© Copyright 2023 Hitachi Energy

CUSTOMER	:	ASSAM ELECTRICITY GRID CORPORATION LTD
EPC CONTRACTOR	:	TECHNO ELECTRIC & ENGINEERING COMPANY LIMITED
CUSTOMER REF. PO.NO	:	0816SN/24-25/43841 DTD: 27-FEB-2025
HE REF.NO	:	128840
SUBSTATION	:	400/220kV GIS SS AT SONAPUR
EQUIPMENT	:	220kV BUSBAR PROTECTION PANEL
DRAWING REF.	:	General Arrangement : 1KHF128840R1411
		Schematic Drawings : 1KHF128840R1411
		Bill of Material : 1KHY128840R1411, 1KHY128840R1412
STANDARD BAY REF.	:	2RBB

—				
Checked By AM (P&D)	Chec DM	Checked By GM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

APPLICABLE FOR FOLLOWING BAYS

SL.No	BAY REF.	PANEL REF.	BAY DESCRIPTION
1	-	2RBB1, 2RBB2	220kV BUSBAR PROTECTION

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of any contractual obligation nor his responsibilities for complete conformity with particulars of the enquiry with the Indian Statutory Rules / IEC specifications as may be applicable nor does limit the AEGCL's rights under the contract.

Techno Electric & Engineering Co. Ltd. Guwahati

AUX. VOLTAGE : 220V DC

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
Title Page

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram	Ref.Des.	=2R
	DCC EFS		
Resp. dept.	PG-GAS	Rev. ind.	01
Doc. no.	1KHF128840R1411	Language	en
		Sheet	1
		No.sheets	136

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

PAGE NUMBER INDEX

SL.NO.	DESCRIPTION	PAGE NOS.
1	TITLE SHEET	1
2	PAGE NUMBER INDEX	2
3	LIST OF CONTENT	3
4	GENERAL ARRANGEMENT	21....
5	PART LIST	41....
6	SLD, LEGEND,TRIP MATRIX & LOGICS / HARDWIRED INTELROCKS	101....
7	DC CIRCUIT	131....
8	AC CIRCUIT	141....
9	MAIN RELAY CIRCUIT	151....
10	BACK-UP CIRCUIT	181....
11	BCU/SYNCH CIRCUIT/METERING	221....
12	MASTER TRIP RELAY CIRCUIT	261....
13	CB CLOSING, TC-1, TC-2	271....
14	ISOLATOR CONT.MULTI. / CONTROL CKT.	281....
15	TRAFO. TROUBLE CIRCUIT	301....
16	TBC/BB INTERFACING, ETHERNET SW.CKT.	371....
17	SPARE TERMINALS	401....

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and his responsibility to design details, performance particulars and conformity of the supplies with the Indian statutory laws / IEC specifications as may be applicable nor does limit the AEGCL's right under the contract.

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared 08-08-2025 DIVYA S
Approved 08-08-2025 THEJASWINI AR
Project ASSAM ELECTRICITY GRID CORPORATION LTD
400/220kV GIS SS AT SONAPUR
128840

Title 220kV CONTROL & RELAY PANEL
220kV BUSBAR
PAGE NUMBER INDEX

HITACHI Hitachi Energy India Limited

Doc. kind. Circuit diagram
DCC EFS
Ref.Des. =2R
Resp. dept. PG-GAS
Rev. ind. 01
Language en
Doc. no. 1KHF128840R1411
Sheet 2
n. sheet 3

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

Sheet	n.sh.	Description 1	Description 2	Rev.	Revision note
1	2	220kV BUSBAR	Title Page		
2	3	220kV BUSBAR	PAGE NUMBER INDEX		
3	4	List of contents	List of contents		
4	5	List of contents	List of contents		
5	21	List of contents	List of contents		
21	22	220kV BUSBAR	Front view		
22	23	220kV BUSBAR	Section view incl. location designation		
23	24	220kV BUSBAR	Side view		
24	25	220kV BUSBAR	Hinged frame view		
25	26	220kV BUSBAR	Inside view		
26	27	220kV BUSBAR	Hinged frame view		
27	28	220kV BUSBAR	Inside view		
28	29	220kV BUSBAR	Legend list		
29	30	220kV BUSBAR	Legend list		
30	31	220kV BUSBAR	Legend list		
31	32	220kV BUSBAR	PANEL LINE UP		
32	41	220kV BUSBAR	PANEL NAME PLATE		
41	42	Parts list	=2R+BB1		
42	43	Parts list	=2R+BB1		
43	44	Parts list	=2R+BB1		
44	50	Parts list	=2R+BB1		
50	51	Parts list	=2R+BB2		
51	101	Parts list	=2R+BB2		
101	102	220kV BUSBAR	SLD		
102	103	220kV BUSBAR	SLD		
103	104	220kV BUSBAR	BUSBAR LOGICS		
104	131	220kV BUSBAR	LIST OF SYMBOLS		
131	132	220kV BUSBAR	DC DISTRIBUTION CIRCUIT		
132	141	220kV BUSBAR	DC DISTRIBUTION CIRCUIT		

Sheet	n.sh.	Description 1	Description 2	Rev.	Revision note
141	151	220kV BUSBAR	AC DISTRIBUTION CIRCUIT		
151	152	220kV BUSBAR	BAY-D01 & D02 CT INPUTS		
152	153	220kV BUSBAR	BAY-D03 & D04 CT INPUTS		
153	154	220kV BUSBAR	BAY-D05 & D06 CT INPUTS		
154	155	220kV BUSBAR	BAY-D07 & D08 CT INPUTS		
155	156	220kV BUSBAR	BAY-D09 & D10 CT INPUTS		
156	158	220kV BUSBAR	BAY-D11 CT INPUTS		
158	159	220kV BUSBAR	REB670-RPH PROTN. PSM		
159	160	220kV BUSBAR	REB670-RPH BINARY INPUTS		
160	161	220kV BUSBAR	REB670-RPH BINARY INPUTS		
161	162	220kV BUSBAR	REB670-RPH BINARY INPUTS		
162	163	220kV BUSBAR	REB670-RPH BINARY INPUTS		
163	164	220kV BUSBAR	REB670-RPH BINARY INPUTS		
164	165	220kV BUSBAR	REB670-RPH BINARY INPUTS		
165	166	220kV BUSBAR	REB670-RPH BINARY INPUTS		
166	167	220kV BUSBAR	REB670-RPH BINARY INPUTS		
167	168	220kV BUSBAR	REB670-RPH BINARY INPUTS		
168	169	220kV BUSBAR	REB670-RPH BINARY INPUTS		
169	170	220kV BUSBAR	REB670-RPH BINARY INPUTS		
170	170.1	220kV BUSBAR	REB670-RPH BINARY INPUTS		
170.1	170.2	220kV BUSBAR	REB670-RPH BINARY INPUTS		
170.2	170.3	220kV BUSBAR	REB670-RPH BINARY INPUTS		
170.3	171.4	220kV BUSBAR	REB670-RPH BINARY INPUTS		
171.4	171	220kV BUSBAR	REB670-RPH BINARY INPUTS		
171	172	220kV BUSBAR	REB670-RPH BINARY OUTPUTS		
172	173	220kV BUSBAR	REB670-RPH BINARY OUTPUTS		
173	174	220kV BUSBAR	REB670-RPH BINARY OUTPUTS		
174	175	220kV BUSBAR	REB670-RPH BINARY OUTPUTS		
175	176	220kV BUSBAR	REB670-RPH OVERVIEW		

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual responsibilities nor implies acceptance of the deviations, if any, from the requirements of the specifications. In case of conflict between the provisions of IEC standards and the specifications, the provisions of the specifications shall be binding. Any deviations may be accepted only if specifically approved in writing by the AEGCL's representative. Nothing contained herein shall be construed as relieving the contractor from any of his obligations under the contract with the AEGCL's right under the contract

Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

Title: 220kV CONTROL & RELAY PANEL
List of contents
List of contents

HITACHI Hitachi Energy India Limited

Doc. kind.	List of contents	Ref.Des.	=2R
	DCC EAB		
Resp. dept.	PG-GAS	Rev. ind. 01	Language en
Doc. no.	1KHF128840R1411	Sheet	3
		n.sheet	4

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

Sheet	n.sh.	Description 1	Description 2	Rev.	Revision note
176	177	220kV BUSBAR	REB670-RPH OVERVIEW		
177	178	220kV BUSBAR	REB670-RPH OVERVIEW		
178	179	220kV BUSBAR	REB670-RPH OVERVIEW		
179	180	220kV BUSBAR	REB670-RPH OVERVIEW		
180	181	220kV BUSBAR	REB670-RPH OVERVIEW		
181	182	220kV BUSBAR	REB670-YPH PROTN. PSM		
182	183	220kV BUSBAR	REB670-YPH BINARY INPUTS		
183	184	220kV BUSBAR	REB670-YPH BINARY INPUTS		
184	185	220kV BUSBAR	REB670-YPH BINARY INPUTS		
185	186	220kV BUSBAR	REB670-YPH BINARY INPUTS		
186	187	220kV BUSBAR	REB670-YPH BINARY INPUTS		
187	188	220kV BUSBAR	REB670-YPH BINARY INPUTS		
188	189	220kV BUSBAR	REB670-YPH BINARY INPUTS		
189	190	220kV BUSBAR	REB670-YPH BINARY INPUTS		
190	192	220kV BUSBAR	REB670-YPH BINARY INPUTS		
192	193	220kV BUSBAR	REB670-YPH BINARY INPUTS		
193	194	220kV BUSBAR	REB670-YPH BINARY INPUTS		
194	194.1	220kV BUSBAR	REB670-YPH BINARY INPUTS		
194.1	195.2	220kV BUSBAR	REB670-YPH BINARY INPUTS		
195.2	195.3	220kV BUSBAR	REB670-YPH BINARY INPUTS		
195.3	195.4	220kV BUSBAR	REB670-YPH BINARY INPUTS		
195.4	195	220kV BUSBAR	REB670-YPH BINARY INPUTS		
195	196	220kV BUSBAR	REB670-YPH BINARY OUTPUTS		
196	197	220kV BUSBAR	REB670-YPH BINARY OUTPUTS		
197	198	220kV BUSBAR	REB670-YPH BINARY OUTPUTS		
198	199	220kV BUSBAR	REB670-YPH BINARY OUTPUTS		
199	200	220kV BUSBAR	REB670-YPH OVERVIEW		
200	201	220kV BUSBAR	REB670-YPH OVERVIEW		
201	202	220kV BUSBAR	REB670-YPH OVERVIEW		
202	203	220kV BUSBAR	REB670-YPH OVERVIEW		
203	211	220kV BUSBAR	REB670-YPH OVERVIEW		
211	212	220kV BUSBAR	REB670-BPH PROTN. PSM		
212	213	220kV BUSBAR	REB670-BPH BINARY INPUTS		
213	214	220kV BUSBAR	REB670-BPH BINARY INPUTS		
214	215	220kV BUSBAR	REB670-BPH BINARY INPUTS		
215	216	220kV BUSBAR	REB670-BPH BINARY INPUTS		
216	217	220kV BUSBAR	REB670-BPH BINARY INPUTS		
217	218	220kV BUSBAR	REB670-BPH BINARY INPUTS		
218	219	220kV BUSBAR	REB670-BPH BINARY INPUTS		
219	220	220kV BUSBAR	REB670-BPH BINARY INPUTS		
220	221	220kV BUSBAR	REB670-BPH BINARY INPUTS		
221	222	220kV BUSBAR	REB670-BPH BINARY INPUTS		
222	223	220kV BUSBAR	REB670-BPH BINARY INPUTS		
223	223.1	220kV BUSBAR	REB670-BPH BINARY INPUTS		
223.1	223.2	220kV BUSBAR	REB670-BPH BINARY INPUTS		
223.2	223.3	220kV BUSBAR	REB670-BPH BINARY INPUTS		
223.3	223.4	220kV BUSBAR	REB670-BPH BINARY INPUTS		
223.4	224	220kV BUSBAR	REB670-BPH BINARY INPUTS		
224	225	220kV BUSBAR	REB670-BPH BINARY OUTPUTS		
225	226	220kV BUSBAR	REB670-BPH BINARY OUTPUTS		
226	227	220kV BUSBAR	REB670-BPH BINARY OUTPUTS		
227	228	220kV BUSBAR	REB670-BPH BINARY OUTPUTS		
228	229	220kV BUSBAR	REB670-BPH OVERVIEW		
229	230	220kV BUSBAR	REB670-BPH OVERVIEW		
230	231	220kV BUSBAR	REB670-BPH OVERVIEW		
231	232	220kV BUSBAR	REB670-BPH OVERVIEW		
232	261	220kV BUSBAR	REB670-BPH OVERVIEW		
261	262	220kV BUSBAR	TRIP RELAY CKT-D01 & D02		

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations in respect of the correctness of the details, nor confers on him any right not otherwise available to him under the contract.

	Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

Based on

Rev.	Revision note	Date	Name
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK

Prepared 08-08-2025 DIVYA S
Approved 08-08-2025 THEJASWINI AR
Project ASSAM ELECTRICITY GRID CORPORATION LTD
400/220kV GIS SS AT SONAPUR
128840

Title 220kV CONTROL & RELAY PANEL
List of contents
List of contents

HITACHI Hitachi Energy India Limited

Doc. kind. List of contents
DCC EAB
Ref.Des. =2R
Resp. dept. PG-GAS
Rev. ind. 01
Language en
Sheet 4
n.sheet 5
Doc. no. 1KHF128840R1411

1MYN691003-102(A3)REV01

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

Sheet	n.sh.	Description 1	Description 2	Rev.	Revision note
262	263	220kV BUSBAR	TRIP RELAY CKT-D03 & D04		
263	264	220kV BUSBAR	TRIP RELAY CKT-D05 & D06		
264	265	220kV BUSBAR	TRIP RELAY CKT-D07 & D08		
265	266	220kV BUSBAR	TRIP RELAY CKT-D09 & D10		
266	271	220kV BUSBAR	TRIP RELAY CKT-D11		
271	272	220kV BUSBAR	BUSBAR INTERTRIP CIRCUIT-D01		
272	273	220kV BUSBAR	BUSBAR INTERTRIP CIRCUIT-D02		
273	274	220kV BUSBAR	BUSBAR INTERTRIP CIRCUIT-D03		
274	275	220kV BUSBAR	BUSBAR INTERTRIP CIRCUIT-D04		
275	276	220kV BUSBAR	BUSBAR INTERTRIP CIRCUIT-D05		
276	277	220kV BUSBAR	BUSBAR INTERTRIP CIRCUIT-D06		
277	278	220kV BUSBAR	BUSBAR INTERTRIP CIRCUIT-D07		
278	279	220kV BUSBAR	BUSBAR INTERTRIP CIRCUIT-D08		
279	280	220kV BUSBAR	BUSBAR INTERTRIP CIRCUIT-D09		
280	281	220kV BUSBAR	BUSBAR INTERTRIP CIRCUIT-D10		
281	282	220kV BUSBAR	BUSBAR INTERTRIP CIRCUIT-D11		
282	401	220kV BUSBAR	96 FAULTY & 96 OPTD		
401	402	220kV BUSBAR	SPARE TERMINALS		
402	401	220kV BUSBAR	SPARE TERMINALS		
401		220kV BUSBAR	SPARE TERMINALS		

Sheet	n.sh.	Description 1	Description 2	Rev.	Revision note

Checked By	Checked By	Checked By	Checked By	Approved By
AM (P&D)	DM (P&D)	AGM (P&D)	DGM (P&D)	GM (P&D)

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations for the correct design details, performance particulars and conformity of the supplies with the Indian statutory laws / IEC specifications as may be applicable, nor does limit the AEGCL's right under the contract.

Electric & Engineering Co. Ltd. Guwahati

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

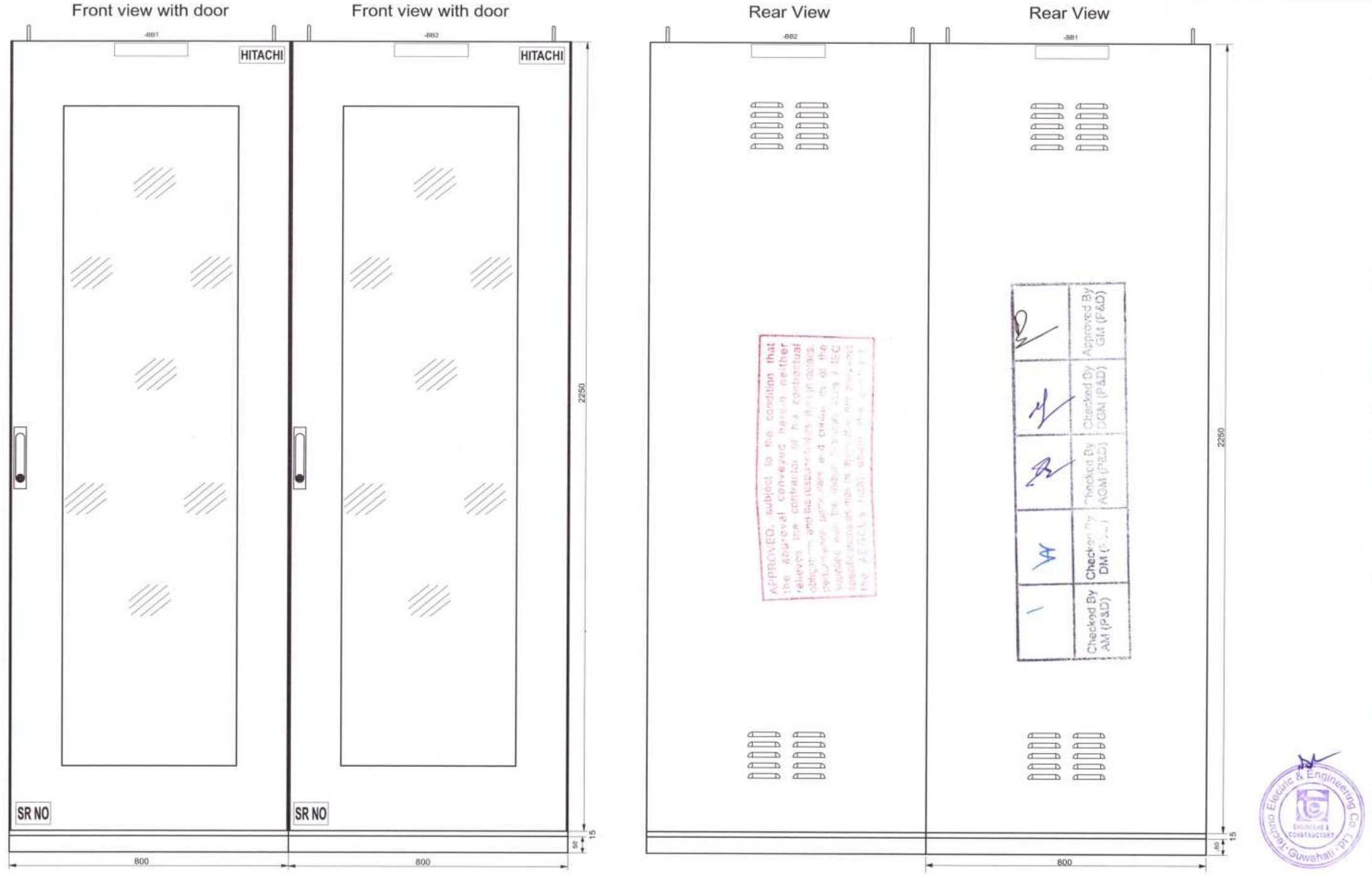
Title: 220kV CONTROL & RELAY PANEL
List of contents
List of contents

HITACHI Hitachi Energy India Limited

Doc. kind.	List of contents	Ref.Des.	=2R
	DCC EAB		
Resp. dept.	PG-GAS	Rev. ind. 01	Language en
Doc. no.	1KHF128840R1411	Sheet	5
		n. sheet	21

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy



Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

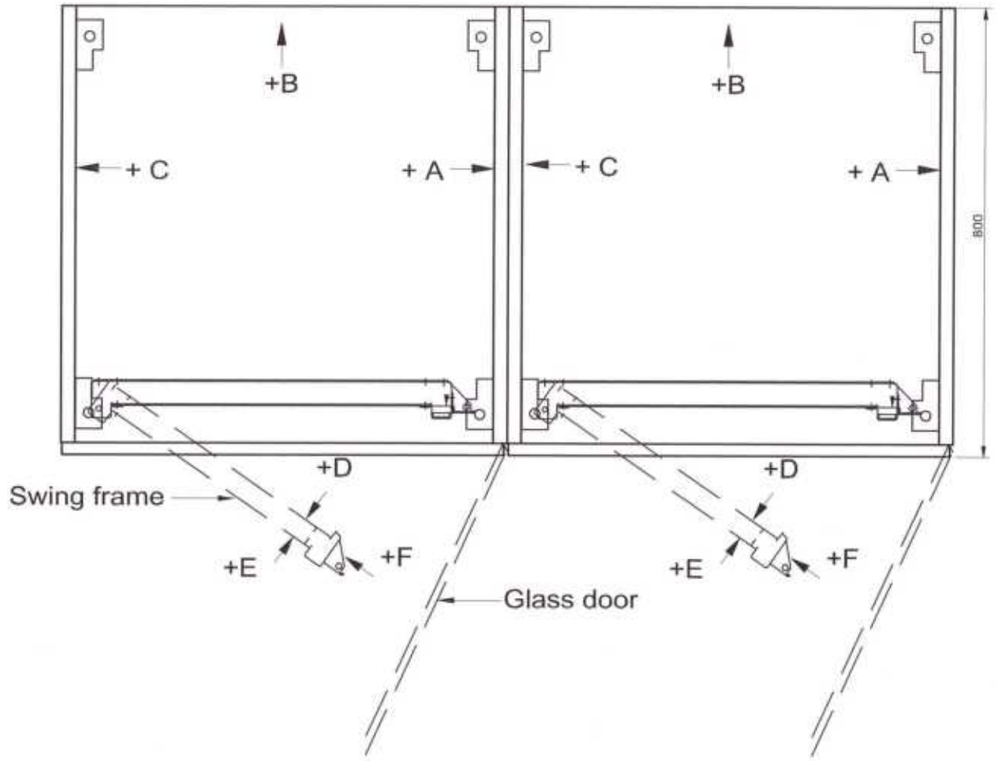
Title	220kV CONTROL & RELAY PANEL 220kV BUSBAR Front view	Doc. kind.	Assembly drawing
		DCC	ELU
		Resp. dept.	PG-GAS
HITACHI	Hitachi Energy India Limited	Doc. no.	1KHF128840R1411

Ref.Des.	=2R		
Rev. ind.	01	Language	en
		Sheet	21
		n. sheet	22

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

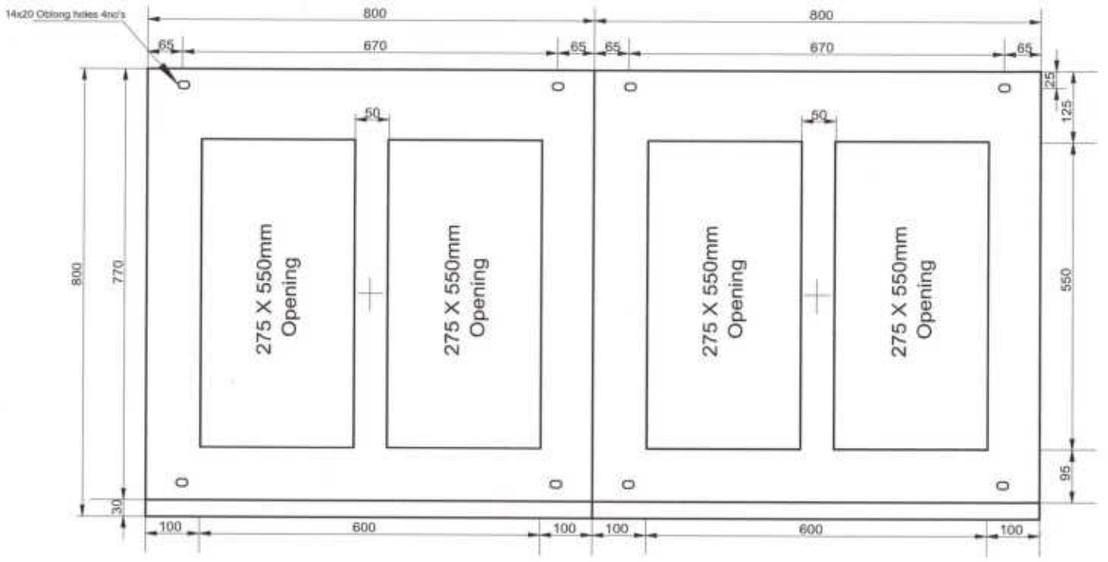
© Copyright 2023 Hitachi Energy

Cross sectional view



Cross sectional view

Foundation Details



Foundation Details

Front

Front

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and his responsibility for design details, performance particulars and conformity of the supplies with the Indian Statutory laws / IEC specifications as may be applicable nor does limit the AEGCL's right under the contract

Assam Electric & Engineering Co Ltd. Guwahati

Note : All Dimensions are in mm
Base frame Dimension is 800mm(W)x770mm(D)

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
Section view incl. location designation

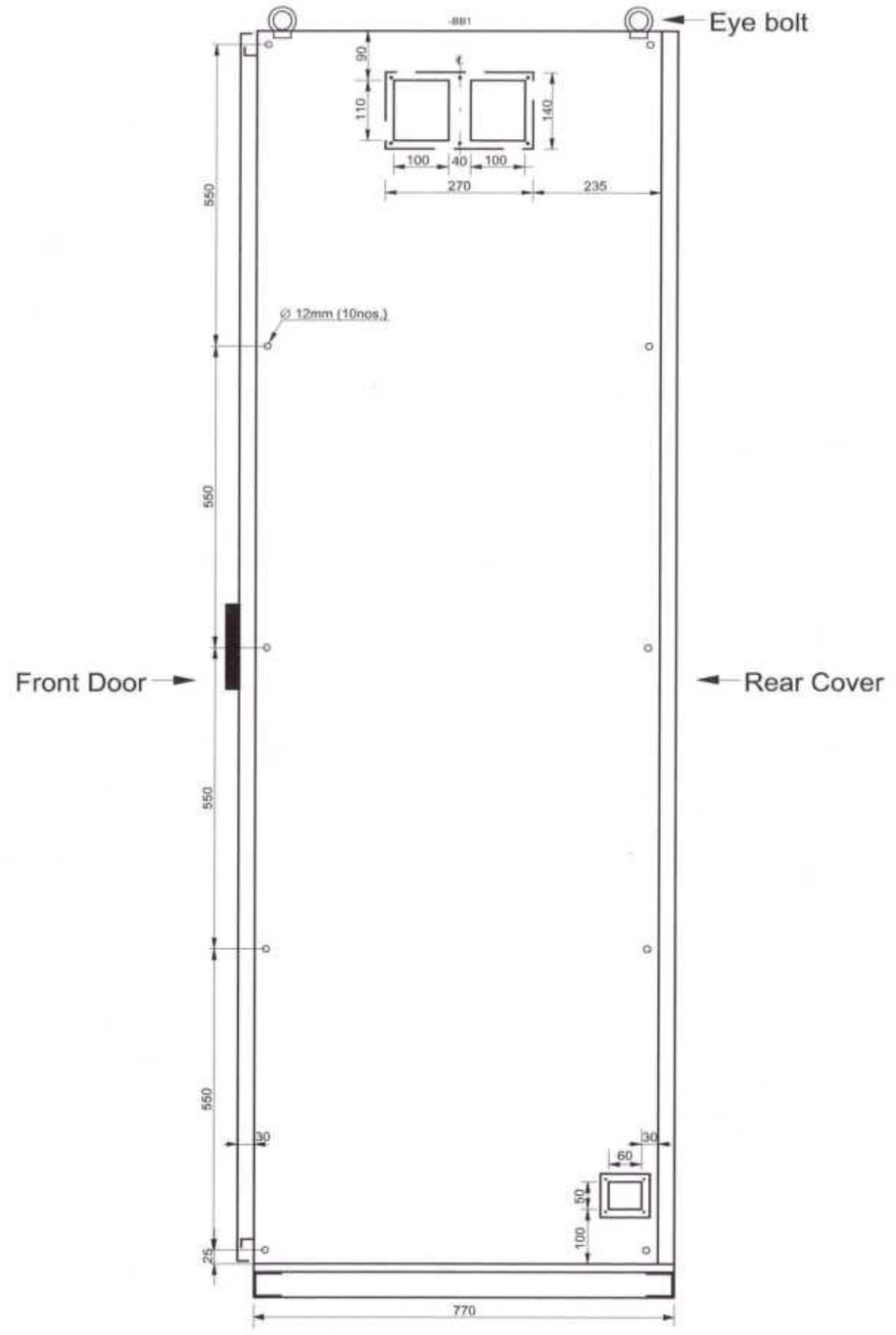
HITACHI Hitachi Energy India Limited

Doc. kind.	Assembly drawing DCC ELU	Ref.Des.	=2R
Resp. dept.	PG-GAS	Rev. ind. 01	Language en
Doc. no.	1KHF128840R1411	Sheet	22
		n. sheet	23

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

Side view



APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and responsibilities in regard to performance particulars and quantity of the supplies with the Indian Statutory laws / IEC specifications as may be applicable nor does it relieve the AEGCL's right under the contract



CUBICLE SPECIFICATION - RELAY PANEL (LOAD BAARING MEMBER - 3.15mm THICKNESS CRCA AS PER SPEC)

Height	2315 (2250+15+50mm)
Width	800mm
Depth	800mm
Anti-Vibration Pad	15mm
Base frame	50mm
Dimensional Tolerance	As per IS 2102 Part1-Medium
Weight	400 kg Approx.
Sheet Thickness Tolerance	As Per IS:16162 Standard
Thickness of material	
Swing frame Assembly	2mm
Swing frame Channel	3mm
Rear cover, Roof plate, Bottom plate	2mm
Mounting, Blanking plate	2mm
Side covers	2mm
Base frame	3mm
Gland plate	3mm
Protection class	IP54
Cubicle illumination	9W LED Lamp
Earth Bar	Tinned Copper Strip of 25mm x 6mm
Bottom Plate	With 2 openings of 275mm x 550mm
Gland Plate	2 nos. of plates - Fixing cable glands SIZE-315mm x 590mm
Gasket Material type	EPDM / Neoprene / XLPE / Polystyrene

Cubicle Colour

Power Coating : :Exterior	RAL7032,Texture finish
:Interior	White glossy
:Base frame	Black
:Thickness	60-80 microns for Glossy / Semi Glossy finish 80-100 mircons of Texture finish

Wires (FRLS)

Wire size of CT Circuits	2.5mm², Phase : RYB, Neutral : Black
Wire size of PT Circuits	2.5mm², Phase : RYB, Neutral : Black(Except: Combiflex relays)
Wire size of DC Circuits	1.5mm² -Grey, Incoming DC - 2.5mm²
Wire size of Aux.AC Circuit	1.5mm² -Grey, Incoming AC - 2.5mm²
Wire size of Earthing	2.5mm², Green

Ferrules

Wire directly connected to TRIP COIL	Red Coloured "T"
All other ferrules	White Sleeve with Nos.marked in Black letters

Terminal blocks (20% spare terminal blocks)

Terminal CT / VT	Disconnecting type
Terminal AC / DC incoming	Disconnecting type
Terminal Earthing	Disconnecting type
Terminal Control	Non-Disconnecting type
Terminal Interpanel, General	Non-Disconnecting & Disconnecting type

LABELS		DIMENSIONS(mm)	LETTER HEIGHT(mm)
1:Main Label (Front)		200 x 60	10
MATERIAL : Acrylic	TYPE OF INSCRIPTION	: Engraving-white letters on black background	
2A : Apparatus Label (Inside-MCB and Terminals)		40 x 16 and 40 x 8	3
MATERIAL : Sticker (Group marker)	TYPE OF INSCRIPTION	: Printing-Black letters on white background	
2B : Apparatus Label (Inside-Fuses)		29 x 29	3
MATERIAL : Aluminium anodised	TYPE OF INSCRIPTION	: Engraving-white letters on black background	
3 : Apparatus Label (Front)		20 x 12 or 48 x 14	3
MATERIAL : Aluminium anodised	TYPE OF INSCRIPTION	: Engraving-white letters on black background	
4:Item Designation Stickers (Inside)		20 x 12	5
MATERIAL : Self adhesive yellow stickers	TYPE OF INSCRIPTION	: Black letters	
5:Flag Relay Labels		29 x 29	2
MATERIAL : Aluminium anodised	TYPE OF INSCRIPTION	: Engraving-white letters on black background	
6:PB / Lamp Lables		30 x 40	3
MATERIAL : Aluminium anodised	TYPE OF INSCRIPTION	: Engraving-white letters on black background	

Electric & Engineering Co. Ltd. Guwahati

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared 08-08-2025 DIVYA S
Approved 08-08-2025 THEJASWINI AR
Project ASSAM ELECTRICITY GRID CORPORATION LTD
400/220kV GIS SS AT SONAPUR
128840

Title 220kV CONTROL & RELAY PANEL
220kV BUSBAR
Side view

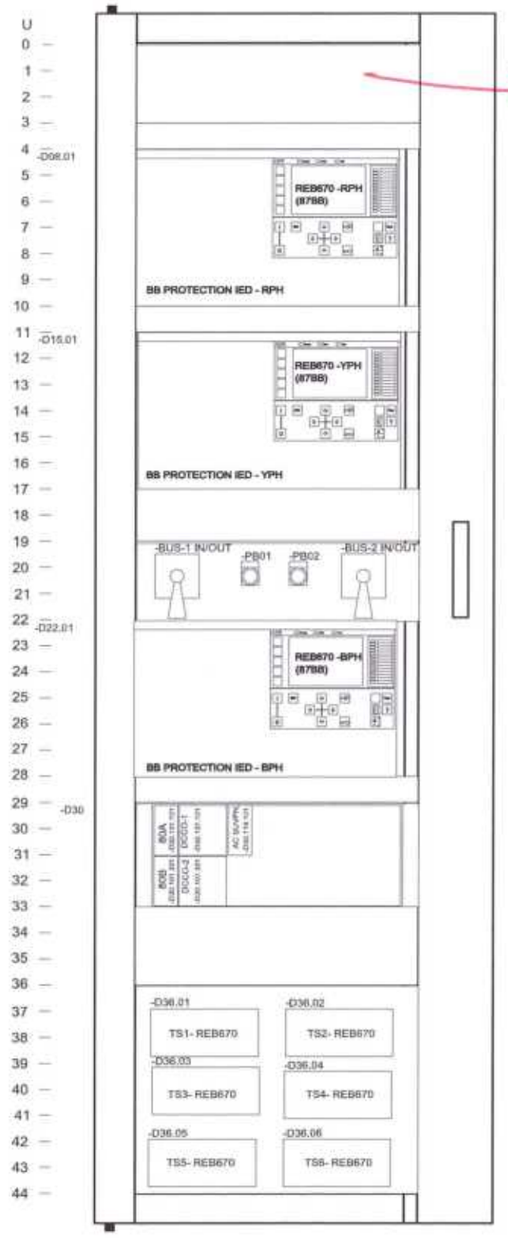
HITACHI Hitachi Energy India Limited

Doc. kind. Assembly drawing
DCC ELU
Ref.Des. =2R
Resp. dept. PG-GAS
Rev. ind. 01
Language en
Doc. no. 1KHF128840R1411
Sheet 23
n. sheet 24

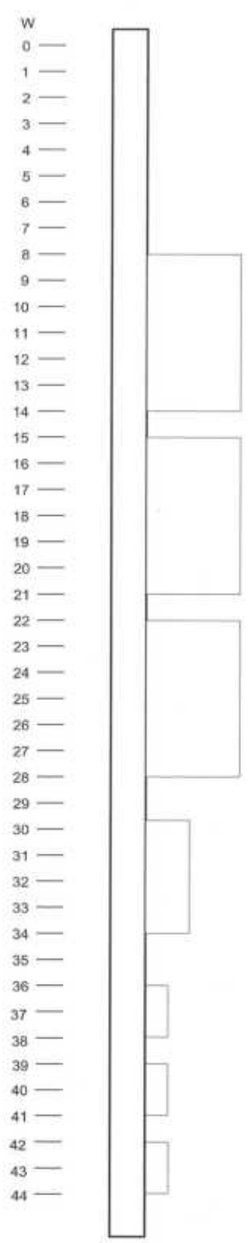
The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

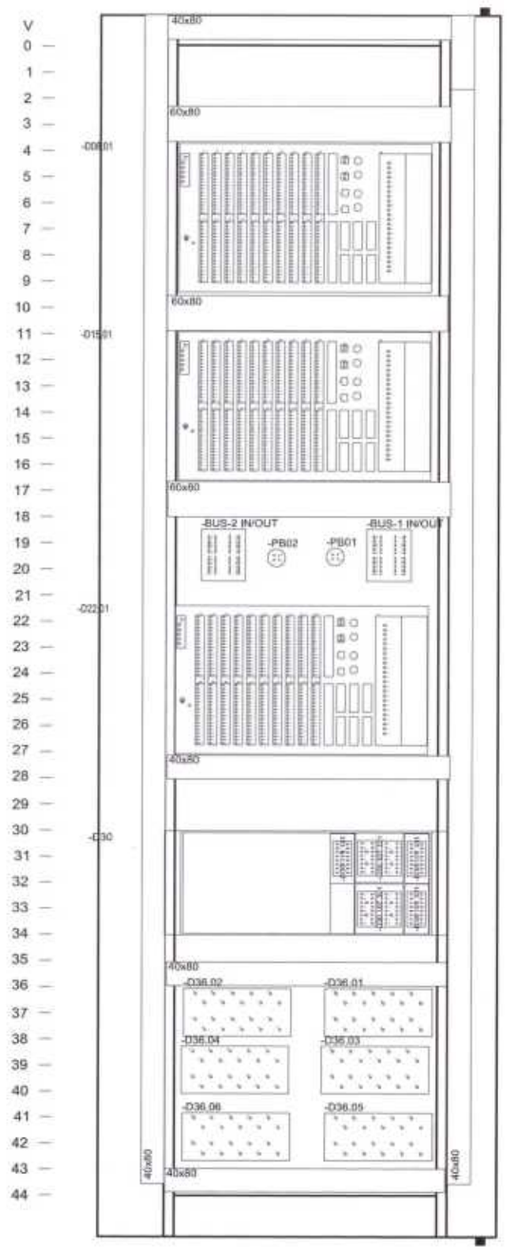
+E Front view hinged frame



+F Side view hinged frame



+D Back view hinged frame



2 nos of Ethernet s/w as per SAS Architecture to be provided

GA to be revised

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations nor has responsibility for correctness of the particulars shown on the drawings with the Indian Statutory rules / IEC specifications as may be applicable nor does limit the purchaser's right under the contract.

Approved By GM (P&D)	Checked By DGM (P&D)	Checked By AGM (P&D)	Checked By DM (P&D)	Checked By AM (P&D)

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
Hinged frame view

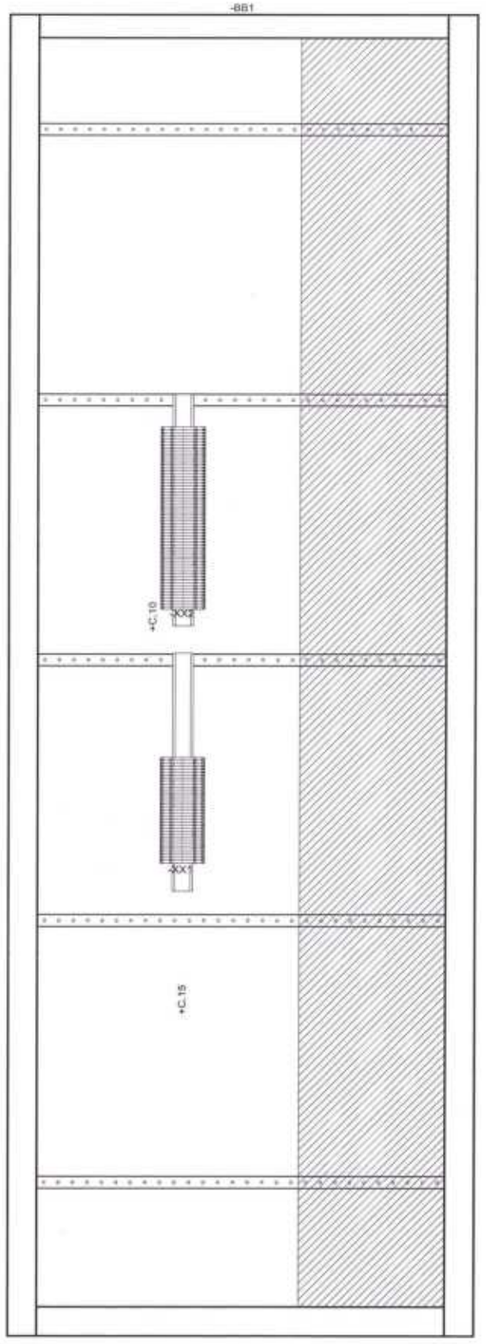
HITACHI Hitachi Energy India Limited

Doc. kind.	Assembly drawing	Ref.Des.	=2R +BB1
DCC	ELU		
Resp. dept.	PG-GAS	Rev. ind.	01
Language	en		
Sheet	24		
n. sheet	25		
Doc. no.	1KHF128840R1411		

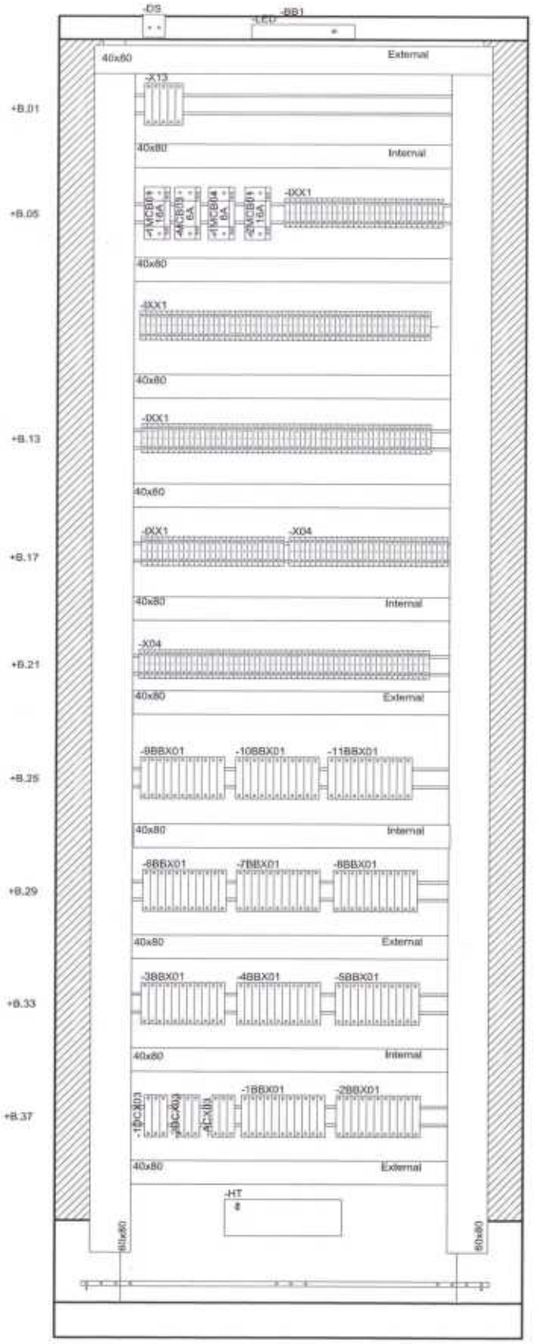
The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

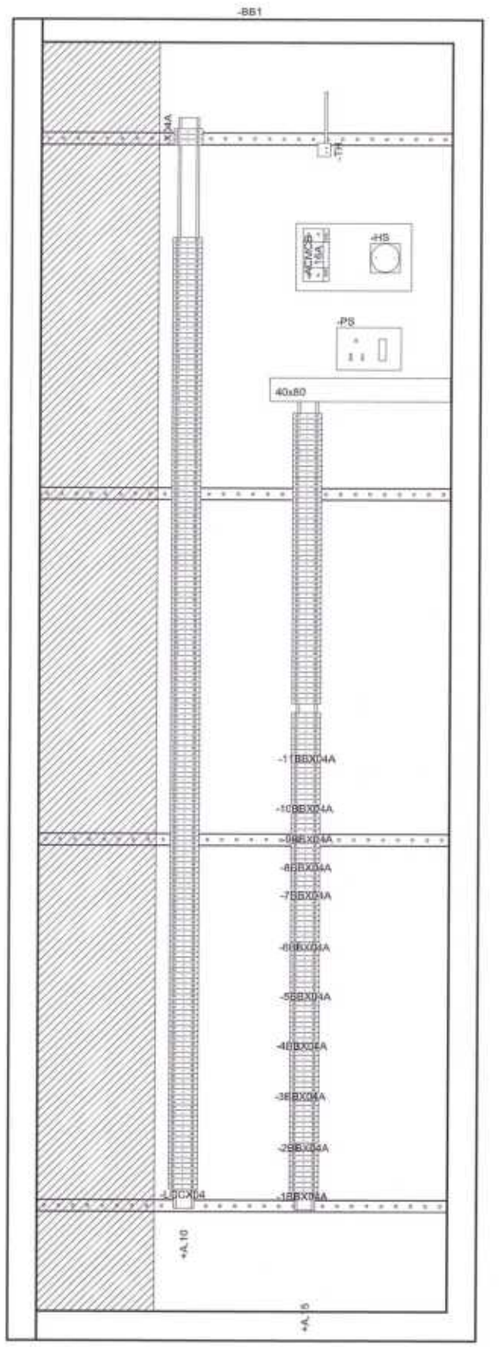
+C Left side



+B Rear plane



+A Right side



APPROVED. subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual responsibilities nor implies acceptance of any deviations. In case of any discrepancies with the Indian specifications as may be applicable for the equipment/ system, the Indian specifications shall prevail. In case of IEC specifications, the same shall be applicable as per the AEGCL's right under the Act.

Approved By	Checked By	Checked By	Checked By	Checked By
CM (P&D)	DGM (P&D)	AGM (P&D)	DM (P&D)	AM (P&D)

NOTE: INTERNAL VIEW IS FOR INFORMATION ONLY. (MAY CHANGE DURING MANUFACTURING).

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
Inside view

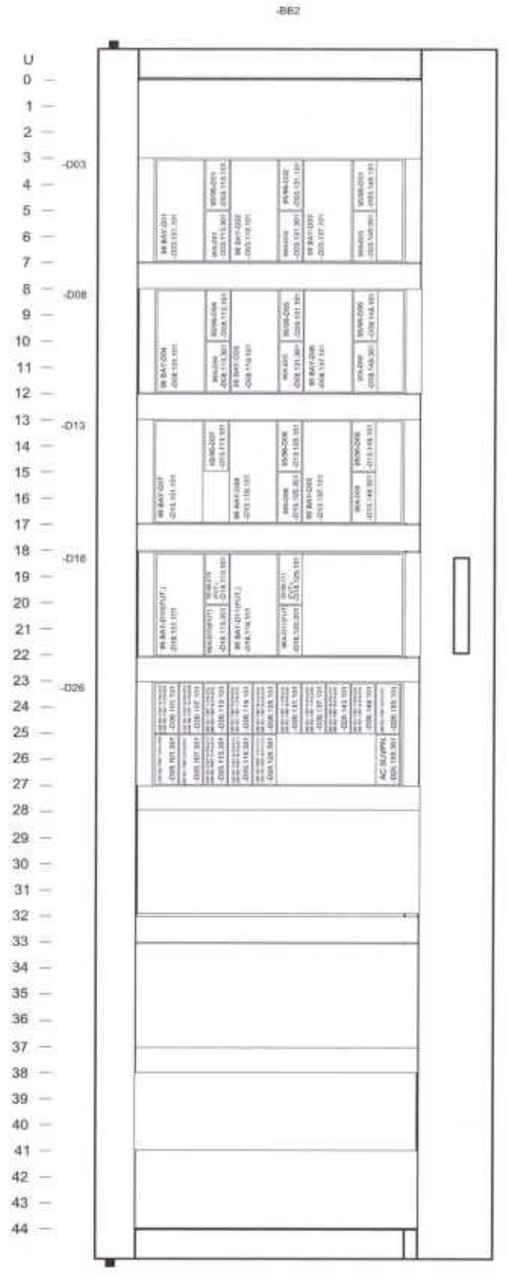
HITACHI Hitachi Energy India Limited

Doc. kind.	Assembly drawing DCC ELU	Ref.Des.	=2R +BB1
Resp. dept.	PG-GAS	Rev. ind. 01	Language en
Doc. no.	1KHF128840R1411	Sheet	25
		n. sheet	26

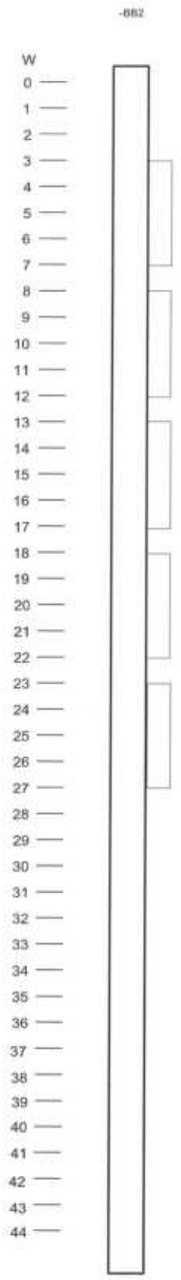
The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

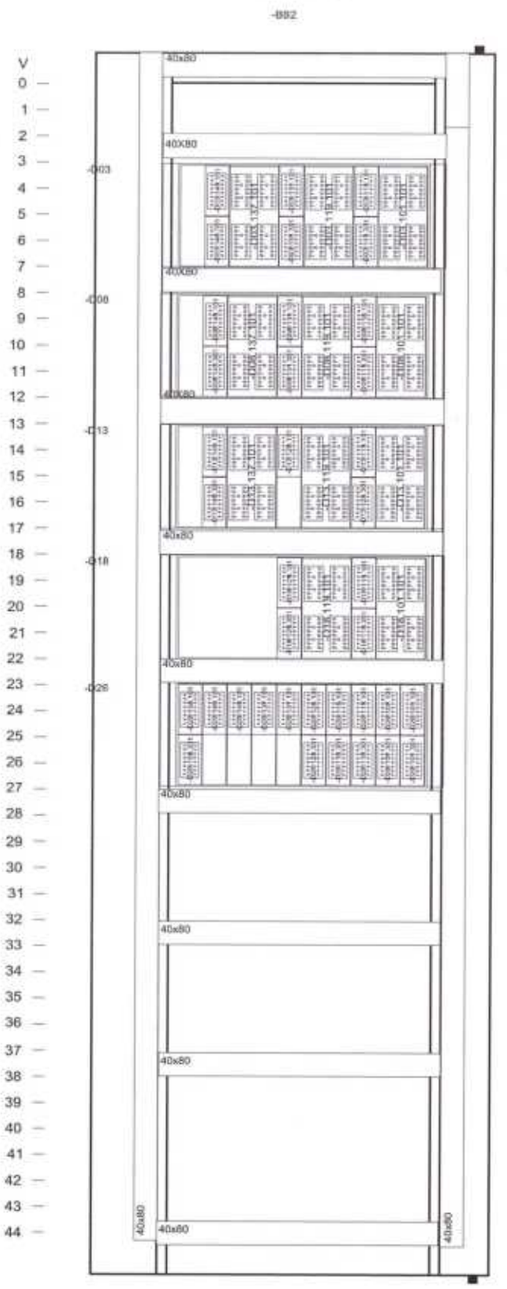
+E Front view hinged frame



+F Side view hinged frame



+D Back view hinged frame



APPROVED subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual responsibility nor implies acceptance of the design details, drawings etc. submitted in conformity with IEC specifications with the Indian Statutory and / IEC specifications as may be applicable nor does limit the AEGCL's right under the contract

Rev.	Revision note	Date	Name
	Based on		
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK

1MYN691003-102(A3)REV01

Prepared 08-08-2025 DIVYA S
Approved 08-08-2025 THEJASWINI AR
Project ASSAM ELECTRICITY GRID CORPORATION LTD
400/220kV GIS SS AT SONAPUR
128840

Title 220kV CONTROL & RELAY PANEL
220kV BUSBAR
Hinged frame view

HITACHI Hitachi Energy India Limited

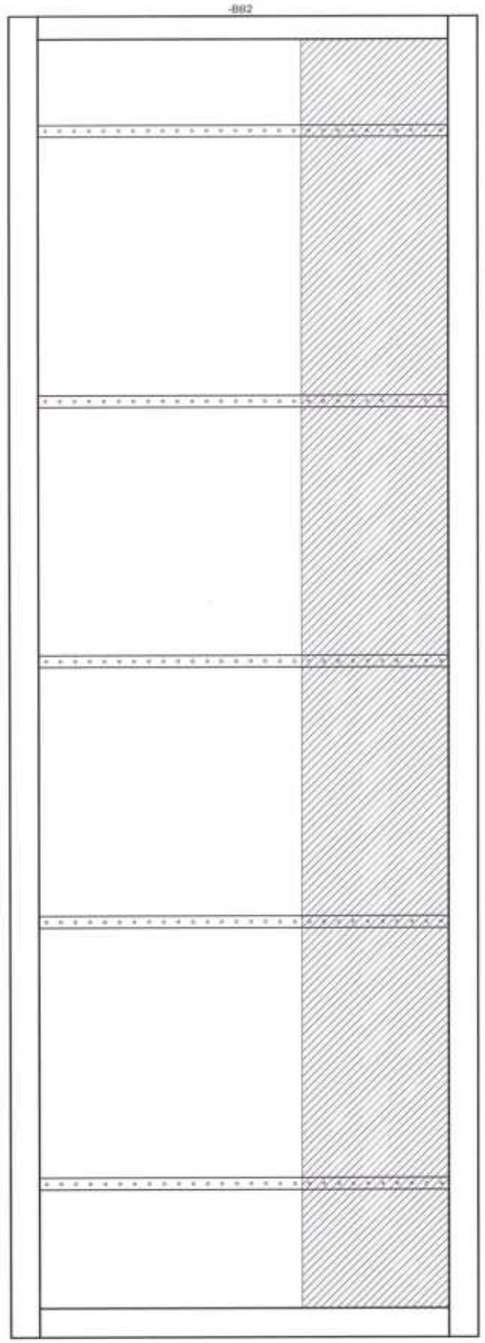
Doc. kind. Assembly drawing
DCC ELU
Resp. dept. PG-GAS
Rev. ind. 01
Doc. no. 1KHF128840R1411

Ref.Des. =2R +BB2
Language en
Sheet 26
n. sheet 27

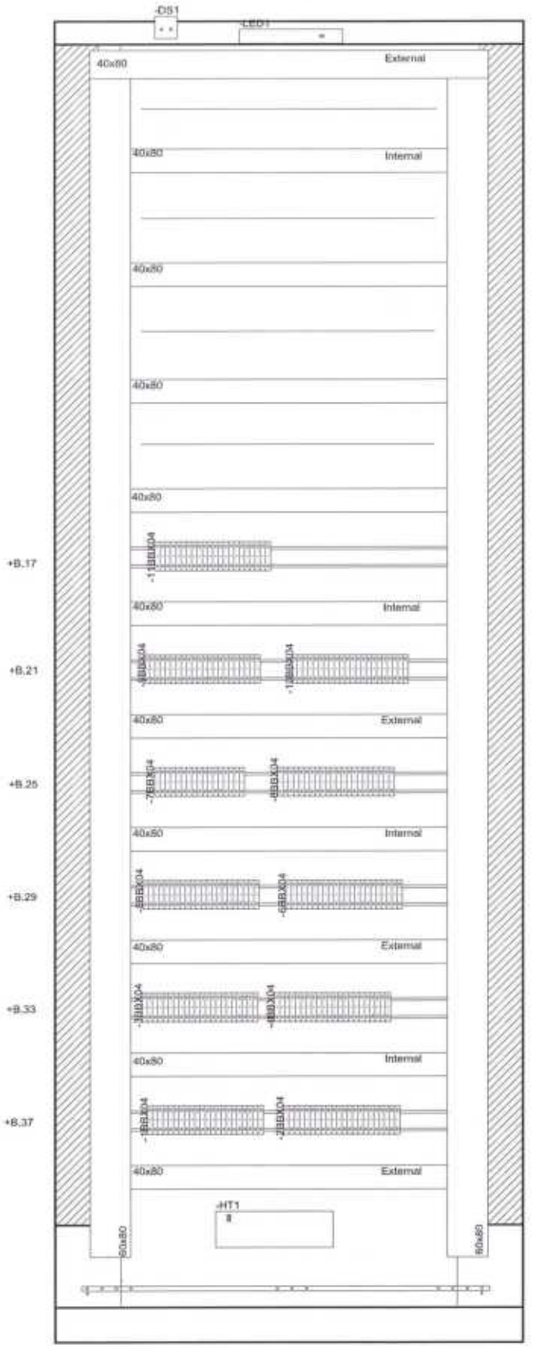
The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

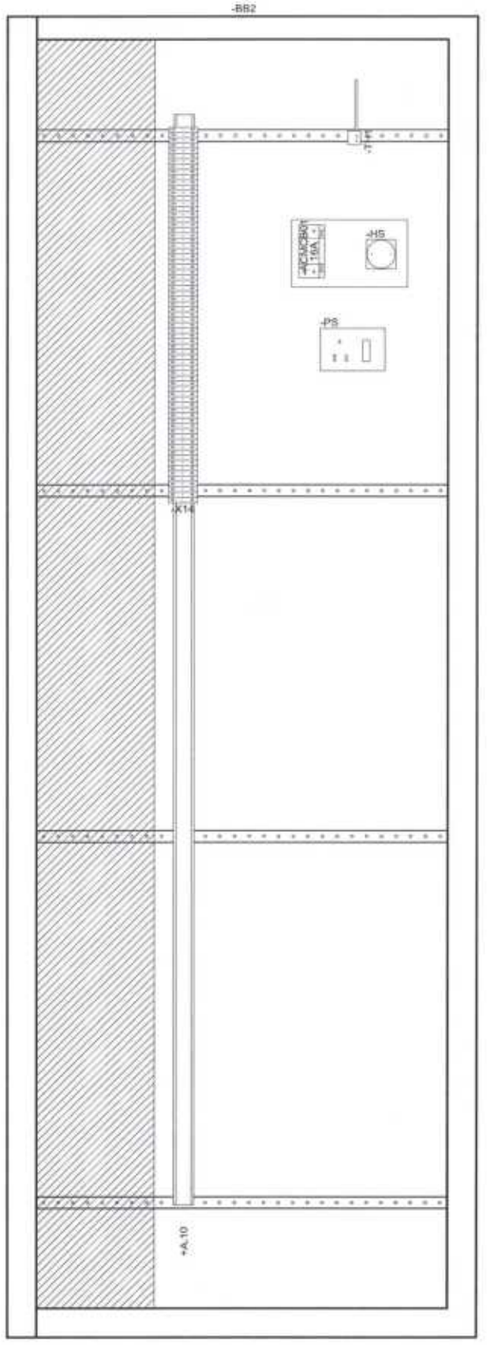
+C Left side



+B Rear plane



+A Right side



APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual responsibilities nor implies deviation from the requirements of the contract documents. Any deviations from the contract documents shall be specifically highlighted and brought to the notice of AEGCL's right under the contract.

Approved By	Checked By	Checked By	Checked By	Checked By
GM (P&D)	DGM (P&D)	AGM (P&D)	DM (P&D)	AM (P&D)

NOTE: INTERNAL VIEW IS FOR INFORMATION ONLY. (MAY CHANGE DURING MANUFACTURING).

