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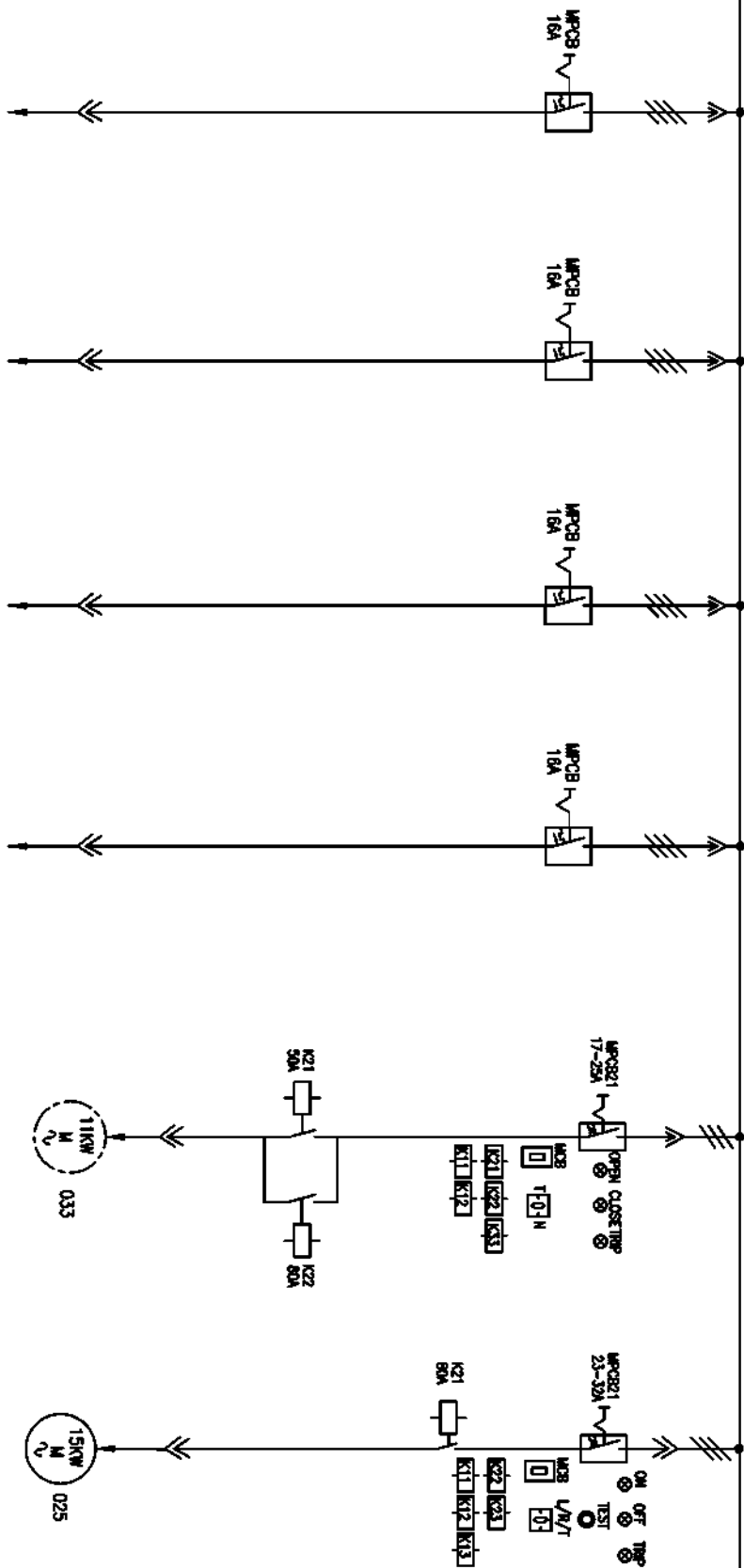
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415V, 3200A, 3PHASE, 4WIRE, 50KA FOR 1SEC

SECTION-B



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DRG. NO. EP-3-SL-047-869

| KGS TAG NO. | FEDER DESCRIPTION                     | FEDER RATING | FEDER NO. | SCHEME REF      | CABLE SIZE         |
|-------------|---------------------------------------|--------------|-----------|-----------------|--------------------|
|             | AIR DRIER FOR A COMPRESSOR PLANT AREA | 16A          | 150       | EP-3-CS-047-022 | 1-4C X 16 SQMM(AL) |
|             | TOILET EXHAUST FAN                    | 16A          | 15R       | EP-3-CS-047-022 | 1-4C X 16 SQMM(AL) |
|             | POCUB AT ISH                          | 16A          | 15S       | EP-3-CS-047-022 | 1-4C X 16 SQMM(AL) |
|             | POCUB AT ISH                          | 16A          | 15T       | EP-3-CS-047-022 | 1-4C X 16 SQMM(AL) |
|             | SPARE                                 | 11kW         | 15U       | EP-3-CS-047-033 | -                  |
|             | SPARE                                 | 15kW         | 16P       | EP-3-CS-047-025 | -                  |

| INVENTORY NO.                                                                                                                                                                                                                                                                                                                                                                 |          |                                  |     |        |          |      |      |       |          |          |       |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|----------------------------------|-----|--------|----------|------|------|-------|----------|----------|-------|
| REV.                                                                                                                                                                                                                                                                                                                                                                          | DATE     | DESCRIPTION                      | BY  | APPRO. | APPROVED | KCSB | NAME | SIGN. | DATE     | FILE NO. | SCALE |
| 01                                                                                                                                                                                                                                                                                                                                                                            | 09.08.17 | REVISED AS PER UPDATED LOAD LIST | AKH | AKH    | CHECKED  |      | AKH  |       | 25.05.17 | 3        |       |
| 02                                                                                                                                                                                                                                                                                                                                                                            |          |                                  |     |        |          |      |      |       |          |          |       |
| 03                                                                                                                                                                                                                                                                                                                                                                            |          |                                  |     |        |          |      |      |       |          |          |       |
| 04                                                                                                                                                                                                                                                                                                                                                                            |          |                                  |     |        |          |      |      |       |          |          |       |
| 05                                                                                                                                                                                                                                                                                                                                                                            |          |                                  |     |        |          |      |      |       |          |          |       |
| 06                                                                                                                                                                                                                                                                                                                                                                            |          |                                  |     |        |          |      |      |       |          |          |       |
| 07                                                                                                                                                                                                                                                                                                                                                                            |          |                                  |     |        |          |      |      |       |          |          |       |
| <div><div><div>REVISION</div><div></div></div><div>DR :<br/>FILE NO.:</div></div> <div><div>TITLE :</div><div>BHARAT HEAVY ELECTRICALS LIMITED<br/>ELECTRO-PORCELAIN DIVISION BANGALORE</div><div>SINGLE LINE DIAGRAM<br/>AHS MCC (AHS MCC-1) NEAR TP-6</div><div>NO. OF SHEETS<br/>SHEET: 26</div></div> <div><div>NO. OF SHEETS<br/>SHEET: 26</div><div>REV. 01</div></div> |          |                                  |     |        |          |      |      |       |          |          |       |

BHARAT HEAVY ELECTRICALS LIMITED

ELECTROPORCELAIN DIVISION BANGALORE

SINGLE LINE DIAGRAM

AHS MCC (AHS MCC-1) NEAR TP-6

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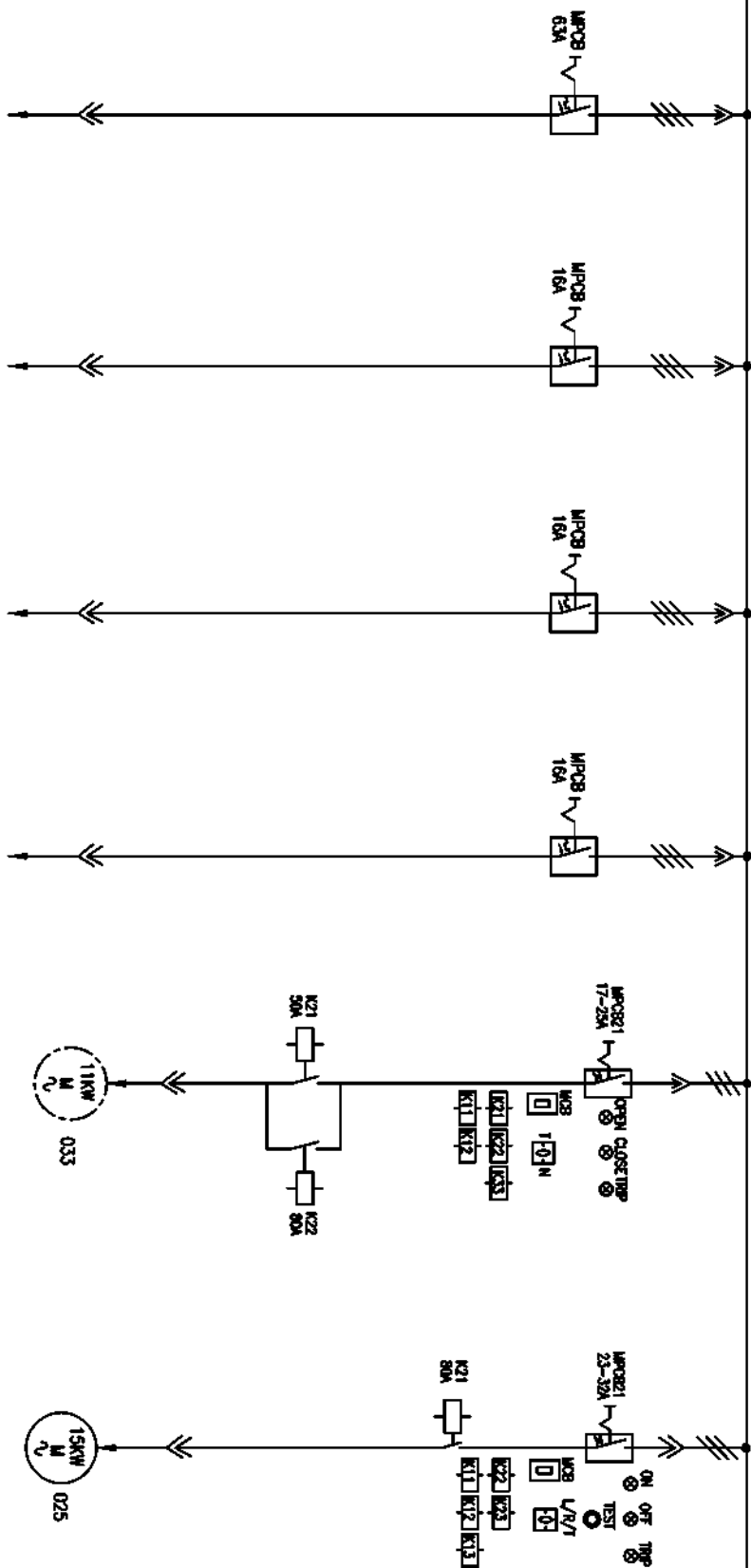
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415V, 3200A, 3PHASE, 4WIRE, 50KA FOR 1SEC

SECTION-B



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DRG. NO. EP-3-SL-047-869

INVENTORY NO.

| REV. NO. | DATE     | DESCRIPTION                      | BY   | APPD. | APPROVED | KSB | NAME    | SIGN.    | DATE | FILE NO. | SCALE | JOB NO. | CP-14-047 | DRG. NO.        | EP-3-SL-047-869 | NO. OF SHEETS | 27 | REV. | 01 |
|----------|----------|----------------------------------|------|-------|----------|-----|---------|----------|------|----------|-------|---------|-----------|-----------------|-----------------|---------------|----|------|----|
| 01       | 09.08.17 | REVISED AS PER UPDATED LOAD LIST | ASHT | ASHT  | CHECKED  |     | TRINATH | 25.05.17 | 3    | DR :     |       | 108     | NO.       | EP-3-SL-047-869 |                 | 32            |    |      |    |
| 02       |          |                                  |      |       |          |     |         |          |      |          |       |         |           |                 |                 |               |    |      |    |
| 03       |          |                                  |      |       |          |     |         |          |      |          |       |         |           |                 |                 |               |    |      |    |
| 04       |          |                                  |      |       |          |     |         |          |      |          |       |         |           |                 |                 |               |    |      |    |
| 05       |          |                                  |      |       |          |     |         |          |      |          |       |         |           |                 |                 |               |    |      |    |
| 06       |          |                                  |      |       |          |     |         |          |      |          |       |         |           |                 |                 |               |    |      |    |
| 07       |          |                                  |      |       |          |     |         |          |      |          |       |         |           |                 |                 |               |    |      |    |

BHARAT HEAVY ELECTRICALS LIMITED

ELECTROPORCELAIN DIVISION BANGALORE

SINGLE LINE DIAGRAM

AHS MCC (AHS MCC-1) NEAR TP-6

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### ERECT ANGLE PROJECTION

**ALL DIMENSIONS ARE IN MM**

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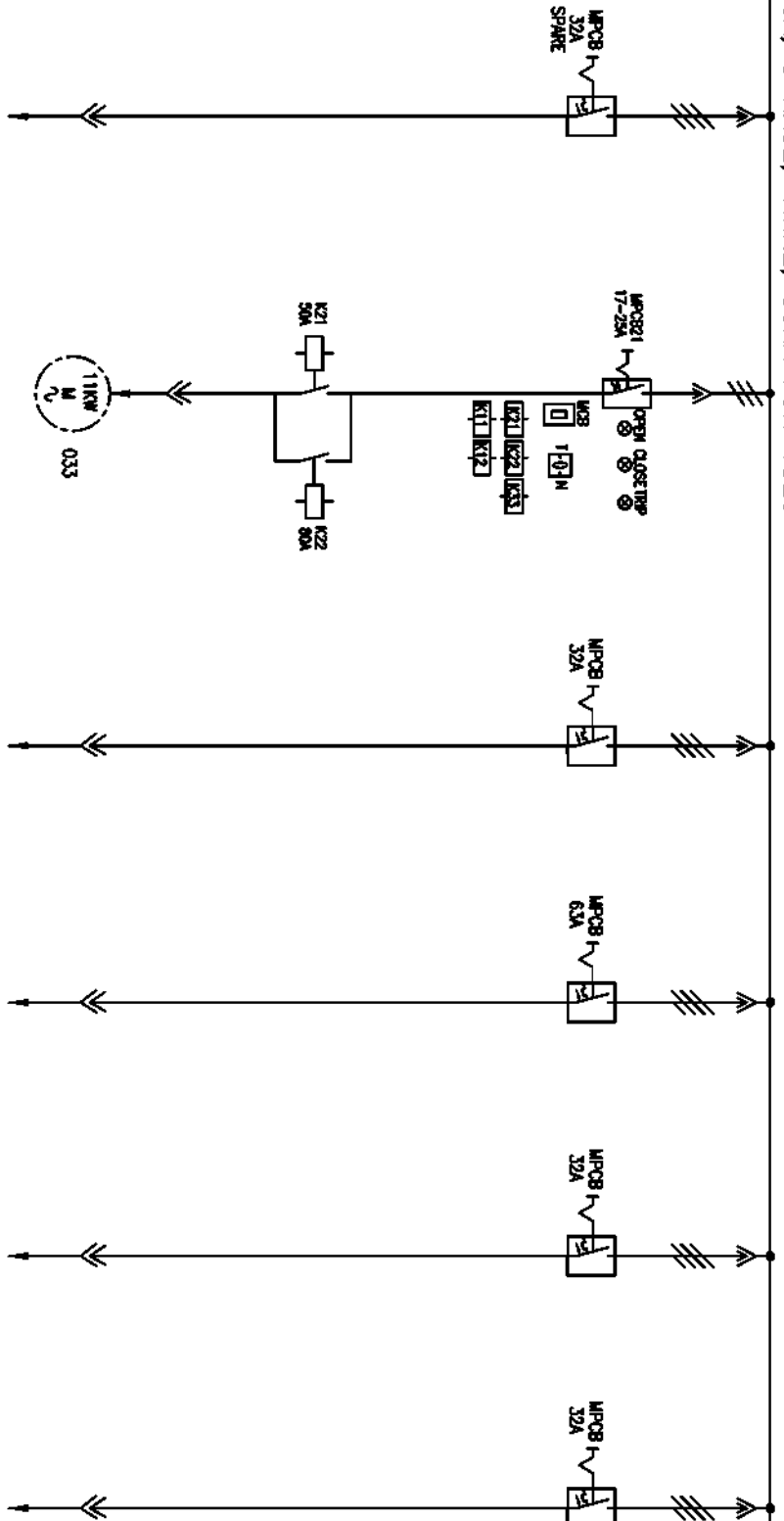
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**1**

415V, 3200A, 3PHASE, 4WIRE, 50KA FOR 1SEC

**SECTION-B**



| COCS TAG NO.       |                 |                    |                        |                                 |                    |                 |
|--------------------|-----------------|--------------------|------------------------|---------------------------------|--------------------|-----------------|
| FEEDER DESCRIPTION | SPARE           | CLINKER GRINDER    | 5.0T EOT CRANE AT ASPH | AIR CONDITIONER DB FOR DCS ROOM | DRAIN PUMP AT VCOH | SPARE           |
| FEEDER RATING      | 32A             | 11KW               | 32A                    | 63A                             | 32A                | 32A             |
| FEEDER NO.         | 17R             | 17S                | 18Q                    | 18R                             | 18S                | 18T             |
| SCHEME REF         | EP-3-CS-047-022 | EP-3-CS-047-033    | EP-3-CS-047-022        | EP-3-CS-047-022                 | EP-3-CS-047-022    | EP-3-CS-047-022 |
| CABLE SIZE         | -               | 1-3C X 120 SQMM(A) | 1-4C X 16 SQMM(A)      | 1-4C X 16 SQMM(A)               | 1-3C X 35 SQMM(A)  | -               |

DRG. NO. EP-3-SL-047-869

INVENTORY NO.

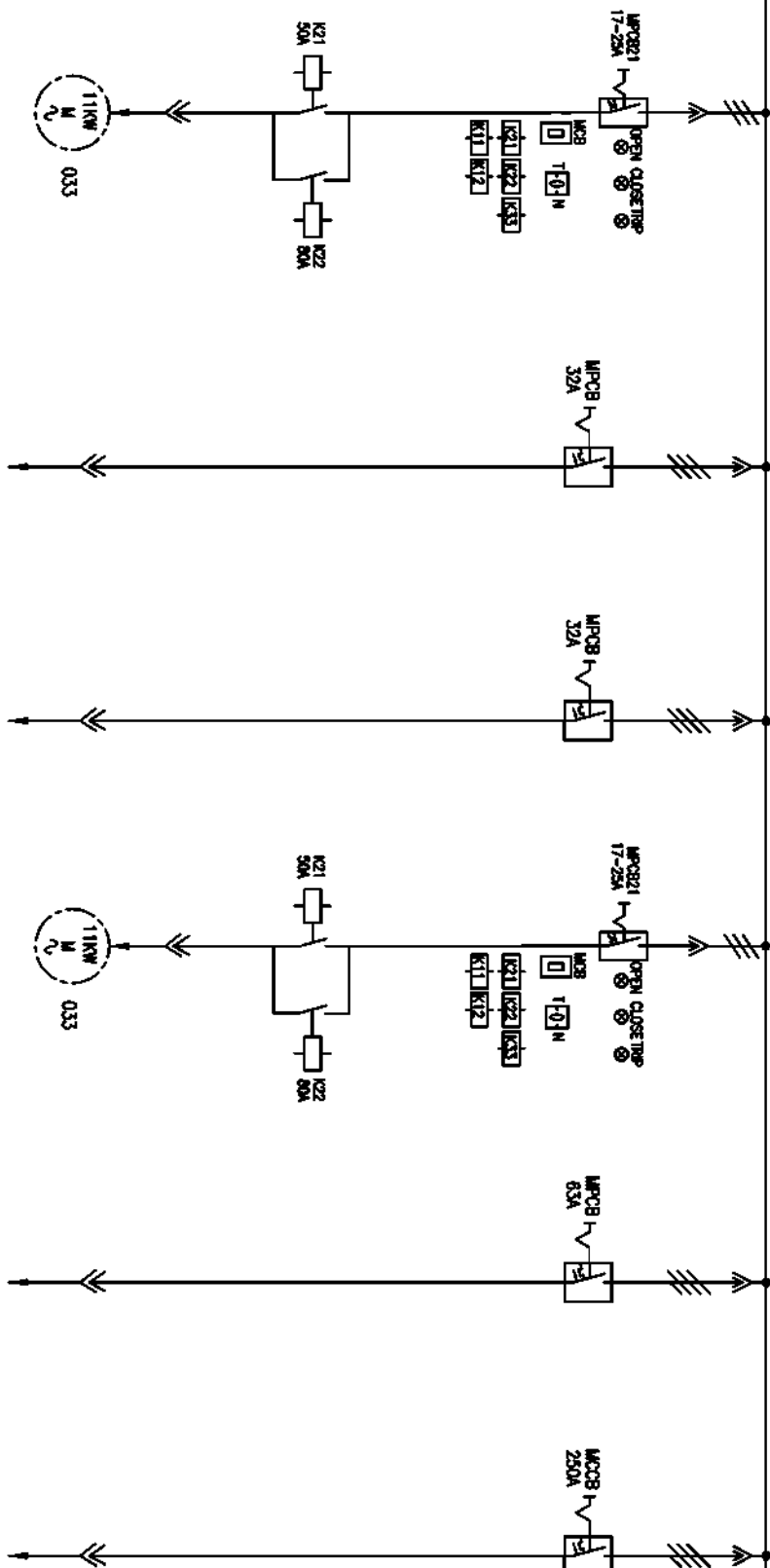
[illegible]

FIRST ANGLE PROJECTION

ALL DIMENSIONS ARE IN MM.

415V, 3200A, 3PHASE, 4WIRE, 50KA FOR 1SEC

SECTION-B



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DRG. NO. EP-3-SL-047-869

INVENTORY NO.

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BHARAT HEAVY ELECTRICALS LIMITED

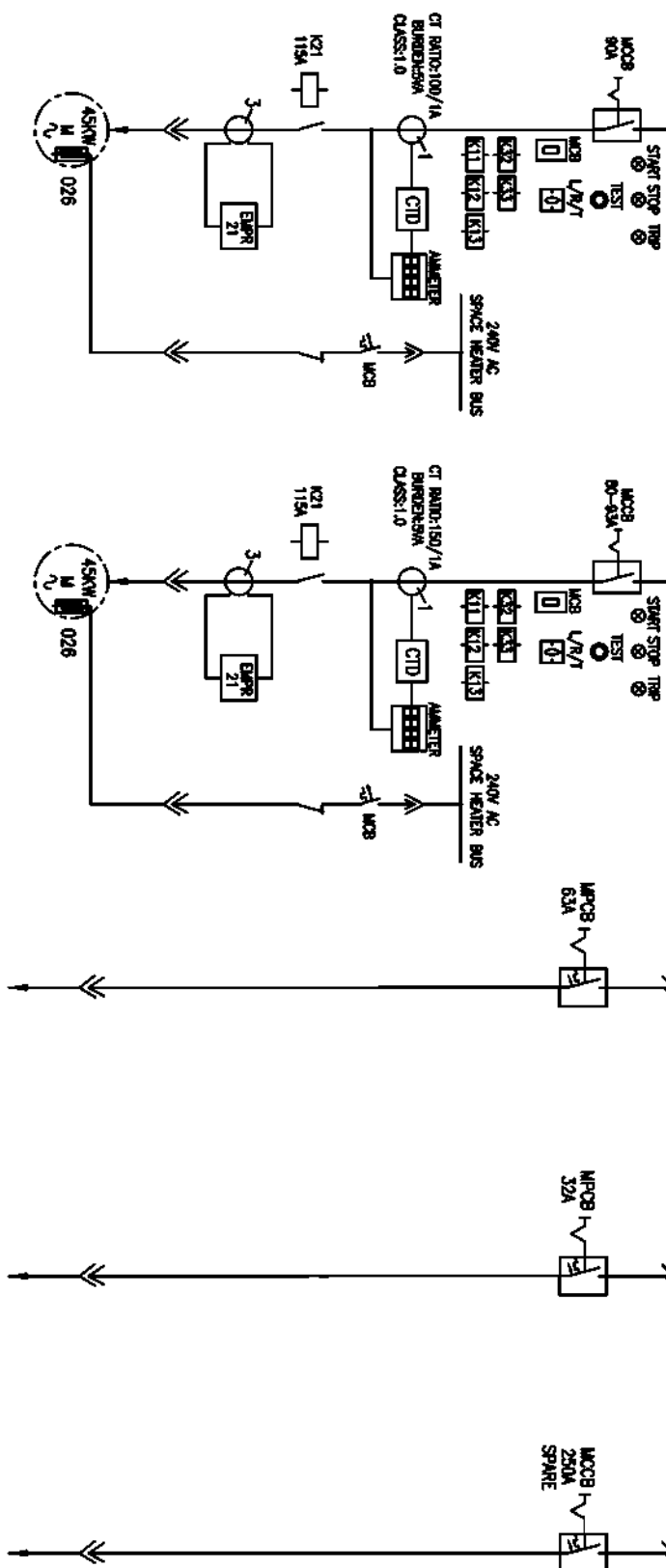
ELECTROPORCELAIN DIVISION BANGALORE

SINGLE LINE DIAGRAM

AHS MCC (AHS MCC-1) NEAR TP-6



**SECTION-B**



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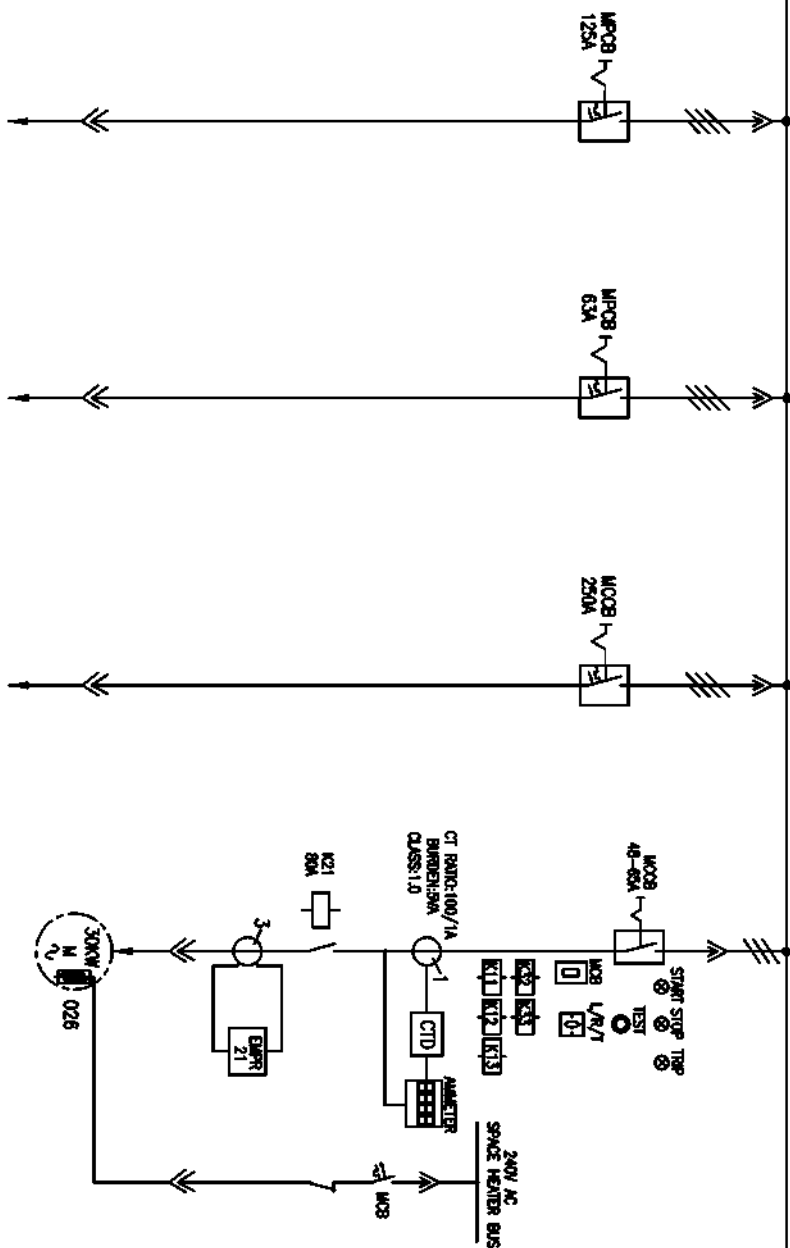
DRG. NO. EP-3-SL-047-869

|                    |                 |                             |                                         |                    |                 |
|--------------------|-----------------|-----------------------------|-----------------------------------------|--------------------|-----------------|
| KKS TAG NO.        |                 |                             |                                         |                    |                 |
| FEEDER DESCRIPTION | SPARE           | HOSD LP WATER TRANSFER PUMP | AIR CONDITIONER DB FOR AHS CONTROL ROOM | UPS                | SPARE           |
| FEEDER RATING      | 45KW            | 45KW                        | 63A                                     | 32A                | 250A            |
| FEEDER NO.         | 205             | 21P                         | 21Q                                     | 21R                | 21S             |
| SCHEME REF         | EP-3-CS-047-026 | EP-3-CS-047-026             | EP-3-CS-047-022                         | EP-3-CS-047-022    | EP-3-CS-047-022 |
| CABLE SIZE         | -               | 1-3C X 150 SQMM(AL)         | 1-4C X 16 SQMM(AL)                      | 1-4C X 16 SQMM(AL) | -               |

| INVENTORY NO.                                                                                                                                                                                                                                                                                                                                                                                                                                                             |          |                                  |                         |                    |                                                                                                                                                                                                             |         |                    |          |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|----------------------------------|-------------------------|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|--------------------|----------|--|
| REV.                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | DATE     | DESCRIPTION                      | BY                      | APPRO.             | APPROVED                                                                                                                                                                                                    | NAME    | SIGN.              | DATE     |  |
| 07                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |          |                                  |                         |                    |                                                                                                                                                                                                             |         |                    |          |  |
| 06                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |          |                                  |                         |                    |                                                                                                                                                                                                             |         |                    |          |  |
| 05                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |          |                                  |                         |                    | DESIGNED                                                                                                                                                                                                    | TRINATH | <i>[Signature]</i> | 25.05.17 |  |
| 04                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |          |                                  |                         |                    |                                                                                                                                                                                                             |         |                    |          |  |
| 03                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |          |                                  |                         |                    | DRAWN                                                                                                                                                                                                       | TRINATH | <i>[Signature]</i> | 25.05.17 |  |
| 02                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |          |                                  |                         |                    | CHECKED                                                                                                                                                                                                     |         |                    |          |  |
| 01                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 05.08.17 | REVISED AS PER UPDATED LOAD LIST | <i>[Signature]</i>      | <i>[Signature]</i> |                                                                                                                                                                                                             |         |                    |          |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |          |                                  |                         |                    | KCSB                                                                                                                                                                                                        |         | <i>[Signature]</i> | 25.05.17 |  |
| <div style="display: flex; justify-content: space-between; align-items: center;"> <div> <p>DR : _____</p> <p>FILE NO.: 8</p> </div> <div style="text-align: center;">  </div> <div> <p>TITLE :</p> <p><b>BHARAT HEAVY ELECTRICALS LIMITED</b></p> <p>ELECTRO-ORCLAM DIVISION BANGALORE</p> <p><b>SINGLE LINE DIAGRAM</b></p> <p><b>AHS MCC (AHS MCC-1) NEAR TP-6</b></p> </div> </div> |          |                                  |                         |                    |                                                                                                                                                                                                             |         |                    |          |  |
| SCALE                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |          | 108 NO. CP-14-047                | 086 NO. EP-3-SL-047-869 |                    | <div style="display: flex; justify-content: space-between; align-items: center;"> <div> <p>NO. OF SHEETS</p> <p>32</p> </div> <div> <p>SHEET</p> <p>30</p> </div> <div> <p>REV.</p> <p>01</p> </div> </div> |         |                    |          |  |

415V, 3200A, 3PHASE, 4WIRE, 50KA FOR 1 SEC

SECTION-B



| KKS TAG NO.  | DB / STARTER FOR VENTILATION FAN IN AHS MCC | AHS LDB-2 VCOH       | INCOMER TO CLARIFIER  | RECYCLE WATER PUMP  |
|--------------|---------------------------------------------|----------------------|-----------------------|---------------------|
| FEDER RATING | 125A                                        | 63S                  | 250A                  | 300W                |
| FEDER NO.    | 22P                                         | 22Q                  | 22R                   | 22S                 |
| SCHEME REF   | EP-3-CS-047-022                             | EP-3-CS-047-022      | EP-3-CS-047-022       | EP-3-CS-047-026     |
| CABLE SIZE   | 1-4C X 16 SQMM(AL)                          | 1-3.5C X 95 SQMM(AL) | 1-3.5C X 400 SQMM(AL) | 1-3C X 300 SQMM(AL) |

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DRG. NO. EP-3-SL-047-869

INVENTORY NO.

| REV. NO. | DATE     | DESCRIPTION                      | BY    | APPD. | APPROVED | KSB | NAME    | SIGN. | DATE     |
|----------|----------|----------------------------------|-------|-------|----------|-----|---------|-------|----------|
| 01       | 09.08.17 | REVISED AS PER UPDATED LOAD LIST | AKASH | AKASH | CHECKED  |     | TRINATH |       | 25.05.17 |
| 02       |          |                                  |       |       |          |     | TRINATH |       | 25.05.17 |
| 03       |          |                                  |       |       |          |     | TRINATH |       | 25.05.17 |
| 04       |          |                                  |       |       |          |     | TRINATH |       | 25.05.17 |
| 05       |          |                                  |       |       |          |     | TRINATH |       | 25.05.17 |
| 06       |          |                                  |       |       |          |     | TRINATH |       | 25.05.17 |
| 07       |          |                                  |       |       |          |     | TRINATH |       | 25.05.17 |

|                                  |                   |                                     |                  |
|----------------------------------|-------------------|-------------------------------------|------------------|
| BHARAT HEAVY ELECTRICALS LIMITED |                   | ELECTROPORCELAIN DIVISION BANGALORE |                  |
| TITLE :                          |                   | SINGLE LINE DIAGRAM                 |                  |
| AHS MCC (AHS MCC-1) NEAR TP-6    |                   | AHS MCC (AHS MCC-1) NEAR TP-6       |                  |
| SCALE                            | 108 NO. CP-14-047 | DRG. NO. EP-3-SL-047-869            | NO. OF SHEETS 32 |
| NO. OF SHEETS 31                 | REV. 01           |                                     |                  |

3

[illegible]

FIRST ANGLE PROJECTION

ALL DIMENSIONS ARE IN MM.

1

2

3

4

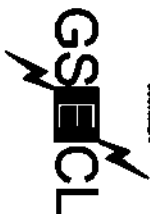
5

6

7

8

CUSTOMER:



GUJARAT ELECTRICITY CORPORATION LIMITED  
VADODARA, GUJARAT

PROJECT:

1x800 MW WANAKBORI THERMAL POWER STATION  
EXTENSION UNIT-8

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DRG. NO. EP-3-SL-047-870

INVENTORY NO.

| REV. NO. | DATE     | DESCRIPTION                      | BY      | APPROD. | APPROVED | KSB     | SCALE: 1/11 | JOB NO. CP-14-047                              | DRG. NO. EP-3-SL-047-870 | NO. OF SHEETS | REV. |
|----------|----------|----------------------------------|---------|---------|----------|---------|-------------|------------------------------------------------|--------------------------|---------------|------|
| 1        | 04.05.17 | REVISED AS PER UPDATED LOAD LIST | TRINATH | TRINATH | CHECKED  | TRINATH | 24.05.17    | AMRS MCC LOAD LIST (AMS MCC-3) (ASH DYKE AREA) |                          | 12            | 01   |
| 2        |          |                                  |         |         | DRAWN    |         |             |                                                |                          |               |      |
| 3        |          |                                  |         |         | DESIGNED | TRINATH | 24.05.17    |                                                |                          |               |      |
| 4        |          |                                  |         |         |          |         |             |                                                |                          |               |      |

CUSTOMER CONSULTANT:



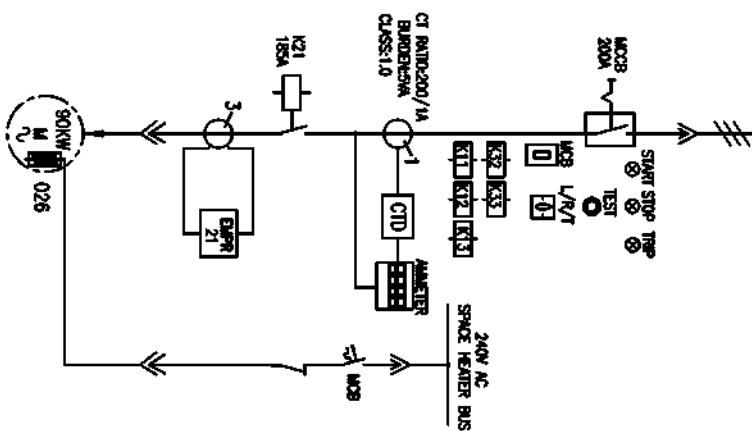
DEVELOPMENT CONSULTANT PVT LTD  
KOLKATA

BHARAT HEAVY ELECTRICALS LIMITED  
ELECTROPROCESSING DIVISION BANGALORE

TITLE :  
SINGLE LINE DIAGRAM



## SECTION-A

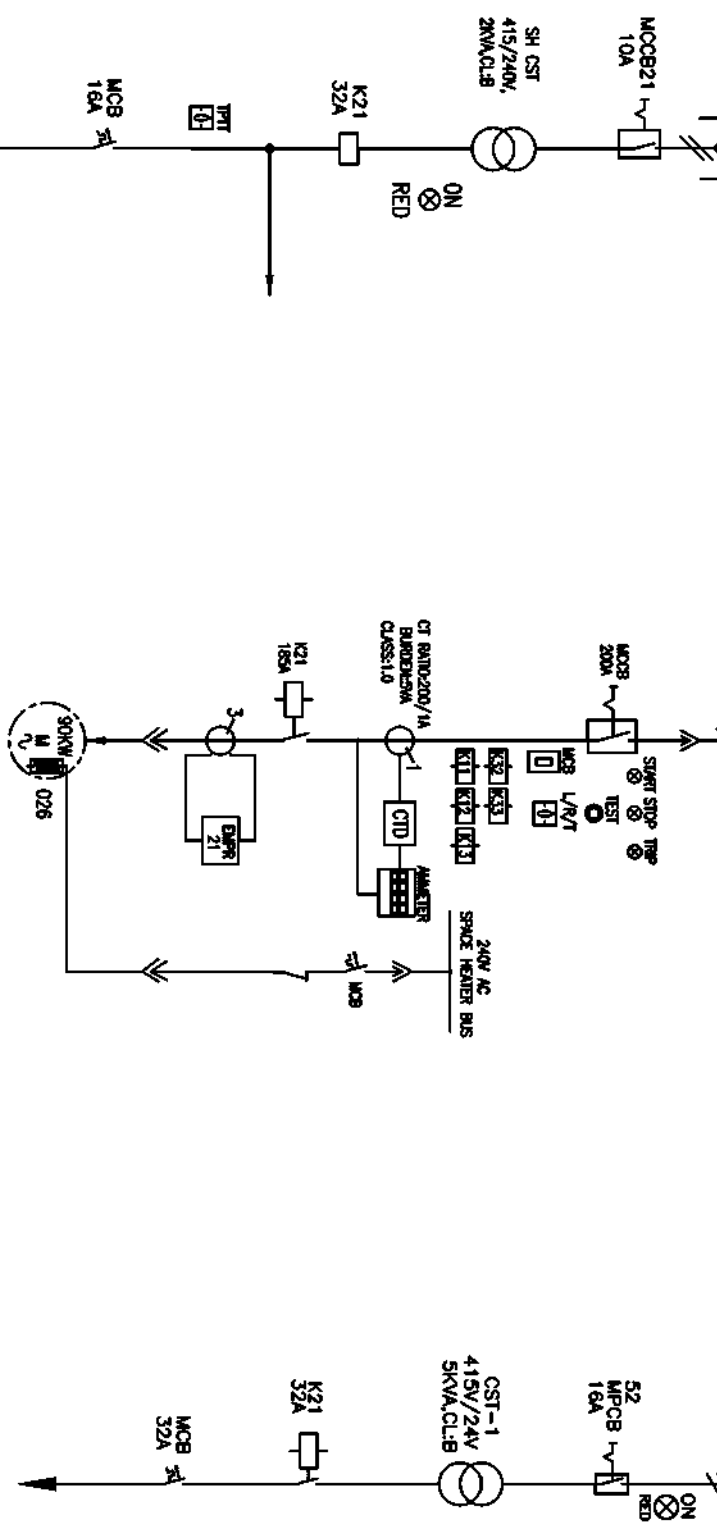


DRG. NO. EP-3-SL-047-870

|    |    |            |
|----|----|------------|
| 12 | 02 | REV.<br>01 |
|----|----|------------|

