN0712 - WIRE WAS ADDED FOR SCADA MARCH'S KIOSK		

AS BUILT DWG
 16 MAY 2003
 VISAKHAPATNAM

GEC ALSTHOM T&D
 Power Electronic Systems Limited
 CERTIFIED FOR MANUFACTURE
 NAME: B T BARRETT
 DEPT: 738 DATE: 9/8/97
 SIGNED: BTB

THIRD ANGLE PROJECTION
 ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED
 DRAWING TO GS006 UNLESS OTHERWISE STATED
 FOR THE STANDARD OF ACCURACY OF ALL UNITS/STANDARD DIMENSIONS SEE SPEC. STAND/020/PROJ
 IF IN DOUBT ASK

DRAWN JCP
 CH'D PNS
 APP'D RFR
 SCALE
 TRACED
 DESIGN PRJ
 DRG No. 637EZ1Y04601 SHT 7
 CURRENT ISSUE E



NOTES
 [100N] DEMOTES FILE No OF [7C100N] SECTION
 REFER TO [100I] FOR FILE INDEX
 REFER TO [100J] FOR LOCATION & DEVICE LIST

ISSUE	DATE	PRJ	REVISION	REASON
A	11/06/97	JCP	1	ISSUE FOR SCADA MARSHALLING
B	08/08/97	JCP	2	REVISION TO ENHANCE RELAY LOGGING
C	29/07/98	JCP	3	REVISION TO ENHANCE RELAY LOGGING
D	01/05/99	JCP	4	REVISION TO ENHANCE RELAY LOGGING
E	16/05/2000	JCP	5	AS BUILT DWG

AS BUILT DWG
 16 MAY 2000
VISAKHAPATNAM

GEC ALSTHOM T&D Power Electronic Systems Limited CERTIFIED FOR MANUFACTURE NAME: B T BARRETT DEPT: 739 DATE: 9/8/97 SIGNED: BTB	THIRD ANGLE PROJECTION IF IN DOUBT ASK	ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED DRAWING TO BS308 UNLESS OTHERWISE STATED FOR THE STANDARD OF ACCURACY OF ALL UNTOLERANCED DIMENSIONS SEE SPEC. STAND/022/PROG	DRAWN: JCP CHD: PNS APP'D: RFR SCALE: TRACED: DESIGN: PRJ APP'D:
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FILE 7C1008

POWER GRID CORPORATION OF INDIA LIMITED
 1 x 500MW HVDC BACK-TO-BACK PROJECT
VISAKHAPATNAM

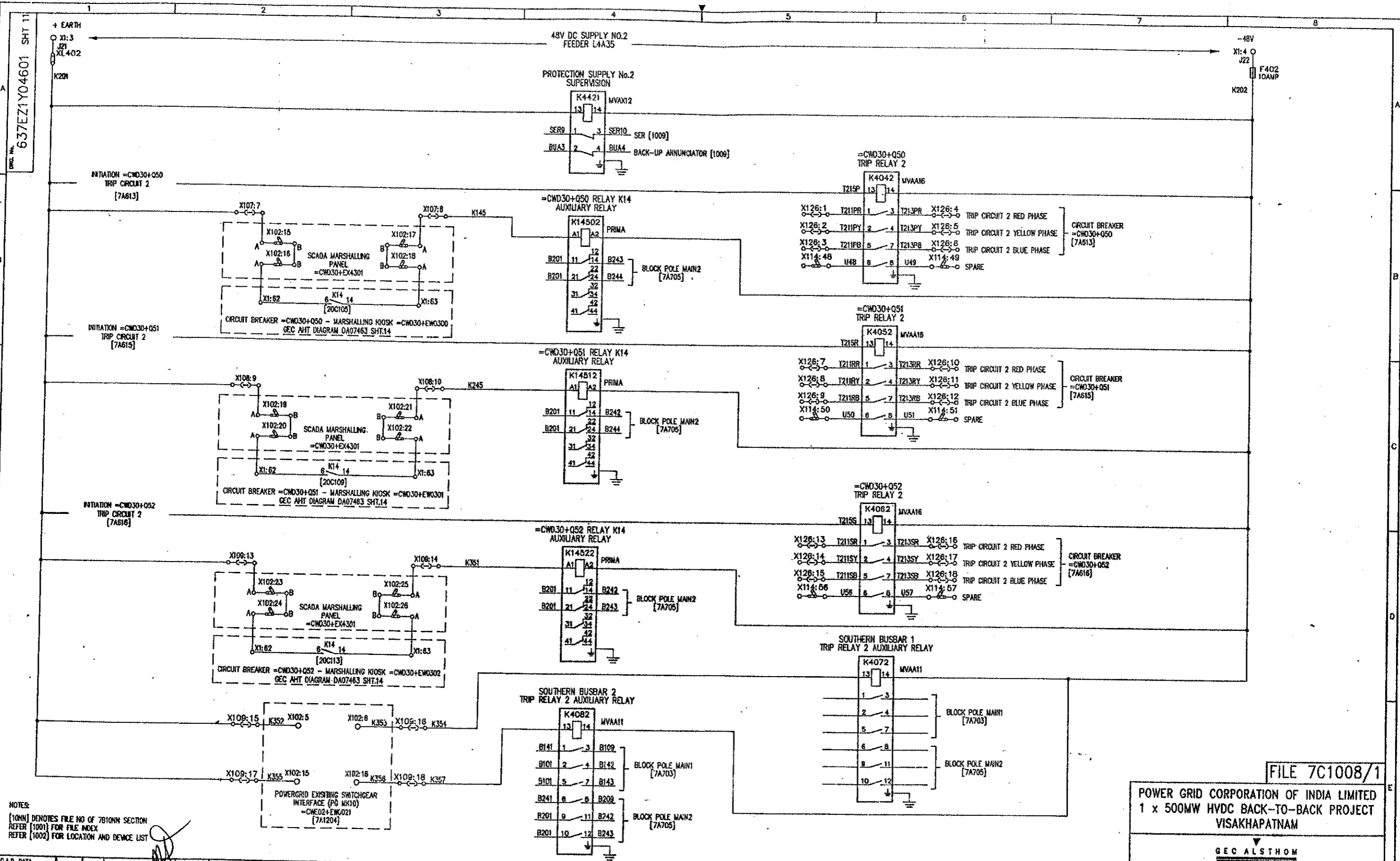
GEC ALSTHOM
 T&D

GEC ALSTHOM T&D
 Power Electronic Systems Limited
 Moulton, England

VISAKHAPATNAM
 CIRCUIT DIAGRAM FOR
 DC CIRCUITS OF PROTECTION No 1
 CIRCUIT BREAKER =CWD30+Q52

ORG. No. **637EZ1Y04601 SHT 8** CURRENT ISSUE **E**

CUSTOMER: POWERGRID WHEN QUOTING DRG. No. STATE CURRENT ISSUE ORDER No. CP 0136



NOTES:
 [100N] DENOTES FILE NO OF 7810NN SECTION
 REFER [1001] FOR FILE INDEX
 REFER [1002] FOR LOCATION AND DEVICE LIST

FILE 7C1008/1

POWER GRID CORPORATION OF INDIA LIMITED
 1 x 500MW HVDC BACK-TO-BACK PROJECT
 VISAKHAPATNAM

GEC ALSTHOM
 T&D

GEC ALSTHOM T&D
 Power Electronic Systems Limited

VISAKHAPATNAM
 CIRCUIT DIAGRAM FOR
 DC CIRCUITS OF PROTECTION No 2
 CIRCUIT BREAKERS =CWD30+Q50, Q51 & Q52

C.A.B. DATA	PRJ	A	B	07	05	01	99
ISSUE	JCP	JCP	JCP	07	05	01	99
NAME	JCP	JCP	JCP	07	05	01	99
LOCATION	JCP	JCP	JCP	07	05	01	99