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
Inside view

HITACHI Hitachi Energy India Limited

Doc. kind.	Assembly drawing	Ref.Des.	=2R +BB2
	DCC ELU		
Resp. dept.	PG-GAS	Rev. ind.	01
Language	en		
Sheet	27		
Doc. no.	1KHF128840R1411	n. sheet	28

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

Plane: NA

Device name	Description (1)	Description (2)	Type designation
-TH	Thermostat	--	TH

Plane: A

Device name	Description (1)	Description (2)	Type designation
-PS	Outlet	--	SW

Plane: B

Device name	Description (1)	Description (2)	Type designation
-1MCB01	I/C DC-1 MCB	--	-
-1MCB04	BB TRIP RLY. MCB	--	-
-2MCB01	I/C DC-2 MCB	--	-
-HT	Heating	--	SPHT
-LED	Lamp	--	LED
-MCB03	REB670 MCB	--	-

Plane: D

Device name	Description (1)	Description (2)	Type designation
-BUS-1 IN/OUT	BUS-1 IN/OUT SWITCH	--	8-2-pos. contacts
-BUS-2 IN/OUT	BUS-1 IN/OUT SWITCH	--	8-2-pos. contacts
-D08.01	BUSBAR PROTN. IED	--	REB670-RPH
-D15.01	BUSBAR PROTN. IED	--	REB670-YPH
-D22.01	BUSBAR PROTN. IED	--	REB670-BPH
-D30.101.101	DC-1 SUPVN(80A)	--	TSR-B
-D30.101.301	DC-2 SUPVN(80A)	--	TSR-B
-D30.107.101	DCCO-1 RELAY	--	RXMH2
-D30.107.301	DCCO-2 RELAY	--	RXMH2
-D30.119.101	AC SUVPN. RELAY	--	RXMA1
-D36.01	TS1-REB670	--	MPB/MPG
-D36.02	TS2-REB670	--	MPB/MPG
-D36.03	TS3-REB670	--	MPB/MPG
-D36.04	TS4-REB670	--	MPB/MPG
-D36.05	TS5-REB670	--	MPB/MPG
-D36.06	TS6-REB670	--	MPB/MPG
-PB01	OPEN CT RESET	--	-
-PB02	96 RESET PB	--	-

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and his responsibilities design details, performance particulars and conformity of the supplies with the Indian Statutory laws / IEC specifications as may be applicable nor does limit the AEGCL's right under the contract.

Assam Electric & Engineering Co. Ltd. Guwahati

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
Legend list

HITACHI Hitachi Energy India Limited

Doc. kind.	Assembly drawing	Ref.Des.	=2R +BB1
DCC	ELU		
Resp. dept.	PG-GAS	Rev. ind. 01	Language en
Doc. no.	1KHF128840R1411	Sheet	28
		n. sheet	29

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

Plane: NA

Device name	Description (1)	Description (2)	Type designation
-TH1	Thermostat	--	TH

Plane: A

Device name	Description (1)	Description (2)	Type designation
-PS	Outlet	--	SW

Plane: B

Device name	Description (1)	Description (2)	Type designation
-HT1	Heating	--	SPHT
-LED1	Lamp	--	LED

Plane: D

Device name	Description (1)	Description (2)	Type designation
-D03.101.101	96 BAY-D01	--	RXMVB4
-D03.113.101	95/96-D01	--	TSR-B
-D03.113.301	EFP/LBB OPTD-96X-D01	--	RXMS1
-D03.119.101	96 BAY-D02	--	RXMVB4
-D03.131.101	95/96-D02	--	TSR-B
-D03.131.301	EFP/LBB OPTD-96X-D02	--	RXMS1
-D03.137.101	96 BAY-D03	--	RXMVB4
-D03.149.101	95/96-D03	--	TSR-B
-D03.149.301	EFP/LBB OPTD-96X-D03	--	RXMS1
-D08.101.101	96 BAY-D04	--	RXMVB4
-D08.113.101	95/96-D04	--	TSR-B
-D08.113.301	EFP/LBB OPTD-96X-D04	--	RXMS1
-D08.119.101	96 BAY-D05	--	RXMVB4
-D08.131.101	95/96-D05	--	TSR-B
-D08.131.301	EFP/LBB OPTD-96X-D05	--	RXMS1
-D08.137.101	96 BAY-D06	--	RXMVB4
-D08.149.101	95/96-D06	--	TSR-B

Device name	Description (1)	Description (2)	Type designation
-D08.149.301	EFP/LBB OPTD-96X-D06	--	RXMS1
-D13.101.101	96 BAY-D07	--	RXMVB4
-D13.113.101	95/96-D07	--	TSR-B
-D13.119.101	96 BAY-D08	--	RXMVB4
-D13.125.101	95/96-D08	--	TSR-B
-D13.125.301	EFP/LBB OPTD-96X-D08	--	RXMS1
-D13.137.101	96 BAY-D09	--	RXMVB4
-D13.149.101	95/96-D09	--	TSR-B
-D13.149.301	EFP/LBB OPTD-96X-D09	--	RXMS1
-D18.101.101	96 BAY-D10(FUT.)	--	RXMVB4
-D18.113.101	95/96-D10(FUT.)	--	TSR-B
-D18.113.301	EFP/LBB OPTD-96X-D10(FUT.)	--	RXMS1
-D18.119.101	96 BAY-D11(FUT.)	--	RXMVB4
-D18.125.101	95/96-D11(FUT.)	--	TSR-B
-D18.125.301	EFP/LBB OPTD-96X-D11(FUT.)	--	RXMS1
-D26.101.101	LBB RE-TRIP R-PH BAY-D01	LBB RE-TRIP Y-PH BAY-D01	RXMM1
-D26.101.301	LBB RE-TRIP 3-PH BAY-D08	LBB RE-TRIP 3-PH BAY-D08	RXMM1
-D26.107.101	LBB RE-TRIP B-PH BAY-D01	LBB RE-TRIP R-PH BAY-D02	RXMM1
-D26.107.301	LBB RE-TRIP 3-PH BAY-D09	LBB RE-TRIP 3-PH BAY-D09	RXMM1
-D26.113.101	LBB RE-TRIP Y-PH BAY-D02	LBB RE-TRIP B-PH BAY-D02	RXMM1
-D26.113.301	LBB RE-TRIP R-PH BAY-D10(FUT.)	LBB RE-TRIP Y-PH BAY-D10(FUT.)	RXMM1
-D26.119.101	LBB RE-TRIP R-PH BAY-D03	LBB RE-TRIP Y-PH BAY-D03	RXMM1
-D26.119.301	LBB RE-TRIP B-PH BAY-D10(FUT.)	LBB RE-TRIP R-PH BAY-D11(FUT.)	RXMM1
-D26.125.101	LBB RE-TRIP B-PH BAY-D03	LBB RE-TRIP R-PH BAY-D04	RXMM1
-D26.125.301	LBB RE-TRIP Y-PH BAY-D11(FUT.)	LBB RE-TRIP B-PH BAY-D11(FUT.)	RXMM1
-D26.131.101	LBB RE-TRIP Y-PH BAY-D04	LBB RE-TRIP B-PH BAY-D04	RXMM1
-D26.137.101	LBB RE-TRIP R-PH BAY-D05	LBB RE-TRIP Y-PH BAY-D05	RXMM1

Approved By GM (P&D)
Checked By DGM (P&D)
Checked By AGM (P&D)
Checked By DM (P&D)
Checked By AM (P&D)

APPROVED, subject to the condition that the approval conveyed herein neither alters the contractual obligations of the parties nor relieves the contractor from its responsibility to perform the works in accordance with the specifications and other requirements of the contract. The AE/CLs right under the contract

Rev.	Revision note	Date	Name
Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK

1MYN691003-102(A3)REV01

Prepared 08-08-2025 DIVYA S
Approved 08-08-2025 THEJASWINI AR
Project ASSAM ELECTRICITY GRID CORPORATION LTD
400/220kV GIS SS AT SONAPUR
128840

Title 220kV CONTROL & RELAY PANEL
220kV BUSBAR
Legend list

HITACHI Hitachi Energy India Limited

Doc. kind. Assembly drawing
DCC ELU
Resp. dept. PG-GAS
Doc. no. 1KHF128840R1411
Rev. ind. 01
Ref.Des. =2R +BB2
Language en
Sheet 29
n. sheet 30

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

Device name	Description (1)	Description (2)	Type designation
-D26.143.101	LBB RE-TRIP B-PH BAY-D05	LBB RE-TRIP R-PH BAY-D06	RXMM1
-D26.149.101	LBB RE-TRIP Y-PH BAY-D06	LBB RE-TRIP B-PH BAY-D06	RXMM1
-D26.155.101	LBB RE-TRIP 3-PH BAY-D07	LBB RE-TRIP 3-PH BAY-D07	RXMM1
-D26.155.301	AC SUVPN. RELAY	--	RXMA1

—				
Checked By AM (P&D)	Chec DM (P	hecked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and responsibilities in regard to details, performance particulars and conformity of the supplies with the Indian statutory laws / IEC specifications as may be applicable nor does limit the AEGCL's right under the contract.

Executive Engineering Co. Ltd. Guwahati

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared 08-08-2025 DIVYA S
Approved 08-08-2025 THEJASWINI AR
Project ASSAM ELECTRICITY GRID CORPORATION LTD
400/220kV GIS SS AT SONAPUR
128840

Title 220kV CONTROL & RELAY PANEL
220kV BUSBAR
Legend list

HITACHI Hitachi Energy India Limited

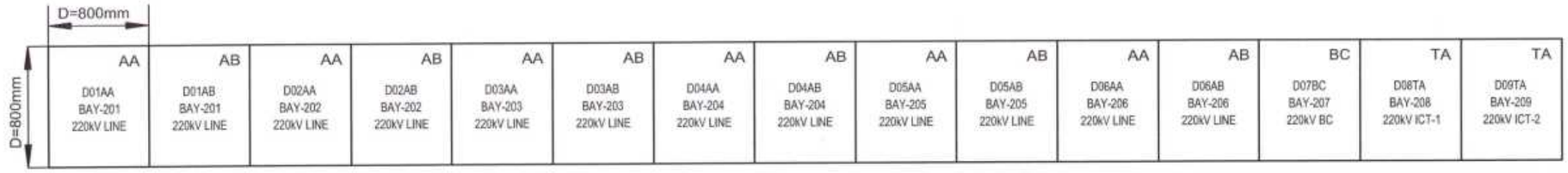
Doc. kind. Assembly drawing
DCC ELU
Resp. dept. PG-GAS
Doc. no. 1KHF128840R1411

Ref.Des. =2R +BB2
Rev. ind. 01
Language en
Sheet 30
n. sheet 31

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization is prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

220KV GIS BUILDING



FRONT

FRONT



Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and his responsibilities of... details, performance parameters and ... of the supplies with the Indian Statutory laws / IEC specifications as may be applicable nor does it... the AEGCL's right under the contract.

APPLICABLE BAYS

FUTURE BAYS

NOTE:- PANEL LINE UP TO BE CONFIRMED BY CUSTOMER

Based on

Rev.	Revision note	Date	Name
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK

1MYN691003-102(A3)REV01

Prepared 08-08-2025 DIVYA S
Approved 08-08-2025 THEJASWINI AR
Project ASSAM ELECTRICITY GRID CORPORATION LTD
400/220kV GIS SS AT SONAPUR
128840

Title 220kV CONTROL & RELAY PANEL
220kV BUSBAR
PANEL LINE UP

HITACHI Hitachi Energy India Limited

Doc. kind. Circuit diagram
DCC EFS
Resp. dept. PG-GAS
Doc. no. 1KHF128840R1411

Ref.Des. =2R
Rev. ind. 01
Language en
Sheet 31
n. sheet 32

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

PANEL NAME PLATE DETAILS

200

60

2RBB1
BUSBAR
PROTECTION PANEL

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and responsibilities in details, performance particulars and guarantees of the supplies vis-a-vis the Indian Standards / IEC specifications as may be applicable nor does it limit ASSCL's right under the contract.

200

60

2RBB2
BUSBAR
PROTECTION PANEL

Based on

Rev.	Revision note	Date	Name
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK

Prepared 08-08-2025 DIVYA S
Approved 08-08-2025 THEJASWINI AR
Project ASSAM ELECTRICITY GRID CORPORATION LTD
400/220kV GIS SS AT SONAPUR
128840

Title 220kV CONTROL & RELAY PANEL
220kV BUSBAR
PANEL NAME PLATE

HITACHI Hitachi Energy India Limited (Formerly known as ABB Power Products and Systems India Limited)

Doc. kind. Assembly drawing
DCC ELU
Resp. dept. PG-GAS
Doc. no. 1KHF128840R1411

Ref.Des. =2R
Rev. ind. 01
Language en
Sheet 32
n. sheet 41

1MYN691003-102(A3)REV01

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

Pos.	Location	Device designation	Device description	Type designation	Technical data	Remark	Article number	Manufacturer	Manufacturer number	Qty.	Document / sheet
1	+A	-TH	Thermostal	TH	230VAC, 15A, 50 Hz	Range : 30-85°C	IN7635-3001	GIRISH EGO		1	141
2	+A.10	-ACMCB	Miniature circuit breaker	-	16A	240VAC, 2P, C-curve, Icn-10kA	-	ABB/Schneider/L&T/ Siemens	-	1	141
			Auxiliary contact block	-		1CO	-	ABB/Schneider/L&T/ Siemens	-	1	141,170
3	+A.10	-HS	On/off Switch		1-2 pos on/off switch,5A, Flush mounting	Wing Type knob	1MYN533014-001	Switron		1	141
4	+A.10	-LCCX04	Feed-through terminal	CSB3/N3UL/KABTM3	1100V, 41A	Polyamide, 0.5-2.5mm²		Connectwell/Elmex		180	159,160,161,162,163,164, 165,166,167,168,169,170.1, 170.2,170.3,182,183,184, 185,186,187,188,189,190, 192,193,212,213,214,215, 216,217,218,219,220,221, 222,401
5	+A.10	-PS	AC Socket with Switch	SW	230VAC, 05-15A	Box type, Indian standard	1MYN538103-001	Anchor		1	141
6	+A.10	-X04	Feed-through terminal	CSB3/N3UL/KABTM3	1100V, 41A	Polyamide, 0.5-2.5mm²		Connectwell/Elmex		154	165,166,167,170,170.3, 171.4,172,173,174,194, 195.3,195.4,198,223,223.3, 223.4,227,401
7	+A.10	-X04A	Feed-through terminal	CSB3/N3UL/KABTM3	1100V, 41A	Polyamide, 0.5-2.5mm²		Connectwell/Elmex		3	132,401
8	+A.15	-1BBX04A	Feed-through terminal	CSB3/N3UL/KABTM3	1100V, 41A	Polyamide, 0.5-2.5mm²		Connectwell/Elmex		8	159,182,212,401
9	+A.15	-2BBX04A	Feed-through terminal	CSB3/N3UL/KABTM3	1100V, 41A	Polyamide, 0.5-2.5mm²		Connectwell/Elmex		8	160,183,213,401
10	+A.15	-3BBX04A	Feed-through terminal	CSB3/N3UL/KABTM3	1100V, 41A	Polyamide, 0.5-2.5mm²		Connectwell/Elmex		8	161,184,214,401
11	+A.15	-4BBX04A	Feed-through terminal	CSB3/N3UL/KABTM3	1100V, 41A	Polyamide, 0.5-2.5mm²		Connectwell/Elmex		8	162,185,215,401
12	+A.15	-5BBX04A	Feed-through terminal	CSB3/N3UL/KABTM3	1100V, 41A	Polyamide, 0.5-2.5mm²		Connectwell/Elmex		8	163,186,216,401
13	+A.15	-6BBX04A	Feed-through terminal	CSB3/N3UL/KABTM3	1100V, 41A	Polyamide, 0.5-2.5mm²		Connectwell/Elmex		8	164,187,217,401
14	+A.15	-7BBX04A	Feed-through terminal	CSB3/N3UL/KABTM3	1100V, 41A	Polyamide, 0.5-2.5mm²		Connectwell/Elmex		4	165,401
15	+A.15	-8BBX04A	Feed-through terminal	CSB3/N3UL/KABTM3	1100V, 41A	Polyamide, 0.5-2.5mm²		Connectwell/Elmex		4	166,401
16	+A.15	-9BBX04A	Feed-through terminal	CSB3/N3UL/KABTM3	1100V, 41A	Polyamide, 0.5-2.5mm²		Connectwell/Elmex		4	167,401
17	+A.15	-10BBX04A	Feed-through terminal	CSB3/N3UL/KABTM3	1100V, 41A	Polyamide, 0.5-2.5mm²		Connectwell/Elmex		8	168,192,221,401
18	+A.15	-11BBX04A	Feed-through terminal	CSB3/N3UL/KABTM3	1100V, 41A	Polyamide, 0.5-2.5mm²		Connectwell/Elmex		8	169,193,222,402
19	+B.00	-DS	Door limit switch	DLS	230V AC, 5A	Single pole, 1NO, Cover for Insulation	IIN5374-3001-1	Kaycee		1	141
20	+B.00	-LED	LED Lamp	LED	240VAC, 9.08W			SPECTRUM TECHVISION (P) LTD		1	141
21	+B.01	-X13	Disconnect terminal	CBDT4UNS/KLTDM4	1100V, 41A	Polyamide, 1.5-6mm²		Connectwell/Elmex		5	132,141,401
22	+B.05	-1MCB01	Miniature circuit breaker	-	16A	220VDC, 2P, C-curve, Icn-10kA	-	ABB/Schneider/L&T/ Siemens	-	1	131
			Auxiliary contact block	-		1CO	-	ABB/Schneider/L&T/ Siemens	-	1	131,170

APPROVED, subject to the condition that the approval conveyed herein neither relieves the consignor of his contractual obligations in respect of the design details, performance particulars, quality, etc. of the supplies with the instructions and specifications as may be agreed to and not limited to IEC standards, nor relieves the consignor of his statutory obligations under the Central Electricity Authority (Measures Relating to Safety and Electric Supply) Regulations, 2010 and amendments thereof.

Approved By GM (P&D)
Checked By DGM (P&D)
Checked By AGM (P&D)
Checked By DM (P&D)
Checked By AM (P&D)

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

Title: 220kV CONTROL & RELAY PANEL Parts list =2R+BB1

HITACHI Hitachi Energy India Limited

Doc. kind.	Parts list
DCC	EPB
Resp. dept.	PG-GAS
Doc. no.	1KHY128840R1411
Ref.Des.	=2R +BB1
Rev. ind.	01
Language	en
Sheet	41
n. sheet	42

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

Pos.	Location	Device designation	Device description	Type designation	Technical data	Remark	Article number	Manufacturer	Manufacturer number	Qty.	Document / sheet
23	+B.05	-1MCB04	Miniature circuit breaker	-	6A	220VDC, 2P, C-curve, Icn-10kA	-	ABB/Schneider/L&T/ Siemens	-	1	132
			Auxiliary contact block	-		1CO	-	ABB/Schneider/L&T/ Siemens	-	1	132,170
24	+B.05	-2MCB01	Miniature circuit breaker	-	16A	220VDC, 2P, C-curve, Icn-10kA	-	ABB/Schneider/L&T/ Siemens	-	1	131
			Auxiliary contact block	-		1CO	-	ABB/Schneider/L&T/ Siemens	-	1	131,170
25	+B.05	-MCB03	Miniature circuit breaker	-	6A	220VDC, 2P, C-curve, Icn-10kA	-	ABB/Schneider/L&T/ Siemens	-	1	132
			Auxiliary contact block	-		1CO	-	ABB/Schneider/L&T/ Siemens	-	1	132
26	+B.17	-IXX1	Feed-through terminal	CSB3/N3UL/KABTM3	1100V, 41A	Polyamide, 0.5-2.5mm²		Connectwell/Elmex		167	159,160,161,162,163,164, 165,166,167,168,169,170, 170.1,170.2,170.3,171,172, 401
27	+B.25	-9BBX01	Disconnect terminal	CBDT4UNS/KLTDM4	1100V, 41A	Polyamide, 1.5-6mm²		Connectwell/Elmex		11	155,402
28	+B.25	-10BBX01	Disconnect terminal	CBDT4UNS/KLTDM4	1100V, 41A	Polyamide, 1.5-6mm²		Connectwell/Elmex		11	155,402
29	+B.25	-11BBX01	Disconnect terminal	CBDT4UNS/KLTDM4	1100V, 41A	Polyamide, 1.5-6mm²		Connectwell/Elmex		11	156,402
30	+B.29	-6BBX01	Disconnect terminal	CBDT4UNS/KLTDM4	1100V, 41A	Polyamide, 1.5-6mm²		Connectwell/Elmex		11	153,402
31	+B.29	-7BBX01	Disconnect terminal	CBDT4UNS/KLTDM4	1100V, 41A	Polyamide, 1.5-6mm²		Connectwell/Elmex		11	154,402
32	+B.29	-8BBX01	Disconnect terminal	CBDT4UNS/KLTDM4	1100V, 41A	Polyamide, 1.5-6mm²		Connectwell/Elmex		11	154,402
33	+B.33	-3BBX01	Disconnect terminal	CBDT4UNS/KLTDM4	1100V, 41A	Polyamide, 1.5-6mm²		Connectwell/Elmex		11	152,402
34	+B.33	-4BBX01	Disconnect terminal	CBDT4UNS/KLTDM4	1100V, 41A	Polyamide, 1.5-6mm²		Connectwell/Elmex		11	152,402
35	+B.33	-5BBX01	Disconnect terminal	CBDT4UNS/KLTDM4	1100V, 41A	Polyamide, 1.5-6mm²		Connectwell/Elmex		11	153,402
36	+B.37	-1BBX01	Disconnect terminal	CBDT4UNS/KLTDM4	1100V, 41A	Polyamide, 1.5-6mm²		Connectwell/Elmex		11	151,402
37	+B.37	-1DCX03	Disconnect terminal	CBDT4UNS/KLTDM4	1100V, 41A	Polyamide, 1.5-6mm²		Connectwell/Elmex		3	131,401
38	+B.37	-2BBX01	Disconnect terminal	CBDT4UNS/KLTDM4	1100V, 41A	Polyamide, 1.5-6mm²		Connectwell/Elmex		11	151,402
39	+B.37	-2DCX03	Disconnect terminal	CBDT4UNS/KLTDM4	1100V, 41A	Polyamide, 1.5-6mm²		Connectwell/Elmex		3	131,401
40	+B.37	-ACX03	Disconnect terminal	CBDT4UNS/KLTDM4	1100V, 41A	Polyamide, 1.5-6mm²		Connectwell/Elmex		3	141,401
41	+B.41	-HT	Heating	SPHT	240V AC, 50W		IN6677-3001-2	APT CONTROLS		1	141
42	+C.10	-XX2	Feed-through terminal	280-833/CX2.5/4	1000V, 24A	Polyamide, 0.08-2.5mm², 1x4 wire		Wago/Connectwell		62	158,159,160,161,162,163, 164,165,166,167,168,169, 170,170.1,170.2,170.3,171.4, 181,182,183,184,185,186, 187,188,189,190,192,193, 194,194.1,195.2,195.3,195.4, 211,212,213,214,215,216, 217,218,219,220,221,222, 223,223.1,223.2,223.3,223.4, 401

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations nor implies any deviation from the requirements of the contract. The approval is limited to the details submitted and does not cover any modifications made by the supplier with the intent to comply with the applicable standards as may be determined by the AEGCL right under the contract.

Approved By GM (P&D)
Checked By DGM (P&D)
Checked By AGM (P&D)
Checked By DM (P&D)
Checked By AM (P&D)

Rev.	Revision note	Date	Name
Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK

Prepared 08-08-2025 DIVYA S
Approved 08-08-2025 THEJASWINI AR
Project ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840

Title 220kV CONTROL & RELAY PANEL Parts list =2R+BB1

HITACHI Hitachi Energy India Limited

Doc. kind. Parts list
DCC EPB
Resp. dept. PG-GAS
Doc. no. 1KHY128840R1411

Ref.Des. =2R +BB1
Rev. ind. 01
Language en
Sheet 42
n. sheet 43

1MYN691003-102(A3)REV01

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

Pos.	Location	Device designation	Device description	Type designation	Technical data	Remark	Article number	Manufacturer	Manufacturer number	Qty.	Document / sheet
43	+C.15	-XX1	Feed-through terminal	280-833/CX2.5/4	1000V, 24A	Polyamide, 0.08-2.5mm², 1x4 wire		Wago/Connectwell		36	158,171,172,173,181,195, 196,197,211,224,225,226, 401
44	+D.08	-D08.01	R_PH BB PROTN_REB670	REB670*2.2 (WITH PRP)		-	1KHY128840M5252	HITACHI	1KHY128840M5252	1	
			Ethernet module	SFP	100Base-FX, LC connectors	Version 2.2	-	-	-	2	
			Power supply module	PSM	90-250VDC	50/60Hz	-	-	-	1	158,171
			Binary input module	BIM	220-250VDC, 50ma	16 inputs	-	-	-	8	159,160,161,162,163,164, 165,166,167,168,169,170, 170.1,170.2,170.3,171.4,175, 176,177,178,179,180
			Binary output module	BOM		24 output relays	-	-	-	2	171,172,173,174,176,179
			Transformer input module	TRM	1A, 50/60Hz	12I	-	-	-	1	151,152,153,154,155,156, 175
			Rack casing	1/1x19" rack casing	11xI/O, 2xTRM	1/1x19", Version 2.2	-	-	-	1	
			15 LED indication module	LED		Normal size	-	-	-	1	158
45	+D.15	-D15.01	Y_PH BB PROTN_REB670	REB670*2.2 (WITH PRP)		-	1KHY128840M5252	HITACHI	1KHY128840M5252	1	
			Ethernet module	SFP	100Base-FX, LC connectors	Version 2.2	-	-	-	2	
			Power supply module	PSM	90-250VDC	50/60Hz	-	-	-	1	181,195
			Binary input module	BIM	220-250VDC, 50ma	16 inputs	-	-	-	8	182,183,184,185,186,187, 188,189,190,192,193,194, 194.1,195.2,195.3,195.4,199, 200,201,202,203
			Binary output module	BOM		24 output relays	-	-	-	2	195,196,197,198,201,202
			Transformer input module	TRM	1A, 50/60Hz	12I	-	-	-	1	151,152,153,154,155,156
			Rack casing	1/1x19" rack casing	11xI/O, 2xTRM	1/1x19", Version 2.2	-	-	-	1	
			15 LED indication module	LED		Normal size	-	-	-	1	181
46	+D.18	-BUS-1 IN/OUT	Rotary Switch	8-2-pos. contacts	32A, 660V	Stayput, Pistol grip handle, Lockable and key pos. both in 90D Switching angle	1MYN910009-AAAA	Switron	1MYN910009-AAAA	1	170
47	+D.18	-BUS-2 IN/OUT	Rotary Switch	8-2-pos. contacts	32A, 660V	Stayput, Pistol grip handle, Lockable and key pos. both in 90D Switching angle	1MYN910009-AAAA	Switron	1MYN910009-AAAA	1	170
48	+D.18	-PB01	Push button	-	2NO	Green, Compact momemtary	-	ABB/L&T/Teknic/ Schneider/SECO	-	1	170
49	+D.18	-PB02	Push button	-	1NO, 1NC		-	ABB/L&T/Teknic/ Schneider/SECO	-	1	171,261

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and he responsibilities in all details, performance particulars and completely of the supplies with the Indian Standard laws / IEC specifications as may be applicable nor does limit the AEGCL's right under the contract.

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)
—				

Based on

Rev.	Revision note	Date	Name
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK

Prepared 08-08-2025 DIVYA S
Approved 08-08-2025 THEJASWINI AR
Project ASSAM ELECTRICITY GRID CORPORATION LTD
400/220kV GIS SS AT SONAPUR
128840

Title 220kV CONTROL & RELAY PANEL
Parts list
=2R+BB1

HITACHI Hitachi Energy India Limited

Doc. kind. Parts list
DCC EPB
Resp. dept. PG-GAS
Doc. no. 1KHY128840R1411

Ref.Des. =2R +BB1
Rev. ind. 01
Language en
Sheet 43
n. sheet 44

1MYN691003-102(A3)REV01

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

Pos.	Location	Device designation	Device description	Type designation	Technical data	Remark	Article number	Manufacturer	Manufacturer number	Qty.	Document / sheet
50	+D.22	-D22.01	B_PH BB PROTN_REB670	REB670*2.2 (WITH PRP)		-	1KHY128840M5252	HITACHI	1KHY128840M5252	1	
			Ethernet module	SFP	100Base-FX, LC connectors	Version 2.2	-	-	-	2	
			Power supply module	PSM	90-250VDC	50/60Hz	-	-	-	1	211,224
			Binary input module	BIM	220-250VDC, 50ma	16 inputs	-	-	-	8	212,213,214,215,216,217, 218,219,220,221,222,223, 223.1,223.2,223.3,223.4,228, 229,230,231,232
			Binary output module	BOM		24 output relays	-	-	-	2	224,225,226,227,230,231
			Transformer input module	TRM	1A, 50/60Hz	12I	-	-	-	1	151,152,153,154,155,156
			Rack casing	1/1x19" rack casing	11xI/O, 2xTRM	1/1x19", Version 2.2	-	-	-	1	
			15 LED indication module	LED		Normal size	-	-	-	1	211
51	+D.30	-D30.101.101	Trip circuit supervision relay	TSR-B	110/220VDC	2NC, 1NO	1MYN569339-A	ABB	1MYN569339-A	1	131,170
		-D30.101.301	Trip circuit supervision relay	TSR-B	110/220VDC	2NC, 1NO	1MYN569339-A	ABB	1MYN569339-A	1	131,170
		-D30.107.101	Auxiliary relay	RXMH2	220VDC	4NO, 4NC, without flag	RK 223069-AS	ABB	RK 223069-AS	1	131
		-D30.107.301	Auxiliary relay	RXMH2	220VDC	4NO, 4NC, without flag	RK 223069-AS	ABB	RK 223069-AS	1	131
		-D30.119.101	Auxiliary relay	RXMA1	110-125VDC	2NO, 2NC	RK211052-AN	ABB	RK211052-AN	1	141,170
52	+D.32	-D36.01	Test block	MPB/MPG	10NC		1KHS282430P0001	DAV Industries	1KHS282430P0001	1	151,158,171,172
53	+D.32	-D36.02	Test block	MPB/MPG	10NC		1KHS282430P0001	DAV Industries	1KHS282430P0001	1	152,158,171,172
54	+D.36	-D36.03	Test block	MPB/MPG	10NC		1KHS282430P0001	DAV Industries	1KHS282430P0001	1	153,158,171,172
55	+D.36	-D36.04	Test block	MPB/MPG	10NC		1KHS282430P0001	DAV Industries	1KHS282430P0001	1	154,158,171,172
56	+D.36	-D36.05	Test block	MPB/MPG	10NC		1KHS282430P0001	DAV Industries	1KHS282430P0001	1	155,158,171,172
57	+D.36	-D36.06	Test block	MPB/MPG	10NC		1KHS282430P0001	DAV Industries	1KHS282430P0001	1	156,158,171,172

Checked By AM (P&D)	Checked By DM	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

APPROVED subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and responsibilities and liabilities, performance guarantees and warranty of the supplies with the relevant codes and IEC specifications as may be applicable nor does what the AEGCL's right under the contract.

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

Title: 220kV CONTROL & RELAY PANEL
Parts list
=2R+BB1

HITACHI Hitachi Energy India Limited

Doc. kind.	Parts list	Ref.Des.	=2R +BB1
	DCC EPB		
Resp. dept.	PG-GAS	Rev. ind. 01	Language en
Doc. no.	1KHY128840R1411	Sheet	44
		n. sheet	50

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

Pos.	Location	Device designation	Device description	Type designation	Technical data	Remark	Article number	Manufacturer	Manufacturer number	Qty.	Document / sheet
1	+A	-TH1	Thermostat	TH	230VAC, 15A, 50 Hz	Range : 30-85°C	IN7635-3001	GIRISH EGO		1	27,141
2	+A.10	-ACMCB01	Miniature circuit breaker	-	16A	240VAC, 2P, C-curve, Icn-10kA	-	ABB/Schneider/L&T/ Siemens	-	1	27,141
			Auxiliary contact block	-		1CO	-	ABB/Schneider/L&T/ Siemens	-	1	27,141,170
3	+A.10	-HS	On/off Switch		1-2 pos on/off switch,5A, Flush mounting	Wing Type knob	1MYN533014-001	Switron		1	27,141
4	+A.10	-PS	AC Socket with Switch	SW	230VAC, 05-15A	Box type, Indian standard	1MYN538103-001	Anchor		1	27,141
5	+A.10	-X14	Feed-through terminal	CSB3/N3UL/KABTM3	1100V, 41A	Polyamide, 0.5-2.5mm²		Connectwell/Elmex		71	27,170,171,172,173,197,226, 282,401
6	+B.00	-DS1	Door limit switch	DLS	230V AC, 5A	Single pole, 1NO, Cover for Insulation	IIN5374-3001-1	Kaycee		1	27,141
7	+B.00	-LED1	LED Lamp	LED	240VAC, 9.08W			SPECTRUM TECHVISION (P) LTD		1	27,141
8	+B.17	-11BBX04	Feed-through terminal	CSB3/N3UL/KABTM3	1100V, 41A	Polyamide, 0.5-2.5mm²		Connectwell/Elmex		22	27,281,401
9	+B.21	-9BBX04	Feed-through terminal	CSB3/N3UL/KABTM3	1100V, 41A	Polyamide, 0.5-2.5mm²		Connectwell/Elmex		22	27,279,401
10	+B.21	-10BBX04	Feed-through terminal	CSB3/N3UL/KABTM3	1100V, 41A	Polyamide, 0.5-2.5mm²		Connectwell/Elmex		22	27,280,401
11	+B.25	-7BBX04	Feed-through terminal	CSB3/N3UL/KABTM3	1100V, 41A	Polyamide, 0.5-2.5mm²		Connectwell/Elmex		17	27,277,401
12	+B.25	-8BBX04	Feed-through terminal	CSB3/N3UL/KABTM3	1100V, 41A	Polyamide, 0.5-2.5mm²		Connectwell/Elmex		22	27,278,401
13	+B.29	-5BBX04	Feed-through terminal	CSB3/N3UL/KABTM3	1100V, 41A	Polyamide, 0.5-2.5mm²		Connectwell/Elmex		22	27,275,401
14	+B.29	-6BBX04	Feed-through terminal	CSB3/N3UL/KABTM3	1100V, 41A	Polyamide, 0.5-2.5mm²		Connectwell/Elmex		22	27,276,401
15	+B.33	-3BBX04	Feed-through terminal	CSB3/N3UL/KABTM3	1100V, 41A	Polyamide, 0.5-2.5mm²		Connectwell/Elmex		22	27,273,401
16	+B.33	-4BBX04	Feed-through terminal	CSB3/N3UL/KABTM3	1100V, 41A	Polyamide, 0.5-2.5mm²		Connectwell/Elmex		22	27,274,401
17	+B.37	-1BBX04	Feed-through terminal	CSB3/N3UL/KABTM3	1100V, 41A	Polyamide, 0.5-2.5mm²		Connectwell/Elmex		22	27,271,401
18	+B.37	-2BBX04	Feed-through terminal	CSB3/N3UL/KABTM3	1100V, 41A	Polyamide, 0.5-2.5mm²		Connectwell/Elmex		22	27,272,401
19	+B.41	-HT1	Heating	SPHT	240V AC, 50W		IN6677-3001-2	APT CONTROLS		1	27,141
20	+D.03	-D03.101.101	Bistable relay	RXMVB4	220VDC	11NO, 3NC	1MYN563039-AS	ABB	1MYN563039-AS	1	26,261,271,282
		-D03.113.101	Trip circuit supervision relay	TSR-B	110/220VDC	2NC, 1NO	1MYN569339-A	ABB	1MYN569339-A	1	26,261,282
		-D03.113.301	High speed trip relay	RXMS1	220VDC	6NO, Variant B	RK216063-AS	ABB	RK216063-AS	1	26,261,271
		-D03.119.101	Bistable relay	RXMVB4	220VDC	11NO, 3NC	1MYN563039-AS	ABB	1MYN563039-AS	1	26,261,272,282
		-D03.131.101	Trip circuit supervision relay	TSR-B	110/220VDC	2NC, 1NO	1MYN569339-A	ABB	1MYN569339-A	1	26,261,282
		-D03.131.301	High speed trip relay	RXMS1	220VDC	6NO, Variant B	RK216063-AS	ABB	RK216063-AS	1	26,261,272
		-D03.137.101	Bistable relay	RXMVB4	220VDC	11NO, 3NC	1MYN563039-AS	ABB	1MYN563039-AS	1	26,262,273,282
		-D03.149.101	Trip circuit supervision relay	TSR-B	110/220VDC	2NC, 1NO	1MYN569339-A	ABB	1MYN569339-A	1	26,262,282
		-D03.149.301	High speed trip relay	RXMS1	220VDC	6NO, Variant B	RK216063-AS	ABB	RK216063-AS	1	26,262,273

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations, nor implies any relaxation or deviation from drawings, specifications and the instructions to be supplied with the equipment. The approval is without prejudice to any rights of the AEGCL under the contract.

Checked By DM (P&D)
Checked By AGM (P&D)
Checked By DJM (P&D)
Approved By GM (P&D)

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared 08-08-2025 DIVYA S
Approved 08-08-2025 THEJASWINI AR
Project ASSAM ELECTRICITY GRID CORPORATION LTD
400/220kV GIS SS AT SONAPUR
128840

Title 220kV CONTROL & RELAY PANEL
Parts list
=2R+BB2

HITACHI Hitachi Energy India Limited

Doc. kind. Parts list
DCC EPB
Resp. dept. PG-GAS
Doc. no. 1KHY128840R1412

Ref.Des. =2R +BB2
Rev. ind. 01
Language en
Sheet 50
n. sheet 51

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

Pos.	Location	Device designation	Device description	Type designation	Technical data	Remark	Article number	Manufacturer	Manufacturer number	Qty.	Document / sheet
21	+D.08	-D08.101.101	Bistable relay	RXMVB4	220VDC	11NO, 3NC	1MYN563039-AS	ABB	1MYN563039-AS	1	26,262,274,282
		-D08.113.101	Trip circuit supervision relay	TSR-B	110/220VDC	2NC, 1NO	1MYN569339-A	ABB	1MYN569339-A	1	26,262,282
		-D08.113.301	High speed trip relay	RXMS1	220VDC	6NO, Variant B	RK216063-AS	ABB	RK216063-AS	1	26,262,274
		-D08.119.101	Bistable relay	RXMVB4	220VDC	11NO, 3NC	1MYN563039-AS	ABB	1MYN563039-AS	1	26,263,275,282
		-D08.131.101	Trip circuit supervision relay	TSR-B	110/220VDC	2NC, 1NO	1MYN569339-A	ABB	1MYN569339-A	1	26,263,282
		-D08.131.301	High speed trip relay	RXMS1	220VDC	6NO, Variant B	RK216063-AS	ABB	RK216063-AS	1	26,263,275
		-D08.137.101	Bistable relay	RXMVB4	220VDC	11NO, 3NC	1MYN563039-AS	ABB	1MYN563039-AS	1	26,263,276,282
		-D08.149.101	Trip circuit supervision relay	TSR-B	110/220VDC	2NC, 1NO	1MYN569339-A	ABB	1MYN569339-A	1	26,263,282
		-D08.149.301	High speed trip relay	RXMS1	220VDC	6NO, Variant B	RK216063-AS	ABB	RK216063-AS	1	26,263,276
22	+D.13	-D13.101.101	Bistable relay	RXMVB4	220VDC	11NO, 3NC	1MYN563039-AS	ABB	1MYN563039-AS	1	26,264,277,282
		-D13.113.101	Trip circuit supervision relay	TSR-B	110/220VDC	2NC, 1NO	1MYN569339-A	ABB	1MYN569339-A	1	26,264,282
		-D13.119.101	Bistable relay	RXMVB4	220VDC	11NO, 3NC	1MYN563039-AS	ABB	1MYN563039-AS	1	26,264,278,282
		-D13.125.101	Trip circuit supervision relay	TSR-B	110/220VDC	2NC, 1NO	1MYN569339-A	ABB	1MYN569339-A	1	26,264,282
		-D13.125.301	High speed trip relay	RXMS1	220VDC	6NO, Variant B	RK216063-AS	ABB	RK216063-AS	1	26,264,278
		-D13.137.101	Bistable relay	RXMVB4	220VDC	11NO, 3NC	1MYN563039-AS	ABB	1MYN563039-AS	1	26,265,279,282
		-D13.149.101	Trip circuit supervision relay	TSR-B	110/220VDC	2NC, 1NO	1MYN569339-A	ABB	1MYN569339-A	1	26,265,282
		-D13.149.301	High speed trip relay	RXMS1	220VDC	6NO, Variant B	RK216063-AS	ABB	RK216063-AS	1	26,265,279
23	+D.18	-D18.101.101	Bistable relay	RXMVB4	220VDC	11NO, 3NC	1MYN563039-AS	ABB	1MYN563039-AS	1	26,265,280,282
		-D18.113.101	Trip circuit supervision relay	TSR-B	110/220VDC	2NC, 1NO	1MYN569339-A	ABB	1MYN569339-A	1	26,265,282
		-D18.113.301	High speed trip relay	RXMS1	220VDC	6NO, Variant B	RK216063-AS	ABB	RK216063-AS	1	26,265,280
		-D18.119.101	Bistable relay	RXMVB4	220VDC	11NO, 3NC	1MYN563039-AS	ABB	1MYN563039-AS	1	26,266,281,282
		-D18.125.101	Trip circuit supervision relay	TSR-B	110/220VDC	2NC, 1NO	1MYN569339-A	ABB	1MYN569339-A	1	26,266,282
		-D18.125.301	High speed trip relay	RXMS1	220VDC	6NO, Variant B	RK216063-AS	ABB	RK216063-AS	1	26,266,281
24	+D.26	-D26.101.101	Auxiliary relay	RXMM1	220-250VDC	6NO	RK214003-AS	ABB	RK214003-AS	1	26,261,271
		-D26.101.301	Auxiliary relay	RXMM1	220-250VDC	6NO	RK214003-AS	ABB	RK214003-AS	1	26,264,278
		-D26.107.101	Auxiliary relay	RXMM1	220-250VDC	6NO	RK214003-AS	ABB	RK214003-AS	1	26,261,271,272
		-D26.107.301	Auxiliary relay	RXMM1	220-250VDC	6NO	RK214003-AS	ABB	RK214003-AS	1	26,265,279
		-D26.113.101	Auxiliary relay	RXMM1	220-250VDC	6NO	RK214003-AS	ABB	RK214003-AS	1	26,261,272
		-D26.113.301	Auxiliary relay	RXMM1	220-250VDC	6NO	RK214003-AS	ABB	RK214003-AS	1	26,265,280
		-D26.119.101	Auxiliary relay	RXMM1	220-250VDC	6NO	RK214003-AS	ABB	RK214003-AS	1	26,262,273
		-D26.119.301	Auxiliary relay	RXMM1	220-250VDC	6NO	RK214003-AS	ABB	RK214003-AS	1	26,265,266,280,281
		-D26.125.101	Auxiliary relay	RXMM1	220-250VDC	6NO	RK214003-AS	ABB	RK214003-AS	1	26,262,273,274
		-D26.125.301	Auxiliary relay	RXMM1	220-250VDC	6NO	RK214003-AS	ABB	RK214003-AS	1	26,266,281
		-D26.131.101	Auxiliary relay	RXMM1	220-250VDC	6NO	RK214003-AS	ABB	RK214003-AS	1	26,262,274
		-D26.137.101	Auxiliary relay	RXMM1	220-250VDC	6NO	RK214003-AS	ABB	RK214003-AS	1	26,263,275
		-D26.143.101	Auxiliary relay	RXMM1	220-250VDC	6NO	RK214003-AS	ABB	RK214003-AS	1	26,263,275,276
		-D26.149.101	Auxiliary relay	RXMM1	220-250VDC	6NO	RK214003-AS	ABB	RK214003-AS	1	26,263,276
		-D26.155.101	Auxiliary relay	RXMM1	220-250VDC	6NO	RK214003-AS	ABB	RK214003-AS	1	26,264,277
		-D26.155.301	Auxiliary relay	RXMA1	110-125VDC	2NO, 2NC	RK211052-AN	ABB	RK211052-AN	1	26,141,170

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations nor has implications on drawings pertaining to products as per the scope of supply and the terms and conditions of specifications mentioned in the contract. The AEGCL's right under the contract.

Checked By DM (P&D)
Checked By GM (P&D)
Approved By GM (P&D)
Checked By AM (P&D)

Assam Electrical Engineering Co. Ltd. Guwahati

Rev.	Revision note	Date	Name
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK

Based on

Prepared 08-08-2025 DIVYA S
Approved 08-08-2025 THEJASWINI AR
Project ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840

Title 220kV CONTROL & RELAY PANEL Parts list =2R+BB2

HITACHI Hitachi Energy India Limited

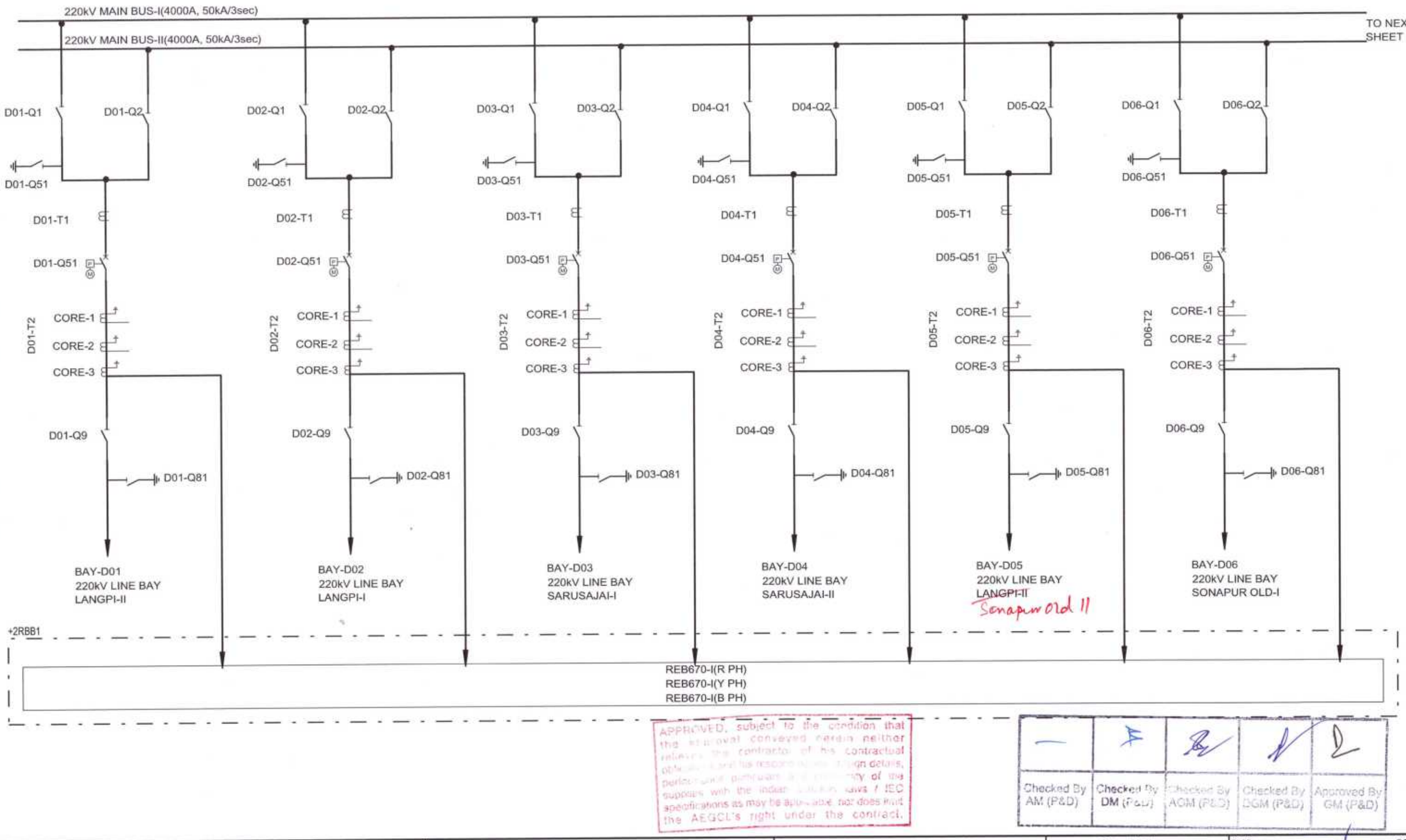
Doc. kind. Parts list
DCC EPB
Resp. dept. PG-GAS
Doc. no. 1KHY128840R1412

Ref.Des. =2R +BB2
Rev. ind. 01
Language en
Sheet 51
n. sheet 101

1MYN691003-102(A3)REV01

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy



APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and responsibilities, design details, performance guarantees and conformity of the supplies with the latest codes, laws / IEC specifications as may be applicable, nor does it limit the AEGCL's right under the contract.

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AOM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)
—				

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

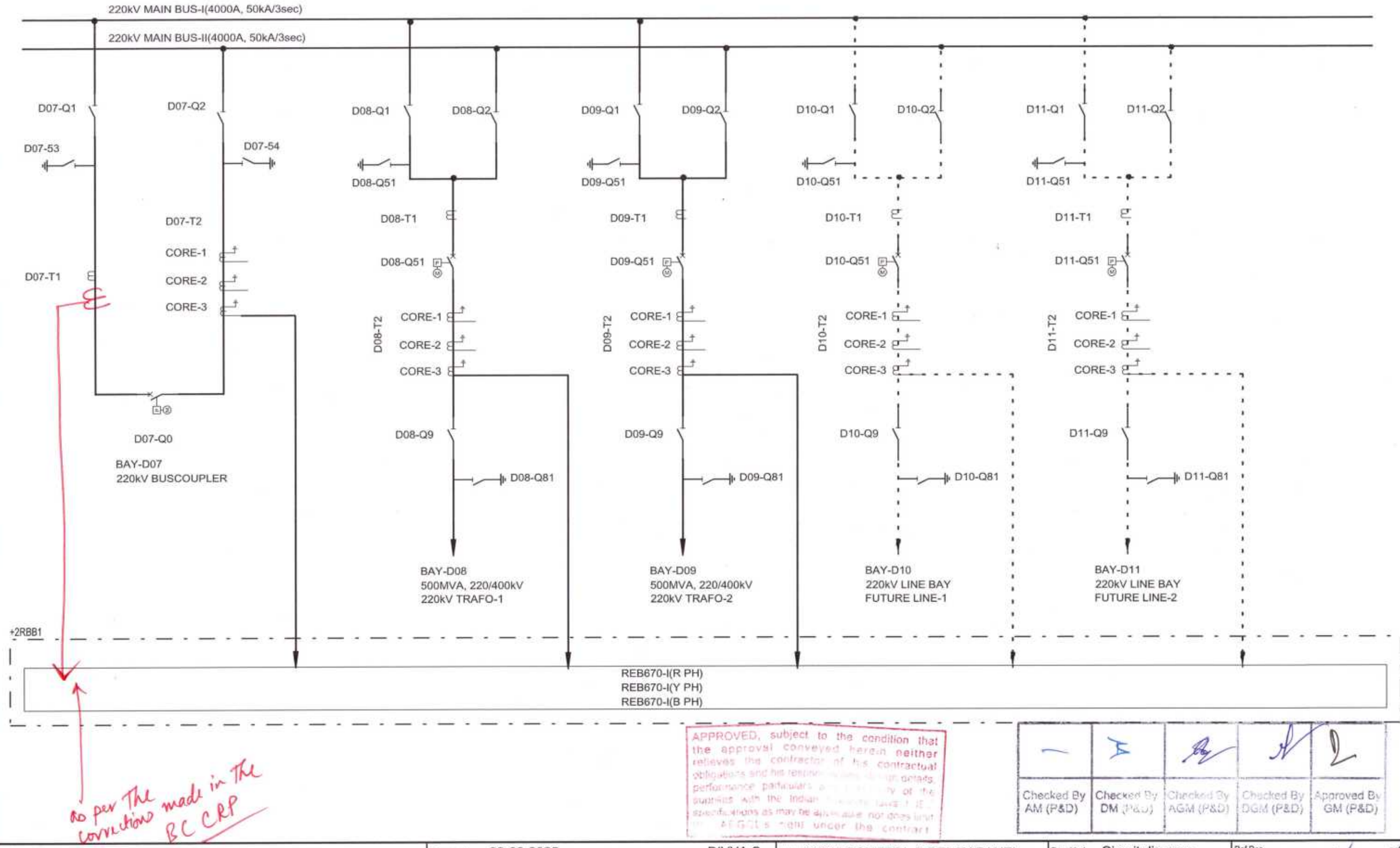
Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
SLD

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram	Ref.Des.	=2R
DCC	EFS		
Resp. dept.	PG-GAS	Rev. ind.	01
Doc. no.	1KHF128840R1411	Language	en
		Sheet	101
		n. sheet	102

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy
The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.



APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and his responsibility to strictly adhere performance parameters and quality of the supplies with the Indian Statutory laws / IE specifications as may be applicable nor does limit the AEGCL's right under the contract.

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)
—	A			

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
SLD

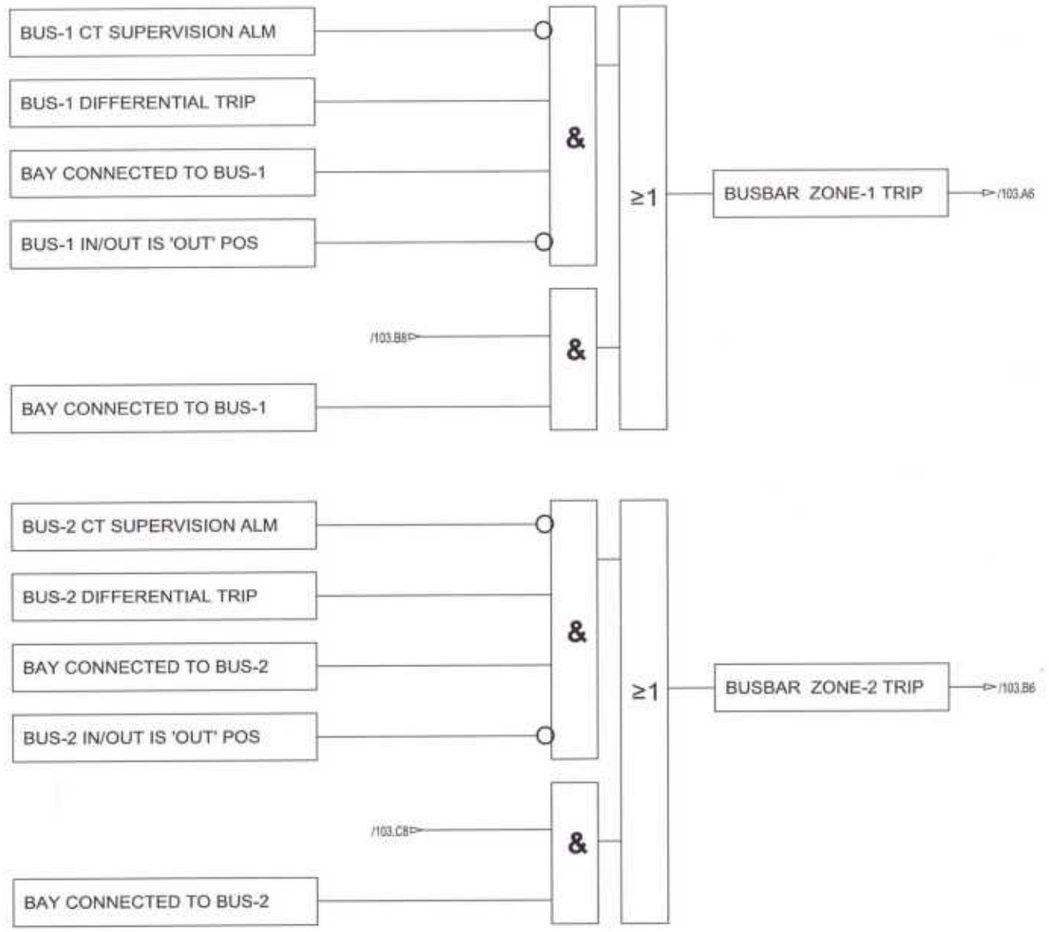
HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram	Ref.Des.	=2R
	DCC EFS		
Resp. dept.	PG-GAS	Rev. ind.	01
Doc. no.	1KHF128840R1411	Language	en
		Sheet	102
		n. sheet	103

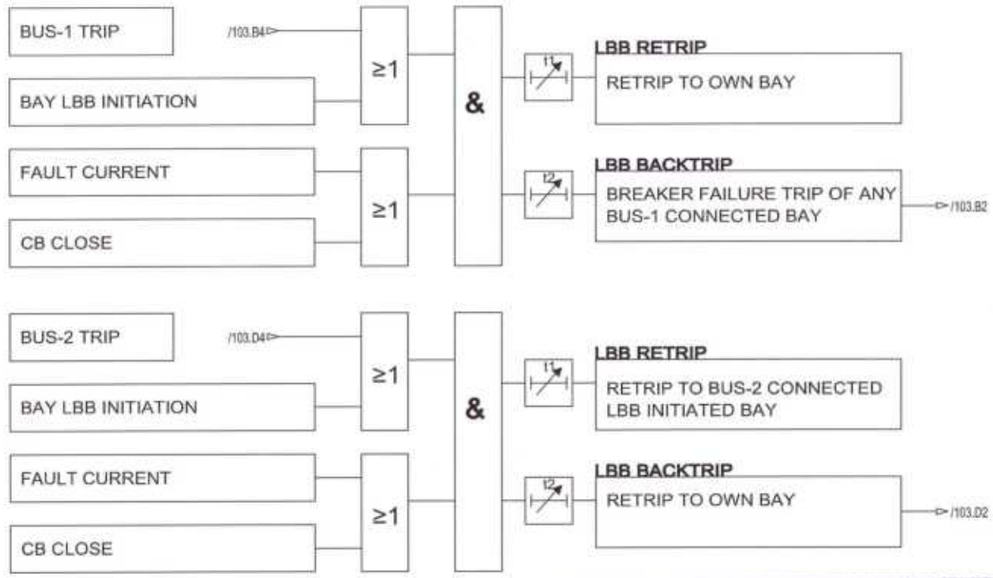
© Copyright 2023 Hitachi Energy

OVERALL BUSBAR TRIP LOGIC BUS-1/BUS-2

BUSBAR PROTECTION TRIP LOGIC

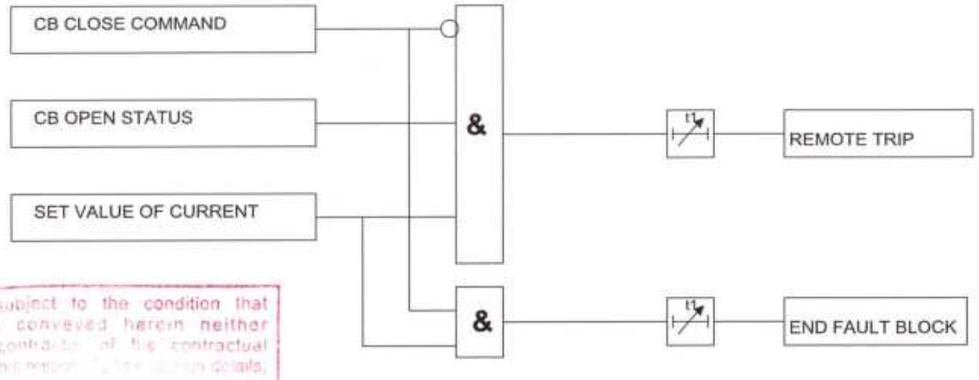


BREAKER FAILURE TRIP LOGIC



Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

END FAULT PROTECTION TRIP LOGIC



NOTE

For 'Zone Trip' Command from any LCC, both BB-1 & BB-2 including BC to be tripped (irrespective of Feeders connected to BB1 or 2)

THIS LOGIC TO BE INCLUDED.

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and responsibilities, including performance parameters, of the supplies with the indicated [illegible] specifications as may be [illegible] the AEGCL's right under the contract.