## SECTION-A

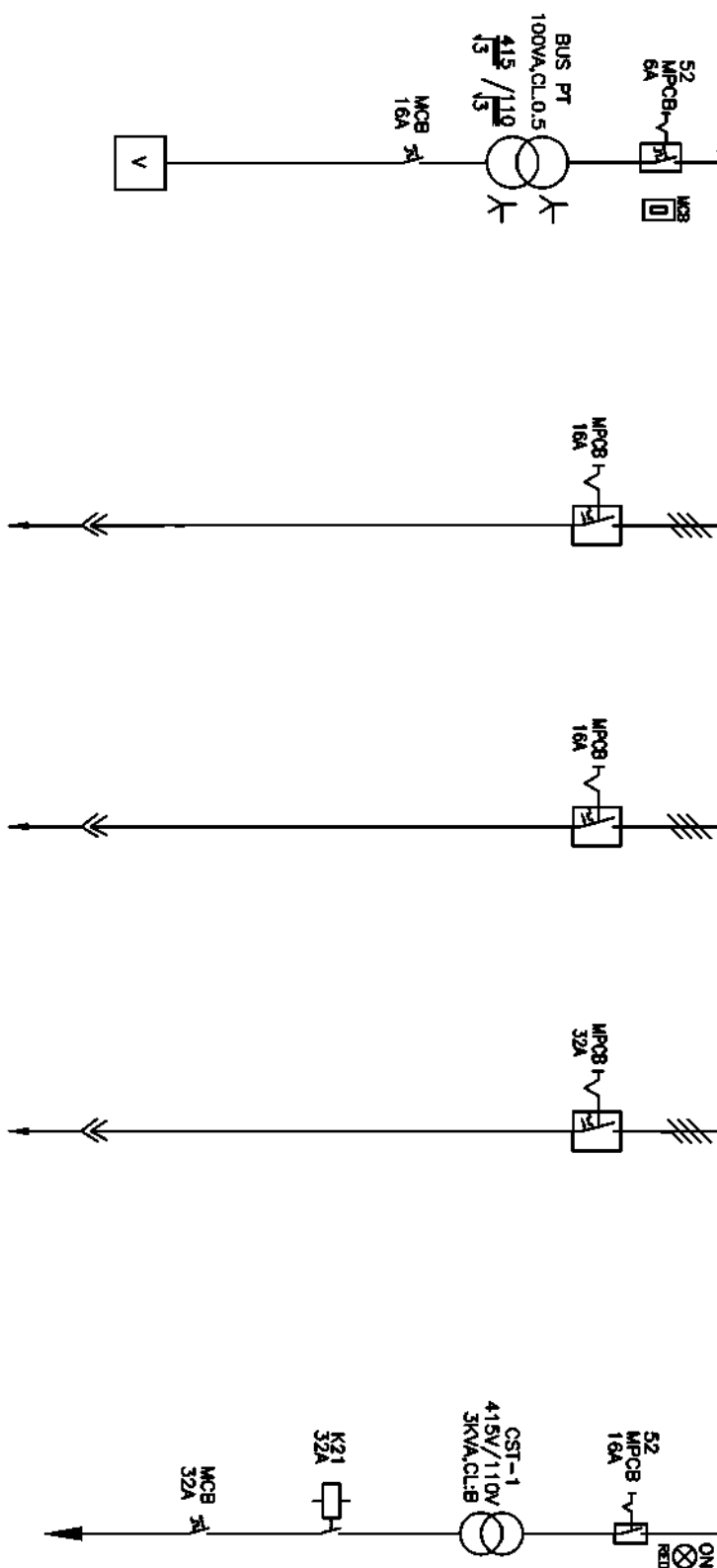
**240V, SPACE HEATER SUPPLY BUS**



| KCS TAG NO.        |                     |                      |                         |
|--------------------|---------------------|----------------------|-------------------------|
| FEEDER DESCRIPTION | SPACE HEATER TRAFQ. | RECOVERY WATER PUMP  | 24V CONTROL TRANSFORMER |
| FEEDER RATING      | 2MVA                | 90KW                 | 5KVA                    |
| FEEDER NO.         | 2B                  | 3A                   | 3B                      |
| SCHEDULE REF       | EP-3-CS-047-041     | EP-3-CS-047-026      | EP-3-CS-047-039         |
| CABLE SIZE         | -                   | 1-3C X 185 SQMM (AL) | -                       |

| INVENTORY NO.                                                                                                                                                                                                                                                                                                                                       |          |                                  |  |  |  |          |         |          |          |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|----------------------------------|--|--|--|----------|---------|----------|----------|
| 07                                                                                                                                                                                                                                                                                                                                                  |          |                                  |  |  |  |          |         |          |          |
| 06                                                                                                                                                                                                                                                                                                                                                  |          |                                  |  |  |  |          |         |          |          |
| 05                                                                                                                                                                                                                                                                                                                                                  |          |                                  |  |  |  |          |         |          |          |
| 04                                                                                                                                                                                                                                                                                                                                                  |          |                                  |  |  |  | DESIGNED | TRINATH | 24.05.17 |          |
| 03                                                                                                                                                                                                                                                                                                                                                  |          |                                  |  |  |  |          |         |          |          |
| 02                                                                                                                                                                                                                                                                                                                                                  |          |                                  |  |  |  | DRAWN    | TRINATH | 24.05.17 |          |
| 01                                                                                                                                                                                                                                                                                                                                                  |          |                                  |  |  |  | CHECKED  |         |          |          |
| REV.                                                                                                                                                                                                                                                                                                                                                | 04.08.17 | REVISED AS PER UPDATED LOAD LIST |  |  |  |          |         |          |          |
| NO.                                                                                                                                                                                                                                                                                                                                                 |          |                                  |  |  |  | BY       | APPRO.  | APPROVED | KCSB     |
|                                                                                                                                                                                                                                                                                                                                                     |          |                                  |  |  |  |          |         |          | 24.05.17 |
| <div style="display: flex; justify-content: space-between;"> <div> <p>DR :</p> <p>FILE NO. : 3</p> </div> <div>  </div> </div>                                                                                                                                   |          |                                  |  |  |  |          |         |          |          |
| <div style="display: flex; justify-content: space-between;"> <div> <p><b>BHARAT HEAVY ELECTRICALS LIMITED</b></p> <p>ELECTRO-PORCELAIN DIVISION BANGALORE</p> </div> <div> <p><b>TITLE :</b></p> <p>SINGLE LINE DIAGRAM</p> <p>AMWRS MCC LOAD LIST (AHS MCC-3) (ASH DYKE AREA)</p> </div> <div> <p><b>NO. OF SHEETS</b></p> <p>12</p> </div> </div> |          |                                  |  |  |  |          |         |          |          |
| <div style="display: flex; justify-content: space-between;"> <div> <p>SCALE</p> <p>108 NO. CP-14-047</p> </div> <div> <p>DRG. NO. EP-3-SL-047-870</p> </div> <div> <p><b>SHEET</b></p> <p>03</p> </div> </div>                                                                                                                                      |          |                                  |  |  |  |          |         |          |          |
| <div style="display: flex; justify-content: space-between;"> <div></div> <div></div> <div> <p><b>REV.</b></p> <p>01</p> </div> </div>                                                                                                                                                                                                               |          |                                  |  |  |  |          |         |          |          |

**SECTION-A**



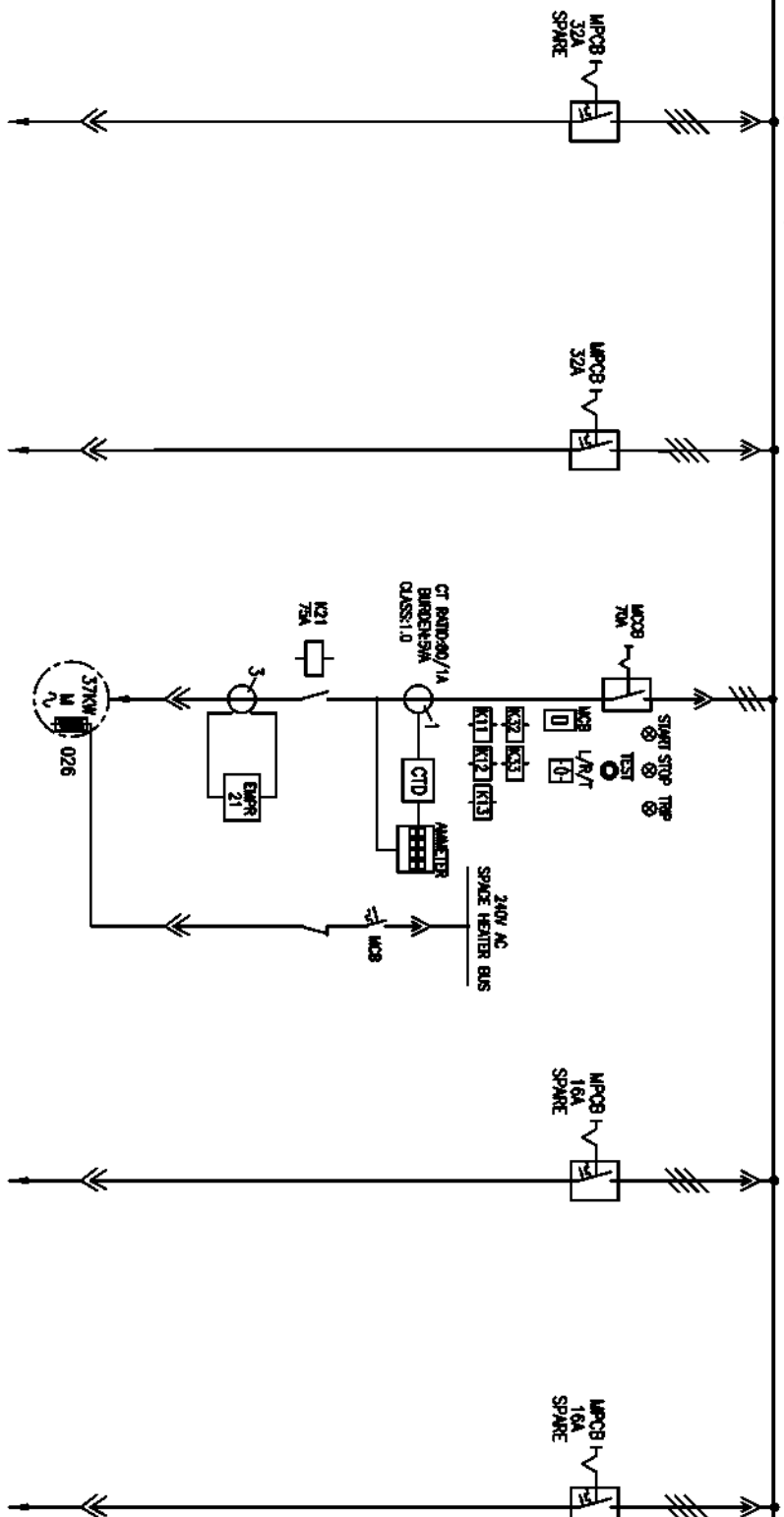
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INVENTORY NO.

|                    |                 |                                          |                    |                      |                     |
|--------------------|-----------------|------------------------------------------|--------------------|----------------------|---------------------|
| KKS TAG NO.        |                 |                                          |                    |                      |                     |
| FEEDER DESCRIPTION | BUS PT-A        | DB / STARTER FOR VENTILATION FAN IN AMRS | TOILET EXHAUST FAN | DRAIN SUMP PUMP AMRS | CONTROL TRANSFORMER |
| FEEDER RATING      | 100VA           | 16A                                      | 16A                | 32A                  | 3KVA                |
| FEEDER NO.         | 4A              | 4B                                       | 4C                 | 4D                   | 4E                  |
| SCHEME REF         | EP-3-CS-047-036 | EP-3-CS-047-022                          | EP-3-CS-047-022    | EP-3-CS-047-022      | EP-3-CS-047-039     |
| CABLE SIZE         | -               | 1-4C X 16 SQMM(AL)                       | 1-4C X 16 SQMM(AL) | 1-3C X 16 SQMM(AL)   | -                   |

[illegible]

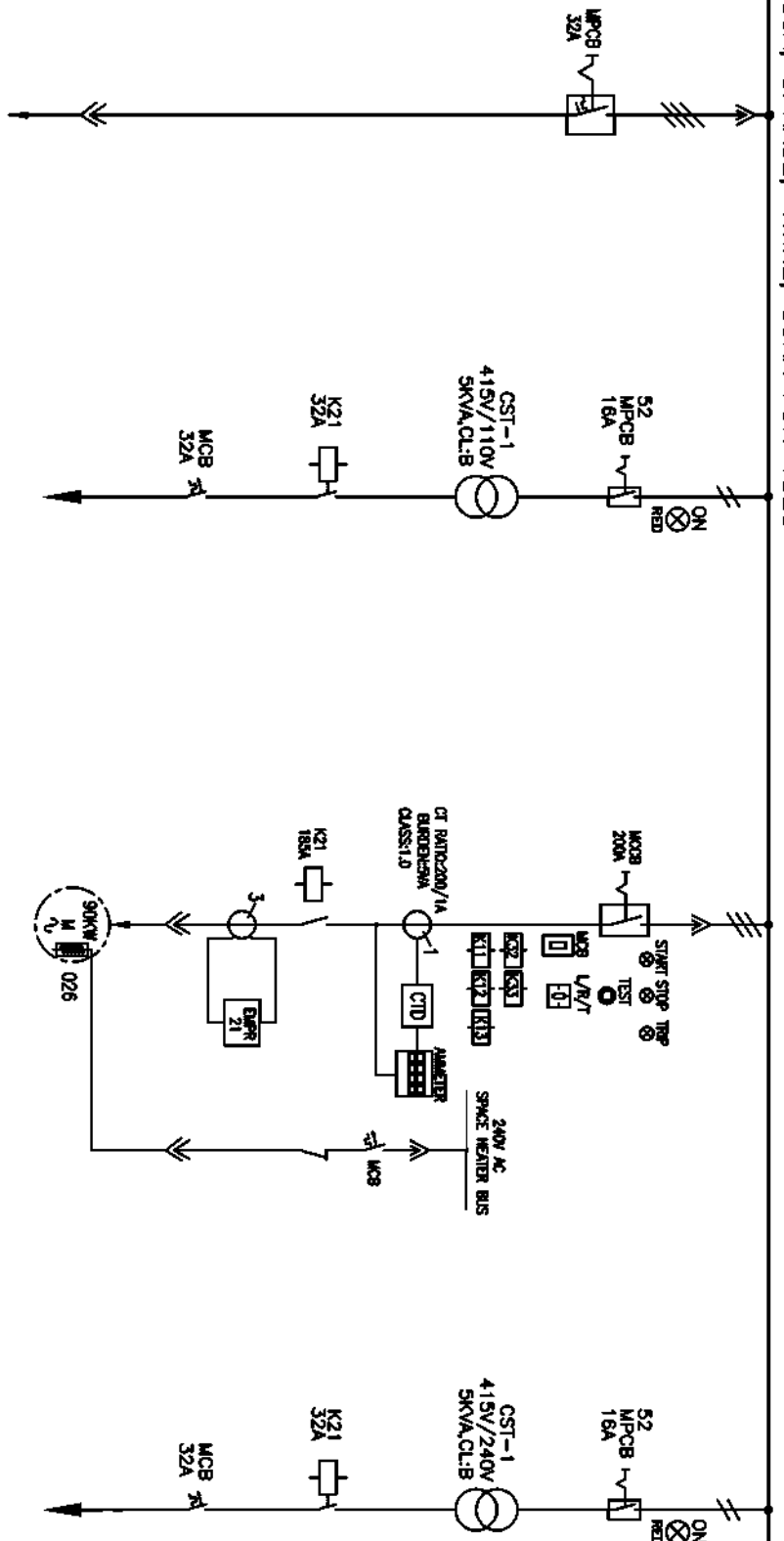
## SECTION-A



| KKS TAG NO.        |                 |                                        |                 |                 |
|--------------------|-----------------|----------------------------------------|-----------------|-----------------|
| FEEDER DESCRIPTION | SPARE           | DB/STARTER FOR VENTILATION FAN IN AMRS | SPARE           | SPARE           |
| FEEDER RATING      | 32A             | 32A                                    | 37KW            | 16A             |
| FEEDER NO.         | 2R              | 2S                                     | 2T              | 3Q              |
| SCHEME REF         | EP-3-CS-047-022 | EP-3-CS-047-022                        | EP-3-CS-047-026 | EP-3-CS-047-022 |
| CABLE SIZE         | -               | 1-3C X 16 SQMM(AL)                     | -               | -               |

[illegible]

## SECTION-A



| KCS TAG NO.        |                    |                          |                 |
|--------------------|--------------------|--------------------------|-----------------|
| FEEDER DESCRIPTION | 3T EOT CRANE AMRS  | 110V CONTROL TRANSFORMER | SPARE           |
| FEEDER RATING      | 32A                | 5KVA                     | 90KW            |
| FEEDER NO.         | 3S                 | 3T                       | 4Q              |
| SCHIEFF REF        | EP-3-CS-047-022    | EP-3-CS-047-039          | EP-3-CS-047-026 |
| CABLE SIZE         | 1-4C X 16 SQMM(AL) | -                        | -               |

| INVENTORY NO. |     |          |                                 |                 |                 |          |         |          |          |
|---------------|-----|----------|---------------------------------|-----------------|-----------------|----------|---------|----------|----------|
| REV.          | NO. | DATE     | DESCRIPTION                     | BY              | APPRO.          | APPROVED | KS8     | DATE     | FILE NO. |
| 01            |     | 04.08.17 | ISSUED AS PER UPDATED LOAD LIST | <i>S. S. S.</i> | <i>S. S. S.</i> | CHECKED  |         |          | 3        |
| 02            |     |          |                                 |                 |                 |          |         |          |          |
| 03            |     |          |                                 |                 |                 | DRAWN    | TRINATH | 24.08.17 |          |
| 04            |     |          |                                 |                 |                 | DESIGNED | TRINATH | 24.08.17 |          |
| 05            |     |          |                                 |                 |                 |          |         |          |          |
| 06            |     |          |                                 |                 |                 |          |         |          |          |
| 07            |     |          |                                 |                 |                 |          |         |          |          |

|                                                                                     |  |              |  |
|-------------------------------------------------------------------------------------|--|--------------|--|
|  |  | <b>DR :</b>  |  |
| <b>FILE NO.:</b>                                                                    |  | <b>SCALE</b> |  |

|                                                                                         |  |                                                                                     |  |
|-----------------------------------------------------------------------------------------|--|-------------------------------------------------------------------------------------|--|
| <b>BHARAT HEAVY ELECTRICALS LIMITED</b><br>ELECTROPOWER DIVISION BANGALORE              |  |  |  |
| <b>TITLE :</b><br>SINGLE LINE DIAGRAM<br>AMRS MCC LOAD LIST (AHS MCC-3) (ASH DYKE AREA) |  | NO. OF SHEETS : 12<br>SHEET : 06                                                    |  |
| J08 NO. CP-14-047                                                                       |  | DNG. NO. EP-3-SL-047-870                                                            |  |
|                                                                                         |  | REV. 01                                                                             |  |

FIRST ANGLE PROJECTION

ALL DIMENSIONS ARE IN MM.

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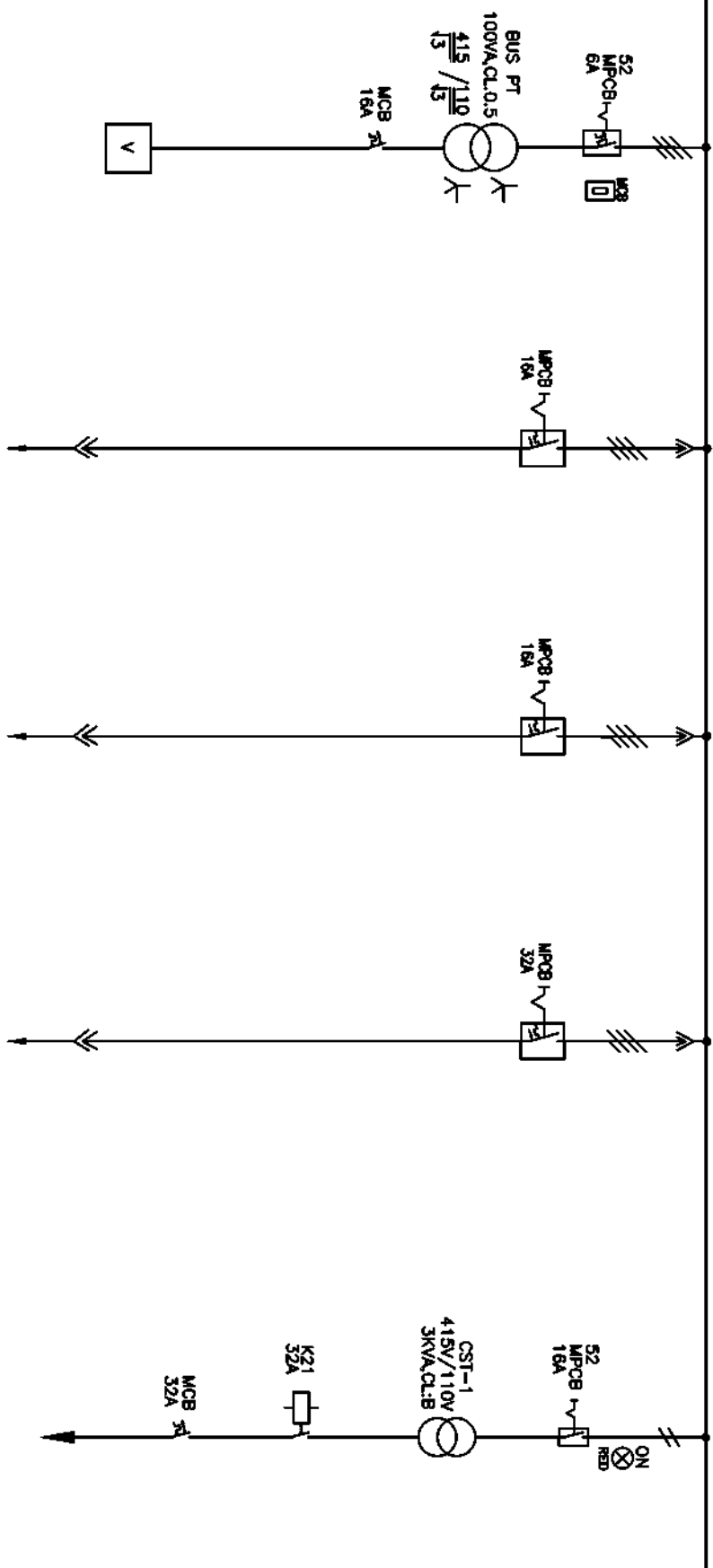
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415V, 800A, 3PHASE, 4WIRE, 50KA FOR 1SEC

SECTION-B



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DRG. NO. EP-3-SL-047-870

| KOS TAG NO. | FEDER DESCRIPTION | RECOVERY WATER LOCAL PANEL | POCAB AT AMRS     | DRAIN SLUMP PUMP AMRS | CONTROL TRANSFORMER |
|-------------|-------------------|----------------------------|-------------------|-----------------------|---------------------|
|             | FEDER RATING      | 100VA                      | 16A               | 32A                   | 3KVA                |
|             | FEDER NO.         | 6A                         | 6B                | 6C                    | 6E                  |
|             | SCHEME REF        | EP-3-CS-047-036            | EP-3-CS-047-022   | EP-3-CS-047-022       | EP-3-CS-047-039     |
|             | CABLE SIZE        | -                          | 1-4C X 16 SQMM(A) | 1-4C X 16 SQMM(A)     | 1-3C X 16 SQMM(A)   |

INVENTORY NO.

| REV. NO. | DATE     | DESCRIPTION                      | BY       | APPD.    | APPROVED | KSB | NAME    | SIGN.    | DATE | FILE NO. |
|----------|----------|----------------------------------|----------|----------|----------|-----|---------|----------|------|----------|
| 01       | 04.08.17 | REMOVED AS PER UPDATED LOAD LIST | 24.05.17 | 24.05.17 | CHECKED  |     | TRINATH | 24.05.17 |      |          |
| 02       |          |                                  |          |          |          |     |         |          |      |          |
| 03       |          |                                  |          |          |          |     |         |          |      |          |
| 04       |          |                                  |          |          |          |     |         |          |      |          |
| 05       |          |                                  |          |          |          |     |         |          |      |          |
| 06       |          |                                  |          |          |          |     |         |          |      |          |
| 07       |          |                                  |          |          |          |     |         |          |      |          |

BHARAT HEAVY ELECTRICALS LIMITED

ELECTROPORCELAIN DIVISION BANGALORE

TITLE :

AMRS MCC LOAD LIST (AHS MCC-3) (ASH DYKE AREA)

SCALE

JOB NO. CP-14-047

DRG. NO. EP-3-SL-047-870

NO. OF

SHEETS

12

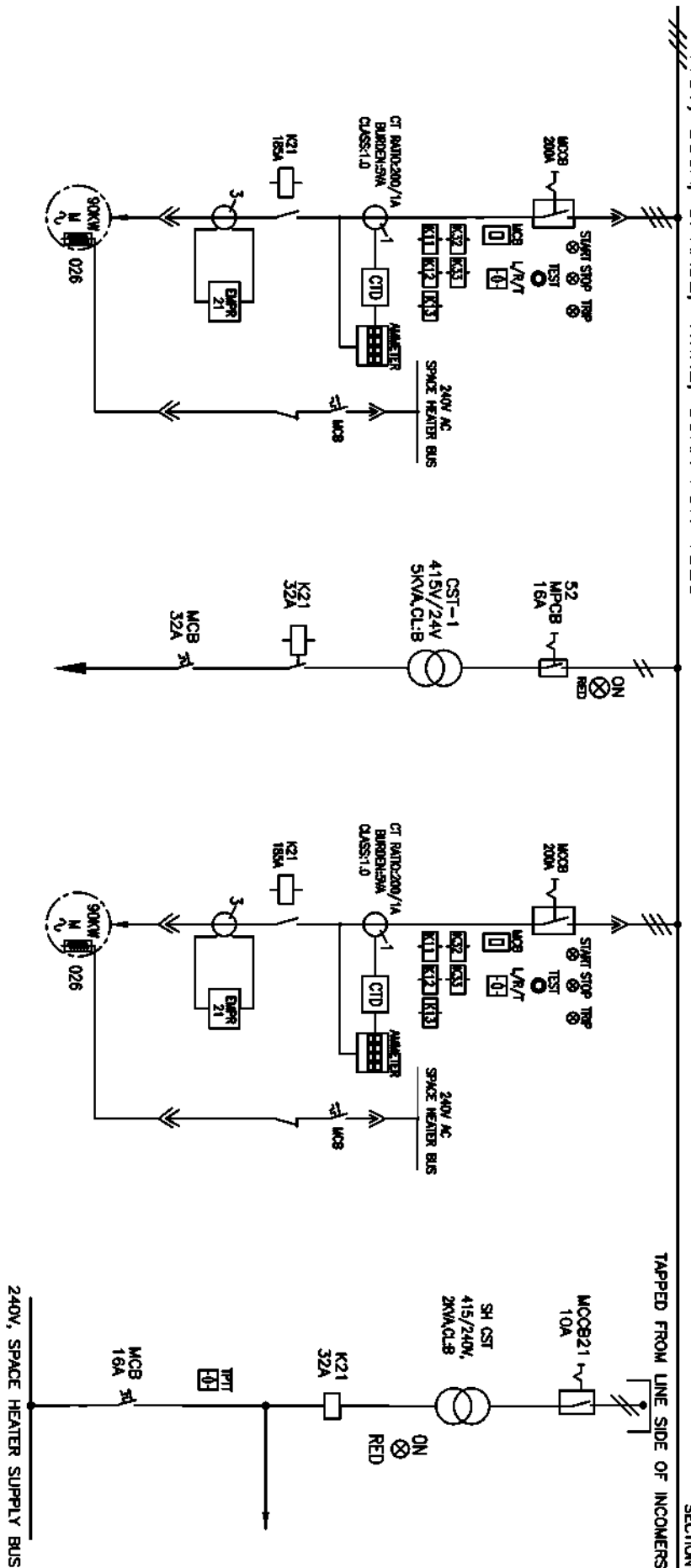
SHEET

06

REV.

01

## SECTION-B



| KKS TAG NO.        |                      |                         |                      |                     |
|--------------------|----------------------|-------------------------|----------------------|---------------------|
| FEEDER DESCRIPTION | RECOVERY WATER PUMP  | 24V CONTROL TRANSFORMER | RECOVERY WATER PUMP  | SPACE HEATER TRAF0. |
| FEEDER RATING      | 90KW                 | 5KVA                    | 90KW                 | 2KVA                |
| FEEDER NO.         | 7A                   | 7B                      | 8A                   | 8B                  |
| SCHEME REF         | EP-3-CS-047-026      | EP-3-CS-047-039         | EP-3-CS-047-026      | EP-3-CS-047-041     |
| CABLE SIZE         | 1-3C X 185 SQMM (AL) | -                       | 1-3C X 185 SQMM (AL) | -                   |

| INVENTORY NO. |     |          |                                 |          |          |          |     |                                                                                     |         |
|---------------|-----|----------|---------------------------------|----------|----------|----------|-----|-------------------------------------------------------------------------------------|---------|
| REV.          | NO. | DATE     | DESCRIPTION                     | BY       | APPRO.   | APPROVED | KS8 | FILE NO.                                                                            | SCALE   |
| 01            |     | 04.08.17 | ISSUED AS PER UPDATED LOAD LIST | S. S. S. | S. S. S. | CHECKED  |     | 3                                                                                   |         |
| 02            |     |          |                                 |          |          |          |     | DR :                                                                                |         |
| 03            |     |          |                                 |          |          | DRAWN    |     |  |         |
| 04            |     |          |                                 |          |          | DESIGNED |     |                                                                                     | TITLE : |
| 06            |     |          |                                 |          |          |          |     |                                                                                     |         |
| 07            |     |          |                                 |          |          |          |     |                                                                                     |         |

**BHARAT HEAVY ELECTRICALS LIMITED**

ELECTRO-PORCELAIN DIVISION BANGALORE



**SINGLE LINE DIAGRAM**

**AWMS MCC LOAD LIST (AHS MCC-3) (ASH DYKE AREA)**

NO. OF SHEETS

12

SHEET NO.

09

REV.

01

NO. OF SHEETS

12

NO. OF SHEETS

12

SHEET NO.

09

REV.

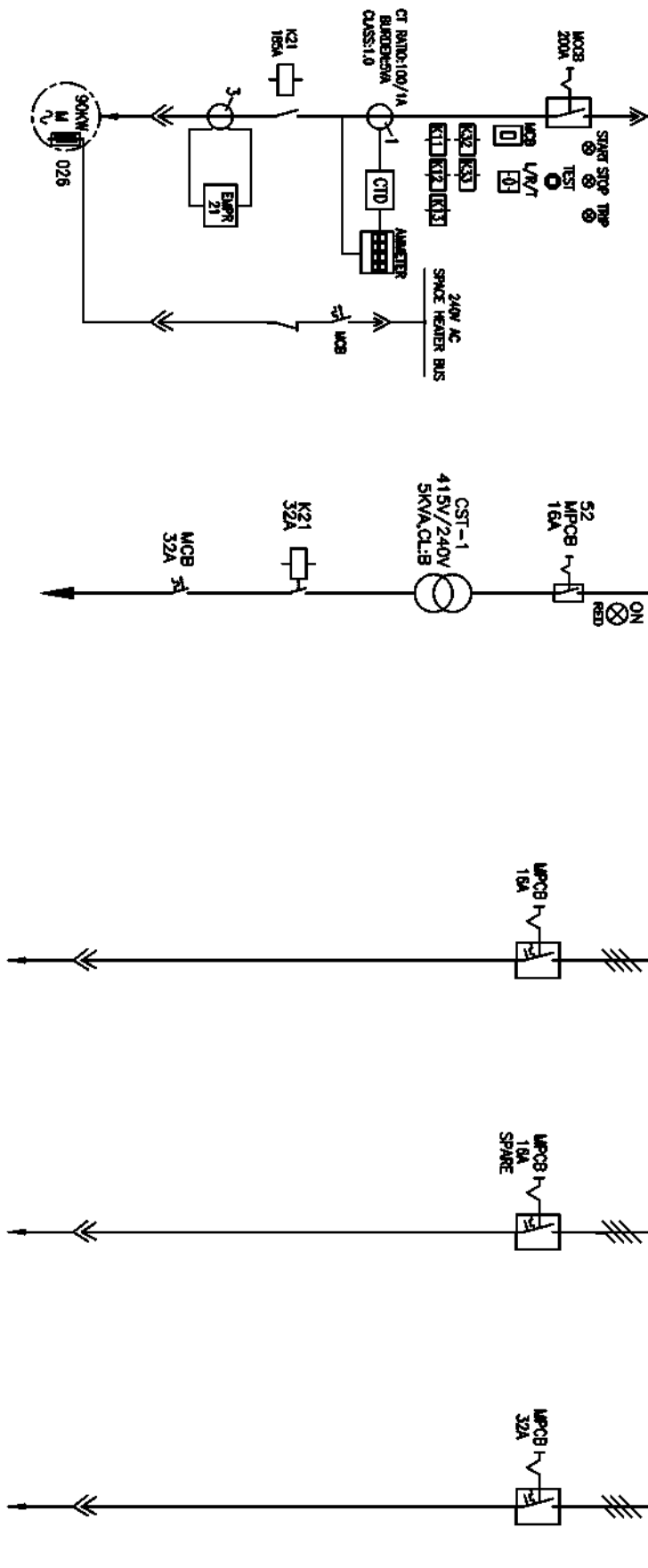
01

NO. OF SHEETS

12

415V, 800A, 3PHASE, 4WIRE, 50KA FOR 1SECC

## SECTION-B



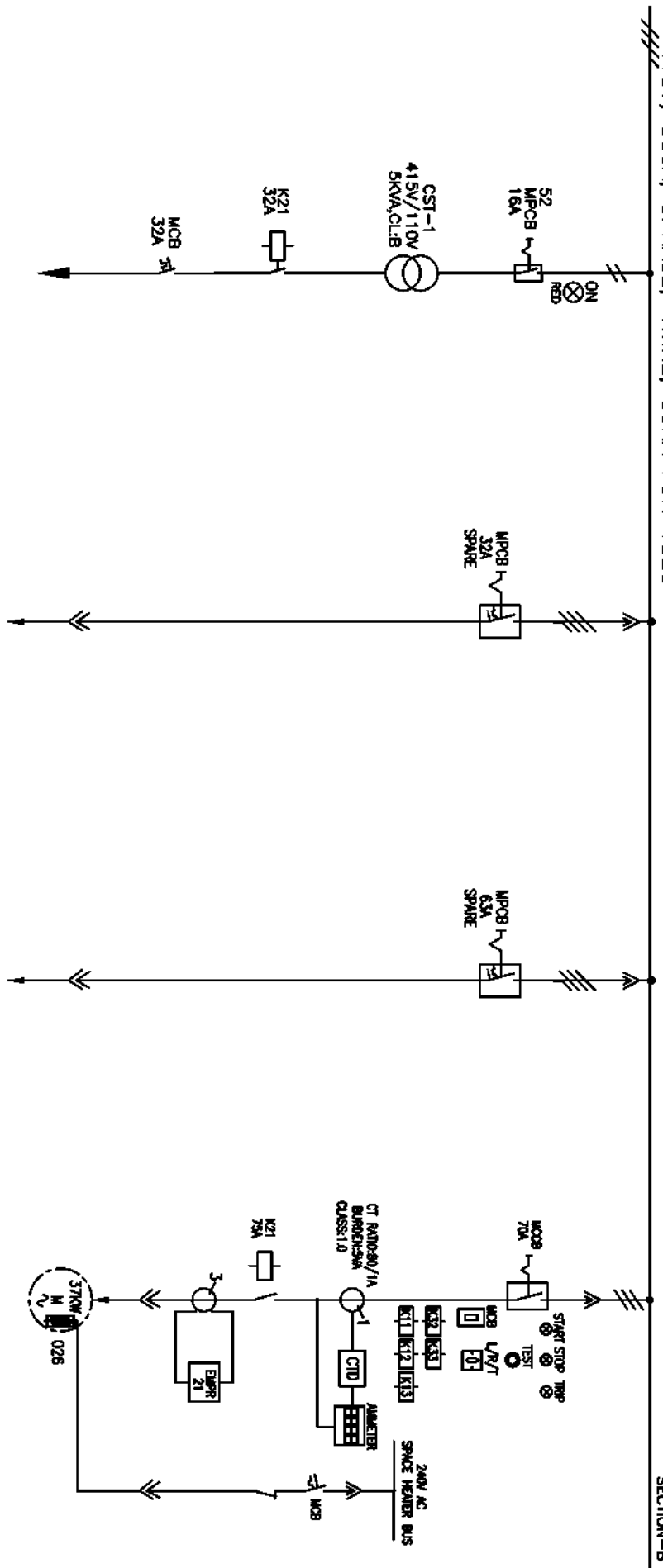
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DRG. NO. EP-3-SL-047-870

| KKS TAG NO.        |                 |                          |                    |                    |
|--------------------|-----------------|--------------------------|--------------------|--------------------|
| FEEDER DESCRIPTION | SPARE           | 240V CONTROL TRANSFORMER | MISC USE           | SPARE              |
| FEEDER RATING      | 90KW            | 5KVA                     | 16A                | 16A                |
| FEEDER NO.         | 6P              | 6Q                       | 7Q                 | 7R                 |
| SCHEME REF         | EP-3-CS-047-026 | EP-3-CS-047-039          | EP-3-CS-047-022    | EP-3-CS-047-022    |
| CABLE SIZE         | -               | -                        | 1-4C X 16 SQMM(AL) | -                  |
|                    |                 |                          |                    | 1-3C X 16 SQMM(AL) |

[illegible]

## SECTION-B



| KCS TAG NO.        |                          |                 |                           |
|--------------------|--------------------------|-----------------|---------------------------|
| FEEDER DESCRIPTION | 110V CONTROL TRANSFORMER | SPARE           | ELECTRIC HOIST FOR MCC 5T |
| FEEDER RATING      | 5KVA                     | 32A             | 32A                       |
| FEEDER NO.         | 7T                       | 8R              | 8S                        |
| SCHWAB REF         | EP-3-CS-047-039          | EP-3-CS-047-022 | EP-3-CS-047-022           |
| CABLE SIZE         | -                        | -               | 1-3C X 16 SQMM(AL)        |
|                    |                          |                 | SPARE                     |
|                    |                          |                 | 37 KW                     |
|                    |                          |                 | 8T                        |
|                    |                          |                 | EP-3-CS-047-026           |
|                    |                          |                 | -                         |

| INVENTORY NO. |     |          |                                 |    |        |          |     |                                                                                          |       |
|---------------|-----|----------|---------------------------------|----|--------|----------|-----|------------------------------------------------------------------------------------------|-------|
| REV.          | NO. | DATE     | DESCRIPTION                     | BY | APPRO. | APPROVED | KS8 | FILE NO.                                                                                 | SCALE |
| 01            |     | 04.08.17 | ISSUED AS PER UPDATED LOAD LIST |    |        | CHECKED  |     | DR :  |       |
| 02            |     |          |                                 |    |        |          |     |                                                                                          |       |
| 03            |     |          |                                 |    |        | DRAWN    |     |                                                                                          |       |
| 04            |     |          |                                 |    |        |          |     |                                                                                          |       |
| 05            |     |          |                                 |    |        | DESIGNED |     |                                                                                          |       |
| 06            |     |          |                                 |    |        |          |     |                                                                                          |       |
| 07            |     |          |                                 |    |        |          |     |                                                                                          |       |

|                                                                                |                          |                                                                                     |
|--------------------------------------------------------------------------------|--------------------------|-------------------------------------------------------------------------------------|
| <b>BHARAT HEAVY ELECTRICALS LIMITED</b><br>ELECTROPORCELAIN DIVISION BANGALORE |                          |  |
| SINGLE LINE DIAGRAM<br>AAWRS MCC LOAD LIST (AHS MCC-3) (ASH DYKE AREA)         |                          |                                                                                     |
| TITLE :<br>AAWRS MCC LOAD LIST (AHS MCC-3) (ASH DYKE AREA)                     |                          | NO. OF SHEETS : 12<br>SHEET NO. : 11                                                |
| J08 NO. CP-14-047                                                              | DRG. NO. EP-3-SL-047-870 | REV. 01                                                                             |

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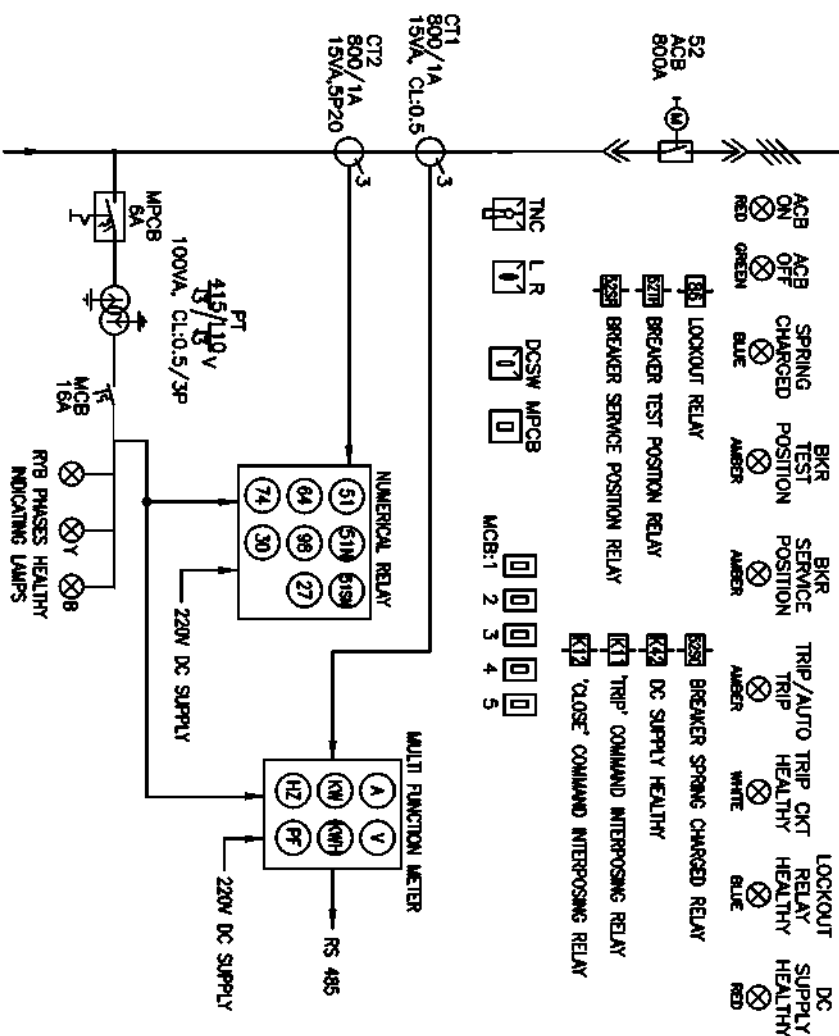
6

7

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415V, 800A, 3PHASE, 4WIRE, 50KA FOR 1SEC

SECTION-B



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DRG. NO. EP-3-SL-047-870

INVENTORY NO.

| REV. NO. | DATE     | DESCRIPTION                      | BY       | APPD.    | APPROVED | KSB | 24.05.17 | 3 | FILE NO.: |
|----------|----------|----------------------------------|----------|----------|----------|-----|----------|---|-----------|
| 01       | 04.09.17 | REMOVED AS PER UPDATED LOAD LIST | 3.2.2017 | 3.2.2017 | CHECKED  |     |          |   | DR :      |
| 02       |          |                                  |          |          |          |     |          |   |           |
| 03       |          |                                  |          |          |          |     |          |   |           |
| 04       |          |                                  |          |          |          |     |          |   |           |
| 05       |          |                                  |          |          |          |     |          |   |           |
| 06       |          |                                  |          |          |          |     |          |   |           |
| 07       |          |                                  |          |          |          |     |          |   |           |

|                    |                 |
|--------------------|-----------------|
| KKS TAG NO.        |                 |
| FEDDER DESCRIPTION | MCBOMER-B       |
| FEDDER RATING      | 800A            |
| FEDDER NO.         | 88              |
| SCHEME REF         | EP-3-CS-047-002 |
| CABLE SIZE         | BUS DUCT        |

|                                                |                   |
|------------------------------------------------|-------------------|
| BHARAT HEAVY ELECTRICALS LIMITED               |                   |
| ELECTROPORCELAIN DIVISION BANGALORE            |                   |
| TITLE :                                        |                   |
| SINGLE LINE DIAGRAM                            |                   |
| AMRS MCC LOAD LIST (AHS MCC-3) (ASH DYKE AREA) |                   |
| SCALE                                          | 108 NO. CP-14-047 |
| DRG. NO.                                       | EP-3-SL-047-870   |
| NO. OF SHEETS                                  | 12                |
| SHEET NO.                                      | 12                |
| REV.                                           | 01                |

FIRST ANGLE PROJECTION

ALL DIMENSIONS ARE IN MM.