REFER TO LOCAL 2845
 TERMINALS X102:15 TO 26 INC
 ADDED. RELAY K14 CONTACTS
 ADDED. X102 TERMINAL REF'S
 ADDED ON PG. 10011.

REVISIONS TO ECH 8712-
 X102: WAS X101 FOR SCADA
 MARSHLING KIOSK.

AS BUILT DWG
 16 MAY 2003
 VISAKHAPATNAM

GEC ALSTHOM T&D
 Power Electronic Systems Limited
 CERTIFIED FOR
 MANUFACTURE

NAME: BT BARRETT
 DEPT. 739 DATE: 28/07/98
 SIGNED: BT BARRETT

THIRD ANGLE
 PROJECTION

ALL DIMENSIONS
 IN MILLIMETRES
 UNLESS OTHERWISE STATED

DRAWN: PREM
 CVD: RFR
 APPD: RFR
 SCALE:
 WRACD:
 DESIGN: PRJ
 APPD:

IF IN DOUBT
 ASK

FOR THE STANDARD OF
 ACCURACY OF ALL
 UNBALANCED DIMENSIONS
 SEE SPEC. 61410/023/PROG

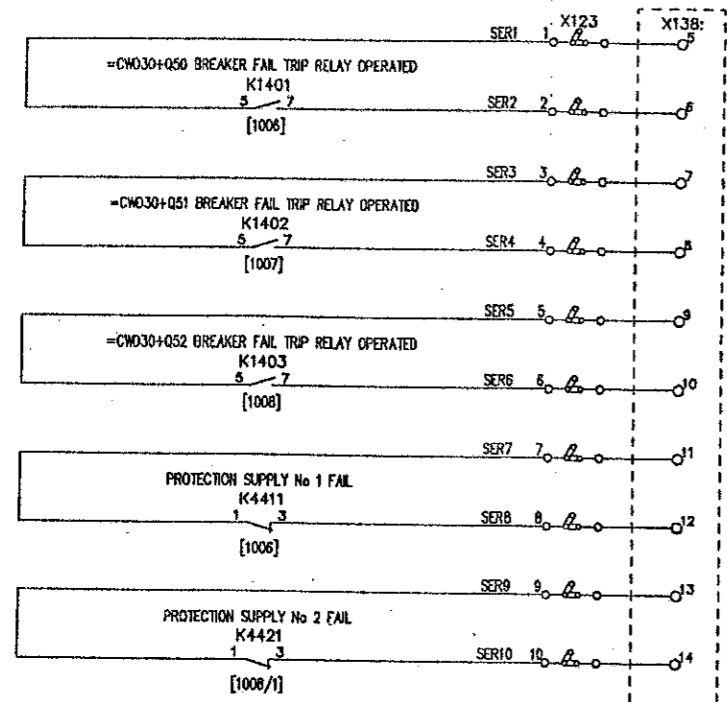
DRG. No.
 637EZ1Y04601 SHT 11

CURRENT
 ISSUE
 C

DO NOT SCALE PRINT
 WHEN QUOTING DRG. No. STATE CURRENT ISSUE
 CUSTOMER: POWERGRID
 ORDER No. CF0138

DRG. No. 637EZ1Y04601 SHT 9

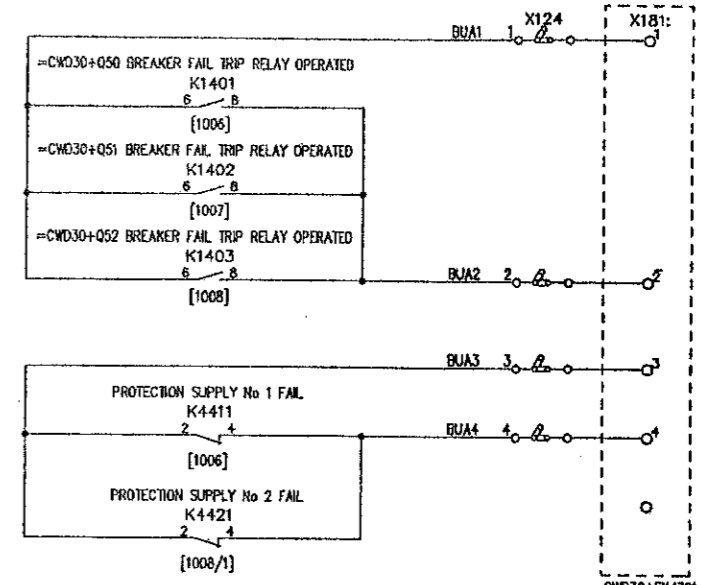
SEQUENCE OF EVENTS RECORDER ALARM SIGNALS



NOTE.
TERMINAL TO CONNECT
CABLE OVERALL SCREEN
AT THIS CUBICLE ONLY.

=CWD30+EX4301
SCADA MARSHALLING
[20C135]

BACK-UP ANNUNCIATOR ALARM SIGNALS



MAJOR ALARM

MINOR ALARM

NOTE.
TERMINAL TO CONNECT
CABLE OVERALL SCREEN
AT THIS CUBICLE ONLY.