* For Parameter Setting, Function Mode to be Selected as 'Current' (OR) 'CB Pos'

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
BUSBAR LOGICS

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram	Ref.Des.	=2R
DCC	EFS		
Resp. dept.	PG-GAS	Rev. ind.	01
Doc. no.	1KHF128840R1411	Language	en
		Sheet	103
		nr sheet	104

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

TERMINAL BLOCK DESIGNATION FOR EXTERNAL WIRING

X01	CT CIRCUITS
DCX03, ACX03	DC/AC INCOMING CIRCUITS
X04	CONTROL CIRCUITS
BBX04	BUSBAR CIRCUIT
XX1,XX2,	DC CIRCUITS FOR LOOPING
**X04	CONTROL CIRCUITS
LCCX04	LCC CIRCUITS

TERMINAL BLOCK DESIGNATION FOR INTERPANEL BUS WIRING

DCX13, ACX13	DC/AC INCOMING CIRCUITS
X14	CONTROL CIRCUITS

TERMINAL BLOCKS

	NON DISCONNECTING TB
	DIS CONNECTING TB
	CT/CVT JUNCTION BOX TERMINAL
	BREAKER TERMINAL
	ISOLATOR TERMINAL
	MARSHALLING KIOSK TB
	PLCC/FOTE TERMINALS
	ACDB/DCDB TERMINALS

SYMBOL LIST

	MCB
	FUSE
	LINK
	RELAY COIL
	RELAY REVERSE FLAG
	RELAY MANUAL RESET FLAG
	PUSH BUTTON ON CONTACT
	NO CONTACT
	NC CONTACT
	EARTH
	SWITCH CONTACT
	LED LAMP
	SPACE HEATER
	DIODE
	RESISTOR
	VARISTOR

SYMBOL LIST

	BINARY INPUT
	BINARY OUTPUT
	CHANGE OVER OUTPUT
	CT/PT INPUT
	mA INPUT
	POWER SUPPLY INPUT
	FO COMM. PORT
	RS232/485 COMM. PORT
	RJ45 COMM. PORT
	CURRENT TRANSFORMER
	CVT
	PT
	CIRCUIT BREAKER
	LIGHNING ARRESTOR

Checked By Chief DM (P&D)
Checked By AGM (P&D)
Checked By DGM (P&D)
Approved By GM (P&D)

Subject to the condition that approval hereby conveyed does not relieve us of our contractual obligations in any way. The design, manufacture and performance of the equipment shall be in accordance with all IEC specifications as may be applicable unless otherwise specifically agreed to in the contract specifications and in case of any conflict, the latter shall govern. In any case AEGCL's right under the contract shall not be prejudiced.

FERRULE NOMENCLATURE

FERRULE 'A' : CT CIRCUIT- MAIN PROTECTION
FERRULE 'B' : CT CIRCUIT- BUSBAR PROTECTION
FERRULE 'C' : CT CIRCUIT- BACKUP PROTECTION
FERRULE 'D' : CT CIRCUIT- METERING
FERRULE 'E' : PT CKTS
FERRULE 'H' : AUXILLARY AC CKTS
FERRULE 'J' : AUXILLARY DC CKTS
FERRULE 'K' : CONTROL CKTS
FERRULE 'L' : INDICATION CKTS
FERRULE 'P' : DC CKT- BUSBAR PROTECTION
FERRULE 'U' : SPARE CONTACTS

NOTES:**REPLACE WITH BAY NO.

Rev.	Revision note	Date	Name
Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
LIST OF SYMBOLS

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram	Ref.Des.	=2R
	DCC EFS		
Resp. dept.	PG-GAS	Rev. ind. 01	Language en
Doc. no.	1KHF128840R1411	Sheet	104
		n. sheet	131

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

+BB1

+DCDB

220V DC-1

-1DCX03

-1MCB01 16A

I/C DC-1 MCB

-D30.101.101 DC-1 SUPVN(80A) TSR-B

-D30.107.101 DCCO-1 RELAY

-D30.107.101

DCCO-1 RELAY

+DCDB

220V DC-2

-2DCX03

-2MCB01 16A

I/C DC-2 MCB

-D30.101.301 DC-2 SUPVN(80A) TSR-B

-D30.107.301 DCCO-2 RELAY

-D30.107.301

DCCO-2 RELAY

-1MCB01

I/C DC-1 MCB

-2MCB01

I/C DC-2 MCB

-D30.101.101 DC-1 SUPVN(80A) TSR-B

-D30.101.301 DC-2 SUPVN(80A) TSR-B

-D30.107.101 DCCO-1 RELAY

-D30.107.301 DCCO-2 RELAY

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and the responsibilities, design details, performance particulars and conformity of the supplies with the Indian Electricity Rules / IEC specifications as may be applicable nor does limit the AEGCL's right under the contract.

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)
—				

* Supply to Ethernet S/W to be included

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

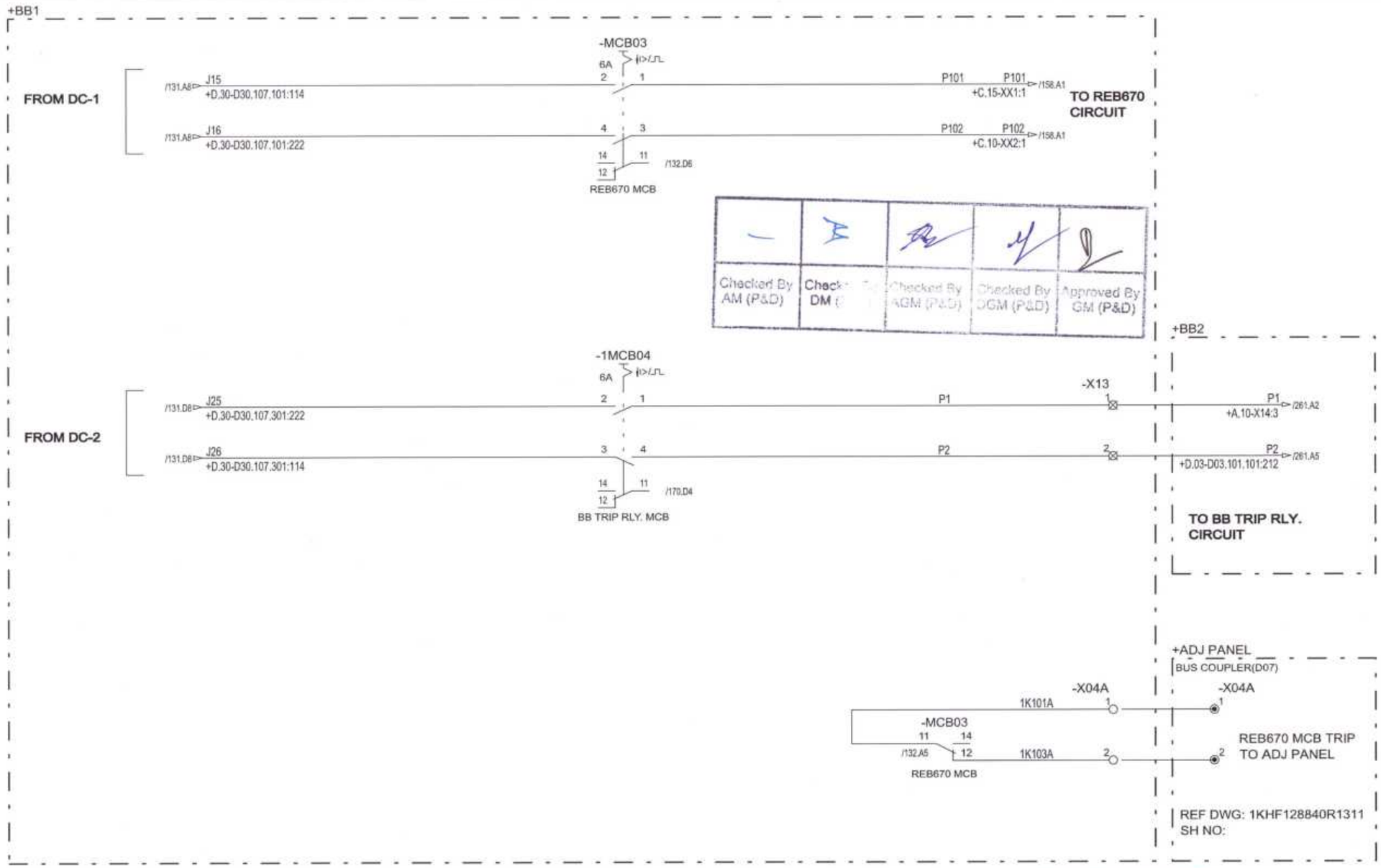
Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
DC DISTRIBUTION CIRCUIT

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram	Ref.Des.	=2R
DCC	EFS		
Resp. dept.	PG-GAS	Rev. ind.	01
Doc. no.	1KHF128840R1411	Language	en
		Sheet	131
		A sheet	132

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy



APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and all responsibilities design details, performance particulars of the equipment, compliance with the Indian Electricity Rules / IEC specifications as may be applicable nor does limit the AEGCL's right under the contract.

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

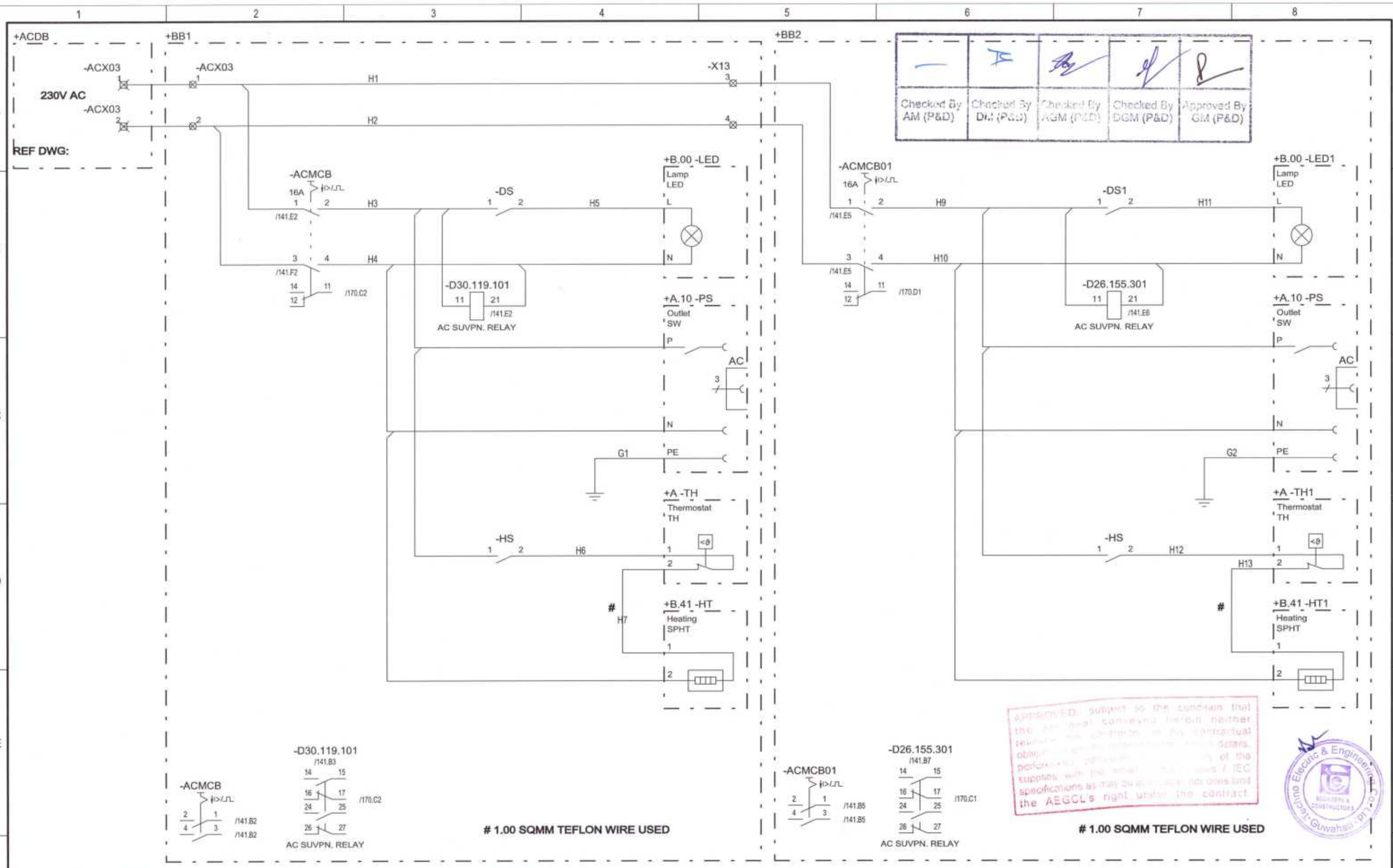
Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
DC DISTRIBUTION CIRCUIT

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram	Ref.Des.	=2R
	DCC EFS		
Resp. dept.	PG-GAS	Rev. ind.	01
Doc. no.	1KHF128840R1411	Language	en
		Sheet	132
		n. sheet	141

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy



Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

APPROVED subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations with regard to dates, performance, completeness of the supplies with the relevant IS / IEC specifications as may be applicable nor does limit the AEGCL's right under the contract.

Guwahati

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
AC DISTRIBUTION CIRCUIT

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram	Ref.Des.	=2R
	DCC EFS		
Resp. dept.	PG-GAS	Rev. ind. 01	Language en
Doc. no.	1KHF128840R1411	Sheet	141
		n. sheet	151

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

+D01-LCC

+BB1

-X660

-1BBX01

-D36.01

CT-T2 CORE-3
CT RATIO: 1600-800/1A
CL: PX

1	1	1B111	S3	R3 /158.A7	1B113	X401 1
5	3	1B131	S4	R4 /158.B7	1B133	X401 1
9	5	1B151	S5	R5 /158.B7	1B153	X401 1
13	7	1B171	S6	R6 /158.B7	1B173	

TS1-REB670

REF DWG: AEGCL-SONA-0816SN-VEN-2GIS-086, SH NO: 75

+D.08 -D08.01
R_PH BB PROTN_RLY_REB670
X401 1 (+) 2 (-)
3IE /175.A2
R-PH CURRENT
BAY-D01
1A CT: P40#AI.01

+D.15 -D15.01
Y_PH BB PROTN_RLY_REB670
X401 1 (+) 2 (-)
3IE
B-PH CURRENT
BAY-D01
1A CT: P40#AI.01

+D.22 -D22.01
B_PH BB PROTN_RLY_REB670_MAIN
X401 1 (+) 2 (-)
3IE
B-PH CURRENT
BAY-D01
1A CT: P40#AI.01

+D02-LCC

-X660

-2BBX01

-D36.01

CT-T2 CORE-3
CT RATIO: 1600-800/1A
CL: PX

1	1	2B111	S7	R7 /158.B7	2B113	X401 3
5	3	2B131	S8	R8 /158.B7	2B133	X401 3
9	5	2B151	S9	R9 /158.B7	2B153	X401 3
13	7	2B171	S10	R10 /158.B7	2B173	

TS1-REB670

REF DWG: AEGCL-SONA-0816SN-VEN-2GIS-086, SH NO: 76

+D.08 -D08.01
R_PH BB PROTN_RLY_REB670
X401 3 (+) 4 (-)
3IE /175.B2
R-PH CURRENT
BAY-D02
1A CT: P40#AI.02

+D.15 -D15.01
Y_PH BB PROTN_RLY_REB670
X401 3 (+) 4 (-)
3IE
Y-PH CURRENT
BAY-D02
1A CT: P40#AI.02

+D.22 -D22.01
B_PH BB PROTN_RLY_REB670_MAIN
X401 3 (+) 4 (-)
3IE
B-PH CURRENT
BAY-D02
1A CT: P40#AI.02

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and his responsibilities for details, performance particulars of [illegible] of the supplies with the Indian [illegible] laws / IEC specifications as may be applicable, nor does it limit the [illegible] rights under the contract.

Tata Electric Engineering Co. Ltd. ENGINEERS & CONTRACTORS

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
BAY-D01 & D02 CT INPUTS

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram	Ref.Des.	=2R
	DCC EFS		
Resp. dept.	PG-GAS	Rev. ind.	01
Doc. no.	1KHF128840R1411	Language	en
		Sheet	151
		n. sheet	152

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

+D03-LCC

+BB1

-X660

-3BBX01

-D36.02

CT-T2 CORE-3
CT RATIO: 1600-800/1A
CL: PX

REF DWG: AEGCL-SONA-0816SN-VEN-2GIS-086, SH NO: 74

1	1	3B111	S3	R3 /158.A8	3B113	+D.08 -D08.01 R_PH BB PROTN_RLY_REB670 X401 5
2						6
5	3	3B131	S4	R4 /158.B8	3B133	+D.15 -D15.01 Y_PH BB PROTN_RLY_REB670 X401 5
4						6
9	5	3B151	S5	R5 /158.B8	3B153	+D.22 -D22.01 B_PH BB PROTN_RLY_REB670_MAIN X401 5
6						6
13	7	3B171	S6	R6 /158.B8	3B173	
8						
9						

TS2-REB670

R-PH CURRENT	
BAY-D03	
1A CT:	P40#AI.03
/175.B2	

Y-PH CURRENT	
BAY-D03	
1A CT:	P40#AI.03

B-PH CURRENT	
BAY-D03	
1A CT:	P40#AI.03

+D04-LCC

-X660

-4BBX01

-D36.02

CT-T2 CORE-3
CT RATIO: 1600-800/1A
CL: PX

REF DWG: AEGCL-SONA-0816SN-VEN-2GIS-086, SH NO: 75

1	1	4B111	S7	R7 /158.B8	4B113	+D.08 -D08.01 R_PH BB PROTN_RLY_REB670 X401 7
2						8
2	3	4B131	S8	R8 /158.B8	4B133	+D.15 -D15.01 Y_PH BB PROTN_RLY_REB670 X401 7
4						8
3	5	4B151	S9	R9 /158.B8	4B153	+D.22 -D22.01 B_PH BB PROTN_RLY_REB670_MAIN X401 7
6						8
4	7	4B171	S10	R10 /158.B8	4B173	
8						
9						

TS2-REB670

R-PH CURRENT	
BAY-D04	
1A CT:	P40#AI.04
/175.B2	

Y-PH CURRENT	
BAY-D04	
1A CT:	P40#AI.04

B-PH CURRENT	
BAY-D04	
1A CT:	P40#AI.04

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and his responsibility for design details, performance particulars and compliance of the supplies with the Indian statutory laws / IEC specifications as may be applicable and does not absolve the AEGCL & / or their agents of any liability

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
BAY-D03 & D04 CT INPUTS

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram	Ref.Des.	=2R
	DCC EFS		
Resp. dept.	PG-GAS	Rev. ind.	01
Doc. no.	1KHF128840R1411	Language	en
		Sheet	152
		n. sheet	153

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

+D05-LCC

CT-T2 CORE-3
CT RATIO: 1600-800/1A
CL: PX

REF DWG: AEGCL-SONA-0816SN-VEN-2GIS-086, SH NO: 74

+BB1

-CTA

-5BBX01

-D36.03

3R	1	5B111	S3	R3 /158.C7	5B113	+D.08 -D08.01 R_PH BB PROTN_RLY_REB670 X401 9 / 10 — R-PH CURRENT, BAY-D05, 1A CT: P40#AI.05 /175.C2
3Y	3	5B131	S4	R4 /158.C7	5B133	+D.15 -D15.01 Y_PH BB PROTN_RLY_REB670 X401 9 / 10 — Y-PH CURRENT, BAY-D05, 1A CT: P40#AI.05
3B	5	5B151	S5	R5 /158.C7	5B153	+D.22 -D22.01 B_PH BB PROTN_RLY_REB670_MAIN X401 9 / 10 — B-PH CURRENT, BAY-D05, 1A CT: P40#AI.05
3N	7	5B171	S6	R6 /158.C7	5B173	

TS3-REB670

+D06-LCC

CT-T2 CORE-3
CT RATIO: 1600-800/1A
CL: PX

REF DWG: AEGCL-SONA-0816SN-VEN-2GIS-086, SH NO: 74

-CTA

-6BBX01

-D36.03

3R	1	6B111	S7	R7 /158.C7	6B113	+D.08 -D08.01 R_PH BB PROTN_RLY_REB670 X401 11 / 12 — R-PH CURRENT, BAY-D06, 1A CT: P40#AI.06 /175.C2
3Y	3	6B131	S8	R8 /158.C7	6B133	+D.15 -D15.01 Y_PH BB PROTN_RLY_REB670 X401 11 / 12 — Y-PH CURRENT, BAY-D06, 1A CT: P40#AI.06
3B	5	6B151	S9	R9 /158.C7	6B153	+D.22 -D22.01 B_PH BB PROTN_RLY_REB670_MAIN X401 11 / 12 — B-PH CURRENT, BAY-D06, 1A CT: P40#AI.06
3N	7	6B171	S10	R10 /158.C7	6B173	

TS3-REB670

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and his responsibilities about details, performance particulars and conformity of the supplies with the Indian Statutory laws / IEC specifications as may be applicable nor does limit the AEGCL's right under the contract.

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
BAY-D05 & D06 CT INPUTS

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram	Ref.Des.	=2R
DCC	EFS		
Resp. dept.	PG-GAS	Rev. ind.	01
Doc. no.	1KHF128840R1411	Language	en
		Sheet	153
		n. sheet	154

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

+D07-LCC

-X660

-7BBX01

CT-T2 CORE-3
CT RATIO: 3000-1600-800/1A
CL: PX

DWG REF:AEGCL-SONA-0816SN-VEN-2GIS-086, SH NO: 85

+BB1

1	1	7B111	S3	R3 /158.C8	7B113
5	3	7B131	S4	R4 /158.C8	7B133
9	5	7B151	S5	R5 /158.C8	7B153
13	7	7B171	S6	R6 /158.C8	7B173

-D36.04
TS4-REB670

+D.08 -D08.01
R_PH BB PROTN_RLY_REB670
X401 13(+) 14(-)
3IE /175.C2
R-PH CURRENT
BAY-D07
1A CT: P40#AI.07

+D.15 -D15.01
Y_PH BB PROTN_RLY_REB670
X401 13(+) 14(-)
3IE
Y-PH CURRENT
BAY-D07
1A CT: P40#AI.07

+D.22 -D22.01
B_PH BB PROTN_RLY_REB670_MAIN
X401 13(+) 14(-)
3IE
B-PH CURRENT
BAY-D07
1A CT: P40#AI.07

* Additional CT i/p from D07 to be included as per correction

+D08-LCC

-X660

-8BBX01

CT-T2 CORE-3
CT RATIO: 1600-800/1A
CL: PX

DWG REF:AEGCL-SONA-0816SN-VEN-2GIS-086, SH NO: 73

1	1	8B111	S7	R7 /158.C8	8B113
5	3	8B131	S8	R8 /158.C8	8B133
9	5	8B151	S9	R9 /158.C8	8B153
13	7	8B171	S10	R10 /158.C8	8B173

-D36.04
TS4-REB670

+D.08 -D08.01
R_PH BB PROTN_RLY_REB670
X401 15(+) 16(-)
3IE /175.D2
R-PH CURRENT
BAY-D08
1A CT: P40#AI.08

+D.15 -D15.01
Y_PH BB PROTN_RLY_REB670
X401 15(+) 16(-)
3IE
Y-PH CURRENT
BAY-D08
1A CT: P40#AI.08

+D.22 -D22.01
B_PH BB PROTN_RLY_REB670_MAIN
X401 15(+) 16(-)
3IE
B-PH CURRENT
BAY-D08
1A CT: P40#AI.08

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and his responsibilities design details, performance particulars of the supplies with the Indian Standards laws / IEC specifications as may be applicable nor does limit the AEGCL's right under the contract

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
BAY-D07 & D08 CT INPUTS

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram	Ref.Des.	=2R
	DCC EFS		
Resp. dept.	PG-GAS	Rev. ind.	01
Doc. no.	1KHF128840R1411	Language	en
		Sheet	154
		o. sheet	155

© Copyright 2023 Hitachi Energy

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

+D09-LCC

+BB1

-X660

-9BBX01

-D36.05

CT-T2 CORE-3
CT RATIO: 1600-800/1A
CL: PX

DWG REF:AEGCL-SONA-0816SN-VEN-2GIS-086, SH NO: 75

3R	1	9B111	S3	R3 /158.D7	9B113	+D.08 -D08.01 R_PH BB PROTN_RLY_REB670 X401 17	R-PH CURRENT, BAY-D09, 1A CT: P40#AI.09 /175.D2
	2					18	
3Y	3	9B131	S4	R4 /158.D7	9B133	+D.15 -D15.01 Y_PH BB PROTN_RLY_REB670 X401 17	Y-PH CURRENT, BAY-D09, 1A CT: P40#AI.09
	4					18	
3B	5	9B151	S5	R5 /158.D7	9B153	+D.22 -D22.01 B_PH BB PROTN_RLY_REB670_MAIN X401 17	B-PH CURRENT, BAY-D09, 1A CT: P40#AI.09
	6					18	
3N	7	9B171	S6	R6 /158.D7	9B173		
	8			TS5-REB670			
	9						

+D10(FUT. LINE-1)

-10BBX01

-D36.05

CT-T2 CORE-3
CT RATIO: 1600-800/1A
CL: PX

NOTE: DETAILS TO BE GIVEN BY CUSTOMER

**	1	10B111	S7	R7 /158.D7	10B113	+D.08 -D08.01 R_PH BB PROTN_RLY_REB670 X401 19	R-PH CURRENT, FUTURE LINE-1, 1A CT: P40#AI.10 /175.D2
	2					20	
**	3	10B131	S8	R8 /158.E7	10B133	+D.15 -D15.01 Y_PH BB PROTN_RLY_REB670 X401 19	Y-PH CURRENT, FUTURE LINE-1, 1A CT: P40#AI.10
	4					20	
**	5	10B151	S9	R9 /158.E7	10B153	+D.22 -D22.01 B_PH BB PROTN_RLY_REB670_MAIN X401 19	B-PH CURRENT, FUTURE LINE-1, 1A CT: P40#AI.10
	6					20	
**	7	10B171	S10	R10 /158.E7	10B173		
	8			TS5-REB670			
	9						

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and liabilities, such details, construction particulars etc. as necessary of the supplies with the Indian statutory laws / IEC specifications as may be applicable, but does limit the AEGCL's rights under the contract.

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

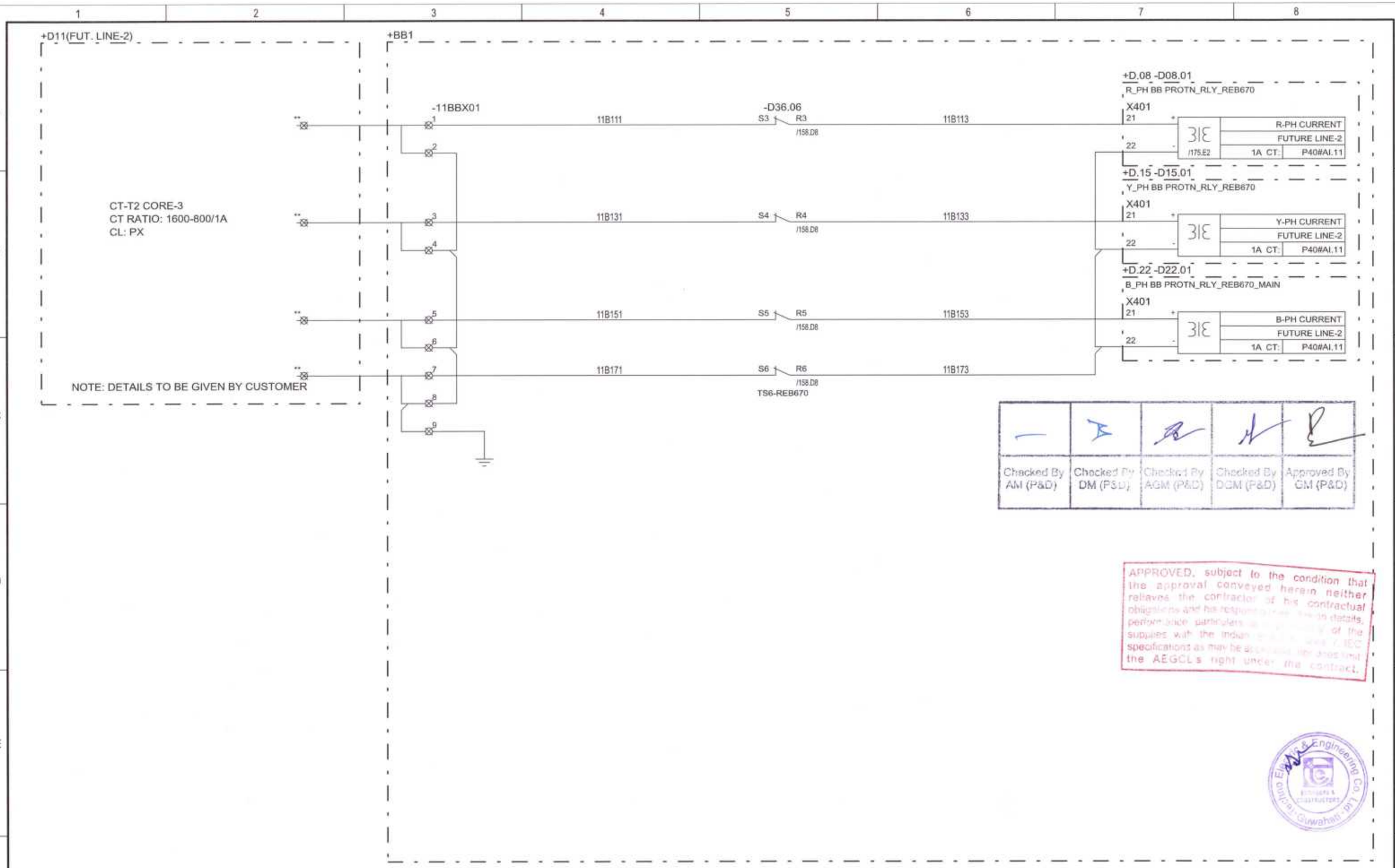
Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
BAY-D09 & D10 CT INPUTS

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram	Ref.Des.	=2R
	DCC EFS		
Resp. dept.	PG-GAS	Rev. ind.	01
Doc. no.	1KHF128840R1411	Language	en
		Sheet	155
		n.sheet	156

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy



Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
BAY-D11 CT INPUTS

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram	Ref.Des.	=2R
	DCC EFS		
Resp. dept.	PG-GAS	Rev. ind. 01	Language en
Doc. no.	1KHF128840R1411	Sheet	156
		n. sheet	158

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

+BB1

+D.08 -D08.01
R_PH BB PROTN_RLY_REB670

+B.05-MCB03:1 /132.A7 P101
+B.05-MCB03:3 /132.A7 P102

Power supply module
PSM

-XX1 1 P101A
-XX2 1 P102A
-X11 4 +
5 -
90-250VDC

G17 PE /158.B5

P101 /159.A3
P102 /159.A6

+D.08 -D08.01
Indication HMI
LED

1	ZONE-1 B/B OPTD.
2	ZONE-2 B/B OPTD.
3	BUS-1 LBB OPTD.
4	BUS-2 LBB OPTD.
5	B/B ZONE-1 BLOCKED
6	B/B ZONE-2 BLOCKED
7	Z-1 B/B OPEN CT ALARM
8	Z-2 B/B OPEN CT ALARM
9	MAIN-2 R-PH RELAY FAIL
10	
11	
12	
13	
14	
15	

O: Open
I: Closed
C: Cancel/Clear
E: Enter/Select/Execute
L/R: Local/Remote/off

+D.08 -D08.01
Power supply module
PSM
90-250VDC
1MRK002239-BB

-X11 4 +
5 -
/158.B2
90-250VDC
PE

-X11 2
3 /171.F2
1
REB670 RPH FAULTY
Relay ready

-D36.01 TS1-REB670
-D36.02 TS2-REB670
-D36.03 TS3-REB670
-D36.04 TS4-REB670
-D36.05 TS5-REB670
-D36.06 TS6-REB670

Test
Normal
S1 R1 /171.A2
S2 R2 /172.A2
S3 R3 /151.A5
S4 R4 /151.B5
S5 R5 /151.B5
S6 R6 /151.C5
S7 R7 /151.D5
S8 R8 /151.D5
S9 R9 /151.E5
S10 R10 /151.E5

Test
Normal
S1 R1 /171.B2
S2 R2 /172.B2
S3 R3 /152.A5
S4 R4 /152.B5
S5 R5 /152.B5
S6 R6 /152.C5
S7 R7 /152.D5
S8 R8 /152.D5
S9 R9 /152.E5
S10 R10 /152.E5

Test
Normal
S1 R1 /171.C2
S2 R2 /172.C2
S3 R3 /153.A5
S4 R4 /153.B5
S5 R5 /153.B5
S6 R6 /153.C5
S7 R7 /153.D5
S8 R8 /153.D5
S9 R9 /153.E5
S10 R10 /153.E5

Test
Normal
S1 R1 /171.C2
S2 R2 /172.C2
S3 R3 /154.A5
S4 R4 /154.B5
S5 R5 /154.B5
S6 R6 /154.C5
S7 R7 /154.D5
S8 R8 /154.D5
S9 R9 /154.E5
S10 R10 /154.E5

Test
Normal
S1 R1 /171.D2
S2 R2 /172.D2
S3 R3 /155.A5
S4 R4 /155.B5
S5 R5 /155.B5
S6 R6 /155.C5
S7 R7 /155.D5
S8 R8 /155.D5
S9 R9 /155.E5
S10 R10 /155.E5

Test
Normal
S1 R1 /171.E2
S2 R2 /172.E2
S3 R3 /156.A5
S4 R4 /156.B5
S5 R5 /156.B5
S6 R6 /156.C5
S7 R7
S8 R8
S9 R9
S10 R10

APPROVED, subject to the condition that this approval conveyed herein neither relieves the contractor of his contractual obligations and responsibility in details, performance particulars and conformity of the supplies with the Indian Statutory laws / IEC specifications as may be applicable, nor does limit the AEGCL's right under the contract.

LIST OF FUNCTIONS:

1. BUSBAR DIFFERENTIAL (87BB)
2. BREAKER FAILURE PROTECTION (50BF)
3. END FAULT PROTECTION

* SCADA (PRP) Ports to be Shown

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
REB670-RPH PROTN. PSM

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram	Ref.Des.	=2R
	DCC EFS		
Resp. dept.	PG-GAS	Rev. ind.	01
Doc. no.	1KHF128840R1411	Language	en
		Sheet	158
		n. sheet	159

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

+BB1

+D01-LCC
BAY-D01 LCC PANEL

COMMON +VE -LCCX04

-X352 60	Q1 ISOL OPEN	-X352 61	2	-IXX1 1
-X352 64	Q1 ISOL CLOSE	-X352 65	3	-IXX1 2
-X352 77	Q2 ISOL OPEN	-X352 78	4	-IXX1 3
-X352 83	Q2 ISOL CLOSE	-X352 84	5	-IXX1 4
-X17LA 43	Q0CB R-PH OPEN	-X17LA 44	6	-IXX1 5

+D01AA
BAY-D01 LINE

+VE -1BBX04A

**	1		
**	2	CB MANUAL CLOSE COMMAND (BCU)	-IXX1 6
**	3	LBB 3-PH INITIATION FROM D01 BAY	-IXX1 7
**	4	LBB R-PH INITIATION FROM D01 BAY	

REF DWG: 1KHF128840R1111,SH NO: ***

+C.15-XX1:1 /158.B1 P101

+C.10-XX2:1 /158.B1 P102

+D.08 -D08.01
R_PH BB PROTN_RLY_REB670

-XX2

P103A	X31 1	2	/175.A4	Q1 ISOL OPEN BAY-D01	220-250VDC P3#BI.01
P105A	X31 3	4	/175.B4	Q1 ISOL CLOSE BAY-D01	220-250VDC P3#BI.02
P107A	X31 5	6	/175.B4	Q2 ISOL OPEN BAY-D01	220-250VDC P3#BI.03
P109A	X31 7	8	/175.B4	Q2 ISOL CLOSE BAY-D01	220-250VDC P3#BI.04
P111A	X31 9	10	/175.C4	Q0CB R-PH OPEN BAY-D01	220-250VDC P3#BI.05
P113A	X31 11	12	/175.C4	Q0 CB MANUAL CLOSE FROM BAY-D01	220-250VDC P3#BI.06
	X31 13	14	/175.C4	LBB 3-PH INITIATION FROM BAY-D01	220-250VDC P3#BI.07
P117A	X31 15	16	/175.D4	LBB R-PH INITIATION FROM BAY-D01	220-250VDC P3#BI.08

+D.15-D15.01:1 (X31) P103A /182.A4
+D.15-D15.01:3 (X31) P105A /182.B4
+D.15-D15.01:5 (X31) P107A /182.B4
+D.15-D15.01:7 (X31) P109A /182.C4
+D.15-D15.01:11 (X31) P113A /182.D4
+D.15-D15.01:13 (X31) P115A /182.D4

+D.22-D22.01:13 (X31) P115A /212.D4
+D.22-D22.01:11 (X31) P113A /212.D4
+D.22-D22.01:7 (X31) P109A /212.C4
+D.22-D22.01:5 (X31) P107A /212.B4
+D.22-D22.01:3 (X31) P105A /212.B4
+D.22-D22.01:1 (X31) P103A /212.A4

P101 /160.A3
P102 /160.A6

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations nor he responsible for details, deficiencies, particulars etc. in conformity of the supplies with the Indian Statutory laws / IEC specifications as may be applicable, nor does limit AEGCL's right under the contract.

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

Title: 220kV CONTROL & RELAY PANEL 220kV BUSBAR REB670-RPH BINARY INPUTS

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram	Ref.Des.	=2R
DCC	EFS		
Resp. dept.	PG-GAS	Rev. ind.	01
Doc. no.	1KHF128840R1411	Language	en
		Sheet	159
		n. sheet	160

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

+BB1

+D02-LCC
BAY-D02 LCC PANEL

COMMON +VE — -LCCX04:7 — +A,15-1BBX04A:1 <159.E3 P101

-X352:60	Q1 ISOL OPEN	-X352:61	-LCCX04:8	-IXX1:8	P119A
-X352:66	Q1 ISOL CLOSE	-X352:67	-LCCX04:9	-IXX1:9	P121A
-X352:79	Q2 ISOL OPEN	-X352:80	-LCCX04:10	-IXX1:10	P123A
-X352:85	Q2 ISOL CLOSE	-X352:86	-LCCX04:11	-IXX1:11	P125A
-X17LA:43	Q0CB R-PH OPEN	-X17LA:44	-LCCX04:12	-IXX1:12	P127A

+D02AA
BAY-D02 LINE

+VE	**		-2BBX04A:1		
	**		-2BBX04A:2	-IXX1:13	P129A
CB MANUAL CLOSE COMMAND (BCU)	**				
LBB 3-PH INITIATION FROM D02 BAY	**		-2BBX04A:3	-IXX1:14	
LBB R-PH INITIATION FROM D02 BAY	**		-2BBX04A:4		P133A

REF DWG: 1KHF129883R1111, SH NO: ***

+A,10-LCCX04:13 /161.A3 <> P101

/163.A4 <> +D,15-D15.01:11 (X32) P119A
/163.B4 <> +D,15-D15.01:3 (X32) P121A
/163.B4 <> +D,15-D15.01:5 (X32) P123A
/163.C4 <> +D,15-D15.01:7 (X32) P125A
/163.D4 <> +D,15-D15.01:11 (X32) P129A
/163.D4 <> +D,15-D15.01:13 (X32) P131A

/213.D4 <> +D,22-D22.01:13 (X32) P131A
/213.D4 <> +D,22-D22.01:11 (X32) P129A
/213.C4 <> +D,22-D22.01:7 (X32) P125A
/213.B4 <> +D,22-D22.01:5 (X32) P123A
/213.B4 <> +D,22-D22.01:3 (X32) P121A
/213.A4 <> +D,22-D22.01:1 (X32) P119A

/161.A6 <> +C,10-XX2:4 P102

+C,10-XX2:2 <159.E7 P102

+D,08 -D08.01
R_PH BB PROTN_RLY_REB670

-XX2:3

X32:1	/175.A7	Q1 ISOL OPEN	BAY-D02	220-250VDC	P3#BI.09
X32:3	/175.B7	Q1 ISOL CLOSE	BAY-D02	220-250VDC	P3#BI.10
X32:5	/175.B7	Q2 ISOL OPEN	BAY-D02	220-250VDC	P3#BI.11
X32:7	/175.B7	Q2 ISOL CLOSE	BAY-D02	220-250VDC	P3#BI.12
X32:9	/175.C7	Q0CB R-PH OPEN	BAY-D02	220-250VDC	P3#BI.13
X32:11	/175.C7	Q0 CB MANUAL CLOSE	FROM BAY-D02	220-250VDC	P3#BI.14
X32:13	/175.C7	LBB 3-PH INITIATION	FROM BAY-D02	220-250VDC	P3#BI.15
X32:15	/175.D7	LBB R-PH INITIATION	FROM BAY-D02	220-250VDC	P3#BI.16

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and the responsibility to design details, performance parameters, etc. necessary to meet the specifications as may be applicable, nor does it limit the ACCCL's right under the contract.

Rev.	Revision note	Date	Name
	Based on		
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK

1MYN691003-102(A3)REV01

Prepared 08-08-2025 DIVYA S
Approved 08-08-2025 THEJASWINI AR
Project ASSAM ELECTRICITY GRID CORPORATION LTD
400/220kV GIS SS AT SONAPUR
128840

Title 220kV CONTROL & RELAY PANEL
220kV BUSBAR
REB670-RPH BINARY INPUTS

HITACHI Hitachi Energy India Limited

Doc. kind. Circuit diagram
DCC EFS
Resp. dept. PG-GAS
Doc. no. 1KHF128840R1411

Ref.Des. =2R
Rev. ind. 01
Language en
Sheet 160
n. sheet 161

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

+BB1

+D03-LCC
BAY-D03 LCC PANEL

COMMON +VE — -LCCX04 13 — +A,16-2BBX04A:1 <=/160.E3 P101

-X352 60	Q1 ISOL OPEN	-X352 61	-LCCX04 14	-IXX1 15	P103B	-XX2 4
-X352 66	Q1 ISOL CLOSE	-X352 67	-LCCX04 15	-IXX1 16	P105B	-XX2 4
-X352 79	Q2 ISOL OPEN	-X352 80	-LCCX04 16	-IXX1 17	P107B	-XX2 4
-X352 85	Q2 ISOL CLOSE	-X352 86	-LCCX04 17	-IXX1 18	P109B	-XX2 4
-X17LA 43	Q0CB R-PH OPEN	-X17LA 44	-LCCX04 18	-IXX1 19	P111B	-XX2 4

+D03AA
BAY-D03 LINE

+VE ** — -3BBX04A 1 — 2 — -IXX1 20 — P113B — -XX2 4

CB MANUAL CLOSE COMMAND (BCU) **

LBB 3-PH INITIATION FROM D03 BAY ** — 3 — -IXX1 21 — P115B — -XX2 4

LBB R-PH INITIATION FROM D03 BAY ** — 4 — P117B — -XX2 4

REF DWG: 1KHF129883R1111, SH NO: ***

+A,10-LCCX04:19 <=/162.A3 P101

+C,10-XX2:3 <=/160.E6 P102

+C,10-XX2:5 <=/162.A6 P102

+D,15-D15,01:1 (X51) <=/184.A4 P103B
+D,15-D15,01:3 (X51) <=/184.B4 P105B
+D,15-D15,01:5 (X51) <=/184.B4 P107B
+D,15-D15,01:7 (X51) <=/184.C4 P109B
+D,15-D15,01:11 (X51) <=/184.D4 P113B
+D,15-D15,01:13 (X51) <=/184.D4 P115B

P115B => +D,22-D22,01:11 (X51) /214.D4 P113B
+D,22-D22,01:7 (X51) /214.C4 P109B
+D,22-D22,01:5 (X51) /214.B4 P107B
+D,22-D22,01:3 (X51) /214.B4 P105B
+D,22-D22,01:1 (X51) /214.A4 P103B

+D,08-D08,01
R_PH BB PROTN_RLY_REB670

X51 1	2	/176.A6	Q1 ISOL OPEN BAY-D03	220-250VDC	P5#BI.01
X51 3	4	/176.B6	Q1 ISOL CLOSE BAY-D03	220-250VDC	P5#BI.02
X51 5	6	/176.B6	Q2 ISOL OPEN BAY-D03	220-250VDC	P5#BI.03
X51 7	8	/176.B6	Q2 ISOL CLOSE BAY-D03	220-250VDC	P5#BI.04
X51 9	10	/176.C6	Q0CB R-PH OPEN BAY-D03	220-250VDC	P5#BI.05
X51 11	12	/176.C6	Q0 CB MANUAL CLOSE FROM BAY-D03	220-250VDC	P5#BI.06
X51 13	14	/176.C6	LBB 3-PH INITIATION FROM BAY-D03	220-250VDC	P5#BI.07
X51 15	16	/176.D6	LBB R-PH INITIATION FROM BAY-D03	220-250VDC	P5#BI.08

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of any commitment, contract or liability in respect of performance parameters and warranty of supplies with the latest version of the specifications as may be applicable or does not limit the AEGCL's right under the contract.

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared 08-08-2025 DIVYA S
Approved 08-08-2025 THEJASWINI AR
Project ASSAM ELECTRICITY GRID CORPORATION LTD
400/220kV GIS SS AT SONAPUR
128840

Title 220kV CONTROL & RELAY PANEL
220kV BUSBAR
REB670-RPH BINARY INPUTS

HITACHI Hitachi Energy India Limited

Doc. kind. Circuit diagram
DCC EFS
Resp. dept. PG-GAS
Doc. no. 1KHF128840R1411

Ref.Des. =2R
Rev. ind. 01
Language en
Sheet 161
n. sheet 162

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

+BB1

+D04-LCC
BAY-D04 LCC PANEL

COMMON +VE — -LCCX04 19 — +A.45-3BBX04A:1 <161.E3 P101

-X352 60	Q1 ISOL OPEN	-X352 61	-LCCX04 20	-IXX1 22	P119B	-XX2 5
-X352 64	Q1ISOL CLOSE	-X352 65	-LCCX04 21	-IXX1 23	P121B	-XX2 5
-X352 77	Q2 ISOL OPEN	-X352 78	-LCCX04 22	-IXX1 24	P123B	-XX2 5
-X352 83	Q2 ISOL CLOSE	-X352 84	-LCCX04 23	-IXX1 25	P125B	-XX2 5
-X17LA 43	Q0CB R-PH OPEN	-X17LA 44	-LCCX04 24	-IXX1 26	P127B	-XX2 5

+D04AA
BAY-D04 LINE

+VE	**	-4BBX04A 1				
	**	-4BBX04A 2		-IXX1 27	P129B	-XX2 5
CB MANUAL CLOSE COMMAND (BCU)	**	-4BBX04A 3		-IXX1 28		
LBB 3-PH INITIATION FROM D04 BAY	**	-4BBX04A 4			P133B	-XX2 5
LBB R-PH INITIATION FROM D04 BAY						

REF DWG: 1KHF129883R1111, SH NO: ***

+A.10-LCCX04:25 P101 /163.A3 <

+0.15-D15.01:1 (X52) P119B /165.A4 <
+0.15-D15.01:3 (X52) P121B /165.B4 <
+0.15-D15.01:5 (X52) P123B /165.B4 <
+0.15-D15.01:7 (X52) P125B /165.C4 <
+0.15-D15.01:11 (X52) P129B /165.D4 <
+0.15-D15.01:13 (X52) P131B /165.D4 <

+0.22-D22.01:13 (X52) P131B /215.D4 <
+0.22-D22.01:11 (X52) P129B /215.D4 <
+0.22-D22.01:7 (X52) P125B /215.C4 <
+0.22-D22.01:5 (X52) P123B /215.B4 <
+0.22-D22.01:3 (X52) P121B /215.B4 <
+0.22-D22.01:1 (X52) P119B /215.A4 <

+C.10-XX2:6 P102 /163.A6 <

+C.10-XX2:4 P102 /161.E5 <

+D.08 -D08.01
R_PH BB PROTN_RLY_REB670

X52 1	Q1 ISOL OPEN	BAY-D04	/176.A8	220-250VDC	P5#BI.09
X52 3	Q1ISOL CLOSE	BAY-D04	/176.B8	220-250VDC	P5#BI.10
X52 5	Q2 ISOL OPEN	BAY-D04	/176.B8	220-250VDC	P5#BI.11
X52 7	Q2 ISOL CLOSE	BAY-D04	/176.B8	220-250VDC	P5#BI.12
X52 9	Q0CB R-PH OPEN	BAY-D04	/176.C8	220-250VDC	P5#BI.13
X52 11	Q0 CB MANUAL CLOSE	FROM BAY-D04	/176.C8	220-250VDC	P5#BI.14
X52 13	LBB 3-PH INITIATION	FROM BAY-D04	/176.C8	220-250VDC	P5#BI.15
X52 15	LBB R-PH INITIATION	FROM BAY-D04	/176.D8	220-250VDC	P5#BI.16

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

SUPPLIED subject to the contract. The detailed terms, conditions and specifications as may be applicable for goods and supplies will be those specified in the contract between the AEGCL and the contract

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared 08-08-2025 DIVYA S
Approved 08-08-2025 THEJASWINI AR
Project ASSAM ELECTRICITY GRID CORPORATION LTD
400/220kV GIS SS AT SONAPUR
128840

Title 220kV CONTROL & RELAY PANEL
220kV BUSBAR
REB670-RPH BINARY INPUTS

HITACHI Hitachi Energy India Limited

Doc. kind. Circuit diagram
DCC EFS
Resp. dept. PG-GAS
Rev. ind. 01
Doc. no. 1KHF128840R1411

Ref.Des. =2R
Language en
Sheet 162
n. sheet 163

© Copyright 2023 Hitachi Energy

Checked By AM (P&D)	Checked By DM (P&C)	Checked By ADM (P&C)	Checked By DGM (P&C)	Approved By GM (P&D)

+BB1

+D05-LCC
BAY-D05 LCC PANEL

COMMON +VE — -LCCX04 25 — +A.J5-4BBX04A-1 /162.E3 P101

-X352 60	Q1 ISOL OPEN	-X352 61	-LCCX04 26	-IXX1 29	P103C
-X352 66	Q1 ISOL CLOSE	-X352 67	-LCCX04 27	-IXX1 30	P105C
-X352 79	Q2 ISOL OPEN	-X352 80	-LCCX04 28	-IXX1 31	P107C
-X352 85	Q2 ISOL CLOSE	-X352 86	-LCCX04 29	-IXX1 32	P109C
-X17LA 43	Q0CB R-PH OPEN	-X17LA 44	-LCCX04 30	-IXX1 33	P111C

+D05AA
BAY-D05 LINE

+VE ** — -5BBX04A 1 — 2 — -IXX1 34 — P113C

CB MANUAL CLOSE COMMAND (BCU) **

LBB 3-PH INITIATION FROM D05 BAY ** — 3 — -IXX1 35

LBB R-PH INITIATION FROM D05 BAY ** — 4 — P117C

REF DWG: 1KHF129883R1111, SH NO: ***

+C.10-XX2:5 /162.E6 P102 — -XX2 6

+D.08 -D08.01
R_PH BB PROTN_RLY_REB670

X71 1	Q1 ISOL OPEN	BAY-D05	220-250VDC	P7#BI.01	/177.A2
X71 3	Q1 ISOL CLOSE	BAY-D05	220-250VDC	P7#BI.02	/177.B2
X71 5	Q2 ISOL OPEN	BAY-D05	220-250VDC	P7#BI.03	/177.B2
X71 7	Q2 ISOL CLOSE	BAY-D05	220-250VDC	P7#BI.04	/177.B2
X71 9	Q0CB R-PH OPEN	BAY-D05	220-250VDC	P7#BI.05	/177.C2
X71 11	Q0 CB MANUAL CLOSE	FROM BAY-D05	220-250VDC	P7#BI.06	/177.C2
X71 13	LBB 3-PH INITIATION	FROM BAY-D05	220-250VDC	P7#BI.07	/177.C2
X71 15	LBB R-PH INITIATION	FROM BAY-D05	220-250VDC	P7#BI.08	/177.D2

+A.10-LCCX04:31 /164.A3 P101

+D.15-D15.01:1 (X71) /186.A4 P103C
+D.15-D15.01:3 (X71) /186.B4 P105C
+D.15-D15.01:5 (X71) /186.B4 P107C
+D.15-D15.01:7 (X71) /186.C4 P109C
+D.15-D15.01:11 (X71) /186.D4 P113C
+D.15-D15.01:13 (X71) /186.D4 P115C

+D.22-D22.01:13 (X71) /216.D4 P115C
+D.22-D22.01:11 (X71) /216.D4 P113C
+D.22-D22.01:7 (X71) /216.C4 P109C
+D.22-D22.01:5 (X71) /216.B4 P107C
+D.22-D22.01:3 (X71) /216.B4 P105C
+D.22-D22.01:1 (X71) /216.A4 P103C

+C.10-XX2:7 /164.A6 P102

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations nor authorizes any deviations, omissions with the drawings, specifications as may be approved by the AEGCL's right under the contract.

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

Prepared 08-08-2025 DIVYA S
Approved 08-08-2025 THEJASWINI AR
Project ASSAM ELECTRICITY GRID CORPORATION LTD
400/220kV GIS SS AT SONAPUR
128840

Title 220kV CONTROL & RELAY PANEL
220kV BUSBAR
REB670-RPH BINARY INPUTS

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram	Ref.Des.	=2R
	DCC EFS		
Resp. dept.	PG-GAS	Rev. ind.	01
Doc. no.	1KHF128840R1411	Language	en
		Sheet	163
		n sheet	164

1MYN691003-102(A3)REV01

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

+BB1

+D06-LCC
BAY-D06 LCC PANEL

COMMON +VE

-LCCX04

-X352 60	Q1 ISOL OPEN	-X352 61	32	-IXX1 36
-X352 66	Q1 ISOL CLOSE	-X352 67	33	37
-X352 79	Q2 ISOL OPEN	-X352 80	34	38
-X352 85	Q2 ISOL CLOSE	-X352 86	35	39
-X17LA 43	Q0CB R-PH OPEN	-X17LA 44	36	40

+D06AA
BAY-D06 LINE

+VE ** -6BBX04A 1

**	CB MANUAL CLOSE COMMAND (BCU)	2	41
**	LBB 3-PH INITIATION FROM D06 BAY	3	42
**	LBB R-PH INITIATION FROM D06 BAY	4	

REF DWG: 1KHF129883R1111, SH NO: ***

+A.A6-5BBX04A:1 /163.E3 P101

+A.10-LCCX04:37 /165.A3 P101

+C.10-XX2:6 /163.E6 P102

+C.10-XX2:8 /165.A6 P102

-XX2 7

P119C P121C P123C P125C P127C P129C P133C

+D.15-D15.01:1 (X72) /187.A4 P119C
+D.15-D15.01:3 (X72) /187.B4 P121C
+D.15-D15.01:5 (X72) /187.B4 P123C
+D.15-D15.01:7 (X72) /187.C4 P125C
+D.15-D15.01:11 (X72) /187.D4 P129C
+D.15-D15.01:13 (X72) /187.D4 P131C

+D.22-D22.01:13 (X72) /217.D4 P131C
+D.22-D22.01:11 (X72) /217.D4 P129C
+D.22-D22.01:7 (X72) /217.C4 P125C
+D.22-D22.01:5 (X72) /217.B4 P123C
+D.22-D22.01:3 (X72) /217.B4 P121C
+D.22-D22.01:1 (X72) /217.A4 P119C

+D.08 -D08.01
R_PH BB PROTN_RLY_REB670

X72 1	/177.A4	Q1 ISOL OPEN	BAY-D06	220-250VDC	P7#BI.09
X72 3	/177.B4	Q1 ISOL CLOSE	BAY-D06	220-250VDC	P7#BI.10
X72 5	/177.B4	Q2 ISOL OPEN	BAY-D06	220-250VDC	P7#BI.11
X72 7	/177.B4	Q2 ISOL CLOSE	BAY-D06	220-250VDC	P7#BI.12
X72 9	/177.C4	Q0CB R-PH OPEN	BAY-D06	220-250VDC	P7#BI.13
X72 11	/177.C4	Q0 CB MANUAL CLOSE	FROM BAY-D06	220-250VDC	P7#BI.14
X72 13	/177.C4	LBB R-PH INITIATION	FROM BAY-D06	220-250VDC	P7#BI.15
X72 15	/177.D4	LBB 3-PH INITIATION	FROM BAY-D06	220-250VDC	P7#BI.16

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligation to deliver the goods of the desirable performance pursuant to the terms of the supplies with the intended [illegible] specifications as may be applicable and does not limit the AEGCL's right under the contract.