1

2

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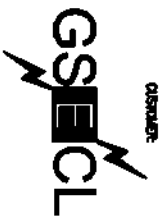
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GUJARAT ELECTRICITY CORPORATION LIMITED  
VADODARA, GUJARAT

PROJECT:

1x800 MW WANAKBORI THERMAL POWER STATION  
EXTENSION UNIT-8

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DRG. NO. EP-3-SL-047-871

INVENTORY NO.

| REV. NO. | DATE     | DESCRIPTION                      | BY      | APPROD. | APPROVED | KSB     | DATE     |
|----------|----------|----------------------------------|---------|---------|----------|---------|----------|
| 1        | 04.09.17 | REVISED AS PER UPDATED LOAD LIST | SAI-ASH | SAI-ASH | CHECKED  | TRINATH | 24.05.17 |
| 2        |          |                                  |         |         | DRAWN    |         |          |
| 3        |          |                                  |         |         | DESIGNED | TRINATH | 24.05.17 |
| 4        |          |                                  |         |         |          |         |          |

CUSTOMER CONSULTANT:  
  
DEVELOPMENT CONSULTANT PVT LTD  
KOLKATA



BHARAT HEAVY ELECTRICALS LIMITED  
ELECTROPROCESSING DIVISION BANGLORE

TITLE :

SINGLE LINE DIAGRAM

SILU MCC LOAD LIST (AHS MCC-2) (NEAR FLY ASH SILO)

JOB NO. CP-14-047

DRG. NO. EP-3-SL-047-871

NO. OF SHEETS

27

SHEET NO.

01

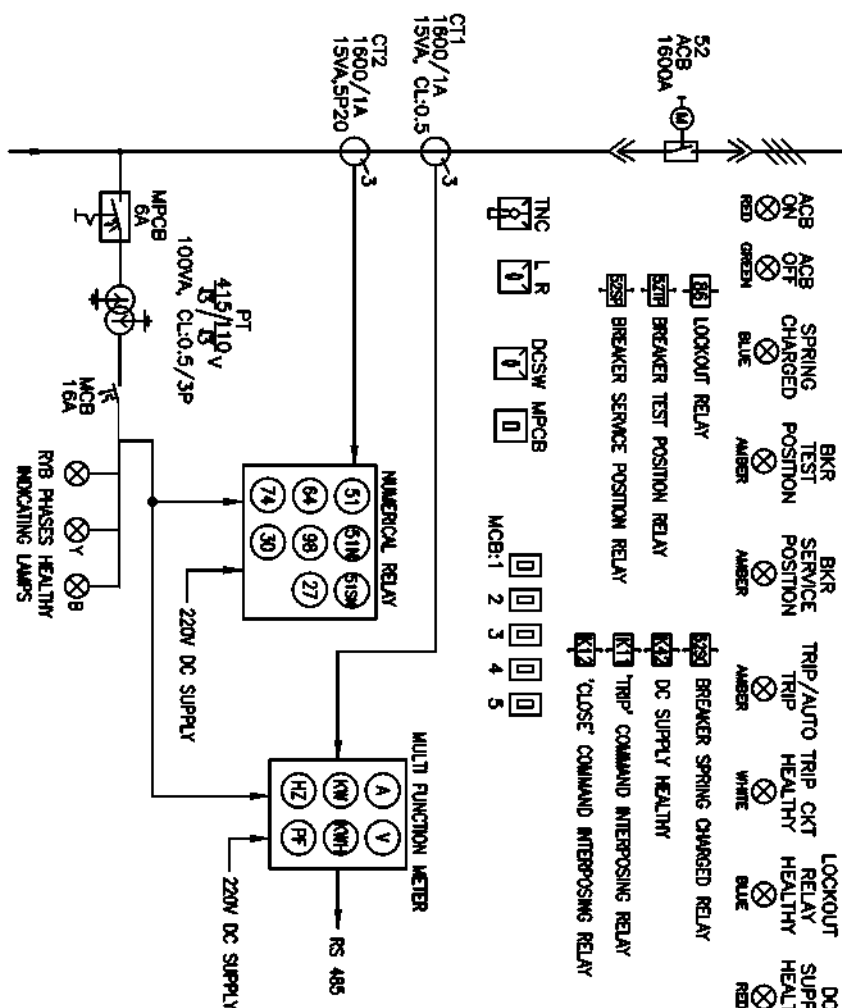
REV.

01

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DRG. NO. EP-3-SL-047-871

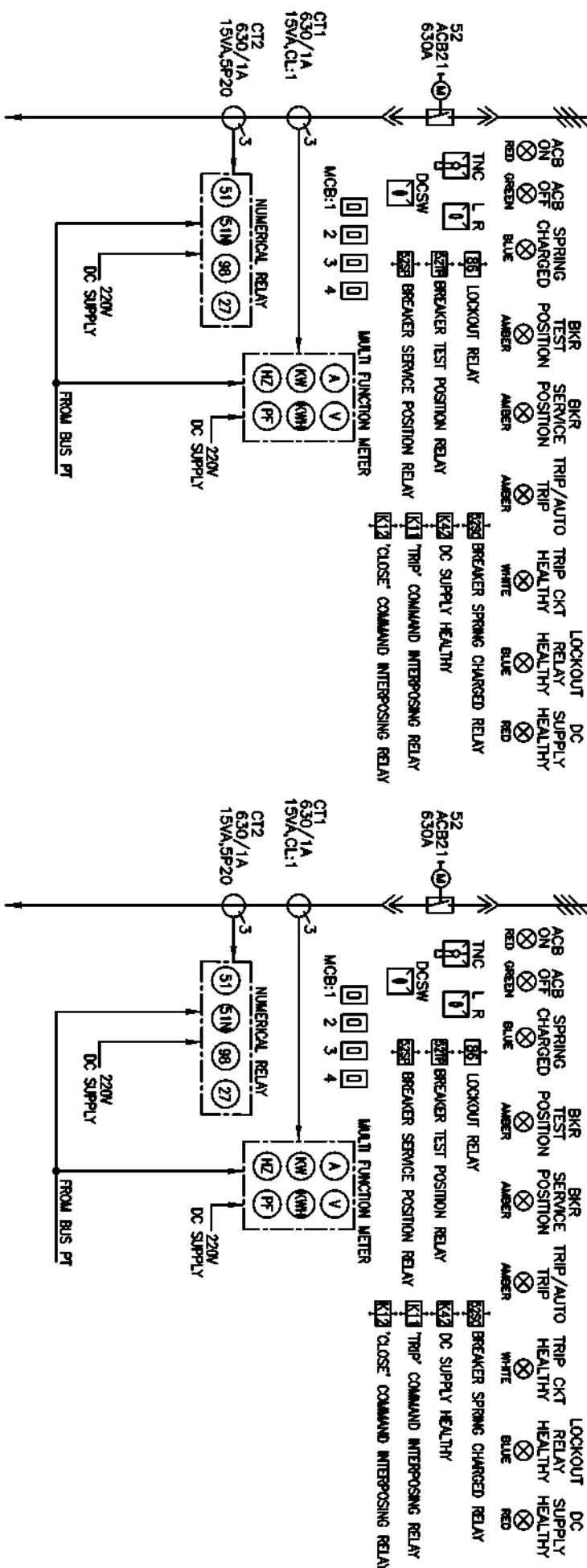
INVENTORY NO.

[illegible]

**SECTION-A**

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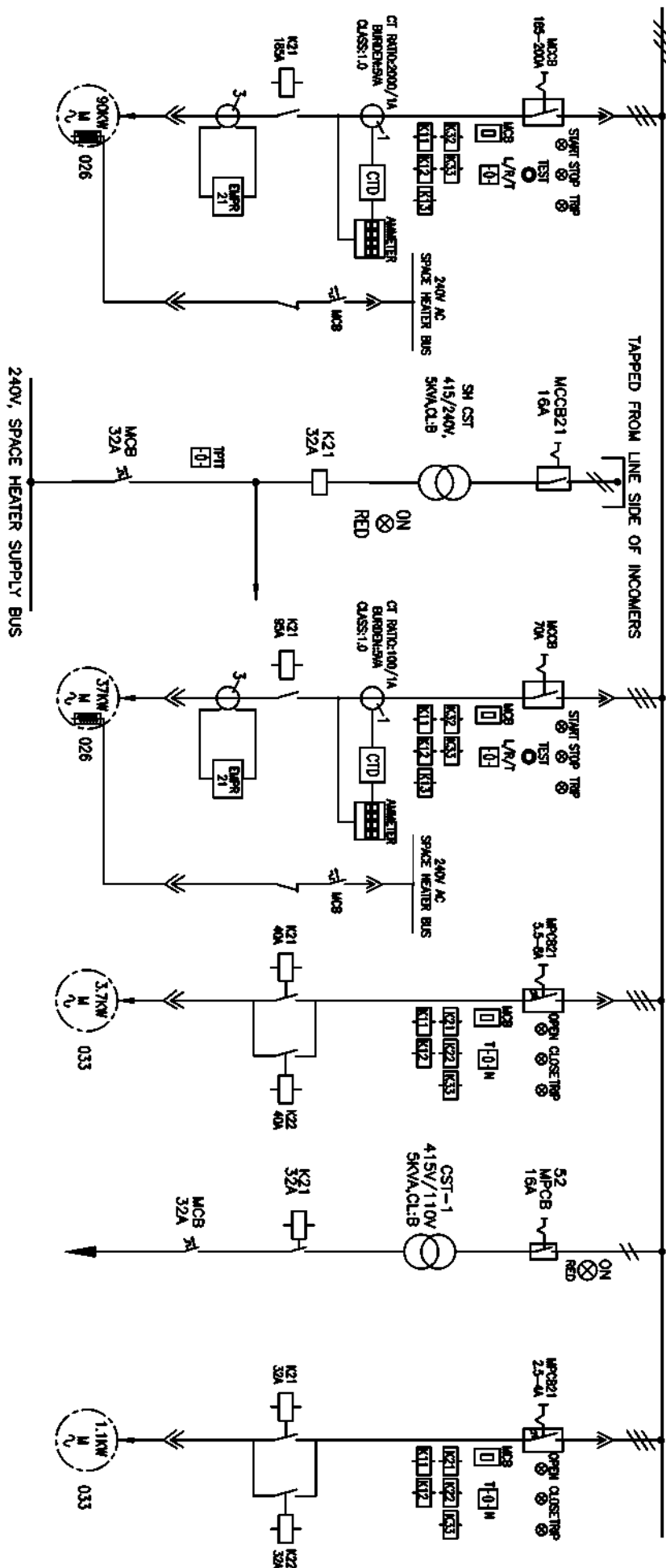
INVENTORY NO.



|                    |                 |                 |
|--------------------|-----------------|-----------------|
| KKS TAG NO.        |                 |                 |
| FEEDER DESCRIPTION | HCSO INCOMMER   | SPARE           |
| FEEDER RATING      | 630A            | 630A            |
| FEEDER NO.         | 2A              | 2B              |
| SCHEME REF         | EP-3-CS-047-013 | EP-3-CS-047-013 |
| CABLE SIZE         | -               | -               |

[illegible]

**SECTION-A**



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DRG. NO. EP-3-SL-047-871

|                    |                     |                     |                 |                    |                         |
|--------------------|---------------------|---------------------|-----------------|--------------------|-------------------------|
| KKS TAG NO.        |                     |                     |                 |                    |                         |
| FEEDER DESCRIPTION | INC AT FLY ASH SILO | SPACE HEATER TRAF0. | SPARE           | RWF AT SKO         | 24V CONTROL TRANSFORMER |
| FEEDER RATING      | 90KW                | 5KVA                | 37KW            | 3.7KW              | 5KVA                    |
| FEEDER NO.         | 3A                  | 3B                  | 4A              | 4B                 | 4C                      |
| SCHEDULE REF       | EP-3-CS-047-026     | EP-3-CS-047-041     | EP-3-CS-047-026 | EP-3-CS-047-033    | EP-3-CS-047-039         |
| CABLE SIZE         | 1-3C X 150 SQMM(AL) | -                   | -               | 1-3C X 16 SQMM(AL) | -                       |
|                    |                     |                     |                 |                    | 1-3C X 2.5 SQMM(CU)     |

| INVENTORY NO. |          |                                  |    |        |          |          |       |          |  |
|---------------|----------|----------------------------------|----|--------|----------|----------|-------|----------|--|
| REV.          | DATE     | DESCRIPTION                      | BY | APPRO. | APPROVED | NAME     | SIGN. | DATE     |  |
| 07            |          |                                  |    |        |          |          |       |          |  |
| 06            |          |                                  |    |        |          |          |       |          |  |
| 05            |          |                                  |    |        |          | DESIGNED |       | 24.05.17 |  |
| 04            |          |                                  |    |        |          |          |       |          |  |
| 03            |          |                                  |    |        |          | DRAWN    |       | 24.05.17 |  |
| 02            |          |                                  |    |        |          |          |       |          |  |
| 01            | 04.08.17 | REVISED AS PER UPDATED LOAD LIST |    |        |          |          |       |          |  |

|                                                                                      |                   |                                                                                     |
|--------------------------------------------------------------------------------------|-------------------|-------------------------------------------------------------------------------------|
| <b>BHARAT HEAVY ELECTRICALS LIMITED</b><br>ELECTRO-PORCELAIN DIVISION BANGALORE      |                   |  |
| TITLE :<br>SINGLE LINE DIAGRAM<br>SILO MCC LOAD LIST (AHS MCC-2) (NEAR FLY ASH SILO) |                   |                                                                                     |
| SCALE                                                                                | 108 NO. CP-14-047 |                                                                                     |

|               |    |
|---------------|----|
| NO. OF SHEETS | 27 |
| SHEET NO.     | 04 |
| REV.          | 01 |

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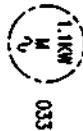
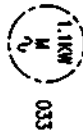
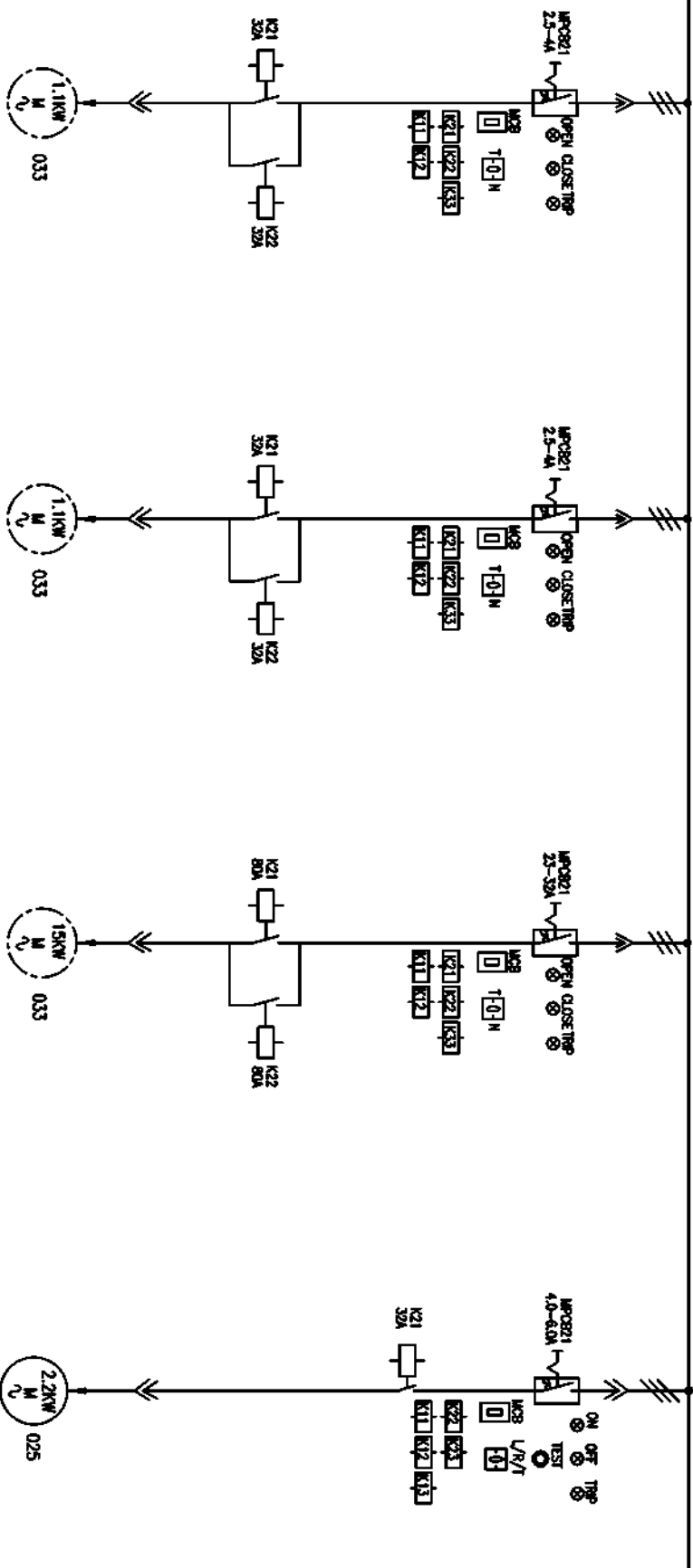
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415V, 1600A, 3PHASE, 4WIRE, 50KA FOR 1SEC

SECTION-A



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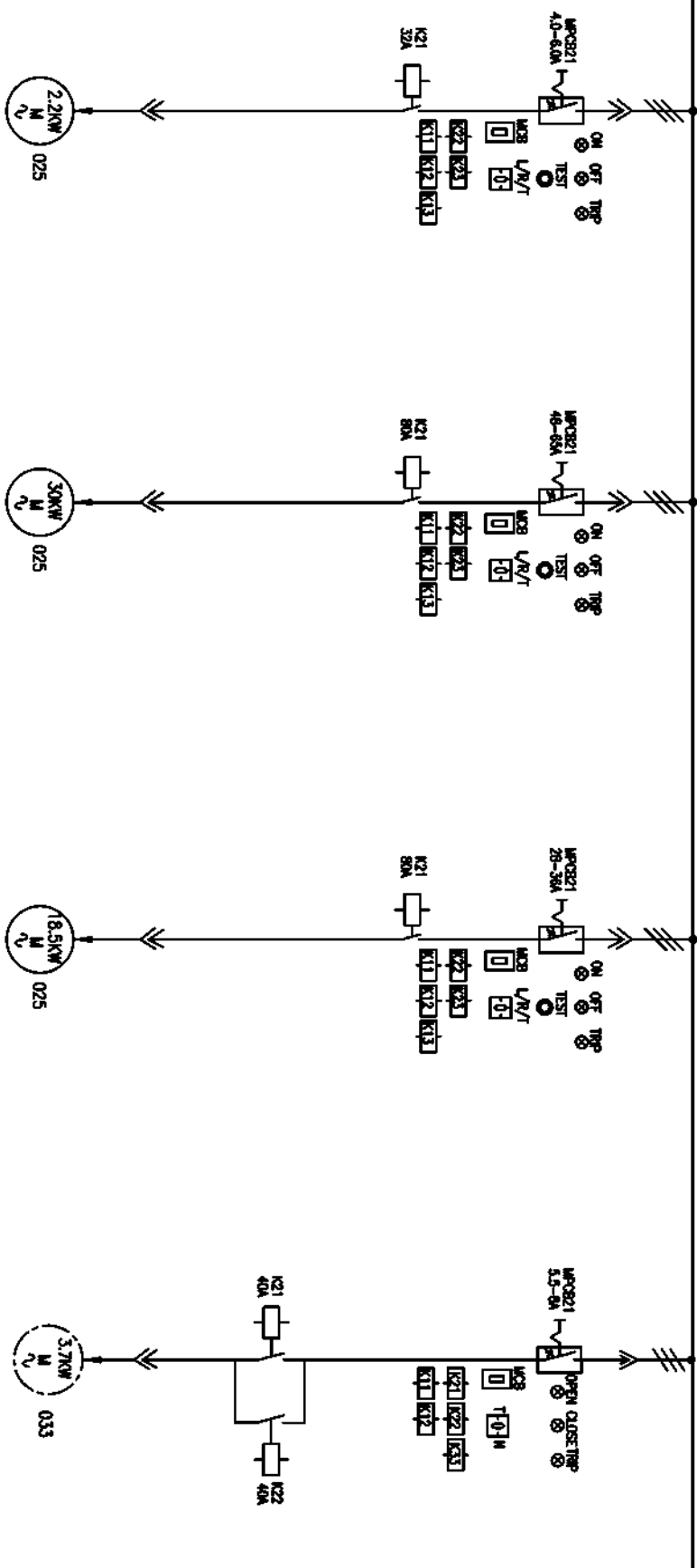
DRG. NO. EP-3-SL-047-871

INVENTORY NO.

| REV. | NO. | DATE     | DESCRIPTION                      | BY  | APPROD. | APPROVED | KSB | NAME    | SIGN. | DATE     |
|------|-----|----------|----------------------------------|-----|---------|----------|-----|---------|-------|----------|
| 01   | 01  | 04.08.17 | REVISED AS PER UPDATED LOAD LIST | KSJ | KSJ     |          |     | TRINATH |       | 24.05.17 |
| 02   | 02  |          |                                  |     |         |          |     | TRINATH |       | 24.05.17 |
| 03   | 03  |          |                                  |     |         |          |     | TRINATH |       | 24.05.17 |
| 04   | 04  |          |                                  |     |         |          |     | TRINATH |       | 24.05.17 |
| 05   | 05  |          |                                  |     |         |          |     | TRINATH |       | 24.05.17 |
| 06   | 06  |          |                                  |     |         |          |     | TRINATH |       | 24.05.17 |
| 07   | 07  |          |                                  |     |         |          |     | TRINATH |       | 24.05.17 |

| BHARAT HEAVY ELECTRICALS LIMITED |  |  |  | ELECTROPORCELAIN DIVISION BANGALORE |  |
|----------------------------------|--|--|--|-------------------------------------|--|
| TITLE :                          |  |  |  | SINGLE LINE DIAGRAM                 |  |
| SCALE                            |  |  |  | 108 NO. CP-14-047                   |  |
| DRG. NO.                         |  |  |  | EP-3-SL-047-871                     |  |
| NO. OF SHEETS                    |  |  |  | 27                                  |  |
| SHEET NO.                        |  |  |  | 06                                  |  |
| REV.                             |  |  |  | 01                                  |  |

**SECTION-A**



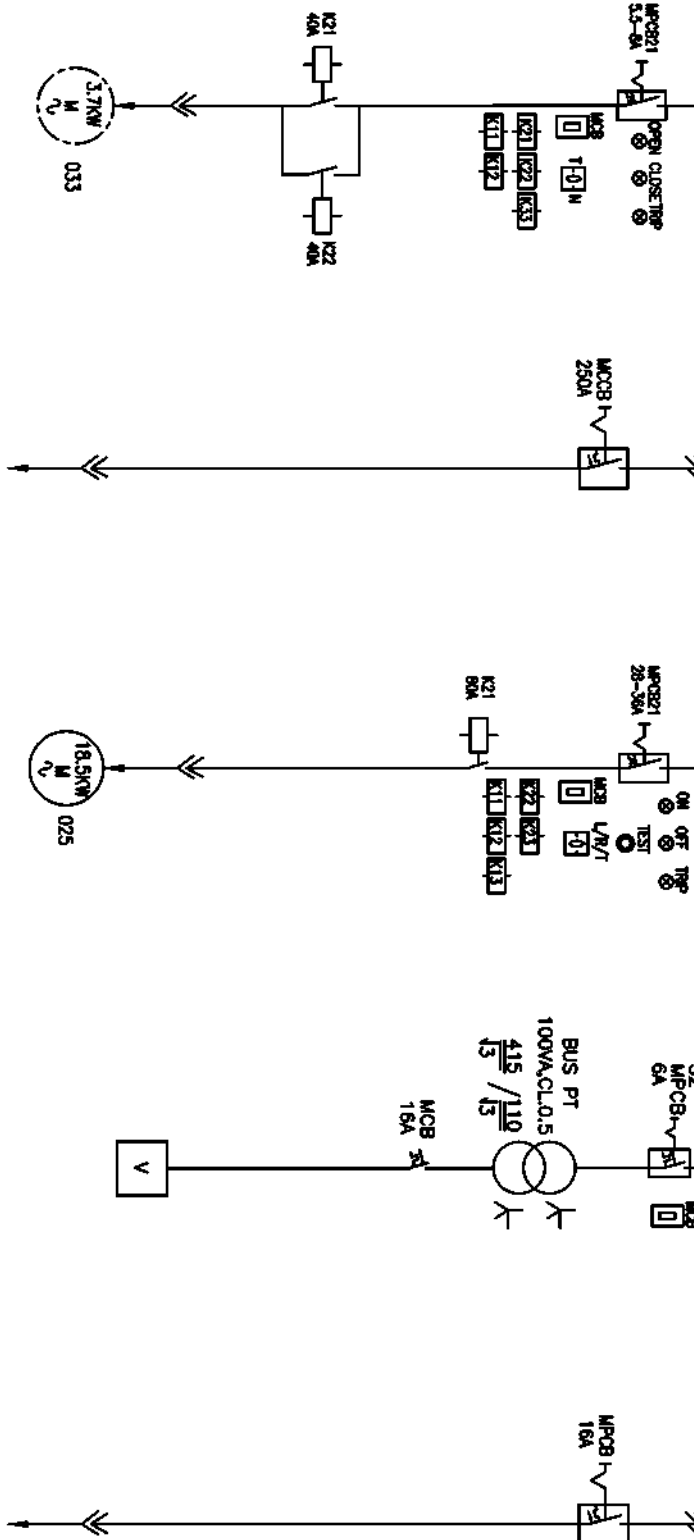
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INVENTORY NO.

|                    |                                |                            |                    |                    |
|--------------------|--------------------------------|----------------------------|--------------------|--------------------|
| KKS TAG NO.        |                                |                            |                    |                    |
| FEEDER DESCRIPTION | BAG FILTER FOR UNLOADING SPOUT | ASH CONDITIONER AT FI SILO | MISC USE           | RWF AT SILO        |
| FEEDER RATING      | 2.2KW                          | 30KW                       | 18.5KW             | 3.7KW              |
| FEEDER NO.         | 6C                             | 6D                         | 6E                 | 7A                 |
| SCHEME REF         | EP-3-CS-047-025                | EP-3-CS-047-025            | EP-3-CS-047-025    | EP-3-CS-047-033    |
| CABLE SIZE         | 1-3C X 2.5 SQMM(CU)            | 1-3C X 35 SQMM(AL)         | 1-3C X 35 SQMM(AL) | 1-3C X 16 SQMM(AL) |

[illegible]

## SECTION-A



|                    |                    |                    |                            |                              |
|--------------------|--------------------|--------------------|----------------------------|------------------------------|
| KKS TAG NO.        |                    |                    |                            |                              |
| FEEDER DESCRIPTION | RWF AT SILO        | MIDB AT AHS MCC-2  | ASH CONDITIONER WATER PUMP | BUS PT-A                     |
| FEEDER RATING      | 3.7KW              | 250A               | 18.5KW                     | 100VA                        |
| FEEDER NO.         | 7B                 | 7C                 | 7D                         | 8A                           |
| SCHEME REF         | EP-3-CS-047-033    | EP-3-CS-047-022    | EP-3-CS-047-025            | EP-3-CS-047-036              |
| CABLE SIZE         | 1-3C X 16 SQMM(AL) | 1-3C X 95 SQMM(AL) | 1-3C X 35 SQMM(AL)         | -                            |
|                    |                    |                    |                            | FLY ASH SILO UNLOADING PANEL |
|                    |                    |                    |                            | 1-4C X 16 SQMM(AL)           |

| INVENTORY NO. |          |                                  |                    |                    |          |         |                    |          |  |
|---------------|----------|----------------------------------|--------------------|--------------------|----------|---------|--------------------|----------|--|
| REV.          | DATE     | DESCRIPTION                      | BY                 | APPRO.             | APPROVED | NAME    | SIGN.              | DATE     |  |
| 07            |          |                                  |                    |                    |          |         |                    |          |  |
| 06            |          |                                  |                    |                    | DESIGNED | TRINATH | <i>[Signature]</i> | 24.05.17 |  |
| 05            |          |                                  |                    |                    |          |         |                    |          |  |
| 04            |          |                                  |                    |                    | DRAWN    | TRINATH | <i>[Signature]</i> | 24.05.17 |  |
| 03            |          |                                  |                    |                    |          |         |                    |          |  |
| 02            |          |                                  |                    |                    | CHECKED  |         |                    |          |  |
| 01            | 04.08.17 | REVISED AS PER UPDATED LOAD LIST | <i>[Signature]</i> | <i>[Signature]</i> |          |         |                    |          |  |

|                                                                                     |  |  |  |             |  |  |  |                  |  |
|-------------------------------------------------------------------------------------|--|--|--|-------------|--|--|--|------------------|--|
|  |  |  |  | <b>DR :</b> |  |  |  | <b>FILE NO.:</b> |  |
| <b>3</b>                                                                            |  |  |  |             |  |  |  |                  |  |

|                                                             |  |  |  |                          |  |  |  |                                                                                     |  |  |  |
|-------------------------------------------------------------|--|--|--|--------------------------|--|--|--|-------------------------------------------------------------------------------------|--|--|--|
| <b>SCALE</b>                                                |  |  |  | <b>108 NO. CP-14-047</b> |  |  |  | <b>DRG. NO. EP-3-SL-047-871</b>                                                     |  |  |  |
| <b>TITLE :</b>                                              |  |  |  |                          |  |  |  |  |  |  |  |
| <b>SINGLE LINE DIAGRAM</b>                                  |  |  |  |                          |  |  |  | <b>NO. OF SHEETS</b>                                                                |  |  |  |
| <b>SILLO MCC LOAD LIST (AHS MCC-2) (NEAR FLY ASH SILLO)</b> |  |  |  |                          |  |  |  | <b>27</b>                                                                           |  |  |  |
|                                                             |  |  |  |                          |  |  |  | <b>SHEET</b>                                                                        |  |  |  |
|                                                             |  |  |  |                          |  |  |  | <b>07</b>                                                                           |  |  |  |
|                                                             |  |  |  |                          |  |  |  | <b>REV.</b>                                                                         |  |  |  |
|                                                             |  |  |  |                          |  |  |  | <b>01</b>                                                                           |  |  |  |

FIRST ANGLE PROJECTION

ALL DIMENSIONS ARE IN MM.

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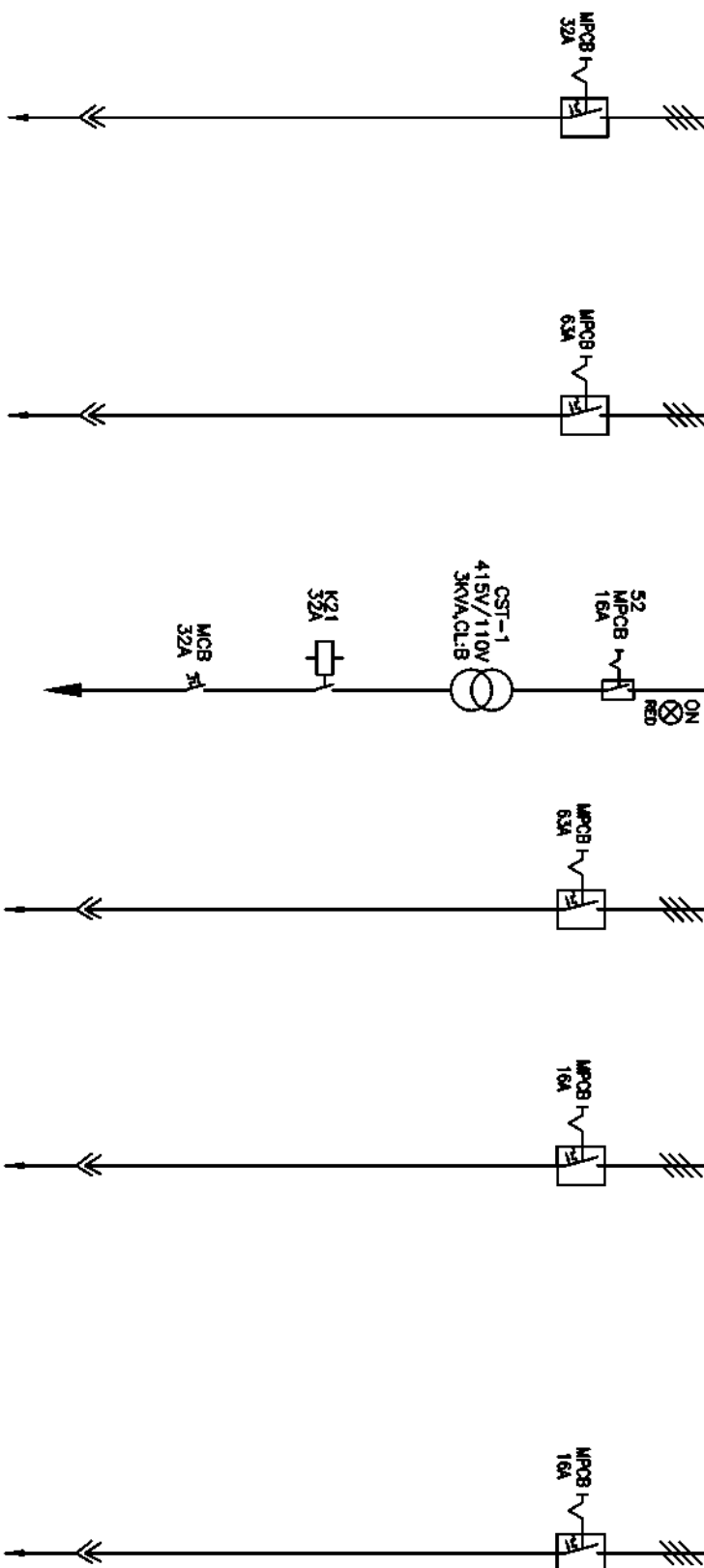
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415V, 1600A, 3PHASE, 4WIRE, 50KA FOR 1SEC

SECTION-A



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DRG. NO. EP-3-SL-047-871

INVENTORY NO.

| REV. | NO. | DATE     | DESCRIPTION                      | BY | APPD. | APPROVED | KSB | NAME    | SIGN. | DATE     | FILE NO. | SCALE | JOB NO. | CP-14-047 | DRG. NO. | EP-3-SL-047-871 | NO. OF SHEETS | 27 | REV. | 01 |
|------|-----|----------|----------------------------------|----|-------|----------|-----|---------|-------|----------|----------|-------|---------|-----------|----------|-----------------|---------------|----|------|----|
| 01   | 01  | 04.08.17 | REVISED AS PER UPDATED LOAD LIST | KS | KS    | CHECKED  |     | TRINATH |       | 24.05.17 | 3        |       |         |           |          |                 |               |    |      |    |
| 02   | 02  |          |                                  |    |       |          |     |         |       |          |          |       |         |           |          |                 |               |    |      |    |
| 03   | 03  |          |                                  |    |       |          |     |         |       |          |          |       |         |           |          |                 |               |    |      |    |
| 04   | 04  |          |                                  |    |       |          |     |         |       |          |          |       |         |           |          |                 |               |    |      |    |
| 05   | 05  |          |                                  |    |       |          |     |         |       |          |          |       |         |           |          |                 |               |    |      |    |
| 06   | 06  |          |                                  |    |       |          |     |         |       |          |          |       |         |           |          |                 |               |    |      |    |
| 07   | 07  |          |                                  |    |       |          |     |         |       |          |          |       |         |           |          |                 |               |    |      |    |

BHARAT HEAVY ELECTRICALS LIMITED

ELECTROPORCELAIN DIVISION BANGALORE

TITLE :

SILO MCC LOAD LIST (AHS MCC-2) (NEAR FLY ASH SILO)

NO. OF SHEETS

27

SHEET NO.

06

FIRST ANGLE PROJECTION

ALL DIMENSIONS ARE IN MM.

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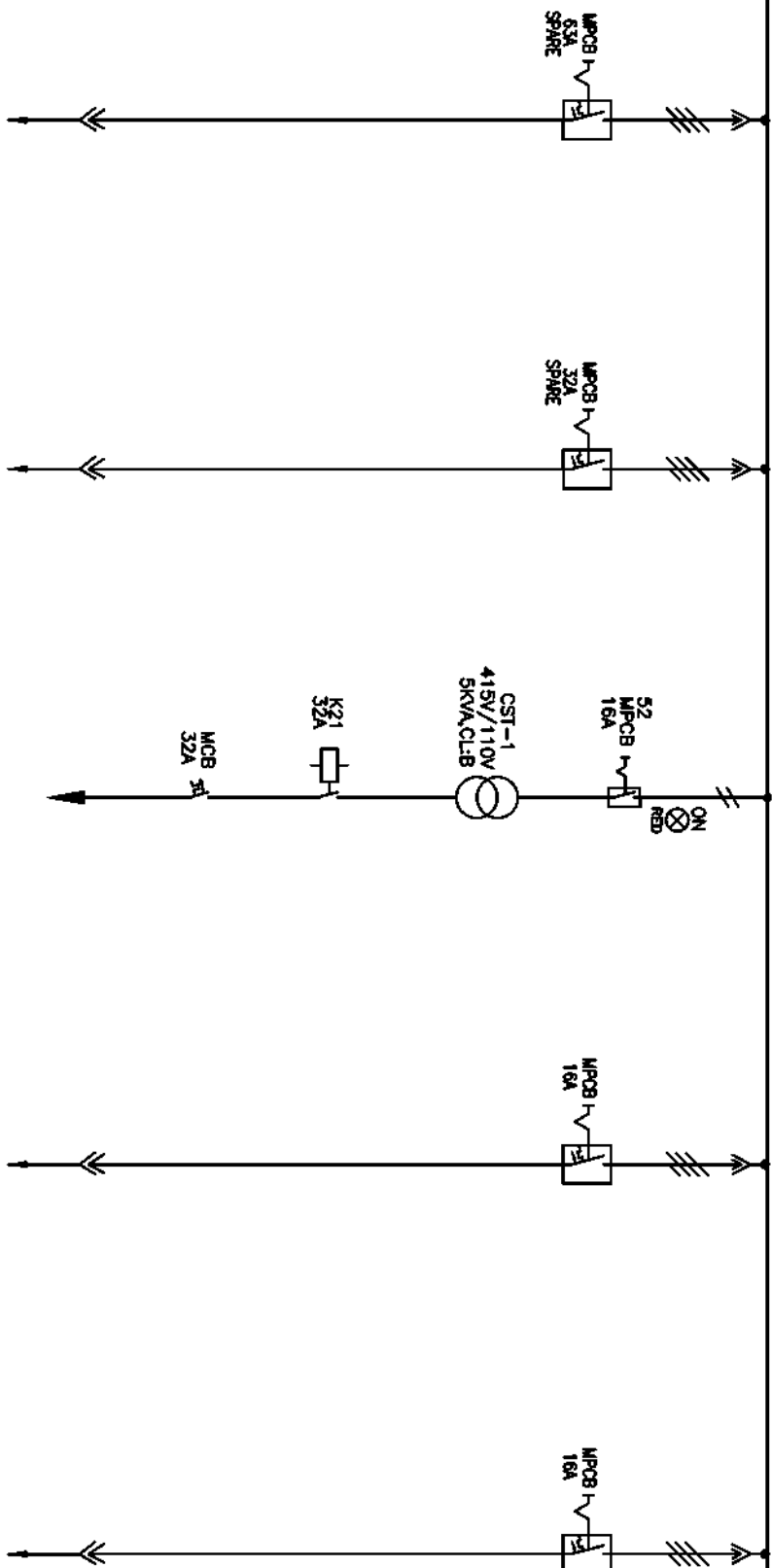
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415V, 1600A, 3PHASE, 4WIRE, 50KA FOR 1SEC

SECTION-A



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DRG. NO. EP-3-SL-047-871

INVENTORY NO.

| REV. NO. | DATE     | DESCRIPTION                      | BY  | APPD. | APPROVED | KSB | NAME    | SIGN. | DATE     | FILE NO. |
|----------|----------|----------------------------------|-----|-------|----------|-----|---------|-------|----------|----------|
| 01       | 04.08.17 | REVISED AS PER UPDATED LOAD LIST | KSJ | KSJ   | CHECKED  |     | TRINATH | KSJ   | 24.05.17 | 3        |
| 02       |          |                                  |     |       |          |     | TRINATH | KSJ   | 24.05.17 |          |
| 03       |          |                                  |     |       |          |     | TRINATH | KSJ   | 24.05.17 |          |
| 04       |          |                                  |     |       |          |     | TRINATH | KSJ   | 24.05.17 |          |
| 05       |          |                                  |     |       |          |     | TRINATH | KSJ   | 24.05.17 |          |
| 06       |          |                                  |     |       |          |     | TRINATH | KSJ   | 24.05.17 |          |
| 07       |          |                                  |     |       |          |     | TRINATH | KSJ   | 24.05.17 |          |

| KCS TAG NO. | FEEDER DESCRIPTION       | FEEDER RATING | FEEDER NO. | SCHEME REF      | CABLE SIZE         |
|-------------|--------------------------|---------------|------------|-----------------|--------------------|
|             | SPARE                    | 63A           | 3T         | EP-3-CS-047-022 | -                  |
|             | SPARE                    | 32A           | 3U         | EP-3-CS-047-022 | -                  |
|             | 110V CONTROL TRANSFORMER | 5KVA          | 3V         | EP-3-CS-047-039 | -                  |
|             | UPS FOR SILO DCS         | 16A           | 4Q         | EP-3-CS-047-022 | 1-4C X 16 SQMM(AL) |
|             | UPS FOR SILO DCS         | 16A           | 4R         | EP-3-CS-047-022 | 1-4C X 16 SQMM(AL) |

BHARAT HEAVY ELECTRICALS LIMITED  
ELECTROPORCELAIN DIVISION BANGALORE

TITLE :

SILO MCC LOAD LIST (AHS MCC-2) (NEAR FLY ASH SILO)