=CWD30+EX4301
SCADA MARSHALLING
[20C132]

NOTES:
[10NN] DENOTES FILE NO OF 7C10NN SECTION
REFER [1001] FOR FILE INDEX
REFER [1002] FOR LOCATION AND DEVICE LIST

FILE 7C1009

POWER GRID CORPORATION OF INDIA LIMITED
1 x 500MW HVDC BACK-TO-BACK PROJECT
VISAKHAPATNAM

GEC ALSTHOM
T&D

GEC ALSTHOM T&D
Power Electronic Systems Limited
Waltham, England

TITLE
VISAKHAPATNAM
=CWD30 BREAKER FAIL PROTECTION
CIRCUIT DIAGRAM FOR
SER & BACK-UP ANNUNCIATOR SIGNALS

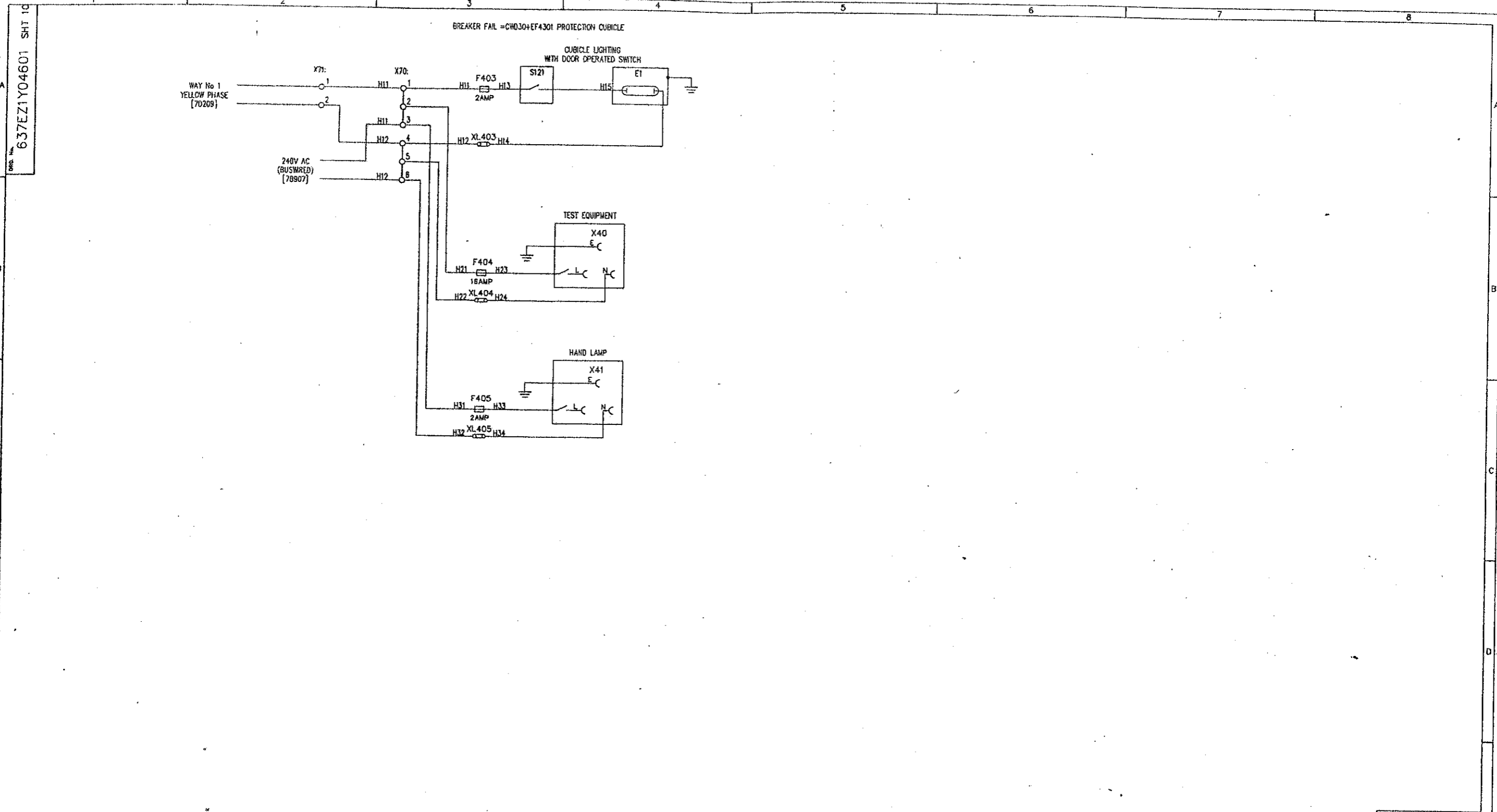
DRG. No. 637EZ1Y04601 SHT 9
CURRENT ISSUE C

G.A.D. DATA	ISSUE	A	PRJ	B
	NAME	C	RFR	PREM
LOCATION	DATE	11/06/97	ISSUE	05/01/99
VISA3619	REVISED TO EN61873 & EN61874-1 X123 & X181 ADDED RELAY K4411 NAME CHANGED FROM BREAKER FAIL SUPPLY FAIL TO BREAKER FAIL SUPPLY FAIL		REFER TO EN61874 DRAWING REF'S ADDED TO SCADA MARSHALLING PANELS.	

AS BUILT DWG
16 MAY 2000
VISAKHAPATNAM

GEC ALSTHOM T&D
Power Electronic Systems Limited
CERTIFIED FOR
MANUFACTURE
NAME: B T BARRETT
DEPT. 739 DATE: 9/6/97
SIGNED: BTB

THIRD ANGLE
PROJECTION
ALL DIMENSIONS
IN MILLIMETRES
UNLESS OTHERWISE STATED
DRAWING TO BS308
UNLESS OTHERWISE STATED
FOR THE STANDARD OF
ACCURACY OF ALL
UNFOLDING DIMENSIONS
SEE SPECIAL STANDARDS/PROC
IF IN DOUBT
ASK
DRAWN: JCP
CHKD: PNS
APP'D: RFR
SCALE:
TRACED:
DESIGN
APP'D: PRJ
DO NOT SCALE PRINT



NOTES:
 [10MM] DENOTES FILE NO OF 7C10MM SECTION
 REFER [1001] FOR FILE INDEX
 REFER [1002] FOR LOCATION AND DEVICE LIST

FILE 7C1010

POWER GRID CORPORATION OF INDIA LIMITED
 1 x 500MW HVDC BACK-TO-BACK PROJECT
 VISAKHAPATNAM

GEC ALSTHOM
 T&D

GEC ALSTHOM T&D
 Power Electronic Systems Limited
 Sheffield, England

VISAKHAPATNAM
 BREAKER FAIL PROTECTION
 CUBICLE = CWD30+EF4301
 AC SUPPLIES AND CUBICLE ILLUMINATION

C.A.D. DATA
 ISSUE B
 NAME
 LOCATION VSA2139

ISSUE A
 DATE 11/06/97
 PREM
 19/09/98
 REVISED TO ENHANCE -
 REMOVED AUX BOARD REPLACED
 WITH FILE REF TO 20208.