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

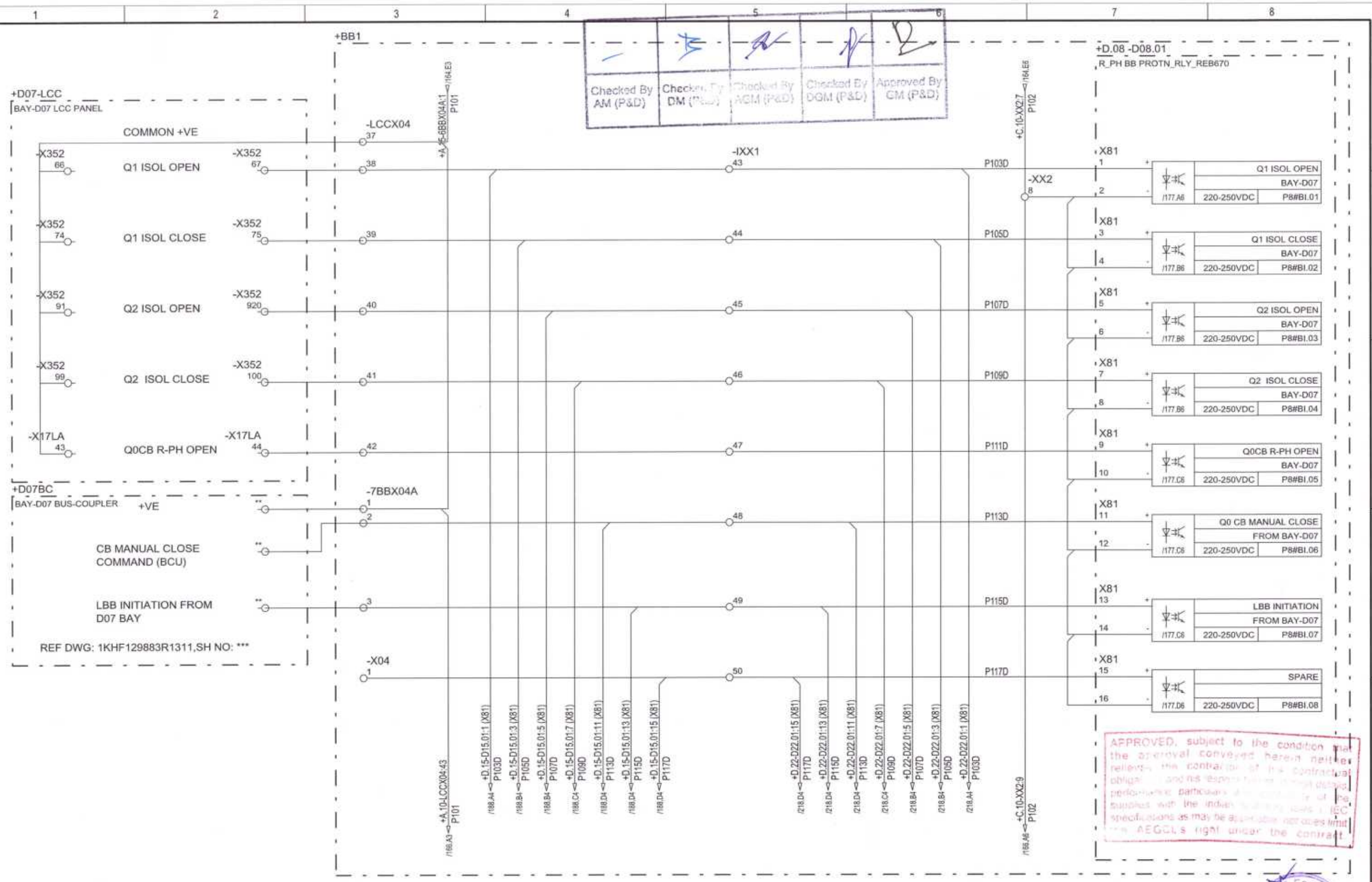
Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
REB670-RPH BINARY INPUTS

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram	Ref.Des.	=2R
DCC	EFS		
Resp. dept.	PG-GAS	Rev. ind.	01
Doc. no.	1KHF128840R1411	Language	en
		Sheet	164
		n. sheet	165

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy



Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

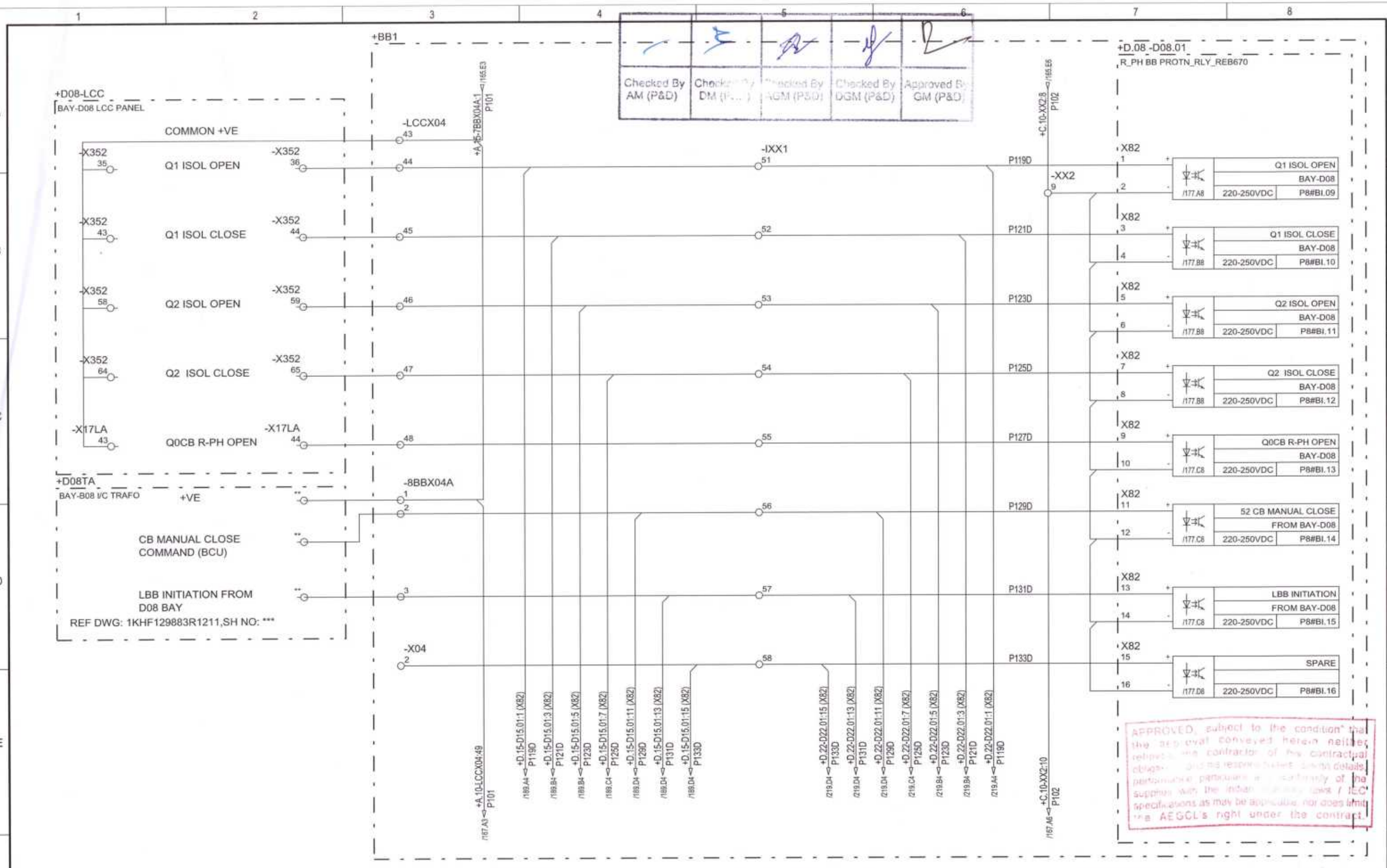
Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
REB670-RPH BINARY INPUTS

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram	Ref.Des.	=2R
	DCC EFS		
Resp. dept.	PG-GAS	Rev. ind.	01
Doc. no.	1KHF128840R1411	Language	en
		Sheet	165
		n. sheet	166

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy



Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
REB670-RPH BINARY INPUTS

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram	Ref.Des.	=2R
	DCC EFS		
Resp. dept.	PG-GAS	Rev. ind.	01
Doc. no.	1KHF128840R1411	Language	en
		Sheet	166
		n. sheet	167

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)
—				

+BB1

+D09-LCC
BAY-D09 LCC PANEL

COMMON +VE

-LCCX04

-X352 35	Q1 ISOL OPEN	-X352 36	49	50	-IXX1 59
-X352 43	Q1 ISOL CLOSE	-X352 44	51		60
-X352 60	Q2 ISOL OPEN	-X352 61	52		61
-X352 66	Q2 ISOL CLOSE	-X352 67	53		62
-X17LA 43	Q0CB R-PH OPEN	-X17LA 44	54		63

+D09TA
BAY-D09 TRAFO

+VE — -9BBX04A 1

CB MANUAL CLOSE COMMAND (BCU) — 2 — 64

LBB INITIATION FROM D09 BAY — 3 — 65

REF DWG: 1KHF129883R1211,SH NO: ***

-X04 3 — 66

+A,15-8BBX04A:1 /166.E3 P101

+A,10-LCCX04:55 /168.A3 P101

+D,15-D15.01:1 (X91) /190.A4 P103E
+D,15-D15.01:3 (X91) /190.B4 P105E
+D,15-D15.01:5 (X91) /190.B4 P107E
+D,15-D15.01:7 (X91) /190.C4 P109E
+D,15-D15.01:11 (X91) /190.D4 P113E
+D,15-D15.01:13 (X91) /190.D4 P115E
+D,15-D15.01:15 (X91) /190.D4 P117E

+D,22-D22.01:15 (X91) /220.D4 P117E
+D,22-D22.01:13 (X91) /220.D4 P115E
+D,22-D22.01:11 (X91) /220.D4 P113E
+D,22-D22.01:7 (X91) /220.C4 P109E
+D,22-D22.01:5 (X91) /220.B4 P107E
+D,22-D22.01:3 (X91) /220.B4 P105E
+D,22-D22.01:1 (X91) /220.A4 P103E

+C,10-XX2:11 /168.A6 P102

+C,10-XX2:9 /168.E6 P102

P103E P105E P107E P109E P111E P113E P115E P117E

-XX2 10

+D.08 -D08.01
R_PH BB PROTN_RLY_REB670

X91 1	Q1 ISOL OPEN	BAY-D09	/178.A2	220-250VDC	P9#BI.01
X91 3	Q1 ISOL CLOSE	BAY-D09	/178.B2	220-250VDC	P9#BI.02
X91 5	Q2 ISOL OPEN	BAY-D09	/178.B2	220-250VDC	P9#BI.03
X91 7	Q2 ISOL CLOSE	BAY-D09	/178.B2	220-250VDC	P9#BI.04
X91 9	Q0CB R-PH OPEN	BAY-D09	/178.C2	220-250VDC	P9#BI.05
X91 11	52 CB MANUAL CLOSE	FROM BAY-D09	/178.C2	220-250VDC	P9#BI.06
X91 13	LBB INITIATION	FROM BAY-D09	/178.C2	220-250VDC	P9#BI.07
X91 15	SPARE		/178.D2	220-250VDC	P9#BI.08

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and the responsibilities for details, performance particulars and conformity of the supplies with the applicable [illegible] specifications as may be specified, nor does it limit the AEGCL's right under the contract.

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared 08-08-2025 DIVYA S
Approved 08-08-2025 THEJASWINI AR
Project ASSAM ELECTRICITY GRID CORPORATION LTD
400/220kV GIS SS AT SONAPUR
128840

Title 220kV CONTROL & RELAY PANEL
220kV BUSBAR
REB670-RPH BINARY INPUTS

HITACHI Hitachi Energy India Limited

Doc. kind. Circuit diagram
DCC EFS
Ref.Des. =2R
Resp. dept. PG-GAS
Rev. ind. 01
Language en
Doc. no. 1KHF128840R1411
Sheet 167
n. sheet 168

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

+BB1

+FUT. LINE-1

COMMON +VE — -LCCX04 55

Q1 ISOL OPEN — 56 — -IXX1 67 — P119E — -XX2 11

Q1 ISOL CLOSE — 57 — 68 — P121E

Q2 ISOL OPEN — 58 — 69 — P123E

Q2 ISOL CLOSE — 59 — 70 — P125E

Q0CB R-PH OPEN — 60 — 71 — P127E

+FUT. LINE-1(AA)
BAY-D10(FUT. LINE-1)

+VE — -10BBX04A 1, 2 — 72 — P129E

CB MANUAL CLOSE COMMAND (BCU) — 3 — 73

LBB 3-PH INITIATION FROM FUT. LINE-1BAY

LBB R-PH INITIATION FROM FUT. LINE-1BAY — 4 — P133E

REF DWG: 1KHF129883R1213,SH NO: ***

+A,16-9BBX04A:1 <167.E3 P101

+A,10-LCCX04:61 /169.A3 P101

+C,10-XX2:10 <167.E5 P102

+C,10-XX2:12 /169.A6 P102

/192.A4 <+D,15-D15,01:1 (X92) P119E
/192.B4 <+D,15-D15,01:3 (X92) P121E
/192.B4 <+D,15-D15,01:5 (X92) P123E
/192.C4 <+D,15-D15,01:7 (X92) P125E
/192.D4 <+D,15-D15,01:11 (X92) P129E
/192.D4 <+D,15-D15,01:13 (X92) P131E

/221.D4 <+D,22-D22,01:13 (X92) P131E
/221.D4 <+D,22-D22,01:11 (X92) P129E
/221.C4 <+D,22-D22,01:7 (X92) P125E
/221.B4 <+D,22-D22,01:5 (X92) P123E
/221.B4 <+D,22-D22,01:3 (X92) P121E
/221.A4 <+D,22-D22,01:1 (X92) P119E

+D,08 -D08,01
R_PH BB PROTN_RLY_REB670

X92 1	/178.A4	Q1 ISOL OPEN	BAY-210	220-250VDC P9#BI.09
X92 2				
X92 3	/178.B4	Q1 ISOL CLOSE	FUT. LINE-1	220-250VDC P9#BI.10
X92 4				
X92 5	/178.B4	Q2 ISOL OPEN	FUT. LINE-1	220-250VDC P9#BI.11
X92 6				
X92 7	/178.B4	Q2 ISOL CLOSE	FUT. LINE-1	220-250VDC P9#BI.12
X92 8				
X92 9	/178.C4	Q0CB R-PH OPEN	FUT. LINE-1	220-250VDC P9#BI.13
X92 10				
X92 11	/178.C4	Q0 CB MANUAL CLOSE	FUT. LINE-1	220-250VDC P9#BI.14
X92 12				
X92 13	/178.C4	LBB 3-PH INITIATION	FUT. LINE-1	220-250VDC P9#BI.15
X92 14				
X92 15	/178.D4	LBB R-PH INITIATION	FUT. LINE-1	220-250VDC P9#BI.16
X92 16				

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations nor the purchaser of any rights under particulars supplied by the supplier with the Indian Statutory rules / IEC specifications as may be applicable but does limit the AEGCL's right under the contract

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared 08-08-2025 DIVYA S
Approved 08-08-2025 THEJASWINI AR
Project ASSAM ELECTRICITY GRID CORPORATION LTD
400/220kV GIS SS AT SONAPUR
128840

Title 220kV CONTROL & RELAY PANEL
220kV BUSBAR
REB670-RPH BINARY INPUTS

HITACHI Hitachi Energy India Limited

Doc. kind. Circuit diagram
DCC EFS
Resp. dept. PG-GAS
Doc. no. 1KHF128840R1411

Ref.Des. =2R
Rev. ind. 01
Language en
Sheet 168
n. sheet 169

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

+BB1

+FUT. LINE-2

COMMON +VE — -LCCX04 61 — +A1.1-10BBX04A:1 /168.E3 P101

Q1 ISOL OPEN — 62 — -IXX1 74 — P103F — -XX2 12 — X101 1(+) 2(-) — /178.A6 — Q1 ISOL OPEN / FUT. LINE-2 / 220-250VDC / P10#BI.01

Q1 ISOL CLOSE — 63 — 75 — P105F — X101 3(+) 4(-) — /178.B6 — Q1 ISOL CLOSE / FUT. LINE-2 / 220-250VDC / P10#BI.02

Q2 ISOL OPEN — 64 — 76 — P107F — X101 5(+) 6(-) — /178.B6 — Q2 ISOL OPEN / FUT. LINE-2 / 220-250VDC / P10#BI.03

Q2 ISOL CLOSE — 65 — 77 — P109F — X101 7(+) 8(-) — /178.B6 — Q2 ISOL CLOSE / FUT. LINE-2 / 220-250VDC / P10#BI.04

Q0CB R-PH OPEN — 66 — 78 — P111F — X101 9(+) 10(-) — /178.C6 — Q0CB R-PH OPEN / FUT. LINE-2 / 220-250VDC / P10#BI.05

+FUT. LINE-2(AA)
BAY-D11(FUT. LINE-2) +VE — -11BBX04A 1, 2 — 79 — P113F — X101 11(+) 12(-) — /178.C6 — Q0 CB OMANUAL CLOSE / FUT. LINE-2 / 220-250VDC / P10#BI.06

CB MANUAL CLOSE COMMAND (BCU)

LBB 3-PH INITIATION FROM FUT. LINE-2 BAY — 3 — 80 — P115F — X101 13(+) 14(-) — /178.C6 — LBB R-PH INITIATION / FUT. LINE-2 / 220-250VDC / P10#BI.07

LBB R-PH INITIATION FROM FUT. LINE-2 BAY — 4 — P117F — X101 15(+) 16(-) — /178.D6 — SPARE / 220-250VDC / P10#BI.08

REF DWG: 1KHF129883R1213,SH NO: ***

+D.08 -D08.01
R_PH BB PROTN_RLY_REB670

+C.10-XX2:11 /168.E8 P102

+D.18-BUS-1 IN/OUT:1P1 /170.A3 P101

+C.10-XX2:13 /170.A6 P102

+D.15-D15.01:1 (X101) /193.A4 P103F
+D.15-D15.01:3 (X101) /193.B4 P105F
+D.15-D15.01:5 (X101) /193.B4 P107F
+D.15-D15.01:7 (X101) /193.C4 P109F
+D.15-D15.01:11 (X101) /193.D4 P113F
+D.15-D15.01:13 (X101) /193.D4 P115F

+D.22-D22.01:13 (X101) /222.D4 P115F
+D.22-D22.01:11 (X101) /222.D4 P113F
+D.22-D22.01:7 (X101) /222.C4 P109F
+D.22-D22.01:5 (X101) /222.B4 P107F
+D.22-D22.01:3 (X101) /222.B4 P105F
+D.22-D22.01:1 (X101) /222.A4 P103F

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and responsibilities, with details, performance particulars of the supplies with the Indian statutory laws / IEC specifications as may be applicable, nor does limit the AEGCL's right under the contract.

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
REB670-RPH BINARY INPUTS

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram	Ref.Des.	=2R
	DCC EFS		
Resp. dept.	PG-GAS	Rev. ind.	01
Doc. no.	1KHF128840R1411	Language	en
		Sheet	169
		n. sheet	170

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)
—	✓	✓	✓	✓

+BB1

+A.15-11BBX04A:1 /169.E3 P101

-BUS-1 IN/OUT
1P2 / 1P1 OUT
BUS-1 IN/OUT SWITCH

-BUS-2 IN/OUT
1P2 / 1P1 OUT
BUS-1 IN/OUT SWITCH

-PB01
13 14
OPEN CT RESET

P101 /224.E6 +D.22-D22.01:2 (-X11)

-IXX1
81 P119F
82 P121F
83 P123F
P125F /224.E6 +D.22-D22.01:3 (-X11)
P125F
P127F
P129F
P131F
P133F

+C.10-XX2:12 /169.E6 P102

-XX2
13

+D.08 -D08.01
R_PH BB PROTN_RLY_REB670

X102 1	-XX2 13	/178.A8	BUS-1 SW. IN OUT POSITION	220-250VDC P10#BI.09
X102 3		/178.B8	BUS-2 SW. IN OUT POSITION	220-250VDC P10#BI.10
X102 5		/178.B8	OPEN CT ALARM RESET	220-250VDC P10#BI.11
X102 7		/178.B8	REB670-BPH FAULTY	220-250VDC P10#BI.12
X102 9		/178.C8	AC MCB 1/2 FAIL	220-250VDC P10#BI.13
X102 11		/178.C8	BB TRIP RLY. MCB FAIL	220-250VDC P10#BI.14
X102 13		/178.C8	I/C DC-1 SUVPN. FAIL	220-250VDC P10#BI.15
X102 15		/178.D8	I/C DC-2 SUVPN. FAIL	220-250VDC P10#BI.16

+BB2

-X14
1
2

-D26.155.301
16 17 /141.E6
AC SUVPN. RELAY

-ACMCB01
11 14 /141.B6 12
-ACMCB
11 14 /141.B3 12
-D30.119.101
16 17 /141.E3
AC SUVPN. RELAY

-1MCB04
11 14 /132.C5 12
BB TRIP RLY. MCB

-1MCB01
11 14 /131.A3 12
I/C DC-1 MCB

-2MCB01
11 14 /131.D3 12
I/C DC-2 MCB

-D30.101.301
16 17 /131.E8
DC-2 SUPVN(80A)

-D30.101.101
16 17 /131.E7
DC-1 SUPVN(80A)

-X04
4

+A.10-LCCX04:67 /170.1.A3 P101

+D.15-D15.01:1 (X102) /194.A4 P119F
+D.15-D15.01:3 (X102) /194.B4 P121F
+D.15-D15.01:5 (X102) /194.B4 P123F
+D.22-D22.01:5 (X102) /223.B4 P123F
+D.22-D22.01:3 (X102) /223.B4 P121F
+D.22-D22.01:1 (X102) /223.A4 P119F

+C.10-XX2:14 /170.1.A6 P102

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and his responsibilities under delivery, performance particulars and guarantee of the supplies with the Indian Statutory laws / rules / specifications as may be applicable nor does limit the AEGCL's right under the contract.

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

Based on

Rev.	Revision note	Date	Name
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK

1MYN691003-102(A3)REV01

Prepared 08-08-2025 DIVYA S
Approved 08-08-2025 THEJASWINI AR
Project ASSAM ELECTRICITY GRID CORPORATION LTD
400/220kV GIS SS AT SONAPUR
128840

Title 220kV CONTROL & RELAY PANEL
220kV BUSBAR
REB670-RPH BINARY INPUTS

HITACHI Hitachi Energy India Limited

Doc. kind. Circuit diagram
DCC EFS
Resp. dept. PG-GAS
Doc. no. 1KHF128840R1411

Ref.Des. =2R
Rev. ind. 01
Language en
Sheet 170
n. sheet 170.1

© Copyright 2023 Hitachi Energy

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

+BB1

+D01-LCC
BAY-D01 LCC PANEL

-X501 -LCCX04

BUSBAR ZONE-1 TRIP
68 67
69 68

BUSBAR ZONE-2 TRIP
70 69
71 70

71 72 73 74 75 76 77 78 79 80 81 82

#

ZONE TRIPPING FOR ZONE 1 &2 FROM ALL BAYS TO BE PARALLELED EXTERNALLY AND SINGLE INPUT TO BE WIRE

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and responsibilities, particularly particulars ... of the supplies will be inspected ... specifications as may be applicable ... the AEGCL's right under the contract.

Additionally
'Zone Trip' from Lcc to be mapped.
(See Logic Sheet)

+A.10-X04:4 <= /170.E3 P101

-IXX1
84 85 86 87 88 89 90 91

+A.10-LCCX04:83 /170.2.A3 <= P101
+D.15-D15.01:1 (X111) /194.1.A3 <= P101G
+D.15-D15.01:3 (X111) /194.1.B3 <= P103G
+D.15-D15.01:5 (X111) /194.1.B3 <= P105G
+D.15-D15.01:7 (X111) /194.1.C3 <= P107G
+D.15-D15.01:9 (X111) /194.1.C3 <= P109G
+D.15-D15.01:11 (X111) /194.1.D3 <= P111G
+D.15-D15.01:13 (X111) /194.1.D3 <= P113G
+D.15-D15.01:15 (X111) /194.1.D3 <= P115G

+D.22-D22.01:15 (X111) /223.1.D4 <= P115G
+D.22-D22.01:13 (X111) /223.1.D4 <= P113G
+D.22-D22.01:11 (X111) /223.1.D4 <= P111G
+D.22-D22.01:9 (X111) /223.1.C4 <= P109G
+D.22-D22.01:7 (X111) /223.1.C4 <= P107G
+D.22-D22.01:5 (X111) /223.1.B4 <= P105G
+D.22-D22.01:3 (X111) /223.1.B4 <= P103G
+D.22-D22.01:1 (X111) /223.1.A4 <= P101G

+C.10-XX2:13 /170.E8 P102

-XX2
14

+C.10-XX2:15 /170.2.A6 <= P102

+D.08 -D08.01
R_PH BB PROTN_RLY_REB670

P101G
X111 1 2 /179.A6 BUSBAR ZONE-1 TRIP FROM D01 LCC 220-250VDC P11#BI.01

P103G
X111 3 4 /179.B6 BUSBAR ZONE-2 TRIP FROM D01 LCC 220-250VDC P11#BI.02

P105G
X111 5 6 /179.B6 SPARE 220-250VDC P11#BI.03

P107G
X111 7 8 /179.B6 SPARE 220-250VDC P11#BI.04

P109G
X111 9 10 /179.C6 SPARE 220-250VDC P11#BI.05

P111G
X111 11 12 /179.C6 SPARE 220-250VDC P11#BI.06

P113G
X111 13 14 /179.C6 SPARE 220-250VDC P11#BI.07

P115G
X111 15 16 /179.D6 SPARE 220-250VDC P11#BI.08

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

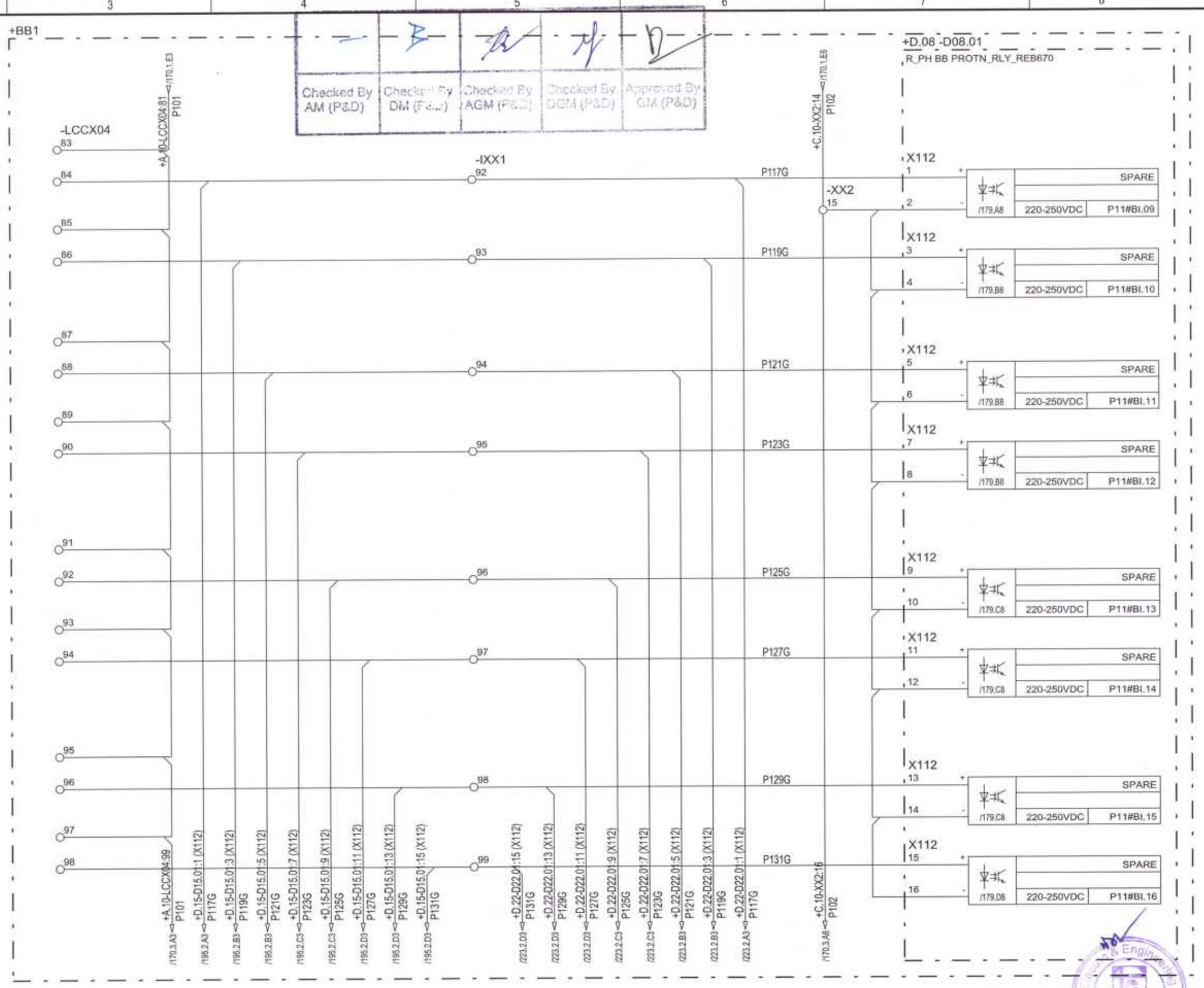
Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
REB670-RPH BINARY INPUTS

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram	Ref.Des.	=2R
	DCC EFS		
Resp. dept.	PG-GAS	Rev. ind.	01
Language	en		
Sheet	170.1		
n. sheet	170.2		
Doc. no.	1KHF128840R1411		

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy



Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

APPROVED, subject to the condition that the approval conveyed herein neither relieves the Contractor of any contractual obligations and responsibilities including performance guarantees and conformity of the supplies with the Indian Statutory laws / IEC specifications as may be applicable, nor does limit the AEGCL's right under the contract.

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

Title	220kV CONTROL & RELAY PANEL 220kV BUSBAR REB670-RPH BINARY INPUTS	Doc. kind.	Circuit diagram DCC EFS
		Resp. dept.	PG-GAS
HITACHI	Hitachi Energy India Limited	Doc. no.	1KHF128840R1411

Ref.Des.	=2R
Rev. ind.	01
Language	en
Sheet	170.2
n. sheet	170.3

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

+BB1

-LCCX04

99 — +A.10-LCCX04:97 <170.2:E3 — P101

100 — -IXX1 100 — P103H — -XX2 16 — +C.10-XX2:15 <170.2:E6 — P102

101

102 — -IXX1 101 — P105H

-X04

5 — P101 >+BB2.A.10-X14:55 /282.A7 — /282.A7 P107H >+BB2.A.10-X14:57 — -IXX1 102 — P107H

6 — P109H

7 — P111H

8 — P113H

9 — P115H

10 — P117H

+D.08-D08.01
R_PH BB PROTN_RLY_REB670

X121 1	SPARE					
X121 2		/180.A3	220-250VDC	P12#BI.01		
X121 3	SPARE					
X121 4		/180.B3	220-250VDC	P12#BI.02		
X121 5	96 OPTD					
X121 6		/180.B3	220-250VDC	P12#BI.03		
X121 7	SPARE					
X121 8		/180.B3	220-250VDC	P12#BI.04		
X121 9	SPARE					
X121 10		/180.C3	220-250VDC	P12#BI.05		
X121 11	SPARE					
X121 12		/180.C3	220-250VDC	P12#BI.06		
X121 13	SPARE					
X121 14		/180.C3	220-250VDC	P12#BI.07		
X121 15	SPARE					
X121 16		/180.D3	220-250VDC	P12#BI.08		

+A.10-X04:11 /171.4.A3 P101
+D.15-D15.01:1 (X121) /196.3.A3 P103H
+D.15-D15.01:3 (X121) /196.3.B3 P105H
+D.15-D15.01:5 (X121) /196.3.B3 P107H
+D.22-D22.01:5 (X121) /223.3.B6 P107H
+D.22-D22.01:3 (X121) /223.3.B6 P105H
+D.22-D22.01:1 (X121) /223.3.A6 P103H
+C.10-XX2:17 /171.4.A6 P102

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and his responsibilities & liabilities, performance particulars and conformity of the supplies with the Indian Statutory Acts / IEC specifications as may be applicable nor does limit the AEGCL's right under the contract

Assam Electrical Engineering Co. Pvt. Ltd. Guwahati

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
REB670-RPH BINARY INPUTS

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram	Ref.Des.	=2R
	DCC EFS		
Resp. dept.	PG-GAS	Rev. ind. 01	Language en
Doc. no.	1KHF128840R1411	Sheet	170.3
		n. sheet	171.4

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

+BB1

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)
–				

+D.08 -D08.01
R_PH BB PROTN_RLY_REB670

-X04

11		>+BB2 A.10-X14:55	<I170.3.E3 P101					
12	P119H			-XX2 17	+C.10-XX2:16	<I170.3.E6 P102	X122 1 / 2	SPARE /180.A4 220-250VDC P12#BI.09
13	P121H						X122 3 / 4	SPARE /180.B4 220-250VDC P12#BI.10
14	P123H						X122 5 / 6	SPARE /180.B4 220-250VDC P12#BI.11
15	P125H						X122 7 / 8	SPARE /180.B4 220-250VDC P12#BI.12
16	P127H						X122 9 / 10	SPARE /180.C4 220-250VDC P12#BI.13
17	P129H						X122 11 / 12	SPARE /180.C4 220-250VDC P12#BI.14
18	P131H						X122 13 / 14	SPARE /180.C4 220-250VDC P12#BI.15
19	P133H						X122 15 / 16	SPARE /180.D4 220-250VDC P12#BI.16
		/181.A1	+C.15-XX1:11 P101		/181.A1	+C.10-XX2:18 P102		

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and his responsibilities under codes, performance particulars and conformity of the supplies with the Indian Statutory and other specifications as may be applicable nor does limit the AEGCL's right under the contract.

Electro Electric & Engineering Co. Ltd. · Guwahati · ENGINEERS & CONSTRUCTORS

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
REB670-RPH BINARY INPUTS

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram	Ref.Des.	=2R
	DCC EFS		
Resp. dept.	PG-GAS	Rev. ind.	01
Language	en		
Doc. no.	1KHF128840R1411	Sheet	171.4
		n. sheet	171

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

+BB1

+D.08 -D08.01

R_PH BB PROTN_RLY_REB670

BBP/EFP/LBB OPTD. BAY-D01 P4#BO.01 /176.A2 — X41 2 — -XX1 2 — -D36.01 R1 S1 /158.A7 TS1-REB670 — X41 1

BBP/EFP/LBB OPTD. BAY-D02 P4#BO.02 /176.B2 — X41 3

BBP/EFP/LBB OPTD. BAY-D03 P4#BO.03 /176.B2 — X41 5 — -D36.02 R1 S1 /158.A8 TS2-REB670 — X41 4

BBP/EFP/LBB OPTD. BAY-D04 P4#BO.04 /176.B2 — X41 6

BBP/EFP/LBB OPTD. BAY-D05 P4#BO.05 /176.C2 — X41 8 — -XX1 3 — -D36.03 R1 S1 /158.C7 TS3-REB670 — X41 7

BBP/LBB OPTD. BAY-D06 P4#BO.06 /176.C2 — X41 9

BBP/EFP/LBB OPTD. BAY-D07 P4#BO.07 /176.C2 — X41 11 — -D36.04 R1 S1 /158.C8 TS4-REB670 — X41 10

BBP/EFP/LBB OPTD. BAY-D08 P4#BO.08 /176.D2 — X41 12

BBP/EFP/LBB OPTD. BAY-D09 P4#BO.09 /176.D2 — X41 14 — -XX1 4 — -D36.05 R1 S1 /158.D7 TS5-REB670 — X41 13

BBP/EFP/LBB OPTD. BAY-D10 (FUT. LINE-1) P4#BO.10 /176.D2 — X41 15

BBP/EFP/LBB OPTD. BAY-D11(FUT. LINE-2) P4#BO.11 /176.E2 — X41 17 — -D36.06 R1 S1 /158.D8 TS6-REB670 — X41 16

96 RESET CMD. /176.E2 — X41 18 — -PB02 13 14 /261.C8 — 96 RESET PB

REB670 RPH FAULTY Relay ready /158.B7 — -X11 2 — 3 — 1 — +C.15-X01:5 P1 /175.A4

+BB2

-X14

+D.03-D03.113.101:11, >+BB1.B.01-X13:1 P1 /261.A1

-IXX1

103	/195.A6 1P4 +D.15-D15.01:1 (X41)	+D.22-D22.01:1 (X41) 1P4 /224.A6	4	1P4 +D.03-D03.101.101:121 /261.A1
104	/195.B6 2P4 +D.15-D15.01:3 (X41)	+D.22-D22.01:3 (X41) 2P4 /224.B6	5	2P4 +D.03-D03.119.101:121 /261.D1
105	/195.B6 3P4 +D.15-D15.01:4 (X41)	+D.22-D22.01:4 (X41) 3P4 /224.B6	6	3P4 +D.03-D03.137.101:121 /262.B1
106	/195.B6 4P4 +D.15-D15.01:6 (X41)	+D.22-D22.01:6 (X41) 4P4 /224.B6	7	4P4 +D.08-D08.101.101:121 /262.D1
107	/195.C6 5P4 +D.15-D15.01:7 (X41)	+D.22-D22.01:7 (X41) 5P4 /224.C6	8	5P4 +D.08-D08.119.101:121 /263.B1
108	/195.C6 6P4 +D.15-D15.01:9 (X41)	+D.22-D22.01:9 (X41) 6P4 /224.C6	9	6P4 +D.08-D08.137.101:121 /263.D1
109	/195.C6 7P4 +D.15-D15.01:10 (X41)	+D.22-D22.01:10 (X41) 7P4 /224.C6	10	7P4 +D.13-D13.101.101:121 /264.B1
110	/195.D6 8P4 +D.15-D15.01:12 (X41)	+D.22-D22.01:12 (X41) 8P4 /224.D6	11	8P4 +D.13-D13.119.101:121 /264.D1
111	/195.D6 9P4 +D.15-D15.01:13 (X41)	+D.22-D22.01:13 (X41) 9P4 /224.D6	12	9P4 +D.13-D13.137.101:121 /265.B1
112	/195.D6 10P4 +D.15-D15.01:15 (X41)	+D.22-D22.01:15 (X41) 10P4 /224.D6	13	10P4 +D.18-D18.101.101:121 /265.D1
113	/195.E6 11P4 +D.15-D15.01:16 (X41)	+D.22-D22.01:16 (X41) 11P4 /224.E6	14	11P4 +D.18-D18.119.101:121 /266.B1
114	/195.E6 1P3 +D.15-D15.01:18 (X41)	+D.22-D22.01:18 (X41) 1P3 /224.E6	15	1P3 +D.03-D03.101.101:211 /261.A2

>+BB2.A.10-X14:54, +A.10-LCCX04:123 P101 /194.C4

P135F /194.C5 +D.15-D15.01:7 (X102)

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and his responsibilities in details, performance particulars and conformity of the supplies with the Indian Statutory laws / IEC specifications as may be applicable nor does limit the AEGCL's right under the contract.

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

Title: 220kV CONTROL & RELAY PANEL 220kV BUSBAR REB670-RPH BINARY OUTPUTS

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram DCC EFS	Ref.Des.	=2R
Resp. dept.	PG-GAS	Rev. ind.	01
Doc. no.	1KHF128840R1411	Language	en
		Sheet	171
		n. sheet	172

© Copyright 2023 Hitachi Energy

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

+BB1

+D.08 -D08.01

R_PH BB PROTN_RLY_REB670

EFP/LBB OPTD	BAY-D01	P4#BO.13	/176.A4	X42 2	-D36.01 R2 S2 /158.A7 TS1-REB670	1
EFP/LBB OPTD	BAY-D02	P4#BO.14	/176.B4	X42 3		
EFP/LBB OPTD	BAY-D03	P4#BO.15	/176.B4	X42 5	-D36.02 R2 S2 /158.A8 TS2-REB670	4
EFP/LBB OPTD	BAY-D04	P4#BO.16	/176.B4	X42 6		
EFP/LBB OPTD	BAY-D05	P4#BO.17	/176.C4	X42 8	-D36.03 R2 S2 /158.C7 TS3-REB670	7
EFP/LBB OPTD	BAY-D06	P4#BO.18	/176.C4	X42 9		
SPARE		P4#BO.19	/176.C4	X42 11	-D36.04 R2 S2 /158.C8 TS4-REB670	10
EFP/LBB OPTD	BAY-D08	P4#BO.20	/176.D4	X42 12		
EFP/LBB OPTD	BAY-D09	P4#BO.21	/176.D4	X42 14	-D36.05 R2 S2 /158.D7 TS5-REB670	13
EFP/LBB OPTD	BAY-D10	P4#BO.22	/176.D4	X42 15		
EFP/LBB OPTD	BAY-D11	P4#BO.23	/176.E4	X42 17	-D36.06 R2 S2 /158.D8 TS6-REB670	16
SPARE		P4#BO.24	/176.E4	X42 18		

-XX1

5	+C.15-XX1:4 P1	/171.E3
6	/196.B6 4P9 +D.15-D15.01:6 (X42)	
7	/196.C6 5P9 +D.15-D15.01:7 (X42)	
9	/196.C6 6P9 +D.15-D15.01:9 (X42)	
10	/196.C6 P139 +D.15-D15.01:10 (X42)	
12	/196.D6 8P7 +D.15-D15.01:12 (X42)	
13	/196.D6 9P7 +D.15-D15.01:13 (X42)	
15	/196.D6 10P9 +D.15-D15.01:15 (X42)	
16	/196.E6 11P9 +D.15-D15.01:16 (X42)	
18	/196.E6 P149 +D.15-D15.01:18 (X42)	
8	+C.15-XX1:8 P1	/171.A3

-IXX1

115	/196.A6 1P9 +D.15-D15.01:1 (X42)	+D.22-D22.01:1 (X42) 1P9 /225.A6
116	/196.B6 2P9 +D.15-D15.01:3 (X42)	+D.22-D22.01:3 (X42) 2P9 /225.B6
117	/196.B6 3P9 +D.15-D15.01:4 (X42)	+D.22-D22.01:4 (X42) 3P9 /225.B6
118	/196.B6 4P9 +D.15-D15.01:6 (X42)	+D.22-D22.01:6 (X42) 4P9 /225.B6
119	/196.C6 5P9 +D.15-D15.01:7 (X42)	+D.22-D22.01:7 (X42) 5P9 /225.C6
120	/196.C6 6P9 +D.15-D15.01:9 (X42)	+D.22-D22.01:9 (X42) 6P9 /225.C6
121	/196.C6 P139 +D.15-D15.01:10 (X42)	+D.22-D22.01:10 (X42) P139 /225.C6
122	/196.D6 8P7 +D.15-D15.01:12 (X42)	+D.22-D22.01:12 (X42) 8P7 /225.D6
123	/196.D6 9P7 +D.15-D15.01:13 (X42)	+D.22-D22.01:13 (X42) 9P7 /225.D6
124	/196.D6 10P9 +D.15-D15.01:15 (X42)	+D.22-D22.01:15 (X42) 10P9 /225.D6
125	/196.E6 11P9 +D.15-D15.01:16 (X42)	+D.22-D22.01:16 (X42) 11P9 /225.E6
126	/196.E6 P149 +D.15-D15.01:18 (X42)	+D.22-D22.01:18 (X42) P149 /225.E6

+BB2

16	1P9 /261.C1	+D.03-D03.113.301:11
17	2P9 /261.E1	+D.03-D03.131.301:11
18	3P9 /262.C1	+D.03-D03.149.301:11
19	4P9 /262.E1	+D.08-D08.113.301:11
20	5P9 /263.C1	+D.08-D08.131.301:11
21	6P9 /263.E1	+D.08-D08.149.301:11
22		
23	8P7 /264.E1	+D.13-D13.125.301:11
24	9P7 /265.C1	+D.13-D13.149.301:11
25	10P9 /265.E1	+D.18-D18.113.301:11
26	11P9 /266.D1	+D.18-D18.125.301:11

-X04 20

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and responsibilities including details, performance, participation and coverage of the supplies with the Indian Statutes, laws / IEC specifications as may be applicable nor does limit the AEGCL's right under the contract.

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

Title: 220kV CONTROL & RELAY PANEL 220kV BUSBAR REB670-RPH BINARY OUTPUTS

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram DCC EFS	Ref.Des.	=2R
Resp. dept.	PG-GAS	Rev. ind.	01
Doc. no.	1KHF128840R1411	Language	en
		Sheet	172
		n. sheet	173

© Copyright 2023 Hitachi Energy

+BB1

+D.08 -D08.01

R_PH BB PROTN_RLY_REB670

LBB RE-TRIP R-PH	BAY-D01	P6#BO.01	/179.A2
LBB RE-TRIP R-PH	BAY-D02	P6#BO.02	/179.B2
LBB RE-TRIP R-PH	BAY-D03	P6#BO.03	/179.B2
LBB RE-TRIP R-PH	BAY-D04	P6#BO.04	/179.B2
LBB RE-TRIP R-PH	BAY-D05	P6#BO.05	/179.C2
LBB RE-TRIP R-PH	BAY-D06	P6#BO.06	/179.C2
LBB RE-TRIP 3-PH	BAY-D07	P6#BO.07	/179.C2
LBB RE-TRIP 3-PH	BAY-D08	P6#BO.08	/179.D2
LBB RE-TRIP 3-PH	BAY-D09	P6#BO.09	/179.D2
LBB RE-TRIP R-PH	BAY-D10 (FUT. LINE-1)	P6#BO.10	/179.D2
LBB RE-TRIP R-PH	BAY-D11(FUT. LINE-2)	P6#BO.11	/179.E2
SPARE		P6#BO.12	/179.E2

X61 2, 1, 3, 5, 4, 6, 8, 7, 9, 11, 10, 12, 14, 13, 15, 17, 16, 18

-XX1 8, 9, 10

+C.15-XX1:7 P1 /172.E3

+C.15-XX1:12 P1 /195.A4

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)
—				

+BB2

27	1P6 /261.B1	+D.26-D26.101.101:11
28	2P6 /261.E1	+D.26-D26.107.101:21
29	3P6 /262.B1	+D.26-D26.119.101:11
30	4P6 /262.E1	+D.26-D26.125.101:21
31	5P6 /263.B1	+D.26-D26.137.101:11
32	6P6 /263.E1	+D.26-D26.143.101:21
33	7P6 /264.C1	+D.26-D26.155.101:11
34	8P6 /264.E1	+D.26-D26.101.301:11
35	9P6 /265.C1	+D.26-D26.107.301:11
36	10P6 /265.E1	+D.26-D26.113.301:11
37	11P6 /266.C1	+D.26-D26.119.301:21

21: /197.C6 7P6 +D.15-D15.01:10 (X61) — +D.22-D22.01:10 (X61) 7P6 /226.C6

22: /197.D6 8P6 +D.15-D15.01:12 (X61) — +D.22-D22.01:12 (X61) 8P6 /226.D6

23: /197.D6 9P6 +D.15-D15.01:13 (X61) — +D.22-D22.01:13 (X61) 9P6 /226.D6

24

25: /197.E6 P177 +D.15-D15.01:18 (X61) — +D.22-D22.01:18 (X61) P177 /226.E6

-X04 26

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and responsibilities in all details, particulars and respects nor of his compliance with the Indian Statutory laws / IEC specifications as may be applicable nor does it relieve ArGCL's right under the contract.

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
REB670-RPH BINARY OUTPUTS

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram	Ref.Des.	=2R
	DCC EFS		
Resp. dept.	PG-GAS	Rev. ind.	01
Doc. no.	1KHF128840R1411	Language	en
		Sheet	173
		n. sheet	174

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

+BB1

+D.08 -D08.01

R_PH BB PROTN_RLY_REB670

SPARE	P6#BO.13	/179.A4	X62 2	1P103	-X04 27
			X62 1	1P105	28
SPARE	P6#BO.14	/179.B4	X62 3	1P107	29
SPARE	P6#BO.15	/179.B4	X62 5	1P109	30
			X62 4	1P111	31
SPARE	P6#BO.16	/179.B4	X62 6	1P113	32
SPARE	P6#BO.17	/179.C4	X62 8	1P115	33
			X62 7	1P117	34
SPARE	P6#BO.18	/179.C4	X62 9	1P119	35
SPARE	P6#BO.19	/179.C4	X62 11	1P121	36
			X62 10	1P123	37
SPARE	P6#BO.20	/179.D4	X62 12	1P125	38
SPARE	P6#BO.21	/179.D4	X62 14		
			X62 13	1P127	39
SPARE	P6#BO.22	/179.D4	X62 15	1P129	40
SPARE	P6#BO.23	/179.E4	X62 17	1P131	41
			X62 16	1P133	42
SPARE	P6#BO.24	/179.E4	X62 18	1P135	43

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and his responsibilities in regards details, performance particulars and guarantees of the supplies with the Indian Statutory laws / IEC specifications as may be applicable nor does limit the AEGCL's right under the contract.

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
REB670-RPH BINARY OUTPUTS

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram	Ref.Des.	=2R
	DCC EFS		
Resp. dept.	PG-GAS	Rev. ind.	01
Doc. no.	1KHF128840R1411	Language	en
		Sheet	174
		n.sheet	175

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

+BB1

+D.08 -D08.01
Transformer input module 1MRK002247-CG
TRM
1A, 50/60Hz

X401

R-PH CURRENT BAY-D01 P40#AI.01	CT: 1A	1	2	/151.A7
R-PH CURRENT BAY-D02 P40#AI.02	CT: 1A	3	4	/151.D7
R-PH CURRENT BAY-D03 P40#AI.03	CT: 1A	5	6	/152.A7
R-PH CURRENT BAY-D04 P40#AI.04	CT: 1A	7	8	/152.D7
R-PH CURRENT BAY-D05 P40#AI.05	CT: 1A	9	10	/153.A7
R-PH CURRENT BAY-D06 P40#AI.06	CT: 1A	11	12	/153.D7
R-PH CURRENT BAY-D07 P40#AI.07	CT: 1A	13	14	/154.A7
R-PH CURRENT BAY-D08 P40#AI.08	CT: 1A	15	16	/154.D7
R-PH CURRENT BAY-D09 P40#AI.09	CT: 1A	17	18	/155.A7
R-PH CURRENT FUTURE LINE-1 P40#AI.10	CT: 1A	19	20	/155.D7
R-PH CURRENT FUTURE LINE-2 P40#AI.11	CT: 1A	21	22	/156.A7
SPARE P40#AI.12	CT: 1A	23	24	

+D.08 -D08.01
Binary input module 1MRK000508-CD
BIM
220-250VDC, 50ma

X31

Q1 ISOL OPEN BAY-D01 P3#BI.01	220-250VDC	1	2	/159.B7
Q1 ISOL CLOSE BAY-D01 P3#BI.02	220-250VDC	3	4	/159.B7
Q2 ISOL OPEN BAY-D01 P3#BI.03	220-250VDC	5	6	/159.C7
Q2 ISOL CLOSE BAY-D01 P3#BI.04	220-250VDC	7	8	/159.C7
Q0CB R-PH OPEN BAY-D01 P3#BI.05	220-250VDC	9	10	/159.C7
Q0 CB MANUAL CLOSE FROM BAY-D01 P3#BI.06	220-250VDC	11	12	/159.D7
LBB 3-PH INITIATION FROM BAY-D01 P3#BI.07	220-250VDC	13	14	/159.D7
LBB R-PH INITIATION FROM BAY-D01 P3#BI.08	220-250VDC	15	16	/159.E7

+D.08 -D08.01
Binary input module 1MRK000508-CD
BIM
220-250VDC, 50ma

X32

Q1 ISOL OPEN BAY-D02 P3#BI.09	220-250VDC	1	2	/160.B7
Q1 ISOL CLOSE BAY-D02 P3#BI.10	220-250VDC	3	4	/160.B7
Q2 ISOL OPEN BAY-D02 P3#BI.11	220-250VDC	5	6	/160.C7
Q2 ISOL CLOSE BAY-D02 P3#BI.12	220-250VDC	7	8	/160.C7
Q0CB R-PH OPEN BAY-D02 P3#BI.13	220-250VDC	9	10	/160.C7
Q0 CB MANUAL CLOSE FROM BAY-D02 P3#BI.14	220-250VDC	11	12	/160.D7
LBB 3-PH INITIATION FROM BAY-D02 P3#BI.15	220-250VDC	13	14	/160.D7
LBB R-PH INITIATION FROM BAY-D02 P3#BI.16	220-250VDC	15	16	/160.E7

Checked By AM (P&D)	Checked By DM	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and his responsibilities, design details, performance particulars etc., conformity of the supplies with the Indian Statutory laws / IEC specifications as may be applicable, nor does limit AEGCL's right under the contract.

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
REB670-RPH OVERVIEW

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram	Ref.Des.	=2R
	DCC EFS		
Resp. dept.	PG-GAS	Rev. ind.	01
Doc. no.	1KHF128840R1411	Language	en
		Sheet	175
		n. sheet	176

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

+BB1

+D.08 -D08.01
Binary output module 1MRK000614-AB
BOM
X41

BBP/EFP/LBB OPTD. BAY-D01 P4#BO.01	2 1	/171.A2
BBP/EFP/LBB OPTD. BAY-D02 P4#BO.02	3	/171.B2
BBP/EFP/LBB OPTD. BAY-D03 P4#BO.03	5 4	/171.B2
BBP/EFP/LBB OPTD. BAY-D04 P4#BO.04	6	/171.B2
BBP/EFP/LBB OPTD. BAY-D05 P4#BO.05	8 7	/171.C2
BBP/LBB OPTD. BAY-D06 P4#BO.06	9	/171.C2
BBP/EFP/LBB OPTD. BAY-D07 P4#BO.07	11 10	/171.C2
BBP/EFP/LBB OPTD. BAY-D08 P4#BO.08	12	/171.D2
BBP/EFP/LBB OPTD. BAY-D09 P4#BO.09	14 13	/171.D2
BBP/EFP/LBB OPTD. BAY-D10 (FUT. LINE-1) P4#BO.10	15	/171.D2
BBP/EFP/LBB OPTD. BAY-D11(FUT. LINE-2) P4#BO.11	17 16	/171.E2
96 RESET CMD.	18	/171.E2

+D.08 -D08.01
Binary output module 1MRK000614-AB
BOM
X42

EFP/LBB OPTD BAY-D01 P4#BO.13	2 1	/172.A2
EFP/LBB OPTD BAY-D02 P4#BO.14	3	/172.B2
EFP/LBB OPTD BAY-D03 P4#BO.15	5 4	/172.B2
EFP/LBB OPTD BAY-D04 P4#BO.16	6	/172.B2
EFP/LBB OPTD BAY-D05 P4#BO.17	8 7	/172.C2
EFP/LBB OPTD BAY-D06 P4#BO.18	9	/172.C2
SPARE P4#BO.19	11 10	/172.C2
EFP/LBB OPTD BAY-D08 P4#BO.20	12	/172.D2
EFP/LBB OPTD BAY-D09 P4#BO.21	14 13	/172.D2
EFP/LBB OPTD BAY-D10 P4#BO.22	15	/172.D2
EFP/LBB OPTD BAY-D11 P4#BO.23	17 16	/172.E2
SPARE P4#BO.24	18	/172.E2

+D.08 -D08.01
Binary input module 1MRK000508-CD
BIM
220-250VDC, 50ma
X51

Q1 ISOL OPEN BAY-D03 P5#BI.01	220-250VDC	+ 1 - 2	/161.B7
Q1 ISOL CLOSE BAY-D03 P5#BI.02	220-250VDC	+ 3 - 4	/161.B7
Q2 ISOL OPEN BAY-D03 P5#BI.03	220-250VDC	+ 5 - 6	/161.C7
Q2 ISOL CLOSE BAY-D03 P5#BI.04	220-250VDC	+ 7 - 8	/161.C7
Q0CB R-PH OPEN BAY-D03 P5#BI.05	220-250VDC	+ 9 - 10	/161.C7
Q0 CB MANUAL CLOSE FROM BAY-D03 P5#BI.06	220-250VDC	+ 11 - 12	/161.D7
LBB 3-PH INITIATION FROM BAY-D03 P5#BI.07	220-250VDC	+ 13 - 14	/161.D7
LBB R-PH INITIATION FROM BAY-D03 P5#BI.08	220-250VDC	+ 15 - 16	/161.E7

+D.08 -D08.01
Binary input module 1MRK000508-CD
BIM
220-250VDC, 50ma
X52

Q1 ISOL OPEN BAY-D04 P5#BI.09	220-250VDC	+ 1 - 2	/162.B7
Q1ISOL CLOSE BAY-D04 P5#BI.10	220-250VDC	+ 3 - 4	/162.B7
Q2 ISOL OPEN BAY-D04 P5#BI.11	220-250VDC	+ 5 - 6	/162.C7
Q2 ISOL CLOSE BAY-D04 P5#BI.12	220-250VDC	+ 7 - 8	/162.C7
Q0CB R-PH OPEN BAY-D04 P5#BI.13	220-250VDC	+ 9 - 10	/162.C7
Q0 CB MANUAL CLOSE FROM BAY-D04 P5#BI.14	220-250VDC	+ 11 - 12	/162.D7
LBB 3-PH INITIATION FROM BAY-D04 P5#BI.15	220-250VDC	+ 13 - 14	/162.D7
LBB R-PH INITIATION FROM BAY-D04 P5#BI.16	220-250VDC	+ 15 - 16	/162.E7

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and responsibilities about details, performance particulars and conformity of the supplies with the Indian Statutory laws / IEC specifications as may be applicable, nor does limit AEGCL's right under the contract

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

Title: 220kV CONTROL & RELAY PANEL 220kV BUSBAR REB670-RPH OVERVIEW

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram	Ref.Des.	=2R
	DCC EFS		
Resp. dept.	PG-GAS	Rev. ind. 01	Language en
Doc. no.	1KHF128840R1411		Sheet 176
			n. sheet 177

1MYN691003-102(A3)REV01

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

+BB1

+D.08 -D08.01
Binary input module
BIM
220-250VDC, 50ma
1MRK000508-CD
X71

Q1 ISOL OPEN	BAY-D05	P7#BI.01	220-250VDC	/163.B7
Q1 ISOL CLOSE	BAY-D05	P7#BI.02	220-250VDC	/163.B7
Q2 ISOL OPEN	BAY-D05	P7#BI.03	220-250VDC	/163.C7
Q2 ISOL CLOSE	BAY-D05	P7#BI.04	220-250VDC	/163.C7
Q0CB R-PH OPEN	BAY-D05	P7#BI.05	220-250VDC	/163.C7
Q0 CB MANUAL CLOSE	FROM BAY-D05	P7#BI.06	220-250VDC	/163.D7
LBB 3-PH INITIATION	FROM BAY-D05	P7#BI.07	220-250VDC	/163.D7
LBB R-PH INITIATION	FROM BAY-D05	P7#BI.08	220-250VDC	/163.E7

+D.08 -D08.01
Binary input module
BIM
220-250VDC, 50ma
1MRK000508-CD
X72

Q1 ISOL OPEN	BAY-D06	P7#BI.09	220-250VDC	/164.B7
Q1 ISOL CLOSE	BAY-D06	P7#BI.10	220-250VDC	/164.B7
Q2 ISOL OPEN	BAY-D06	P7#BI.11	220-250VDC	/164.C7
Q2 ISOL CLOSE	BAY-D06	P7#BI.12	220-250VDC	/164.C7
Q0CB R-PH OPEN	BAY-D06	P7#BI.13	220-250VDC	/164.C7
Q0 CB MANUAL CLOSE	FROM BAY-D06	P7#BI.14	220-250VDC	/164.D7
LBB R-PH INITIATION	FROM BAY-D06	P7#BI.15	220-250VDC	/164.D7
LBB 3-PH INITIATION	FROM BAY-D06	P7#BI.16	220-250VDC	/164.E7

+D.08 -D08.01
Binary input module
BIM
220-250VDC, 50ma
1MRK000508-CD
X81

Q1 ISOL OPEN	BAY-D07	P8#BI.01	220-250VDC	/165.B7
Q1 ISOL CLOSE	BAY-D07	P8#BI.02	220-250VDC	/165.B7
Q2 ISOL OPEN	BAY-D07	P8#BI.03	220-250VDC	/165.C7
Q2 ISOL CLOSE	BAY-D07	P8#BI.04	220-250VDC	/165.C7
Q0CB R-PH OPEN	BAY-D07	P8#BI.05	220-250VDC	/165.C7
Q0 CB MANUAL CLOSE	FROM BAY-D07	P8#BI.06	220-250VDC	/165.D7
LBB INITIATION	FROM BAY-D07	P8#BI.07	220-250VDC	/165.D7
SPARE		P8#BI.08	220-250VDC	/165.E7

+D.08 -D08.01
Binary input module
BIM
220-250VDC, 50ma
1MRK000508-CD
X82

Q1 ISOL OPEN	BAY-D08	P8#BI.09	220-250VDC	/166.B7
Q1 ISOL CLOSE	BAY-D08	P8#BI.10	220-250VDC	/166.B7
Q2 ISOL OPEN	BAY-D08	P8#BI.11	220-250VDC	/166.C7
Q2 ISOL CLOSE	BAY-D08	P8#BI.12	220-250VDC	/166.C7
Q0CB R-PH OPEN	BAY-D08	P8#BI.13	220-250VDC	/166.C7
52 CB MANUAL CLOSE	FROM BAY-D08	P8#BI.14	220-250VDC	/166.D7
LBB INITIATION	FROM BAY-D08	P8#BI.15	220-250VDC	/166.D7
SPARE		P8#BI.16	220-250VDC	/166.E7

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and responsibilities in details, performance particulars and conformity of the supplies with the Indian statutory laws / IEC specifications as may be applicable nor does limit the AEGCL's right under the contract.