SCALE

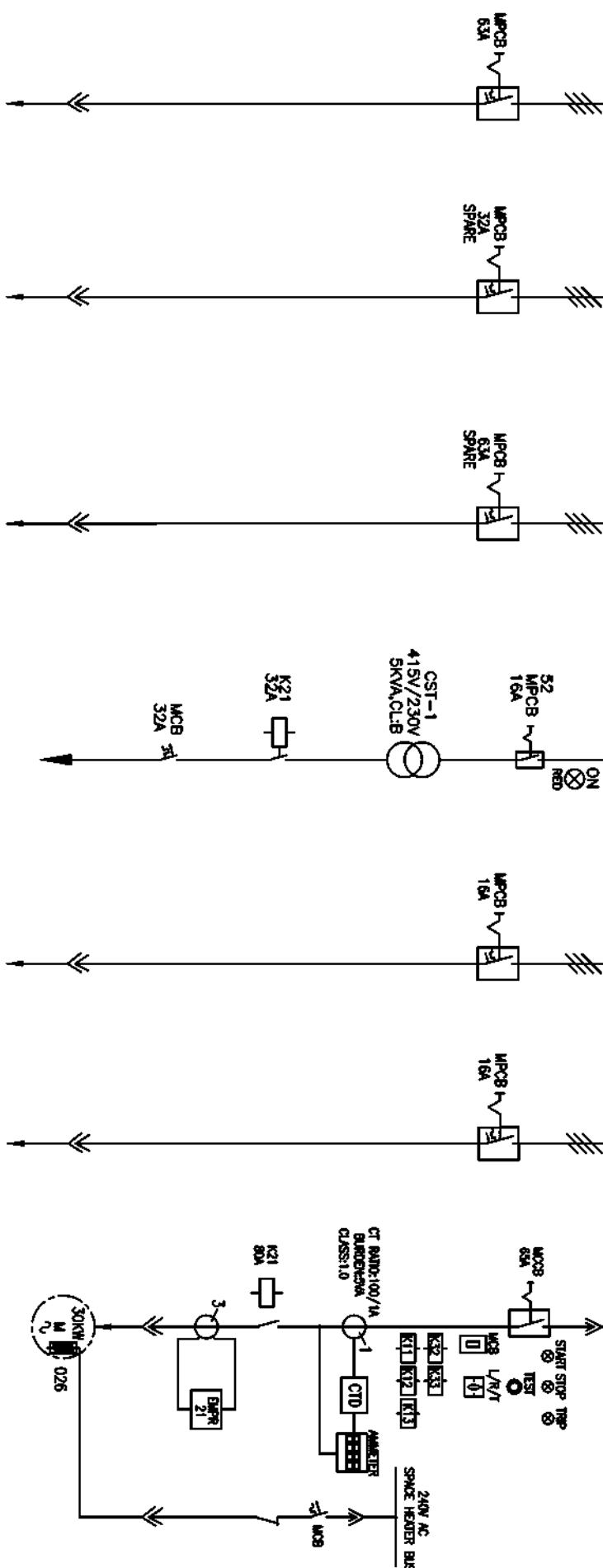
JOB NO. CP-14-047

DRG. NO. EP-3-SL-047-871

NO. OF SHEETS  
27NO. OF SHEETS  
09REV. NO.  
01

415V, 1600A, 3PHASE, 4WIRE, 50KA FOR 1SEC

SECTION-A



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DRG. NO. EP-3-SL-047-871

| KGS TAG NO. | FEEDER DESCRIPTION                 | FEEDER RATING | FEEDER NO. | SCHEME REF      | CABLE SIZE           |
|-------------|------------------------------------|---------------|------------|-----------------|----------------------|
|             | HEATER FOR SILO FLUIDIZING         | 63A           | 4S         | EP-3-CS-047-022 | 1-3.5C X 50 SQMM(AL) |
|             | SPARE                              | 32A           | 4T         | EP-3-CS-047-022 | -                    |
|             | SPARE                              | 63A           | 4U         | EP-3-CS-047-022 | -                    |
|             | 230V CONTROL TRANSFORMER           | 5KVA          | 4V         | EP-3-CS-047-039 | -                    |
|             | 415V SUPPLY TO VFD                 | 16A           | 5Q         | EP-3-CS-047-022 | 1-4C X 16 SQMM(AL)   |
|             | PCCB AT SILO-1                     | 16A           | 5R         | EP-3-CS-047-022 | 1-4C X 16 SQMM(AL)   |
|             | FLY ASH SILO FLUIDIZING AIR BLOWER | 30KW          | 5S         | EP-3-CS-047-026 | 1-3.5C X 50 SQMM(AL) |

INVENTORY NO.

| REV. | DATE     | DESCRIPTION                      | BY  | APPD. | APPROVED | KSB | NAME    | SIGN. | DATE     |
|------|----------|----------------------------------|-----|-------|----------|-----|---------|-------|----------|
| 01   | 04.08.17 | REVISED AS PER UPDATED LOAD LIST | KSJ | KSJ   | CHECKED  |     | TRINATH | KSJ   | 24.05.17 |
| 02   |          |                                  |     |       |          |     |         |       |          |
| 03   |          |                                  |     |       |          |     |         |       |          |
| 04   |          |                                  |     |       |          |     |         |       |          |
| 05   |          |                                  |     |       |          |     |         |       |          |
| 06   |          |                                  |     |       |          |     |         |       |          |
| 07   |          |                                  |     |       |          |     |         |       |          |

| BHARAT HEAVY ELECTRICALS LIMITED    |                     |
|-------------------------------------|---------------------|
| ELECTROPORCELAIN DIVISION BANGALORE |                     |
| TITLE:                              | SINGLE LINE DIAGRAM |
| SCALE:                              | 100% NO. CP-14-047  |
| NO. OF SHEETS:                      | 27                  |
| SHEET NO.:                          | 10                  |
| REV. NO.:                           | 01                  |

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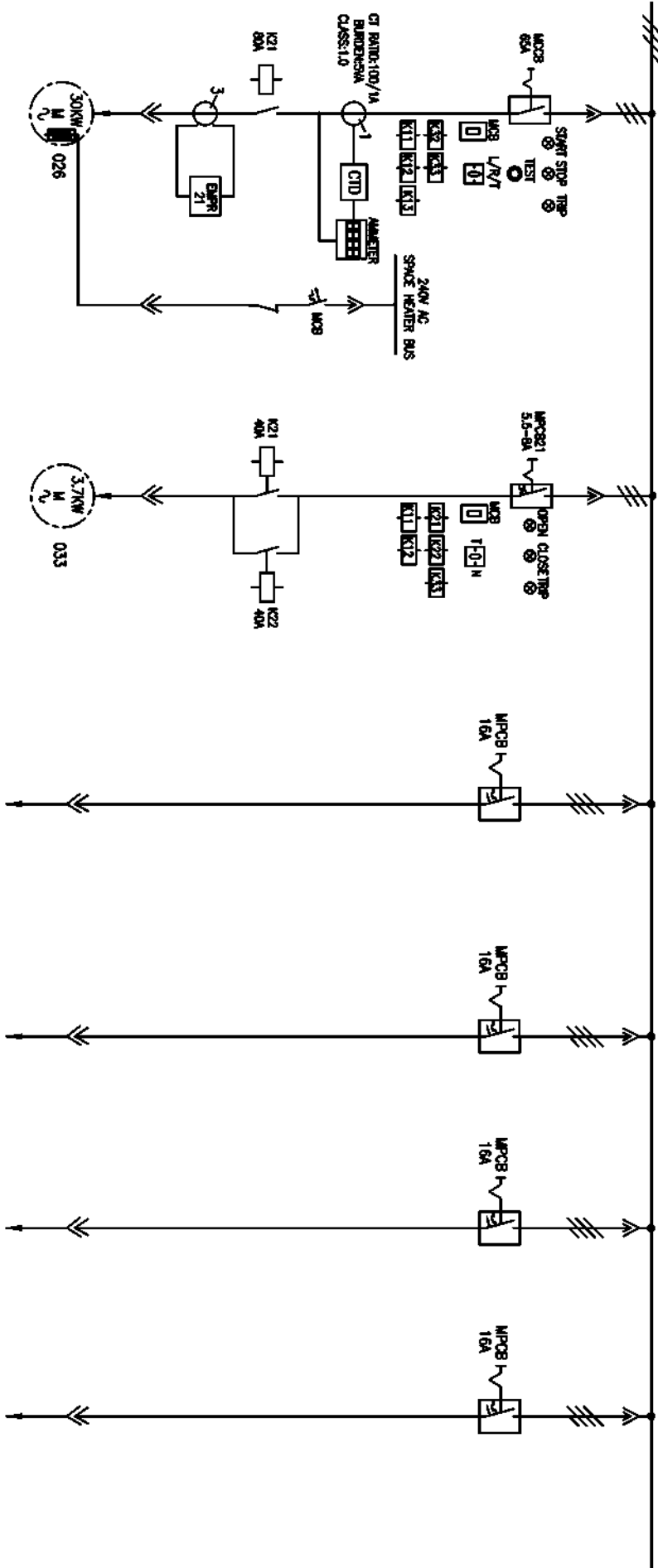
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415V, 1600A, 3PHASE, 4WIRE, 50KA FOR 1SEC

SECTION-A



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DRG. NO. EP-3-SL-047-871

INVENTORY NO.

| REV. | DATE     | DESCRIPTION                      | BY  | APPD. | APPROVED | KSB | FILE NO. | SCALE | JOB NO. | CP-14-047 | DRG. NO. | EP-3-SL-047-871 |
|------|----------|----------------------------------|-----|-------|----------|-----|----------|-------|---------|-----------|----------|-----------------|
| 01   | 04.08.17 | REVISED AS PER UPDATED LOAD LIST | KSJ | KSJ   | CHECKED  |     | DR :     |       |         |           |          |                 |
| 02   |          |                                  |     |       |          |     |          |       |         |           |          |                 |
| 03   |          |                                  |     |       |          |     |          |       |         |           |          |                 |
| 04   |          |                                  |     |       |          |     |          |       |         |           |          |                 |
| 05   |          |                                  |     |       |          |     |          |       |         |           |          |                 |
| 06   |          |                                  |     |       |          |     |          |       |         |           |          |                 |
| 07   |          |                                  |     |       |          |     |          |       |         |           |          |                 |

| KKS TAG NO. | FEEDER DESCRIPTION             | FEEDER RATING | FEEDER NO. | SCHEDULE REF    | CABLE SIZE         |
|-------------|--------------------------------|---------------|------------|-----------------|--------------------|
|             | SPARE                          | 30KW          | 5T         | EP-3-CS-047-026 | -                  |
|             | MISC USE                       | 3.7KW         | 6P         | EP-3-CS-047-033 | 1-3C X 16 SQMM(AL) |
|             | UPS FOR HSSD SYSTEM            | 16A           | 8Q         | EP-3-CS-047-022 | 1-4C X 16 SQMM(AL) |
|             | 1T ELECTRIC HOIST AT SILO TOP  | 16A           | 6R         | EP-3-CS-047-022 | 1-4C X 16 SQMM(AL) |
|             | RAW POWER FOR DCS AT AHS MCC-2 | 16A           | 6S         | EP-3-CS-047-022 | 1-4C X 16 SQMM(AL) |
|             | TOILET EXHAUST FAN             | 16A           | 6T         | EP-3-CS-047-022 | 1-4C X 16 SQMM(AL) |

BHARAT HEAVY ELECTRICALS LIMITED  
ELECTROPORCELAIN DIVISION BANGALORE

TITLE :

SILLO MCC LOAD LIST (AHS MCC-2) (NEAR FLY ASH SILO)

NO. OF  
SHEETS

27

SHEET  
NO.

11

REV.  
NO.

01

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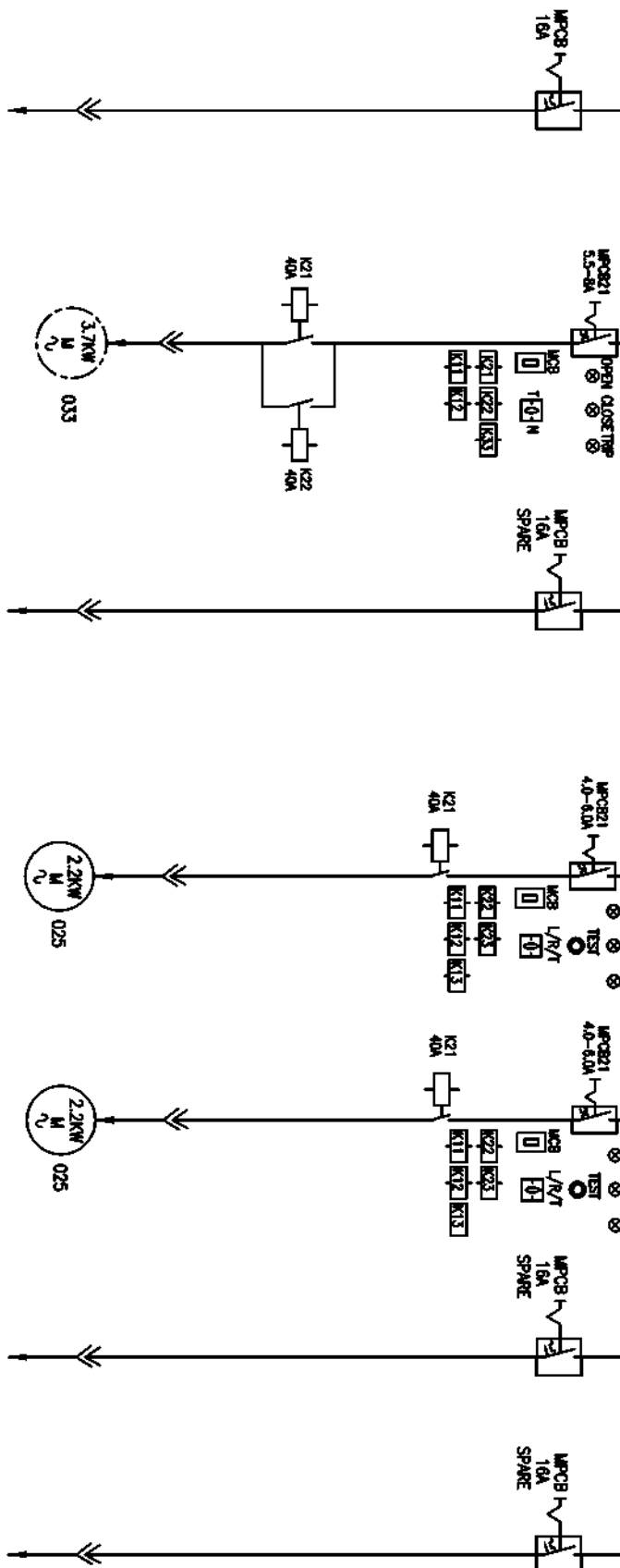
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415V, 1600A, 3PHASE, 4WIRE, 50KA FOR 1SEC

SECTION-A



DRG. NO. EP-3-SL-047-871

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| KKS TAG NO.        | UPS FOR HCSO SYSTEM | SPARE           | SPARE           | SPARE           | SPARE               | SPARE           | SPARE           |
|--------------------|---------------------|-----------------|-----------------|-----------------|---------------------|-----------------|-----------------|
| FEEDER DESCRIPTION | 16A                 | 3.7KW           | 16A             | 2.2KW           | 2.2KW               | 16A             | 16A             |
| FEEDER RATING      | 16A                 | 3.7KW           | 16A             | 2.2KW           | 2.2KW               | 16A             | 16A             |
| FEEDER NO.         | 6U                  | 6V              | 7Q              | 7R              | 7S                  | 7T              | 7U              |
| SCHEME REF         | EP-3-CS-047-022     | EP-3-CS-047-033 | EP-3-CS-047-022 | EP-3-CS-047-025 | EP-3-CS-047-025     | EP-3-CS-047-022 | EP-3-CS-047-022 |
| CABLE SIZE         | 1-4C X 16 SQMM(AL)  | -               | -               | -               | 1-3C X 2.5 SQMM(CU) | -               | -               |

INVENTORY NO.

| REV. | DATE     | DESCRIPTION                      | BY    | APPD. | APPROVED | KSB |
|------|----------|----------------------------------|-------|-------|----------|-----|
| 01   | 04.08.17 | REVISED AS PER UPDATED LOAD LIST | SAJAL | SAJAL | CHECKED  |     |
| 02   |          |                                  |       |       |          |     |
| 03   |          |                                  |       |       |          |     |
| 04   |          |                                  |       |       |          |     |
| 05   |          |                                  |       |       |          |     |
| 06   |          |                                  |       |       |          |     |
| 07   |          |                                  |       |       |          |     |

| NAME    | SIGN. | DATE     |
|---------|-------|----------|
| TRINATH |       | 24.05.17 |
| TRINATH |       | 24.05.17 |

| FILE NO. | SCALE | JOB NO. | CP-14-047 | DRG. NO. | EP-3-SL-047-871 |
|----------|-------|---------|-----------|----------|-----------------|
| 3        |       |         |           |          |                 |

| NO. OF SHEETS | 27 |
|---------------|----|
| SHEET NO.     | 12 |
| REV.          | 01 |

FIRST ANGLE PROJECTION

ALL DIMENSIONS ARE IN MM.

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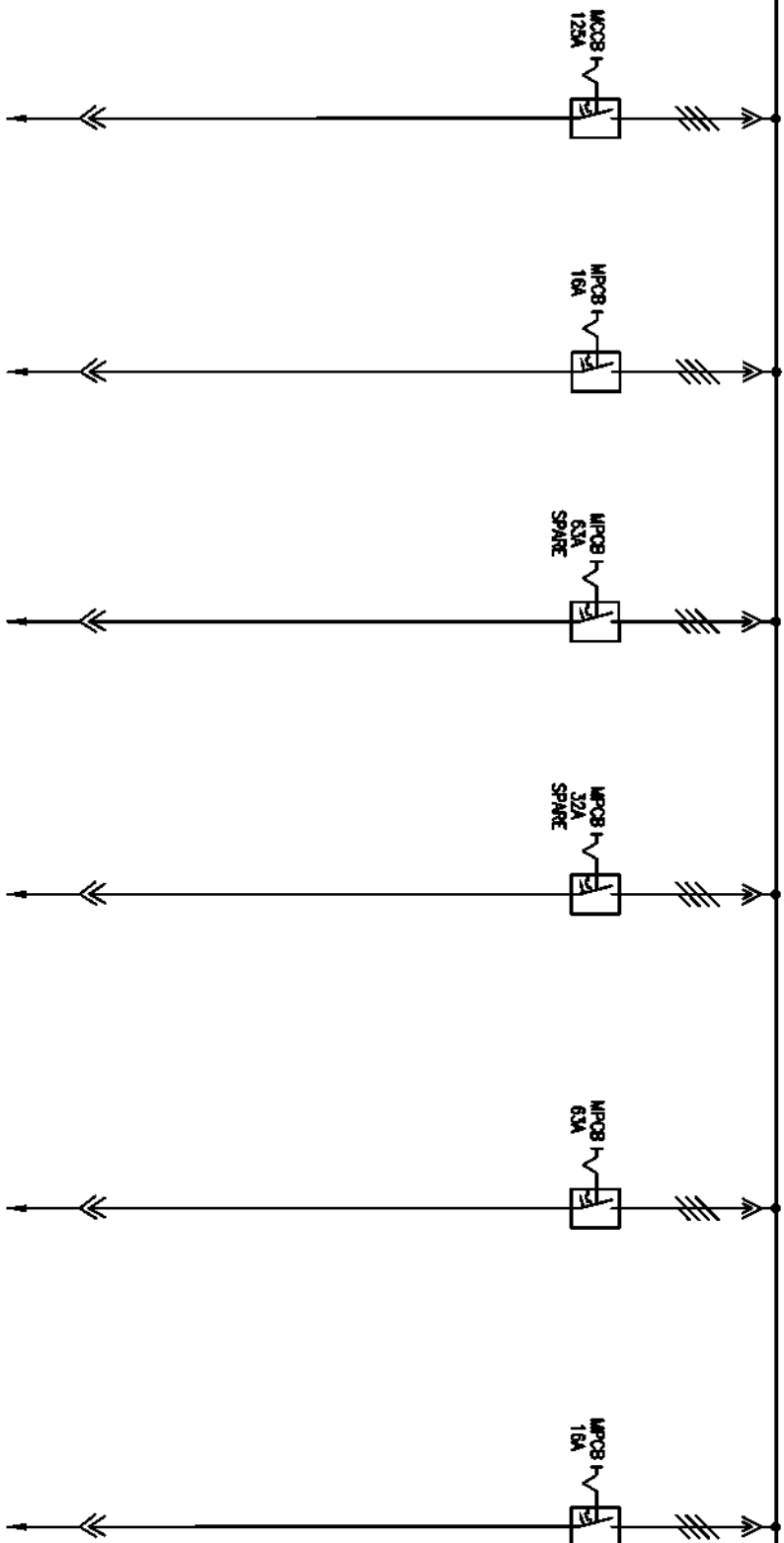
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415V, 1600A, 3PHASE, 4WIRE, 50KA FOR 1SEC

SECTION-A



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DRG. NO. EP-3-SL-047-871

| KGS TAG NO.        | MISC USE             | RAW POWER SUPPLY FOR HCSD | SPARE           | SPARE           | HEATER FOR SILO FLUIDIZING | MISC USE           |
|--------------------|----------------------|---------------------------|-----------------|-----------------|----------------------------|--------------------|
| FEDDER DESCRIPTION | 125A                 | 16A                       | 63A             | 32A             | 63A                        | 16A                |
| FEDDER RATING      | 7V                   | 7V                        | 8Q              | 8R              | 8S                         | 8T                 |
| SCHDME RET         | EP-3-CS-047-022      | EP-3-CS-047-022           | EP-3-CS-047-022 | EP-3-CS-047-022 | EP-3-CS-047-022            | EP-3-CS-047-022    |
| CABLE SIZE         | 1-3.5C X 35 SQMM(AL) | 1-4C X 16 SQMM(AL)        | -               | -               | 1-3C X 50 SQMM(AL)         | 1-4C X 16 SQMM(AL) |

INVENTORY NO.

| REV. | DATE     | DESCRIPTION                      | BY  | APPD. | APPROVED | KSB | NAME    | SIGN. | DATE     | FILE NO. | SCALE | JOB NO. | CP-14-047 | DRG. NO. | EP-3-SL-047-871 | NO. OF SHEETS | 27 | NO. OF SHEETS | 13 | REV. | 01 |
|------|----------|----------------------------------|-----|-------|----------|-----|---------|-------|----------|----------|-------|---------|-----------|----------|-----------------|---------------|----|---------------|----|------|----|
| 01   | 04.08.17 | REVISED AS PER UPDATED LOAD LIST | KSJ | KSJ   | CHECKED  |     | TRINATH | KSJ   | 24.05.17 | 3        |       |         |           |          |                 |               |    |               |    |      |    |
| 02   |          |                                  |     |       |          |     |         |       |          |          |       |         |           |          |                 |               |    |               |    |      |    |
| 03   |          |                                  |     |       |          |     |         |       |          |          |       |         |           |          |                 |               |    |               |    |      |    |
| 04   |          |                                  |     |       |          |     |         |       |          |          |       |         |           |          |                 |               |    |               |    |      |    |
| 05   |          |                                  |     |       |          |     |         |       |          |          |       |         |           |          |                 |               |    |               |    |      |    |
| 06   |          |                                  |     |       |          |     |         |       |          |          |       |         |           |          |                 |               |    |               |    |      |    |
| 07   |          |                                  |     |       |          |     |         |       |          |          |       |         |           |          |                 |               |    |               |    |      |    |

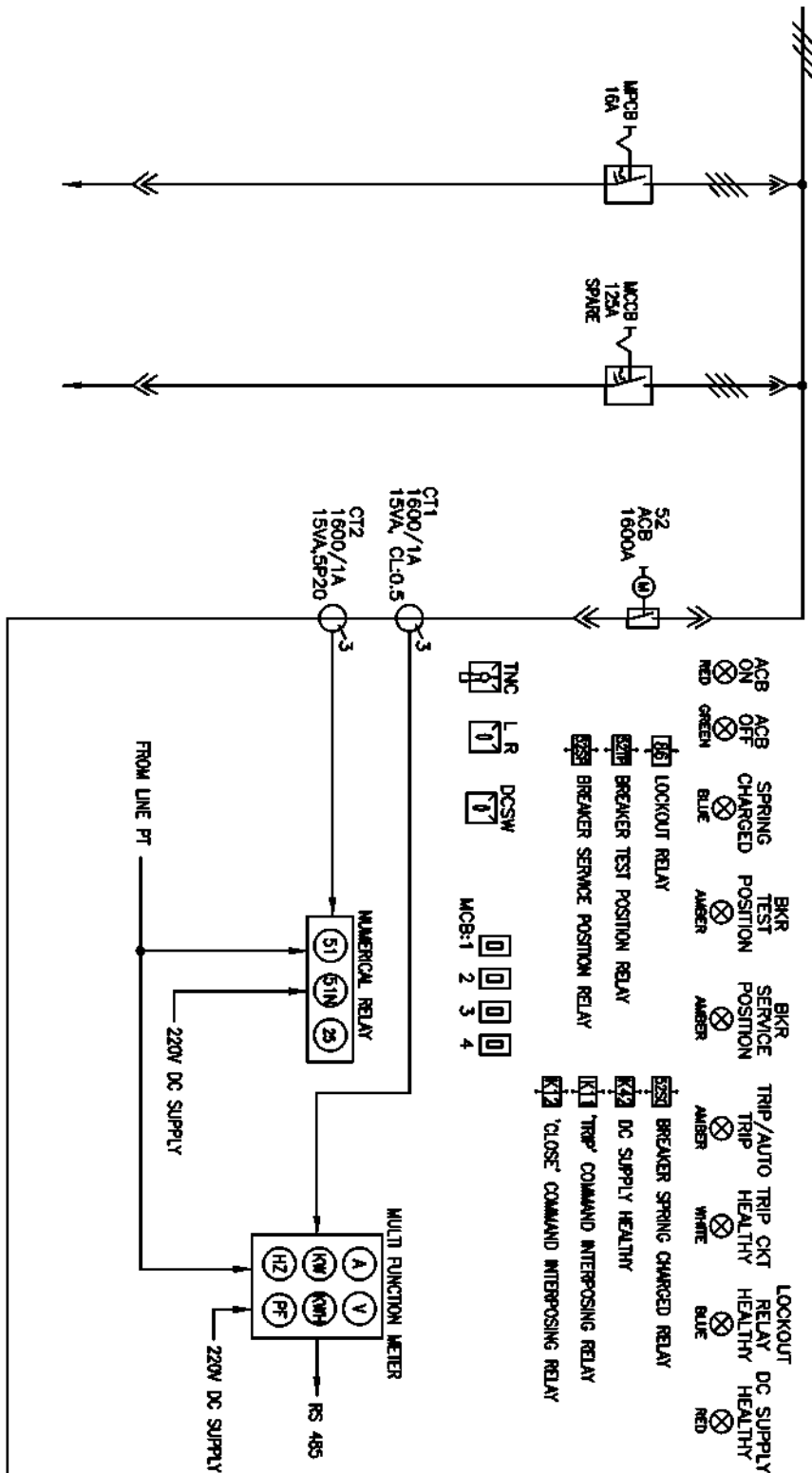
BHARAT HEAVY ELECTRICALS LIMITED

ELECTROPORCELAIN DIVISION BANGALORE

TITLE :

SILO MCC LOAD LIST (AHS MCC-2) (NEAR FLY ASH SILO)

4.15V, 1600A, 3PHASE, 4WIRE, 50KA FOR 1SEC



| FEEDER TAG NO.     |                    |                 |                 |
|--------------------|--------------------|-----------------|-----------------|
| FEEDER DESCRIPTION | MISC USE           | SPARE           | BUSCOUPLER      |
| FEEDER RATING      | 16A                | 125A            | 1600A           |
| FEEDER NO.         | 8U                 | 8V              | 9B              |
| SCHEMATIC REF      | EP-3-CS-047-022    | EP-3-CS-047-022 | EP-3-CS-047-003 |
| CABLE SIZE         | 1-4C X 16 SQMM(AU) | -               | -               |

[illegible]

## SECTION-B



|                    |                 |                              |                                 |                              |
|--------------------|-----------------|------------------------------|---------------------------------|------------------------------|
| KGS TAG NO.        |                 |                              |                                 |                              |
| FEEDER DESCRIPTION | BUS PT-B        | FLY ASH SILO UNLOADING PANEL | DRAIN SUMP PUMP AT FLY ASH SILO | BATTERY CHARGER AT AHS MCC-2 |
| FEEDER RATING      | 100VA           | 16A                          | 32A(11KW)                       | 63A                          |
| FEEDER NO.         | 10A             | 10B                          | 10C                             | 10D                          |
| SCHEM REF          | EP-3-CS-047-036 | EP-3-CS-047-022              | EP-3-CS-047-022                 | EP-3-CS-047-022              |
| CABLE SIZE         | -               | 1-4C X 16 SQMM(A)            | 1-3C X 16 SQMM(A)               | 1-4C X 16 SQMM(A)            |
|                    |                 |                              |                                 | CONTROL TRANSFORMER          |
|                    |                 |                              |                                 | EP-3-CS-047-039              |
|                    |                 |                              |                                 | -                            |

| INVENTORY NO.                                                                        |          |                                  |                    |                         |                                                                                     |                                                                                     |          |                     |  |
|--------------------------------------------------------------------------------------|----------|----------------------------------|--------------------|-------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|----------|---------------------|--|
| REV.                                                                                 | DATE     | DESCRIPTION                      | BY                 | APPROVED                | NAME                                                                                | SIGN.                                                                               | DATE     |                     |  |
| 07                                                                                   |          |                                  |                    |                         |                                                                                     |                                                                                     |          |                     |  |
| 06                                                                                   |          |                                  |                    |                         |                                                                                     |                                                                                     |          |                     |  |
| 05                                                                                   |          |                                  |                    |                         | DESIGNED                                                                            |                                                                                     |          |                     |  |
| 04                                                                                   |          |                                  |                    |                         | TRINATH                                                                             | <i>[Signature]</i>                                                                  | 24.05.17 |                     |  |
| 03                                                                                   |          |                                  |                    |                         |                                                                                     |                                                                                     |          |                     |  |
| 02                                                                                   |          |                                  |                    |                         | DRAWN                                                                               |                                                                                     |          |                     |  |
| 01                                                                                   | 04.08.17 | REVISED AS PER UPDATED LOAD LIST | <i>[Signature]</i> | <i>[Signature]</i>      | TRINATH                                                                             | <i>[Signature]</i>                                                                  | 24.05.17 |                     |  |
|                                                                                      |          |                                  |                    | CHECKED                 |                                                                                     |                                                                                     |          |                     |  |
|                                                                                      |          |                                  |                    | APPROVED                |                                                                                     |                                                                                     |          |                     |  |
|                                                                                      |          |                                  |                    | KCSB                    |                                                                                     | <i>[Signature]</i>                                                                  | 24.05.17 |                     |  |
|                                                                                      |          |                                  |                    |                         |  |                                                                                     |          |                     |  |
|                                                                                      |          |                                  |                    |                         | DR :<br>FILE NO.: 3                                                                 |                                                                                     |          |                     |  |
| BHARAT HEAVY ELECTRICALS LIMITED<br>ELECTROPORECLAM DIVISION BANGALORE               |          |                                  |                    |                         |                                                                                     |                                                                                     |          |                     |  |
| TITLE :<br>SINGLE LINE DIAGRAM<br>SILO MCC LOAD LIST (AHS MCC-2) (NEAR FLY ASH SILO) |          |                                  |                    |                         |                                                                                     |                                                                                     |          |                     |  |
| SCALE                                                                                |          | 408 NO. CP-14-047                |                    | 006 NO. EP-3-SL-047-871 |                                                                                     |  |          | NO. OF SHEETS<br>27 |  |
|                                                                                      |          |                                  |                    |                         |                                                                                     |                                                                                     |          | SHEET<br>15         |  |
|                                                                                      |          |                                  |                    |                         |                                                                                     |                                                                                     |          | REV.<br>01          |  |

FIRST ANGLE PROJECTION

ALL DIMENSIONS ARE IN MM.

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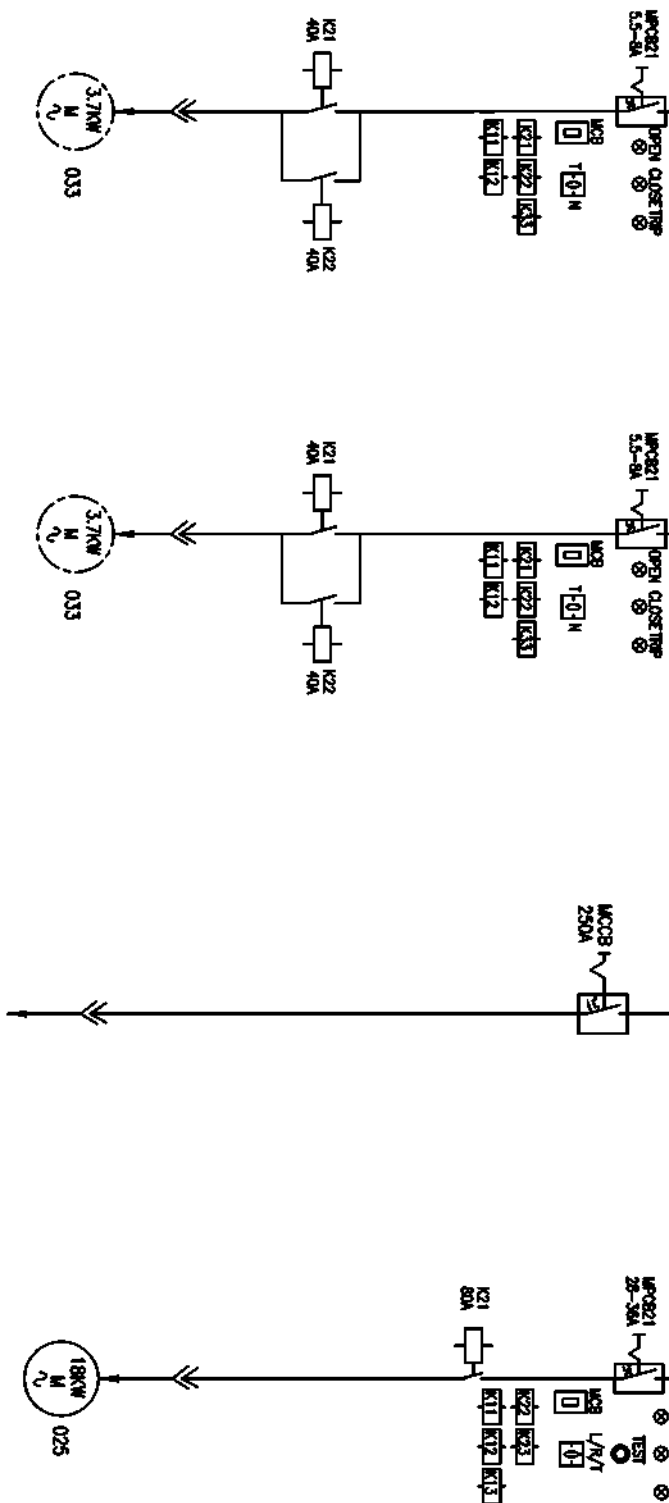
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415V, 1600A, 3PHASE, 4WIRE, 50KA FOR 1SEC

SECTION-B



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DRG. NO. EP-3-SL-047-871

| KGS TAG NO.       |                    |  |  |
|-------------------|--------------------|--|--|
| FEDER DESCRIPTION | RWF AT SILO        |  |  |
| FEDER RATING      | 3.7KW              |  |  |
| FEDER NO.         | 11A                |  |  |
| SCHEME REF        | EP-3-CS-047-033    |  |  |
| CABLE SIZE        | 1-3C X 16 SQMM(AL) |  |  |

| INVENTORY NO. | REV. | DATE     | DESCRIPTION                      | BY | APPD. | APPROVED | KSB | NAME    | SIGN. | DATE     | DR. | FILE NO. | SCALE | JOB NO. | CP-14-047 | DRG. NO. | EP-3-SL-047-871 | NO. OF SHEETS | 27 | NO. OF SHEETS | 16 | REV. | 01 |
|---------------|------|----------|----------------------------------|----|-------|----------|-----|---------|-------|----------|-----|----------|-------|---------|-----------|----------|-----------------|---------------|----|---------------|----|------|----|
| 01            | 01   | 04.08.17 | REVISED AS PER UPDATED LOAD LIST | KS | KS    | CHECKED  |     | TRINATH | KS    | 24.05.17 | DR  |          |       |         |           |          |                 |               |    |               |    |      |    |
| 02            | 02   |          |                                  |    |       |          |     |         |       |          |     |          |       |         |           |          |                 |               |    |               |    |      |    |
| 03            | 03   |          |                                  |    |       |          |     |         |       |          |     |          |       |         |           |          |                 |               |    |               |    |      |    |
| 04            | 04   |          |                                  |    |       |          |     |         |       |          |     |          |       |         |           |          |                 |               |    |               |    |      |    |
| 05            | 05   |          |                                  |    |       |          |     |         |       |          |     |          |       |         |           |          |                 |               |    |               |    |      |    |
| 06            | 06   |          |                                  |    |       |          |     |         |       |          |     |          |       |         |           |          |                 |               |    |               |    |      |    |
| 07            | 07   |          |                                  |    |       |          |     |         |       |          |     |          |       |         |           |          |                 |               |    |               |    |      |    |

BHARAT HEAVY ELECTRICALS LIMITED

ELECTROPORCELAIN DIVISION BANGALORE

TITLE :

SILO MCC LOAD LIST (AHS MCC-2) (NEAR FLY ASH SILO)



FIRST ANGLE PROJECTION

ALL DIMENSIONS ARE IN MM.

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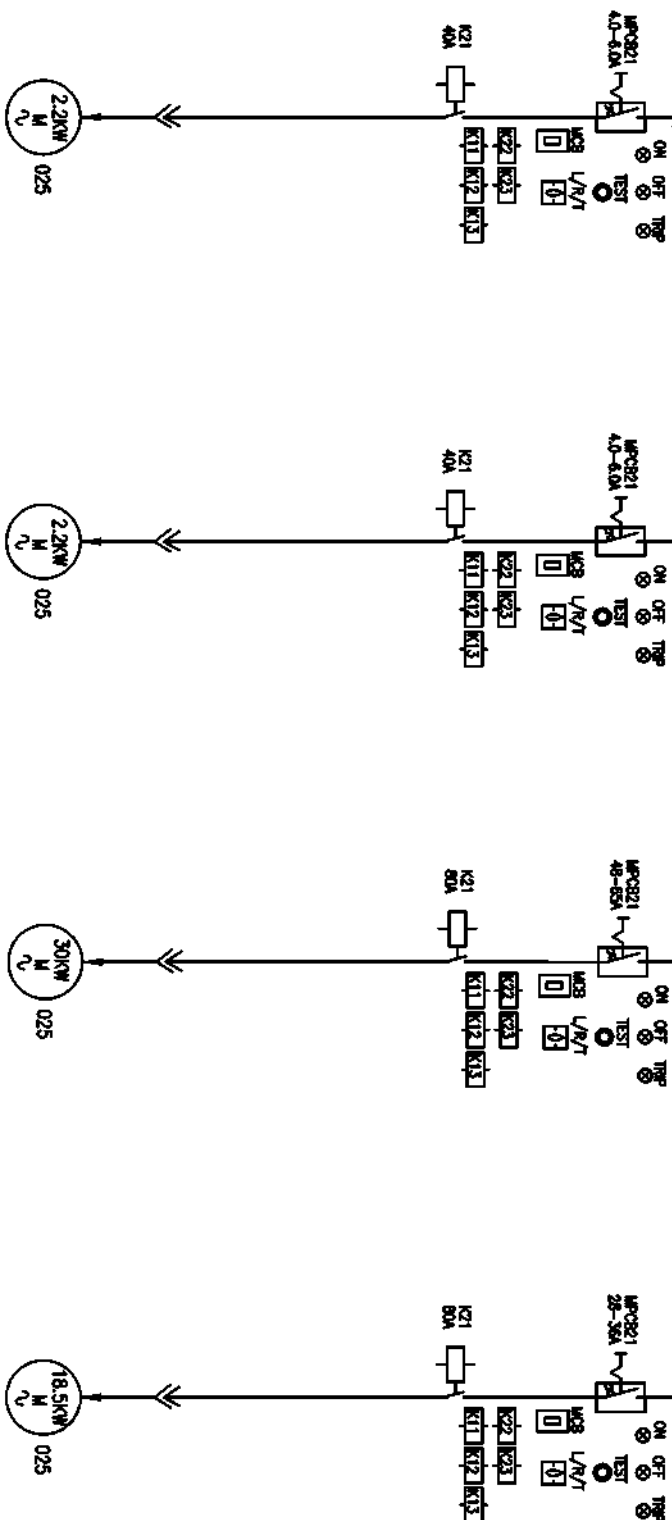
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415V, 1600A, 3PHASE, 4WIRE, 50KA FOR 1SEC

SECTION-B



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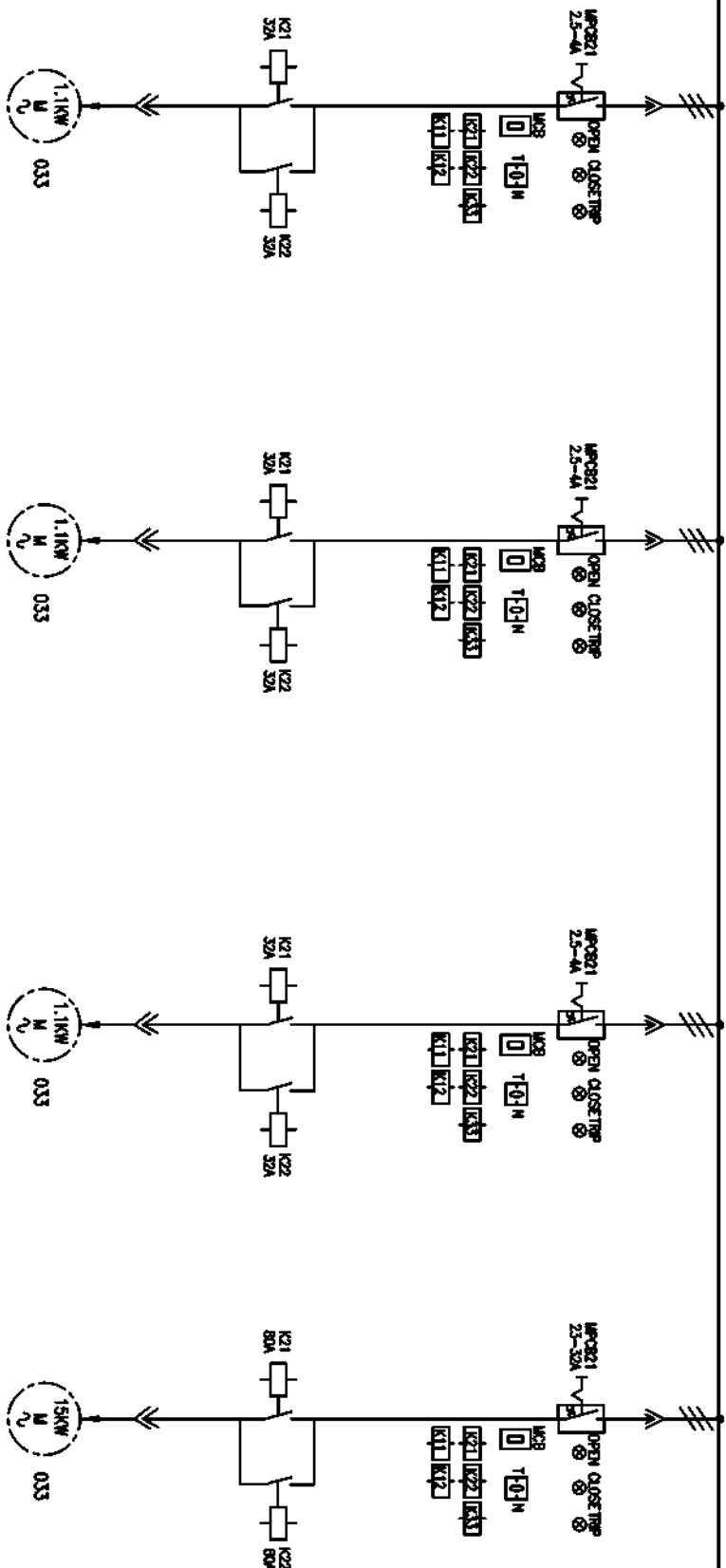
DRG. NO. EP-3-SL-047-871

| KGS TAG NO.       | BAG FILTER FOR UNLOADING SPOUT | BAG FILTER FOR UNLOADING SPOUT | ASH CONDITIONER AT FI SILO | SPARE           |
|-------------------|--------------------------------|--------------------------------|----------------------------|-----------------|
| FEDER DESCRIPTION |                                |                                |                            |                 |
| FEDER RATING      | 2.2KW                          | 2.2KW                          | 30KW                       | 18.5 KW         |
| FEDER NO.         | 12A                            | 12B                            | 12C                        | 12D             |
| SCHEME REF        | EP-3-CS-047-025                | EP-3-CS-047-025                | EP-3-CS-047-025            | EP-3-CS-047-025 |
| CABLE SIZE        | 1-3C X 2.5 SQMM(CU)            | 1-3C X 2.5 SQMM(CU)            | 1-3C X 35 SQMM(AL)         | -               |

|               |          |                                  |  |    |  |       |  |          |  |     |  |          |  |   |  |           |  |       |  |                   |  |                          |  |               |  |    |  |               |  |    |  |      |  |    |  |
|---------------|----------|----------------------------------|--|----|--|-------|--|----------|--|-----|--|----------|--|---|--|-----------|--|-------|--|-------------------|--|--------------------------|--|---------------|--|----|--|---------------|--|----|--|------|--|----|--|
| INVENTORY NO. |          | DATE                             |  | BY |  | APPD. |  | APPROVED |  | KSB |  | 24.05.17 |  | 3 |  | FILE NO.: |  | SCALE |  | JOB NO. CP-14-047 |  | DRG. NO. EP-3-SL-047-871 |  | NO. OF SHEETS |  | 27 |  | NO. OF SHEETS |  | 17 |  | REV. |  | 01 |  |
| 01            | 04.08.17 | REVISED AS PER UPDATED LOAD LIST |  |    |  |       |  |          |  |     |  |          |  |   |  |           |  |       |  |                   |  |                          |  |               |  |    |  |               |  |    |  |      |  |    |  |
| 02            |          |                                  |  |    |  |       |  |          |  |     |  |          |  |   |  |           |  |       |  |                   |  |                          |  |               |  |    |  |               |  |    |  |      |  |    |  |
| 03            |          |                                  |  |    |  |       |  |          |  |     |  |          |  |   |  |           |  |       |  |                   |  |                          |  |               |  |    |  |               |  |    |  |      |  |    |  |
| 04            |          |                                  |  |    |  |       |  |          |  |     |  |          |  |   |  |           |  |       |  |                   |  |                          |  |               |  |    |  |               |  |    |  |      |  |    |  |
| 05            |          |                                  |  |    |  |       |  |          |  |     |  |          |  |   |  |           |  |       |  |                   |  |                          |  |               |  |    |  |               |  |    |  |      |  |    |  |
| 06            |          |                                  |  |    |  |       |  |          |  |     |  |          |  |   |  |           |  |       |  |                   |  |                          |  |               |  |    |  |               |  |    |  |      |  |    |  |
| 07            |          |                                  |  |    |  |       |  |          |  |     |  |          |  |   |  |           |  |       |  |                   |  |                          |  |               |  |    |  |               |  |    |  |      |  |    |  |