AS BUILT DWG
 16 MAY 2000
 VISAKHAPATNAM

GEC ALSTHOM T&D
 Power Electronic, Systems Limited
 CERTIFIED FOR
 MANUFACTURE
 NAME B T BARRET
 DEPT. 739 DATE 8/6/97
 SIGNED BTB

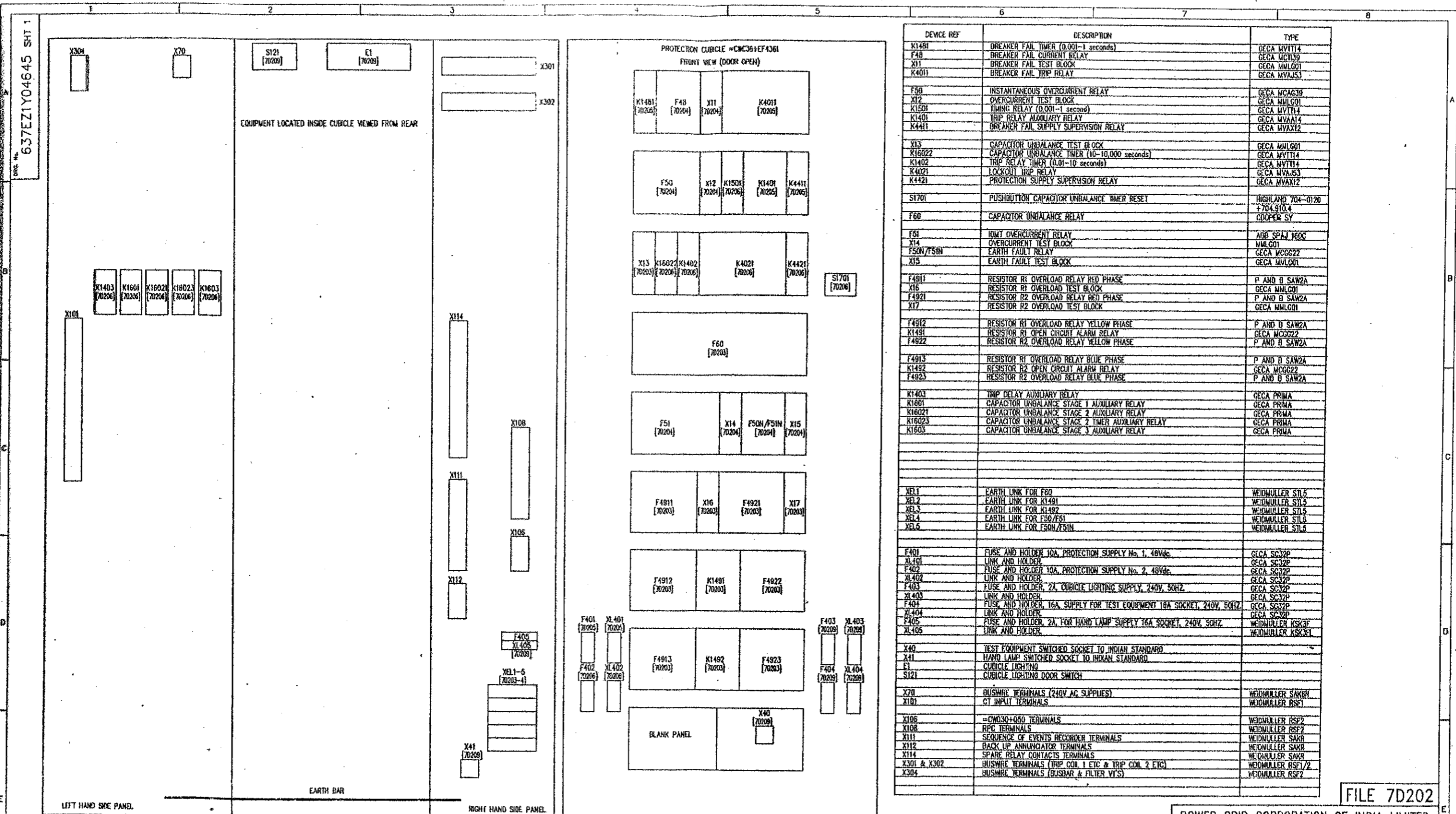
THIRD ANGLE
 PROJECTION
 IF IN DOUBT
 ASK

ALL DIMENSIONS
 IN MILLIMETRES
 UNLESS OTHERWISE STATED
 DRAWING TO BS306
 UNLESS OTHERWISE STATED
 FOR THE STANDARD OF
 ACCURACY OF ALL
 UNTOLERANCED DIMENSIONS
 SEE SPEC. STAND/023/PROC