Rev.	Revision note	Date	Name
	Based on		
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK

Prepared 08-08-2025 DIVYA S
Approved 08-08-2025 THEJASWINI AR
Project ASSAM ELECTRICITY GRID CORPORATION LTD
400/220kV GIS SS AT SONAPUR
128840

Title 220kV CONTROL & RELAY PANEL
220kV BUSBAR
REB670-RPH OVERVIEW

HITACHI Hitachi Energy India Limited

Doc. kind. Circuit diagram
DCC EFS
Resp. dept. PG-GAS
Doc. no. 1KHF128840R1411

Ref.Des. =2R
Rev. ind. 01
Language en
Sheet 177
fr. sheet 178

1MYN691003-102(A3)REV01

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

+BB1

+D.08 -D08.01
Binary input module 1MRK000508-CD
BIM
220-250VDC, 50ma

X91

Q1 ISOL OPEN BAY-D09 P9#BI.01	220-250VDC	+ 1 - 2	/167.B7
Q1 ISOL CLOSE BAY-D09 P9#BI.02	220-250VDC	+ 3 - 4	/167.B7
Q2 ISOL OPEN BAY-D09 P9#BI.03	220-250VDC	+ 5 - 6	/167.C7
Q2 ISOL CLOSE BAY-D09 P9#BI.04	220-250VDC	+ 7 - 8	/167.C7
Q0CB R-PH OPEN BAY-D09 P9#BI.05	220-250VDC	+ 9 - 10	/167.C7
52 CB MANUAL CLOSE FROM BAY-D09 P9#BI.06	220-250VDC	+ 11 - 12	/167.D7
LBB INITIATION FROM BAY-D09 P9#BI.07	220-250VDC	+ 13 - 14	/167.D7
SPARE P9#BI.08	220-250VDC	+ 15 - 16	/167.E7

+D.08 -D08.01
Binary input module 1MRK000508-CD
BIM
220-250VDC, 50ma

X92

Q1 ISOL OPEN BAY-210 P9#BI.09	220-250VDC	+ 1 - 2	/168.B7
Q1 ISOL CLOSE FUT. LINE-1 P9#BI.10	220-250VDC	+ 3 - 4	/168.B7
Q2 ISOL OPEN FUT. LINE-1 P9#BI.11	220-250VDC	+ 5 - 6	/168.C7
Q2 ISOL CLOSE FUT. LINE-1 P9#BI.12	220-250VDC	+ 7 - 8	/168.C7
Q0CB R-PH OPEN FUT. LINE-1 P9#BI.13	220-250VDC	+ 9 - 10	/168.C7
Q0 CB MANUAL CLOSE FUT. LINE-1 P9#BI.14	220-250VDC	+ 11 - 12	/168.D7
LBB 3-PH INITIATION FUT. LINE-1 P9#BI.15	220-250VDC	+ 13 - 14	/168.D7
LBB R-PH INITIATION FUT. LINE-1 P9#BI.16	220-250VDC	+ 15 - 16	/168.E7

+D.08 -D08.01
Binary input module 1MRK000508-CD
BIM
220-250VDC, 50ma

X101

Q1 ISOL OPEN FUT. LINE-2 P10#BI.01	220-250VDC	+ 1 - 2	/169.B7
Q1 ISOL CLOSE FUT. LINE-2 P10#BI.02	220-250VDC	+ 3 - 4	/169.B7
Q2 ISOL OPEN FUT. LINE-2 P10#BI.03	220-250VDC	+ 5 - 6	/169.C7
Q2 ISOL CLOSE FUT. LINE-2 P10#BI.04	220-250VDC	+ 7 - 8	/169.C7
Q0CB R-PH OPEN FUT. LINE-2 P10#BI.05	220-250VDC	+ 9 - 10	/169.C7
Q0 CB OMANUAL CLOSE FUT. LINE-2 P10#BI.06	220-250VDC	+ 11 - 12	/169.D7
LBB R-PH INITIATION FUT. LINE-2 P10#BI.07	220-250VDC	+ 13 - 14	/169.D7
SPARE P10#BI.08	220-250VDC	+ 15 - 16	/169.E7

+D.08 -D08.01
Binary input module 1MRK000508-CD
BIM
220-250VDC, 50ma

X102

BUS-1 SW. IN OUT POSITION P10#BI.09	220-250VDC	+ 1 - 2	/170.B7
BUS-2 SW. IN OUT POSITION P10#BI.10	220-250VDC	+ 3 - 4	/170.B7
OPEN CT ALARM RESET P10#BI.11	220-250VDC	+ 5 - 6	/170.C7
REB670-BPH FAULTY P10#BI.12	220-250VDC	+ 7 - 8	/170.C7
AC MCB 1/2 FAIL P10#BI.13	220-250VDC	+ 9 - 10	/170.C7
BB TRIP RLY. MCB FAIL P10#BI.14	220-250VDC	+ 11 - 12	/170.D7
I/C DC-1 SUVPN. FAIL P10#BI.15	220-250VDC	+ 13 - 14	/170.D7
I/C DC-2 SUVPN. FAIL P10#BI.16	220-250VDC	+ 15 - 16	/170.E7

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

APPROVED, subject to the condition that the approval conveyed here in neither relieves the contractor of his contractual obligations and his responsibilities/ details, performance particulars and conformity of the supplies with the Indian Statutory laws / IEC specifications as may be applicable, nor does limit the AEGCL's right under the contract.

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
REB670-RPH OVERVIEW

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram DCC EFS	Ref.Des.	-2R
Resp. dept.	PG-GAS	Rev. ind.	01
Doc. no.	1KHF128840R1411	Language	en
		Sheet	178
		n. sheet	179

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

+BB1

+D.08 -D08.01
Binary output module 1MRK000614-AB
BOM
X61

LBB RE-TRIP R-PH BAY-D01 P6#BO.01	2 1	/173.A2
LBB RE-TRIP R-PH BAY-D02 P6#BO.02	3	/173.B2
LBB RE-TRIP R-PH BAY-D03 P6#BO.03	5 4	/173.B2
LBB RE-TRIP R-PH BAY-D04 P6#BO.04	6	/173.B2
LBB RE-TRIP R-PH BAY-D05 P6#BO.05	8 7	/173.C2
LBB RE-TRIP R-PH BAY-D06 P6#BO.06	9	/173.C2
LBB RE-TRIP 3-PH BAY-D07 P6#BO.07	11 10	/173.C2
LBB RE-TRIP 3-PH BAY-D08 P6#BO.08	12	/173.D2
LBB RE-TRIP 3-PH BAY-D09 P6#BO.09	14 13	/173.D2
LBB RE-TRIP R-PH BAY-D10 (FUT. LINE-1) P6#BO.10	15	/173.D2
LBB RE-TRIP R-PH BAY-D11(FUT. LINE-2) P6#BO.11	17 16	/173.E2
SPARE P6#BO.12	18	/173.E2

+D.08 -D08.01
Binary output module 1MRK000614-AB
BOM
X62

SPARE P6#BO.13	2 1	/174.A2
SPARE P6#BO.14	3	/174.B2
SPARE P6#BO.15	5 4	/174.B2
SPARE P6#BO.16	6	/174.B2
SPARE P6#BO.17	8 7	/174.C2
SPARE P6#BO.18	9	/174.C2
SPARE P6#BO.19	11 10	/174.C2
SPARE P6#BO.20	12	/174.D2
SPARE P6#BO.21	14 13	/174.D2
SPARE P6#BO.22	15	/174.D2
SPARE P6#BO.23	17 16	/174.E2
SPARE P6#BO.24	18	/174.E2

+D.08 -D08.01
Binary input module 1MRK000508-CD
BIM
220-250VDC, 50ma
X111

BUSBAR ZONE-1 TRIP FROM D01 LCC P11#BI.01 220-250VDC	+ 1 - 2	/170.1.B7
BUSBAR ZONE-2 TRIP FROM D01 LCC P11#BI.02 220-250VDC	+ 3 - 4	/170.1.B7
SPARE P11#BI.03 220-250VDC	+ 5 - 6	/170.1.C7
SPARE P11#BI.04 220-250VDC	+ 7 - 8	/170.1.C7
SPARE P11#BI.05 220-250VDC	+ 9 - 10	/170.1.D7
SPARE P11#BI.06 220-250VDC	+ 11 - 12	/170.1.D7
SPARE P11#BI.07 220-250VDC	+ 13 - 14	/170.1.E7
SPARE P11#BI.08 220-250VDC	+ 15 - 16	/170.1.E7

+D.08 -D08.01
Binary input module 1MRK000508-CD
BIM
220-250VDC, 50ma
X112

SPARE P11#BI.09 220-250VDC	+ 1 - 2	/170.2.B7
SPARE P11#BI.10 220-250VDC	+ 3 - 4	/170.2.B7
SPARE P11#BI.11 220-250VDC	+ 5 - 6	/170.2.C7
SPARE P11#BI.12 220-250VDC	+ 7 - 8	/170.2.C7
SPARE P11#BI.13 220-250VDC	+ 9 - 10	/170.2.D7
SPARE P11#BI.14 220-250VDC	+ 11 - 12	/170.2.D7
SPARE P11#BI.15 220-250VDC	+ 13 - 14	/170.2.E7
SPARE P11#BI.16 220-250VDC	+ 15 - 16	/170.2.E7

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)
—				

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and his responsibility for design details, performance particulars and accuracy of the supplies with the Indian Standard, Code of practice, specifications as may be applicable nor does it affect AEGCL's right under the contract.

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
REB670-RPH OVERVIEW

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram	Ref.Des.	=2R
	DCC EFS		
Resp. dept.	PG-GAS	Rev. ind.	01
Language	en		
Doc. no.	1KHF128840R1411	Sheet	179
		n. sheet	180

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

+BB1

+D.08 -D08.01
Binary input module 1MRK000508-CD
BIM
220-250VDC, 50ma
X121

SPARE	P12#BI.01	220-250VDC	+ 1 - 2	/170.3.B7
SPARE	P12#BI.02	220-250VDC	+ 3 - 4	/170.3.B7
96 OPTD	P12#BI.03	220-250VDC	+ 5 - 6	/170.3.C7
SPARE	P12#BI.04	220-250VDC	+ 7 - 8	/170.3.C7
SPARE	P12#BI.05	220-250VDC	+ 9 - 10	/170.3.C7
SPARE	P12#BI.06	220-250VDC	+ 11 - 12	/170.3.D7
SPARE	P12#BI.07	220-250VDC	+ 13 - 14	/170.3.D7
SPARE	P12#BI.08	220-250VDC	+ 15 - 16	/170.3.E7

+D.08 -D08.01
Binary input module 1MRK000508-CD
BIM
220-250VDC, 50ma
X122

SPARE	P12#BI.09	220-250VDC	+ 1 - 2	/171.4.B7
SPARE	P12#BI.10	220-250VDC	+ 3 - 4	/171.4.B7
SPARE	P12#BI.11	220-250VDC	+ 5 - 6	/171.4.C7
SPARE	P12#BI.12	220-250VDC	+ 7 - 8	/171.4.C7
SPARE	P12#BI.13	220-250VDC	+ 9 - 10	/171.4.C7
SPARE	P12#BI.14	220-250VDC	+ 11 - 12	/171.4.D7
SPARE	P12#BI.15	220-250VDC	+ 13 - 14	/171.4.D7
SPARE	P12#BI.16	220-250VDC	+ 15 - 16	/171.4.E7

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and responsibilities design details, performance particulars and adequacy of the supplies with the Indian Statutory laws / IEC specifications as may be applicable, nor does limit the AEGCL's right under the contract

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
REB670-RPH OVERVIEW

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram	Ref.Des.	=2R
	DCC EFS		
Resp. dept.	PG-GAS	Rev. ind. 01	Language en
Doc. no.	1KHF128840R1411	Sheet	180
		n. sheet	181

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

+BB1

+D.15 -D15.01
Y_PH BB PROTN_RLY_REB670

+A.10-X04:11 <171.4E6
P101
+C.10-X2:17 <171.4E6
P102

Power supply module
PSM
-XX1
11
P101B
-XX2
18
P102B
-X11
4
+
5
-
90-250VDC
G18
PE
/181.B5

/182.A3 <
P101
/182.A6 <
P102

+D.15 -D15.01
Indication HMI
LED

1	ZONE-1 B/B OPTD.
2	ZONE-2 B/B OPTD.
3	BUS-1 LBB OPTD.
4	BUS-2 LBB OPTD.
5	B/B ZONE-1 BLOCKED
6	B/B ZONE-2 BLOCKED
7	Z-1 B/B OPEN CT ALARM
8	Z-2 B/B OPEN CT ALARM
9	MAIN-2 R-PH RELAY FAIL
10	
11	
12	
13	
14	
15	

O: Open

I: Closed

C: Cancel/Clear

E: Enter/Select/Execute

L/R: Local/Remote/off

+D.15 -D15.01
Power supply module
PSM
90-250VDC
1MRK002239-BB

-X11
4
+
5
-
/181.B2
90-250VDC
PE

-X11
2
3
1
/195.F2
REB670 YPH FAULTY
Relay ready

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)
—				

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations nor constitutes waiver of any details, performance particulars and/or requirements of the supplies with the Indian statutory laws / IEC specifications as may be applicable nor does limit the AEGCL's right under the contract.

Arunachal Electric & Engineering Co. Ltd. Guwahati

LIST OF FUNCTIONS:

1. BUSBAR DIFFERENTIAL (87BB)
2. BREAKER FAILURE PROTECTION (50BF)
3. END FAULT PROTECTION

* SCADA (PRP) port to be included.

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
REB670-YPH PROTN. PSM

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram	Ref.Des.	=2R
	DCC EFS		
Resp. dept.	PG-GAS	Rev. ind.	01
Language	en		
Sheet	181		
Doc. no.	1KHF128840R1411	n. sheet	182

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization is prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

+BB1

+D.15 -D15.01
Y_PH BB PROTN_RLY_REB670

+C.15-XX1:11 /181.B1 P101

+C.10-XX2:18 /181.B1 P102

+201-LCC
BAY-201 LCC PANEL

-X1 23 — 52 CB Y-PH OPEN — -X1 24 — -LCCX04 103 — 104 — P139F

+D01AA
BAY-D01 LINE

LBB Y-PH INITIATION FROM D01 BAY — ** — -1BBX04A 5

+A.10-LCCX04:105 /183.A3 P101

+C.10-XX2:20 /183.A6 P102

-XX2 19

/159.E4 P103A	X31 1 +	2 -	/190.A2	Q1 ISOL OPEN / BAY-D01 / 220-250VDC / P3#BI.01
/159.E4 P105A	X31 3 +	4 -	/199.B2	Q1 ISOL CLOSE / BAY-D01 / 220-250VDC / P3#BI.02
/159.E4 P107A	X31 5 +	6 -	/199.B2	Q2 ISOL OPEN / BAY-D01 / 220-250VDC / P3#BI.03
/159.E4 P109A	X31 7 +	8 -	/199.B2	Q2 ISOL CLOSE / BAY-D01 / 220-250VDC / P3#BI.04
	X31 9 +	10 -	/199.C2	Q0CB Y-PH OPEN / BAY-D01 / 220-250VDC / P3#BI.05
/159.E4 P113A	X31 11 +	12 -	/199.C2	Q0 CB MANUAL CLOSE / FROM BAY-D01 / 220-250VDC / P3#BI.06
/159.E4 P115A	X31 13 +	14 -	/199.C2	LBB 3-PH INITIATION / FROM BAY-D01 / 220-250VDC / P3#BI.07
	X31 15 +	16 -	/199.D2	LBB Y-PH INITIATION / FROM BAY-D01 / 220-250VDC / P3#BI.08

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and the design, drawings, particulars and performance of the supplies with the Indian Statutory, Local, IEC specifications as may be applicable nor does limit the AEGCL's right under the contract.

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
REB670-YPH BINARY INPUTS

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram	Ref.Des.	=2R
DCC	EFS		
Resp. dept.	PG-GAS	Rev. ind.	01
Language	en		
Doc. no.	1KHF128840R1411	Sheet	182
		n. sheet	183

© Copyright 2023 Hitachi Energy

+BB1

+A.10-LCCX04:103 <182.E3 P101

+C.10-XX2:19 <182.E7 P102

+D.15 -D15.01
Y_PH BB PROTN_RLY_REB670

/160.E4> P119A → -XX2 20 → X32 1 / 2 → /199.A4 : Q1 ISOL OPEN | BAY-D02 | 220-250VDC | P3#BI.09

/160.E4> P121A → X32 3 / 4 → /199.B4 : Q1 ISOL CLOSE | BAY-D02 | 220-250VDC | P3#BI.10

/160.E4> P123A → X32 5 / 6 → /199.B4 : Q2 ISOL OPEN | BAY-D02 | 220-250VDC | P3#BI.11

/160.E4> P125A → X32 7 / 8 → /199.B4 : Q2 ISOL CLOSE | BAY-D02 | 220-250VDC | P3#BI.12

+202-LCC
BAY-202 LCC PANEL

-X1 23 — 52 CB Y-PH OPEN — -X1 24 → -LCCX04 105 / 106 → P141F → X32 9 / 10 → /199.C4 : Q0 CB Y-PH OPEN | BAY-D02 | 220-250VDC | P3#BI.13

/160.E4> P129A → X32 11 / 12 → /199.C4 : Q0 CB MANUAL CLOSE | FROM BAY-D02 | 220-250VDC | P3#BI.14

+D02AA
BAY-D02 LINE

LBB Y-PH INITIATION FROM D02 BAY — -2BBX04A 5

/160.E4> P131A → X32 13 / 14 → /199.C4 : LBB 3-PH INITIATION | FROM BAY-D02 | 220-250VDC | P3#BI.15

X32 15 / 16 → /199.D4 : LBB Y-PH INITIATION | FROM BAY-D02 | 220-250VDC | P3#BI.16

+A.10-LCCX04:107 /184.A3 <> P101

+C.10-XX2:21 /184.A6 <> P102

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and his responsibility for correct details, performance particulars and conformity of the supplies with the Indian statutory rules / IEC specifications as may be applicable nor does it limit the AEGCL's right under the contract.

Rev.	Revision note	Date	Name
	Based on		
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK

Prepared 08-08-2025 DIVYA S
Approved 08-08-2025 THEJASWINI AR
Project ASSAM ELECTRICITY GRID CORPORATION LTD
400/220kV GIS SS AT SONAPUR
128840

Title 220kV CONTROL & RELAY PANEL
220kV BUSBAR
REB670-YPH BINARY INPUTS

HITACHI Hitachi Energy India Limited

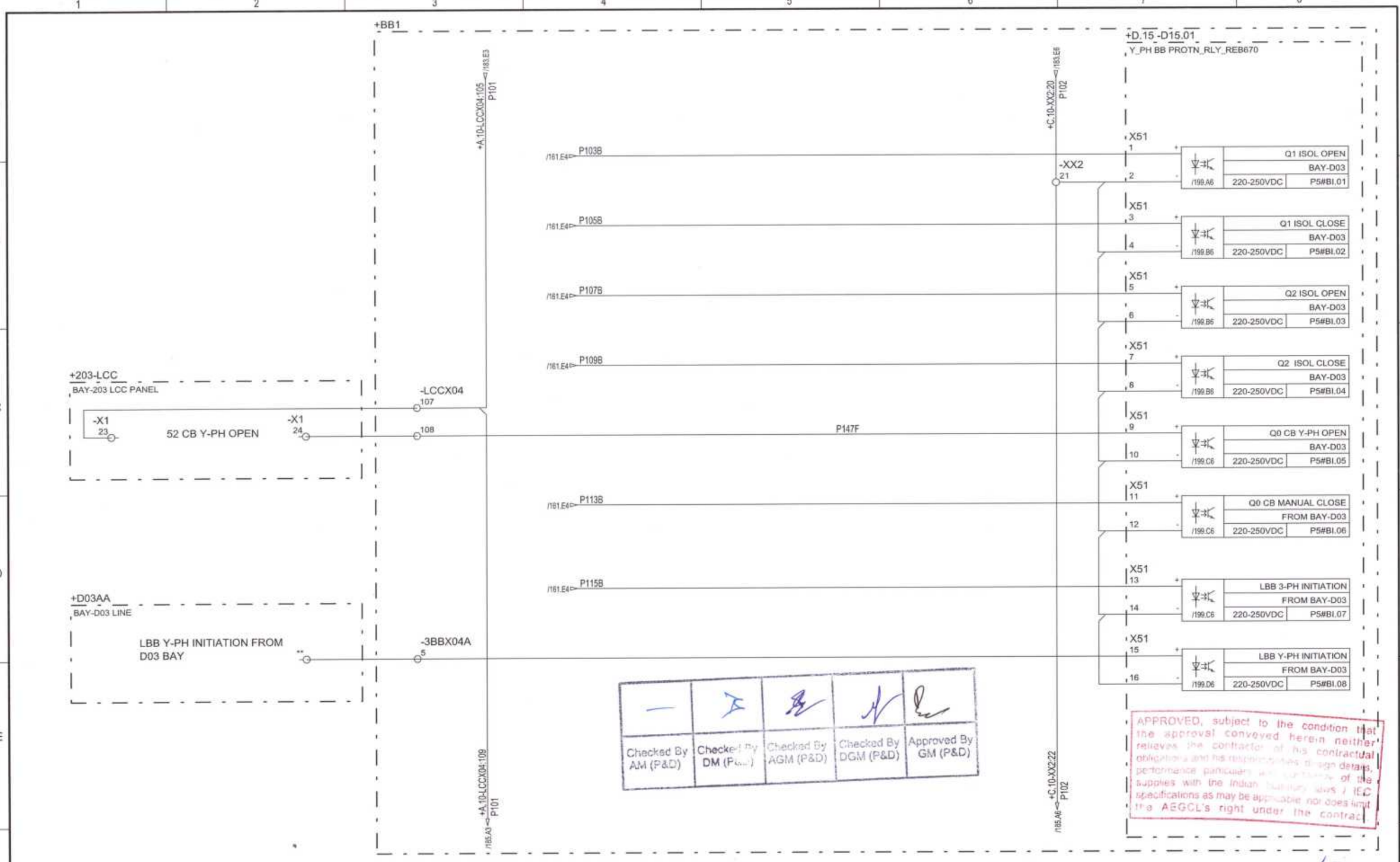
Doc. kind. Circuit diagram
DCC EFS
Resp. dept. PG-GAS
Doc. no. 1KHF128840R1411

Ref.Des. =2R
Rev. ind. 01
Language en
Sheet 183
n. sheet 184

1MYN691003-102(A3)REV01

The reproduction, distribution and utilization of this document as well as the communication of its content to others without express authorization is prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy



Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025 DIVYA S
Approved	08-08-2025 THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840

Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
REB670-YPH BINARY INPUTS

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram DCC EFS	Ref.Des.	=2R
Resp. dept.	PG-GAS	Rev. ind.	01
Doc. no.	1KHF128840R1411	Language	en
		Sheet	184
		n. sheet	185

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

+BB1

+D.15 -D15.01
Y_PH BB PROTN_RLY_REB670

+A.10-LCCX04:107 <184.E3 P101

+C.10-XX2:21 <184.E6 P102

+D04-LCC
BAY-D04 LCC PANEL

-X1 23 — 52 CB Y-PH OPEN — -X1 24

-LCCX04 109

110

P143F

+D04AA
BAY-D04 LINE

LBB Y-PH INITIATION FROM D04 BAY

-4BBX04A 5

+A.10-LCCX04:111 /186.A3 <P101

+C.10-XX2:23 /186.A6 <P102

/162.E4 P119B	-XX2 22	X52 1	2	Q1 ISOL OPEN BAY-D04 /199.A8 220-250VDC P5#BI.09
/162.E4 P121B		X52 3	4	Q1 ISOL CLOSE BAY-D04 /199.B8 220-250VDC P5#BI.10
/162.E4 P123B		X52 5	6	Q2 ISOL OPEN BAY-D04 /199.B8 220-250VDC P5#BI.11
/162.E4 P125B		X52 7	8	Q2 ISOL CLOSE BAY-D04 /199.B8 220-250VDC P5#BI.12
		X52 9	10	Q0CB Y-PH OPEN BAY-D04 /199.C8 220-250VDC P5#BI.13
/162.E4 P129B		X52 11	12	Q0 CB MANUAL CLOSE FROM BAY-D04 /199.C8 220-250VDC P5#BI.14
/162.E4 P131B		X52 13	14	LBB 3-PH INITIATION FROM BAY-D04 /199.C8 220-250VDC P5#BI.15
		X52 15	16	LBB Y-PH INITIATION FROM BAY-D04 /199.D8 220-250VDC P5#BI.16

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)
—				

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and his responsibilities design details, performance particulars and supply of the supplies with the Indian Statutory laws / IEC specifications as may be applicable nor does limit the AEGCL's right under the contract.

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

Title: 220kV CONTROL & RELAY PANEL 220kV BUSBAR REB670-YPH BINARY INPUTS

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram	Ref.Des.	=2R
	DCC EFS		
Resp. dept.	PG-GAS	Rev. ind.	01
Doc. no.	1KHF128840R1411	Language	en
		Sheet	185
		n. sheet	186

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

+BB1

+A.10-LCCX04:109 /186.E3 P101

+C.10-XX2:22 /188.E6 P102

+D.15 -D15.01
Y_PH BB PROTN_RLY_REB670

/163.E4 P103C → -XX2 23 → X71 1 / 2 → /200.A2 | Q1 ISOL OPEN / BAY-D05 / 220-250VDC / P7#BI.01

/163.E4 P105C → X71 3 / 4 → /200.B2 | Q1 ISOL CLOSE / BAY-D05 / 220-250VDC / P7#BI.02

/163.E4 P107C → X71 5 / 6 → /200.B2 | Q2 ISOL OPEN / BAY-D05 / 220-250VDC / P7#BI.03

/163.E4 P109C → X71 7 / 8 → /200.B2 | Q2 ISOL CLOSE / BAY-D05 / 220-250VDC / P7#BI.04

+205-LCC
BAY-205 LCC PANEL

-X1 23 — 52 CB Y-PH OPEN — -X1 24

-LCCX04 111 / 112

P145F → X71 9 / 10 → /200.C2 | Q0CB Y-PH OPEN / BAY-D05 / 220-250VDC / P7#BI.05

/163.E4 P113C → X71 11 / 12 → /200.C2 | Q0CB R-PH OPEN / FROM BAY-D05 / 220-250VDC / P7#BI.06

/163.E4 P115C → X71 13 / 14 → /200.C2 | LBB 3-PH INITIATION / BAY-D05 / 220-250VDC / P7#BI.07

+D05AA
BAY-D05 LINE

LBB Y-PH INITIATION FROM D05 BAY **

-5BBX04A 5 → X71 15 / 16 → /200.D2 | LBB Y-PH INITIATION / BAY-D05 / 220-250VDC / P7#BI.08

+A.10-LCCX04:113 /187.A3 P101

+C.10-XX2:24 /187.A6 P102

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)
—				

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and his responsibilities in regard to performance particulars and conformity of the supplies with the Indian Statutory laws / IEC specifications as may be applicable nor does limit the AEGCL's right under the contract.

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

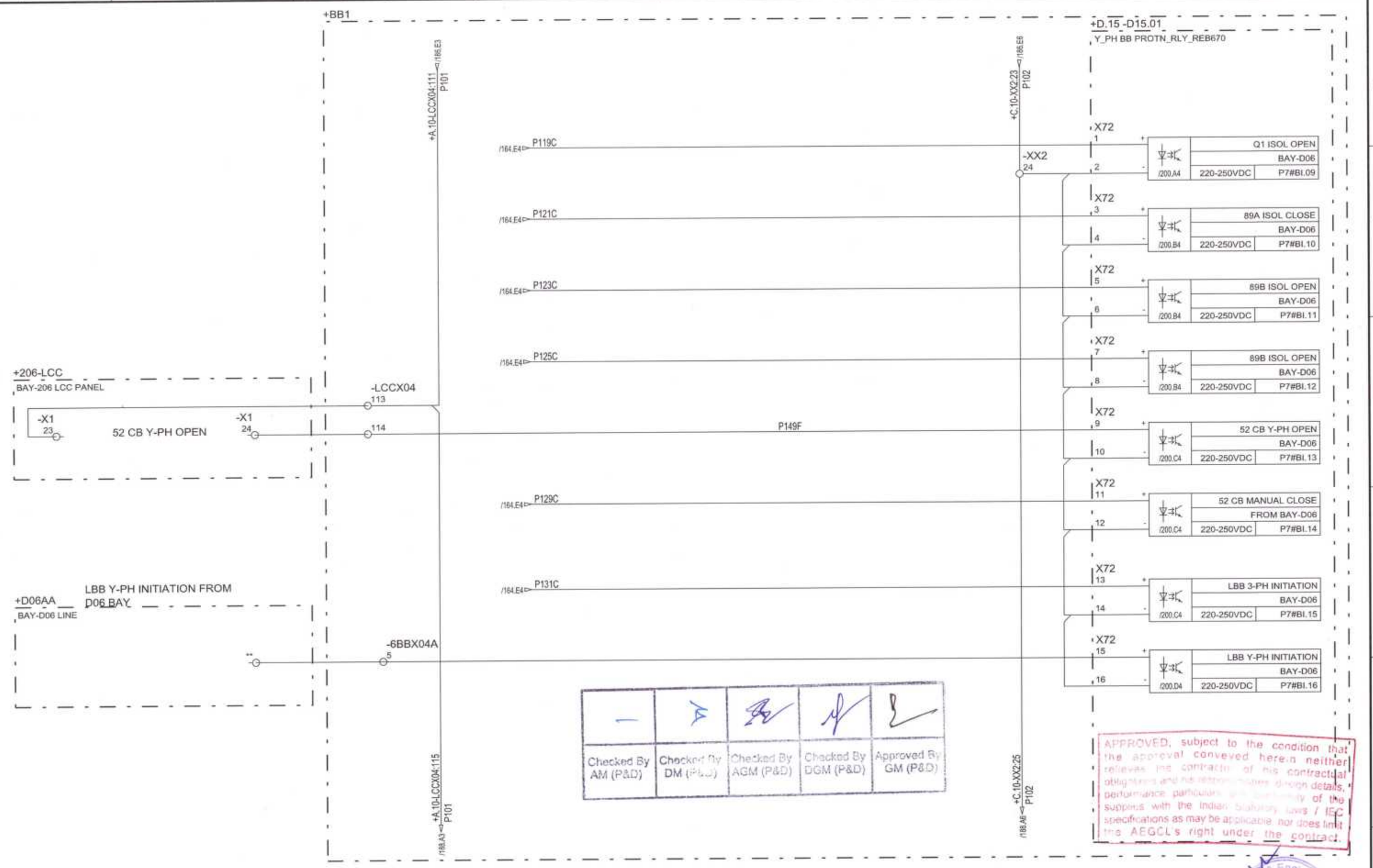
Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
REB670-YPH BINARY INPUTS

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram	Ref.Des.	=2R
DCC	EFS		
Resp. dept.	PG-GAS	Rev. ind.	01
Doc. no.	1KHF128840R1411	Language	en
		Sheet	186
		n. sheet	187

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy



Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

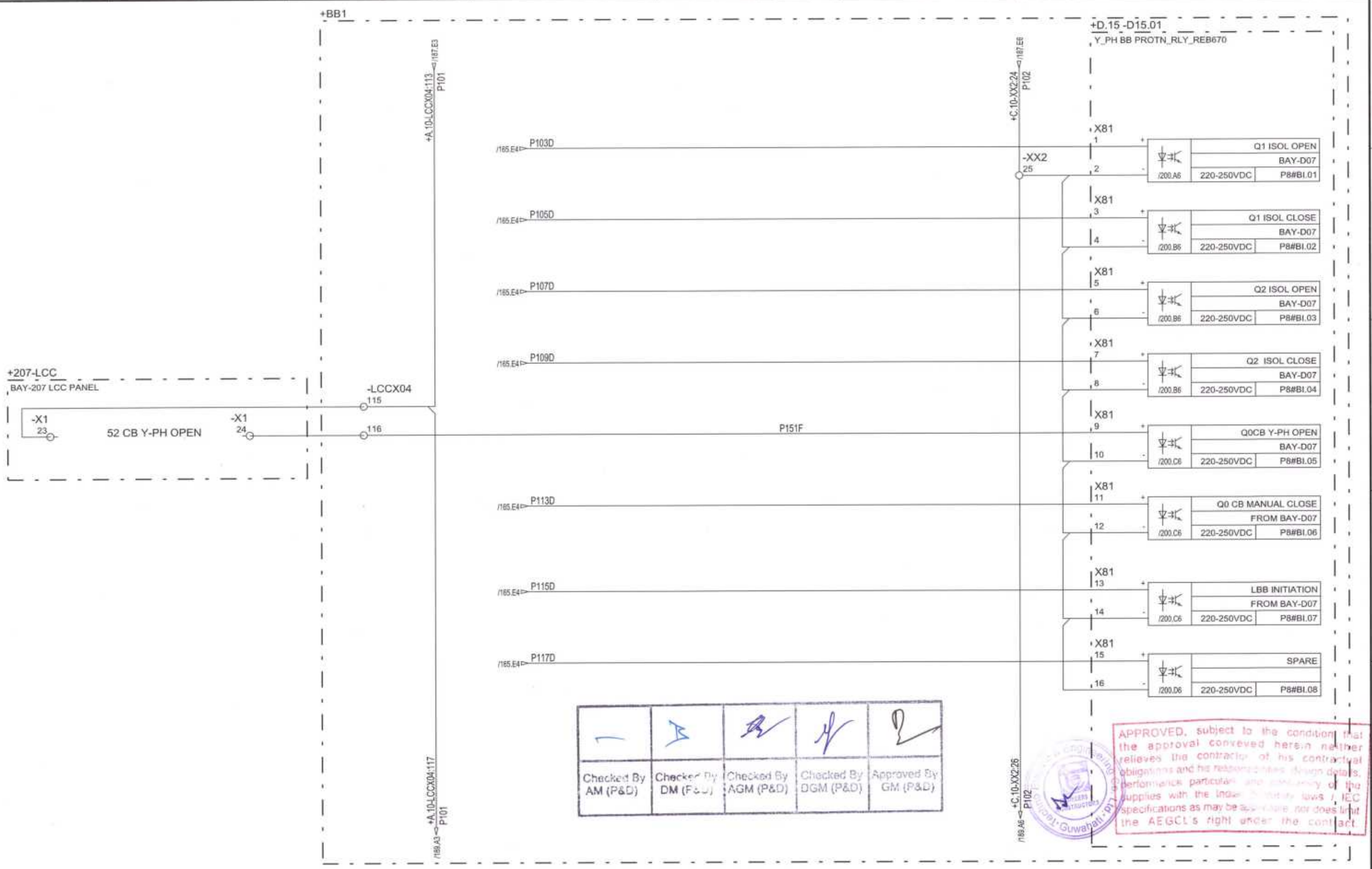
Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
REB670-YPH BINARY INPUTS

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram	Ref.Des.	=2R
	DCC EFS		
Resp. dept.	PG-GAS	Rev. ind.	01
Doc. no.	1KHF128840R1411	Language	en
		Sheet	187
		n. sheet	188

The reproduction, distribution and utilization of this document as well as the communication of its content to others without express authorization is prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy



Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

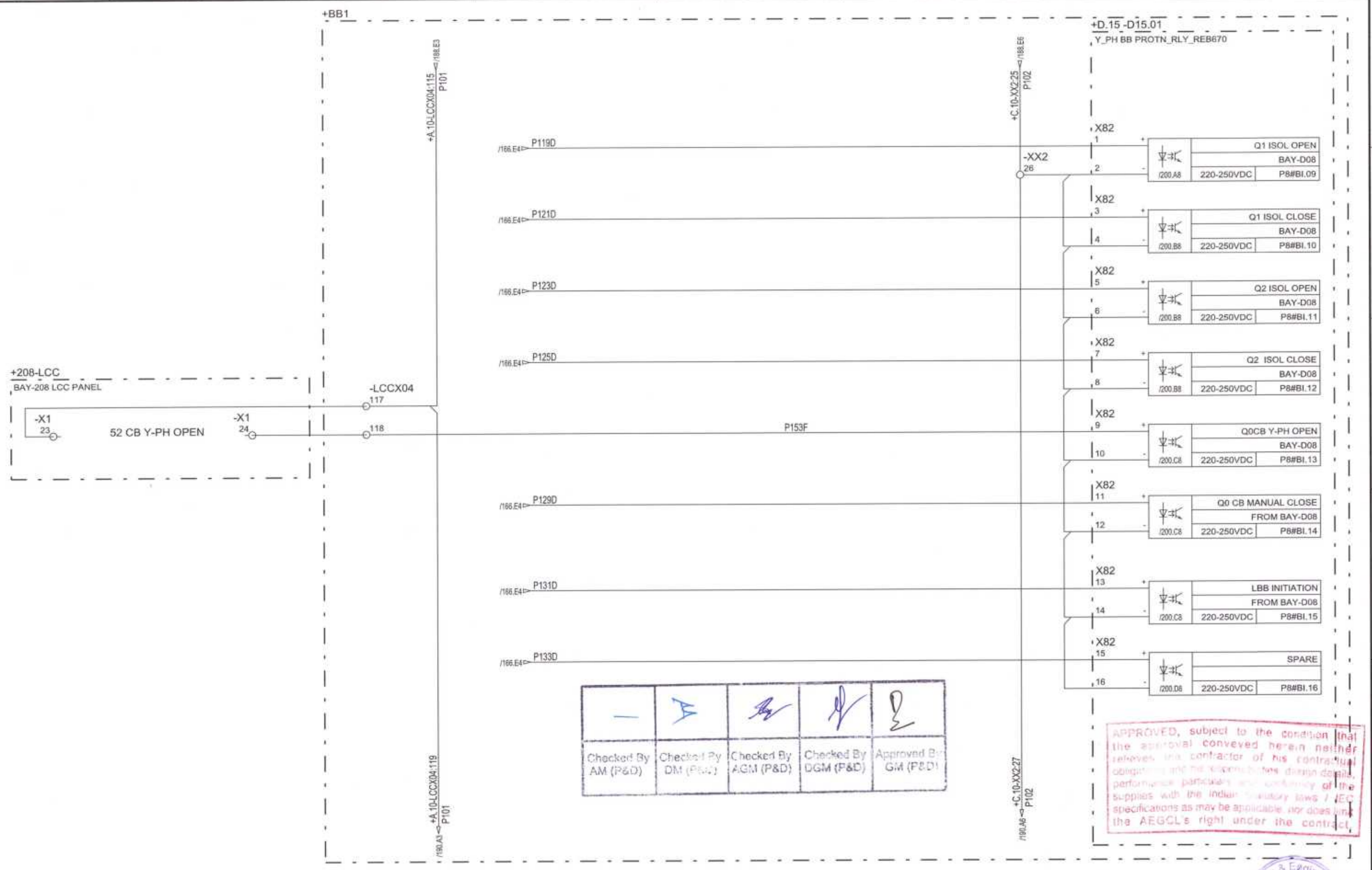
Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
REB670-YPH BINARY INPUTS

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram	Ref.Des.	=2R
	DCC EFS		
Resp. dept.	PG-GAS	Rev. ind.	01
Language	en		
Sheet	188		
Doc. no.	1KHF128840R1411	n. sheet	189

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy



The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

Rev.	Revision note	Date	Name
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK

Based on

1MYN691003-102(A3)REV01

Prepared 08-08-2025 DIVYA S
Approved 08-08-2025 THEJASWINI AR
Project ASSAM ELECTRICITY GRID CORPORATION LTD
400/220kV GIS SS AT SONAPUR
128840

Title 220kV CONTROL & RELAY PANEL
220kV BUSBAR
REB670-YPH BINARY INPUTS

HITACHI Hitachi Energy India Limited

Doc. kind. Circuit diagram
DCC EFS
Resp. dept. PG-GAS
Doc. no. 1KHF128840R1411

Ref.Des. =2R
Rev. ind. 01
Language en
Sheet 189
n. sheet 190

© Copyright 2023 Hitachi Energy

+BB1

+A.10-LCCX04:117 /169.E3 P101

+C.10-XX2:26 /169.E6 P102

+D.15 -D15.01
Y_PH BB PROTN_RLY_REB670

+209-LCC
BAY-209 LCC PANEL

-LCCX04
119

-X1
23

52 CB Y-PH OPEN

-X1
24

120

P155F

-XX2
27

/167.E4 P103E	X91 1	+		Q1 ISOL OPEN BAY-D09		
		- 2	/201.A2	220-250VDC	P9#BI.01	
/167.E4 P105E	X91 3	+		Q1 ISOL CLOSE BAY-D09		
		- 4	/201.B2	220-250VDC	P9#BI.02	
/167.E4 P107E	X91 5	+		Q2 ISOL OPEN BAY-D09		
		- 6	/201.B2	220-250VDC	P9#BI.03	
/167.E4 P109E	X91 7	+		Q2 ISOL CLOSE BAY-D09		
		- 8	/201.B2	220-250VDC	P9#BI.04	
	X91 9	+		Q0CB Y-PH OPEN BAY-D09		
		- 10	/201.C2	220-250VDC	P9#BI.05	
/167.E4 P113E	X91 11	+		Q0 CB MANUAL CLOSE FROM BAY-D09		
		- 12	/201.C2	220-250VDC	P9#BI.06	
/167.E4 P115E	X91 13	+		LBB INITIATION FROM BAY-D09		
		- 14	/201.C2	220-250VDC	P9#BI.07	
/167.E4 P117E	X91 15	+		SPARE		
		- 16	/201.D2	220-250VDC	P9#BI.08	

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and his responsibilities design details, performance particulars and conformity of the supplies with the Indian statutory laws / IEC specifications as may be applicable nor does limit the AEGCL's right under the contract.

+A.10-LCCX04:121 /192.A3 P101

+C.10-XX2:28 /192.A6 P102

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
REB670-YPH BINARY INPUTS

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram	Ref.Des.	=2R
	DCC EFS		
Resp. dept.	PG-GAS	Rev. ind.	01
Doc. no.	1KHF128840R1411	Language	en
		Sheet	190
		n. sheet	192

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

+BB1

+D.15 -D15.01
Y_PH BB PROTN_RLY_REB670

+A.10-LCCX04:119 /190.E3 P101

+C.10-XX2:27 /190.E8 P102

+210-LCC
BAY-210 LCC PANEL

-X1 23 — 52 CB Y-PH OPEN — -X1 24

-LCCX04 121 / 122

P157F

+D10AA
BAY-D10 LINE

LBB Y-PH INITIATION FROM D10 BAY

-10BBX04A 5

+A.10-LCCX04:123 /193.A3 P101

+C.10-XX2:29 /193.A8 P102

-XX2 28

P119E	/166.E4	X92 1 / 2	/201.A4	Q1 ISOL OPEN BAY-D10 220-250VDC P9#BI.09
P121E	/166.E4	X92 3 / 4	/201.B4	Q1 ISOL CLOSE BAY-D10 220-250VDC P9#BI.10
P123E	/166.E4	X92 5 / 6	/201.B4	Q2 ISOL OPEN BAY-D10 220-250VDC P9#BI.11
P125E	/166.E4	X92 7 / 8	/201.B4	Q2 ISOL CLOSE BAY-D10 220-250VDC P9#BI.12
		X92 9 / 10	/201.C4	Q0CB R-PH OPEN BAY-D10 220-250VDC P9#BI.13
P129E	/166.E4	X92 11 / 12	/201.C4	Q0 CB MANUAL CLOSE FROM BAY-D10 220-250VDC P9#BI.14
P131E	/166.E4	X92 13 / 14	/201.C4	LBB 3-PH INITIATION FROM BAY-D10 220-250VDC P9#BI.15
		X92 15 / 16	/201.D4	LBB Y-PH INITIATION FROM BAY-D10 220-250VDC P9#BI.16

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)
—	A			

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and his responsibility for design details, performance particulars and conformity of the supplies with the Indian Statutory laws / IEC specifications as may be applicable nor does it limit the AEGCL's right under the contract.

Rev.	Revision note	Date	Name
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK

Based on

1MYN691003-102(A3)REV01

Prepared 08-08-2025 DIVYA S
Approved 08-08-2025 THEJASWINI AR
Project ASSAM ELECTRICITY GRID CORPORATION LTD
400/220kV GIS SS AT SONAPUR
128840

Title 220kV CONTROL & RELAY PANEL
220kV BUSBAR
REB670-YPH BINARY INPUTS

HITACHI Hitachi Energy India Limited

Doc. kind. Circuit diagram
DCC EFS
Resp. dept. PG-GAS
Doc. no. 1KHF128840R1411

Ref.Des. =2R
Rev. ind. 01
Language en
Sheet 192
n. sheet 193

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

+BB1

+A.10-LCCX04:121 /192.E3 P101

+C.10-XX2:28 /192.E6 P102

+D.15-D15.01
Y_PH BB PROTN_RLY_REB670

+211-LCC
BAY-211 LCC PANEL

-LCCX04 123

-X1 23 — 52 CB Y-PH OPEN — -X1 24 — 124 — P159F

+D11AA
BAY-D11 LINE

LBB Y-PH INITIATION FROM D11 BAY — ** — -11BBX04A 5

-XX2 29

/169.E4 P103F	X101 1	2	Q1 ISOL OPEN	BAY-D11	220-250VDC	P10#BI.01
/169.E4 P105F	X101 3	4	Q1 ISOL CLOSE	BAY-D11	220-250VDC	P10#BI.02
/169.E4 P107F	X101 5	6	Q2 ISOL OPEN	BAY-D11	220-250VDC	P10#BI.03
/169.E4 P109F	X101 7	8	Q2 ISOL CLOSE	BAY-D11	220-250VDC	P10#BI.04
	X101 9	10	Q0CB Y-PH OPEN	BAY-D11	220-250VDC	P10#BI.05
/169.E4 P113F	X101 11	12	Q0 CB MANUAL CLOSE	FROM BAY-D11	220-250VDC	P10#BI.06
/169.E4 P115F	X101 13	14	LBB 3-PH INITIATION	BAY-D11	220-250VDC	P10#BI.07
	X101 15	16	LBB Y-PH INITIATION	FROM BAY-D11	220-250VDC	P10#BI.08

+D.08-D08.D12:(-X11) /194.A3 P101

+C.10-XX2:30 /194.A6 P102

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and responsibilities, performance particulars or compliance of the supplies with the Indian statutory regulations, IEC specifications as may be applicable nor does it affect AEGCL's right under the contract.

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
REB670-YPH BINARY INPUTS

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram	Ref.Des.	=2R
	DCC EFS		
Resp. dept.	PG-GAS	Rev. ind.	01
Doc. no.	1KHF128840R1411	Language	en
		Sheet	193
		n. sheet	194

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

+BB1

+D.15-D15.01
Y_PH BB PROTN_RLY_REB670

+A.10-LCCX04:123 /193.E3 P101

+C.10-XX2:29 /193.E6 P102

/170.E5 P119F	-XX2 30	X102 1	2	BUS-1 SW. IN OUT POSITION 220-250VDC P10#BI.09
/170.E5 P121F		X102 3	4	BUS-2 SW. IN OUT POSITION 220-250VDC P10#BI.10
/170.E5 P123F		X102 5	6	OPEN CT ALARM RESET 220-250VDC P10#BI.11
P101 /171.E6 +D.08-D08.01:2 (-X11)	/171.E6 P135F	P135F X102 7	8	REB670-RPH FAULTY 220-250VDC P10#BI.12
P101 /282.A3 >+BB2.A.10-X14:54	/282.A3 #1070	X102 9	10	96 FAULTY 220-250VDC P10#BI.13
44		X102 11	12	SPARE 220-250VDC P10#BI.14
45		X102 13	14	SPARE 220-250VDC P10#BI.15
46		X102 15	16	SPARE 220-250VDC P10#BI.16

P101

P102

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By CM (P&D)

APPROVED, subject to the conditions that the approval conveyed herein neither relieves the contractor [illegible] obligations and his responsibility [illegible] performance particulars [illegible] supplies with the indent [illegible] specifications as may be [illegible] as to limit the AEGCL's right under the contract.

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared 08-08-2025 DIVYA S
Approved 08-08-2025 THEJASWINI AR
Project ASSAM ELECTRICITY GRID CORPORATION LTD
400/220kV GIS SS AT SONAPUR
128840

Title 220kV CONTROL & RELAY PANEL
220kV BUSBAR
REB670-YPH BINARY INPUTS

HITACHI Hitachi Energy India Limited

Doc. kind. Circuit diagram
DCC EFS
Resp. dept. PG-GAS
Doc. no. 1KHF128840R1411

Ref.Des. =2R
Rev. ind. 01
Language en
Sheet 194
n. sheet 194.1

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

+BB1

+D.15-D15.01
Y_PH BB PROTN_RLY_REB670

P102

-XX2
31

/170.1.E3	P101G +B.17-IXX1:84	X111 1	2	/202.A6	220-250VDC	SPARE P11#BI.01
/170.1.E4	P103G +B.17-IXX1:85	X111 3	4	/202.B6	220-250VDC	SPARE P11#BI.02
/170.1.E4	P105G +B.17-IXX1:86	X111 5	6	/202.B6	220-250VDC	SPARE P11#BI.03
/170.1.E4	P107G +B.17-IXX1:87	X111 7	8	/202.B6	220-250VDC	SPARE P11#BI.04
/170.1.E4	P109G +B.17-IXX1:88	X111 9	10	/202.C6	220-250VDC	SPARE P11#BI.05
/170.1.E4	P111G +B.17-IXX1:89	X111 11	12	/202.C6	220-250VDC	SPARE P11#BI.06
/170.1.E4	P113G +B.17-IXX1:90	X111 13	14	/202.C6	220-250VDC	SPARE P11#BI.07
/170.1.E5	P115G +B.17-IXX1:91	X111 15	16	/202.D6	220-250VDC	SPARE P11#BI.08

P102

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)
—				

APPROVED, subject to the relation that the approval conveyed herein neither relieves the contractor of his contractual obligations nor implies any acceptance/deviation pertaining to any of the subject and the instant [illegible] / IEC specifications as may be applicable for [illegible] e AEGCL's right under the contract.

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared 08-08-2025 DIVYA S
Approved 08-08-2025 THEJASWINI AR
Project ASSAM ELECTRICITY GRID CORPORATION LTD
400/220kV GIS SS AT SONAPUR
128840

Title 220kV CONTROL & RELAY PANEL
220kV BUSBAR
REB670-YPH BINARY INPUTS

HITACHI Hitachi Energy India Limited

Doc. kind. Circuit diagram
DCC EFS
Resp. dept. PG-GAS
Doc. no. 1KHF128840R1411

Ref.Des. =2R
Rev. ind. 01
Language en
Sheet 194.1
n. sheet 195.2

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

+BB1

+D.15-D15.01
Y_PH BB PROTN_RLY_REB670

P102

-XX2
32

/170.2.E3	P117G +B.17-IXX1:92	X112 1	2	/202.A8	SPARE	220-250VDC	P11#BI.09
/170.2.E4	P119G +B.17-IXX1:93	X112 3	4	/202.B8	SPARE	220-250VDC	P11#BI.10
/170.2.E4	P121G +B.17-IXX1:94	X112 5	6	/202.B8	SPARE	220-250VDC	P11#BI.11
/170.2.E4	P123G +B.17-IXX1:95	X112 7	8	/202.B8	SPARE	220-250VDC	P11#BI.12
/170.2.E4	P125G +B.17-IXX1:96	X112 9	10	/202.C8	SPARE	220-250VDC	P11#BI.13
/170.2.E4	P127G +B.17-IXX1:97	X112 11	12	/202.C8	SPARE	220-250VDC	P11#BI.14
/170.2.E4	P129G +B.17-IXX1:98	X112 13	14	/202.C8	SPARE	220-250VDC	P11#BI.15
/170.2.E5	P131G +B.17-IXX1:99	X112 15	16	/202.D8	SPARE	220-250VDC	P11#BI.16

P102

Checked By AM (P&D)	Checked By DM (P&D)	Checked By ACM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and the tender rules, design details, performance particulars, quantity of the supplies with the Indian Electricity Rules / IEC specifications as may be applicable nor does limit the AEGCL's right under the contract.

Rev.	Revision note	Date	Name
	Based on		
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK

Prepared 08-08-2025 DIVYA S
Approved 08-08-2025 THEJASWINI AR
Project ASSAM ELECTRICITY GRID CORPORATION LTD
400/220kV GIS SS AT SONAPUR
128840

Title 220kV CONTROL & RELAY PANEL
220kV BUSBAR
REB670-YPH BINARY INPUTS

HITACHI Hitachi Energy India Limited

Doc. kind. Circuit diagram
DCC EFS
Resp. dept. PG-GAS
Doc. no. 1KHF128840R1411
Ref.Des. =2R
Rev. ind. 01
Language en
Sheet 195.2
n. sheet 195.3

1MYN691003-102(A3)REV01

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy
The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

+BB1

+D.15-D15.01
Y_PH BB PROTN_RLY_REB670

P102

-XX2
33

/170.3.E3	P103H +B.17-IXX1:100	X121 1	+	SPARE			
		2	-	/203.A3	220-250VDC	P12#BI.01	
/170.3.E4	P105H +B.17-IXX1:101	X121 3	+	SPARE			
		4	-	/203.B3	220-250VDC	P12#BI.02	
/170.3.E5	P107H +B.17-IXX1:102	X121 5	+	96 OPTD			
		6	-	/203.B3	220-250VDC	P12#BI.03	
47	P135H	X121 7	+	SPARE			
		8	-	/203.B3	220-250VDC	P12#BI.04	
48	P137H	X121 9	+	SPARE			
		10	-	/203.C3	220-250VDC	P12#BI.05	
49	P139H	X121 11	+	SPARE			
		12	-	/203.C3	220-250VDC	P12#BI.06	
50	P141H	X121 13	+	SPARE			
		14	-	/203.C3	220-250VDC	P12#BI.07	
51	P143H	X121 15	+	SPARE			
		16	-	/203.D3	220-250VDC	P12#BI.08	

P102

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations arising in any manner from details, performance particulars or quantity of the supplies with the indian statutes / I.E.G. specifications as may be applicable nor does limit the AEGCL's right under the contract.

Rev.	Revision note	Date	Name
Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK

1MYN691003-102(A3)REV01

Prepared 08-08-2025 DIVYA S
Approved 08-08-2025 THEJASWINI AR
Project ASSAM ELECTRICITY GRID CORPORATION LTD
400/220kV GIS SS AT SONAPUR
128840

Title 220kV CONTROL & RELAY PANEL
220kV BUSBAR
REB670-YPH BINARY INPUTS

HITACHI Hitachi Energy India Limited

Doc. kind. Circuit diagram
DCC EFS
Resp. dept. PG-GAS
Doc. no. 1KHF128840R1411
Ref.Des. -S2R
Rev. ind. 01
Language en
Sheet 195.3
n. sheet 195.4

© Copyright 2023 Hitachi Energy

+BB1

+D.15-D15.01
Y_PH BB PROTN_RLY_REB670

-X04

52	P145H	P102	-XX2 34	X122 1	+	/203.A4	SPARE	P12#BI.09
				2	-		220-250VDC	
53	P147H			X122 3	+	/203.B4	SPARE	P12#BI.10
				4	-		220-250VDC	
54	P149H			X122 5	+	/203.B4	SPARE	P12#BI.11
				6	-		220-250VDC	
55	P151H			X122 7	+	/203.B4	SPARE	P12#BI.12
				8	-		220-250VDC	
56	P153H			X122 9	+	/203.C4	SPARE	P12#BI.13
				10	-		220-250VDC	
57	P155H			X122 11	+	/203.C4	SPARE	P12#BI.14
				12	-		220-250VDC	
58	P157H			X122 13	+	/203.C4	SPARE	P12#BI.15
				14	-		220-250VDC	
59	P159H	P102		X122 15	+	/203.D4	SPARE	P12#BI.16
				16	-		220-250VDC	

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and responsibilities in design, performance parameters a... accuracy of the supplies with the Indian statutory laws / rules / specifications as may be applicable, nor does it... the AEGCL's right under the contract.

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
REB670-YPH BINARY INPUTS

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram	Ref.Des.	=2R
DCC	EFS		
Resp. dept.	PG-GAS	Rev. ind.	01
Doc. no.	1KHF128840R1411	Language	en
		Sheet	195.4
		n. sheet	195

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

+BB1

+D.15 -D15.01

Y_PH BB PROTN_RLY_REB670

BBP/LBB/ OPTD. BAY-D01 P4#BO.01	/201.A6	X41 2 / 1	-XX1 12
BBP/LBB/ OPTD. BAY-D02 P4#BO.02	/201.B6	X41 3	
BBP/LBB/ OPTD. BAY-D03 P4#BO.03	/201.B6	X41 5 / 4	
BBP/LBB/ OPTD. BAY-D04 P4#BO.04	/201.B6	X41 6	
BBP/LBB/ OPTD. BAY-D05 P4#BO.05	/201.C6	X41 8 / 7	-XX1 13
BBP/LBB/ OPTD. BAY-D06 P4#BO.06	/201.C6	X41 9	
BBP/LBB/ OPTD. BAY-D07 P4#BO.07	/201.C6	X41 11 / 10	
BBP/LBB/ OPTD. BAY-D08 P4#BO.08	/201.D6	X41 12	
BBP/LBB/ OPTD. BAY-D09 P4#BO.09	/201.D6	X41 14 / 13	-XX1 14
BBP/LBB/ OPTD. BAY-D10(FUT. LINE-1) P4#BO.10	/201.D6	X41 15	
BBP/LBB/ OPTD. BAY-D11(FUT.LINE-2) P4#BO.11	/201.E6	X41 17 / 16	
SPARE P4#BO.12	/201.E6	X41 18	
REB670 YPH FAULTY Relay ready	/181.B7	-X11 2 / 3 / 1	

+C.15-XX1:10 P1 /173.E3

1P4 +B.17-IXX1:103 /171.A4

2P4 +B.17-IXX1:104 /171.B4

3P4 +B.17-IXX1:105 /171.B4

4P4 +B.17-IXX1:106 /171.B4

5P4 +B.17-IXX1:107 /171.C4

6P4 +B.17-IXX1:108 /171.C4

7P4 +B.17-IXX1:109 /171.C4

8P4 +B.17-IXX1:110 /171.D4

9P4 +B.17-IXX1:111 /171.D4

10P4 +B.17-IXX1:112 /171.D4

11P4 +B.17-IXX1:113 /171.E4

1P3 +B.17-IXX1:114 /171.E4

+A.10-LCCX04:145 P101 /223.C4

P137F +D.22-D22.01:7 (X102) /223.C5

-C.15-XX1:15 P1 /196.A4

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)
—				

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and responsibilities, design details, performance particulars, ... supplies with the Indian ... specifications as may be applicable, nor does limit the AEGCL's right under the contract.

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
REB670-YPH BINARY OUTPUTS

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram	Ref.Des.	=2R
	DCC EFS		
Resp. dept.	PG-GAS	Rev. ind. 01	Language en
Doc. no.	1KHF128840R1411	Sheet	195
		n. sheet	196

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

+BB1

+D.15 -D15.01

Y_PH BB PROTN_RLY_REB670

EFP/LBB/ OPTD. BAY-D01 P4#BO.13	/201.A8	X42 2 1	-XX1 15	+C.15-XX1:14 P1	/195.E3
EFP/LBB/ OPTD. BAY-D02 P4#BO.14	/201.B8	X42 3			
EFP/LBB/ OPTD. BAY-D03 P4#BO.15	/201.B8	X42 5 4			
EFP/LBB/ OPTD. BAY-D04 P4#BO.16	/201.B8	X42 6			
EFP/LBB/ OPTD. BAY-D05 P4#BO.17	/201.C8	X42 8 7	-XX1 16		
EFP/LBB/ OPTD. BAY-D06 P4#BO.18	/201.C8	X42 9			
EFP/LBB/ OPTD. BAY-D07 P4#BO.19	/201.C8	X42 11 10			
EFP/LBB/ OPTD. BAY-D08 P4#BO.20	/201.D8	X42 12			
EFP/LBB/ OPTD. BAY-D09 P4#BO.21	/201.D8	X42 14 13	-XX1 17		
EFP/LBB/ OPTD. BAY-D10(FUT. LINE-1) P4#BO.22	/201.D8	X42 15			
EFP/LBB/ OPTD. BAY-D11(FUT.LINE-2) P4#BO.23	/201.E8	X42 17 16			
SPARE P4#BO.24	/201.E8	X42 18			

1P9 +B.17-IXX1:115	/172.A4
2P9 +B.17-IXX1:116	/172.B4
3P9 +B.17-IXX1:117	/172.B4
4P9 +B.17-IXX1:118	/172.B4
5P9 +B.17-IXX1:119	/172.C4
6P9 +B.17-IXX1:120	/172.C4
P139 +B.17-IXX1:121	/172.C4
8P7 +B.17-IXX1:122	/172.D4
9P7 +B.17-IXX1:123	/172.D4
10P9 +B.17-IXX1:124	/172.D4
11P9 +B.17-IXX1:125	/172.E4
P149 +B.17-IXX1:126	/172.E4

+C.15-XX1:18 P1 /195.A4

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations nor his responsibilities of design details, performance particulars and conformity of the supplies with the Indian statutory laws / IEC specifications as may be applicable nor does limit the AEGCL's right under the contract.