415V, 1600A, 3PHASE, 4WIRE, 50KA FOR 1SEC

SECTION-B



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DRG. NO. EP-3-SL-047-871

INVENTORY NO.

| REV. | DATE     | DESCRIPTION                      | BY | APPD. | APPROVED | KSB | NAME    | SIGN. | DATE     | FILE NO. | SCALE | JOB NO. | CP-14-047 | DRG. NO. | EP-3-SL-047-871 | NO. OF SHEETS | 27 | NO. OF SHEETS | 18 | REV. | 01 |
|------|----------|----------------------------------|----|-------|----------|-----|---------|-------|----------|----------|-------|---------|-----------|----------|-----------------|---------------|----|---------------|----|------|----|
| 01   | 04.08.17 | REVISED AS PER UPDATED LOAD LIST | KS | KS    | CHECKED  |     | TRINATH | KS    | 24.05.17 | 3        |       |         |           |          |                 |               |    |               |    |      |    |
| 02   |          |                                  |    |       |          |     |         |       |          |          |       |         |           |          |                 |               |    |               |    |      |    |
| 03   |          |                                  |    |       |          |     |         |       |          |          |       |         |           |          |                 |               |    |               |    |      |    |
| 04   |          |                                  |    |       |          |     |         |       |          |          |       |         |           |          |                 |               |    |               |    |      |    |
| 05   |          |                                  |    |       |          |     |         |       |          |          |       |         |           |          |                 |               |    |               |    |      |    |
| 06   |          |                                  |    |       |          |     |         |       |          |          |       |         |           |          |                 |               |    |               |    |      |    |
| 07   |          |                                  |    |       |          |     |         |       |          |          |       |         |           |          |                 |               |    |               |    |      |    |

BHARAT HEAVY ELECTRICALS LIMITED

ELECTROPORCELAIN DIVISION BANGALORE

TITLE :

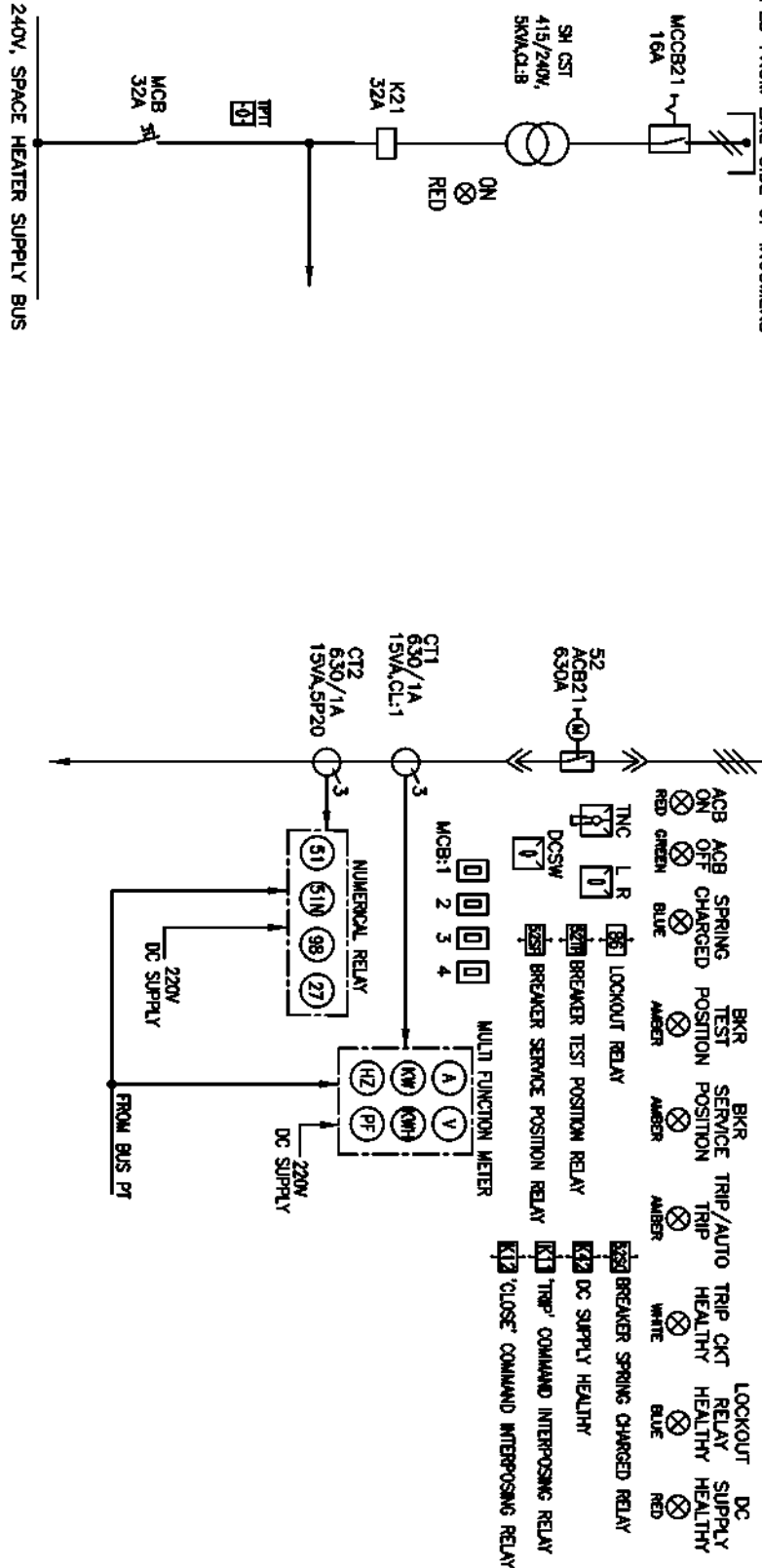
SILLO MCC LOAD LIST (AHS MCC-2) (NEAR FLY ASH SILO)



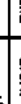


## SECTION-B

1133



| KCS TAG NO.        |                 |                 |
|--------------------|-----------------|-----------------|
| FEEDER DESCRIPTION | SPACE HEATER    | HCSO INCOMMER   |
| FEEDER RATING      | 5KVA            | 630A            |
| FEEDER NO.         | 15B             | 16B             |
| SCHEME REF         | EP-3-CS-047-041 | EP-3-CS-047-013 |
| CABLE SIZE         | -               | -               |

| INVENTORY NO. |          |                                  |                    |                    |          |                                                                                     |                    |          |  |
|---------------|----------|----------------------------------|--------------------|--------------------|----------|-------------------------------------------------------------------------------------|--------------------|----------|--|
| REV.          | DATE     | DESCRIPTION                      | BY                 | APPRO.             | APPROVED | NAME                                                                                | SIGN.              | DATE     |  |
| 07            |          |                                  |                    |                    |          |                                                                                     |                    |          |  |
| 06            |          |                                  |                    |                    | DESIGNED | TRINATH                                                                             | <i>[Signature]</i> | 24.05.17 |  |
| 05            |          |                                  |                    |                    |          |                                                                                     |                    |          |  |
| 04            |          |                                  |                    |                    | DRAWN    | TRINATH                                                                             | <i>[Signature]</i> | 24.05.17 |  |
| 03            |          |                                  |                    |                    |          |                                                                                     |                    |          |  |
| 02            |          |                                  |                    |                    | CHECKED  |                                                                                     |                    |          |  |
| 01            | 24.05.17 | REVISED AS PER UPDATED LOAD LIST | <i>[Signature]</i> | <i>[Signature]</i> |          |                                                                                     |                    |          |  |
|               |          |                                  |                    |                    |          |   |                    |          |  |
|               |          |                                  |                    |                    |          | BHARAT HEAVY ELECTRICALS LIMITED<br>ELECTROPORECLAM DIVISION BANGALORE              |                    |          |  |
|               |          |                                  |                    |                    |          | SINGLE LINE DIAGRAM<br>SILO MCC LOAD LIST (AHS MCC-2) (NEAR FLY ASH SILO)           |                    |          |  |
|               |          |                                  |                    |                    |          | TITLE :                                                                             |                    |          |  |
|               |          |                                  |                    |                    |          | NO. OF SHEETS : 27                                                                  |                    |          |  |
|               |          |                                  |                    |                    |          | SHEET : 20                                                                          |                    |          |  |
|               |          |                                  |                    |                    |          | SCALE : 1/88 NO. CP-14-047                                                          |                    |          |  |
|               |          |                                  |                    |                    |          | DRG. NO. EP-3-SL-047-871                                                            |                    |          |  |
|               |          |                                  |                    |                    |          |  |                    |          |  |

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### ERECT ANGLE PROJECTION

**ALL DIMENSIONS ARE IN MM**

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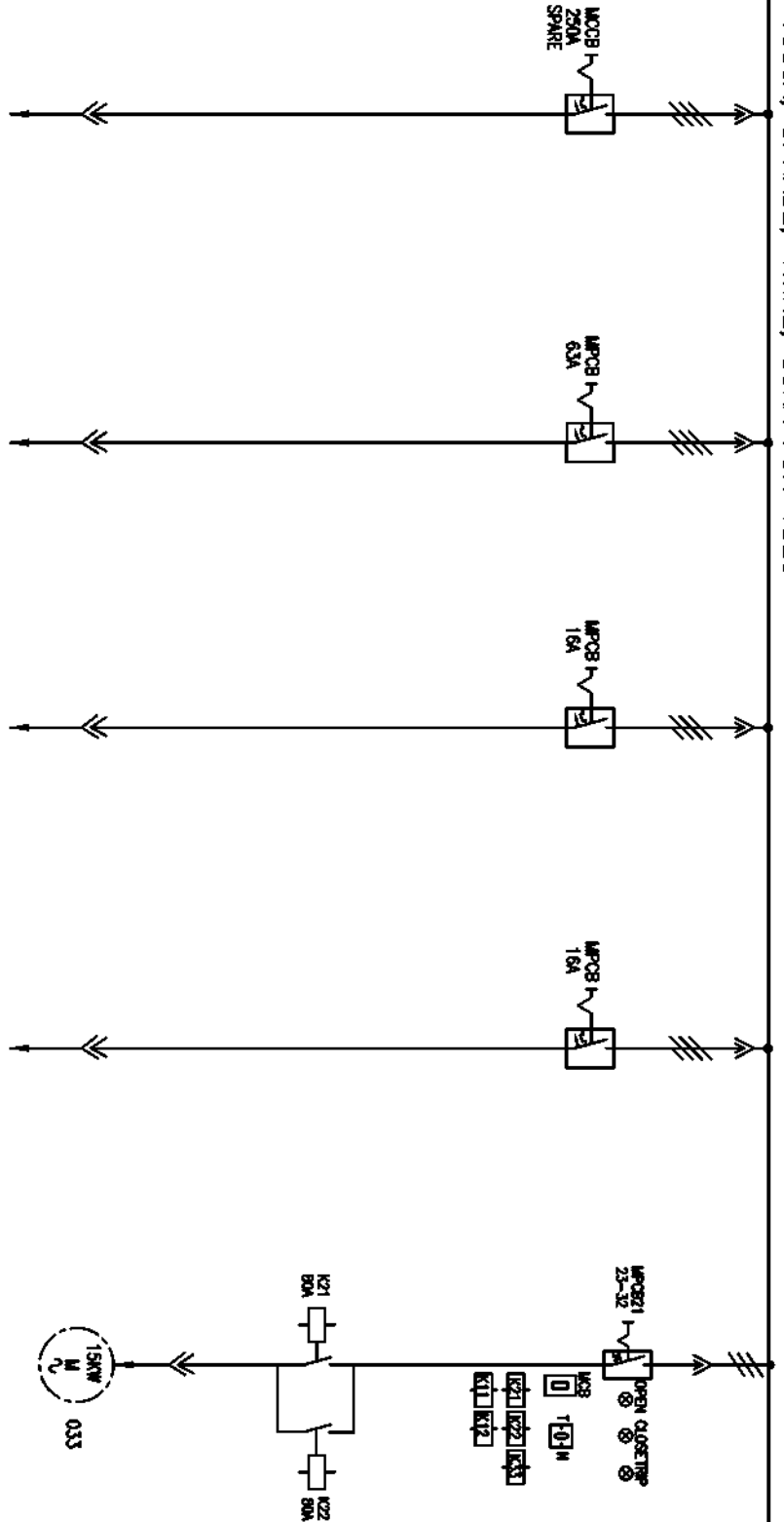
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**D**

415V. 1600A. 3PHASE. 4WIRE. 50KA FOR 1SEC

## SECTION-B



| KGS TAG NO.        |                 |                            |                    |                    |
|--------------------|-----------------|----------------------------|--------------------|--------------------|
| FEEDER DESCRIPTION | SPARE           | HEATER FOR SILO FLUIDIZING | MSC USE            | MSC USE            |
| FEEDER RATING      | 250A            | 63A                        | 16A                | 15KW               |
| FEEDER NO.         | 10Q             | 10R                        | 10S                | 10U                |
| SCHEDULE REF       | EP-3-CS-047-022 | EP-3-CS-047-022            | EP-3-CS-047-022    | EP-3-CS-047-033    |
| CABLE SIZE         | -               | 1-3.5C X 15 SQMM(AL)       | 1-4C X 16 SQMM(AL) | 1-3C X 95 SQMM(AL) |

DRG. NO. EP-3-SL-047-871

INVENTORY NO.

[illegible]

FIRST ANGLE PROJECTION

ALL DIMENSIONS ARE IN MM.

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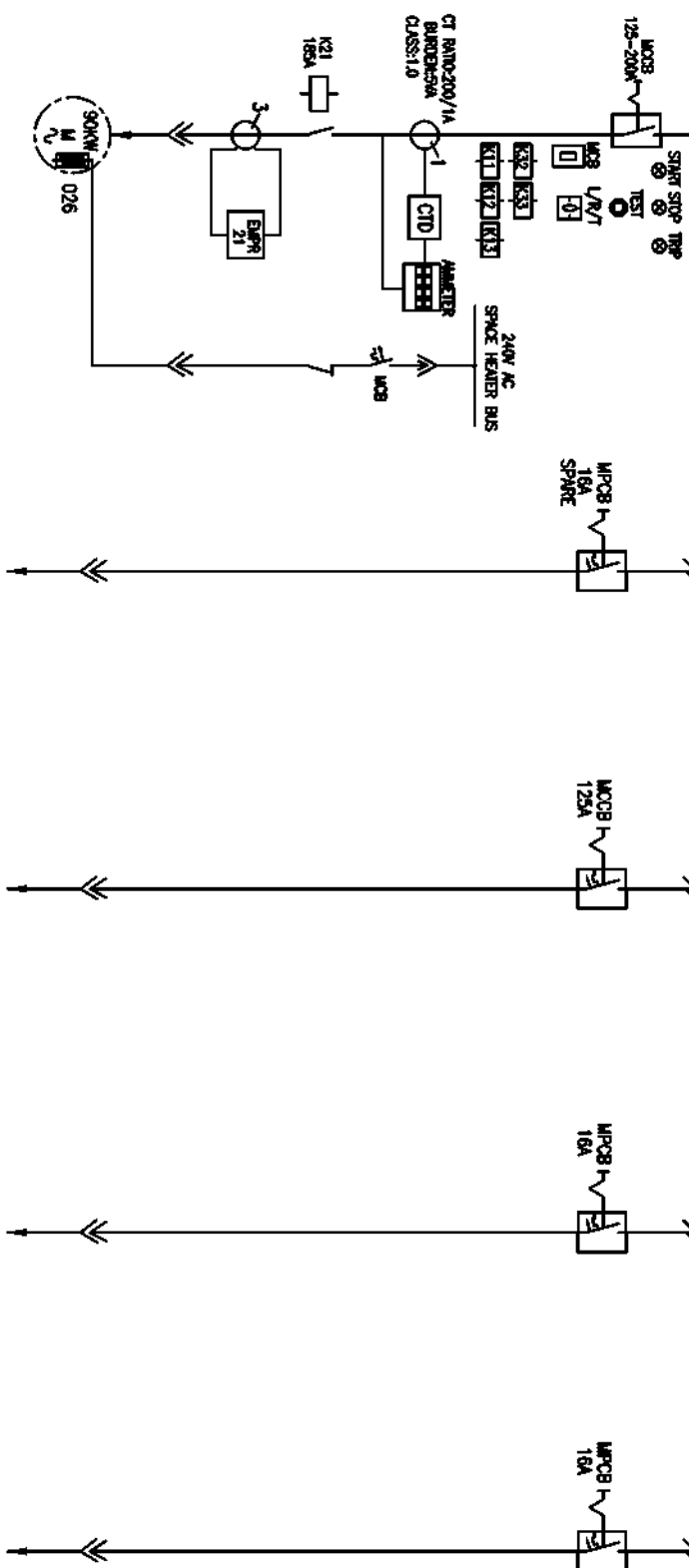
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415V, 1600A, 3PHASE, 4WIRE, 50KA FOR 1SEC

SECTION-B



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DRG. NO. EP-3-SL-047-871

| KGS TAG NO. | FEEDER DESCRIPTION           | FEEDER RATING | FEEDER NO. | SCHEME REF      | CABLE SIZE           |
|-------------|------------------------------|---------------|------------|-----------------|----------------------|
|             | SPARE                        | 90KW          | 11P        | EP-3-CS-047-026 | -                    |
|             | SPARE                        | 16A           | 11Q        | EP-3-CS-047-022 | -                    |
|             | ACDB WELDING AT AHS MCC-2    | 125A          | 11R        | EP-3-CS-047-022 | 1-3.5C X 35 SQMM(AL) |
|             | UPS FOR HUSD SYSTEM          | 16A           | 12Q        | EP-3-CS-047-022 | 1-4C X 16 SQMM(AL)   |
|             | IT ELECTRIC HOST AT SILO TOP | 16A           | 12R        | EP-3-CS-047-022 | 1-4C X 16 SQMM(AL)   |

INVENTORY NO.

| REV. | DATE     | DESCRIPTION                      | BY  | APPD. | APPROVED | KSB | NAME    | SIGN. | DATE     | FILE NO. | SCALE | JOB NO. | CP-14-047 | DRG. NO. | EP-3-SL-047-871 | NO. OF SHEETS | 27 | NO. OF SHEETS | 22 | REV. | 01 |
|------|----------|----------------------------------|-----|-------|----------|-----|---------|-------|----------|----------|-------|---------|-----------|----------|-----------------|---------------|----|---------------|----|------|----|
| 01   | 04.08.17 | REVISED AS PER UPDATED LOAD LIST | KSJ | KSJ   | CHECKED  |     | TRINATH |       | 24.05.17 | 3        |       |         |           |          |                 |               |    |               |    |      |    |
| 02   |          |                                  |     |       |          |     |         |       |          |          |       |         |           |          |                 |               |    |               |    |      |    |
| 03   |          |                                  |     |       |          |     |         |       |          |          |       |         |           |          |                 |               |    |               |    |      |    |
| 04   |          |                                  |     |       |          |     |         |       |          |          |       |         |           |          |                 |               |    |               |    |      |    |
| 05   |          |                                  |     |       |          |     |         |       |          |          |       |         |           |          |                 |               |    |               |    |      |    |
| 06   |          |                                  |     |       |          |     |         |       |          |          |       |         |           |          |                 |               |    |               |    |      |    |
| 07   |          |                                  |     |       |          |     |         |       |          |          |       |         |           |          |                 |               |    |               |    |      |    |

BHARAT HEAVY ELECTRICALS LIMITED

ELECTROPORCELAIN DIVISION BANGALORE

TITLE :

SILO MCC LOAD LIST (AHS MCC-2) (NEAR FLY ASH SILO)

FIRST ANGLE PROJECTION

ALL DIMENSIONS ARE IN MM.

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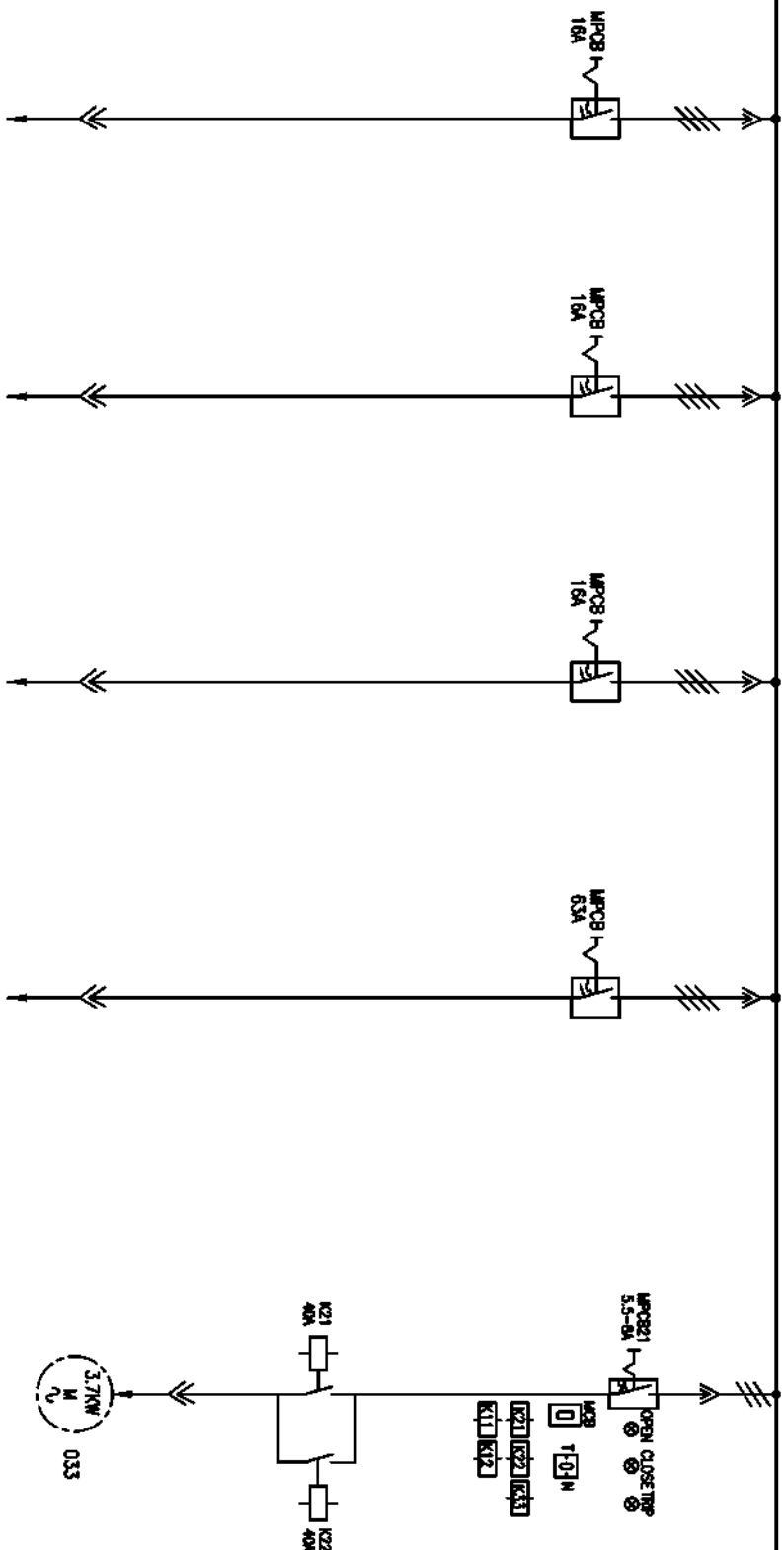
6

7

8

415V, 1600A, 3PHASE, 4WIRE, 50KA FOR 1SEC

SECTION-B



| KOS TAG NO.        | RAW POWER FOR DCS AT AHS MCC-2 | DB / STARTER FOR VENTILATION FAN IN SILO MCC | PCCB AT SILO-2     | AIR CONDITIONER DB FOR HCSSO/SILO CONTROL ROOM | SPARE           |
|--------------------|--------------------------------|----------------------------------------------|--------------------|------------------------------------------------|-----------------|
| FEDDER DESCRIPTION | 16A                            | 16A(63kW)                                    | 16A                | 63A                                            | 3.7kW           |
| FEDDER RATING      | 12S                            | 12T                                          | 12U                | 12V                                            | 12W             |
| SCHEME REF         | EP-3-CS-047-022                | EP-3-CS-047-022                              | EP-3-CS-047-022    | EP-3-CS-047-022                                | EP-3-CS-047-033 |
| CABLE SIZE         | 1-4C X 16 SQMM(AL)             | 1-4C X 16 SQMM(AL)                           | 1-4C X 16 SQMM(AL) | 1-4C X 16 SQMM(AL)                             | -               |

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DRG. NO. EP-3-SL-047-871

INVENTORY NO.

| REV. | DATE     | DESCRIPTION                      | BY  | APPD. | APPROVED | KSB | NAME    | SIGN. | DATE     |
|------|----------|----------------------------------|-----|-------|----------|-----|---------|-------|----------|
| 01   | 24.05.17 | REVISED AS PER UPDATED LOAD LIST | KSJ | KSJ   | CHECKED  |     | TRINATH |       | 24.05.17 |
| 02   |          |                                  |     |       |          |     | TRINATH |       | 24.05.17 |
| 03   |          |                                  |     |       |          |     | TRINATH |       | 24.05.17 |
| 04   |          |                                  |     |       |          |     | TRINATH |       | 24.05.17 |
| 05   |          |                                  |     |       |          |     | TRINATH |       | 24.05.17 |
| 06   |          |                                  |     |       |          |     | TRINATH |       | 24.05.17 |
| 07   |          |                                  |     |       |          |     | TRINATH |       | 24.05.17 |

|                                                               |  |                                     |  |
|---------------------------------------------------------------|--|-------------------------------------|--|
| BHARAT HEAVY ELECTRICALS LIMITED                              |  | ELECTROPORCELAIN DIVISION BANGALORE |  |
| TITLE :<br>SILO MCC LOAD LIST (AHS MCC-2) (NEAR FLY ASH SILO) |  | NO. OF SHEETS : 27                  |  |
| SCALE : 100 NO. CP-14-047                                     |  | SHEET : 23                          |  |
| DRG. NO. EP-3-SL-047-871                                      |  | REV. : 01                           |  |

FIRST ANGLE PROJECTION

ALL DIMENSIONS ARE IN MM.

1

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3

4

5

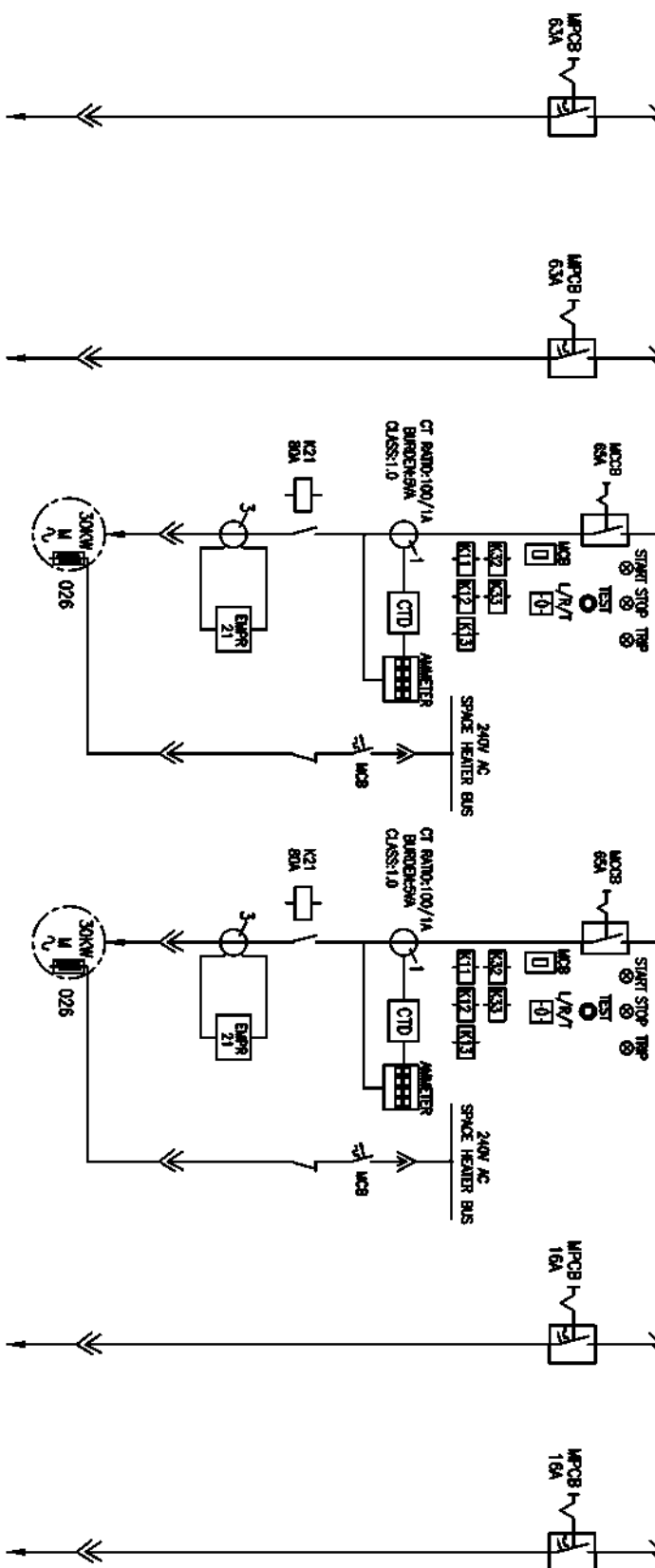
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7

8

415V, 1600A, 3PHASE, 4WIRE, 50KA FOR 1SEC

SECTION-B



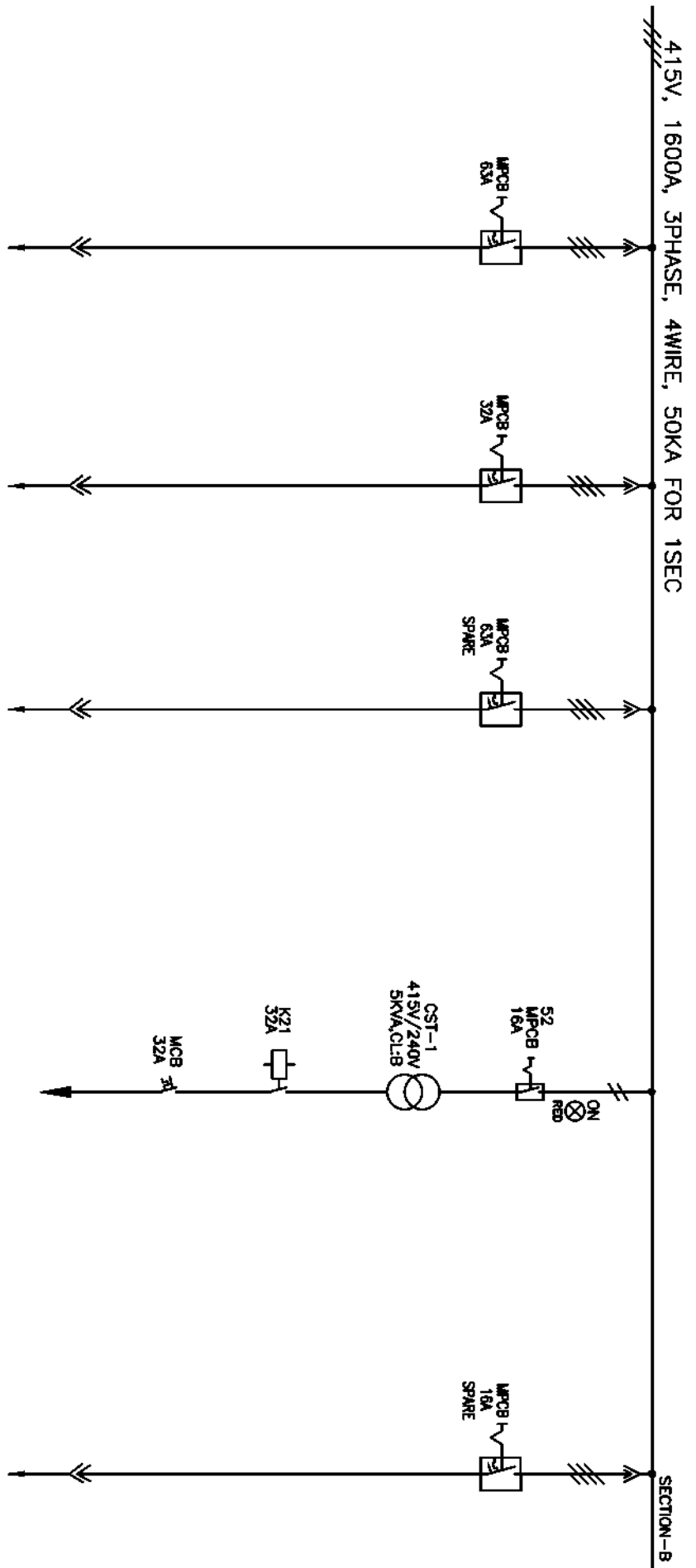
| KGS TAG NO. | DESCRIPTION                           | FEEDER RATING | FEEDER NO. | SCHEME REF      | CABLE SIZE            |
|-------------|---------------------------------------|---------------|------------|-----------------|-----------------------|
|             | HTR FOR FA SILO FLUIDIZING AIR BLOWER | 63A           | 13Q        | EP-3-CS-047-026 | 1-3.5C X 120 SQMM(AL) |
|             | AHS LDB-3 AHSRS                       | 63A           | 13R        | EP-3-CS-047-026 | 1-3C X 2.5 SQMM(CU)   |
|             | FLY ASH SILO FLUIDIZING AIR BLOWER    | 30KW          | 13S        | EP-3-CS-047-026 | 1-3.5C X 15 SQMM(AL)  |
|             | FLY ASH SILO FLUIDIZING AIR BLOWER    | 30KW          | 13T        | EP-3-CS-047-026 | 1-3.5C X 15 SQMM(AL)  |
|             | UPS FOR SILO DCS                      | 16A           | 14Q        | EP-3-CS-047-022 | 1-4C X 16 SQMM(AL)    |
|             | BATTERY ROOM VENTILATION              | 16A           | 14R        | EP-3-CS-047-022 | 1-4C X 16 SQMM(AL)    |

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DRG. NO. EP-3-SL-047-871

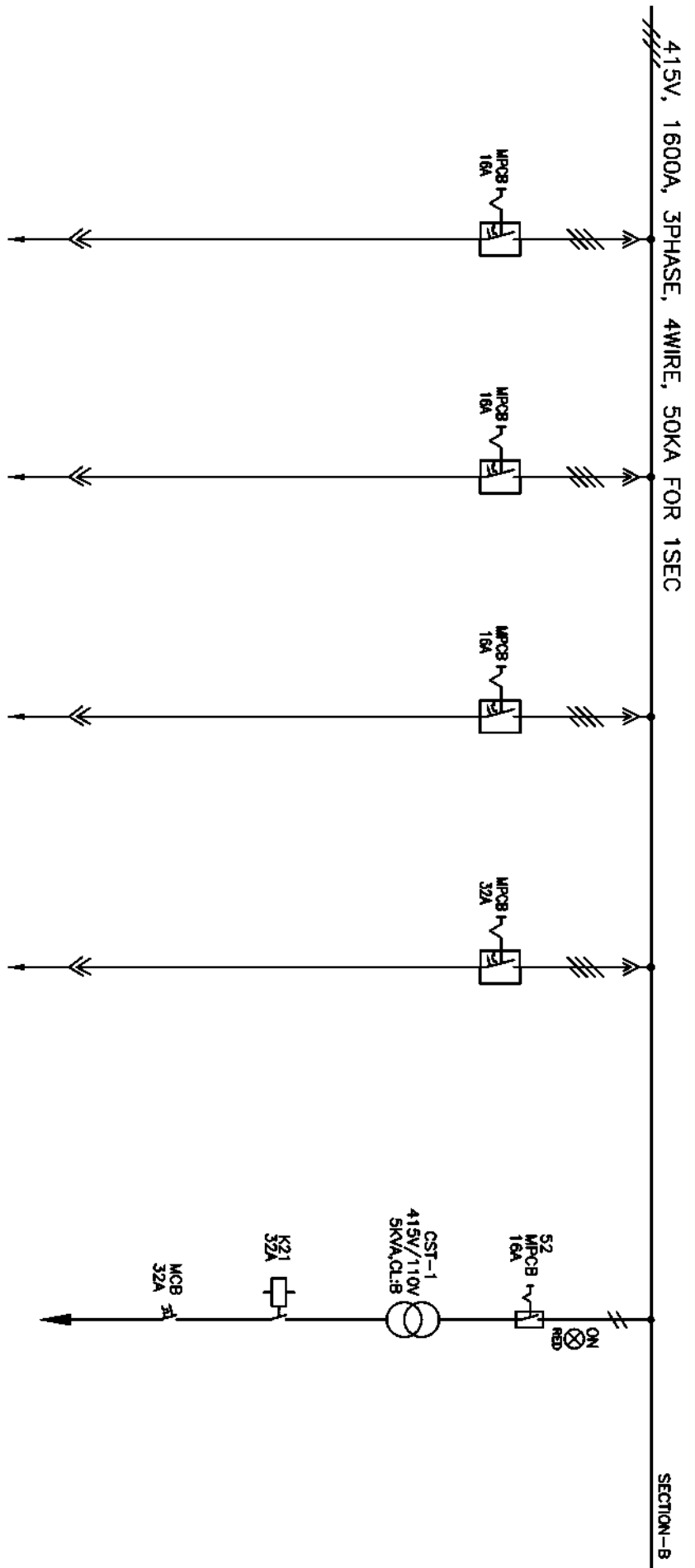
INVENTORY NO.

| REV. | DATE     | DESCRIPTION                      | BY | APPD. | APPROVED | KSB | NAME | SIGN. | DATE     | FILE NO. | SCALE | JOB NO. | CP-14-047 | DRG. NO.  | EP-3-SL-047-871 | NO. OF SHEETS | 27              | NO. OF SHEETS | 24 | REV. | 01 |
|------|----------|----------------------------------|----|-------|----------|-----|------|-------|----------|----------|-------|---------|-----------|-----------|-----------------|---------------|-----------------|---------------|----|------|----|
| 01   | 04.08.17 | REVISED AS PER UPDATED LOAD LIST | KS | KS    | KS       | KS  | KS   | KS    | 24.05.17 | 3        | 1:1   | 108     | NO.       | CP-14-047 | 008             | NO.           | EP-3-SL-047-871 | 27            | 24 | 01   |    |
| 02   |          |                                  |    |       |          |     |      |       |          |          |       |         |           |           |                 |               |                 |               |    |      |    |
| 03   |          |                                  |    |       |          |     |      |       |          |          |       |         |           |           |                 |               |                 |               |    |      |    |
| 04   |          |                                  |    |       |          |     |      |       |          |          |       |         |           |           |                 |               |                 |               |    |      |    |
| 05   |          |                                  |    |       |          |     |      |       |          |          |       |         |           |           |                 |               |                 |               |    |      |    |
| 06   |          |                                  |    |       |          |     |      |       |          |          |       |         |           |           |                 |               |                 |               |    |      |    |
| 07   |          |                                  |    |       |          |     |      |       |          |          |       |         |           |           |                 |               |                 |               |    |      |    |



| KCS TAG NO.        |                    |                    |                 |                          |
|--------------------|--------------------|--------------------|-----------------|--------------------------|
| FEEDER DESCRIPTION | MISC USE           | MISC USE           | SPACE           | 240V CONTROL TRANSFORMER |
| FEEDER RATING      | 63A                | 32A                | 63A             | 50VA                     |
| FEEDER NO.         | 14S                | 14T                | 14U             | 14V                      |
| SCHEME REF         | EP-3-CS-047-022    | EP-3-CS-047-022    | EP-3-CS-047-022 | EP-3-CS-047-039          |
| CABLE SIZE         | 1-4C X 16 SQMM(AL) | 1-3C X 16 SQMM(AL) | -               | -                        |
|                    |                    |                    |                 | SPACE                    |
|                    |                    |                    |                 | 16A                      |
|                    |                    |                    |                 | 150                      |
|                    |                    |                    |                 | EP-3-CS-047-022          |
|                    |                    |                    |                 | -                        |

[illegible]

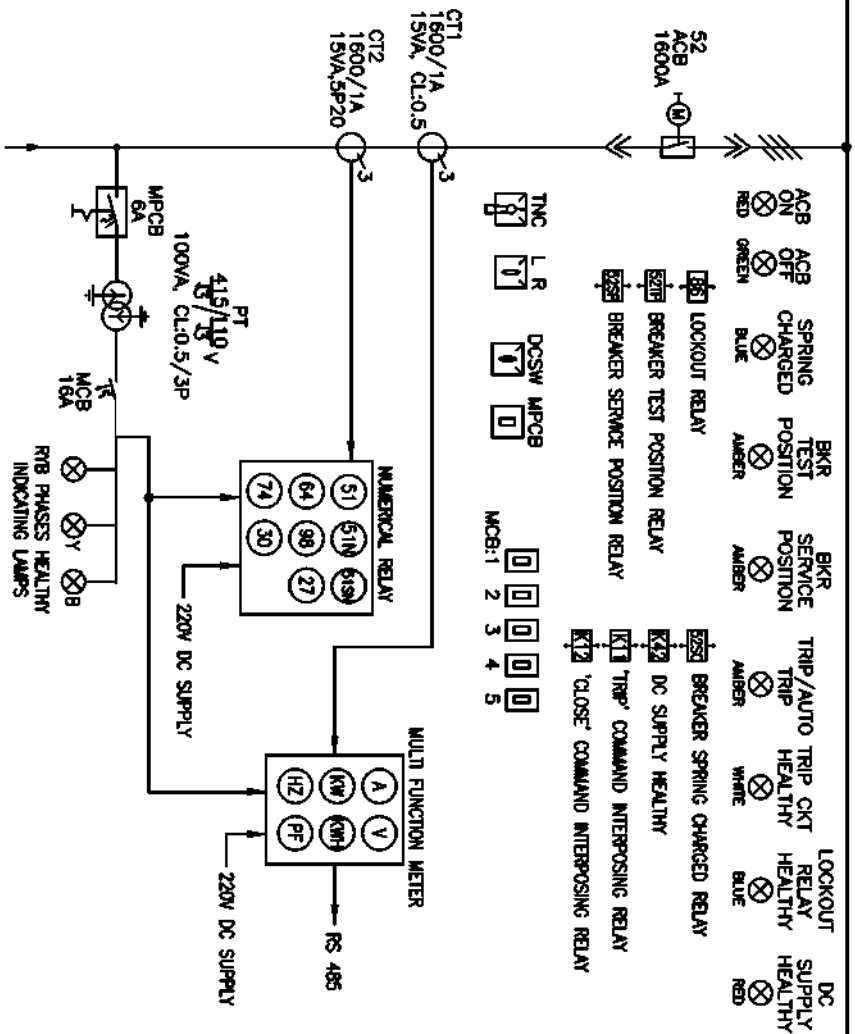


| KCS TAG NO.        |                          |                                      |                    |                           |
|--------------------|--------------------------|--------------------------------------|--------------------|---------------------------|
| FEEDER DESCRIPTION | DRIER FOR IAC AT FA SILO | RAW POWER SUPPLY FOR WEIGH BRIDGE DB | 415V SUPPLY TO VFD | ELECTRIC HOIST FOR MCC 7T |
| FEEDER RATING      | 16A                      | 16A                                  | 16A                | 32A                       |
| FEEDER NO.         | 15R                      | 15S                                  | 15T                | 15U                       |
| SCHEME REF         | EP-3-CS-047-022          | EP-3-CS-047-022                      | EP-3-CS-047-022    | EP-3-CS-047-022           |
| CABLE SIZE         | 1-4C X 16 SQMM(AL)       | 1-4C X 16 SQMM(AL)                   | 1-4C X 16 SQMM(AL) | 1-3C X 16 SQMM(AL)        |
|                    |                          |                                      |                    | 110V CONTROL TRANSFORMER  |
|                    |                          |                                      |                    | 5KVA                      |
|                    |                          |                                      |                    | 15V                       |
|                    |                          |                                      |                    | EP-3-CS-047-039           |
|                    |                          |                                      |                    | -                         |

INVENTORY NO.