DRW. No. 637EZ1Y04601 SHT 10
 CURRENT ISSUE B

DD NOT SCALE PRINT

CUSTOMER POWERGRID ORDER No. CF0136



DEVICE REF	DESCRIPTION	TYPE
K1481	BREAKER FAIL TIMER (0.001-1 seconds)	GECA MVTT14
F48	BREAKER FAIL CURRENT RELAY	GECA MCH39
X11	BREAKER FAIL TEST BLOCK	GECA MVLG01
K4011	BREAKER FAIL TRIP RELAY	GECA MVAJ53
F60	INSTANTANEOUS OVERCURRENT RELAY	GECA MCAG39
X12	OVERCURRENT TEST BLOCK	GECA MMLG01
K1501	TIMING RELAY (0.001-1 second)	GECA MVTT14
K1401	TRIP RELAY AUXILIARY RELAY	GECA MVAI14
K4411	BREAKER FAIL SUPERVISION RELAY	GECA MVAX12
X13	CAPACITOR UNBALANCE TEST BLOCK	GECA MMLG01
K16022	CAPACITOR UNBALANCE TIMER (10-10,000 seconds)	GECA MVTT14
K1402	TRIP RELAY TIMER (0.01-10 seconds)	GECA MVTT14
K4021	LOCKOUT TRIP RELAY	GECA MVAJ53
K4421	PROTECTION SUPPLY SUPERVISION RELAY	GECA MVAX12
S1701	PUSHBUTTON CAPACITOR UNBALANCE TIMER RESET	HIGHLAND 704-0120 +704.910.4
F60	CAPACITOR UNBALANCE RELAY	COOPER SY
F61	10M OVERCURRENT RELAY	ABB SPAJ 160C
X14	OVERCURRENT TEST BLOCK	MMLG01
F50N/F51N	EARTH FAULT RELAY	GECA MCGG22
X15	EARTH FAULT TEST BLOCK	GECA MMLG01
F4811	RESISTOR R1 OVERLOAD RELAY RED PHASE	P AND B SAW2A
X16	RESISTOR R1 OVERLOAD TEST BLOCK	GECA MMLG01
F4921	RESISTOR R2 OVERLOAD RELAY RED PHASE	P AND B SAW2A
X17	RESISTOR R2 OVERLOAD TEST BLOCK	GECA MMLG01
F4812	RESISTOR R1 OVERLOAD RELAY YELLOW PHASE	P AND B SAW2A
K1481	RESISTOR R1 OPEN CIRCUIT ALARM RELAY	GECA MCGG22
F4922	RESISTOR R2 OVERLOAD RELAY YELLOW PHASE	P AND B SAW2A
F4913	RESISTOR R1 OVERLOAD RELAY BLUE PHASE	P AND B SAW2A
K1482	RESISTOR R2 OPEN CIRCUIT ALARM RELAY	GECA MCGG22
F4923	RESISTOR R2 OVERLOAD RELAY BLUE PHASE	P AND B SAW2A
K1403	TRIP DELAY AUXILIARY RELAY	GECA PRMA
K1601	CAPACITOR UNBALANCE STAGE 1 AUXILIARY RELAY	GECA PRMA
K16021	CAPACITOR UNBALANCE STAGE 2 AUXILIARY RELAY	GECA PRMA
K16023	CAPACITOR UNBALANCE STAGE 2 TIMER AUXILIARY RELAY	GECA PRMA
K1603	CAPACITOR UNBALANCE STAGE 3 AUXILIARY RELAY	GECA PRMA
XEL1	EARTH LINK FOR F60	WEIDMULLER STL5
XEL2	EARTH LINK FOR K1491	WEIDMULLER STL5
XEL3	EARTH LINK FOR K1492	WEIDMULLER STL5
XEL4	EARTH LINK FOR F60/F61	WEIDMULLER STL5
XEL5	EARTH LINK FOR F50N/F51N	WEIDMULLER STL5
F401	FUSE AND HOLDER 10A, PROTECTION SUPPLY No. 1, 48Vdc	GECA SC32P
XL401	LINK AND HOLDER	GECA SC32P
F402	FUSE AND HOLDER 10A, PROTECTION SUPPLY No. 2, 48Vdc	GECA SC32P
XL402	LINK AND HOLDER	GECA SC32P
F403	FUSE AND HOLDER, 2A, CUBICLE LIGHTING SUPPLY, 240V, 50HZ	GECA SC32P
XL403	LINK AND HOLDER	GECA SC32P
F404	FUSE AND HOLDER, 16A, SUPPLY FOR TEST EQUIPMENT 16A SOCKET, 240V, 50HZ	GECA SC32P
XL404	LINK AND HOLDER	GECA SC32P
F405	FUSE AND HOLDER, 2A, FOR HAND LAMP SUPPLY 16A SOCKET, 240V, 50HZ	WEIDMULLER KSK3E
XL405	LINK AND HOLDER	WEIDMULLER KSK3E
X40	TEST EQUIPMENT SWITCHED SOCKET TO INDIAN STANDARD	
X41	HAND LAMP SWITCHED SOCKET TO INDIAN STANDARD	
E1	CUBICLE LIGHTING	
S121	CUBICLE LIGHTING DOOR SWITCH	
X70	BUSHWIRE TERMINALS (240V AC SUPPLIES)	WEIDMULLER SAK8N
X101	GT INPUT TERMINALS	WEIDMULLER RSE1
X106	=CWC30+050 TERMINALS	WEIDMULLER RSP2
X108	RFC TERMINALS	WEIDMULLER RSP2
X111	SEQUENCE OF EVENTS RECORDER TERMINALS	WEIDMULLER SAKR
X112	BACK UP ANNUNCIATOR TERMINALS	WEIDMULLER SAKR
X114	SPARE RELAY CONTACTS TERMINALS	WEIDMULLER SAKR
X301 & X302	BUSHWIRE TERMINALS (TRIP COIL 1 ETC & TRIP COIL 2 ETC)	WEIDMULLER RSE1/2
X304	BUSHWIRE TERMINALS (BUSBAR & FILTER VTS)	WEIDMULLER RSE2

FILE 7D202

POWER GRID CORPORATION OF INDIA LIMITED
1 x 500MW HVDC BACK-TO-BACK PROJECT
VISAKHAPATNAM

GE ALSTHOM
T&D

Power Electronic Systems Limited
Shefford, England

VISAKHAPATNAM
AC HARMONIC FILTER =CWC36+EF4361
EQUIPMENT AND DEVICE LIST

DRG. No. 637EZ1Y04645 SHT 1
CURRENT ISSUE C

REFER 637EZ1Y04596 FOR FILE INDEX (7D202)

ISSUE	A	PRJ	B
C	13	PNB	26
	08	JCP	08
	97		97

REVISOR TO ENDS- X102 & X103 DELETED & X105 ADDED
PREM
REVISOR TO ENDS- X102 & X103 DELETED R11, R12, R13, R14
DELETED R11, R12, R13, R14

AS BUILT DWG
14 APR 2000
VISAKHAPATNAM

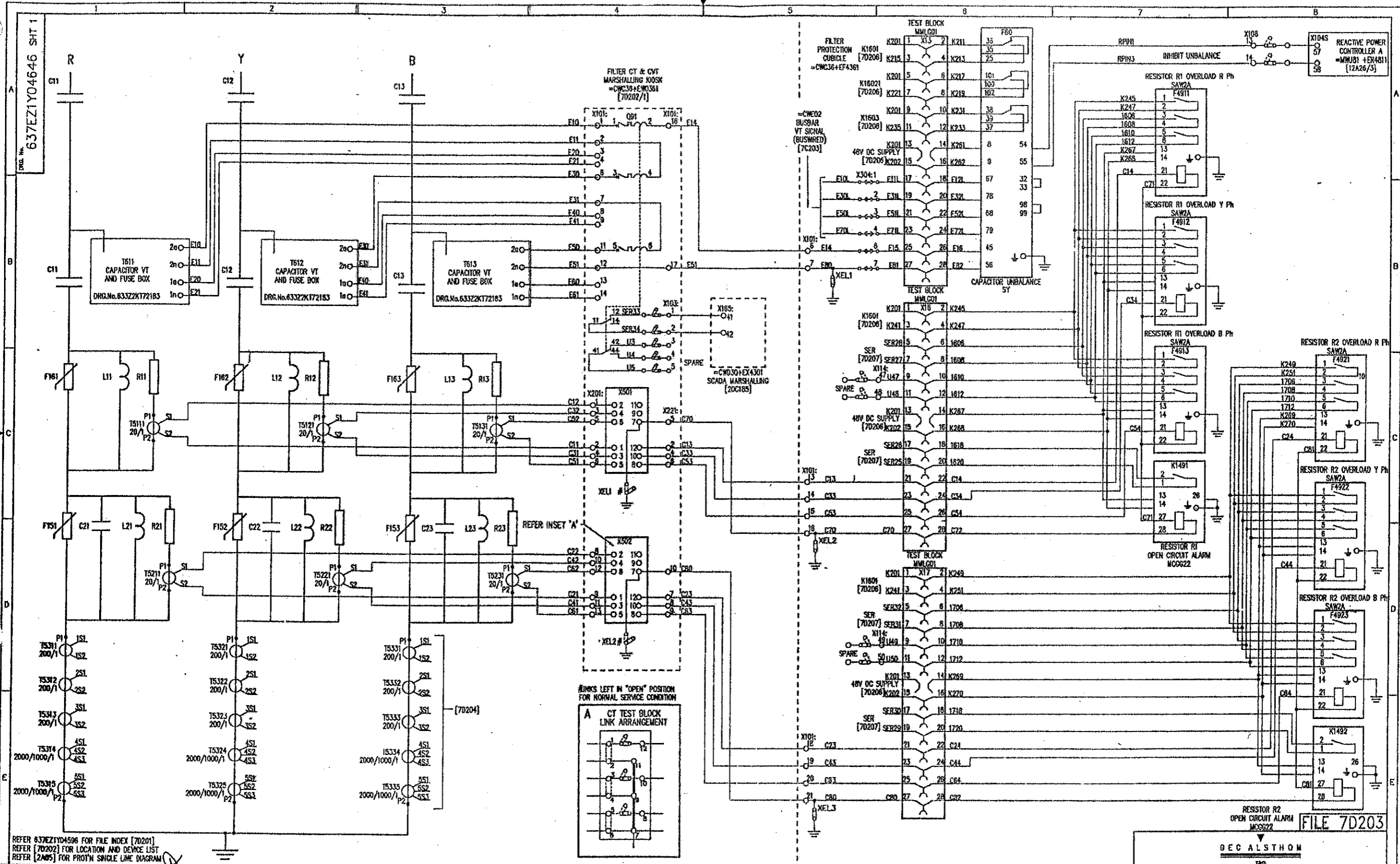
GE ALSTHOM T&D
Power Electronic Systems Limited
CERTIFIED FOR MANUFACTURE
NAME: B T BARRETT
DEPT. 739 DATE: 5/8/97
SIGNED: BTB