Assam Electric Engineering Co. Ltd. Guwahati

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
REB670-YPH BINARY OUTPUTS

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram	Ref.Des.	=2R
	DCC EFS		
Resp. dept.	PG-GAS	Rev. ind.	01
Doc. no.	1KHF128840R1411	Language	en
		Sheet	196
		n. sheet	197

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

+BB1

+D.15 -D15.01

Y_PH BB PROTN_RLY_REB670

LBB RE-TRIP Y-PH BAY-D01 P6#BO.01	/202.A2	X61 2 1	-XX1 18	+C.15-XX1:17 P1	/198.E3
LBB RE-TRIP Y-PH BAY-D02 P6#BO.02	/202.B2	X61 3			
LBB RE-TRIP Y-PH BAY-D03 P6#BO.03	/202.B2	X61 5 4			
LBB RE-TRIP Y-PH BAY-D04 P6#BO.04	/202.C2	X61 6			
LBB RE-TRIP Y-PH BAY-D05 P6#BO.05	/202.C2	X61 8 7	-XX1 19		
LBB RE-TRIP Y-PH BAY-D06 P6#BO.06	/202.C2	X61 9			
LBB RE-TRIP 3-PH BAY-D07 P6#BO.07	/202.C2	X61 11 10		7P6 +A.10-X04:21	/173.C4
LBB RE-TRIP 3-PH BAY-D08 P6#BO.08	/202.D2	X61 12		8P6 +A.10-X04:22	/173.D4
LBB RE-TRIP 3-PH BAY-D09 P6#BO.09	/202.D2	X61 14 13	-XX1 20	9P6 +A.10-X04:23	/173.D4
LBB RE-TRIP Y-PH BAY-D10(FUT.LINE-1) P6#BO.10	/202.E2	X61 15			
LBB RE-TRIP Y-PH BAY-D11(FUT.LINE-2) P6#BO.11	/202.E2	X61 17 16			
SPARE P6#BO.12	/202.E2	X61 18		P177 +A.10-X04:25	/173.E4

+C.15-XX1:22 P1 /224.A4

+BB2

-X14

38	1P7 +D.26-D26.101.101:21	/261.C1
39	2P7 +D.26-D26.113.101:11	/261.E1
40	3P7 +D.26-D26.119.101:21	/262.C1
41	4P7 +D.26-D26.131.101:11	/262.E1
42	5P7 +D.26-D26.137.101:21	/263.C1
43	6P7 +D.26-D26.149.101:11	/263.E1
44	10P7 +D.26-D26.113.301:21	/265.E1
45	11P7 +D.26-D26.125.301:11	/266.C1

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations as to correctness of design details, performance parameters, delivery of the supplies with the indicated make(s) / IEC specifications as may be applicable nor does limit the AEGCL's right under the contract.

Guwahati Electrical Engineering Co. Ltd. ENGINEERS & CONTRACTORS

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

Title: 220kV CONTROL & RELAY PANEL 220kV BUSBAR REB670-YPH BINARY OUTPUTS

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram DCC EFS	Ref.Des.	=2R
Resp. dept.	PG-GAS	Rev. ind. 01	Language en
Doc. no.	1KHF128840R1411	Sheet	197
		n. sheet	198

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

+BB1

+D.15 -D15.01

Y_PH BB PROTN_RLY_REB670

SPARE	P6#BO.13	/202.A4	X62:2	2P103	-X04:60
			X62:1	2P105	-X04:61
SPARE	P6#BO.14	/202.B4	X62:3	2P107	-X04:62
SPARE	P6#BO.15	/202.B4	X62:5	2P109	-X04:63
			X62:4	2P111	-X04:64
SPARE	P6#BO.16	/202.C4	X62:6	2P113	-X04:65
SPARE	P6#BO.17	/202.C4	X62:8	2P115	-X04:66
			X62:7	2P117	-X04:67
SPARE	P6#BO.18	/202.C4	X62:9	2P119	-X04:68
SPARE	P6#BO.19	/202.C4	X62:11	2P121	-X04:69
			X62:10	2P123	-X04:70
SPARE	P6#BO.20	/202.D4	X62:12	2P125	-X04:71
SPARE	P6#BO.21	/202.D4	X62:14	2P127	-X04:72
			X62:13	2P129	-X04:73
SPARE	P6#BO.22	/202.E4	X62:15	2P131	-X04:74
SPARE	P6#BO.23	/202.E4	X62:17	2P133	-X04:75
			X62:16	2P135	-X04:76
SPARE	P6#BO.24	/202.E4	X62:18	2P137	-X04:77

Checked By AM (P&D)	Checked By DM (P	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)
—	▷			

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and responsibilities of any details, performance particulars of any of the supplies with the relevant [illegible] / IEC specifications as may be applicable nor does limit the AEGCL's right under the contract.

Based on

01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR

Project: ASSAM ELECTRICITY GRID CORPORATION LTD
400/220kV GIS SS AT SONAPUR
128840

Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
REB670-YPH BINARY OUTPUTS

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram	Ref.Des.	=2R
	DCC EFS		
Resp. dept.	PG-GAS	Rev. ind. 01	Language en
Doc. no.	1KHF128840R1411	Sheet	198
		n. sheet	199

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

+BB1

+D.15 -D15.01
Binary input module
BIM
220-250VDC, 50ma
1MRK000508-CD
X31

Q1 ISOL OPEN	BAY-D01	P3#BI.01	220-250VDC	/182.B7
Q1 ISOL CLOSE	BAY-D01	P3#BI.02	220-250VDC	/182.B7
Q2 ISOL OPEN	BAY-D01	P3#BI.03	220-250VDC	/182.C7
Q2 ISOL CLOSE	BAY-D01	P3#BI.04	220-250VDC	/182.C7
Q0CB Y-PH OPEN	BAY-D01	P3#BI.05	220-250VDC	/182.C7
Q0 CB MANUAL CLOSE	FROM BAY-D01	P3#BI.06	220-250VDC	/182.D7
LBB 3-PH INITIATION	FROM BAY-D01	P3#BI.07	220-250VDC	/182.D7
LBB Y-PH INITIATION	FROM BAY-D01	P3#BI.08	220-250VDC	/182.E7

+D.15 -D15.01
Binary input module
BIM
220-250VDC, 50ma
1MRK000508-CD
X32

Q1 ISOL OPEN	BAY-D02	P3#BI.09	220-250VDC	/183.B7
Q1 ISOL CLOSE	BAY-D02	P3#BI.10	220-250VDC	/183.B7
Q2 ISOL OPEN	BAY-D02	P3#BI.11	220-250VDC	/183.C7
Q2 ISOL CLOSE	BAY-D02	P3#BI.12	220-250VDC	/183.C7
Q0 CB Y-PH OPEN	BAY-D02	P3#BI.13	220-250VDC	/183.C7
Q0 CB MANUAL CLOSE	FROM BAY-D02	P3#BI.14	220-250VDC	/183.D7
LBB 3-PH INITIATION	FROM BAY-D02	P3#BI.15	220-250VDC	/183.D7
LBB Y-PH INITIATION	FROM BAY-D02	P3#BI.16	220-250VDC	/183.E7

+D.15 -D15.01
Binary input module
BIM
220-250VDC, 50ma
1MRK000508-CD
X51

Q1 ISOL OPEN	BAY-D03	P5#BI.01	220-250VDC	/184.B7
Q1 ISOL CLOSE	BAY-D03	P5#BI.02	220-250VDC	/184.B7
Q2 ISOL OPEN	BAY-D03	P5#BI.03	220-250VDC	/184.C7
Q2 ISOL CLOSE	BAY-D03	P5#BI.04	220-250VDC	/184.C7
Q0 CB Y-PH OPEN	BAY-D03	P5#BI.05	220-250VDC	/184.C7
Q0 CB MANUAL CLOSE	FROM BAY-D03	P5#BI.06	220-250VDC	/184.D7
LBB 3-PH INITIATION	FROM BAY-D03	P5#BI.07	220-250VDC	/184.D7
LBB Y-PH INITIATION	FROM BAY-D03	P5#BI.08	220-250VDC	/184.E7

+D.15 -D15.01
Binary input module
BIM
220-250VDC, 50ma
1MRK000508-CD
X52

Q1 ISOL OPEN	BAY-D04	P5#BI.09	220-250VDC	/185.B7
Q1 ISOL CLOSE	BAY-D04	P5#BI.10	220-250VDC	/185.B7
Q2 ISOL OPEN	BAY-D04	P5#BI.11	220-250VDC	/185.C7
Q2 ISOL CLOSE	BAY-D04	P5#BI.12	220-250VDC	/185.C7
Q0CB Y-PH OPEN	BAY-D04	P5#BI.13	220-250VDC	/185.C7
Q0 CB MANUAL CLOSE	FROM BAY-D04	P5#BI.14	220-250VDC	/185.D7
LBB 3-PH INITIATION	FROM BAY-D04	P5#BI.15	220-250VDC	/185.D7
LBB Y-PH INITIATION	FROM BAY-D04	P5#BI.16	220-250VDC	/185.E7

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and responsibilities in all details, performance particulars of the supplies with the latest approved drawings and specifications as may be required during execution of the AEGCL's right under the contract

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
REB670-YPH OVERVIEW

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram DCC EFS	Ref.Des.	=2R
Resp. dept.	PG-GAS	Rev. ind.	01
Doc. no.	1KHF128840R1411	Language	en
		Sheet	199
		n. sheet	200

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

+BB1

+D.15 -D15.01
Binary input module
BIM
220-250VDC, 50ma
1MRK000508-CD
X71

Q1 ISOL OPEN BAY-D05 P7#BI.01 220-250VDC	+	1	/186.B7
	-	2	
Q1 ISOL CLOSE BAY-D05 P7#BI.02 220-250VDC	+	3	/186.B7
	-	4	
Q2 ISOL OPEN BAY-D05 P7#BI.03 220-250VDC	+	5	/186.C7
	-	6	
Q2 ISOL CLOSE BAY-D05 P7#BI.04 220-250VDC	+	7	/186.C7
	-	8	
Q0CB Y-PH OPEN BAY-D05 P7#BI.05 220-250VDC	+	9	/186.C7
	-	10	
Q0CB R-PH OPEN FROM BAY-D05 P7#BI.06 220-250VDC	+	11	/186.D7
	-	12	
LBB 3-PH INITIATION BAY-D05 P7#BI.07 220-250VDC	+	13	/186.D7
	-	14	
LBB Y-PH INITIATION BAY-D05 P7#BI.08 220-250VDC	+	15	/186.E7
	-	16	

+D.15 -D15.01
Binary input module
BIM
220-250VDC, 50ma
1MRK000508-CD
X72

Q1 ISOL OPEN BAY-D06 P7#BI.09 220-250VDC	+	1	/187.B7
	-	2	
89A ISOL CLOSE BAY-D06 P7#BI.10 220-250VDC	+	3	/187.B7
	-	4	
89B ISOL OPEN BAY-D06 P7#BI.11 220-250VDC	+	5	/187.C7
	-	6	
89B ISOL OPEN BAY-D06 P7#BI.12 220-250VDC	+	7	/187.C7
	-	8	
52 CB Y-PH OPEN BAY-D06 P7#BI.13 220-250VDC	+	9	/187.C7
	-	10	
52 CB MANUAL CLOSE FROM BAY-D06 P7#BI.14 220-250VDC	+	11	/187.D7
	-	12	
LBB 3-PH INITIATION BAY-D06 P7#BI.15 220-250VDC	+	13	/187.D7
	-	14	
LBB Y-PH INITIATION BAY-D06 P7#BI.16 220-250VDC	+	15	/187.E7
	-	16	

+D.15 -D15.01
Binary input module
BIM
220-250VDC, 50ma
1MRK000508-CD
X81

Q1 ISOL OPEN BAY-D07 P8#BI.01 220-250VDC	+	1	/188.B7
	-	2	
Q1 ISOL CLOSE BAY-D07 P8#BI.02 220-250VDC	+	3	/188.B7
	-	4	
Q2 ISOL OPEN BAY-D07 P8#BI.03 220-250VDC	+	5	/188.C7
	-	6	
Q2 ISOL CLOSE BAY-D07 P8#BI.04 220-250VDC	+	7	/188.C7
	-	8	
Q0CB Y-PH OPEN BAY-D07 P8#BI.05 220-250VDC	+	9	/188.C7
	-	10	
Q0 CB MANUAL CLOSE FROM BAY-D07 P8#BI.06 220-250VDC	+	11	/188.D7
	-	12	
LBB INITIATION FROM BAY-D07 P8#BI.07 220-250VDC	+	13	/188.D7
	-	14	
SPARE P8#BI.08 220-250VDC	+	15	/188.E7
	-	16	

+D.15 -D15.01
Binary input module
BIM
220-250VDC, 50ma
1MRK000508-CD
X82

Q1 ISOL OPEN BAY-D08 P8#BI.09 220-250VDC	+	1	/189.B7
	-	2	
Q1 ISOL CLOSE BAY-D08 P8#BI.10 220-250VDC	+	3	/189.B7
	-	4	
Q2 ISOL OPEN BAY-D08 P8#BI.11 220-250VDC	+	5	/189.C7
	-	6	
Q2 ISOL CLOSE BAY-D08 P8#BI.12 220-250VDC	+	7	/189.C7
	-	8	
Q0CB Y-PH OPEN BAY-D08 P8#BI.13 220-250VDC	+	9	/189.C7
	-	10	
Q0 CB MANUAL CLOSE FROM BAY-D08 P8#BI.14 220-250VDC	+	11	/189.D7
	-	12	
LBB INITIATION FROM BAY-D08 P8#BI.15 220-250VDC	+	13	/189.D7
	-	14	
SPARE P8#BI.16 220-250VDC	+	15	/189.E7
	-	16	

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and responsibilities of the performance guarantee of the supplies with the latest revision / NLC specifications as may be applicable nor does limit the AEGCL's right under the contract.

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

Assam Electric Engineering Co. Ltd. Electrical Engineers & Constructors Guwahati

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
REB670-YPH OVERVIEW

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram	Ref.Des.	=2R
	DCC EFS		
Resp. dept.	PG-GAS	Rev. ind. 01	Language en
Doc. no.	1KHF128840R1411	Sheet	200
		n. sheet	201

© Copyright 2023 Hitachi Energy

+BB1

+D.15 -D15.01
Binary input module
BIM
220-250VDC, 50ma
1MRK000508-CD
X91

Q1 ISOL OPEN BAY-D09 P9#BI.01 220-250VDC	+ 1 - 2	/190.B7
Q1 ISOL CLOSE BAY-D09 P9#BI.02 220-250VDC	+ 3 - 4	/190.B7
Q2 ISOL OPEN BAY-D09 P9#BI.03 220-250VDC	+ 5 - 6	/190.C7
Q2 ISOL CLOSE BAY-D09 P9#BI.04 220-250VDC	+ 7 - 8	/190.C7
Q0CB Y-PH OPEN BAY-D09 P9#BI.05 220-250VDC	+ 9 - 10	/190.C7
Q0 CB MANUAL CLOSE FROM BAY-D09 P9#BI.06 220-250VDC	+ 11 - 12	/190.D7
LBB INITIATION FROM BAY-D09 P9#BI.07 220-250VDC	+ 13 - 14	/190.D7
SPARE P9#BI.08 220-250VDC	+ 15 - 16	/190.E7

+D.15 -D15.01
Binary input module
BIM
220-250VDC, 50ma
1MRK000508-CD
X92

Q1 ISOL OPEN BAY-D10 P9#BI.09 220-250VDC	+ 1 - 2	/192.B7
Q1 ISOL CLOSE BAY-D10 P9#BI.10 220-250VDC	+ 3 - 4	/192.B7
Q2 ISOL OPEN BAY-D10 P9#BI.11 220-250VDC	+ 5 - 6	/192.C7
Q2 ISOL CLOSE BAY-D10 P9#BI.12 220-250VDC	+ 7 - 8	/192.C7
Q0CB R-PH OPEN BAY-D10 P9#BI.13 220-250VDC	+ 9 - 10	/192.C7
Q0 CB MANUAL CLOSE FROM BAY-D10 P9#BI.14 220-250VDC	+ 11 - 12	/192.D7
LBB 3-PH INITIATION FROM BAY-D10 P9#BI.15 220-250VDC	+ 13 - 14	/192.D7
LBB Y-PH INITIATION FROM BAY-D10 P9#BI.16 220-250VDC	+ 15 - 16	/192.E7

+D.15 -D15.01
Binary output module
BOM
1MRK000614-AB
X41

BBP/LBB/ OPTD. BAY-D01 P4#BO.01	2 1	/195.A2
BBP/LBB/ OPTD. BAY-D02 P4#BO.02	3	/195.B2
BBP/LBB/ OPTD. BAY-D03 P4#BO.03	5 4	/195.B2
BBP/LBB/ OPTD. BAY-D04 P4#BO.04	6	/195.B2
BBP/LBB/ OPTD. BAY-D05 P4#BO.05	8 7	/195.C2
BBP/LBB/ OPTD. BAY-D06 P4#BO.06	9	/195.C2
BBP/LBB/ OPTD. BAY-D07 P4#BO.07	11 10	/195.C2
BBP/LBB/ OPTD. BAY-D08 P4#BO.08	12	/195.D2
BBP/LBB/ OPTD. BAY-D09 P4#BO.09	14 13	/195.D2
BBP/LBB/ OPTD. BAY-D10(FUT. LINE-1) P4#BO.10	15	/195.D2
BBP/LBB/ OPTD. BAY-D11(FUT.LINE-2) P4#BO.11	17 16	/195.E2
SPARE P4#BO.12	18	/195.E2

+D.15 -D15.01
Binary output module
BOM
1MRK000614-AB
X42

EFP/LBB/ OPTD. BAY-D01 P4#BO.13	2 1	/196.A2
EFP/LBB/ OPTD. BAY-D02 P4#BO.14	3	/196.B2
EFP/LBB/ OPTD. BAY-D03 P4#BO.15	5 4	/196.B2
EFP/LBB/ OPTD. BAY-D04 P4#BO.16	6	/196.B2
EFP/LBB/ OPTD. BAY-D05 P4#BO.17	8 7	/196.C2
EFP/LBB/ OPTD. BAY-D06 P4#BO.18	9	/196.C2
EFP/LBB/ OPTD. BAY-D07 P4#BO.19	11 10	/196.C2
EFP/LBB/ OPTD. BAY-D08 P4#BO.20	12	/196.D2
EFP/LBB/ OPTD. BAY-D09 P4#BO.21	14 13	/196.D2
EFP/LBB/ OPTD. BAY-D10(FUT. LINE-1) P4#BO.22	15	/196.D2
EFP/LBB/ OPTD. BAY-D11(FUT.LINE-2) P4#BO.23	17 16	/196.E2
SPARE P4#BO.24	18	/196.E2

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations nor implies deviation from details, performance parameters and quality of the supplies with the Indian Statutory and IEC specifications as may be applicable nor does limit the AEGCL's right under the contract.

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
REB670-YPH OVERVIEW

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram	Ref.Des.	=2R
	DCC EFS		
Resp. dept.	PG-GAS	Rev. ind. 01	Language en
Doc. no.	1KHF128840R1411	Sheet	201
		n. sheet	202

1MYN691003-102(A3)REV01

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

+BB1

+D.15 -D15.01
Binary output module 1MRK000614-AB
BOM

X61

LBB RE-TRIP Y-PH BAY-D01 P6#BO.01	2	1	/197.A2
LBB RE-TRIP Y-PH BAY-D02 P6#BO.02	3		/197.B2
LBB RE-TRIP Y-PH BAY-D03 P6#BO.03	5	4	/197.B2
LBB RE-TRIP Y-PH BAY-D04 P6#BO.04	6		/197.B2
LBB RE-TRIP Y-PH BAY-D05 P6#BO.05	8	7	/197.C2
LBB RE-TRIP Y-PH BAY-D06 P6#BO.06	9		/197.C2
LBB RE-TRIP 3-PH BAY-D07 P6#BO.07	11	10	/197.C2
LBB RE-TRIP 3-PH BAY-D08 P6#BO.08	12		/197.D2
LBB RE-TRIP 3-PH BAY-D09 P6#BO.09	14	13	/197.D2
LBB RE-TRIP Y-PH BAY-D10(FUT.LINE-1) P6#BO.10	15		/197.D2
LBB RE-TRIP Y-PH BAY-D11(FUT.LINE-2) P6#BO.11	17	16	/197.E2
SPARE P6#BO.12	18		/197.E2

+D.15 -D15.01
Binary output module 1MRK000614-AB
BOM

X62

SPARE P6#BO.13	2	1	/198.A2
SPARE P6#BO.14	3		/198.B2
SPARE P6#BO.15	5	4	/198.B2
SPARE P6#BO.16	6		/198.B2
SPARE P6#BO.17	8	7	/198.C2
SPARE P6#BO.18	9		/198.C2
SPARE P6#BO.19	11	10	/198.C2
SPARE P6#BO.20	12		/198.D2
SPARE P6#BO.21	14	13	/198.D2
SPARE P6#BO.22	15		/198.D2
SPARE P6#BO.23	17	16	/198.E2
SPARE P6#BO.24	18		/198.E2

+D.15 -D15.01
Binary input module 1MRK000508-CD
BIM
220-250VDC, 50ma

X111

SPARE P11#BI.01 220-250VDC	+	1	- 2	/194.1.B7
SPARE P11#BI.02 220-250VDC	+	3	- 4	/194.1.B7
SPARE P11#BI.03 220-250VDC	+	5	- 6	/194.1.C7
SPARE P11#BI.04 220-250VDC	+	7	- 8	/194.1.C7
SPARE P11#BI.05 220-250VDC	+	9	- 10	/194.1.C7
SPARE P11#BI.06 220-250VDC	+	11	- 12	/194.1.D7
SPARE P11#BI.07 220-250VDC	+	13	- 14	/194.1.D7
SPARE P11#BI.08 220-250VDC	+	15	- 16	/194.1.E7

+D.15 -D15.01
Binary input module 1MRK000508-CD
BIM
220-250VDC, 50ma

X112

SPARE P11#BI.09 220-250VDC	+	1	- 2	/195.2.B7
SPARE P11#BI.10 220-250VDC	+	3	- 4	/195.2.B7
SPARE P11#BI.11 220-250VDC	+	5	- 6	/195.2.C7
SPARE P11#BI.12 220-250VDC	+	7	- 8	/195.2.C7
SPARE P11#BI.13 220-250VDC	+	9	- 10	/195.2.C7
SPARE P11#BI.14 220-250VDC	+	11	- 12	/195.2.D7
SPARE P11#BI.15 220-250VDC	+	13	- 14	/195.2.D7
SPARE P11#BI.16 220-250VDC	+	15	- 16	/195.2.E7

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

APPROVED, subject to the condition that the approval conveyed herein in manner relieves ... of the contractual obligations ... performance ... supplies with ... Indian ... laws / IEC specifications as may be applicable, nor does limit the AEGCL's right under the contract

Electrical Engineering Co. Ltd. Guwahati

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
REB670-YPH OVERVIEW

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram	Ref.Des.	=2R
	DCC EFS		
Resp. dept.	PG-GAS	Rev. ind. 01	Language en
Doc. no.	1KHF128840R1411		Sheet 202
			n. sheet 203

© Copyright 2023 Hitachi Energy

+BB1

+D.15 -D15.01
Binary input module 1MRK000508-CD
BIM
220-250VDC, 50ma
X121

SPARE	P12#BI.01	220-250VDC	1 / 2	/195.3.B7
SPARE	P12#BI.02	220-250VDC	3 / 4	/195.3.B7
96 OPTD	P12#BI.03	220-250VDC	5 / 6	/195.3.C7
SPARE	P12#BI.04	220-250VDC	7 / 8	/195.3.C7
SPARE	P12#BI.05	220-250VDC	9 / 10	/195.3.C7
SPARE	P12#BI.06	220-250VDC	11 / 12	/195.3.D7
SPARE	P12#BI.07	220-250VDC	13 / 14	/195.3.D7
SPARE	P12#BI.08	220-250VDC	15 / 16	/195.3.E7

+D.15 -D15.01
Binary input module 1MRK000508-CD
BIM
220-250VDC, 50ma
X122

SPARE	P12#BI.09	220-250VDC	1 / 2	/195.4.B7
SPARE	P12#BI.10	220-250VDC	3 / 4	/195.4.B7
SPARE	P12#BI.11	220-250VDC	5 / 6	/195.4.C7
SPARE	P12#BI.12	220-250VDC	7 / 8	/195.4.C7
SPARE	P12#BI.13	220-250VDC	9 / 10	/195.4.C7
SPARE	P12#BI.14	220-250VDC	11 / 12	/195.4.D7
SPARE	P12#BI.15	220-250VDC	13 / 14	/195.4.D7
SPARE	P12#BI.16	220-250VDC	15 / 16	/195.4.E7

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)
—				

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and his responsibilities (design details, performance particulars and completeness of the supplies with the Indian statutory laws / IEC specifications as may be applicable) nor does limit the AEGCL's right under the contract.

Electro Engineering Co. Ltd. Guwahati ENGINEERS & CONTRACTORS

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
REB670-YPH OVERVIEW

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram	Ref.Des.	=2R
	DCC EFS		
Resp. dept.	PG-GAS	Rev. ind. 01	Language en
Doc. no.	1KHF128840R1411	Sheet	203
		n. sheet	211

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

+BB1

+D.22 -D22.01
B_PH BB PROTN_RLY_REB670_MAIN

Power supply module
PSM

-XX1 21 P101C
-XX2 35 P102C
-X11 4 (+) 5 (-)
90-250VDC
G19 PE
/211.B5

P101 P102
+A.10-LCCX04:125 P101 /212.A3
+C.10-XX2:36 P102 /212.A6

+D.22 -D22.01
Indication HMI
LED

1	ZONE-1 B/B OPTD.
2	ZONE-2 B/B OPTD.
3	BUS-1 LBB OPTD.
4	BUS-2 LBB OPTD.
5	B/B ZONE-1 BLOCKED
6	B/B ZONE-2 BLOCKED
7	Z-1 B/B OPEN CT ALARM
8	Z-2 B/B OPEN CT ALARM
9	MAIN-2 R-PH RELAY FAIL
10	
11	
12	
13	
14	
15	

O: Open
I: Closed
C: Cancel/Clear
E: Enter/Select/Execute
L/R: Local/Remote/off

+D.22 -D22.01
Power supply module
PSM
90-250VDC
1MRK002239-BB

-X11 4 (+) 5 (-)
/211.B2
90-250VDC
PE

-X11 2 3 1
REB670 BPH FAULTY
Relay ready
/224.F2

SCADA (PRP) port to be included.

LIST OF FUNCTIONS:

1. BUSBAR DIFFERENTIAL (87BB)
2. BREAKER FAILURE PROTECTION (50BF)
3. END FAULT PROTECTION

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)
—				

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and responsibilities for design details, performance particulars and guarantees, of the supplies with the Indian Statutory rules / IEC specifications as may be applicable nor does limit the AEGCL's right under the contract.

Based on

Rev.	Revision note	Date	Name
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK

1MYN691003-102(A3)REV01

Prepared 08-08-2025 DIVYA S
Approved 08-08-2025 THEJASWINI AR
Project ASSAM ELECTRICITY GRID CORPORATION LTD
400/220kV GIS SS AT SONAPUR
128840

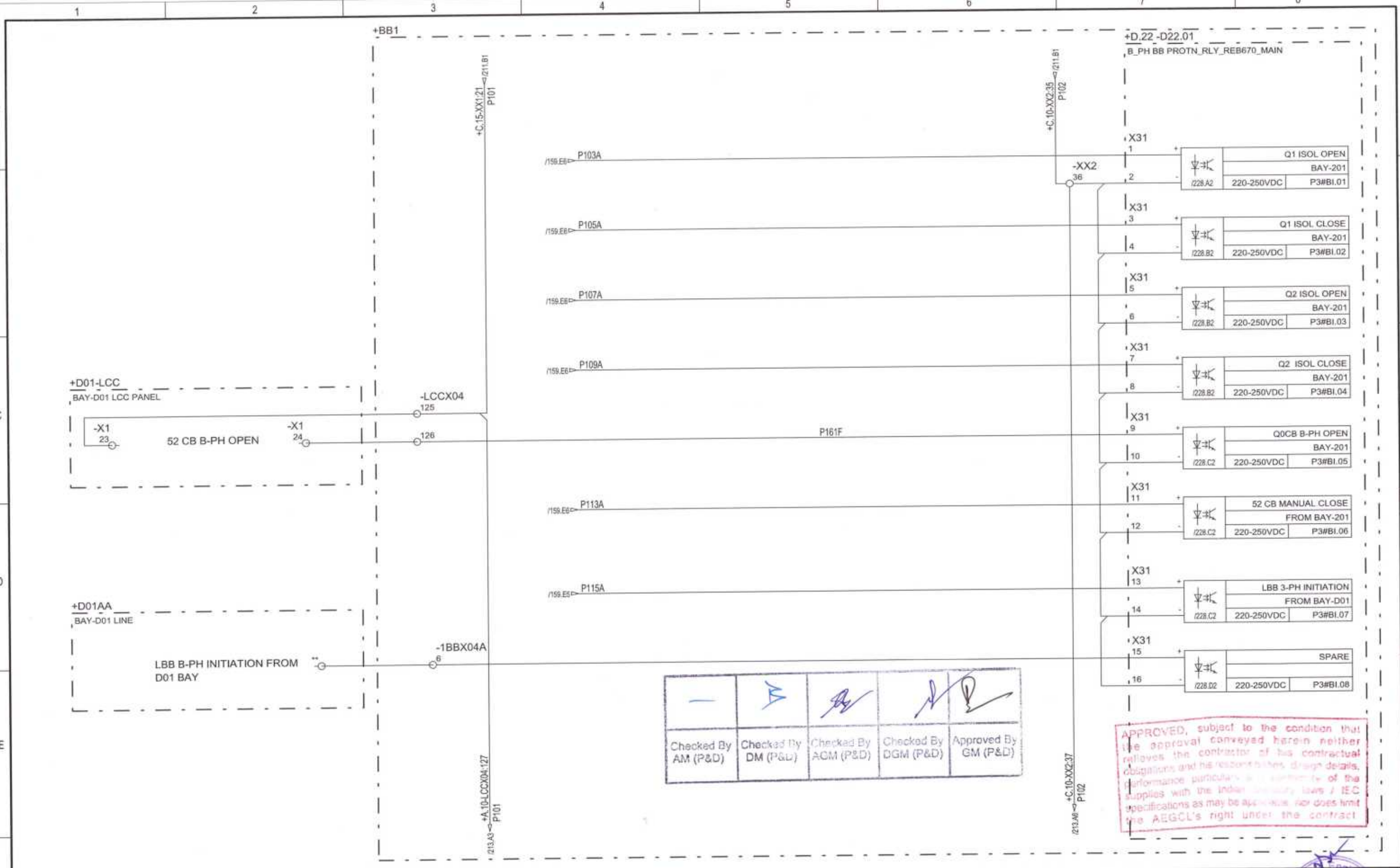
Title 220kV CONTROL & RELAY PANEL
220kV BUSBAR
REB670-BPH PROTN. PSM

HITACHI Hitachi Energy India Limited

Doc. kind. Circuit diagram
DCC EFS
Ref.Des. =2R
Resp. dept. PG-GAS
Rev. ind. 01
Language en
Sheet 211
Doc. no. 1KHF128840R1411
n. sheet 212

The reproduction, disclosure and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy



Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
REB670-BPH BINARY INPUTS

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram	Ref.Des.	=2R
	DCC EFS		
Resp. dept.	PG-GAS	Rev. ind.	01
Doc. no.	1KHF128840R1411	Language	en
		Sheet	212
		n. sheet	213

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

+BB1

+D.22 -D22.01
B_PH BB PROTN_RLY_REB670_MAIN

+A.10-LCCX04:125 /212.E3 P101

+C.10-XX2:36 /212.E7 P102

/160.E6 P119A → -XX2 37 → X32 1 / 2 → /228.A4 — Q1 ISOL OPEN / BAY-D02 / 220-250VDC / P3#BI.09

/160.E6 P121A → X32 3 / 4 → /228.B4 — Q1 ISOL CLOSE / BAY-D02 / 220-250VDC / P3#BI.10

/160.E6 P123A → X32 5 / 6 → /228.B4 — Q2 ISOL OPEN / BAY-D02 / 220-250VDC / P3#BI.11

/160.E6 P125A → X32 7 / 8 → /228.B4 — Q2 ISOL CLOSE / BAY-D02 / 220-250VDC / P3#BI.12

+D02-LCC
BAY-D02 LCC PANEL

-LCCX04 127

-X1 23 — 52 CB B-PH OPEN — -X1 24 → 128

P163F → X32 9 / 10 → /228.C4 — Q0CB B-PH OPEN / BAY-D02 / 220-250VDC / P3#BI.13

/160.E6 P129A → X32 11 / 12 → /228.C4 — Q0CB R-PH OPEN / FROM BAY-D02 / 220-250VDC / P3#BI.14

/160.E5 P131A → X32 13 / 14 → /228.C4 — LBB 3-PH INITIATION / FROM BAY-D02 / 220-250VDC / P3#BI.15

+D02AA
BAY-D02 LINE

-2BBX04A 6

LBB B-PH INITIATION FROM D02 BAY

X32 15 / 16 → /228.D4 — LBB B-PH INITIATION / FROM BAY-D02 / 220-250VDC / P3#BI.16

+A.10-LCCX04:129 /214.A3 P101

+C.10-XX2:38 /214.A6 P102

Checked By AM (P&D)	Checked By DM (P&D)	Checked By ACM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)
—				

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and responsibilities, design details, performance particulars etc. and comply of the supplies with the Indian statutory laws / IEC specifications as may be applicable nor does limit the AEGCL's right under the contract.

Rev.	Revision note	Date	Name
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK

Based on

1MYN691003-102(A3)REV01

Prepared 08-08-2025 DIVYA S
Approved 08-08-2025 THEJASWINI AR
Project ASSAM ELECTRICITY GRID CORPORATION LTD
400/220kV GIS SS AT SONAPUR
128840

Title 220kV CONTROL & RELAY PANEL
220kV BUSBAR
REB670-BPH BINARY INPUTS

HITACHI Hitachi Energy India Limited

Doc. kind. Circuit diagram
DCC EFS
Resp. dept. PG-GAS
Doc. no. 1KHF128840R1411

Ref.Des. =2R
Rev. ind. 01
Language en
Sheet 213
n. sheet 214

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

+BB1

+A.10-LCCX04:127 /213.E3 P101

+C.10-XX2:37 /213.E6 P102

+D.22 -D22.01
B_PH BB PROTN_RLY_REB670_MAIN

/161.E6 P103B	-XX2 38	X51 1	2	/228.A6	220-250VDC	Q1 ISOL OPEN BAY-D03 P5#BI.01
/161.E6 P105B		X51 3	4	/228.B6	220-250VDC	Q1 ISOL CLOSE BAY-D03 P5#BI.02
/161.E6 P107B		X51 5	6	/228.B6	220-250VDC	Q2 ISOL OPEN BAY-D03 P5#BI.03
/161.E6 P109B		X51 7	8	/228.B6	220-250VDC	Q2 ISOL CLOSE BAY-D03 P5#BI.04
P165F		X51 9	10	/228.C6	220-250VDC	Q0CB B-PH OPEN BAY-D03 P5#BI.05
/161.E6 P113B		X51 11	12	/228.C6	220-250VDC	52 CB MANUAL CLOSE FROM BAY-D03 P5#BI.06
P115B		X51 13	14	/228.C6	220-250VDC	LBB 3-PH INITIATION FROM BAY-D03 P5#BI.07
		X51 15	16	/228.D6	220-250VDC	LBB B-PH INITIATION FROM BAY-D03 P5#BI.08

+203-LCC
BAY-203 LCC PANEL

-LCCX04 129

-X1 23 — 52 CB Y-PH OPEN — -X1 24 — 130

+D03AA
BAY-D03 LINE

LBB B-PH INITIATION FROM** D03 BAY — -3BBX04A 6

+A.10-LCCX04:131 /215.A3 P101

+C.10-XX2:39 /215.A8 P102

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and responsibilities design details, performance particulars conformity of the supplies with the Indian statutory laws / IE specifications as may be applicable nor does limit the AEGCL's right under the contract

Rev.	Revision note	Date	Name
	Based on		
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK

Prepared 08-08-2025 DIVYA S
Approved 08-08-2025 THEJASWINI AR
Project ASSAM ELECTRICITY GRID CORPORATION LTD
400/220kV GIS SS AT SONAPUR
128840

Title 220kV CONTROL & RELAY PANEL
220kV BUSBAR
REB670-BPH BINARY INPUTS

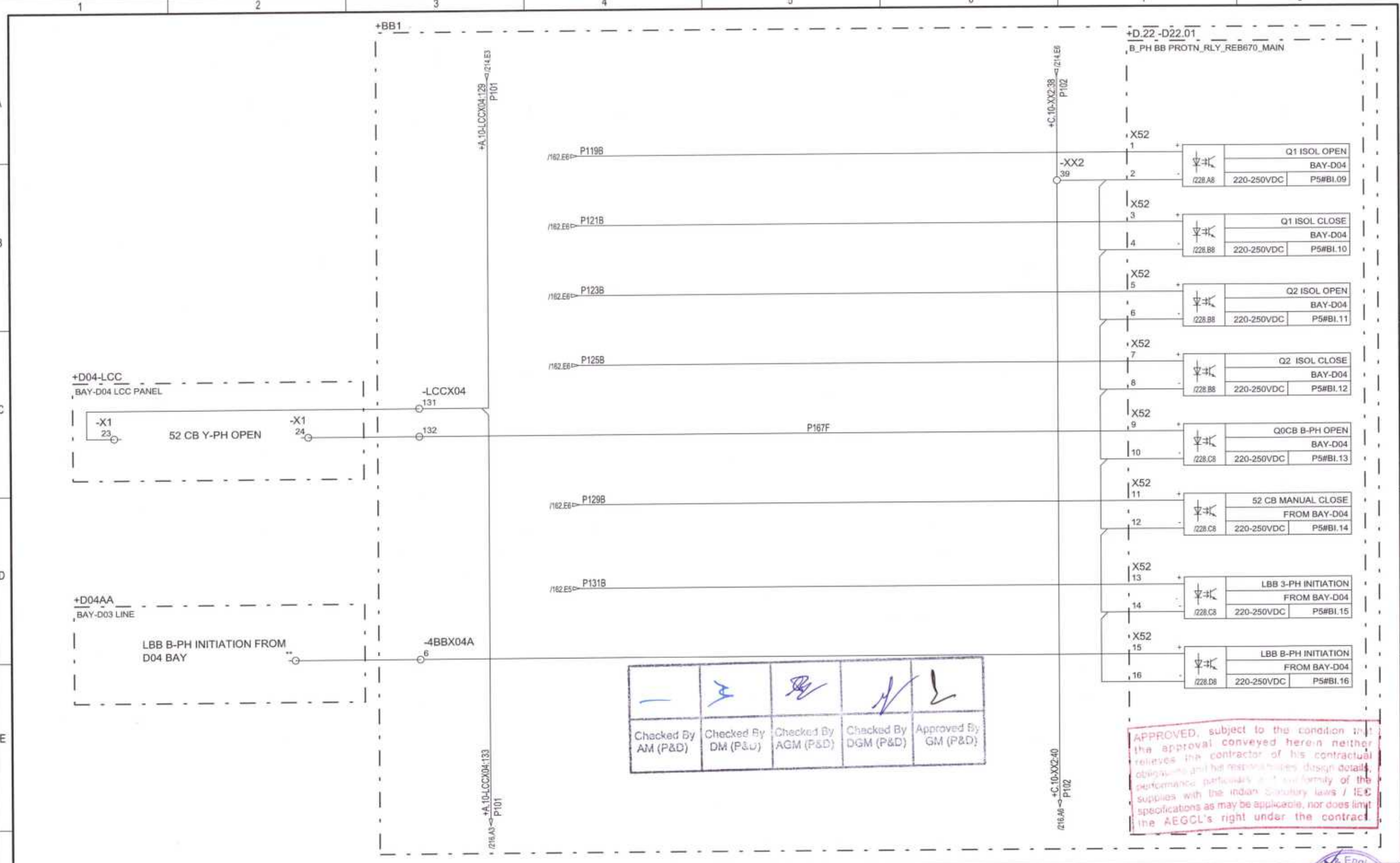
HITACHI Hitachi Energy India Limited

Doc. kind. Circuit diagram
DCC EFS
Resp. dept. PG-GAS
Doc. no. 1KHF128840R1411
Ref.Des. =2R
Rev. ind. 01
Language en
Sheet 214
n. sheet 215

1MYN691003-102(A3)REV01

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy



Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

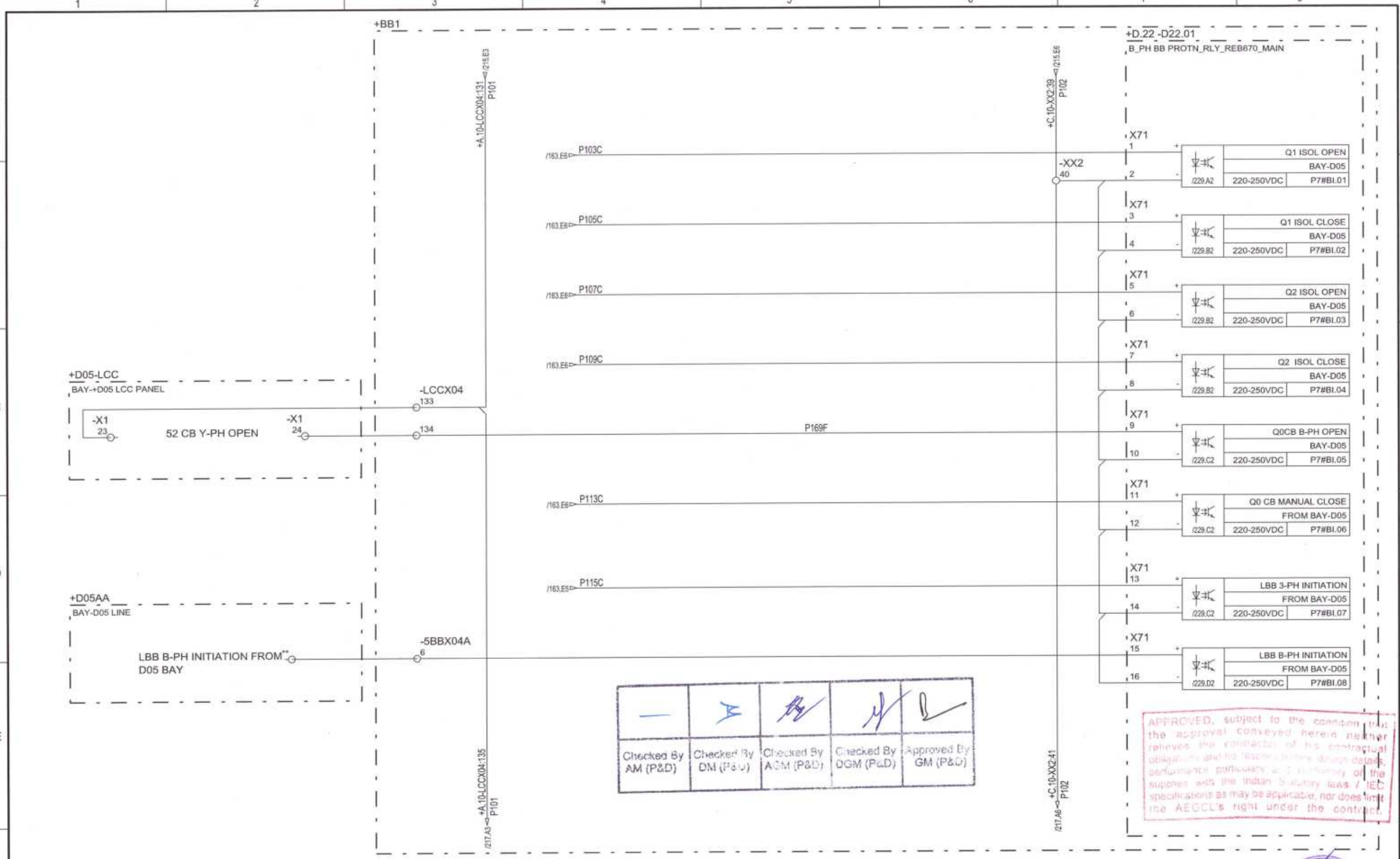
Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
REB670-BPH BINARY INPUTS

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram	Ref.Des.	=2R
	DCC EFS		
Resp. dept.	PG-GAS	Rev. ind.	01
Doc. no.	1KHF128840R1411	Language	en
		Sheet	215
		n. sheet	216

The reproduction, distribution and utilization of this document as well as the communication or its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy



Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared 08-08-2025 DIVYA S
Approved 08-08-2025 THEJASWINI AR
Project ASSAM ELECTRICITY GRID CORPORATION LTD
400/220kV GIS SS AT SONAPUR
128840

Title 220kV CONTROL & RELAY PANEL
220kV BUSBAR
REB670-BPH BINARY INPUTS

HITACHI Hitachi Energy India Limited

Doc. kind. Circuit diagram
DCC EFS
Resp. dept. PG-GAS
Doc. no. 1KHF128840R1411

Ref.Des. =2R
Rev. ind. 01
Language en
Sheet 216
n. sheet 217

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

+BB1

+A.10-LCCX04:133 /216.E3 P101

+C.10-XX2:40 /216.E6 P102

+D.22 -D22.01
B_PH BB PROTN_RLY_REB670_MAIN

/164.E6 P119C	-XX2 41	X72 1	2	/229.A4	220-250VDC	Q1 ISOL OPEN BAY-D06 P7#BI.09
/164.E6 P121C		X72 3	4	/229.B4	220-250VDC	Q1 ISOL CLOSE BAY-D06 P7#BI.10
/164.E6 P123C		X72 5	6	/229.B4	220-250VDC	Q2 ISOL OPEN BAY-D06 P7#BI.11
/164.E6 P125C		X72 7	8	/229.B4	220-250VDC	Q2 ISOL CLOSE BAY-D06 P7#BI.12
P171F		X72 9	10	/229.C4	220-250VDC	Q0CB B-PH OPEN BAY-D06 P7#BI.13
/164.E6 P129C		X72 11	12	/229.C4	220-250VDC	Q0 CB MANUAL CLOSE FROM BAY-D06 P7#BI.14
/164.E5 P131C		X72 13	14	/229.C4	220-250VDC	LBB 3-PH INITIATION FROM BAY-D06 P7#BI.15
		X72 15	16	/229.D4	220-250VDC	LBB B-PH INITIATION FROM BAY-D06 P7#BI.16

+206-LCC
BAY-206 LCC PANEL

-LCCX04 135

-X1 23 — 52 CB Y-PH OPEN — -X1 24 — 136

+D06AA
BAY-D06 LINE

LBB B-PH INITIATION FROM** D06 BAY — -6BBX04A 6

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and his responsibilities in details, performance particulars and conformity of the supplies with the Indian Statutory laws / IEC specifications as may be applicable nor does limit the AEGCL's right under the contract.

+A.10-LCCX04:137 /218.A3 P101

+C.10-XX2:42 /218.A6 P102

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared 08-08-2025 DIVYA S
Approved 08-08-2025 THEJASWINI AR
Project ASSAM ELECTRICITY GRID CORPORATION LTD
400/220kV GIS SS AT SONAPUR
128840

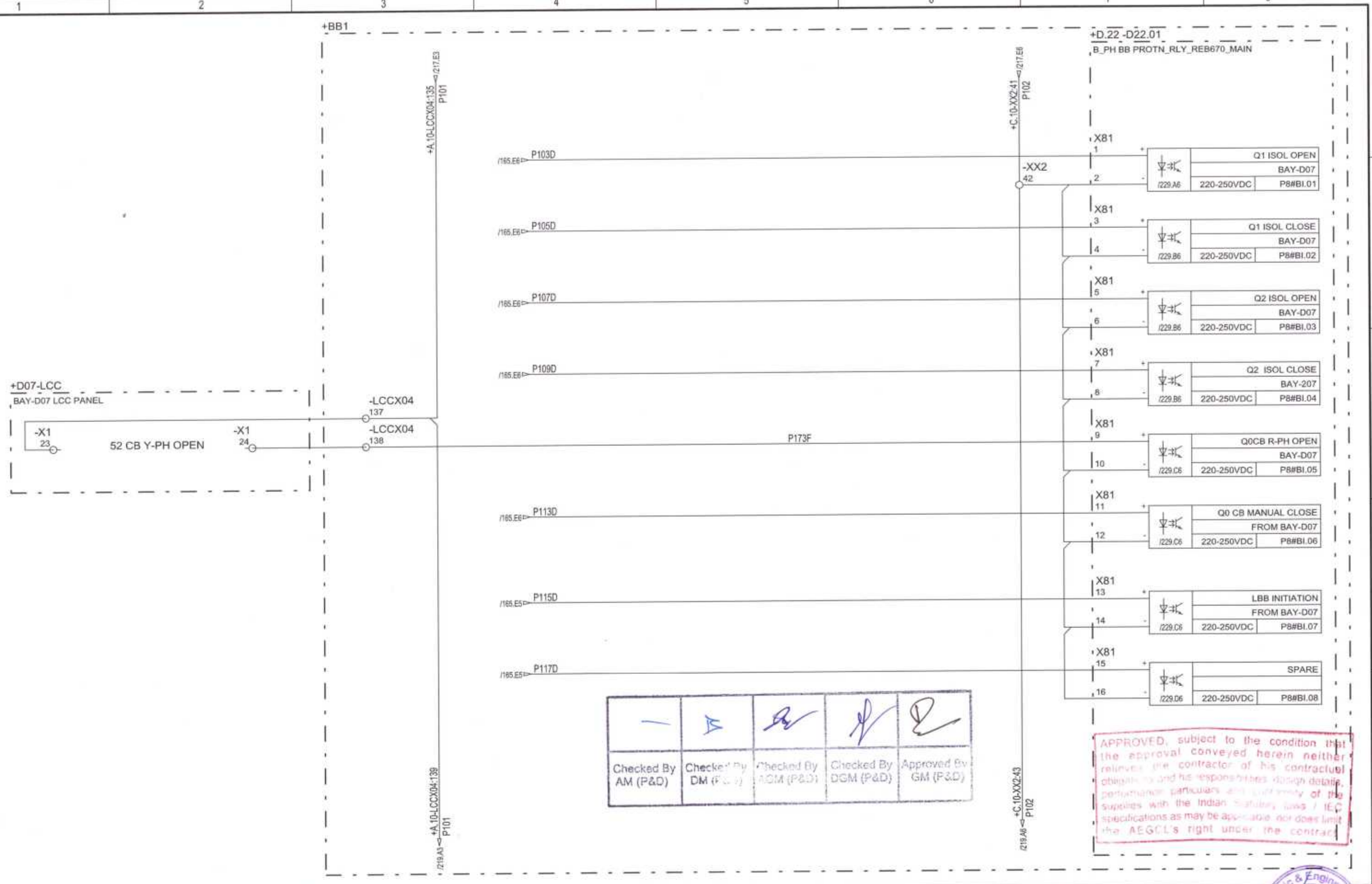
Title 220kV CONTROL & RELAY PANEL
220kV BUSBAR
REB670-BPH BINARY INPUTS

HITACHI Hitachi Energy India Limited

Doc. kind. Circuit diagram
DCC EFS
Resp. dept. PG-GAS
Doc. no. 1KHF128840R1411

Ref.Des. =2R
Rev. ind. 01
Language en
Sheet 217
n. sheet 218

© Copyright 2023 Hitachi Energy



Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
REB670-BPH BINARY INPUTS

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram	Ref.Des.	=2R
	DCC EFS		
Resp. dept.	PG-GAS	Rev. ind.	01
Doc. no.	1KHF128840R1411	Language	en
		Sheet	218
		n. sheet	219

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

+BB1

+D.22 -D22.01
B_PH BB PROTN_RLY_REB670_MAIN

+A.10-LCCX04:137 /218.E3 P101

+C.10-XX2:42 /218.E8 P102

+D08-LCC
BAY-D08 LCC PANEL

-LCCX04
139

-X1
23

52 CB Y-PH OPEN

-X1
24

140

P175F

-XX2
43

/166.E6 P119D	X82 1	+	/229.A8	Q1 ISOL OPEN BAY-D08	220-250VDC	P8#BI.09
		2	-			
/166.E6 P121D	X82 3	+	/229.B8	Q1 ISOL CLOSE BAY-D08	220-250VDC	P8#BI.10
		4	-			
/166.E6 P123D	X82 5	+	/229.B8	Q2 ISOL OPEN BAY-D08	220-250VDC	P8#BI.11
		6	-			
/166.E6 P125D	X82 7	+	/229.B8	Q2 ISOL CLOSE BAY-D08	220-250VDC	P8#BI.12
		8	-			
	X82 9	+	/229.C8	Q0CB R-PH OPEN BAY-D08	220-250VDC	P8#BI.13
		10	-			
/166.E6 P129D	X82 11	+	/229.C8	Q0CB R-PH OPEN FROM BAY-D08	220-250VDC	P8#BI.14
		12	-			
/166.E5 P131D	X82 13	+	/229.C8	LBB INITIATION FROM BAY-D08	220-250VDC	P8#BI.15
		14	-			
/166.E5 P133D	X82 15	+	/229.D8	SPARE	220-250VDC	P8#BI.16
		16	-			

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and his responsibilities, design details, performance particulars and conformity of the supplies with the Indian Statutory laws & IEC specifications as may be applicable, nor does it in any AEGCL's right under the contract.

+C.10-XX2:44 /220.A6 P102

/220.A3 +A.10-LCCX04:141 P101

Rev.	Revision note	Date	Name
Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK

1MYN691003-102(A3)REV01

Prepared 08-08-2025 DIVYA S
Approved 08-08-2025 THEJASWINI AR
Project ASSAM ELECTRICITY GRID CORPORATION LTD
400/220kV GIS SS AT SONAPUR
128840

Title 220kV CONTROL & RELAY PANEL
220kV BUSBAR
REB670-BPH BINARY INPUTS

HITACHI Hitachi Energy India Limited

Doc. kind. Circuit diagram
DCC EFS
Resp. dept. PG-GAS
Doc. no. 1KHF128840R1411

Ref.Des. =2R
Rev. ind. 01
Language en
Sheet 219
n. sheet 220

This reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

+BB1

+D.22 -D22.01
B_PH BB PROTN_RLY_REB670_MAIN

+A.10-LCCX04:139 /219.E3 P101

+C.10-XX2:43 /219.E6 P102

+D09-LCC
BAY-D09 LCC PANEL

-X1 23 — 52 CB Y-PH OPEN — -X1 24

-LCCX04 141 — 142

P177F

/167.E6 P103E	-XX2 44	X91 1	2	/230.A2	Q1 ISOL OPEN BAY-D09	220-250VDC P9#BI.01
/167.E6 P105E		X91 3	4	/230.B2	Q1 ISOL CLOSE BAY-D09	220-250VDC P9#BI.02
/167.E6 P107E		X91 5	6	/230.B2	Q2 ISOL OPEN BAY-D09	220-250VDC P9#BI.03
/167.E6 P109E		X91 7	8	/230.B2	Q2 ISOL CLOSE BAY-D09	220-250VDC P9#BI.04
		X91 9	10	/230.C2	Q0CB R-PH OPEN BAY-D09	220-250VDC P9#BI.05
/167.E6 P113E		X91 11	12	/230.C2	Q0 CB MANUAL CLOSE FROM BAY-D09	220-250VDC P9#BI.06
/167.E5 P115E		X91 13	14	/230.C2	LBB INITIATION FROM BAY-D09	220-250VDC P9#BI.07
/167.E5 P117E		X91 15	16	/230.D2	SPARE	220-250VDC P9#BI.08

+A.10-LCCX04:143 /221.A3 P101

+C.10-XX2:45 /221.A6 P102

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)
—				

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and its responsibilities, design details, performance particulars and conformity of the supplies with the Indian Statutes, laws / IEC specifications as may be applicable, nor does limit the AEGCL's right under the contract.

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
REB670-BPH BINARY INPUTS

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram	Ref.Des.	=2R
	DCC EFS		
Resp. dept.	PG-GAS	Rev. ind.	01
Doc. no.	1KHF128840R1411	Language	en
		Sheet	220
		n. sheet	221

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

+BB1

+A.10-LCCX04:141 /220.E3 P101

+C.10-XX2:44 /220.E6 P102

+D.22 -D22.01
B_PH BB PROTN_RLY_REB670_MAIN

/168.E6 P119E → -XX2 45 → X92 1 / 2 → /230.A4 | Q1 ISOL OPEN BAY-210 | 220-250VDC | P9#BI.09

/168.E6 P121E → X92 3 / 4 → /230.B4 | Q1 ISOL CLOSE BAY-210 | 220-250VDC | P9#BI.10

/168.E6 P123E → X92 5 / 6 → /230.B4 | Q2 ISOL OPEN BAY-210 | 220-250VDC | P9#BI.11

/168.E6 P125E → X92 7 / 8 → /230.B4 | Q2 ISOL OPEN BAY-210 | 220-250VDC | P9#BI.12

+D10-LCC
BAY-D10 LCC PANEL

-X1 23 — 52 CB Y-PH OPEN — -X1 24 → -LCCX04 143 / 144 → P179F → X92 9 / 10 → /230.C4 | Q0CB R-PH OPEN BAY-210 | 220-250VDC | P9#BI.13

/168.E6 P129E → X92 11 / 12 → /230.C4 | Q0 CB MANUAL CLOSE FROM BAY-210 | 220-250VDC | P9#BI.14

+D10AA
BAY-D10 LINE

/168.E5 P131E → X92 13 / 14 → /230.C4 | LBB 3-PH INITIATION FROM BAY-D10 | 220-250VDC | P9#BI.15

LBB B-PH INITIATION FROM D10 BAY ** → -10BBX04A 6 → X92 15 / 16 → /230.D4 | LBB B-PH INITIATION FROM BAY-D10 | 220-250VDC | P9#BI.16

+A.10-LCCX04:145 /222.A3 P101

+C.10-XX2:46 /222.A6 P102

—	A	B		
Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations including design details, performance particulars and accuracy of the supplies with the Indian statutory laws / IEC specifications as may be applicable nor does limit the AEGCL's right under the contract.

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
REB670-BPH BINARY INPUTS

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram	Ref.Des.	=2R
	DCC EFS		
Resp. dept.	PG-GAS	Rev. ind.	01
Doc. no.	1KHF128840R1411	Language	en
		Sheet	221
		n. sheet	222

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

+BB1

+D.22-D22.01
B_PH BB PROTN_RLY_REB670_MAIN

+A.10-LCCX04:143 /221.E3 P101

+C.10-XX2:45 /221.E6 P102

+211-LCC
BAY-211 LCC PANEL

-X1 23 — 52 CB Y-PH OPEN — -X1 24

-LCCX04 145

-LCCX04 146

P181F

+D11AA
BAY-D10 LINE

LBB B-PH INITIATION FROM D11 BAY

-11BBX04A 6

+D.15-D15.01:2 (-X11) /223.A3 P101

+C.10-XX2:47 /223.A6 P102

-XX2 46

/169.E6 P103F	X101 1 + 2 -	Q1 ISOL OPEN	BAY-D11	220-250VDC P10#BI.01
/169.E6 P105F	X101 3 + 4 -	Q1 ISOL CLOSE	BAY-D11	220-250VDC P10#BI.02
/169.E6 P107F	X101 5 + 6 -	Q2 ISOL OPEN	BAY-D11	220-250VDC P10#BI.03
/169.E6 P109F	X101 7 + 8 -	Q2 ISOL CLOSE	BAY-D11	220-250VDC P10#BI.04
	X101 9 + 10 -	Q0CB R-PH OPEN	BAY-D11	220-250VDC P10#BI.05
/169.E6 P113F	X101 11 + 12 -	Q0 CB MANUAL CLOSE	FROM BAY-D11	220-250VDC P10#BI.06
/169.E5 P115F	X101 13 + 14 -	LBB 3-PH INITIATION	BAY-211	220-250VDC P10#BI.07
	X101 15 + 16 -	LBB B-PH INITIATION	BAY-211	220-250VDC P10#BI.08

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and his responsibilities in design, performance guarantees and warranty of the supplies with the Indian statutory laws / IEC specifications as may be applicable nor construes the AEGCL's right under the contract.