[illegible]

## SECTION-B



|                    |                 |
|--------------------|-----------------|
| WGS TAG NO.        |                 |
| FEDDER DESCRIPTION | INCOMER-B       |
| FEDDER RATING      | 1600A           |
| FEDDER NO.         | 17B             |
| SCHEME REF         | EP-3-CS-047-002 |
| CABLE SIZE         | BUS DUCT        |

| INVENTORY NO.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |          |                                  |                                                                                   |                                                                                   |          |         |                                                                                    |          |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|----------|---------|------------------------------------------------------------------------------------|----------|--|
| REV.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | DATE     | DESCRIPTION                      | BY                                                                                | APPRO.                                                                            | APPROVED | NAME    | SIGN.                                                                              | DATE     |  |
| 07                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |          |                                  |                                                                                   |                                                                                   |          |         |                                                                                    |          |  |
| 06                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |          |                                  |                                                                                   |                                                                                   | DESIGNED | TRINATH |   | 24.03.17 |  |
| 04                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |          |                                  |                                                                                   |                                                                                   | DRAWN    | TRINATH |  | 24.03.17 |  |
| 03                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |          |                                  |                                                                                   |                                                                                   |          |         |                                                                                    |          |  |
| 02                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |          |                                  |                                                                                   |                                                                                   | CHECKED  |         |                                                                                    |          |  |
| 01                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 04.08.17 | REVISED AS PER UPDATED LOAD LIST |  |  |          |         |                                                                                    |          |  |
| <div style="display: flex; justify-content: space-between;"> <div> <p>FILE NO. : <b>DR :</b></p> <p>SCALE : <b>1/8" = 1'-0"</b></p> </div> <div> <p><b>BHARAT HEAVY ELECTRICALS LIMITED</b></p> <p>ELECTROPORCELAIN DIVISION BANGALORE</p> <p><b>SINGLE LINE DIAGRAM</b></p> <p><b>SILLO MCC LOAD LIST (AHS MCC-2) (NEAR FLY ASH SILLO)</b></p> </div> <div> <p></p> <p>NO. OF SHEETS : <b>27</b></p> <p>SHEET : <b>27</b></p> <p>REV. : <b>01</b></p> </div> </div> |          |                                  |                                                                                   |                                                                                   |          |         |                                                                                    |          |  |

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DRG. NO. EP-3-CS-047-001

| INVENTORY NO.                                                           |          | DESCRIPTION                                      |  | REV. NO.          |  | DATE                     |  |
|-------------------------------------------------------------------------|----------|--------------------------------------------------|--|-------------------|--|--------------------------|--|
| 4                                                                       |          |                                                  |  |                   |  |                          |  |
| 3                                                                       |          |                                                  |  |                   |  |                          |  |
| 01                                                                      | 18.11.18 | REUSED IN LINE WITH CUSTOMER/CONSULTANT COMMENTS |  |                   |  |                          |  |
| 04                                                                      | 12.07.18 | REUSED IN LINE WITH FEW COMMENTS DTD12.07.18     |  |                   |  |                          |  |
| REV. NO.                                                                |          |                                                  |  |                   |  |                          |  |
| BHARAT HEAVY ELECTRICALS LIMITED<br>ELECTROPROCESSING DIVISION BANGLORE |          | TITLE :                                          |  | JOB NO. CP-14-047 |  | DRG. NO. EP-3-CS-047-001 |  |
| 10                                                                      |          | CONTROL SCHEME FOR MODULE                        |  | SCALE NO.         |  | REV. 03                  |  |
| 01                                                                      |          | TYPE DAET INCOMER-A                              |  | SHEET NO.         |  | NO. OF SHEETS            |  |

**DEVELOPMENT CONSULTANTS**  
Development only for general construction with  
consultants and specifications  
Contractor to be responsible for any error and for  
timeliness of detailed implementation of contract  
documents.  
Approved by: BR  
Date: 10-02-17

|    |              |              |              |               |
|----|--------------|--------------|--------------|---------------|
| 1  | 1. Drawings  | 2. Approved  | 3. Approved  | 4. Approved   |
| 2  | 2. Approved  | 3. Approved  | 4. Approved  | 5. Approved   |
| 3  | 3. Approved  | 4. Approved  | 5. Approved  | 6. Approved   |
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| 97 | 97. Approved | 98. Approved | 99. Approved | 100. Approved |

**GSECL**  
GUJARAT ELECTRICITY CORPORATION LIMITED  
VADODARA, GUJARAT

PROJECT:  
1x800 MW WANAKBORI THERMAL POWER STATION  
EXTENSION UNIT-8

| DRAWING NO.     | DESCRIPTION OF DRAWING                   | SCHEME REQUIREMENT                                                                     |
|-----------------|------------------------------------------|----------------------------------------------------------------------------------------|
| EP-3-CS-047-001 | Control Scheme for Module type DAET /C-A | INCOMER FOR BOARD WHERE IN<br>INCOMING 415V ACB BREAKER<br>FEEDER FED FROM TRANSFORMER |

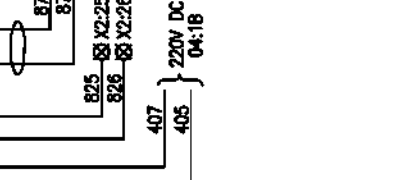
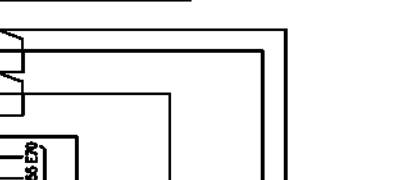
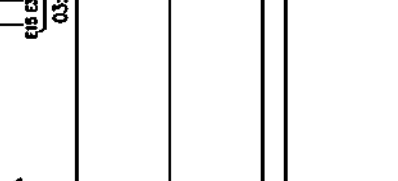
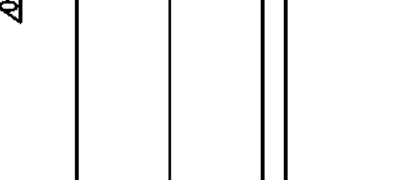
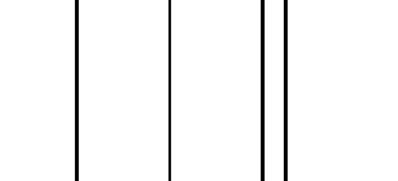
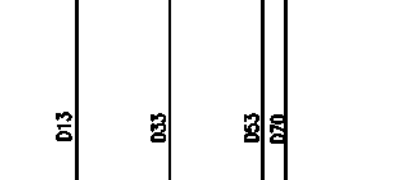
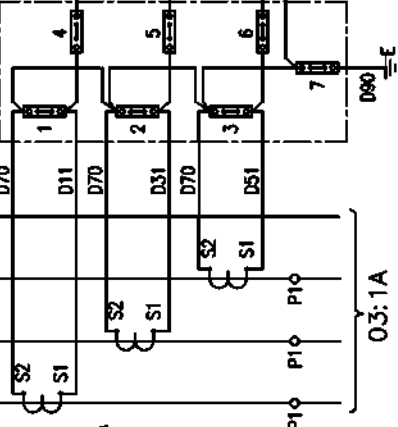
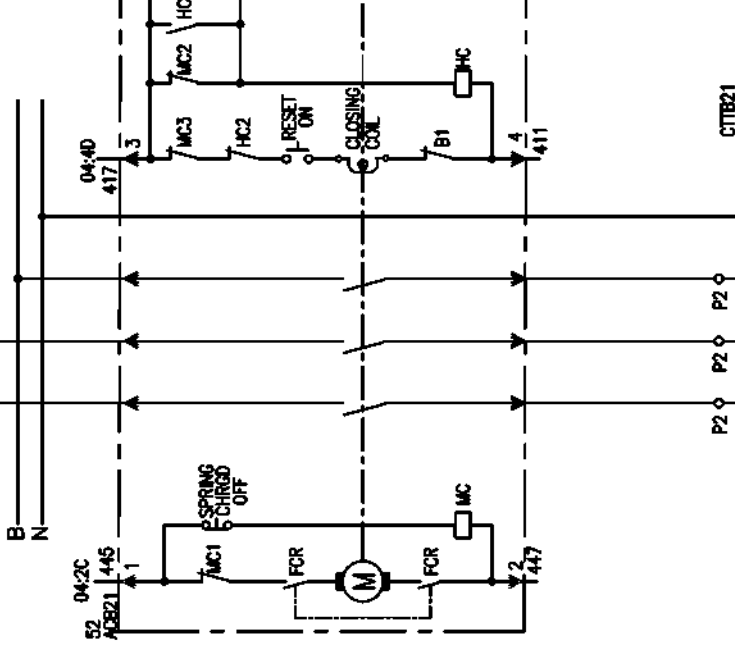
**DEVELOPMENT CONSULTANT PVT LTD**  
KOLKATA



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DRG. NO. EP-3-CS-047-001

FORM 66-271 A3



ALL DIMENSIONS ARE IN MM.

FIRST ANGLE PROJECTION

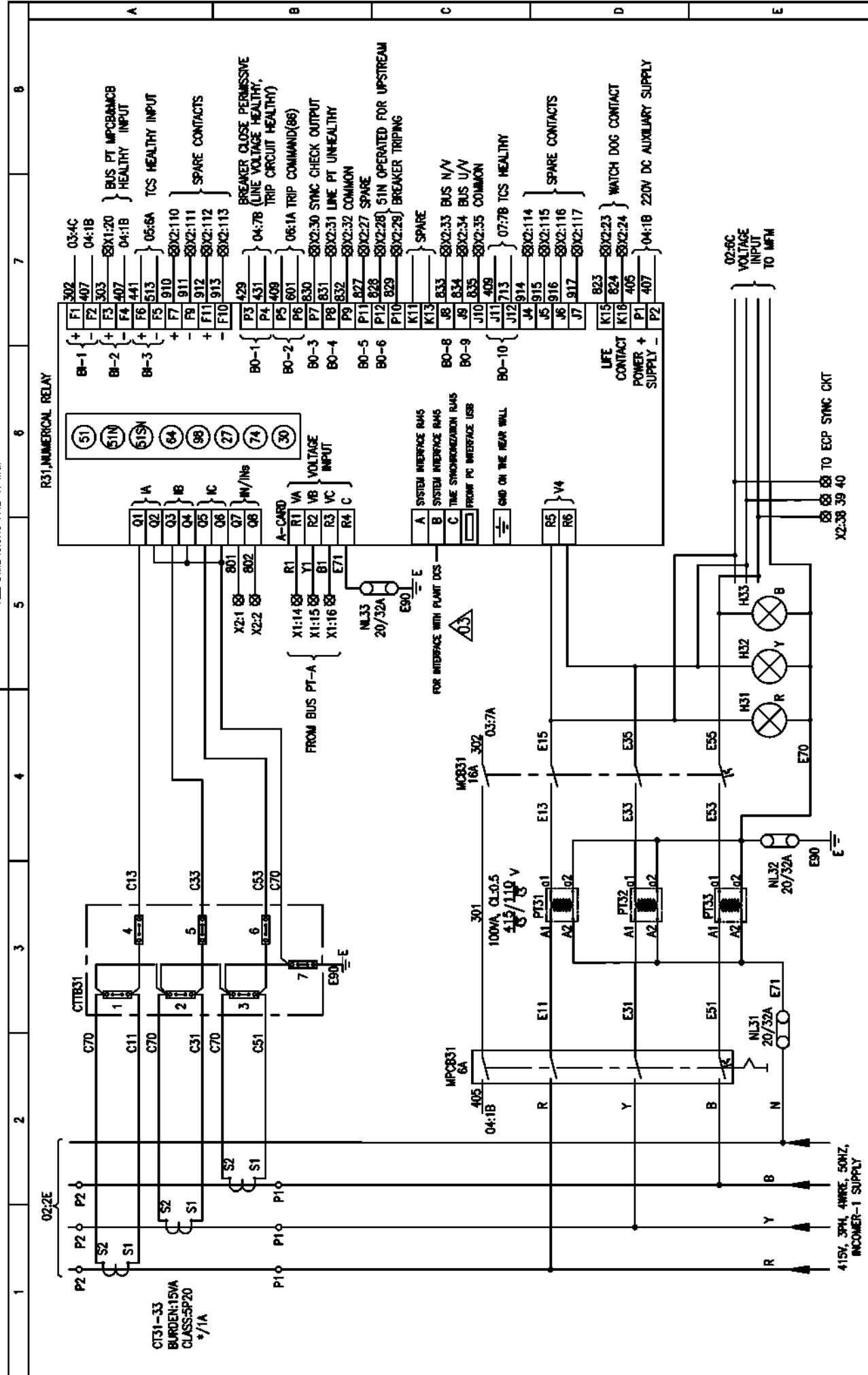
415V, 3PHASE, 4WIRE 50HZ, 50KA FOR 1SEC.

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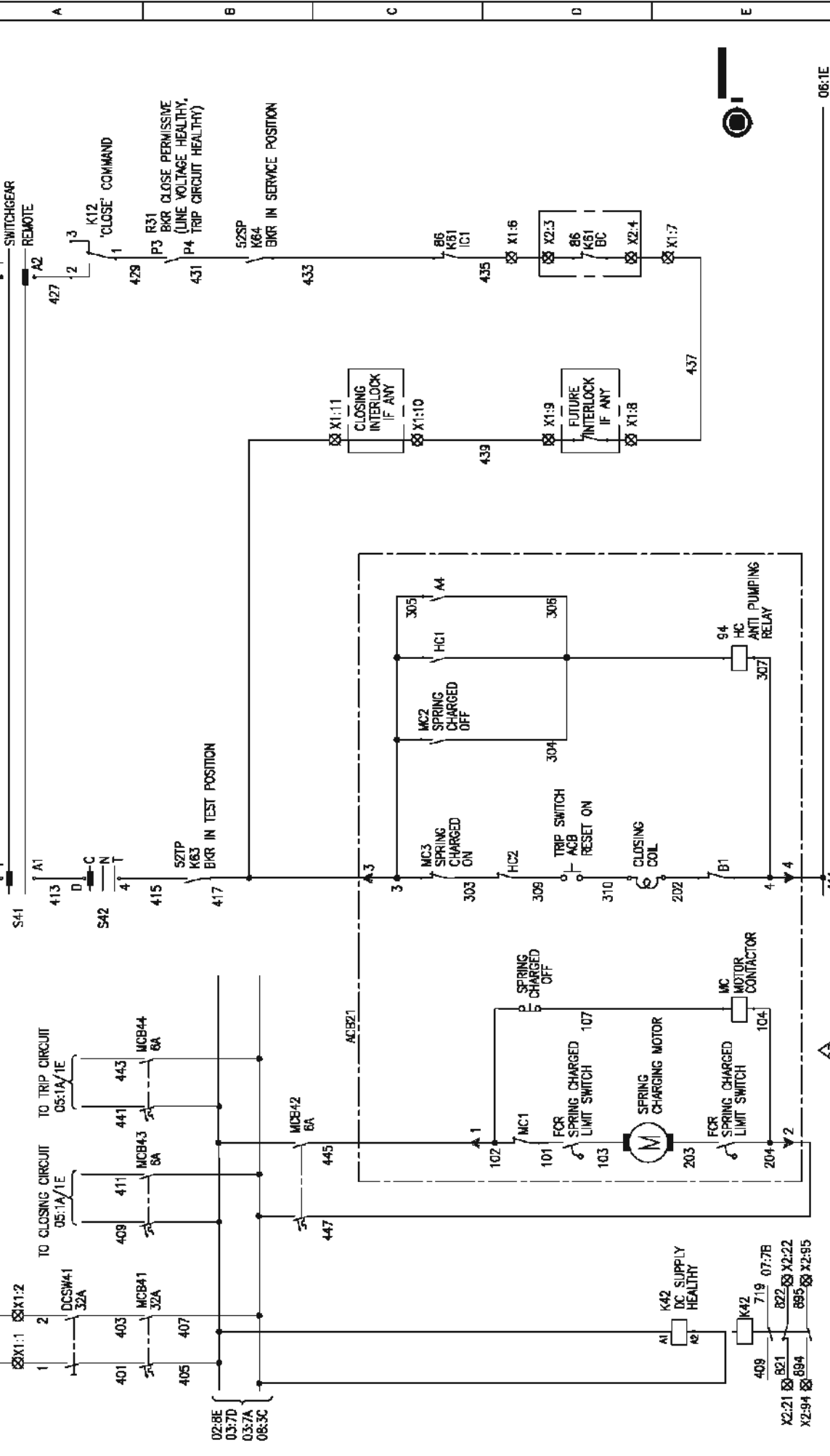
| INVENTORY NO.                                 |  |  |  | REV. NO.                 |          |                                                |         |
|-----------------------------------------------|--|--|--|--------------------------|----------|------------------------------------------------|---------|
| 4                                             |  |  |  | 01                       | 12.07.16 | REVISED IN LINE WITH PEM COMMENTS DTD:12.07.16 |         |
| 3                                             |  |  |  | 02                       | 24.06.16 | CHECKED                                        | TRINATH |
| 2                                             |  |  |  | 03                       | 24.06.16 | DRAWN                                          | TRINATH |
| 1                                             |  |  |  | 04                       | 24.06.16 | APPROVED                                       | KSB     |
| DESCRIPTION                                   |  |  |  | BY                       |          |                                                |         |
| CONTROL SCHEME FOR MODULE TYPE DAET INCOMER-A |  |  |  | SCALE: NA                |          |                                                |         |
| BHARAT HEAVY ELECTRICALS LIMITED              |  |  |  | Dwg. No. EP-3-CS-047-001 |          |                                                |         |
| ELECTROPEREANS DIVISION BANGALORE             |  |  |  | NO. OF SHEETS 10         |          |                                                |         |
| TITLE :                                       |  |  |  | SHEET NO. 02             |          |                                                |         |
|                                               |  |  |  | REV. 03                  |          |                                                |         |



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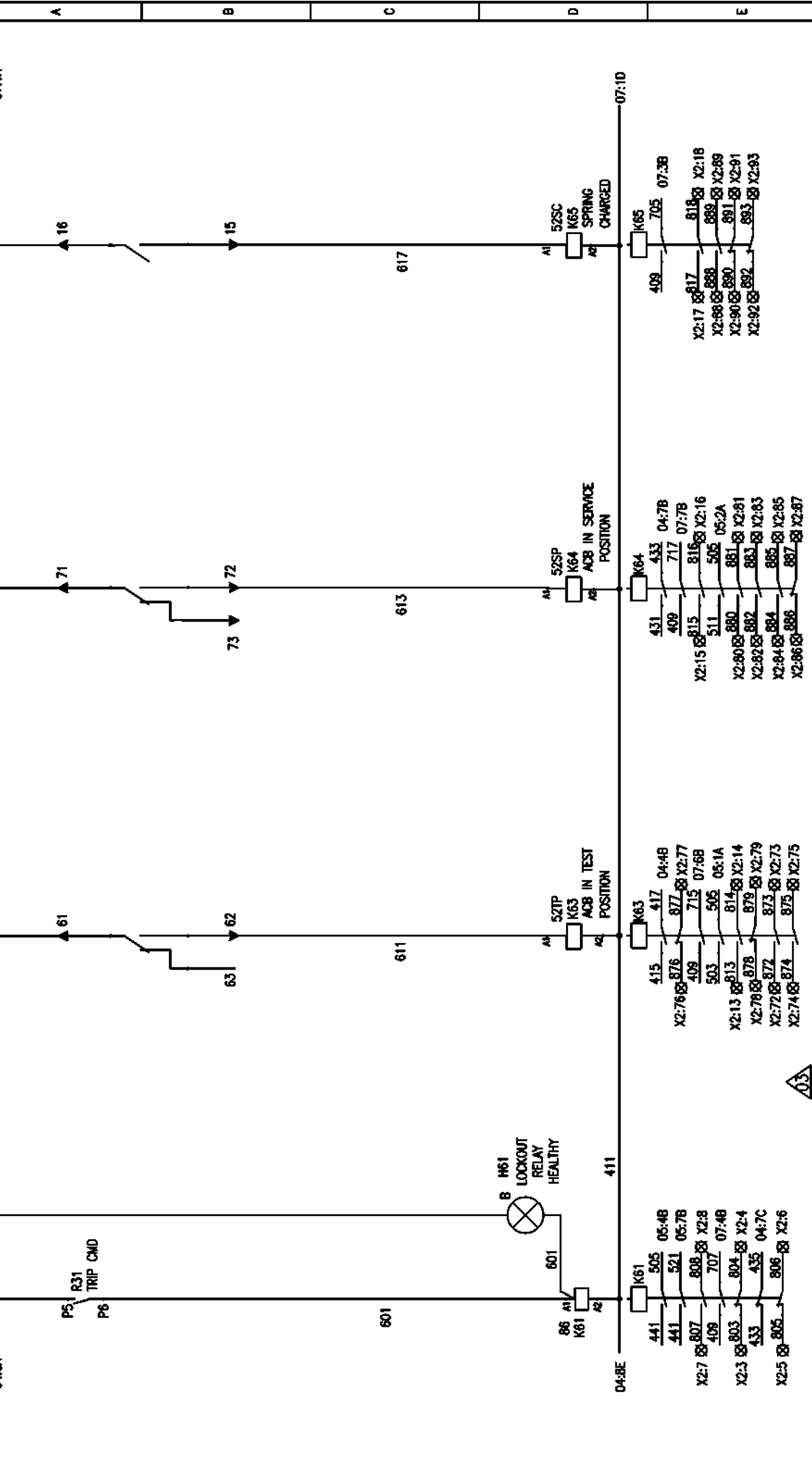
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DRG. NO. EP-3-CS-047-001

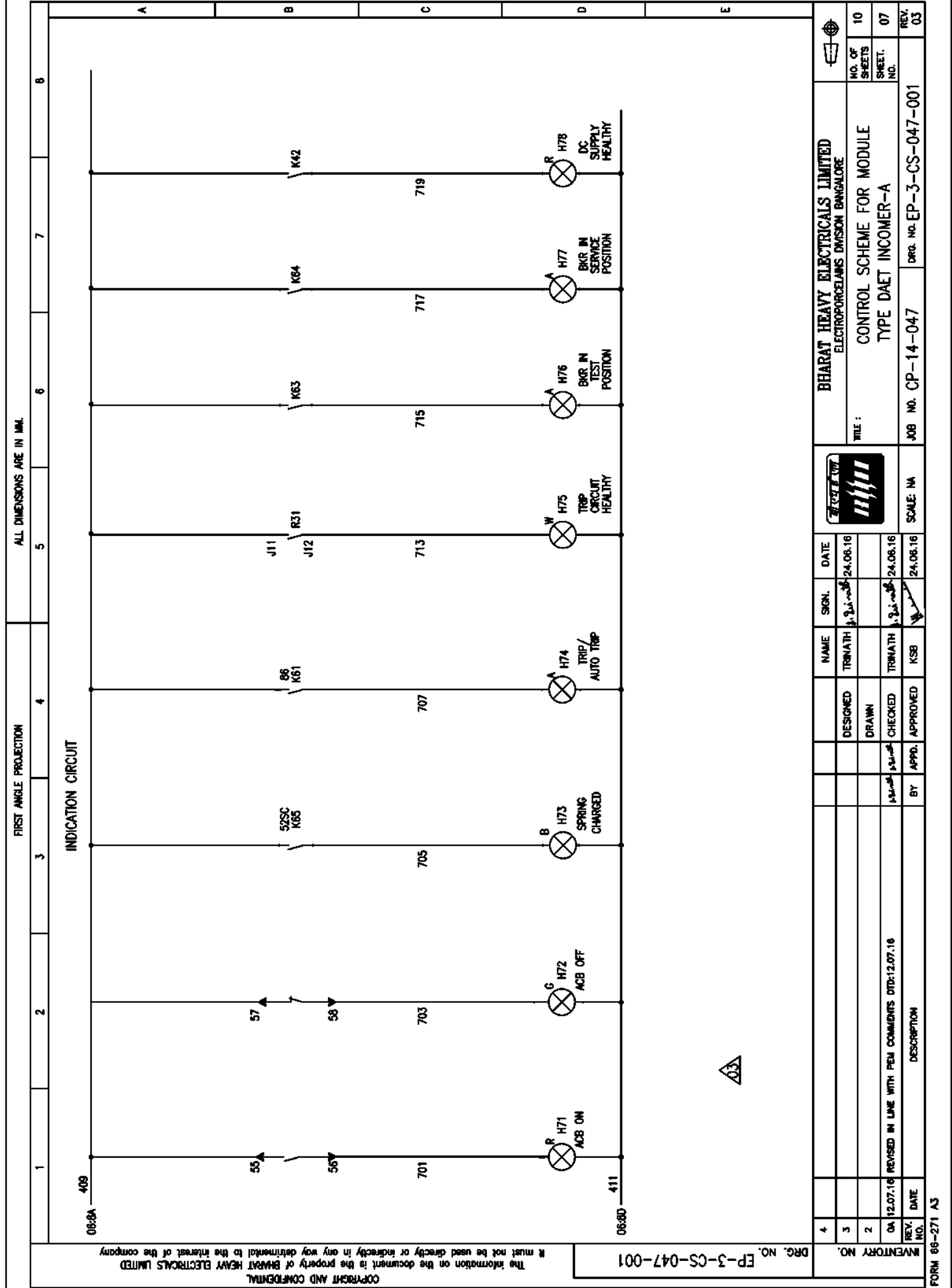


| INVENTORY NO.                    |  |  |  | REV. NO.                             |          |                                                |  |
|----------------------------------|--|--|--|--------------------------------------|----------|------------------------------------------------|--|
| 4                                |  |  |  | 01                                   | 12.07.18 | REVISED IN LINE WITH PEM COMMENTS DTD:12.07.18 |  |
| 3                                |  |  |  | 02                                   |          |                                                |  |
| 2                                |  |  |  | 03                                   |          |                                                |  |
| 1                                |  |  |  | 04                                   |          |                                                |  |
| BY                               |  |  |  | DATE                                 |          |                                                |  |
| APPROVED                         |  |  |  | DESCRIPTION                          |          |                                                |  |
| CHECKED                          |  |  |  | BY                                   |          |                                                |  |
| DRAWN                            |  |  |  | APPROVED                             |          |                                                |  |
| DESIGNED                         |  |  |  | CHECKED                              |          |                                                |  |
| NAME                             |  |  |  | DATE                                 |          |                                                |  |
| TRINATH                          |  |  |  | 24.06.16                             |          |                                                |  |
| SIGN.                            |  |  |  | 24.06.16                             |          |                                                |  |
| DATE                             |  |  |  | 24.06.16                             |          |                                                |  |
| SCALE: NA                        |  |  |  | J08 NO. CP-14-047                    |          |                                                |  |
| J08 NO. CP-14-047                |  |  |  | DRG. NO. EP-3-CS-047-001             |          |                                                |  |
| BHARAT HEAVY ELECTRICALS LIMITED |  |  |  | ELECTROPORCELAINS DIVISION BANGALORE |          |                                                |  |
| TITLE :                          |  |  |  | CONTROL SCHEME FOR MODULE            |          |                                                |  |
| TYPE DAET INCOMER-A              |  |  |  | NO. OF SHEETS                        |          |                                                |  |
|                                  |  |  |  | 10                                   |          |                                                |  |
|                                  |  |  |  | SHEET NO.                            |          |                                                |  |
|                                  |  |  |  | 04                                   |          |                                                |  |
|                                  |  |  |  | REV.                                 |          |                                                |  |
|                                  |  |  |  | 03                                   |          |                                                |  |





| INVENTORY NO.                                                           |  |  |  | REV. NO.                                         |          |                                                |  |
|-------------------------------------------------------------------------|--|--|--|--------------------------------------------------|----------|------------------------------------------------|--|
| 4                                                                       |  |  |  | 0A                                               | 12.07.16 | REVISED IN LINE WITH PEM COMMENTS DTD:12.07.16 |  |
| 3                                                                       |  |  |  | 2                                                |          |                                                |  |
| 2                                                                       |  |  |  | 1                                                |          |                                                |  |
| 1                                                                       |  |  |  | 0                                                |          |                                                |  |
| BHARAT HEAVY ELECTRICALS LIMITED<br>ELECTROPORCELAIN DIVISION BANGALORE |  |  |  | CONTROL SCHEME FOR MODULE<br>TYPE DAET INCOMER-A |          |                                                |  |
| TITLE :                                                                 |  |  |  | NO. OF SHEETS<br>10                              |          |                                                |  |
| BHARAT HEAVY ELECTRICALS LIMITED                                        |  |  |  | SHEET NO.<br>06                                  |          |                                                |  |
| ELECTROPORCELAIN DIVISION BANGALORE                                     |  |  |  | REV.<br>03                                       |          |                                                |  |
| SCALE: NA                                                               |  |  |  | Dwg. No. EP-3-CS-047-001                         |          |                                                |  |
| DATE: 24.06.16                                                          |  |  |  | FORM 66-271 A3                                   |          |                                                |  |
| SIGN.:                                                                  |  |  |  |                                                  |          |                                                |  |
| NAME:                                                                   |  |  |  |                                                  |          |                                                |  |
| DESIGNED:                                                               |  |  |  |                                                  |          |                                                |  |
| DRAWN:                                                                  |  |  |  |                                                  |          |                                                |  |
| CHECKED:                                                                |  |  |  |                                                  |          |                                                |  |
| APPROVED:                                                               |  |  |  |                                                  |          |                                                |  |
| BY:                                                                     |  |  |  |                                                  |          |                                                |  |
| DESCRIPTION:                                                            |  |  |  |                                                  |          |                                                |  |



**FORM 66-271 A3**

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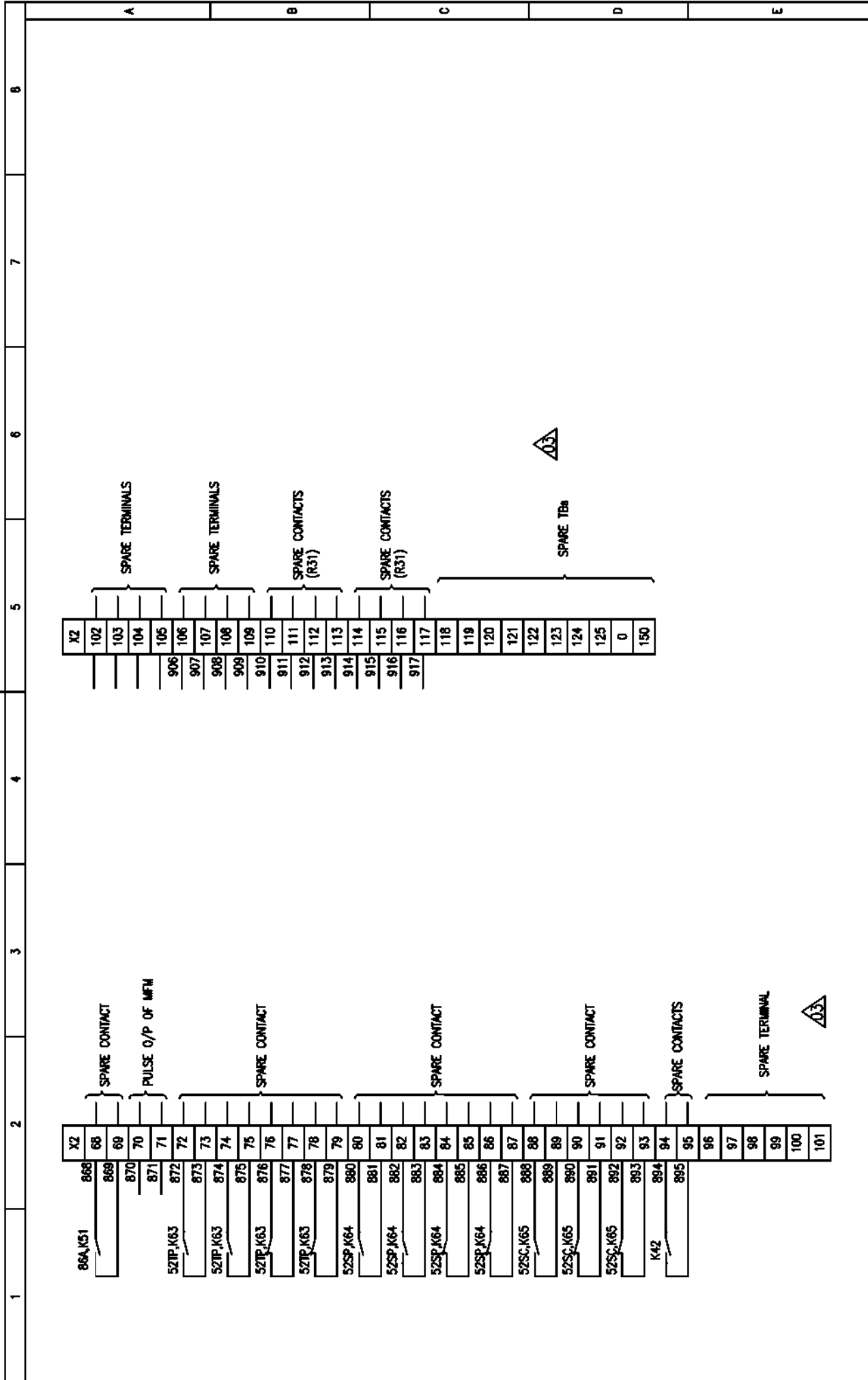
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DRG. NO. EP-3-CS-047-001

FORM 66-271 A3

FIRST ANGLE PROJECTION

ALL DIMENSIONS ARE IN MM.



|                                                                         |  |  |  |                                                             |  |  |  |                                                |  |  |  |                          |  |  |  |             |  |  |  |
|-------------------------------------------------------------------------|--|--|--|-------------------------------------------------------------|--|--|--|------------------------------------------------|--|--|--|--------------------------|--|--|--|-------------|--|--|--|
| BHARAT HEAVY ELECTRICALS LIMITED<br>ELECTROPORCELAINS DIVISION BANGLORE |  |  |  | TITLE :<br>CONTROL SCHEME FOR MODULE<br>TYPE DAET INCOMER-A |  |  |  | NO. OF SHEETS<br>10                            |  |  |  | SHEET NO.<br>08          |  |  |  | REV.<br>03  |  |  |  |
| BHARAT HEAVY ELECTRICALS LIMITED<br>ELECTROPORCELAINS DIVISION BANGLORE |  |  |  | SCALE : NA                                                  |  |  |  | JOB NO. CP-14-047                              |  |  |  | DRG. NO. EP-3-CS-047-001 |  |  |  |             |  |  |  |
| DATE                                                                    |  |  |  | SIGN.                                                       |  |  |  | NAME                                           |  |  |  | DESIGNED                 |  |  |  | DRAWN       |  |  |  |
| 24.08.16                                                                |  |  |  | TRINATH                                                     |  |  |  | TRINATH                                        |  |  |  | CHECKED                  |  |  |  | APPROVED    |  |  |  |
| 24.08.16                                                                |  |  |  | KSB                                                         |  |  |  | KSB                                            |  |  |  | BY                       |  |  |  | DESCRIPTION |  |  |  |
| 1                                                                       |  |  |  | 12.07.16                                                    |  |  |  | REVISED IN LINE WITH PEM COMMENTS DTD:12.07.16 |  |  |  |                          |  |  |  |             |  |  |  |

| 1       | 2                                  | 3 | 4 | 5 | 6 | 7 | 8 |
|---------|------------------------------------|---|---|---|---|---|---|
| LEGEND  | DESCRIPTION                        |   |   |   |   |   |   |
| ACB(52) | AIR CIRCUIT BREAKER                |   |   |   |   |   |   |
| CT      | CURRENT TRANSFORMER                |   |   |   |   |   |   |
| CTTB    | CURRENT TRANSFORMER TERMINAL BLOCK |   |   |   |   |   |   |
| PT      | POTENTIAL TRANSFORMER              |   |   |   |   |   |   |
| NL      | NEUTRAL LINK                       |   |   |   |   |   |   |
| MPCB    | MOTOR PROTECTION CIRCUIT BREAKER   |   |   |   |   |   |   |
| MCB     | MINIATURE CIRCUIT BREAKER          |   |   |   |   |   |   |
| MFM     | MULTI FUNCTION METER               |   |   |   |   |   |   |
| CTD     | CURRENT TRANSDUCER                 |   |   |   |   |   |   |
| VTD     | VOLTAGE TRANSDUCER                 |   |   |   |   |   |   |
| TCS     | TRIP COIL SUPERVISION              |   |   |   |   |   |   |
| C9      | ACB TEST POSITION LIMIT SWITCH     |   |   |   |   |   |   |
| C7      | ACB SERVICE POSITION LIMIT SWITCH  |   |   |   |   |   |   |
| FCR     | ACB SPRING CHARGING LIMIT SWITCH   |   |   |   |   |   |   |
| M       | ACB SPRING CHARGING MOTOR          |   |   |   |   |   |   |
| DCSW    | DC SWITCH                          |   |   |   |   |   |   |
| H       | INDICATION LAMP                    |   |   |   |   |   |   |
| K11     | INTERPOSING RELAY                  |   |   |   |   |   |   |
| K12     | INTERPOSING RELAY                  |   |   |   |   |   |   |
| K       | AUXILIARY CONTACTOR                |   |   |   |   |   |   |
| R       | NUMERICAL RELAY                    |   |   |   |   |   |   |

| LEGEND | DESCRIPTION                  |
|--------|------------------------------|
| 51     | OVER CURRENT                 |
| 51N    | EARTH FAULT                  |
| 51SN   | SENSITIVE GROUND EARTH FAULT |
| 64     | RESTRICTED EARTH FAULT       |
| 98     | FUSE FAILURE                 |
| 27     | UNDER VOLTAGE                |
| 74     | TRIP CIRCUIT SUPERVISION     |
| 30     | TRIP ANNUNCIATION            |

**CROSS REFERENCE EXAMPLE:**

1.) 04:40  
     '0' INDICATES Y-AXIS ZONE  
     '4' INDICATES X-AXIS ZONE  
     '04' INDICATES PAGE NUMBER

2.) 07:6B  
     '0' INDICATES Y-AXIS ZONE  
     '6' INDICATES X-AXIS ZONE  
     '07' INDICATES PAGE NUMBER

**COMPONENTS NUMBERING EXAMPLE:**

1.) MCB41  
     '1' INDICATES SERIAL NUMBER OF COMPONENT ON THAT PAGE  
     '4' INDICATES PAGE NUMBER  
     'MCB' INDICATES COMPONENT NAME

2.) MCB42  
     '2' INDICATES SERIAL NUMBER OF COMPONENT ON THAT PAGE  
     '4' INDICATES PAGE NUMBER  
     'MCB' INDICATES COMPONENT NAME

3.) K71  
     '1' INDICATES SERIAL NUMBER OF COMPONENT ON THAT PAGE  
     '7' INDICATES PAGE NUMBER  
     'K' INDICATES COMPONENT NAME

[illegible]

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PRG. NO. EP-3-CS-047-002

INVENTORY NO.

**DEVELOPMENT CONSULTANTS  
PRIVATE LIMITED**

**Computer to be responsible for any accident or for fulfillment of detailed requirements of various documents.**

№ 2 10.02.17

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**I. Estimated Demand**

**Apprenticeship programs are needed.  
Funding must be increased.**



## Management: Don't overinvest in IT

**Approved concept  
in action. Harvard  
Steel Company.**

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## CONTENTS

**★**

FIRST MILE PROTECTION

ALL DIMENSIONS ARE IN MM

**GS&C**

GUJARAT ELECTRICITY CORPORATION LIMITED  
VADODARA, GUJARAT

**PROJECT:**

1x800 MW WANAKBORI THERMAL POWER STATION  
EXTENSION UNIT-8

DEVELOPMENT CONSULTANT PVT LTD  
KOLKATA



DRAWING NO.