THIRD ANGLE PROJECTION
IF IN DOUBT ASK

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED
DRAWING TO BS308 UNLESS OTHERWISE STATED
FOR THE STANDARD OF ACCURACY OF ALL UNLATERAL DIMENSIONS SEE SPEC. STAND/003/PROC

DRAWN: JCP
CHKD: PNS
APPD: RFR
SCALE:
TRACED:
DESIGN: PRJ
APPD:

DO NOT SCALE PRINT
WHEN QUOTING DRG. NO. STATE CURRENT ISSUE
CUSTOMER: POWERGRID
ORDER No. CF0136



REFER 637EZ1Y04596 FOR FILE INDEX [70201]
 REFER [70202] FOR LOCATION AND DEVICE LIST
 REFER [2405] FOR PROTH SINGLE LINE DIAGRAM

ISSUE	A		B		C	
	DATE	13	22	07	14	08
NAME	A		B		C	
637EZ1Y04646	A		B		C	
LOCATION	A		B		C	
MSA3555	A		B		C	

AS BUILT DWG
 14 APR 2000
VISAKHAPATNAM

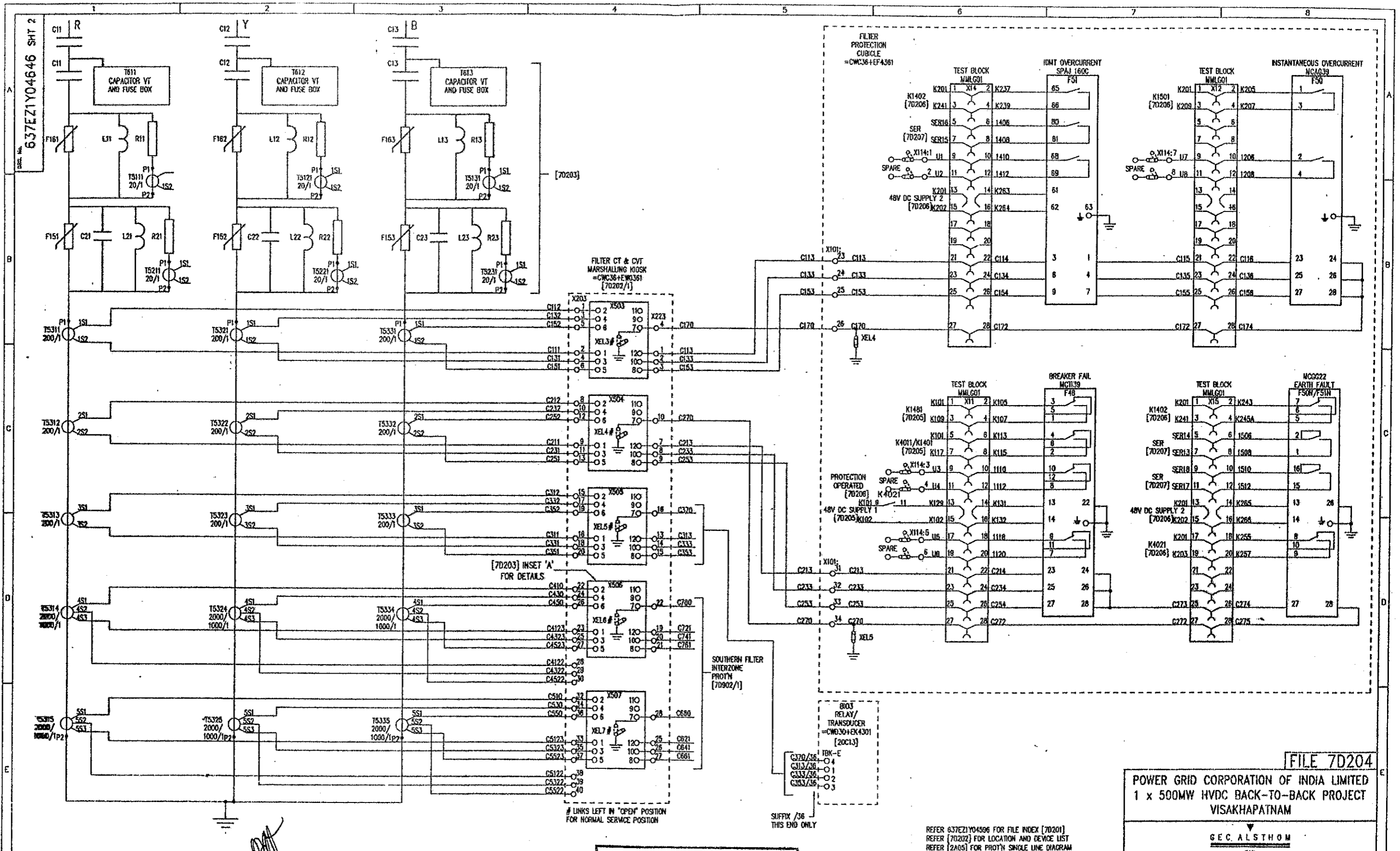
POWER GRID CORPORATION OF INDIA LIMITED
 1 x 500MW HVDC BACK-TO-BACK PROJECT
 VISAKHAPATNAM

GEC ALSTHOM
 T&D
 CERTIFIED FOR MANUFACTURE
 NAME: B T BARRETT
 DEPT. 739 DATE: 5/8/97
 SIGNED: BTB

THIRD ANGLE PROJECTION
 ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED
 DRAWING TO BS308 UNLESS OTHERWISE STATED
 FOR THE STANDARD OF ACCURACY OF ALL UNDIMENSIONED DIMENSIONS SEE SPEC. STAND/GS/PROC