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared 08-08-2025 DIVYA S
Approved 08-08-2025 THEJASWINI AR
Project ASSAM ELECTRICITY GRID CORPORATION LTD
400/220kV GIS SS AT SONAPUR
128840

Title 220kV CONTROL & RELAY PANEL
220kV BUSBAR
REB670-BPH BINARY INPUTS

HITACHI Hitachi Energy India Limited

Doc. kind. Circuit diagram
DCC EFS
Resp. dept. PG-GAS
Doc. no. 1KHF128840R1411

Ref.Des. =2R
Rev. ind. 01
Language en
Sheet 222
n. sheet 223

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

+BB1

+D.22-D22.01
B_PH BB PROTN_RLY_REB670_MAIN

+A.10-LCCX04:145 /222.E3 P101

+C.10-XX2:46 /222.E6 P102

/170.E6 P119F	X102 1	-XX2 47	BUS-1 SW. IN OUT POSITION 220-250VDC P10#BI.09
/170.E6 P121F	X102 3		BUS-2 SW. IN OUT POSITION 220-250VDC P10#BI.10
/170.E6 P123F	X102 5		OPEN CT ALARM RESET 220-250VDC P10#BI.11
P101 /195.E6 +D.15-D15.01:2 (-X11)	/195.E6 P137F	P137F	X102 7 REB670-YPH FAULTY 220-250VDC P10#BI.12
-X04 78	P161H		X102 9 SPARE 220-250VDC P10#BI.13
79	P163H		X102 11 SPARE 220-250VDC P10#BI.14
80	P165H		X102 13 SPARE 220-250VDC P10#BI.15
81	P167H		X102 15 SPARE 220-250VDC P10#BI.16

P101

+C.10-XX2:48 /223.1.A8 P102

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and responsibilities given details, performance parameters, etc. in any way of the supplies with the Indian Statutory rules / IEC specifications as may be applicable nor does limit the AEGCL's right under the contract

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
REB670-BPH BINARY INPUTS

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram	Ref.Des.	=2R
	DCC EFS		
Resp. dept.	PG-GAS	Rev. ind.	01
Doc. no.	1KHF128840R1411	Language	en
		Sheet	223
		n. sheet	223.1

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

+BB1

+D.22-D22.01
B_PH BB PROTN_RLY_REB670_MAIN

+C.10-XX2:47 /223.E6
P102

-XX2
48

/170.1.E6	P101G +B.17-IXX1:84	X111 1 +	2 -	/231.A6	220-250VDC	SPARE P11#BI.01
/170.1.E6	P103G +B.17-IXX1:85	X111 3 +	4 -	/231.B6	220-250VDC	SPARE P11#BI.02
/170.1.E6	P105G +B.17-IXX1:86	X111 5 +	6 -	/231.B6	220-250VDC	SPARE P11#BI.03
/170.1.E6	P107G +B.17-IXX1:87	X111 7 +	8 -	/231.B6	220-250VDC	SPARE P11#BI.04
/170.1.E5	P109G +B.17-IXX1:88	X111 9 +	10 -	/231.C6	220-250VDC	SPARE P11#BI.05
/170.1.E5	P111G +B.17-IXX1:89	X111 11 +	12 -	/231.C6	220-250VDC	SPARE P11#BI.06
/170.1.E5	P113G +B.17-IXX1:90	X111 13 +	14 -	/231.C6	220-250VDC	SPARE P11#BI.07
/170.1.E5	P115G +B.17-IXX1:91	X111 15 +	16 -	/231.D6	220-250VDC	SPARE P11#BI.08

+C.10-XX2:49 /223.2.A6
P102

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations nor responsibilities of design details, performance parameters and conformity of the supplies with the Indian Statutory laws / IEC specifications as may be applicable nor does limit the AEGCL's right under the contract.

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared 08-08-2025 DIVYA S
Approved 08-08-2025 THEJASWINI AR
Project ASSAM ELECTRICITY GRID CORPORATION LTD
400/220kV GIS SS AT SONAPUR
128840

Title 220kV CONTROL & RELAY PANEL
220kV BUSBAR
REB670-BPH BINARY INPUTS

HITACHI Hitachi Energy India Limited

Doc. kind. Circuit diagram
DCC EFS
Resp. dept. PG-GAS
Doc. no. 1KHF128840R1411

Ref.Des. =2R
Rev. ind. 01
Language en
Sheet 223.1
n. sheet 223.2

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

+BB1

+D.22 -D22.01
B_PH BB PROTN_RLY_REB670_MAIN

+C.10-XX2:48 /223.1,E6
P102

/170.2,E6	P117G	+B.17-IXX1:92	-XX2 49	X112 1	2	/231.A8	SPARE 220-250VDC P11#BI.09
/170.2,E6	P119G	+B.17-IXX1:93		X112 3	4	/231.B8	SPARE 220-250VDC P11#BI.10
/170.2,E6	P121G	+B.17-IXX1:94		X112 5	6	/231.B8	SPARE 220-250VDC P11#BI.11
/170.2,E6	P123G	+B.17-IXX1:95		X112 7	8	/231.B8	SPARE 220-250VDC P11#BI.12
/170.2,E5	P125G	+B.17-IXX1:96		X112 9	10	/231.C8	SPARE 220-250VDC P11#BI.13
/170.2,E5	P127G	+B.17-IXX1:97		X112 11	12	/231.C8	SPARE 220-250VDC P11#BI.14
/170.2,E5	P129G	+B.17-IXX1:98		X112 13	14	/231.C8	SPARE 220-250VDC P11#BI.15
/170.2,E5	P131G	+B.17-IXX1:99		X112 15	16	/231.D8	SPARE 220-250VDC P11#BI.16

+C.10-XX2:50 /223.3,A6
P102

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

APPROVED, subject to the condition that the 'approval' conveyed herein neither relieves the contractor of his contractual obligations and responsibilities in all details, particulars and [illegible] complies with the Indian Statutory Laws / IEC specifications as may be applicable nor does limit the AEGCL's right under the contract.

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
REB670-BPH BINARY INPUTS

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram	Ref.Des.	=2R
	DCC EFS		
Resp. dept.	PG-GAS	Rev. ind.	01
Doc. no.	1KHF128840R1411	Language	en
		Sheet	223.2
		n. sheet	223.3

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy
The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

+BB1

+D.22-D22.01
B_PH BB PROTN_RLY_REB670_MAIN

#1113

+C.10-XX2:49 /223.2:E8
P102

-XX2
50

/170.3.E6	P103H	+B.17-IXX1:100	X121 1 2	/232.A2	220-250VDC	SPARE P12#BI.01
/170.3.E6	P105H	+B.17-IXX1:101	X121 3 4	/232.B2	220-250VDC	SPARE P12#BI.02
/170.3.E5	P107H	+B.17-IXX1:102	X121 5 6	/232.B2	220-250VDC	96 OPTD P12#BI.03
82	P169H		X121 7 8	/232.B2	220-250VDC	SPARE P12#BI.04
83	P171H		X121 9 10	/232.C2	220-250VDC	SPARE P12#BI.05
84	P173H		X121 11 12	/232.C2	220-250VDC	SPARE P12#BI.06
85	P175H		X121 13 14	/232.C2	220-250VDC	SPARE P12#BI.07
86	P177H		X121 15 16	/232.D2	220-250VDC	SPARE P12#BI.08

#1113

+C.10-XX2:51 /223.4:A6
P102

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and his responsibilities in regard to performance particulars and accuracy of the supplies with the Indian Statutory laws / IE Rules / IEC specifications as may be applicable nor does limit the AEGCL's right under the contract.

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
REB670-BPH BINARY INPUTS

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram	Ref.Des.	=2R
DCC	EFS		
Resp. dept.	PG-GAS	Rev. ind.	01
Doc. no.	1KHF128840R1411	Language	en
		Sheet	223.3
		n. sheet	223.4

© Copyright 2023 Hitachi Energy

+BB1

+D.22-D22.01
B_PH BB PROTN_RLY_REB670_MAIN

+C.10-XX2:50 /223.1.E6
P102

-X04

87	P179H	-XX2 51	X122 1	+	SPARE			
			2	-	/232.A4	220-250VDC	P12#BI.09	
88	P181H		X122 3	+	SPARE			
			4	-	/232.B4	220-250VDC	P12#BI.10	
89	P183H		X122 5	+	SPARE			
			6	-	/232.B4	220-250VDC	P12#BI.11	
90	P185H		X122 7	+	SPARE			
			8	-	/232.B4	220-250VDC	P12#BI.12	
91	P187H		X122 9	+	SPARE			
			10	-	/232.C4	220-250VDC	P12#BI.13	
92	P189H		X122 11	+	SPARE			
			12	-	/232.C4	220-250VDC	P12#BI.14	
93	P191H		X122 13	+	SPARE			
			14	-	/232.C4	220-250VDC	P12#BI.15	
94	P193H		X122 15	+	SPARE			
			16	-	/232.D4	220-250VDC	P12#BI.16	

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and for the variations shown details, performance particulars and conformity of the system with the Indian Statutory laws / IEC specifications as may be applicable nor does limit the AEGCL's right under the contract.

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
REB670-BPH BINARY INPUTS

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram	Ref.Des.	=2R
	DCC EFS		
Resp. dept.	PG-GAS	Rev. ind.	01
Language	en		
Sheet	223.4		
Doc. no.	1KHF128840R1411	n. sheet	224

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

+BB1

+D.22 -D22.01

B_PH BB PROTN_RLY_REB670_MAIN

BBP/LBB OPTD. BAY-D01 P4#BO.01	/230.A6	X41 2	-XX1 22
		1	
BBP/LBB OPTD. BAY-D02 P4#BO.02	/230.B6	X41 3	
BBP/LBB OPTD. BAY-D03 P4#BO.03	/230.B6	X41 5	
		4	
BBP/LBB OPTD. BAY-D04 P4#BO.04	/230.C6	X41 6	
BBP/LBB OPTD. BAY-D05 P4#BO.05	/230.C6	X41 8	-XX1 23
		7	
BBP/LBB OPTD. BAY-D06 P4#BO.06	/230.C6	X41 9	
BBP/LBB OPTD. BAY-D07 P4#BO.07	/230.C6	X41 11	
		10	
BBP/LBB OPTD. BAY-D08 P4#BO.08	/230.D6	X41 12	
BBP/LBB/EFP OPTD. BAY-209 P4#BO.09	/230.D6	X41 14	-XX1 24
		13	
BBP/LBB OPTD. BAY-D10(FUT.LINE-1) P4#BO.10	/230.E6	X41 15	
BBP/LBB/EFP OPTD. BAY-D11(FUT.LINE-2) P4#BO.11	/230.E6	X41 17	
		16	
SPARE P4#BO.12	/230.E6	X41 18	
REB670 BPH FAULTY Relay ready	/211.B7	-X11 2	
		3	
		1	

+C.15-XX1:20 /197.E3 P1

1P4 /171.A5 +B.17-IXX1:103

2P4 /171.B5 +B.17-IXX1:104

3P4 /171.B5 +B.17-IXX1:105

4P4 /171.B5 +B.17-IXX1:106

5P4 /171.C5 +B.17-IXX1:107

6P4 /171.C5 +B.17-IXX1:108

7P4 /171.C5 +B.17-IXX1:109

8P4 /171.D5 +B.17-IXX1:110

9P4 /171.D5 +B.17-IXX1:111

10P4 /171.D5 +B.17-IXX1:112

11P4 /171.E5 +B.17-IXX1:113

1P3 /171.E5 +B.17-IXX1:114

+A.10-ACMCB:11, +D.18-PB01:13, >+BB2.A.10-X14:1 /170.C3 P101

P125F /170.C4 +D.08-D08.01:7 (X102)

+C.15-XX1:25 /226.A4 P1

Checked By AM (P&D)	Checked By DM (P&D)	Checked By ACM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)
—				

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and responsibilities design details, performance particulars and conformity of the supplies with the Indian Statutory laws / IEC specifications as may be applicable, nor does limit the AEGCL's right under the contract

Assam Electrical Engineering Co. LTD. Guwahati

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

Title: 220kV CONTROL & RELAY PANEL 220kV BUSBAR REB670-BPH BINARY OUTPUTS

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram DCC EFS	Ref.Des.	=2R
Resp. dept.	PG-GAS	Rev. ind.	01
Doc. no.	1KHF128840R1411	Language	en
		Sheet	224
		n. sheet	225

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

+BB1

+D.22 -D22.01

B_PH BB PROTN_RLY_REB670_MAIN

BBP/EFP OPTD. BAY-D01 P4#BO.13	/230.A8	X42 2	-XX1 25	+C.15-XX1:24 P1 /224.E3	
		X42 1			1P9 /172.A5 +B.17-IXX1:115
BBP/EFP OPTD. BAY-D02 P4#BO.14	/230.B8	X42 3			2P9 /172.B5 +B.17-IXX1:116
BBP/EFP OPTD. BAY-D03 P4#BO.15	/230.B8	X42 5			
		X42 4			3P9 /172.B5 +B.17-IXX1:117
BBP/EFP OPTD. BAY-D04 P4#BO.16	/230.C8	X42 6			4P9 /172.B5 +B.17-IXX1:118
BBP/EFP OPTD. BAY-D05 P4#BO.17	/230.C8	X42 8	-XX1 26		
		X42 7			5P9 /172.C5 +B.17-IXX1:119
BBP/EFP OPTD. BAY-D06 P4#BO.18	/230.C8	X42 9			6P9 /172.C5 +B.17-IXX1:120
BBP/EFP OPTD. BAY-D07 P4#BO.19	/230.C8	X42 11			
		X42 10			P139 /172.C5 +B.17-IXX1:121
BBP/EFP OPTD. BAY-D08 P4#BO.20	/230.D8	X42 12			8P7 /172.D5 +B.17-IXX1:122
BBP/EFP OPTD. BAY-D09 P4#BO.21	/230.D8	X42 14	-XX1 27		
		X42 13			9P7 /172.D5 +B.17-IXX1:123
BBP/EFP OPTD. BAY-D10(FUT. LINE-1) P4#BO.22	/230.E8	X42 15			10P9 /172.D5 +B.17-IXX1:124
BBP/EFP OPTD. BAY-D11(FUT.LINE-2) P4#BO.23	/230.E8	X42 17			
		X42 16			11P9 /172.E5 +B.17-IXX1:125
SPARE P4#BO.24	/230.E8	X42 18			P149 /172.E5 +B.17-IXX1:126

+C.15-XX1:28 P1 /226.A4

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and his responsibilities for details, performance particulars and conformity of the supplies with the Indian statutory laws / IEC specifications as may be applicable nor does limit the APEGCL's right under the contract.

Assam Electric Engineering Co. Ltd. Guwahati

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

Title: 220kV CONTROL & RELAY PANEL 220kV BUSBAR REB670-BPH BINARY OUTPUTS

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram	Ref.Des.	=2R
DCC	EFS		
Resp. dept.	PG-GAS	Rev. ind.	01
Language	en		
Doc. no.	1KHF128840R1411	Sheet	225
		n. sheet	226

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

+BB1

+D.22 -D22.01

B_PH BB PROTN_RLY_REB670_MAIN

LBB RE-TRIP B-PH BAY-D01 P6#BO.01	/231.A3	X61 2	-XX1 28	1	+C.15-XX1:27 P1 /225.E3
LBB RE-TRIP B-PH BAY-D02 P6#BO.02	/231.B3	X61 3			
LBB RE-TRIP B-PH BAY-D03 P6#BO.03	/231.B3	X61 5		4	
LBB RE-TRIP B-PH BAY-D04 P6#BO.04	/231.B3	X61 6			
LBB RE-TRIP B-PH BAY-D05 P6#BO.05	/231.C3	X61 8	-XX1 29	7	
LBB RE-TRIP B-PH BAY-D06 P6#BO.06	/231.C3	X61 9			
LBB RE-TRIP 3-PH BAY-D07 P6#BO.07	/231.C3	X61 11		10	7P6 /173.C5 +A.10-X04:21
LBB RE-TRIP 3-PH BAY-D08 P6#BO.08	/231.D3	X61 12			8P6 /173.D5 +A.10-X04:22
LBB RE-TRIP 3-PH BAY-B09 P6#BO.09	/231.D3	X61 14	-XX1 30	13	9P6 /173.D5 +A.10-X04:23
LBB RE-TRIP B-PH BAY-D10(FUT. LINE-1) P6#BO.10	/231.D3	X61 15			
LBB RE-TRIP B-PH BAY-D11(FUT.LINE-2) P6#BO.11	/231.E3	X61 17		16	
SPARE P6#BO.12	/231.E3	X61 18			P177 /173.E5 +A.10-X04:25

+BB2

-X14

46	1P8 /261.C1 +D.26-D26.107.101:11
47	2P8 /261.E1 +D.26-D26.113.101:21
48	3P8 /262.C1 +D.26-D26.125.101:11
49	4P8 /262.E1 +D.26-D26.131.101:21
50	5P8 /263.C1 +D.26-D26.143.101:11
51	6P8 /263.E1 +D.26-D26.149.101:21
52	10P8 /265.E1 +D.26-D26.119.301:11
53	11P8 /266.C1 +D.26-D26.125.301:21

Checked By AM (P&D)	Checked By DM (P&D)	Checked By ACM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)
—				

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and his responsibilities for materials, performance particulars and compliance of the supplies with the Indian Statutory laws / IEC specifications as may be applicable, nor does limit the AEGCL's right under the contract.

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
REB670-BPH BINARY OUTPUTS

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram	Ref.Des.	=2R
	DCC EFS		
Resp. dept.	PG-GAS	Rev. ind.	01
Doc. no.	1KHF128840R1411	Language	en
		Sheet	226
		n. sheet	227

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

+BB1

+D.22 -D22.01

B_PH BB PROTN_RLY_REB670_MAIN

SPARE	P6#BO.13	/231.A4	X62 2	3P103	-X04 95
			X62 1	3P105	96
SPARE	P6#BO.14	/231.B4	X62 3	3P107	97
SPARE	P6#BO.15	/231.B4	X62 5	3P109	98
			X62 4	3P111	99
SPARE	P6#BO.16	/231.B4	X62 6	3P113	100
SPARE	P6#BO.17	/231.C4	X62 8	3P115	101
			X62 7	3P117	102
SPARE	P6#BO.18	/231.C4	X62 9	3P119	103
SPARE	P6#BO.19	/231.C4	X62 11	3P121	104
			X62 10	3P123	105
SPARE	P6#BO.20	/231.D4	X62 12	3P125	106
SPARE	P6#BO.21	/231.D4	X62 14	3P127	107
			X62 13	3P129	108
SPARE	P6#BO.22	/231.D4	X62 15		
SPARE	P6#BO.23	/231.E4	X62 17	3P131	109
			X62 16	3P133	110
SPARE	P6#BO.24	/231.E4	X62 18	3P135	111

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By CM (P&D)

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and responsibilities design details, performance particulars and conformity of the supplies with the Indian Statutory laws / IEC specifications as may be applicable nor does limit the AEGCL's right under the contract.

Based on

01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared 08-08-2025 DIVYA S

Approved 08-08-2025 THEJASWINI AR

Project ASSAM ELECTRICITY GRID CORPORATION LTD
400/220kV GIS SS AT SONAPUR
128840

Title 220kV CONTROL & RELAY PANEL
220kV BUSBAR
REB670-BPH BINARY OUTPUTS

HITACHI Hitachi Energy India Limited

Doc. kind. Circuit diagram
DCC EFS

Ref.Des. =2R

Resp. dept. PG-GAS

Rev. ind. 01

Language en

Doc. no. 1KHF128840R1411

Sheet 227

n. sheet 228

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

+BB1

+D.22 -D22.01
Binary input module 1MRK000508-CD
BIM
220-250VDC, 50ma
X31

Q1 ISOL OPEN BAY-201 P3#BI.01	220-250VDC	+ 1 - 2	/212.B7
Q1 ISOL CLOSE BAY-201 P3#BI.02	220-250VDC	+ 3 - 4	/212.B7
Q2 ISOL OPEN BAY-201 P3#BI.03	220-250VDC	+ 5 - 6	/212.C7
Q2 ISOL CLOSE BAY-201 P3#BI.04	220-250VDC	+ 7 - 8	/212.C7
Q0CB B-PH OPEN BAY-201 P3#BI.05	220-250VDC	+ 9 - 10	/212.C7
52 CB MANUAL CLOSE FROM BAY-201 P3#BI.06	220-250VDC	+ 11 - 12	/212.D7
LBB 3-PH INITIATION FROM BAY-D01 P3#BI.07	220-250VDC	+ 13 - 14	/212.D7
SPARE P3#BI.08	220-250VDC	+ 15 - 16	/212.E7

+D.22 -D22.01
Binary input module 1MRK000508-CD
BIM
220-250VDC, 50ma
X32

Q1 ISOL OPEN BAY-D02 P3#BI.09	220-250VDC	+ 1 - 2	/213.B7
Q1 ISOL CLOSE BAY-D02 P3#BI.10	220-250VDC	+ 3 - 4	/213.B7
Q2 ISOL OPEN BAY-D02 P3#BI.11	220-250VDC	+ 5 - 6	/213.C7
Q2 ISOL CLOSE BAY-D02 P3#BI.12	220-250VDC	+ 7 - 8	/213.C7
Q0CB B-PH OPEN BAY-D02 P3#BI.13	220-250VDC	+ 9 - 10	/213.C7
Q0CB R-PH OPEN FROM BAY-D02 P3#BI.14	220-250VDC	+ 11 - 12	/213.D7
LBB 3-PH INITIATION FROM BAY-D02 P3#BI.15	220-250VDC	+ 13 - 14	/213.D7
LBB B-PH INITIATION FROM BAY-D02 P3#BI.16	220-250VDC	+ 15 - 16	/213.E7

+D.22 -D22.01
Binary input module 1MRK000508-CD
BIM
220-250VDC, 50ma
X51

Q1 ISOL OPEN BAY-D03 P5#BI.01	220-250VDC	+ 1 - 2	/214.B7
Q1 ISOL CLOSE BAY-D03 P5#BI.02	220-250VDC	+ 3 - 4	/214.B7
Q2 ISOL OPEN BAY-D03 P5#BI.03	220-250VDC	+ 5 - 6	/214.C7
Q2 ISOL CLOSE BAY-D03 P5#BI.04	220-250VDC	+ 7 - 8	/214.C7
Q0CB B-PH OPEN BAY-D03 P5#BI.05	220-250VDC	+ 9 - 10	/214.C7
52 CB MANUAL CLOSE FROM BAY-D03 P5#BI.06	220-250VDC	+ 11 - 12	/214.D7
LBB 3-PH INITIATION FROM BAY-D03 P5#BI.07	220-250VDC	+ 13 - 14	/214.D7
LBB B-PH INITIATION FROM BAY-D03 P5#BI.08	220-250VDC	+ 15 - 16	/214.E7

+D.22 -D22.01
Binary input module 1MRK000508-CD
BIM
220-250VDC, 50ma
X52

Q1 ISOL OPEN BAY-D04 P5#BI.09	220-250VDC	+ 1 - 2	/215.B7
Q1 ISOL CLOSE BAY-D04 P5#BI.10	220-250VDC	+ 3 - 4	/215.B7
Q2 ISOL OPEN BAY-D04 P5#BI.11	220-250VDC	+ 5 - 6	/215.C7
Q2 ISOL CLOSE BAY-D04 P5#BI.12	220-250VDC	+ 7 - 8	/215.C7
Q0CB B-PH OPEN BAY-D04 P5#BI.13	220-250VDC	+ 9 - 10	/215.C7
52 CB MANUAL CLOSE FROM BAY-D04 P5#BI.14	220-250VDC	+ 11 - 12	/215.D7
LBB 3-PH INITIATION FROM BAY-D04 P5#BI.15	220-250VDC	+ 13 - 14	/215.D7
LBB B-PH INITIATION FROM BAY-D04 P5#BI.16	220-250VDC	+ 15 - 16	/215.E7

APPROVED subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and responsibilities in all details, performance parameters, etc. of the supplies with the Indian Standards / IEC specifications as may be applicable, nor does it limit the AEGCL's right under the contract.

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
REB670-BPH OVERVIEW

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram	Ref.Des.	=2R
	DCC EFS		
Resp. dept.	PG-GAS	Rev. ind.	01
Language	en		
Sheet	228		
Doc. no.	1KHF128840R1411	n. sheet	229

The reproduction, distribution and utilization of this document as well as the communication of its contents to owners without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

+BB1

+D.22 -D22.01
Binary input module 1MRK000508-CD
BIM
220-250VDC, 50ma

X71

Q1 ISOL OPEN BAY-D05 P7#BI.01	220-250VDC	+ 1	- 2	/216.B7
Q1 ISOL CLOSE BAY-D05 P7#BI.02	220-250VDC	+ 3	- 4	/216.B7
Q2 ISOL OPEN BAY-D05 P7#BI.03	220-250VDC	+ 5	- 6	/216.C7
Q2 ISOL CLOSE BAY-D05 P7#BI.04	220-250VDC	+ 7	- 8	/216.C7
Q0CB B-PH OPEN BAY-D05 P7#BI.05	220-250VDC	+ 9	- 10	/216.C7
Q0 CB MANUAL CLOSE FROM BAY-D05 P7#BI.06	220-250VDC	+ 11	- 12	/216.D7
LBB 3-PH INITIATION FROM BAY-D05 P7#BI.07	220-250VDC	+ 13	- 14	/216.D7
LBB B-PH INITIATION FROM BAY-D05 P7#BI.08	220-250VDC	+ 15	- 16	/216.E7

+D.22 -D22.01
Binary input module 1MRK000508-CD
BIM
220-250VDC, 50ma

X72

Q1 ISOL OPEN BAY-D06 P7#BI.09	220-250VDC	+ 1	- 2	/217.B7
Q1 ISOL CLOSE BAY-D06 P7#BI.10	220-250VDC	+ 3	- 4	/217.B7
Q2 ISOL OPEN BAY-D06 P7#BI.11	220-250VDC	+ 5	- 6	/217.C7
Q2 ISOL CLOSE BAY-D06 P7#BI.12	220-250VDC	+ 7	- 8	/217.C7
Q0CB B-PH OPEN BAY-D06 P7#BI.13	220-250VDC	+ 9	- 10	/217.C7
Q0 CB MANUAL CLOSE FROM BAY-D06 P7#BI.14	220-250VDC	+ 11	- 12	/217.D7
LBB 3-PH INITIATION FROM BAY-D06 P7#BI.15	220-250VDC	+ 13	- 14	/217.D7
LBB B-PH INITIATION FROM BAY-D06 P7#BI.16	220-250VDC	+ 15	- 16	/217.E7

+D.22 -D22.01
Binary input module 1MRK000508-CD
BIM
220-250VDC, 50ma

X81

Q1 ISOL OPEN BAY-D07 P8#BI.01	220-250VDC	+ 1	- 2	/218.B7
Q1 ISOL CLOSE BAY-D07 P8#BI.02	220-250VDC	+ 3	- 4	/218.B7
Q2 ISOL OPEN BAY-D07 P8#BI.03	220-250VDC	+ 5	- 6	/218.C7
Q2 ISOL CLOSE BAY-207 P8#BI.04	220-250VDC	+ 7	- 8	/218.C7
Q0CB R-PH OPEN BAY-D07 P8#BI.05	220-250VDC	+ 9	- 10	/218.C7
Q0 CB MANUAL CLOSE FROM BAY-D07 P8#BI.06	220-250VDC	+ 11	- 12	/218.D7
LBB INITIATION FROM BAY-D07 P8#BI.07	220-250VDC	+ 13	- 14	/218.D7
SPARE P8#BI.08	220-250VDC	+ 15	- 16	/218.E7

+D.22 -D22.01
Binary input module 1MRK000508-CD
BIM
220-250VDC, 50ma

X82

Q1 ISOL OPEN BAY-D08 P8#BI.09	220-250VDC	+ 1	- 2	/219.B7
Q1 ISOL CLOSE BAY-D08 P8#BI.10	220-250VDC	+ 3	- 4	/219.B7
Q2 ISOL OPEN BAY-D08 P8#BI.11	220-250VDC	+ 5	- 6	/219.C7
Q2 ISOL CLOSE BAY-D08 P8#BI.12	220-250VDC	+ 7	- 8	/219.C7
Q0CB R-PH OPEN BAY-D08 P8#BI.13	220-250VDC	+ 9	- 10	/219.C7
Q0CB R-PH OPEN FROM BAY-D08 P8#BI.14	220-250VDC	+ 11	- 12	/219.D7
LBB INITIATION FROM BAY-D08 P8#BI.15	220-250VDC	+ 13	- 14	/219.D7
SPARE P8#BI.16	220-250VDC	+ 15	- 16	/219.E7

APPROVED subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and the responsibility of design details, performance, particulars, quality of the supplies with the inbuilt provisions of IEC specifications as may be applicable nor does it limit the AEGCL's right under the contract.

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

Based on

Rev.	Revision note	Date	Name
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK

1MYN691003-102(A3)REV01

Prepared 08-08-2025 DIVYA S
Approved 08-08-2025 THEJASWINI AR
Project ASSAM ELECTRICITY GRID CORPORATION LTD
400/220kV GIS SS AT SONAPUR
128840

Title 220kV CONTROL & RELAY PANEL
220kV BUSBAR
REB670-BPH OVERVIEW

HITACHI Hitachi Energy India Limited

Doc. kind. Circuit diagram
DCC EFS
Resp. dept. PG-GAS
Doc. no. 1KHF128840R1411

Ref.Des. =2R
Rev. ind. 01
Language en
Sheet 229
n. sheet 230

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

+BB1

+D.22 -D22.01
Binary input module 1MRK000508-CD
BIM
220-250VDC, 50ma
X91

Q1 ISOL OPEN BAY-D09 P9#BI.01	220-250VDC	1 / 2	/220.B7
Q1 ISOL CLOSE BAY-D09 P9#BI.02	220-250VDC	3 / 4	/220.B7
Q2 ISOL OPEN BAY-D09 P9#BI.03	220-250VDC	5 / 6	/220.C7
Q2 ISOL CLOSE BAY-D09 P9#BI.04	220-250VDC	7 / 8	/220.C7
Q0CB R-PH OPEN BAY-D09 P9#BI.05	220-250VDC	9 / 10	/220.C7
Q0 CB MANUAL CLOSE FROM BAY-D09 P9#BI.06	220-250VDC	11 / 12	/220.D7
LBB INITIATION FROM BAY-D09 P9#BI.07	220-250VDC	13 / 14	/220.D7
SPARE P9#BI.08	220-250VDC	15 / 16	/220.E7

+D.22 -D22.01
Binary input module 1MRK000508-CD
BIM
220-250VDC, 50ma
X92

Q1 ISOL OPEN BAY-210 P9#BI.09	220-250VDC	1 / 2	/221.B7
Q1 ISOL CLOSE BAY-210 P9#BI.10	220-250VDC	3 / 4	/221.B7
Q2 ISOL OPEN BAY-210 P9#BI.11	220-250VDC	5 / 6	/221.C7
Q2 ISOL OPEN BAY-210 P9#BI.12	220-250VDC	7 / 8	/221.C7
Q0CB R-PH OPEN BAY-210 P9#BI.13	220-250VDC	9 / 10	/221.C7
Q0 CB MANUAL CLOSE FROM BAY-210 P9#BI.14	220-250VDC	11 / 12	/221.D7
LBB 3-PH INITIATION FROM BAY-D10 P9#BI.15	220-250VDC	13 / 14	/221.D7
LBB B-PH INITIATION FROM BAY-D10 P9#BI.16	220-250VDC	15 / 16	/221.E7

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and his responsibilities including details, performance particulars and consistency of the supplies with the latest relevant rules / IEC specifications as may be applicable nor prejudices the AEGCL's right under the contract.

+D.22 -D22.01
Binary output module 1MRK000614-AB
BOM
X41

BBP/LBB OPTD. BAY-D01 P4#BO.01		2 / 1	/224.A2
BBP/LBB OPTD. BAY-D02 P4#BO.02		3 / 5	/224.B2
BBP/LBB OPTD. BAY-D03 P4#BO.03		4 / 6	/224.B2
BBP/LBB OPTD. BAY-D04 P4#BO.04		8 / 7	/224.C2
BBP/LBB OPTD. BAY-D05 P4#BO.05		9 / 11	/224.C2
BBP/LBB OPTD. BAY-D06 P4#BO.06		10 / 12	/224.D2
BBP/LBB OPTD. BAY-D07 P4#BO.07		14 / 13	/224.D2
BBP/LBB OPTD. BAY-D08 P4#BO.08		15 / 17	/224.D2
BBP/LBB/EFP OPTD. BAY-209 P4#BO.09		16 / 18	/224.E2
BBP/LBB OPTD. BAY-D10(FUT.LINE-1) P4#BO.10			
BBP/LBB/EFP OPTD. BAY-D11(FUT.LINE-2) P4#BO.11			
SPARE P4#BO.12			

+D.22 -D22.01
Binary output module 1MRK000614-AB
BOM
X42

BBP/EFP OPTD. BAY-D01 P4#BO.13		2 / 1	/225.A2
BBP/EFP OPTD. BAY-D02 P4#BO.14		3 / 5	/225.B2
BBP/EFP OPTD. BAY-D03 P4#BO.15		4 / 6	/225.B2
BBP/EFP OPTD. BAY-D04 P4#BO.16		8 / 7	/225.B2
BBP/EFP OPTD. BAY-D05 P4#BO.17		9 / 11	/225.C2
BBP/EFP OPTD. BAY-D06 P4#BO.18		10 / 12	/225.C2
BBP/EFP OPTD. BAY-D07 P4#BO.19		14 / 13	/225.C2
BBP/EFP OPTD. BAY-D08 P4#BO.20		15 / 17	/225.D2
BBP/EFP OPTD. BAY-D09 P4#BO.21		16 / 18	/225.D2
BBP/EFP OPTD. BAY-D10(FUT. LINE-1) P4#BO.22			/225.D2
BBP/EFP OPTD. BAY-D11(FUT.LINE-2) P4#BO.23			/225.E2
SPARE P4#BO.24			/225.E2

Based on

Rev.	Revision note	Date	Name
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK

Prepared 08-08-2025 DIVYA S
Approved 08-08-2025 THEJASWINI AR
Project ASSAM ELECTRICITY GRID CORPORATION LTD
400/220kV GIS SS AT SONAPUR
128840

Title 220kV CONTROL & RELAY PANEL
220kV BUSBAR
REB670-BPH OVERVIEW

HITACHI Hitachi Energy India Limited

Doc. kind. Circuit diagram
DCC EFS
Ref.Des. =2R
Resp. dept. PG-GAS
Rev. ind. 01
Language en
Sheet 230
n. sheet 231
Doc. no. 1KHF128840R1411

1MYN691003-102(A3)REV01

The reproduction, distribution and utilization of this document as well as the communication or its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

+BB1

+D.22 -D22.01
Binary output module 1MRK000614-AB
BOM

X61

LBB RE-TRIP B-PH BAY-D01 P6#BO.01	2 / 1	/226.A2	
LBB RE-TRIP B-PH BAY-D02 P6#BO.02	3	/226.B2	
LBB RE-TRIP B-PH BAY-D03 P6#BO.03	5 / 4	/226.B2	
LBB RE-TRIP B-PH BAY-D04 P6#BO.04	6	/226.B2	
LBB RE-TRIP B-PH BAY-D05 P6#BO.05	8 / 7	/226.C2	
LBB RE-TRIP B-PH BAY-D06 P6#BO.06	9	/226.C2	
LBB RE-TRIP 3-PH BAY-D07 P6#BO.07	11 / 10	/226.C2	
LBB RE-TRIP 3-PH BAY-D08 P6#BO.08	12	/226.D2	
LBB RE-TRIP 3-PH BAY-B09 P6#BO.09	14 / 13	/226.D2	
LBB RE-TRIP B-PH BAY-D10(FUT. LINE-1) P6#BO.10	15	/226.D2	
LBB RE-TRIP B-PH BAY-D11(FUT.LINE-2) P6#BO.11	17 / 16	/226.E2	
SPARE P6#BO.12	18	/226.E2	

+D.22 -D22.01
Binary output module 1MRK000614-AB
BOM

X62

SPARE P6#BO.13	2 / 1	/227.A2
SPARE P6#BO.14	3	/227.B2
SPARE P6#BO.15	5 / 4	/227.B2
SPARE P6#BO.16	6	/227.B2
SPARE P6#BO.17	8 / 7	/227.C2
SPARE P6#BO.18	9	/227.C2
SPARE P6#BO.19	11 / 10	/227.C2
SPARE P6#BO.20	12	/227.D2
SPARE P6#BO.21	14 / 13	/227.D2
SPARE P6#BO.22	15	/227.D2
SPARE P6#BO.23	17 / 16	/227.E2
SPARE P6#BO.24	18	/227.E2

+D.22 -D22.01
Binary input module 1MRK000508-CD
BIM
220-250VDC, 50ma

X111

SPARE P11#BI.01 220-250VDC	+ 1 / - 2	/223.1.B7	
SPARE P11#BI.02 220-250VDC	+ 3 / - 4	/223.1.B7	
SPARE P11#BI.03 220-250VDC	+ 5 / - 6	/223.1.C7	
SPARE P11#BI.04 220-250VDC	+ 7 / - 8	/223.1.C7	
SPARE P11#BI.05 220-250VDC	+ 9 / - 10	/223.1.C7	
SPARE P11#BI.06 220-250VDC	+ 11 / - 12	/223.1.D7	
SPARE P11#BI.07 220-250VDC	+ 13 / - 14	/223.1.D7	
SPARE P11#BI.08 220-250VDC	+ 15 / - 16	/223.1.E7	

+D.22 -D22.01
Binary input module 1MRK000508-CD
BIM
220-250VDC, 50ma

X112

SPARE P11#BI.09 220-250VDC	+ 1 / - 2	/223.2.B7	
SPARE P11#BI.10 220-250VDC	+ 3 / - 4	/223.2.B7	
SPARE P11#BI.11 220-250VDC	+ 5 / - 6	/223.2.C7	
SPARE P11#BI.12 220-250VDC	+ 7 / - 8	/223.2.C7	
SPARE P11#BI.13 220-250VDC	+ 9 / - 10	/223.2.C7	
SPARE P11#BI.14 220-250VDC	+ 11 / - 12	/223.2.D7	
SPARE P11#BI.15 220-250VDC	+ 13 / - 14	/223.2.D7	
SPARE P11#BI.16 220-250VDC	+ 15 / - 16	/223.2.E7	

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations nor the responsibility for details, performance pursuant to the provisions of the applicable Indian Statutory laws / IEC specifications as may be applicable nor does limit the AEGCL right under the contract.

Based on

Rev.	Revision note	Date	Name
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK

Prepared 08-08-2025 DIVYA S
Approved 08-08-2025 THEJASWINI AR
Project ASSAM ELECTRICITY GRID CORPORATION LTD
400/220kV GIS SS AT SONAPUR
128840

Title 220kV CONTROL & RELAY PANEL
220kV BUSBAR
REB670-BPH OVERVIEW

HITACHI Hitachi Energy India Limited

Doc. kind. Circuit diagram
DCC EFS
Resp. dept. PG-GAS
Doc. no. 1KHF128840R1411

Ref.Des. =2R
Rev. ind. 01
Language en
Sheet 231
n. sheet 232

1MYN691003-102(A3)REV01

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

+BB1

+D.22 -D22.01
Binary input module
BIM
220-250VDC, 50ma
1MRK000508-CD
X121

SPARE	P12#BI.01	220-250VDC	1 / 2	/223.3.B7
SPARE	P12#BI.02	220-250VDC	3 / 4	/223.3.B7
96 OPTD	P12#BI.03	220-250VDC	5 / 6	/223.3.C7
SPARE	P12#BI.04	220-250VDC	7 / 8	/223.3.C7
SPARE	P12#BI.05	220-250VDC	9 / 10	/223.3.C7
SPARE	P12#BI.06	220-250VDC	11 / 12	/223.3.D7
SPARE	P12#BI.07	220-250VDC	13 / 14	/223.3.D7
SPARE	P12#BI.08	220-250VDC	15 / 16	/223.3.E7

+D.22 -D22.01
Binary input module
BIM
220-250VDC, 50ma
1MRK000508-CD
X122

SPARE	P12#BI.09	220-250VDC	1 / 2	/223.4.B7
SPARE	P12#BI.10	220-250VDC	3 / 4	/223.4.B7
SPARE	P12#BI.11	220-250VDC	5 / 6	/223.4.C7
SPARE	P12#BI.12	220-250VDC	7 / 8	/223.4.C7
SPARE	P12#BI.13	220-250VDC	9 / 10	/223.4.C7
SPARE	P12#BI.14	220-250VDC	11 / 12	/223.4.D7
SPARE	P12#BI.15	220-250VDC	13 / 14	/223.4.D7
SPARE	P12#BI.16	220-250VDC	15 / 16	/223.4.E7

Checked By AM (P&D)	Checked By DM (P&D)	Checked By ACM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and the responsibility of the supplies with the Indian Statutory laws / IEC specifications as may be applicable nor does limit the AEGCL's right under the contract.

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

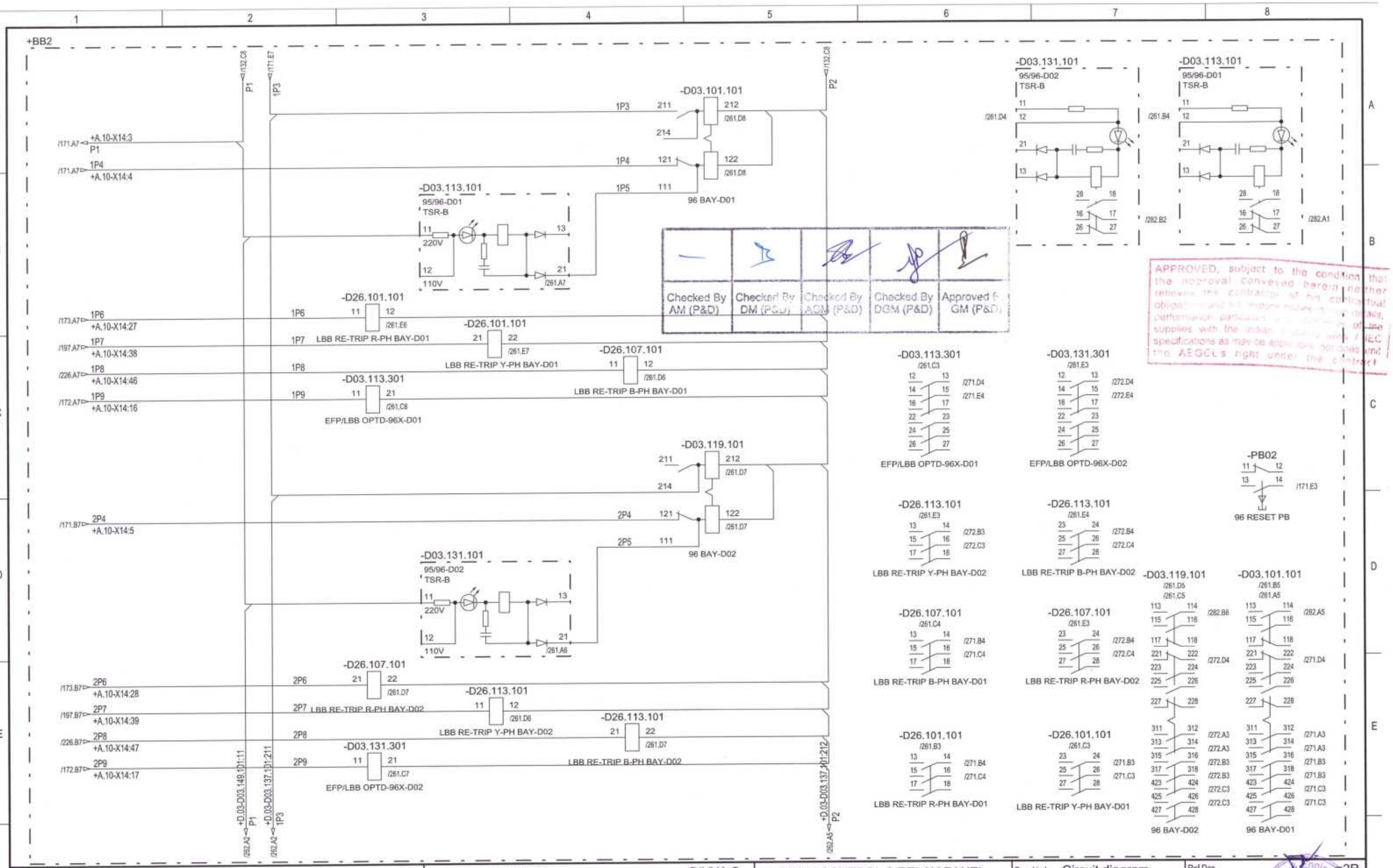
Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
REB670-BPH OVERVIEW

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram	Ref.Des.	=2R
	DCC EFS		
Resp. dept.	PG-GAS	Rev. ind.	01
Doc. no.	1KHF128840R1411	Language	en
		Sheet	232
		n. sheet	261

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy



Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
TRIP RELAY CKT-D01 & D02

HITACHI Hitachi Energy India Limited

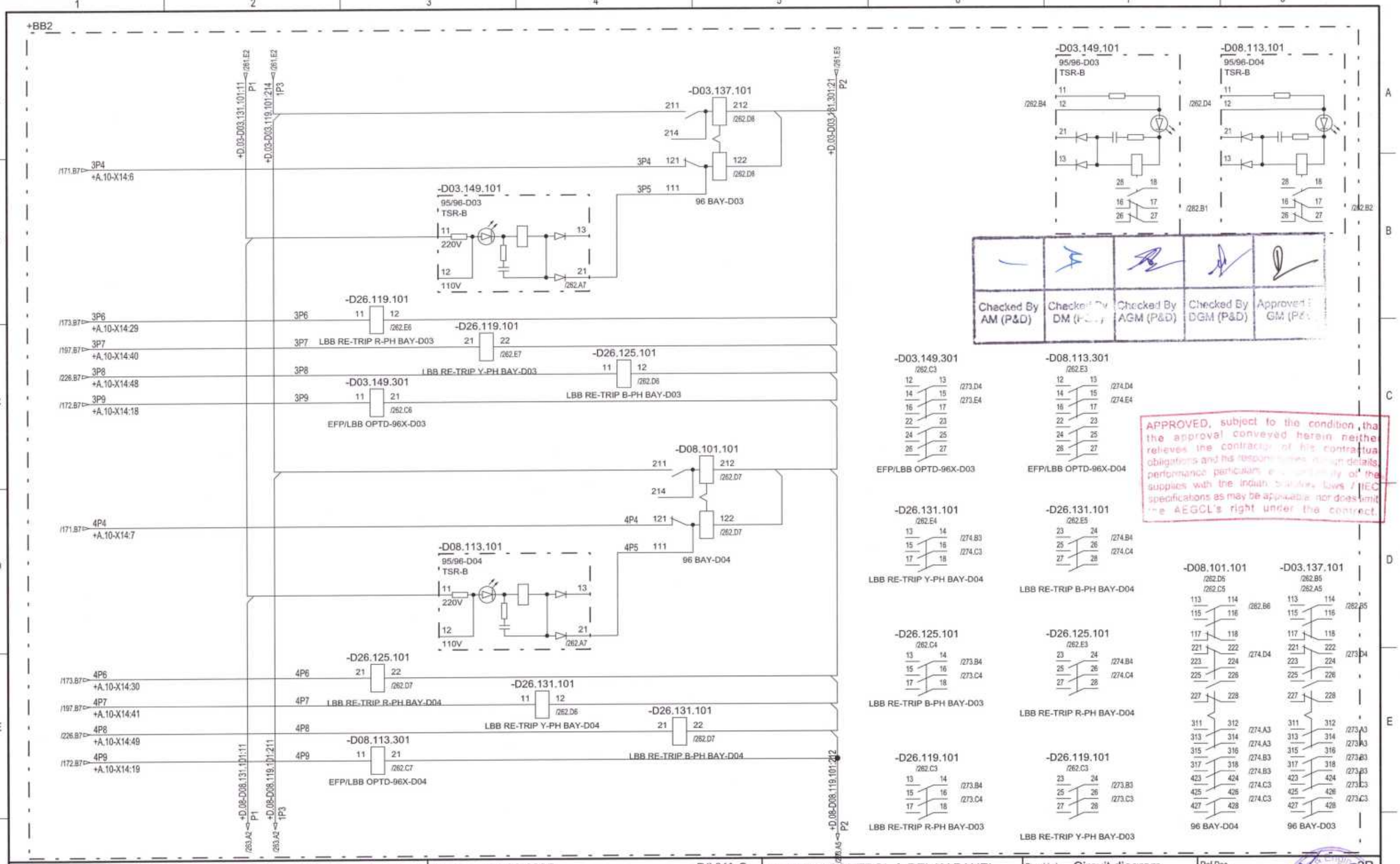
Doc. kind.	Circuit diagram	Ref.Des.	=2R
DCC	EFS		
Resp. dept.	PG-GAS	Rev. ind.	01
Language	en		
Doc. no.	1KHF128840R1411	Sheet	261
		n. sheet	262

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

+BB2



Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
TRIP RELAY CKT-D03 & D04

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram	Ref.Des.	=2R
	DCC EFS		
Resp. dept.	PG-GAS	Rev. ind.	01
Doc. no.	1KHF128840R1411	Language	en
		Sheet	262
		n. sheet	263

© Copyright 2023 Hitachi Energy
The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization is prohibited.
Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

+BB2

-D08.119.101
211 212 /263.D7
214
5P4 121 122 /263.D7
5P5 111
96 BAY-D05

-D08.131.101
95/96-D05
TSR-B
11 220V 13
12 110V 21 /263.A7

-D26.137.101
5P6 11 12 /263.E6
LBB RE-TRIP R-PH BAY-D05

-D26.137.101
5P7 21 22 /263.E7
LBB RE-TRIP Y-PH BAY-D05

-D26.143.101
5P8 11 12 /263.D6
LBB RE-TRIP B-PH BAY-D05

-D08.131.301
5P9 11 21 /263.C6
EFP/LBB OPTD-96X-D05

-D08.137.101
211 212 /263.D8
214
6P4 121 122 /263.D8
6P5 111
96 BAY-D06

-D08.149.101
95/96-D06
TSR-B
11 220V 13
12 110V 21 /263.A8

-D26.143.101
6P6 21 22 /263.D7
LBB RE-TRIP R-PH BAY-D06

-D26.149.101
6P7 11 12 /263.D6
LBB RE-TRIP Y-PH BAY-D06

-D26.149.101
6P8 21 22 /263.D7
LBB RE-TRIP B-PH BAY-D06

-D08.149.301
6P9 11 21 /263.C7
EFP/LBB OPTD-96X-D06

/171.C7 5P4 +A.10-X14:8
/173.C7 5P6 +A.10-X14:31
/197.C7 5P7 +A.10-X14:42
/226.C7 5P8 +A.10-X14:50
/172.C7 5P9 +A.10-X14:20
/171.C7 6P4 +A.10-X14:9
/173.C7 6P6 +A.10-X14:32
/197.C7 6P7 +A.10-X14:43
/226.C7 6P8 +A.10-X14:51
/172.C7 6P9 +A.10-X14:21

+D.08-D08.113.101:11 P1 /262.E2
+D.08-D08.101.101:211 1P3 /262.E2
+D.13-D13.113.101:11 P1 /262.A2
+D.13-D13.101.101:211 1P3 /262.A2
/262.E5 P2
+D.13-D13.101.101:22 P2 /262.A5

-D08.149.101
95/96-D06
TSR-B
/263.D4
11 12 21 13
28 18 16 17 26 27
/282.C2

-D08.131.101
95/96-D05
TSR-B
/263.B4
11 12 21 13
28 18 16 17 26 27
/282.C1

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)
—				

-D08.131.301
/263.C3
12 13 /275.D4
14 15 /275.E4
16 17
22 23
24 25
26 27
EFP/LBB OPTD-96X-D05

-D08.149.301
/263.E3
12 13 /276.D4
14 15 /276.E4
16 17
22 23
24 25
26 27
EFP/LBB OPTD-96X-D06

-D26.149.101
/263.E3
13 14 /276.B3
15 16 /276.C3
17 18
LBB RE-TRIP Y-PH BAY-D06

-D26.149.101
/263.E4
23 24 /276.B4
25 26 /276.C4
27 28
LBB RE-TRIP B-PH BAY-D06

-D26.143.101
/263.C4
13 14 /275.B4
15 16 /275.C4
17 18
LBB RE-TRIP B-PH BAY-D05

-D26.143.101
/263.E3
23 24 /276.B4
25 26 /276.C4
27 28
LBB RE-TRIP R-PH BAY-D06

-D26.137.101
/263.C3
13 14 /275.B4
15 16 /275.C4
17 18
LBB RE-TRIP R-PH BAY-D05

-D26.137.101
/263.C4
23 24 /275.B3
25 26 /275.C3
27 28
LBB RE-TRIP Y-PH BAY-D05

-D08.119.101
/263.B5
/263.A5
113 114 /282.C5
115 116
117 118
221 222 /275.D4
223 224
225 226
227 228
311 312 /275.A3
313 314 /275.A3
315 316 /275.B3
317 318 /275.B3
423 424 /275.C3
425 426 /275.C3
427 428
96 BAY-D05

-D08.137.101
/263.D5
/263.C5
113 114 /282.C6
115 116
117 118
221 222 /276.D4
223 224
225 226
227 228
311 312 /276.A3
313 314 /276.A3
315 316 /276.B3
317 318 /276.B3
423 424 /276.C3
425 426 /276.C3
427 428
96 BAY-D06

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and his responsibilities for details, performance particulars and supplies with the Indian Statutes, laws, IEC specifications as may be applicable nor does and the AEGCL's right under the contract

Rev.	Revision note	Date	Name
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK

Based on

Prepared 08-08-2025 DIVYA S
Approved 08-08-2025 THEJASWINI AR
Project ASSAM ELECTRICITY GRID CORPORATION LTD
400/220kV GIS SS AT SONAPUR
128840

Title 220kV CONTROL & RELAY PANEL
220kV BUSBAR
TRIP RELAY CKT-D05 & D06

HITACHI Hitachi Energy India Limited

Doc. kind. Circuit diagram
DCC EFS
Resp. dept. PG-GAS
Doc. no. 1KHF128840R1411
Ref.Des. =2R
Rev. ind. 01
Language en
Sheet 263
n. sheet 264

1MYN691003-102(A3)REV01

© Copyright 2023 Hitachi Energy

-DD2

-D13.101.101
211 212 /264.D8
214
7P4 121 122 /264.D8
7P5 111
96 BAY-D07

/171.C7 7P4 +A.10-X14:10

-D13.113.101
95/96-D07
TSR-B
11 220V 13
12 110V 21 /264.A6

-D26.155.101
11 12 /264.E6
LBB RE-TRIP 3-PH BAY-D07

/173.C7 7P6 +A.10-X14:33

-D26.155.101
21 22 /264.E7
LBB RE-TRIP 3-PH BAY-D07

-D13.119.101
211 212 /264.D7
214
8P4 121 122 /264.D7
8P5 111
96 BAY-D08

/171.D7 8P4 +A.10-X14:11

-D13.125.101
95/96-D08
TSR-B
11 220V 13
12 110V 21 /264.A7

-D26.101.301
11 12 /264.D6
LBB RE-TRIP 3-PH BAY-D08

/173.D7 8P6 +A.10-X14:34

-D26.101.301
21 22 /264.D7
LBB RE-TRIP 3-PH BAY-D08

-D13.125.301
11 21 /264.C6
EFP/LBB OPTD-96X-D08

/172.D7 8P7 +A.10-X14:23

+D.08-D08.149.101:11 /263.E2 P1
+D.08-D08.137.101:211 /263.E2 1P3
/263.E5 P2
+D.13-D13.149.101:11 /263.A2 P1
+D.13-D13.137.101:211 /263.A2 1P3
/263.A5 P2

-D13.113.101
95/96-D07
TSR-B
/264.B4 11 12 21 13 28 18 16 17 26 27 /282.C1

-D13.125.101
95/96-D08
TSR-B
/264.D4 11 12 21 13 28 18 16 17 26 27 /282.D1

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)
—				

APPROVED, subject to the condition that the approval conveyed hereon neither relieves the contractor of his contractual obligations and his responsibility for details, performance particulars and conformity of the supplies with the Indian Statutory laws / IEC specifications as may be applicable nor does it limit the AEGCL's right under the contract.

-D13.125.301
/264.E4
12 13 /278.D4
14 15 /278.E4
16 17 /278.E4
22 23 /278.F4
24 25
26 27
EFP/LBB OPTD-96X-D08

-D26.101.301
/264.E3
13 14 /278.B4
15 16 /278.B3
17 18 /278.B4
LBB RE-TRIP 3-PH BAY-D08

-D26.101.301
/264.E4
23 24 /278.C4
25 26 /278.C3
27 28 /278.C4
LBB RE-TRIP 3-PH BAY-D08

-D26.155.101
/264.C3
13 14 /277.B4
15 16 /277.B3
17 18 /277.B4
LBB RE-TRIP 3-PH BAY-D07

-D26.155.101
/264.C4
23 24 /277.C4
25 26 /277.C3
27 28 /277.C4
LBB RE-TRIP 3-PH BAY-D07

-D13.119.101
/264.D5 /264.C5
113 114 /282.D6
115 116
117 118
221 222 /278.D4
223 224
225 226
227 228
311 312 /278.A3
313 314 /278.A3
315 316 /278.B3
317 318 /278.B3
423 424 /278.C3
425 426 /278.C3
427 428
96 BAY-D08

-D13.101.101
/264.B5 /264.A5
113 114 /282.C5
115 116
117 118
221 222 /277.D4
223 224
225 226
227 228
311 312 /277.A3
313 314 /277.A3
315 316 /277.B3
317 318 /277.B3
423 424 /277.C3
425 426 /277.C3
427 428
96 BAY-D07

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
TRIP RELAY CKT-D07 & D08

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram	Ref.Des.	=2R
	DCC EFS		
Resp. dept.	PG-GAS	Rev. ind.	01
Doc. no.	1KHF128840R1411	Language	en
		Sheet	264
		n. sheet	265

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization is prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and his responsibilities for details, performance particulars and conformity of the supplies with the Indian Statutory rules / IEC specifications as may be applicable for sales and the AEGCL's right under the contract.

+BB2

-D13.137.101
211 212 /265.D7
214
9P4 121 122 /265.D7
9P5 111
96 BAY-D09

-D13.149.101
95/96-D09
TSR-B
11 13
220V
12 21 /265.A6
110V

-D26.107.301
11 12 /265.E6
LBB RE-TRIP 3-PH BAY-D09
-D26.107.301
21 22 /265.E7
LBB RE-TRIP 3-PH BAY-D09

-D13.149.301
11 21 /265.C8
EFP/LBB OPTD-96X-D09

-D18.101.101
211 212 /265.D8
214
10P4 121 122 /265.D8
10P5 111
96 BAY-D10(FUT.)

-D18.113.101
95/96-D10(FUT.)
TSR-B
11 13
220V
12 21 /265.A7
110V

-D26.113.301
11 12 /265.D6
LBB RE-TRIP R-PH BAY-D10(FUT.)
-D26.113.301
21 22 /265.D7
LBB RE-TRIP Y-PH BAY-D10(FUT.)
-D26.119.301
11 12 /265.D6
LBB RE-TRIP B-PH BAY-D10(FUT.)

-D18.113.301
11 21 /265.C7
EFP/LBB OPTD-96X-D10(FUT.)

/171.D7 9P4 +A.10-X14:12
/173.D7 9P6 +A.10-X14:35
/172.D7 9P7 +A.10-X14:24
/171.D7 10P4 +A.10-X14:13
/173.D7 10P6 +A.10-X14:36
/197.D7 10P7 +A.10-X14:44
/226.D7 10P8 +A.10-X14:52
/172.D7 10P9 +A.10-X14:25

+D.13-D13.125.101:11 /264.E2 P1
+D.13-D13.119.101:211 /264.E2 1P3
+D.13-D13.125.301:21 /264.E5 P2
+D.18-D18.125.101:11 /265.A2 P1
+D.18-D18.119.101:211 /265.A2 1P3
+D.18-D18.125.301:212 /265.A3 P2

-D13.149.101
95/96-D09
TSR-B
/265.B4
11 12
21 13
28 18
16 17
26 27
/282.D1

-D18.113.101
95/96-D10(FUT.)
TSR-B
/265.E4
11 12
21 13
28 18
16 17
26 27
/282.D2

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

-D26.119.301 /265.E5
13 14 /280.B4
15 16 /280.C4
17 18
LBB RE-TRIP B-PH BAY-D10(FUT.)