DESCRIPTION OF DRAWING

### **SCHEME REQUIREMENT**

EP-3-CS-047-002

Control Scheme for Module type DAET1/C-B

INCOMING 415V ACB BREAKER  
FEEDER FED FROM TRANSFORMER

**BHARAT HEAVY ELECTRICALS LIMITED**

ELECTROPORECEL A115 DIVISION BAYKALGORE

# CONTROL SCHEME FOR MODULAR

TYPE DAET INCOMER-B

DRLG NO. EP-3-CS-047-002

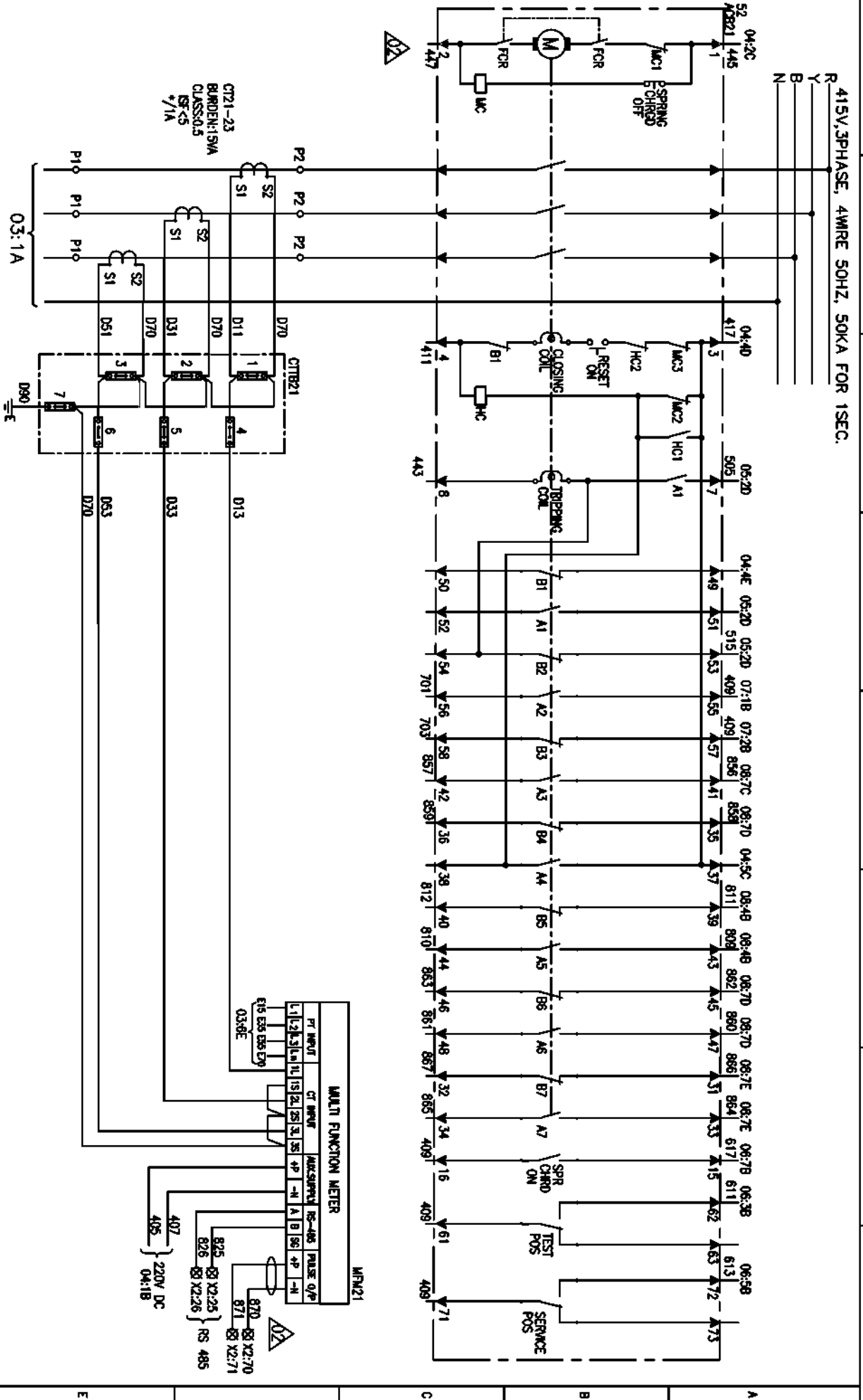


NO. OF SHEETS 1

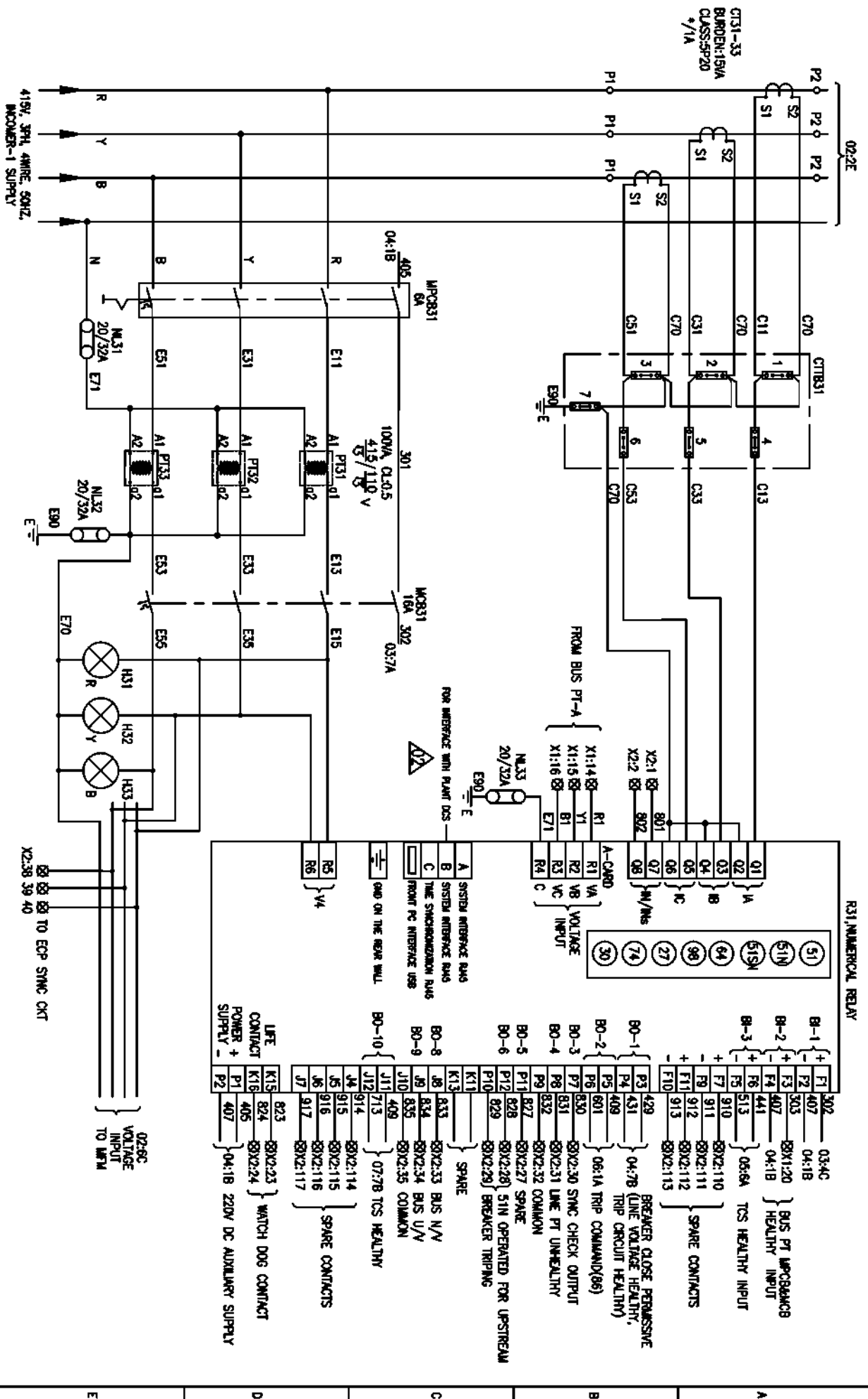
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| FIG. | DOC |
|------|-----|

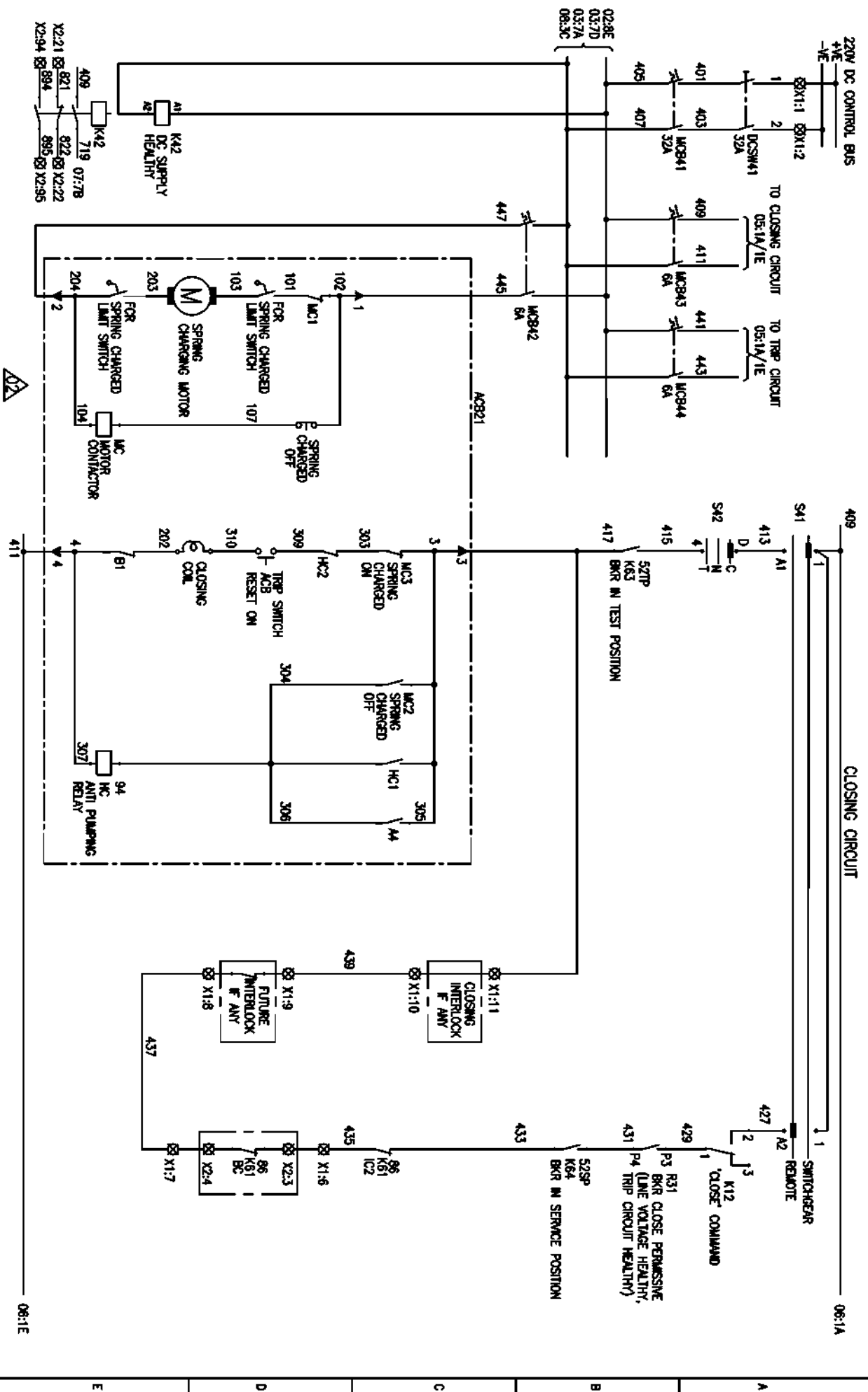
INVENTORY NO.

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|                                                                                     |               |         |
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|                                                                                     | SHEET NO.     | 03      |
|                                                                                     |               | REV. 02 |



INVENTORY NO.

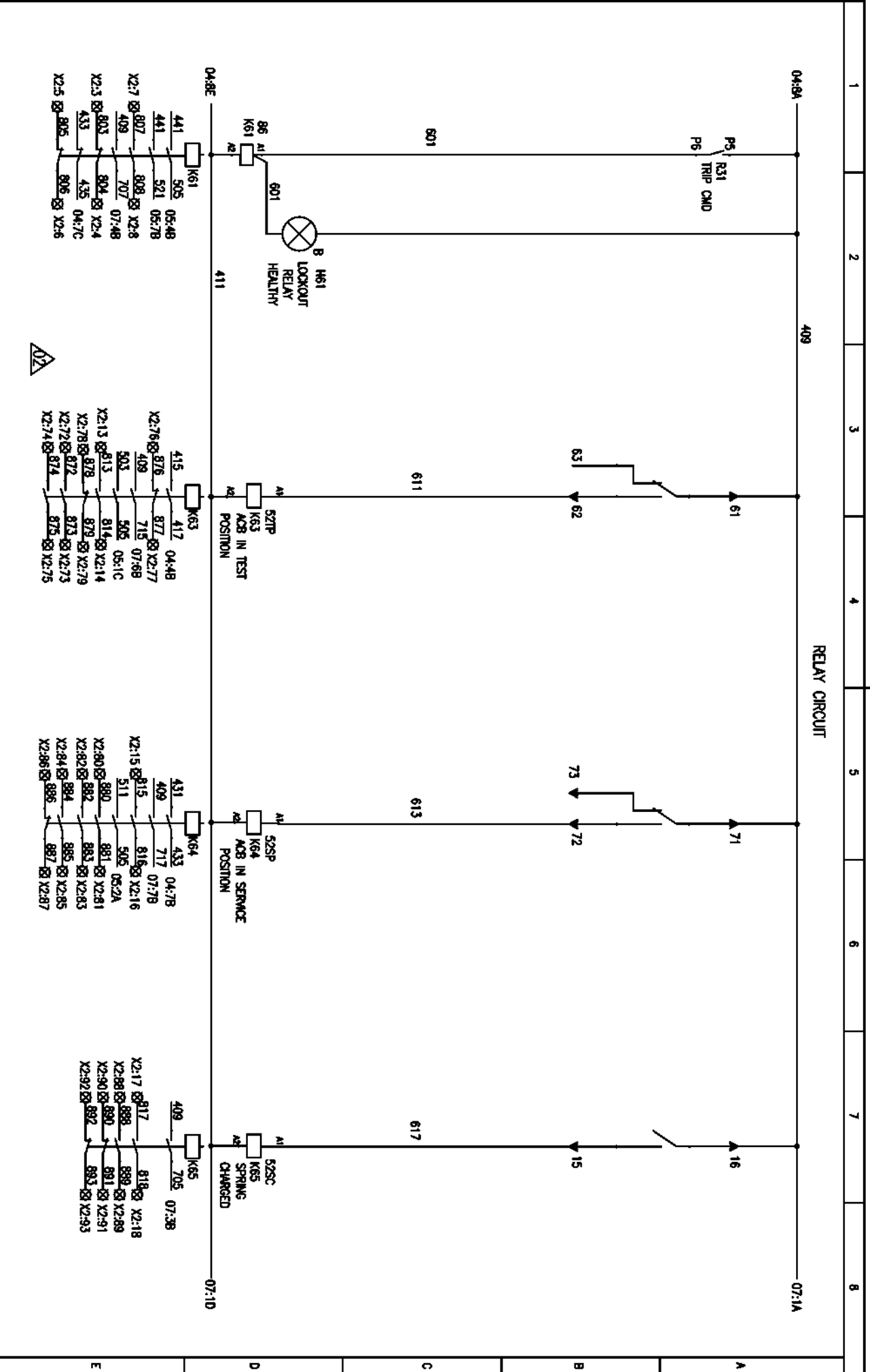
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DRG. NO. EP-3-CS-047-002

INVENTORY NO.

| REV. NO. | DATE     | DESCRIPTION                                     | BY | APPROVED | APPROVED | KSB | SCALE | NO. OF SHEETS | REV. |
|----------|----------|-------------------------------------------------|----|----------|----------|-----|-------|---------------|------|
| 0A       | 12.07.16 | REVISED BY LINE WITH FEED COMMENTS DTD:12.07.16 |    |          |          |     |       | 10            | 02   |
| 2        |          |                                                 |    |          |          |     |       |               |      |
| 3        |          |                                                 |    |          |          |     |       |               |      |
| 4        |          |                                                 |    |          |          |     |       |               |      |



FIRST ANGLE PROJECTION

ALL DIMENSIONS ARE IN MM.

RELAY CIRCUIT

BHARAT HEAVY ELECTRICALS LIMITED  
ELECTROFORCING DIVISION BANGALORE

CONTROL SCHEME FOR MODULE  
TYPE DAET INCOMER-B

TITLE :  
JOB NO. CP-14-047  
DRG. NO. EP-3-CS-047-002



NO. OF SHEETS  
SHEET NO. 08

FIRST ANGLE PROJECTION

ALL DIMENSIONS ARE IN MM.

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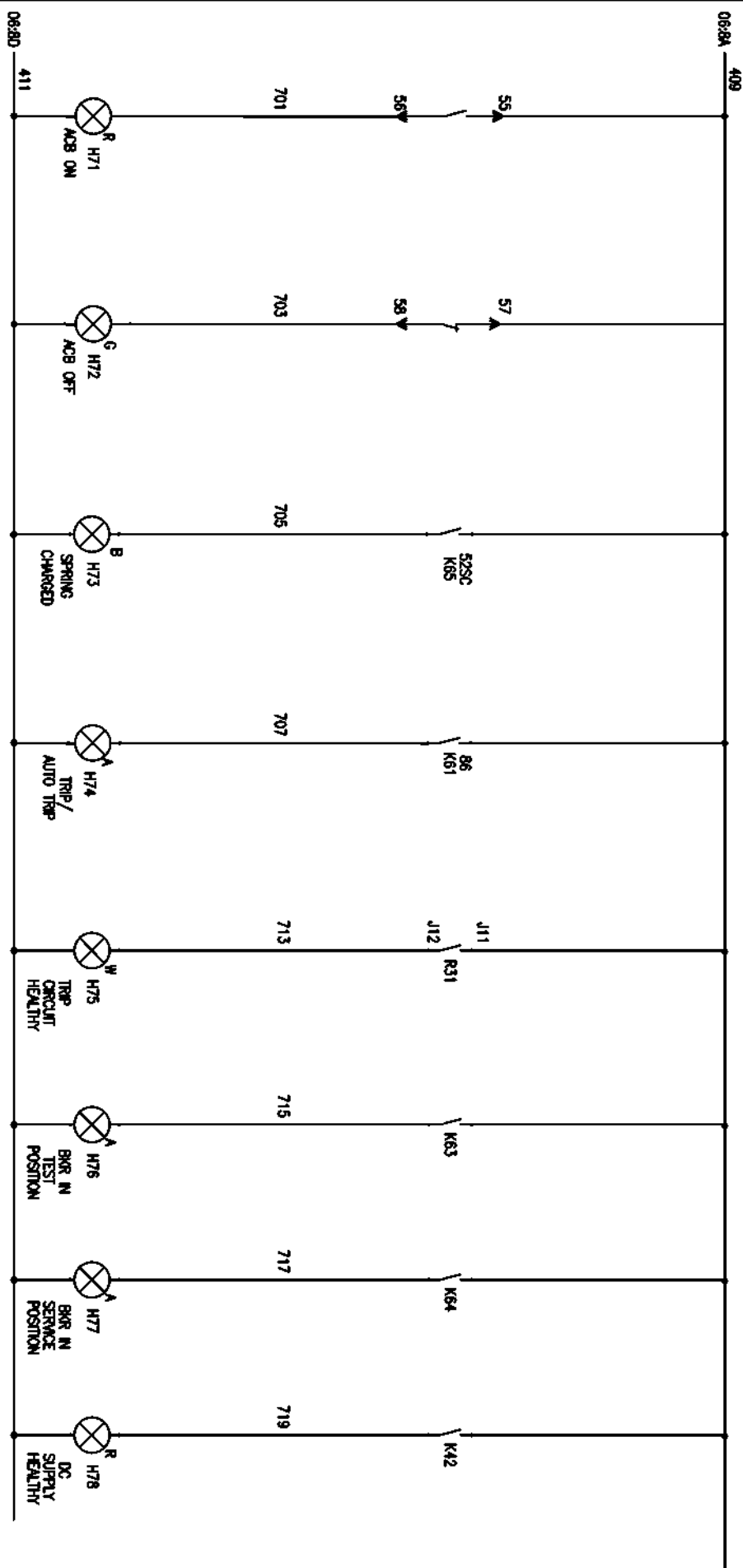
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## INDICATION CIRCUIT



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DRG. NO. EP-3-CS-047-002

INVENTORY NO.

| REV. NO. | DATE | DESCRIPTION | BY | APPRO. | APPROVED | NAME    | SIGN. | DATE     | SCALE | TITLE                                                                    | NO. OF SHEETS | REV. |
|----------|------|-------------|----|--------|----------|---------|-------|----------|-------|--------------------------------------------------------------------------|---------------|------|
| 1        |      |             |    |        |          | TRINATH |       | 24.08.16 |       | BHARAT HEAVY ELECTRICALS LIMITED<br>ELECTROPROCESSING DIVISION BANGALORE | 10            |      |
| 2        |      |             |    |        |          | TRINATH |       | 24.08.16 |       | CONTROL SCHEME FOR MODULE                                                | 07            |      |
| 3        |      |             |    |        |          | TRINATH |       | 24.08.16 |       | TYPE DAET INCOMER-B                                                      | 07            |      |
| 4        |      |             |    |        |          | TRINATH |       | 24.08.16 |       |                                                                          |               |      |



DRG. NO. EP-3-CS-047-002

INVENTORY NO.

REV. NO.

DATE

DESCRIPTION

BY

APPROVED

KSB

SCALE: 1/16"

JOB NO. CP-14-047

DRG. NO. EP-3-CS-047-002

NO. OF SHEETS

SHEET NO.

REV.

02

08

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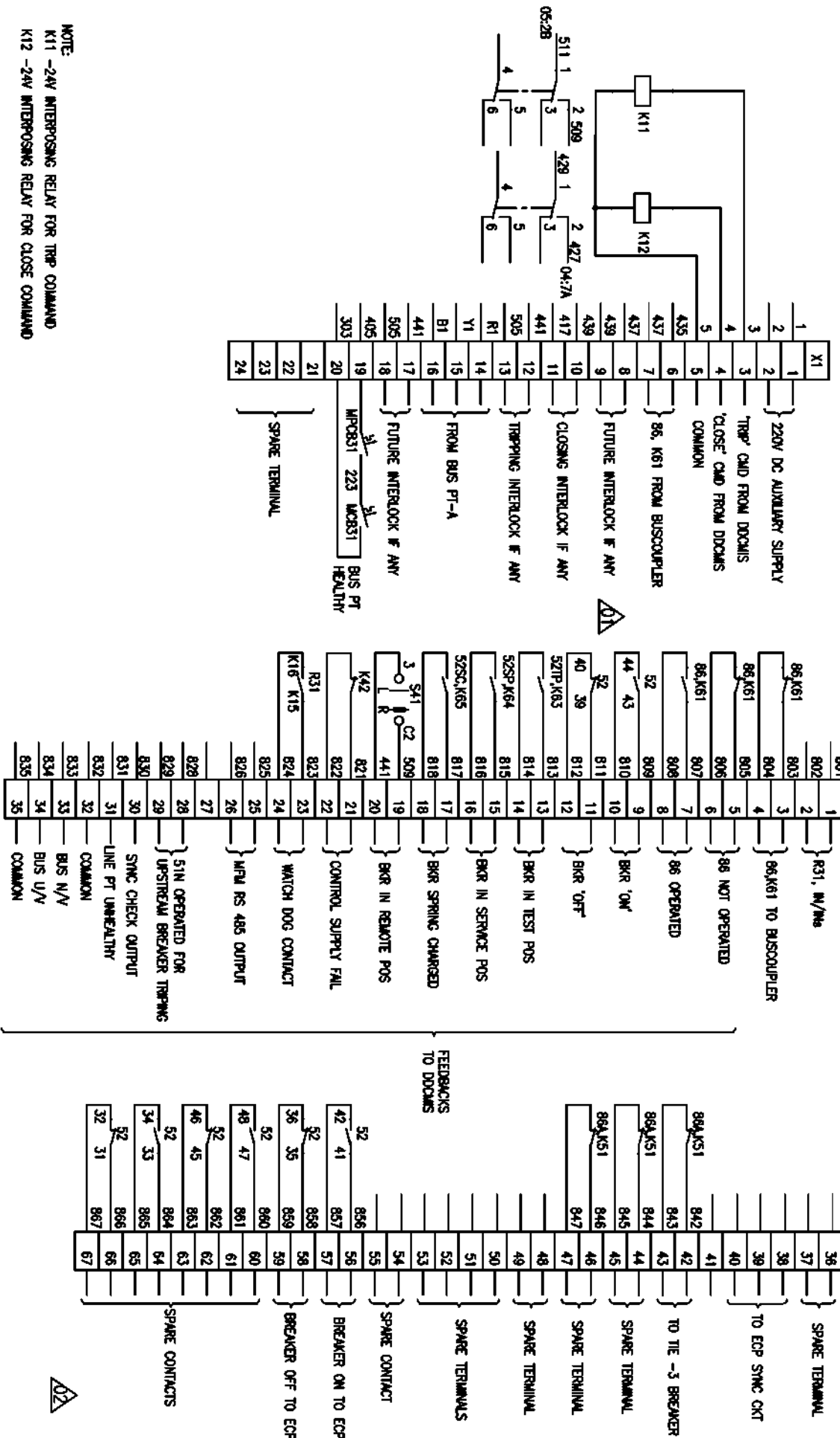
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10

10

FIRST ANGLE PROJECTION

ALL DIMENSIONS ARE IN MM.

BHARAT HEAVY ELECTRICALS LIMITED  
ELECTROPROCESSING DIVISION BANGALORE

TITLE:

CONTROL SCHEME FOR MODULE  
TYPE DAET INCOMER-B

NO. OF SHEETS

SHEET NO.

REV.

02

FIRST ANGLE PROJECTION

ALL DIMENSIONS ARE IN MM.

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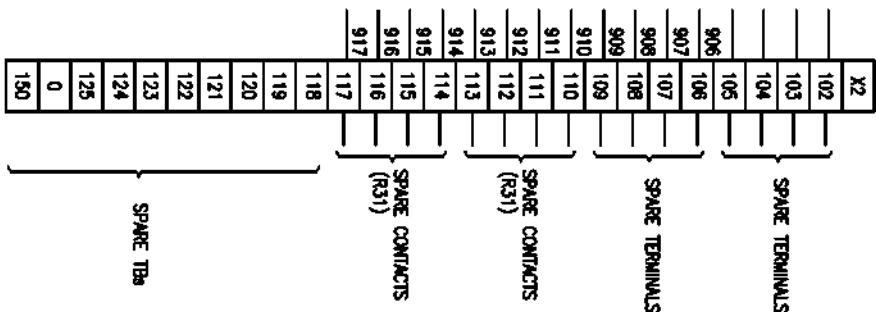
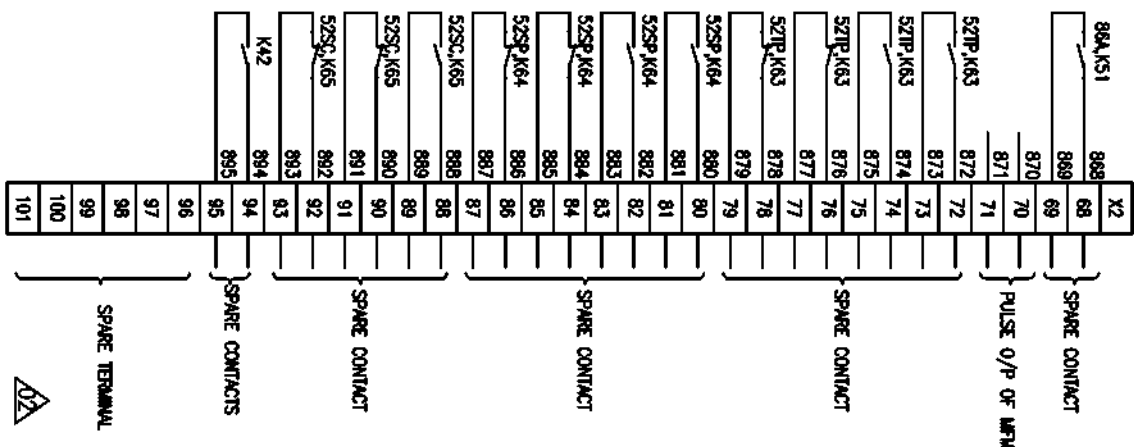
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DRG. NO. EP-3-CS-047-002

INVENTORY NO.

| REV. NO. | DATE     | DESCRIPTION                                     | BY   | APPRO. | APPROVED | KSB     | SCALE: 1:1 | JOB NO. CP-14-047 | DRG. NO. EP-3-CS-047-002 | NO. OF SHEETS | NO. | REV. |
|----------|----------|-------------------------------------------------|------|--------|----------|---------|------------|-------------------|--------------------------|---------------|-----|------|
| 1        | 12.07.16 | REVISED BY LINE WITH FEED COMMENTS DTD:12.07.16 | J.S. | J.S.   | CHECKED  | TRINATH | 24.08.16   |                   |                          | 10            | 09  | 02   |
| 2        |          |                                                 |      |        | DRAWN    |         |            |                   |                          |               |     |      |
| 3        |          |                                                 |      |        | DESIGNED | TRINATH | 24.08.16   |                   |                          |               |     |      |
| 4        |          |                                                 |      |        |          |         |            |                   |                          |               |     |      |



BHARAT HEAVY ELECTRICALS LIMITED

ELECTROPROCESSING DIVISION BANGALORE

TITLE:

CONTROL SCHEME FOR MODULE  
TYPE DAET INCOMER-B

NO. OF SHEETS

10

SHEET NO.

09

E

D

C

B

A



CUSTOMER



GUJARAT ELECTRICITY CORPORATION LIMITED  
VADODARA, GUJARAT

PROJECT:

1x800 MW WANAKBORI THERMAL POWER STATION  
EXTENTION UNIT-8

|                                                                                                                      |                                                           |
|----------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|
| DEVELOPMENT CONSULTANTS<br>PRIVATE LIMITED                                                                           |                                                           |
| Issued only for general construction with<br>constant drawings and specifications.                                   |                                                           |
| Contractor to be responsible for any error and for<br>fulfillment of detailed requirements of contract<br>documents. |                                                           |
| Sheet No. 2                                                                                                          | EXTENSION-02-17                                           |
| DESIGNED BY: BR                                                                                                      |                                                           |
| 1. Drawn                                                                                                             | 4. Approved/checked/checked<br>for construction required. |
| 2. Checked                                                                                                           | 5. Drawn/checked/checked<br>for construction required.    |
| 3. Approved/checked/checked<br>for construction required.                                                            | 6. For Information and<br>record only.                    |
| SEE COVERING LETTER                                                                                                  |                                                           |
| Date:                                                                                                                |                                                           |

| DRAWING NO.     | DESCRIPTION OF DRAWING                  | SCHEME REQUIREMENT                                                                        |
|-----------------|-----------------------------------------|-------------------------------------------------------------------------------------------|
| EP-3-CS-047-003 | Control Scheme for Module type DAET B/C | BUSCOUPLER FOR BOARD WHERE IN<br>INCOMING 415V ACB BREAKER<br>FEEDER FED FROM TRANSFORMER |

CUSTOMER CONSULTANT:

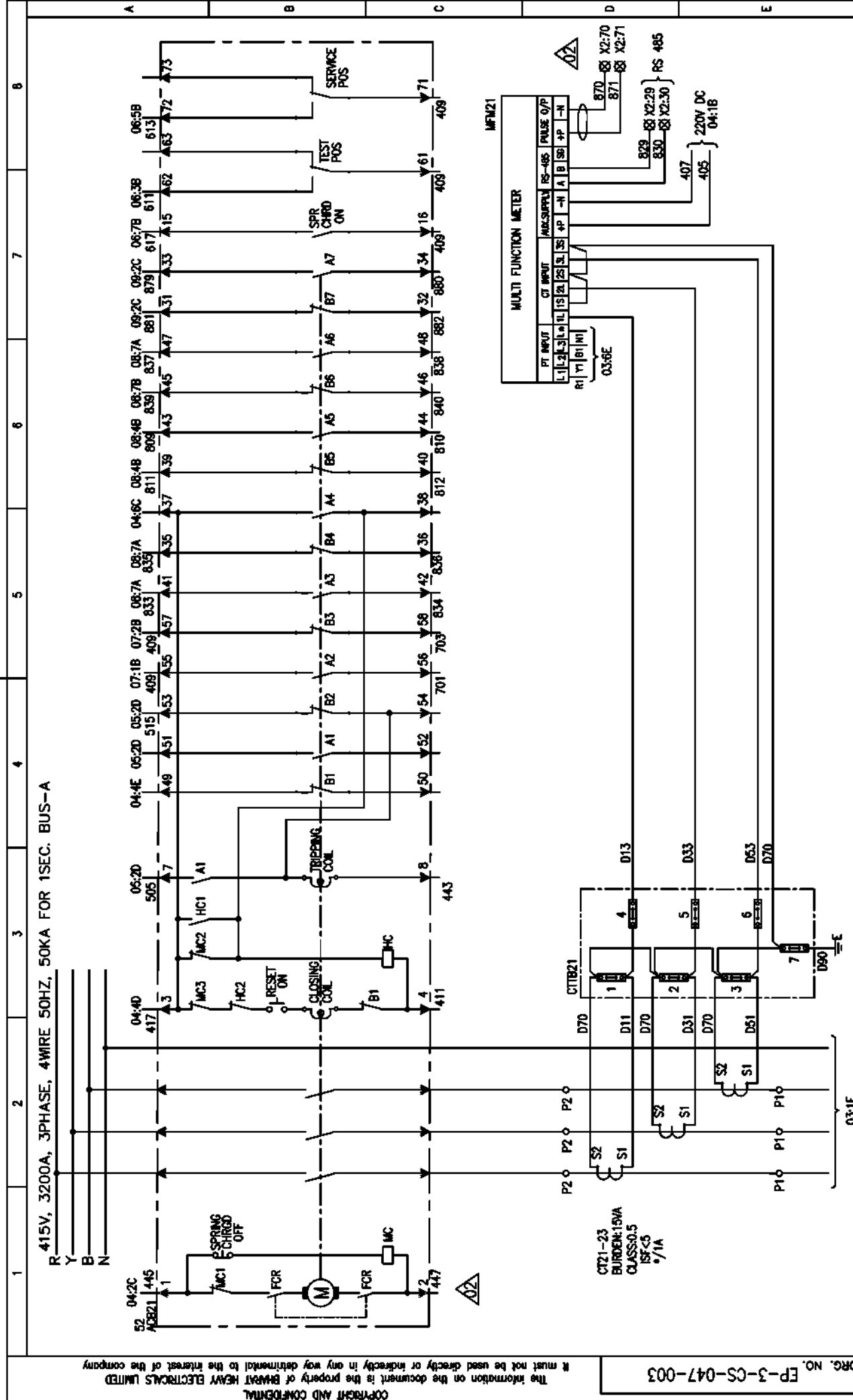


DEVELOPMENT CONSULTANT PVT LTD  
KOLKATA

|                                                                          |  |                                                          |  |                          |  |
|--------------------------------------------------------------------------|--|----------------------------------------------------------|--|--------------------------|--|
| BHARAT HEAVY ELECTRICALS LIMITED<br>ELECTROFACILITIES DIVISION BANGALORE |  | TITLE: CONTROL SCHEME FOR MODULE<br>TYPE DAET BUSCOUPLER |  | NO. OF SHEETS: 12        |  |
| REV. NO. 04, 12.07.18                                                    |  | REV. NO. 01                                              |  | REV. NO. 02              |  |
| BY: [Signature]                                                          |  | APPROVED: [Signature]                                    |  | JOB NO. CP-14-047        |  |
| DESCRIPTION: REVISED IN LINE WITH PDM COMMENTS DTD:12.07.18              |  | SCALE: NA                                                |  | DRG. NO. EP-3-CS-047-003 |  |

FIRST ANGLE PROJECTION

ALL DIMENSIONS ARE IN MM.



| BHARAT HEAVY ELECTRICALS LIMITED<br>ELECTROPROCESSING DIVISION BANGALORE |          |                                                |  | CONTROL SCHEME FOR MODULE<br>TYPE DAET BUSCOUPLER |          |                                                |  | NO. OF SHEETS 12 |          |                                                |  |
|--------------------------------------------------------------------------|----------|------------------------------------------------|--|---------------------------------------------------|----------|------------------------------------------------|--|------------------|----------|------------------------------------------------|--|
| TITLE :                                                                  |          |                                                |  | NO. OF SHEETS 12                                  |          |                                                |  | SHEET NO. 02     |          |                                                |  |
| SCALE : NA                                                               |          |                                                |  | JOB NO. CP-14-047                                 |          |                                                |  | REV. 02          |          |                                                |  |
| DATE                                                                     |          |                                                |  | DATE                                              |          |                                                |  | DATE             |          |                                                |  |
| NAME                                                                     |          |                                                |  | NAME                                              |          |                                                |  | NAME             |          |                                                |  |
| DESIGNED                                                                 |          |                                                |  | DESIGNED                                          |          |                                                |  | DESIGNED         |          |                                                |  |
| DRAWN                                                                    |          |                                                |  | DRAWN                                             |          |                                                |  | DRAWN            |          |                                                |  |
| CHECKED                                                                  |          |                                                |  | CHECKED                                           |          |                                                |  | CHECKED          |          |                                                |  |
| APPROVED                                                                 |          |                                                |  | APPROVED                                          |          |                                                |  | APPROVED         |          |                                                |  |
| BY                                                                       |          |                                                |  | BY                                                |          |                                                |  | BY               |          |                                                |  |
| DESCRIPTION                                                              |          |                                                |  | DESCRIPTION                                       |          |                                                |  | DESCRIPTION      |          |                                                |  |
| 04                                                                       | 12.07.16 | REVISED IN LINE WITH PEM COMMENTS DTD:12.07.16 |  | 04                                                | 12.07.16 | REVISED IN LINE WITH PEM COMMENTS DTD:12.07.16 |  | 04               | 12.07.16 | REVISED IN LINE WITH PEM COMMENTS DTD:12.07.16 |  |











FORM 66-271 A3

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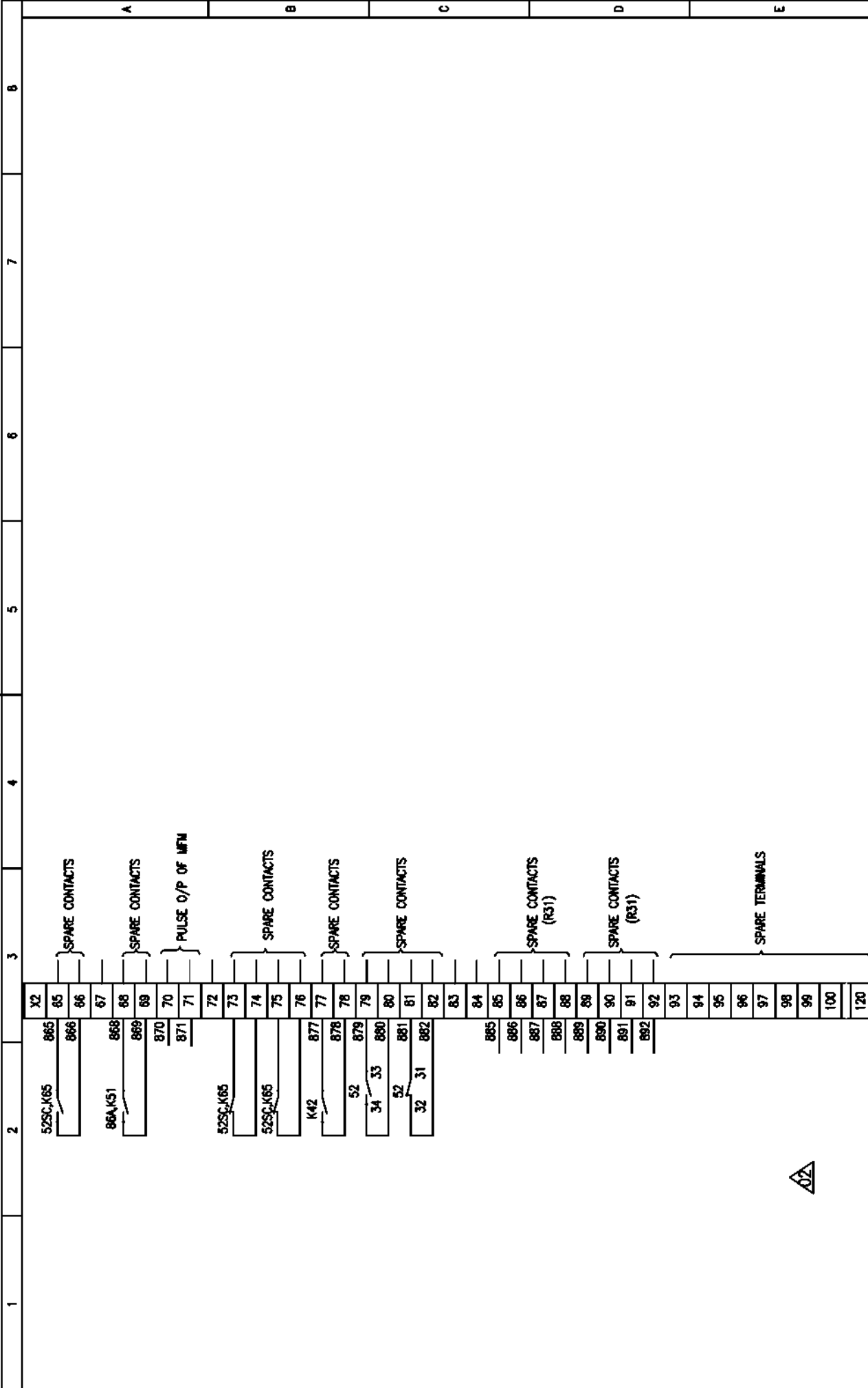
DRG. NO. EP-3-CS-047-003

INVENTORY NO.  
REV. NO. DATE  
DESCRIPTION

FORM 66-271 A3

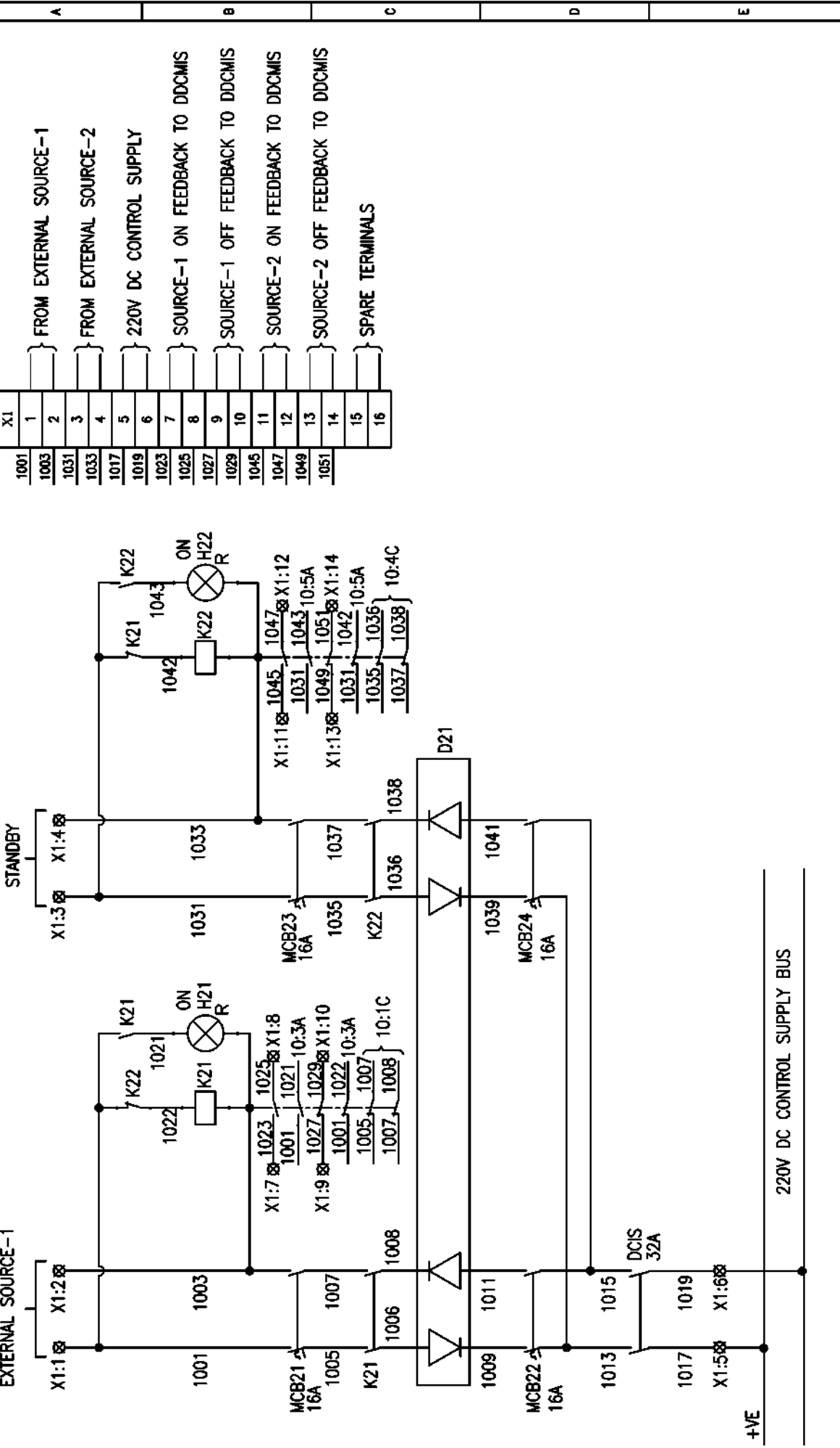
FIRST ANGLE PROJECTION

ALL DIMENSIONS ARE IN MM.