GEC ALSTHOM
 T&D
GEC ALSTHOM T&D
 Power Electronic Systems Limited
 VISAKHAPATNAM
 AC HARMONIC FILTER -CWC36 PROTECTION
 CIRCUIT DIAGRAM FOR AC CIRCUITS
 DRG. No. 637EZ1Y04646 SHT 1
 CUSTOMER: POWERGRID

FILE 7D203



AS BUILT DWG
14 APR 2003
VISAKHAPATNAM

C.A.B. DATA	PRJ	A	PRJ	C
	ISSUE	D	ISSUE	15
NAME	PNS JCP	08	PNS JCP	08
	DATE	15	DATE	08
LOCATION	VISA3090	08	VISA3090	08
		97		97

REVISION TO ENCL 8424 & 8424-1
CHANGED CABLE CORE No ON
X223/19-21 & 25-28 FROM
C413, 453, 453, 470 & C513,
553, 553, 570. ALSO FILE REF
FOR SOUTHERN FILTER INTERZONE
FROM 7090X
ADDED TERMINAL NUMBERS TO
-CWC36+EK4301

REVISION TO ENCL 8555-
CHANGED CABLE CORE No ON
X231/22 & 28 FROM C770 &
C870

GEC ALSTHOM IM	THIRD ANGLE PROJECTION	ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED	DRAWN JCP
Power Electronic, Systems Limited		DRAWING TO BS2000 UNLESS OTHERWISE STATED	CFO PNS
CERTIFIED FOR MANUFACTURE	IF IN DOUBT ASK	FOR THE STANDARD OF ACCURACY OF ALL UNDIMENSIONED DIMENSIONS SEE SPECIAL STAND/023/PROO	APPD RFR
NAME: B T BARRETT			SCALE
DEPT. 739 DATE: 5/8/97			TRACED
SIGNED BTB			DESIGN PRJ