-D26.113.301 /265.E3
13 14 /280.B4
15 16 /280.C4
17 18
LBB RE-TRIP R-PH BAY-D10(FUT.)

-D26.113.301 /265.E4
23 24 /280.B3
25 26 /280.C3
27 28
LBB RE-TRIP Y-PH BAY-D10(FUT.)

-D26.107.301 /265.C3
13 14 /279.B4
15 16 /279.B3
17 18 /279.B4
LBB RE-TRIP 3-PH BAY-D09

-D26.107.301 /265.C4
23 24 /279.C4
25 26 /279.C3
27 28 /279.C4
LBB RE-TRIP 3-PH BAY-D09

-D18.113.301 /265.E3
12 13 /280.D4
14 15 /280.E4
16 17
22 23
24 25
26 27
EFP/LBB OPTD-96X-D10(FUT.)

-D13.149.301 /265.C3
12 13 /279.D4
14 15 /279.E4
16 17 /279.E4
22 23 /279.F4
24 25
26 27
EFP/LBB OPTD-96X-D09

-D13.137.101 /265.B5 /265.A5
113 114 /282.D5
115 116
117 118
221 222 /279.D4
223 224
225 226
227 228
311 312 /279.A3
313 314 /279.A3
315 316 /279.B3
317 318 /279.B3
423 424 /279.C3
425 426 /279.C3
427 428
96 BAY-D09

-D18.101.101 /265.D5 /265.D6
113 114 /282.D6
115 116
117 118 /280.D4
221 222
223 224
225 226
227 228
311 312
313 314 /280.A3
315 316 /280.A3
317 318 /280.B3
423 424 /280.B3
425 426 /280.C3
427 428 /280.C3
96 BAY-D10(FUT.)

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

HITACHI Hitachi Energy India Limited

Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
TRIP RELAY CKT-D09 & D10

Doc. kind.	Circuit diagram DCC EFS	Ref.Des.	=2R
Resp. dept.	PG-GAS	Rev. ind.	01
Doc. no.	1KHF128840R1411	Language	en
		Sheet	265
		n. sheet	266

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy
The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

+BB2

+D.16-D18.113.101:11 /265.E3 P1
+D.18-D18.101.101:211 /265.E2 1P3
+D.18-D18.113.301:21 /265.E5 P2

-D18.119.101
211 212 /266.D8
214
11P4 121 122 /266.D8
11P5 111 96 BAY-D11(FUT.)

/171.E7 11P4 +A.10-X14:14

-D18.125.101
95/96-D11(FUT.)
TSR-B
11 220V 13
12 110V 21 /266.A7

-D18.125.101
95/96-D11(FUT.)
TSR-B
/266.C4 11 12 21 13
28 18 16 17 26 27 /282.E1

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and his responsibilities, design details, performance particulars and completeness of the supplies with the Indian Statutory and IEC specifications as may be applicable nor does limit the AEGCL's right under the contract.

-D26.119.301
/173.E7 11P6 +A.10-X14:37 11P6 21 22 /266.D6
LBB RE-TRIP R-PH BAY-D11(FUT.)

-D26.125.301
/197.E7 11P7 +A.10-X14:45 11P7 11 12 /266.E6
LBB RE-TRIP Y-PH BAY-D11(FUT.)

-D26.125.301
/226.E7 11P8 +A.10-X14:53 11P8 21 22 /266.E7
LBB RE-TRIP B-PH BAY-D11(FUT.)

-D18.125.301
/172.E7 11P9 +A.10-X14:26 11P9 11 21 /266.D7
EFP/LBB OPTD-96X-D11(FUT.)

-D26.119.301
/266.C3
23 24 /281.B4
25 26 /281.C4
27 28
LBB RE-TRIP R-PH BAY-D11(FUT.)

-D18.125.301
/266.D3
12 13 /281.D4
14 15 /281.E4
16 17
22 23
24 25
26 27
EFP/LBB OPTD-96X-D11(FUT.)

-D18.119.101
/266.B5 /266.A5
113 114 /282.E5
115 116
117 118 /281.D4
221 222
223 224
225 226
227 228
311 312 /281.A3
313 314 /281.A3
315 316 /281.B3
317 318 /281.B3
423 424 /281.C3
425 426 /281.C3
427 428
96 BAY-D11(FUT.)

-D26.125.301
/266.C3
13 14 /281.B3
15 16 /281.B4
17 18
LBB RE-TRIP Y-PH BAY-D11(FUT.)

-D26.125.301
/266.C4
23 24 /281.C3
25 26 /281.C4
27 28
LBB RE-TRIP B-PH BAY-D11(FUT.)

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
TRIP RELAY CKT-D11

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram DCC EFS	Ref.Des.	=2R
Resp. dept.	PG-GAS	Rev. ind.	01
Doc. no.	1KHF128840R1411	Language	en
		Sheet	266
		n. sheet	271

© Copyright 2023 Hitachi Energy

+BB2

+D01AA
BAY-D01

-1BBX04 -BBX04

1K3 1 — 1
-D03.101.101 311 312 /261.E8
1K13 2 — 2
313 314 /261.E8
1K15 3 — 3
315 316 /261.E8
96 BAY-D01
-D26.101.101 13 14 /261.E6
LBB RE-TRIP R-PH BAY-D01
-D26.101.101 23 24 /261.E7
LBB RE-TRIP Y-PH BAY-D01
-D26.107.101 13 14 /261.D6
LBB RE-TRIP B-PH BAY-D01
1K17 4 — 4

TO TC-1 CKT
SH NO:

-BBX04

1K53 5 — 5
-D03.101.101 317 318 /261.E8
1K63 6 — 6
423 424 /261.E8
1K65 7 — 7
425 426 /261.E8
96 BAY-D01
-D26.101.101 15 16 /261.E6
LBB RE-TRIP R-PH BAY-D01
-D26.101.101 25 26 /261.E7
LBB RE-TRIP Y-PH BAY-D01
-D26.107.101 15 16 /261.E6
LBB RE-TRIP R-PH BAY-D02
1K67 8 — 8

TO TC-2 CKT
SH NO:

-BBX04

1K301 9 — 9
-D03.101.101 221 222 /261.E8
96 BAY-D01
1K303 10 — 10

TO CB CLS CKT
SH NO:

-BBX04

1K301A 11 — 11
-D03.113.301 12 13 /261.D6
EFP/LBB OPTD-96X-D01
1K303A 12 — 12

TO DT CKT
SH NO:

-BBX04

1K401 13 — 13
-D03.113.301 14 15 /261.D6
EFP/LBB OPTD-96X-D01
1K403 14 — 14

TO DT CKT
SH NO:

—				
Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and the responsibility for complete performance satisfactorily in all details, supplies with the relevant laws / IEC specifications as may be applicable and does not limit AEGCL's right under the contract.

REF DWG:1KHF128840R1113, SH NO:

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
BUSBAR INTERTRIP CIRCUIT-D01

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram	Ref.Des.	=2R
	DCC EFS		
Resp. dept.	PG-GAS	Rev. ind.	01
Doc. no.	1KHF128840R1411	Language	en
		Sheet	271
		n. sheet	272

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

+BB2

+D02AA
BAY-D02

-2BBX04 -BBX04

2K3 1 1
-D03.119.101 311 312 /261.E8
2K13 2 2
313 314 /261.E8
2K15 3 3
315 316 /261.E8
96 BAY-D02
2K17 4 4
-D26.107.101 23 24 /261.D7
LBB RE-TRIP R-PH BAY-D02
-D26.113.101 13 14 /261.D6
LBB RE-TRIP Y-PH BAY-D02
-D26.113.101 23 24 /261.D7
LBB RE-TRIP B-PH BAY-D02

TO TC-1 CKT
SH NO:

-2BBX04 -BBX04

2K53 5 5
-D03.119.101 317 318 /261.E8
2K63 6 6
423 424 /261.E8
2K65 7 7
425 426 /261.E8
96 BAY-D02
2K67 8 8
-D26.107.101 25 26 /261.E7
LBB RE-TRIP R-PH BAY-D02
-D26.113.101 15 16 /261.D6
LBB RE-TRIP Y-PH BAY-D02
-D26.113.101 25 26 /261.D7
LBB RE-TRIP B-PH BAY-D02

TO TC-2 CKT
SH NO:

-2BBX04 -BBX04

2K301 9 9
-D03.119.101 221 222 /261.E8
2K305 10 10
96 BAY-D02

TO CB CLS CKT
SH NO:

-2BBX04 -BBX04

2K303A 11 11
-D03.131.301 12 13 /261.C7
2K305A 12 12
EFP/LBB OPTD-96X-D02

TO DT CKT
SH NO:

-2BBX04 -BBX04

2K405 13 13
-D03.131.301 14 15 /261.C7
2K407 14 14
EFP/LBB OPTD-96X-D02

TO DT CKT
SH NO:

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and his responsibility in all details, performance particulars [illegible] of the supplies with the indian [illegible] laws / IEC specifications as may be applicable nor does limit the AEGCL's right under the contract.

REF DWG: 1KHF128840R1113, SH NO:

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared 08-08-2025 DIVYA S
Approved 08-08-2025 THEJASWINI AR
Project ASSAM ELECTRICITY GRID CORPORATION LTD
400/220kV GIS SS AT SONAPUR
128840

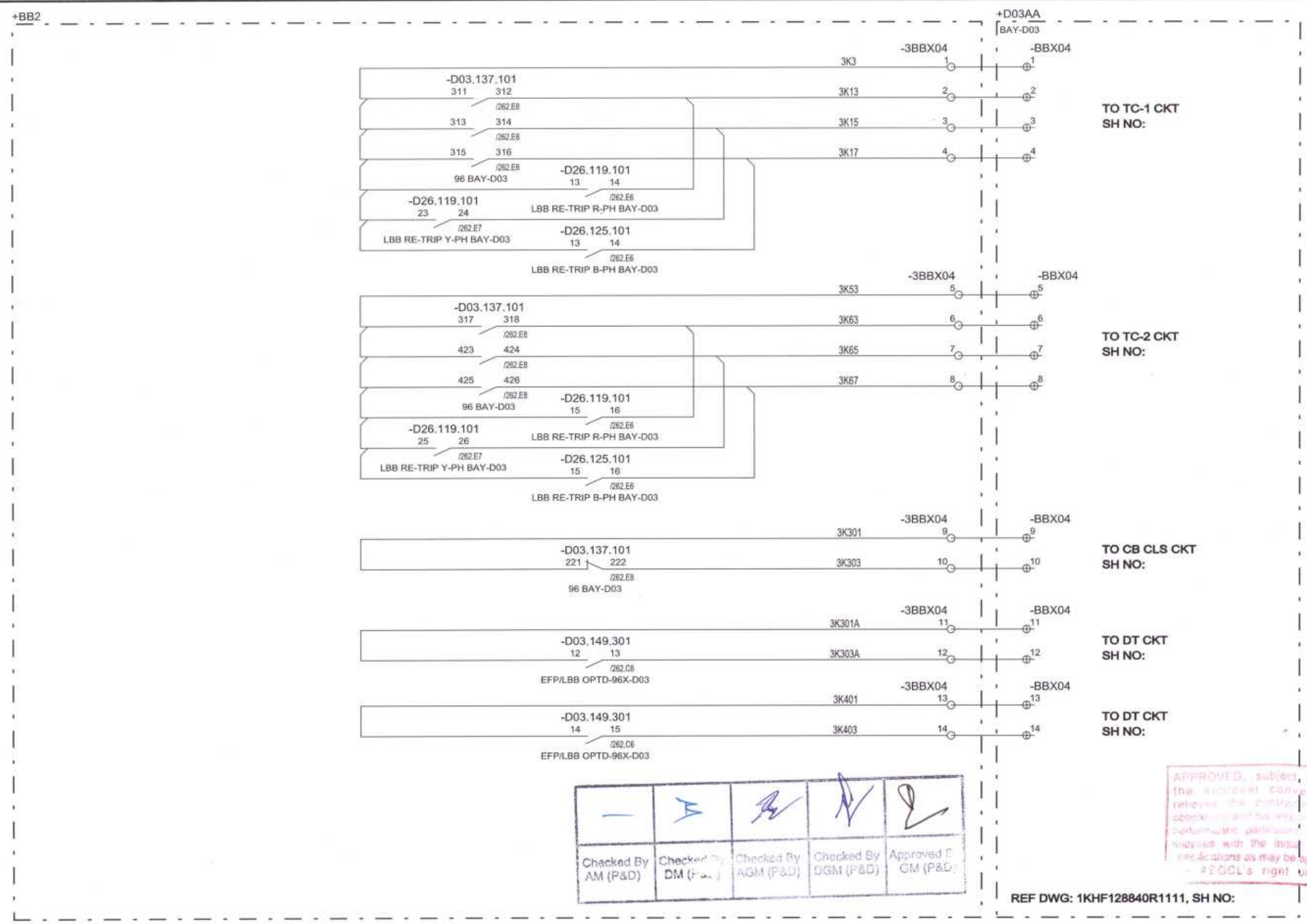
Title 220kV CONTROL & RELAY PANEL
220kV BUSBAR
BUSBAR INTERTRIP CIRCUIT-D02

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram	Ref.Des.	=2R
DCC	EFS		
Resp. dept.	PG-GAS	Rev. ind.	01
Doc. no.	1KHF128840R1411	Language	en
		Sheet	272
		n. sheet	273

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy



APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and liabilities in respect of the performance guarantees, details, workmanship, materials, compliance with the latest codes / IEC specifications as may be applicable nor does it put any liability on APGCL's right under the contract.

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
BUSBAR INTERTRIP CIRCUIT-D03

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram	Ref.Des.	=2R
DCC	EFS		
Resp. dept.	PG-GAS	Rev. ind.	01
Language	en		
Doc. no.	1KHF128840R1411	Sheet	273
		n. sheet	274

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

+BB2

+D04AA
BAY-D04

-4BBX04 / -BBX04

4K3 1 — 1
-D08.101.101 311 — 312 /262.E8
4K13 2 — 2
313 — 314 /262.E8
4K15 3 — 3
315 — 316 /262.E8
96 BAY-D04
-D26.125.101 23 — 24 /262.E7
LBB RE-TRIP R-PH BAY-D04
-D26.131.101 13 — 14 /262.D6
LBB RE-TRIP Y-PH BAY-D04
-D26.131.101 23 — 24 /262.D7
LBB RE-TRIP B-PH BAY-D04
4K17 4 — 4

TO TC-1 CKT
SH NO:

-4BBX04 / -BBX04

4K53 5 — 5
-D08.101.101 317 — 318 /262.E8
4K63 6 — 6
423 — 424 /262.E8
4K65 7 — 7
425 — 426 /262.E8
96 BAY-D04
-D26.125.101 25 — 26 /262.E7
LBB RE-TRIP R-PH BAY-D04
-D26.131.101 15 — 16 /262.D6
LBB RE-TRIP Y-PH BAY-D04
-D26.131.101 25 — 26 /262.D7
LBB RE-TRIP B-PH BAY-D04
4K67 8 — 8

TO TC-2 CKT
SH NO:

-4BBX04 / -BBX04

4K301 9 — 9
-D08.101.101 221 — 222 /262.E8
96 BAY-D04
4K303 10 — 10

TO CB CLS CKT
SH NO:

-4BBX04 / -BBX04

4K301A 11 — 11
-D08.113.301 12 — 13 /262.C7
EFP/LBB OPTD-96X-D04
4K303A 12 — 12

TO DT CKT
SH NO:

-4BBX04 / -BBX04

4K401 13 — 13
-D08.113.301 14 — 15 /262.C7
EFP/LBB OPTD-96X-D04
4K403 14 — 14

TO DT CKT
SH NO:

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of any contractual obligations and the responsibility for satisfactory performance pertaining to quality of the supplies with the Indian Electricity Rules / IEC specifications as may be applicable nor does limit the AEGCL's right under the contract.

REF DWG: 1KHF128840R1111, SH NO:

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared 08-08-2025 DIVYA S
Approved 08-08-2025 THEJASWINI AR
Project ASSAM ELECTRICITY GRID CORPORATION LTD
400/220kV GIS SS AT SONAPUR
128840

Title 220kV CONTROL & RELAY PANEL
220kV BUSBAR
BUSBAR INTERTRIP CIRCUIT-D04

HITACHI Hitachi Energy India Limited

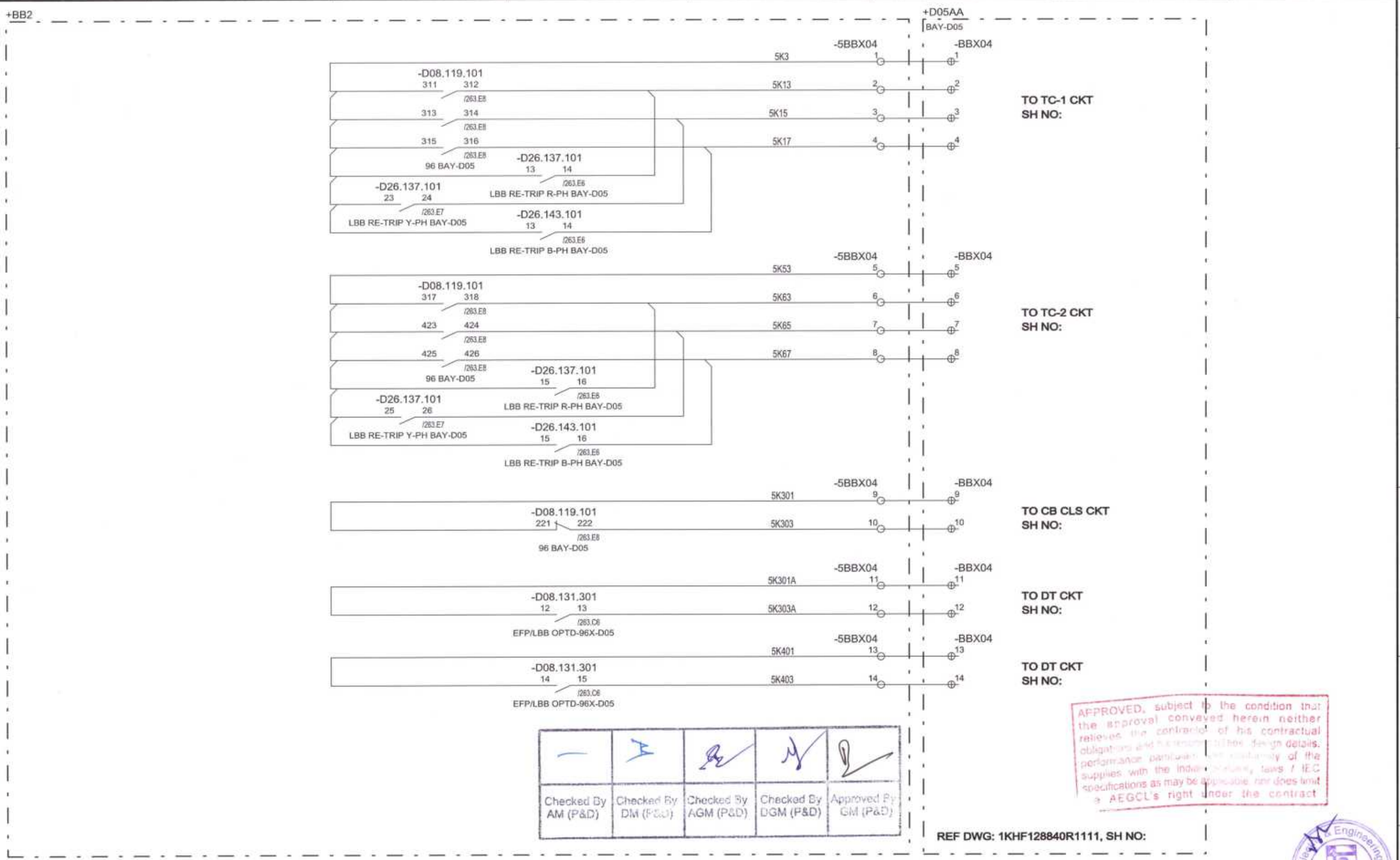
Doc. kind. Circuit diagram
DCC EFS
Resp. dept. PG-GAS
Doc. no. 1KHF128840R1411

Ref.Des. =2R
Rev. ind. 01
Language en
Sheet 274
n. sheet 275

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.



APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and responsibilities for design details, performance particulars and conformity of the supplies with the Indian statutory laws / IEC specifications as may be applicable nor does limit or AEGCL's right under the contract.

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
BUSBAR INTERTRIP CIRCUIT-D05

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram	Ref.Des.	=2R
	DCC EFS		
Resp. dept.	PG-GAS	Rev. ind.	01
Doc. no.	1KHF128840R1411	Language	en
		Sheet	275
		n. sheet	276

© Copyright 2023 Hitachi Energy

+BB2

+D06AA
BAY-D06

-6BBX04 / -BBX04

6K3 — 1 — 1

-D08.137.101 311 — 312 /263.E8

6K13 — 2 — 2

313 — 314 /263.E8

6K15 — 3 — 3

315 — 316 /263.E8

6K17 — 4 — 4

96 BAY-D06

-D26.143.101 23 — 24 /263.E7
LBB RE-TRIP R-PH BAY-D06

-D26.149.101 13 — 14 /263.D6
LBB RE-TRIP Y-PH BAY-D06

-D26.149.101 23 — 24 /263.D7
LBB RE-TRIP B-PH BAY-D06

TO TC-1 CKT
SH NO:

-6BBX04 / -BBX04

6K53 — 5 — 5

-D08.137.101 317 — 318 /263.E8

6K63 — 6 — 6

423 — 424 /263.E8

6K65 — 7 — 7

425 — 426 /263.E8

6K67 — 8 — 8

96 BAY-D06

-D26.143.101 25 — 26 /263.E7
LBB RE-TRIP R-PH BAY-D06

-D26.149.101 15 — 16 /263.D6
LBB RE-TRIP Y-PH BAY-D06

-D26.149.101 25 — 26 /263.D7
LBB RE-TRIP B-PH BAY-D06

TO TC-2 CKT
SH NO:

-6BBX04 / -BBX04

6K301 — 9 — 9

-D08.137.101 221 — 222 /263.E8

6K303 — 10 — 10

96 BAY-D06

TO CB CLS CKT
SH NO:

-6BBX04 / -BBX04

6K301A — 11 — 11

-D08.149.301 12 — 13 /263.C7

6K303A — 12 — 12

EFP/LBB OPTD-96X-D06

TO DT CKT
SH NO:

-6BBX04 / -BBX04

6K401 — 13 — 13

-D08.149.301 14 — 15 /263.C7

6K403 — 14 — 14

EFP/LBB OPTD-96X-D06

TO DT CKT
SH NO:

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)
—				

Techno Electric & Engineering Co. Ltd. ENGINEERS & CONSTRUCTORS Guwahati

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and his responsibility (design details, performance particulars and conformity of the supplies with the Indian statutory laws / IEC specifications as may be applicable) nor does limit AEGCL's right under the contract

REF DWG: 1KHF128840R1111, SH NO:

Rev.	Revision note	Date	Name
	Based on		
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK

1MYN691003-102(A3)REV01

Prepared 08-08-2025 DIVYA S
Approved 08-08-2025 THEJASWINI AR
Project ASSAM ELECTRICITY GRID CORPORATION LTD
400/220kV GIS SS AT SONAPUR
128840

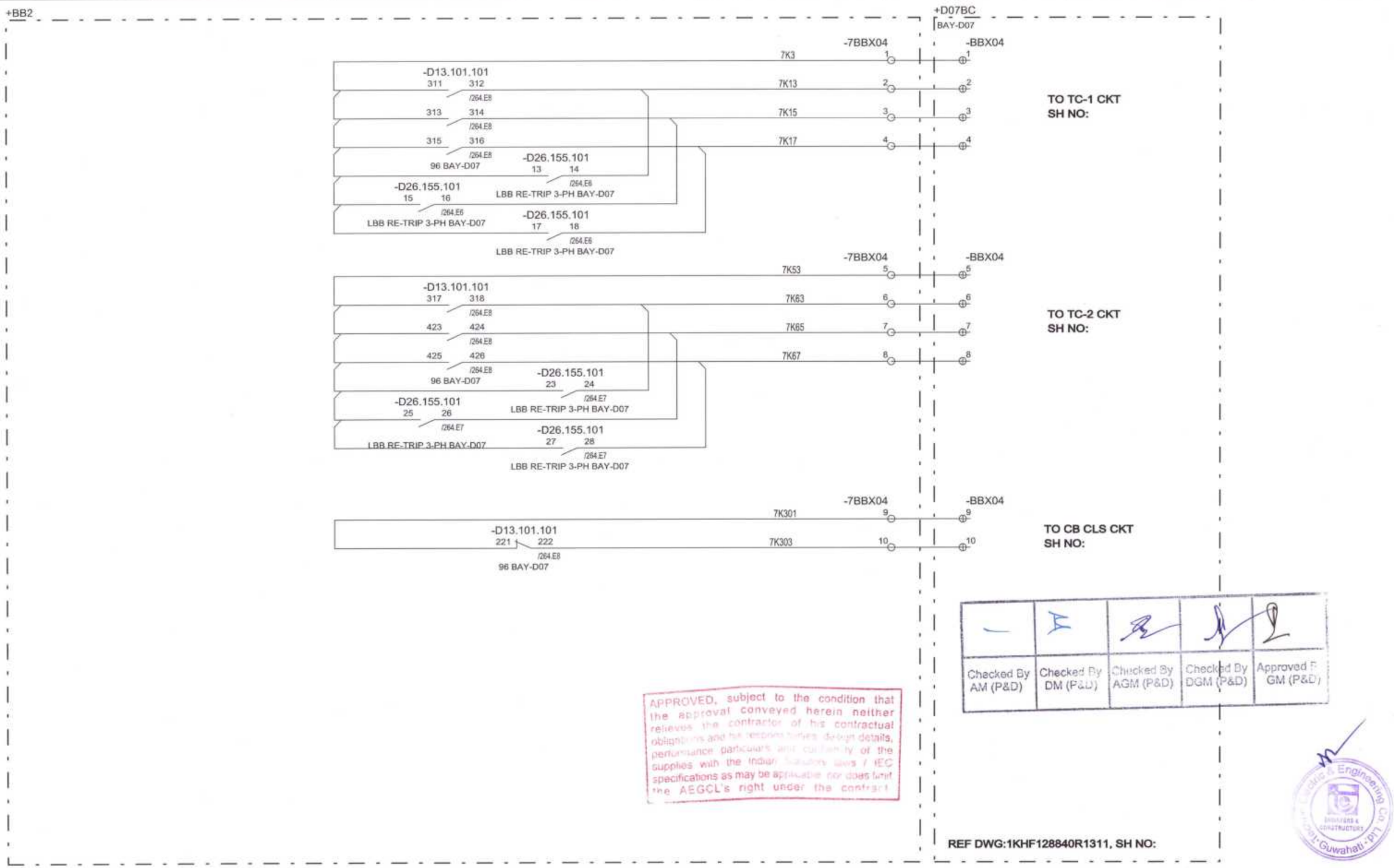
Title 220kV CONTROL & RELAY PANEL
220kV BUSBAR
BUSBAR INTERTRIP CIRCUIT-D06

HITACHI Hitachi Energy India Limited

Doc. kind. Circuit diagram
DCC EFS
Ref.Des. =2R
Resp. dept. PG-GAS
Rev. ind. 01
Language en
Doc. no. 1KHF128840R1411
Sheet 276
n. sheet 277

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy



Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)
—				

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and his responsibilities as per details, performance particulars and conformity of the supplies with the Indian Statutory laws / IEC specifications as may be applicable nor does limit the AEGCL's right under the contract.

Based on

01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

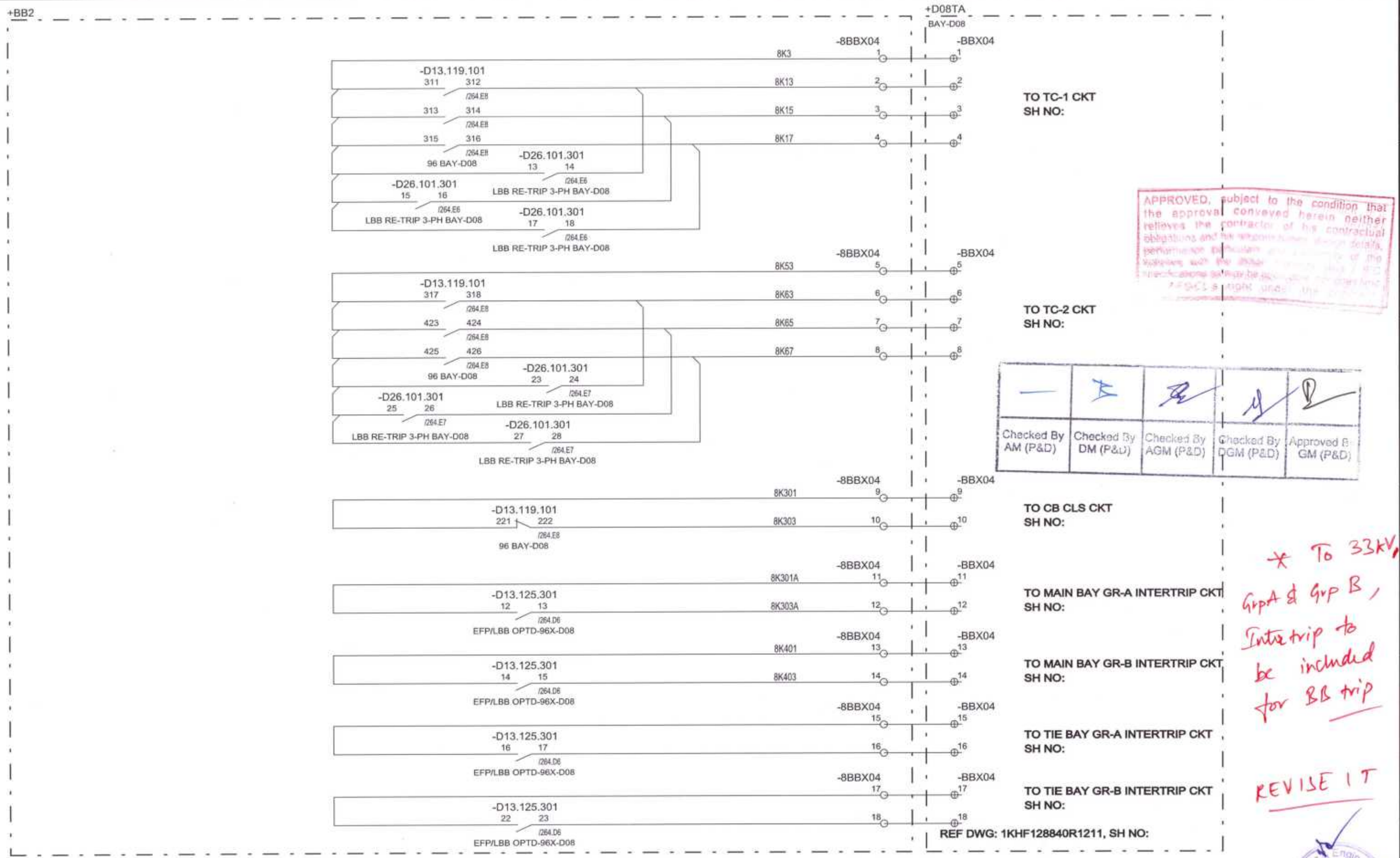
Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
BUSBAR INTERTRIP CIRCUIT-D07

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram	Ref.Des.	=2R
DCC	EFS		
Resp. dept.	PG-GAS	Rev. ind.	01
Language	en		
Doc. no.	1KHF128840R1411	Sheet	277
		n. sheet	278

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy



APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and the responsibility for details, performance specifications, dimensions of the drawings with the actual requirements. The purchaser's right under the

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)
—				

* To 33kV Grp A & Grp B, Intertrip to be included for BB trip

REVISE IT

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
BUSBAR INTERTRIP CIRCUIT-D08

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram	Ref.Des.	=2R
	DCC EFS		
Resp. dept.	PG-GAS	Rev. ind.	01
Doc. no.	1KHF128840R1411	Language	en
		Sheet	278
		n. sheet	279

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

+BB2

+D09TA
BAY-D09

-9BBX04 / -BBX04

9K3 1 — 1
-D13.137.101 311 312 /265.E8
9K13 2 — 2
313 314 /265.E8
9K15 3 — 3
315 316 /265.E8
9K17 4 — 4
96 BAY-D09
-D26.107.301 13 14 /265.E6 LBB RE-TRIP 3-PH BAY-D09
-D26.107.301 15 16 /265.E6 LBB RE-TRIP 3-PH BAY-D09
-D26.107.301 17 18 /265.F6 LBB RE-TRIP 3-PH BAY-D09

TO TC-1 CKT
SH NO:

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and the responsibility of ensuring performance, particularly ... of the supplies with the ... specifications as may be ... the AEGCL's right under the ...

9K53 5 — 5
-D13.137.101 317 318 /265.E8
9K63 6 — 6
423 424 /265.E8
9K65 7 — 7
425 426 /265.E8
9K67 8 — 8
96 BAY-D09
-D26.107.301 23 24 /265.E7 LBB RE-TRIP 3-PH BAY-D09
-D26.107.301 25 26 /265.E7 LBB RE-TRIP 3-PH BAY-D09
-D26.107.301 27 28 /265.F7 LBB RE-TRIP 3-PH BAY-D09

TO TC-2 CKT
SH NO:

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

9K301 9 — 9
-D13.137.101 221 222 /265.E8
9K303 10 — 10
96 BAY-D09

TO CB CLS CKT
SH NO:

9K301A 11 — 11
-D13.149.301 12 13 /265.C8
9K303A 12 — 12
EFP/LBB OPTD-96X-D09

TO MAIN BAY GR-A INTERTRIP CKT,
SH NO:

* Same Comments Pg 278

9K401 13 — 13
-D13.149.301 14 15 /265.C8
9K403 14 — 14
EFP/LBB OPTD-96X-D09

TO MAIN BAY GR-B INTERTRIP CKT
SH NO:

REVISE IT

15 — 15
-D13.149.301 16 17 /265.C8
16 — 16
EFP/LBB OPTD-96X-D09

TO TIE BAY GR-A INTERTRIP CKT
SH NO:

17 — 17
-D13.149.301 22 23 /265.C8
18 — 18
EFP/LBB OPTD-96X-D09

TO TIE BAY GR-B INTERTRIP CKT
SH NO:

REF DWG: 1KHF128840R1211, SH NO:

Techno Electric Engineering ENGINEERS & CONSTRUCTORS Guwahati-PIT

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
BUSBAR INTERTRIP CIRCUIT-D09

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram	Ref.Des.	=2R
	DCC EFS		
Resp. dept.	PG-GAS	Rev. ind. 01	Language en
Doc. no.	1KHF128840R1411	Sheet	279
		n. sheet	280

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

+BB2

+D10AA
BAY-D10 (FUT. LINE-1)

-10BBX04 -BBX04

10K3 1 — 1
-D18.101.101 313 314 /265.E8
10K13 2 — 2
315 316 /265.E8
10K15 3 — 3
317 318 /265.E8
10K17 4 — 4
96 BAY-D10(FUT.)
-D26.113.301 13 14 /265.E6
LBB RE-TRIP R-PH BAY-D10(FUT.)
-D26.113.301 23 24 /265.E7
LBB RE-TRIP Y-PH BAY-D10(FUT.)
-D26.119.301 13 14 /265.D6
LBB RE-TRIP B-PH BAY-D10(FUT.)

TO TC-1 CKT
SH NO:

-10BBX04 -BBX04

10K53 5 — 5
-D18.101.101 423 424 /265.E8
10K63 6 — 6
425 426 /265.E8
10K65 7 — 7
427 428 /265.E8
10K67 8 — 8
96 BAY-D10(FUT.)
-D26.113.301 15 16 /265.E6
LBB RE-TRIP R-PH BAY-D10(FUT.)
-D26.113.301 25 26 /265.E7
LBB RE-TRIP Y-PH BAY-D10(FUT.)
-D26.119.301 15 16 /265.D6
LBB RE-TRIP B-PH BAY-D10(FUT.)

TO TC-2 CKT
SH NO:

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

-10BBX04 -BBX04

10K301 9 — 9
-D18.101.101 117 118 /265.D8
10K303 10 — 10
96 BAY-D10(FUT.)

TO CB CLS CKT
SH NO:

-10BBX04 -BBX04

10K301A 11 — 11
-D18.113.301 12 13 /265.C8
10K303A 12 — 12
EFP/LBB OPTD-96X-D10(FUT.)

TO DT CKT
SH NO:

-10BBX04 -BBX04

10K401 13 — 13
-D18.113.301 14 15 /265.C8
10K403 14 — 14
EFP/LBB OPTD-96X-D10(FUT.)

TO DT CKT
SH NO:

REF DWG:

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and the applicable laws, codes, standards, performance parameters, etc. in respect of the supplies with the Indian statutory laws / IEC specifications as may be applicable, nor does limit the AEGCL's right under the contract.

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
BUSBAR INTERTRIP CIRCUIT-D10

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram	Ref.Des.	=2R
	DCC EFS		
Resp. dept.	PG-GAS	Rev. ind.	01
Doc. no.	1KHF128840R1411	Language	en
		Sheet	280
		n. sheet	281

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy

+BB2

+D11AA
BAY-D11(FUT. LINE-2)

-11BBX04 / -BBX04

11K3 1 — 1
-D18.119.101 311 — 312 /266.E8
11K13 2 — 2
313 — 314 /266.E8
11K15 3 — 3
315 — 316 /266.E8
96 BAY-D11(FUT.)
-D26.119.301 23 — 24 /266.E6
LBB RE-TRIP R-PH BAY-D11(FUT.)
-D26.125.301 13 — 14 /266.E6
LBB RE-TRIP Y-PH BAY-D11(FUT.)
11K17 4 — 4
-D26.125.301 15 — 16 /266.E6
LBB RE-TRIP B-PH BAY-D11(FUT.)

TO TC-1 CKT
SH NO:

-11BBX04 / -BBX04

11K53 5 — 5
-D18.119.101 317 — 318 /266.E8
11K63 6 — 6
423 — 424 /266.E8
11K65 7 — 7
425 — 426 /266.E8
96 BAY-D11(FUT.)
-D26.119.301 25 — 26 /266.E6
LBB RE-TRIP R-PH BAY-D11(FUT.)
-D26.125.301 23 — 24 /266.E7
LBB RE-TRIP Y-PH BAY-D11(FUT.)
11K67 8 — 8
-D26.125.301 25 — 26 /266.E7
LBB RE-TRIP B-PH BAY-D11(FUT.)

TO TC-2 CKT
SH NO:

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

-11BBX04 / -BBX04

11K301 9 — 9
-D18.119.101 117 — 118 /266.D8
11K303 10 — 10
96 BAY-D11(FUT.)

TO CB CLS CKT
SH NO:

-11BBX04 / -BBX04

11K301A 11 — 11
-D18.125.301 12 — 13 /266.D7
11K303A 12 — 12
EFP/LBB OPTD-96X-D11(FUT.)

TO DT CKT
SH NO:

-11BBX04 / -BBX04

11K401 13 — 13
-D18.125.301 14 — 15 /266.D7
11K403 14 — 14
EFP/LBB OPTD-96X-D11(FUT.)

TO DT CKT
SH NO:

REF DWG:

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and the variations from design details, performance particulars [illegible] only of the supplies with the [illegible] / IEC specifications as may be applicable nor does limit the AEGCL's right under the contract

Rev.	Revision note	Date	Name
	Based on		
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK

Prepared 08-08-2025 DIVYA S
Approved 08-08-2025 THEJASWINI AR
Project ASSAM ELECTRICITY GRID CORPORATION LTD
400/220kV GIS SS AT SONAPUR
128840

Title 220kV CONTROL & RELAY PANEL
220kV BUSBAR
BUSBAR INTERTRIP CIRCUIT-D11

HITACHI Hitachi Energy India Limited

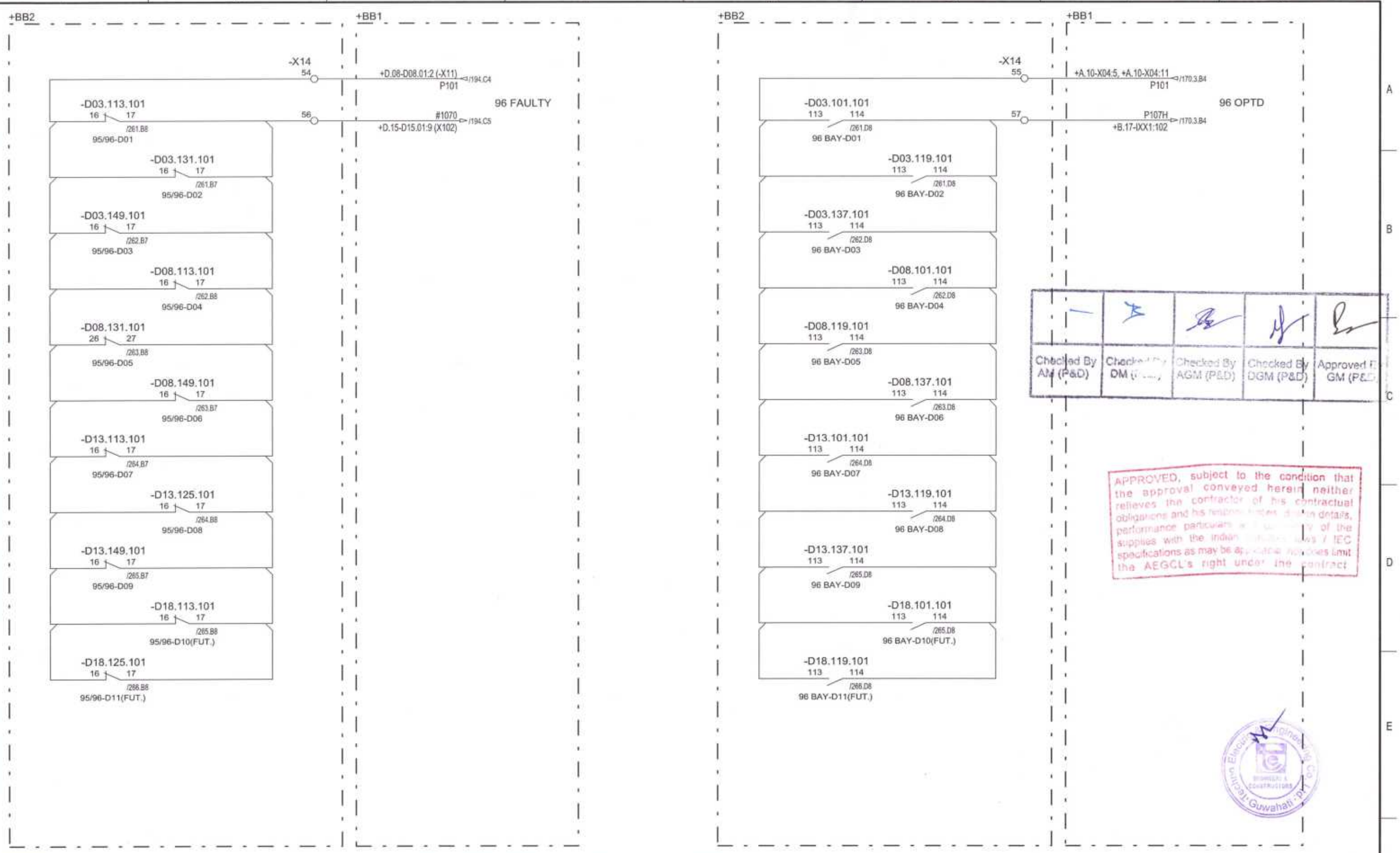
Doc. kind. Circuit diagram
DCC EFS
Resp. dept. PG-GAS
Doc. no. 1KHF128840R1411

Ref.Des. =2R
Rev. ind. 01
Language en
Sheet 281
n. sheet 282

1MYN691003-102(A3)REV01

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy



Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and his responsibilities in the details, performance particulars and suitability of the supplies with the Indian statutory rules / IEC specifications as may be applicable nor does limit the AEGCL's right under the contract.

Electrical Engineers & Consultants Pvt. Ltd. Guwahati

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

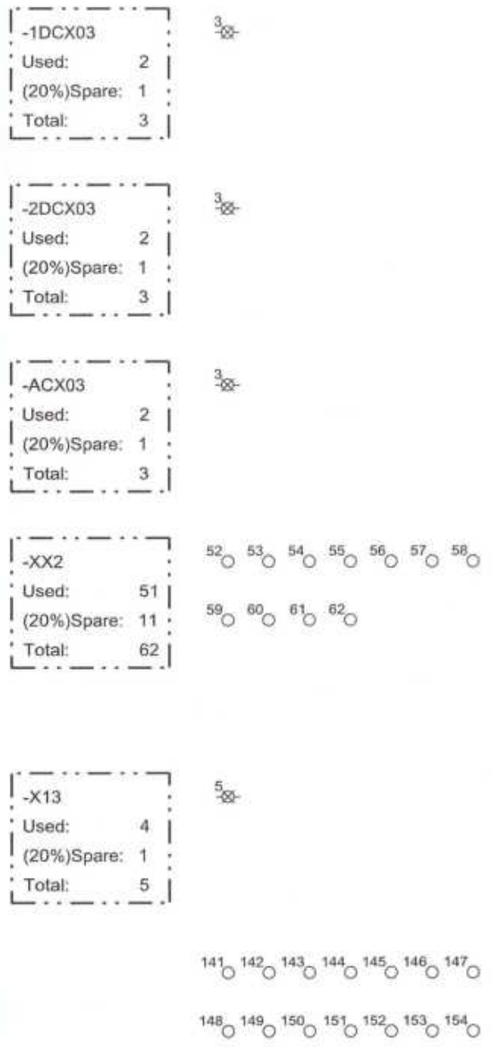
Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
96 FAULTY & 96 OPTD

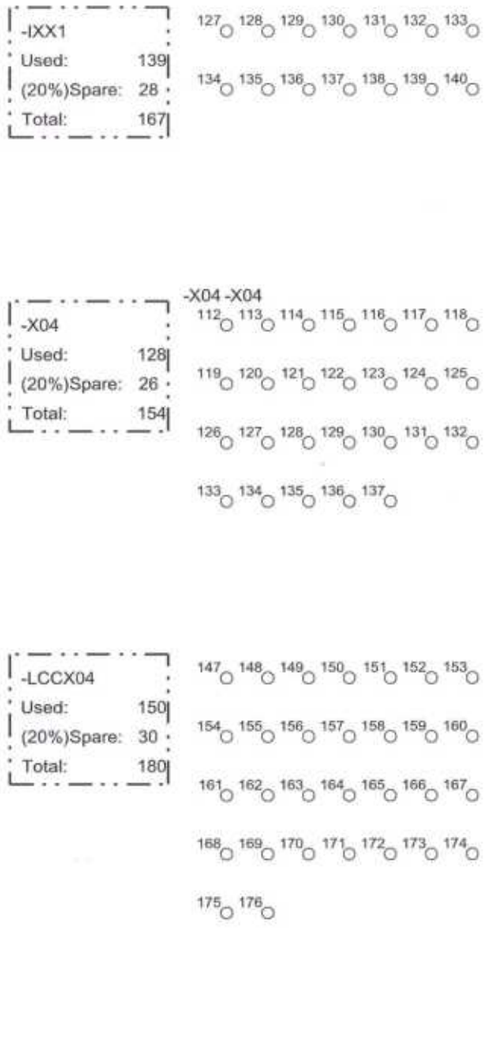
HITACHI Hitachi Energy India Limited

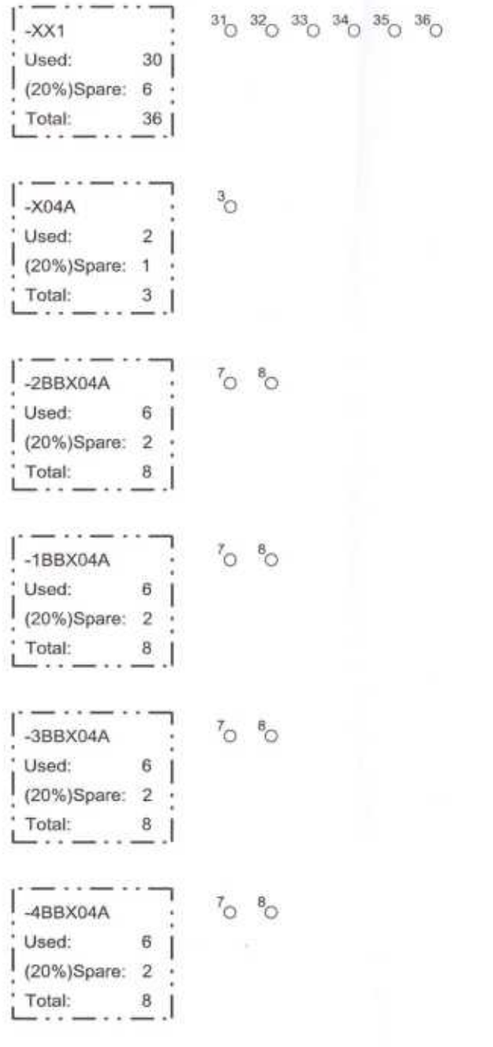
Doc. kind.	Circuit diagram	Ref.Des.	=2R
	DCC EFS		
Resp. dept.	PG-GAS	Rev. ind. 01	Language en
Doc. no.	1KHF128840R1411	Sheet	282
		n. sheet	401

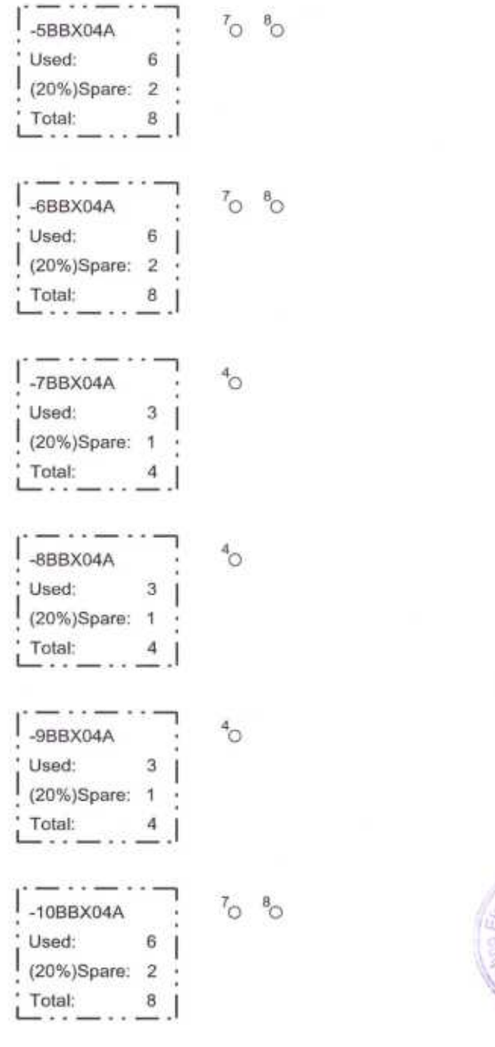
The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy









APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and his responsibilities to ensure details, performance particulars and conformity of the supplies with the latest applicable IEC / IEC specifications as may be applicable nor does limit the AEGCL's right under the contract

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

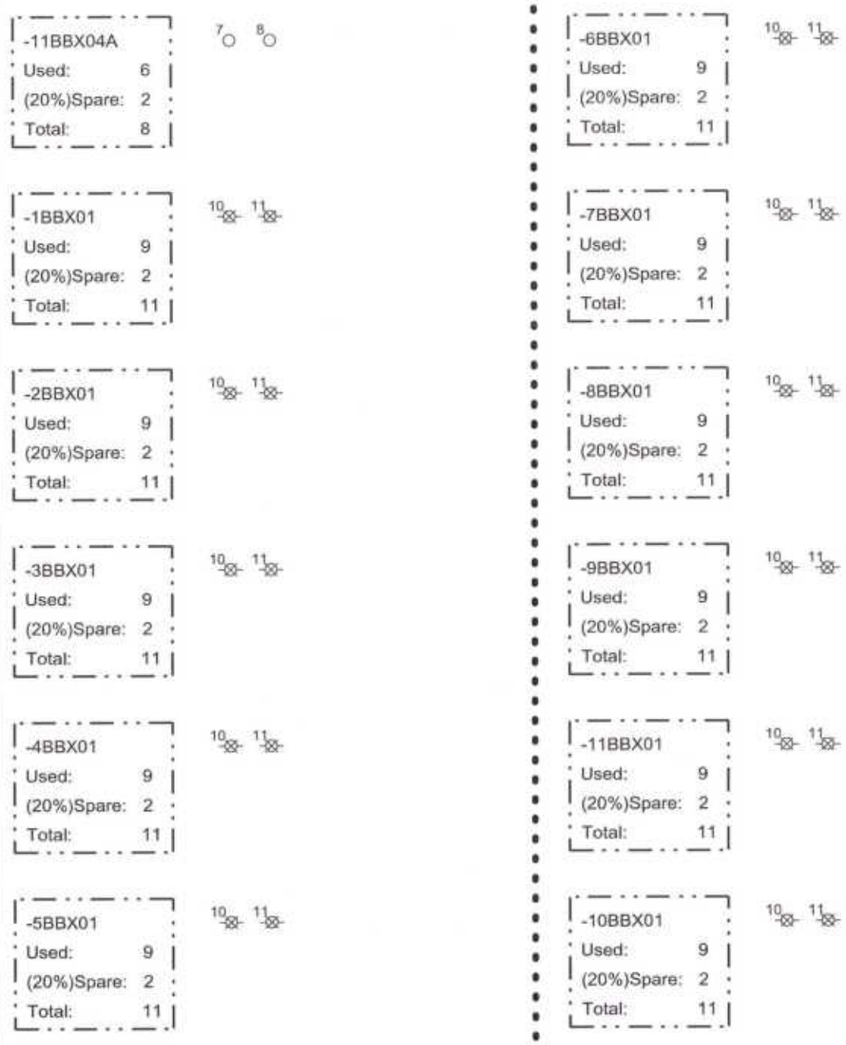
Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
SPARE TERMINALS

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram	Ref.Des.	=2R +BB1
	DCC EFS		
Resp. dept.	PG-GAS	Rev. ind. 01	Language en
Doc. no.	1KHF128840R1411	Sheet	401
		n. sheet	402

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy



APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and his responsibilities to the details, performance particulars and accuracy of the supplies with the Indian Statutory Laws / IEC specifications as may be applicable nor does limit the AEGCL's right under the contract.

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK
Rev.	Revision note	Date	Name

1MYN691003-102(A3)REV01

Prepared	08-08-2025	DIVYA S
Approved	08-08-2025	THEJASWINI AR
Project	ASSAM ELECTRICITY GRID CORPORATION LTD 400/220kV GIS SS AT SONAPUR 128840	

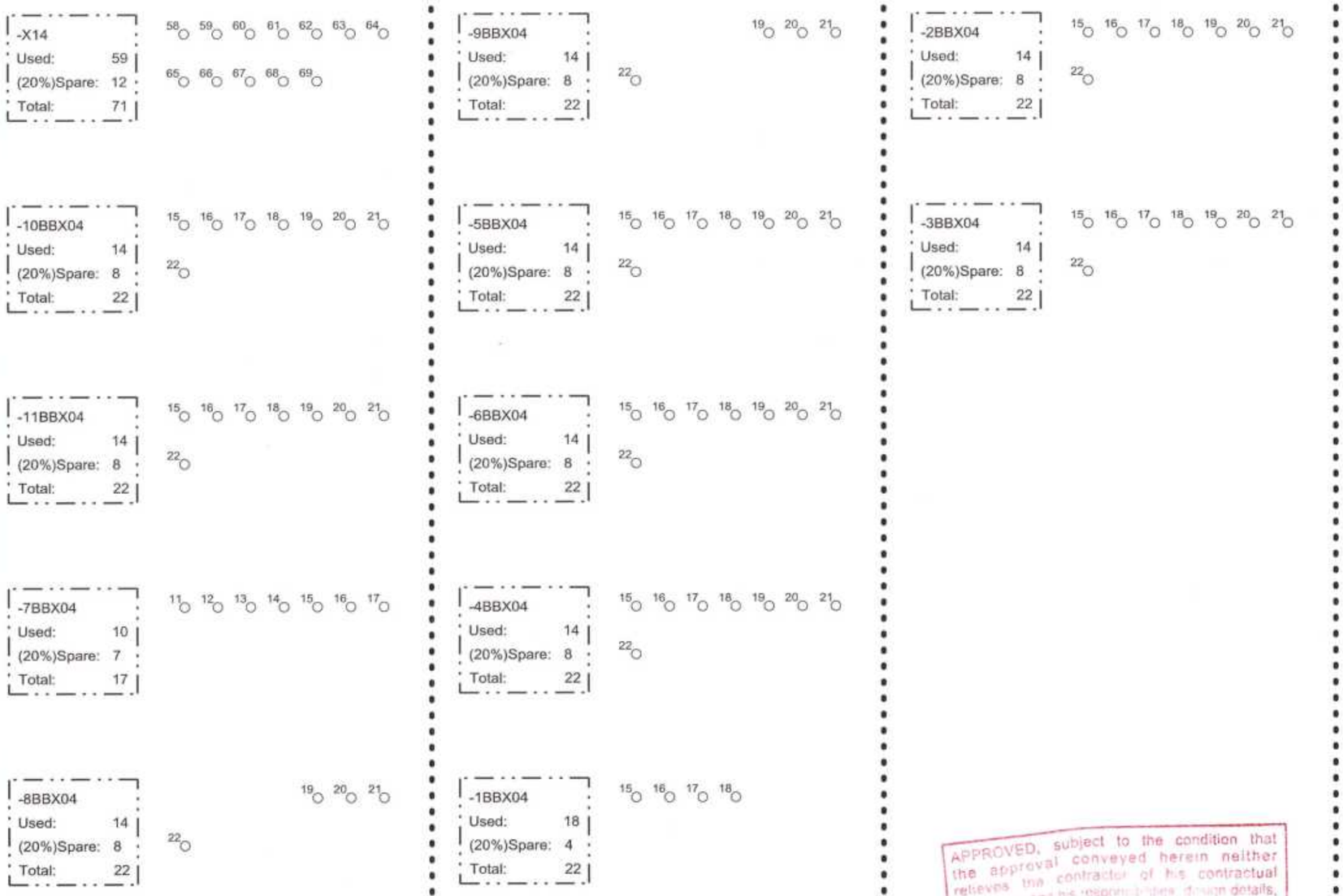
Title: 220kV CONTROL & RELAY PANEL
220kV BUSBAR
SPARE TERMINALS

HITACHI Hitachi Energy India Limited

Doc. kind.	Circuit diagram	Ref.Des.	=2R +BB1
	DCC EFS		
Resp. dept.	PG-GAS	Rev. ind. 01	Language en
Doc. no.	1KHF128840R1411	Sheet	402
		n. sheet	401

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

© Copyright 2023 Hitachi Energy



APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and his responsibilities design details, performance particulars a ... of the supplies with the Indian ... laws / IEC specifications as may be ap... AEGCL's right under the ...

Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)
—				

Rev.	Revision note	Date	Name
Based on			
01	AS PER CUSTOMER COMMENTS	10-10-2025	PK

1MYN691003-102(A3)REV01

Prepared 08-08-2025 DIVYA S
Approved 08-08-2025 THEJASWINI AR
Project ASSAM ELECTRICITY GRID CORPORATION LTD
400/220kV GIS SS AT SONAPUR
128840

Title 220kV CONTROL & RELAY PANEL
220kV BUSBAR
SPARE TERMINALS

HITACHI Hitachi Energy India Limited

Doc. kind. Circuit diagram
DCC EFS
Resp. dept. PG-GAS
Doc. no. 1KHF128840R1411

Ref.Des. =2R +BB2
Rev. ind. 01
Language en
Sheet 401
n. sheet

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization are prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.