FILE 7D204

POWER GRID CORPORATION OF INDIA LIMITED
1 x 500MW HVDC BACK-TO-BACK PROJECT
VISAKHAPATNAM

GEC ALSTHOM
T&D

GEC ALSTHOM T&D
Power Electronic Systems Limited
Whitby, England

VISAKHAPATNAM
AC HARMONIC FILTER -CWC36 PROTECTION
CIRCUIT DIAGRAM FOR
AC CIRCUITS

DRG. No. 637EZ1Y04646 SHT 2

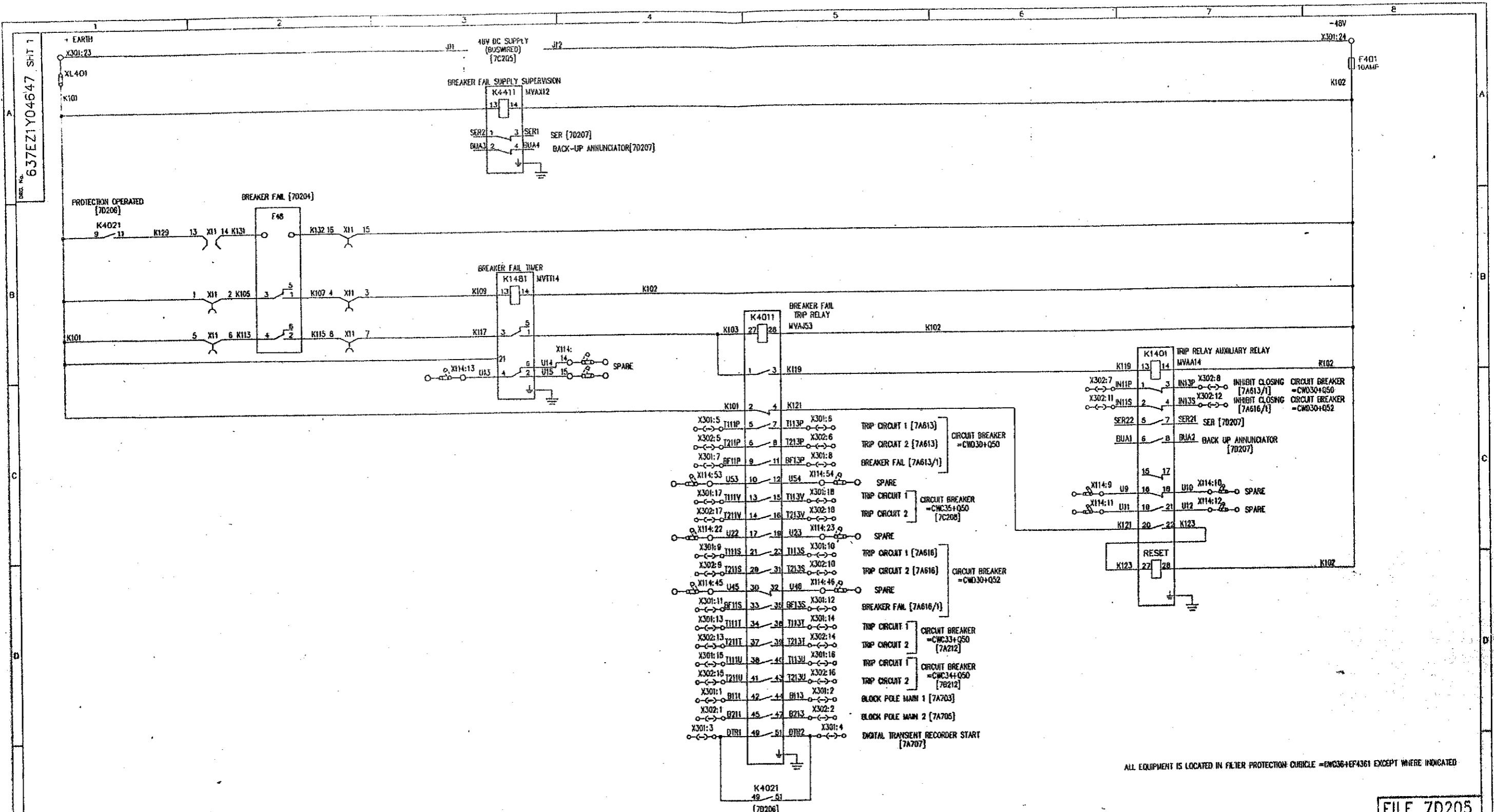
CURRENT ISSUE D

DO NOT SCALE PRINT

WHICH QUOTING DRG. No. STATE CURRENT ISSUE

CUSTOMER POWERGRID

ORDER No. CF0136



ALL EQUIPMENT IS LOCATED IN FILTER PROTECTION CURBICLE -6W036+EF4361 EXCEPT WHERE INDICATED

REFER 637EZ1Y04596 FOR FILE INDEX [70201]
REFER [70202] FOR LOCATION AND DEVICE LIST

FILE 7D205

POWER GRID CORPORATION OF INDIA LIMITED
1 x 500MW HVDC BACK-TO-BACK PROJECT
VISAKHAPATNAM
GEC ALSTHOM
T&D

AS BUILT DWG
14 APR 2009
VISAKHAPATNAM

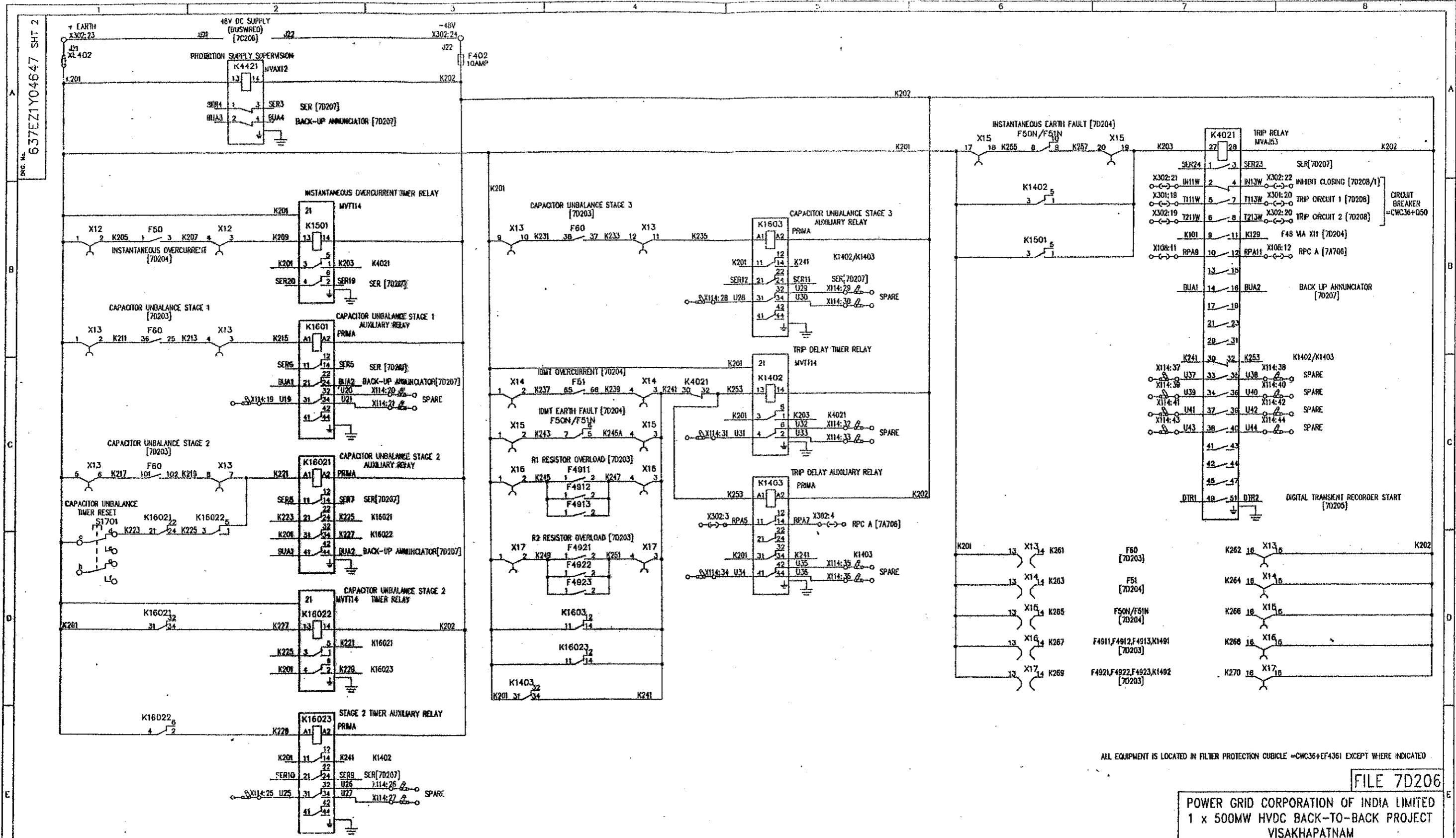
GEC ALSTHOM T&D
Power Electronic Systems Limited
CERTIFIED FOR MANUFACTURE
NAME: B T BARRETT
DEPT: 739 DATE: 5 / 8 / 97
SIGNED: BTB

THIRD ANGLE PROJECTION
IF IN DOUBT ASK

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED
DRAWING TO BS308 UNLESS OTHERWISE STATED
FOR THE STANDARD OF ACCURACY OF ALL UNFINISHED DIMENSIONS SEE SPEC. STAND/023/PROC

DRAWN JCP
CHK PNS
APP'D RFR
SCALE
TRACED
DESIGN APP'D PRJ
DRG. No. 637EZ1Y04647 SHT 1
CURRENT ISSUE B

CAD DATA	A	REVISED TO EMBARCO & R448- REMOVED R111 FROM K1481-14 CHANGED FILE REF'S FROM 7A613 & 7A616 ON X301:8, X302:8 & X301:12, X302:12
ISSUE	PREM	
NAME	DATE	BY
	13/08/97	22/07/98
LOCATION		
VISA2259		



ALL EQUIPMENT IS LOCATED IN FILTER PROTECTION CUBICLE =CWC36+EF4361 EXCEPT WHERE INDICATED

FILE 7D206

POWER GRID CORPORATION OF INDIA LIMITED
1 x 500MW HVDC BACK-TO-BACK PROJECT
VISAKHAPATNAM

GEC ALSTHOM
T&D

GEC ALSTHOM T&D
Power Electronic Systems Limited

VISAKHAPATNAM
AC HARMONIC FILTER =CWC36 PROTECTION
CIRCUIT DIAGRAM FOR
DC CIRCUITS (PROTECTION)

DRG. No. 637EZ1Y04647 SHT 2
CURRENT ISSUE B

REFER 637EZ1Y04596 FOR FILE INDEX [70201]
REFER [70202] FOR LOCATION AND SERVICE LIST

ISSUE	A	PREM
NAME	DATE	13/08/97
LOCATION	VISA2084	

AS BUILT DWG
14 APR 2003
VISAKHAPATNAM

GEC ALSTHOM T&D
Power Electronic Systems Limited
CERTIFIED FOR MANUFACTURE
NAME: B T BARRETT
DEPT. 739 DATE: 5/8/07
SIGNED: BTB

THIRD ANGLE PROJECTION
IF IN DOUBT ASK
ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED
DRAWING TO BS308 UNLESS OTHERWISE STATED
FOR THE STANDARD OF ALL UNITS/TERMINALS DIMENSIONS SEE SPEC. STAND./223/PROD

DO NOT SCALE PRINT

CUSTOMER POWERGRID ORDER No. CF0136