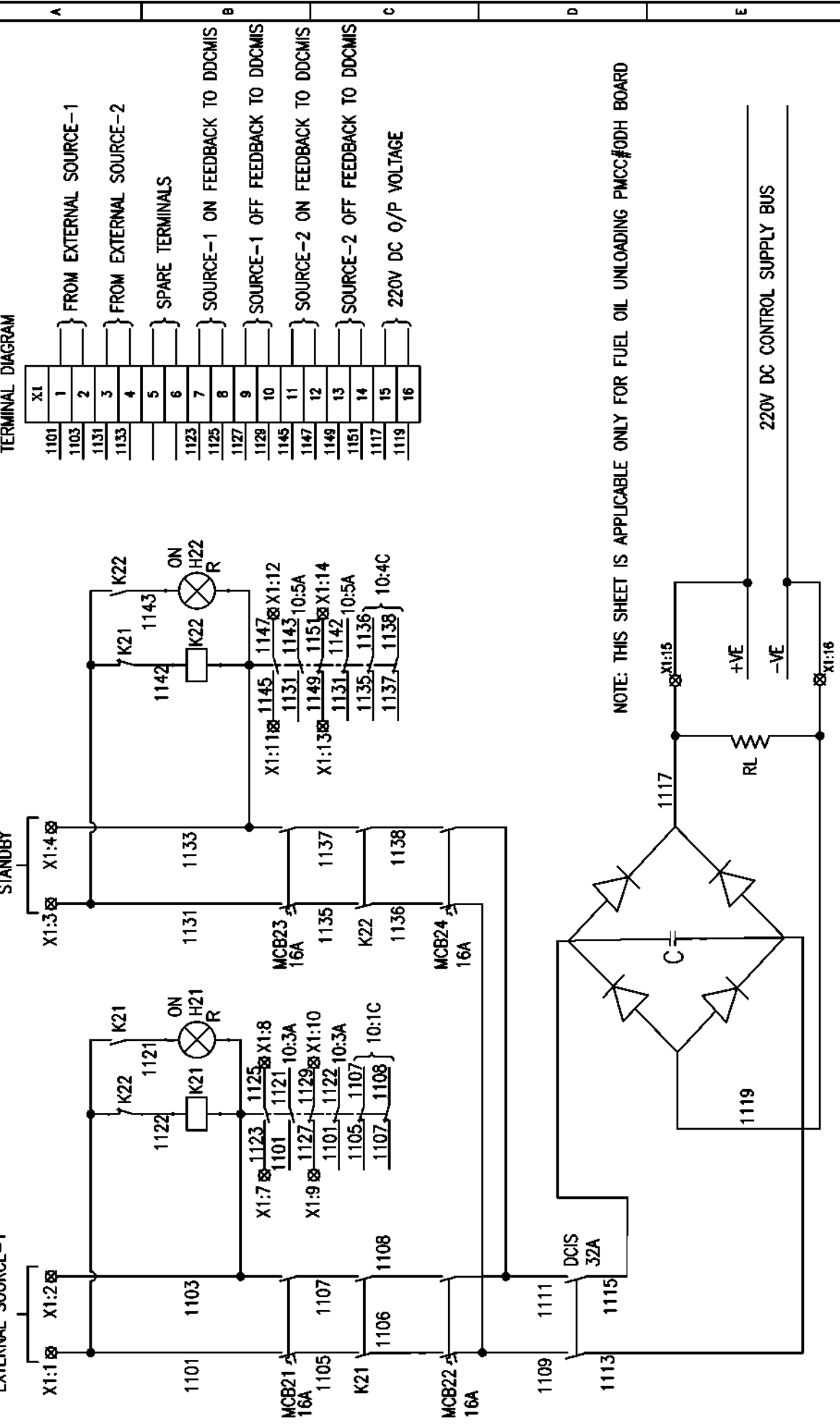


BHARAT HEAVY ELECTRICALS LIMITED  
ELECTROPORCELAINS DIVISION BANGLORE  
TITLE : CONTROL SCHEME FOR MODULE  
TYPE DAET BUSCOUPLER  
JOB NO. CP-14-047  
SCALE: NA  
DATE: 24.06.16  
SIGN: [Signature]  
NAME: TRINATH KSB  
DESIGNED: [Signature]  
DRAWN: [Signature]  
CHECKED: [Signature]  
APPROVED: [Signature]  
BY: [Signature]

NO. OF SHEETS: 12  
SHEET NO.: 09  
REV. NO.: 02  
DRG. NO. EP-3-CS-047-003



|                                                                           |  |  |  |                                                   |  |  |  |
|---------------------------------------------------------------------------|--|--|--|---------------------------------------------------|--|--|--|
| BHARAT HEAVY ELECTRICALS LIMITED<br>ELECTROPERFORMANCE DIVISION BANGALORE |  |  |  | CONTROL SCHEME FOR MODULE<br>TYPE DAET BUSCOUPLER |  |  |  |
| TITLE :                                                                   |  |  |  | NO. OF SHEETS : 12                                |  |  |  |
| JOB NO. CP-14-047                                                         |  |  |  | SHEET NO. : 11                                    |  |  |  |
| SCALE : NA                                                                |  |  |  | REV. NO. : 02                                     |  |  |  |
| DATE : 24.06.16                                                           |  |  |  | DRG. NO. EP-3-CS-047-003                          |  |  |  |
| NAME : TRINATH                                                            |  |  |  | NO. OF SHEETS : 12                                |  |  |  |
| SIGN. :                                                                   |  |  |  | SHEET NO. : 11                                    |  |  |  |
| DESIGNED :                                                                |  |  |  | REV. NO. : 02                                     |  |  |  |
| DRAWN :                                                                   |  |  |  | DRG. NO. EP-3-CS-047-003                          |  |  |  |
| CHECKED :                                                                 |  |  |  | NO. OF SHEETS : 12                                |  |  |  |
| APPROVED :                                                                |  |  |  | SHEET NO. : 11                                    |  |  |  |
| BY :                                                                      |  |  |  | REV. NO. : 02                                     |  |  |  |
| DESCRIPTION :                                                             |  |  |  | DRG. NO. EP-3-CS-047-003                          |  |  |  |
| DATE : 24.06.16                                                           |  |  |  | NO. OF SHEETS : 12                                |  |  |  |
| REV. NO. : 02                                                             |  |  |  | SHEET NO. : 11                                    |  |  |  |



TERMINAL DIAGRAM

| X1   |                                 |
|------|---------------------------------|
| 1101 | FROM EXTERNAL SOURCE-1          |
| 1103 | FROM EXTERNAL SOURCE-2          |
| 1131 | SPARE TERMINALS                 |
| 1133 | SPARE TERMINALS                 |
| 1123 | SOURCE-1 ON FEEDBACK TO DDCMIS  |
| 1125 | SOURCE-1 OFF FEEDBACK TO DDCMIS |
| 1127 | SOURCE-2 ON FEEDBACK TO DDCMIS  |
| 1129 | SOURCE-2 OFF FEEDBACK TO DDCMIS |
| 1145 | 220V DC O/P VOLTAGE             |
| 1147 |                                 |
| 1149 |                                 |
| 1151 |                                 |
| 1117 |                                 |
| 1119 |                                 |

| REV. NO. | DATE     | DESCRIPTION                                    | BY | APPROVED | CHECKED | DRAWN | DESIGNED | NAME    | SIGN. | DATE     | SCALE | NO. OF SHEETS | SHEET NO. | REV. |
|----------|----------|------------------------------------------------|----|----------|---------|-------|----------|---------|-------|----------|-------|---------------|-----------|------|
| 01       | 12.07.16 | REVISED IN LINE WITH PEM COMMENTS DTD:12.07.16 |    |          |         |       |          | TRINATH |       | 24.06.16 | NA    | 12            | 12        | 02   |
| 02       | 12.07.16 | REVISED IN LINE WITH PEM COMMENTS DTD:12.07.16 |    |          |         |       |          | TRINATH |       | 24.06.16 | NA    | 12            | 12        | 02   |

|                                  |                                                |
|----------------------------------|------------------------------------------------|
| BHARAT HEAVY ELECTRICALS LIMITED | ELECTROPORCELAIN DIVISION BANGALORE            |
| TITLE :                          | CONTROL SCHEME FOR MODULE TYPE DAET BUSCOUPLER |
| JOB NO. CP-14-047                | DRG. NO. EP-3-CS-047-003                       |

|                |
|----------------|
| FORM 66-271 A3 |
|----------------|

FIRST ANGLE PROJECTION

ALL DIMENSIONS ARE IN MM.

1 2 3 4 5 6 7 8

| LEGEND  | DESCRIPTION                                 |
|---------|---------------------------------------------|
| ACB(52) | AIR CIRCUIT BREAKER                         |
| CT      | CURRENT TRANSFORMER                         |
| CTTB    | CURRENT TRANSFORMER TERMINAL BLOCK          |
| PT      | POTENTIAL TRANSFORMER                       |
| NL      | NEUTRAL LINK                                |
| MPCB    | MOTOR PROTECTION CIRCUIT BREAKER            |
| MCB     | MINIATURE CIRCUIT BREAKER                   |
| MFM     | MULTI FUNCTION METER                        |
| TCS     | TRIP COIL SUPERVISION                       |
| C9      | ACB TEST POSITION LIMIT SWITCH              |
| C7      | ACB SERVICE POSITION LIMIT SWITCH           |
| FCR     | ACB SPRING CHARGING LIMIT SWITCH            |
| M       | ACB SPRING CHARGING MOTOR                   |
| DCSW    | DC SWITCH                                   |
| H       | INDICATION LAMP                             |
| K11     | INTERPOSING RELAY                           |
| K12     | INTERPOSING RELAY                           |
| K       | AUXILIARY CONTACTOR                         |
| R       | NUMERICAL RELAY                             |
| RES     | RESISTOR                                    |
| D       | DIODE                                       |
| E       | EARTH                                       |
| X1, X2  | TERMINAL BLOCK                              |
| S       | SELECTOR SWITCH                             |
| TNC     | BREAKER CONTROL SWITCH (TRIP/NEUTRAL/CLOSE) |

CROSS REFERENCE EXAMPLE:

- 1.) 04:40  
0' INDICATES Y-AXIS ZONE  
4' INDICATES X-AXIS ZONE  
04' INDICATES PAGE NUMBER
- 2.) 07:68  
8' INDICATES Y-AXIS ZONE  
6' INDICATES X-AXIS ZONE  
07' INDICATES PAGE NUMBER

COMPONENTS NUMBERING EXAMPLE:

- 1.) MCB41  
1' INDICATES SERIAL NUMBER OF COMPONENT ON THAT PAGE  
4' INDICATES PAGE NUMBER  
MCB' INDICATES COMPONENT NAME
- 2.) MCB42  
2' INDICATES SERIAL NUMBER OF COMPONENT ON THAT PAGE  
4' INDICATES PAGE NUMBER  
MCB' INDICATES COMPONENT NAME
- 3.) H71  
1' INDICATES SERIAL NUMBER OF COMPONENT ON THAT PAGE  
7' INDICATES PAGE NUMBER  
H' INDICATES COMPONENT NAME

| LEGEND | DESCRIPTION                  |
|--------|------------------------------|
| 51     | OVER CURRENT                 |
| 51N    | EARTH FAULT                  |
| 51SN   | SENSITIVE GROUND EARTH FAULT |
| 64     | RESTRICTED EARTH FAULT       |
| 98     | FUSE FAILURE                 |
| 27     | UNDER VOLTAGE                |
| 74     | TRIP CIRCUIT SUPERVISION     |
| 30     | TRIP ANNUNCIATION            |

| LEGEND | DESCRIPTION               |
|--------|---------------------------|
| DCIS   | ON/OFF ISOLATING SWITCH   |
| MCB    | MINIATURE CIRCUIT BREAKER |
| D      | DIODE                     |
| X1     | TERMINAL BLOCK            |
| H      | INDICATION LAMP           |
| K      | AUXILIARY CONTACTOR       |

|                                                                        |  |                                                              |  |                          |  |
|------------------------------------------------------------------------|--|--------------------------------------------------------------|--|--------------------------|--|
| BHARAT HEAVY ELECTRICALS LIMITED<br>ELECTROPOREPLANS DIVISION BANGLORE |  | TITLE :<br>CONTROL SCHEME FOR MODULE<br>TYPE DAET BUSCOUPLER |  | NO. OF SHEETS<br>12      |  |
| SCALE: NA                                                              |  | JOB NO. CP-14-047                                            |  | Dwg. No. EP-3-CS-047-003 |  |
| BY: 24.06.16                                                           |  | APPROVED: KSB                                                |  | REV. NO. 02              |  |
| DESIGNED: TRINATH                                                      |  | CHECKED: TRINATH                                             |  | SHEET NO. 12             |  |
| DATE: 24.06.16                                                         |  | DATE: 24.06.16                                               |  | REV. NO. 02              |  |

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DRG. NO. EP-3-CS-047-013

|                                                                                                                                                                                                             |                                                          |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|
| <b>DEVELOPMENT CONSULTANTS<br/>PRIVATE LIMITED</b>                                                                                                                                                          |                                                          |
| Involved only for general coordination with<br>contract drawings and specifications.<br>Contractor to be responsible for any error and for<br>fulfilment of detailed requirements of contract<br>documents. |                                                          |
| ACTION : 2      DATE: 10-02-17                                                                                                                                                                              |                                                          |
| DISTRIBUTED BY : BR                                                                                                                                                                                         |                                                          |
| 1. Issued                                                                                                                                                                                                   | 4. Approved/accepted/retained.<br>Modification required. |
| 2. Referred                                                                                                                                                                                                 | 5. Disapproved. For<br>reconsidering later.              |
| 3. Approved except<br>as noted. Normal<br>final drawing.                                                                                                                                                    | 6. For Information and<br>record only.                   |
| <b>FOR COVERING LETTER</b>                                                                                                                                                                                  |                                                          |
| Date :                                                                                                                                                                                                      |                                                          |

CUSTOMER  
**GSECL**  
GUJARAT ELECTRICITY CORPORATION LIMITED  
VADODARA, GUJARAT

PROJECT:  
1x800 MW WANAKBORI THERMAL POWER STATION  
EXTENSION UNIT-8

| DRAWING NO.     | DESCRIPTION OF DRAWING                        | SCHEME REQUIREMENT                              |
|-----------------|-----------------------------------------------|-------------------------------------------------|
| EP-3-CS-047-013 | Control Scheme for Module type DAE-O/G Feeder | 415V ACB BREAKER FEEDER TO FEED<br>OTHER BOARDS |

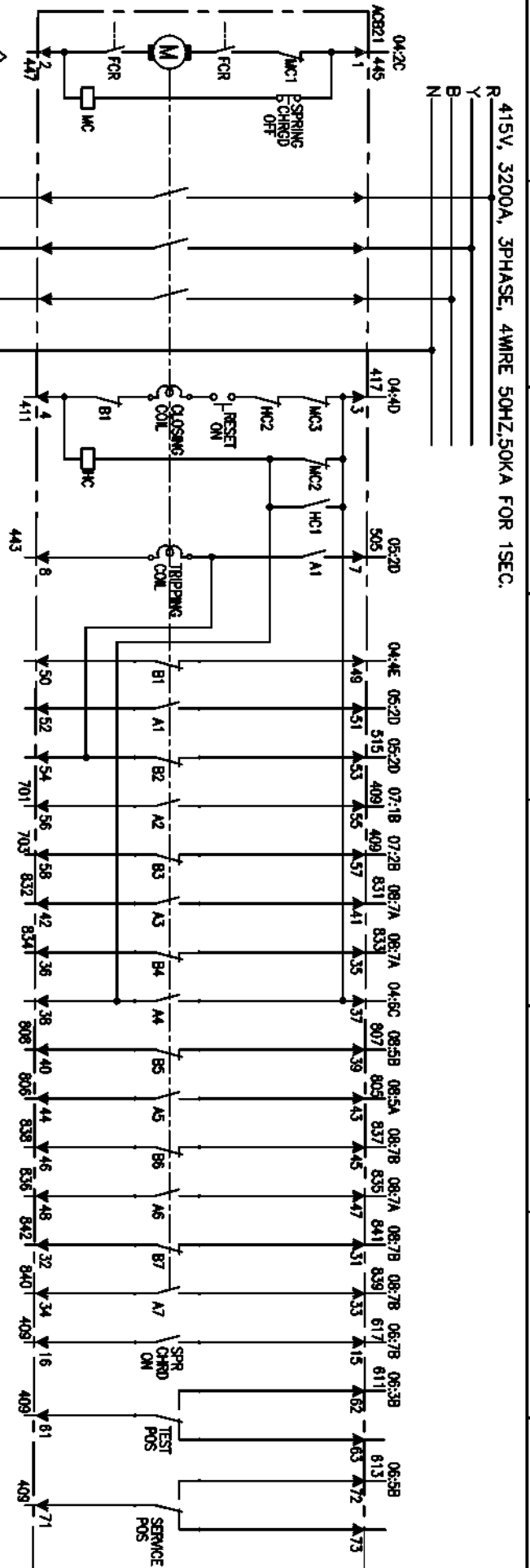
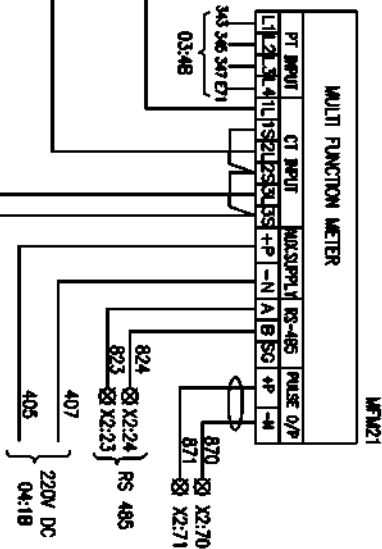
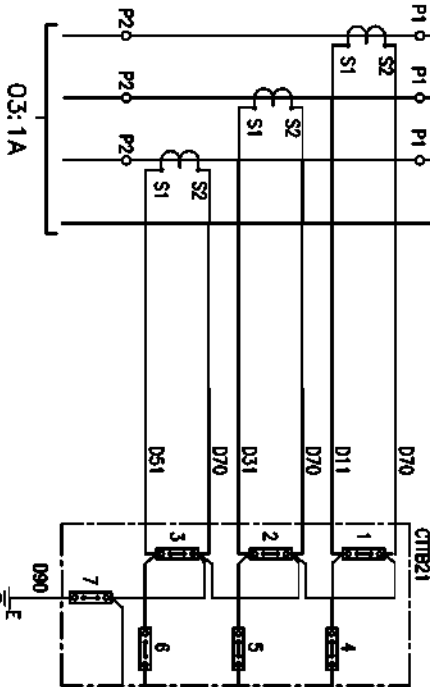
CUSTOMER CONSULTANT:  
  
**DEVELOPMENT CONSULTANT PVT LTD**  
KOLKATA

|               |  |      |  |    |  |          |  |     |  |          |  |          |  |                                                                          |  |                                                                                    |  |          |  |
|---------------|--|------|--|----|--|----------|--|-----|--|----------|--|----------|--|--------------------------------------------------------------------------|--|------------------------------------------------------------------------------------|--|----------|--|
| INVENTORY NO. |  |      |  |    |  |          |  |     |  |          |  |          |  | BHARAT HEAVY ELECTRICALS LIMITED<br>ELECTROPORCELAINS DIVISION BANGALORE |  |  |  |          |  |
| REV. NO.      |  | DATE |  | BY |  | APPROVED |  | KSE |  | 24.08.16 |  | 24.08.16 |  | TITLE :                                                                  |  | NO. OF SHEETS                                                                      |  | 10       |  |
|               |  |      |  |    |  |          |  |     |  |          |  |          |  | CONTROL SCHEME FOR MODULE                                                |  | SHEET                                                                              |  | 01       |  |
|               |  |      |  |    |  |          |  |     |  |          |  |          |  | TYPE DAE OUTGOING FEEDER                                                 |  | NO.                                                                                |  |          |  |
|               |  |      |  |    |  |          |  |     |  |          |  |          |  | JDB NO. CP-14-047                                                        |  | DRG. NO. EP-3-CS-047-013                                                           |  | REV. NO. |  |
|               |  |      |  |    |  |          |  |     |  |          |  |          |  | SCALE: NA                                                                |  |                                                                                    |  | 02       |  |

**INVENTORY NO.**

[illegible]

**BURDEN:15VA**  
**CLASS:0.5**  
**\*/1A**



ALL DIMENSIONS ARE IN MM

2

INVENTORY NO.

| REV. | DATE | DESCRIPTION | BY | APPROVED | NAME    | SIGN.                                                                               | DATE     |
|------|------|-------------|----|----------|---------|-------------------------------------------------------------------------------------|----------|
| 4    |      |             |    |          |         |                                                                                     |          |
| 3    |      |             |    | DESIGNED | TRINATH |  | 24.06.16 |
| 2    |      |             |    | DRAWN    |         |                                                                                     |          |
| 1    |      |             |    | CHECKED  | TRINATH |  | 24.06.16 |
|      |      |             |    |          | KSB     |  | 24.06.16 |



SCALE: MM

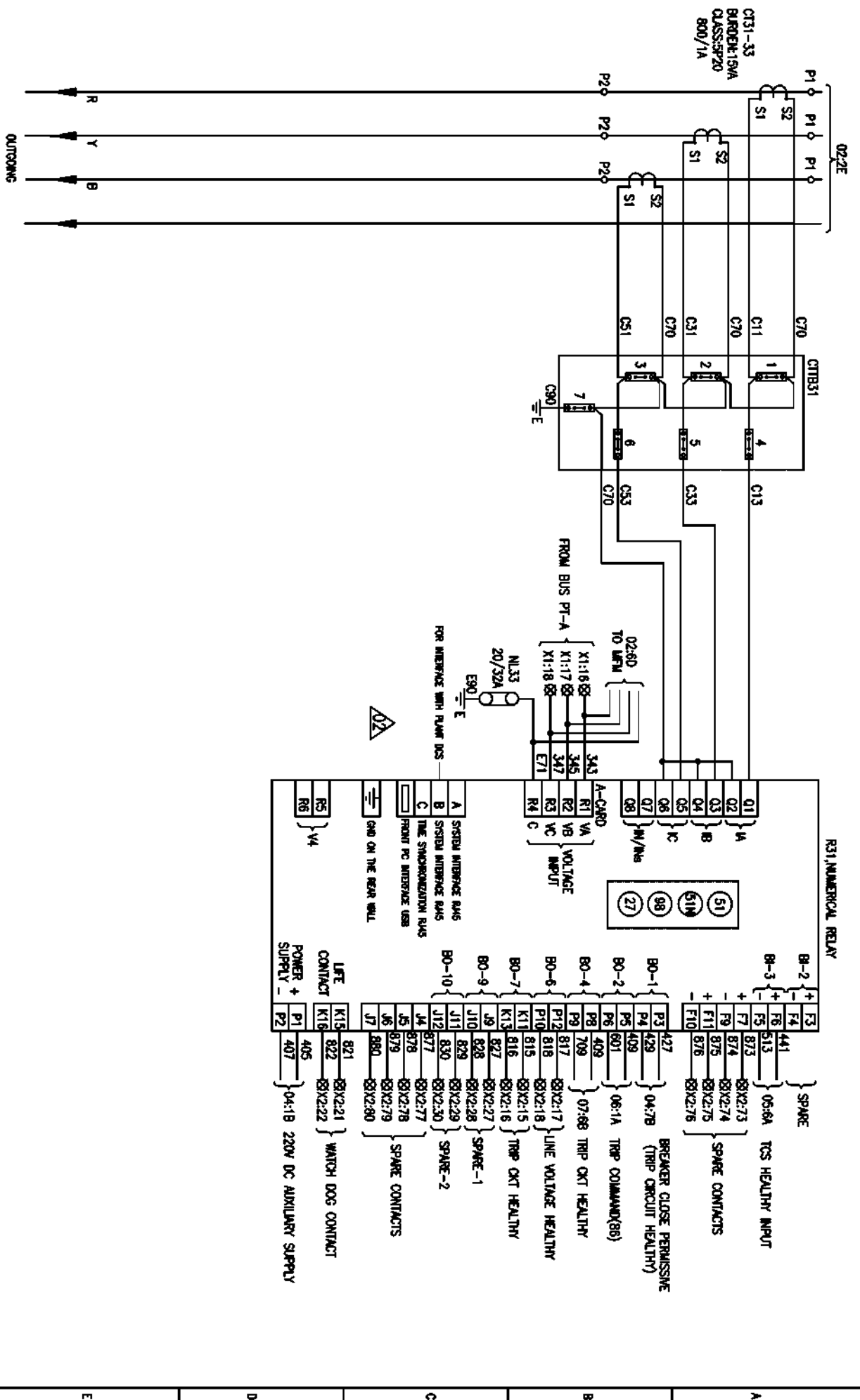
|                   |                                               |
|-------------------|-----------------------------------------------|
| JOB NO. CP-14-047 | <b>BIHARAT HEA</b><br><b>ELECTROP</b>         |
|                   | <b>TITLE :</b><br><b>CONIT</b><br><b>TYPE</b> |

**SHY ELECTRICALS LIMITED**  
PORCELAIN DIVISION BANGLORE

**CONTROL SCHEME FOR MODULAR  
DAE OUTGOING FEEDER**

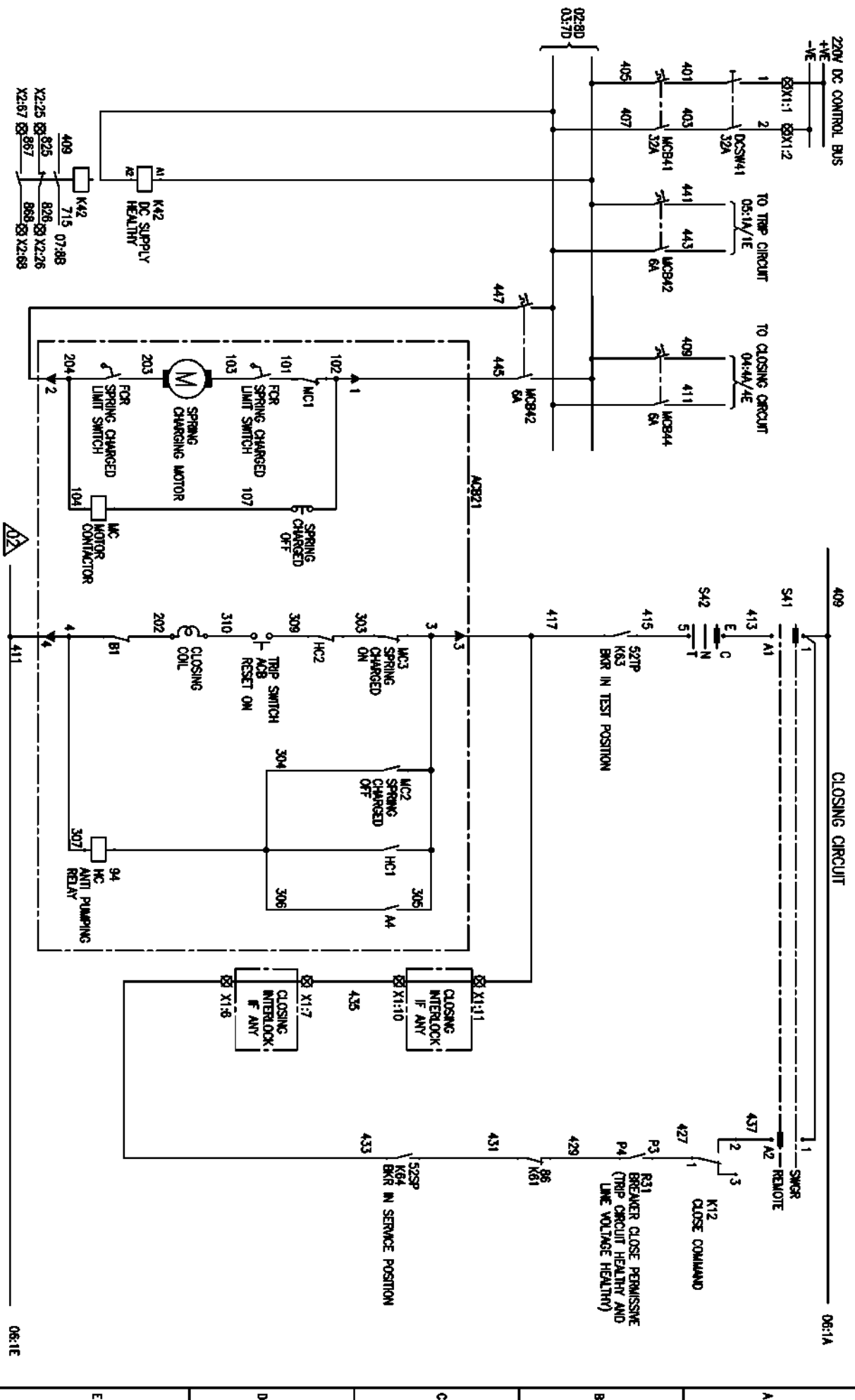
DRG. NO. EP-3-CS-C

|                                                                                     |               |    |
|-------------------------------------------------------------------------------------|---------------|----|
|  | NO. OF SHEETS | 10 |
|                                                                                     | SHEET NO.     | 03 |



INVENTORY NO.

|      |      |             |    |        |          |                                                                                     |                                                                               |                                                                                     |                                                                     |                          |    |
|------|------|-------------|----|--------|----------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------|--------------------------|----|
| 4    |      |             |    |        |          |  | <b>BHARAT HEAVY ELECTRICALS LIMITED</b><br>ELECTROFORGEANS DIVISION BANGALORE |  |                                                                     |                          |    |
| 3    |      |             |    |        |          |                                                                                     |                                                                               |                                                                                     | <b>CONTROL SCHEME FOR MODULE</b><br><b>TYPE DAE OUTGOING FEEDER</b> | NO. OF SHEETS            | 10 |
| 2    |      |             |    |        |          |                                                                                     |                                                                               |                                                                                     |                                                                     | SHEET                    | 04 |
| 1    |      |             |    |        |          |                                                                                     |                                                                               |                                                                                     |                                                                     | REV.                     | 02 |
|      |      |             |    |        |          |                                                                                     |                                                                               |                                                                                     |                                                                     | DATE                     | 02 |
| REV. | DATE | DESCRIPTION | BY | APPRO. | APPROVED | KCSB                                                                                | 24.06.16                                                                      | SCALE: 1/16                                                                         | JOB NO. CP-14-047                                                   | DRG. NO. EP-3-CS-047-013 |    |



FIRST ANGLE PROJECTION

ALL DIMENSIONS ARE IN MM.

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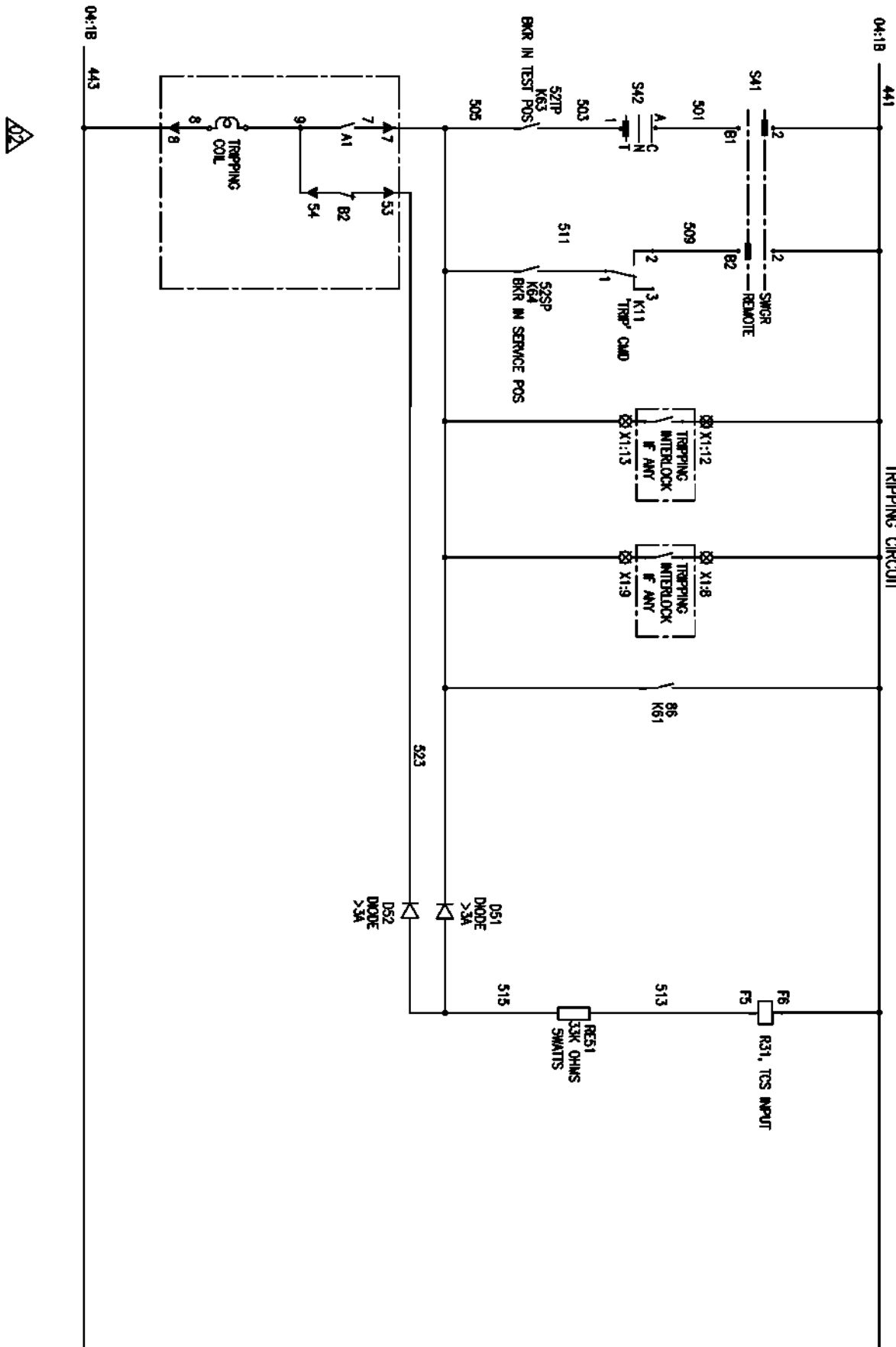
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## TRIPPING CIRCUIT



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DRG. NO. EP-3-CS-047-013

INVENTORY NO.

| REV. NO. | DATE | DESCRIPTION | BY | APPROVED | KSB |
|----------|------|-------------|----|----------|-----|
| 1        |      |             |    |          |     |
| 2        |      |             |    |          |     |
| 3        |      |             |    |          |     |
| 4        |      |             |    |          |     |

BHARAT HEAVY ELECTRICALS LIMITED

ELECTROPROGRAMS DIVISION BANGLORE

TITLE :

CONTROL SCHEME FOR MODULE  
TYPE DAE OUTGOING FEEDER

JOB NO. CP-14-047

DRG. NO. EP-3-CS-047-013



NO. OF SHEETS

SHEET NO.

REV.

02

1

2

3

4

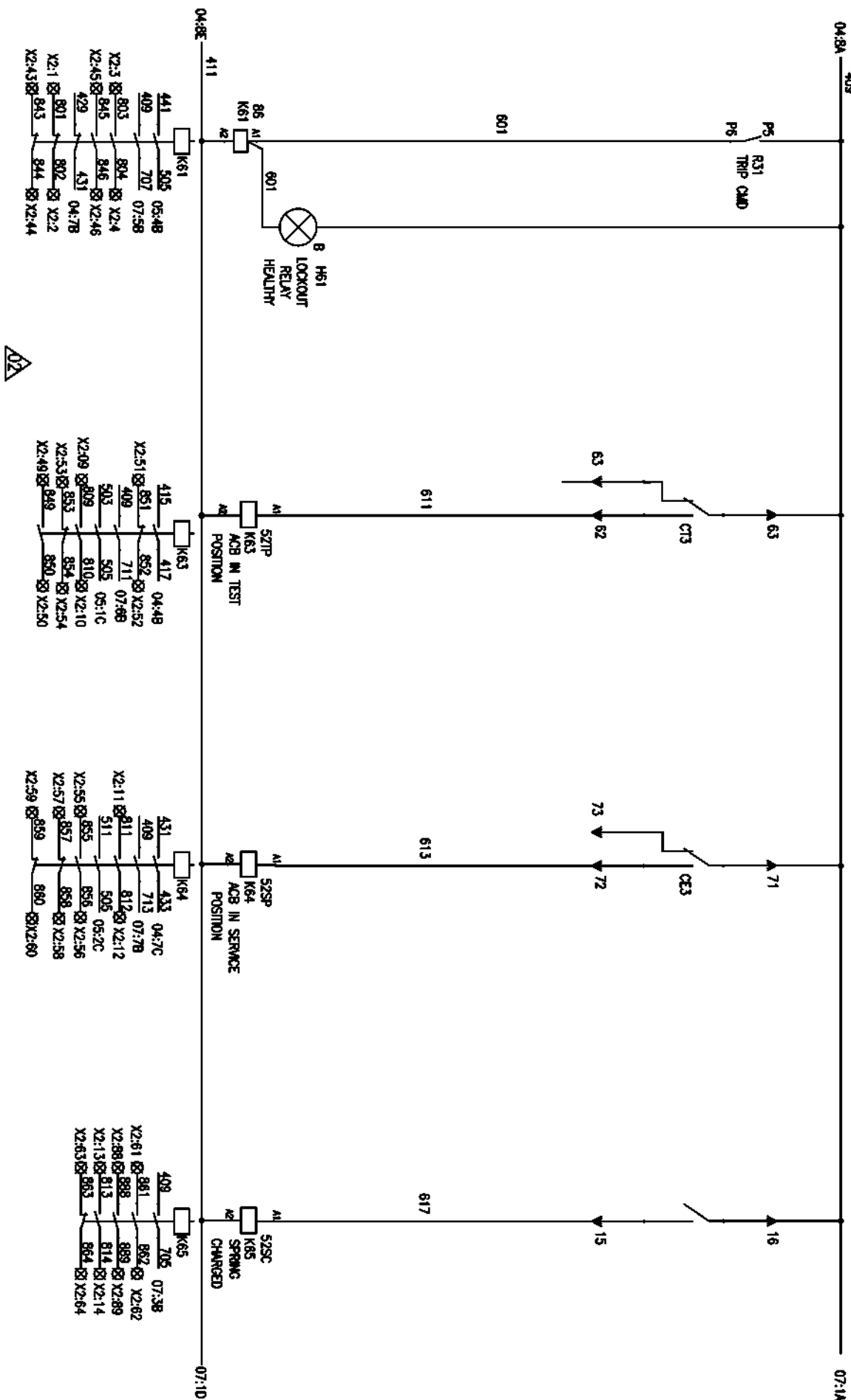
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## RELAY CIRCUIT



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DRG. NO. EP-3-CS-047-013

INVENTORY NO.

| REV. NO. | DATE | DESCRIPTION | BY | APPROVED | KSS | SCALE: 1/1 | JOB NO. CP-14-047 | DRG. NO. EP-3-CS-047-013 | NO. OF SHEETS | SHEET NO. | REV. |
|----------|------|-------------|----|----------|-----|------------|-------------------|--------------------------|---------------|-----------|------|
| 1        |      |             |    |          |     |            |                   |                          | 10            | 06        | 02   |
| 2        |      |             |    |          |     |            |                   |                          |               |           |      |
| 3        |      |             |    |          |     |            |                   |                          |               |           |      |
| 4        |      |             |    |          |     |            |                   |                          |               |           |      |

BHARAT HEAVY ELECTRICALS LIMITED  
ELECTROPROGRAMS DIVISION BANGALORECONTROL SCHEME FOR MODULE  
TYPE DAE OUTGOING FEEDER

FIRST ANGLE PROJECTION

ALL DIMENSIONS ARE IN MM.

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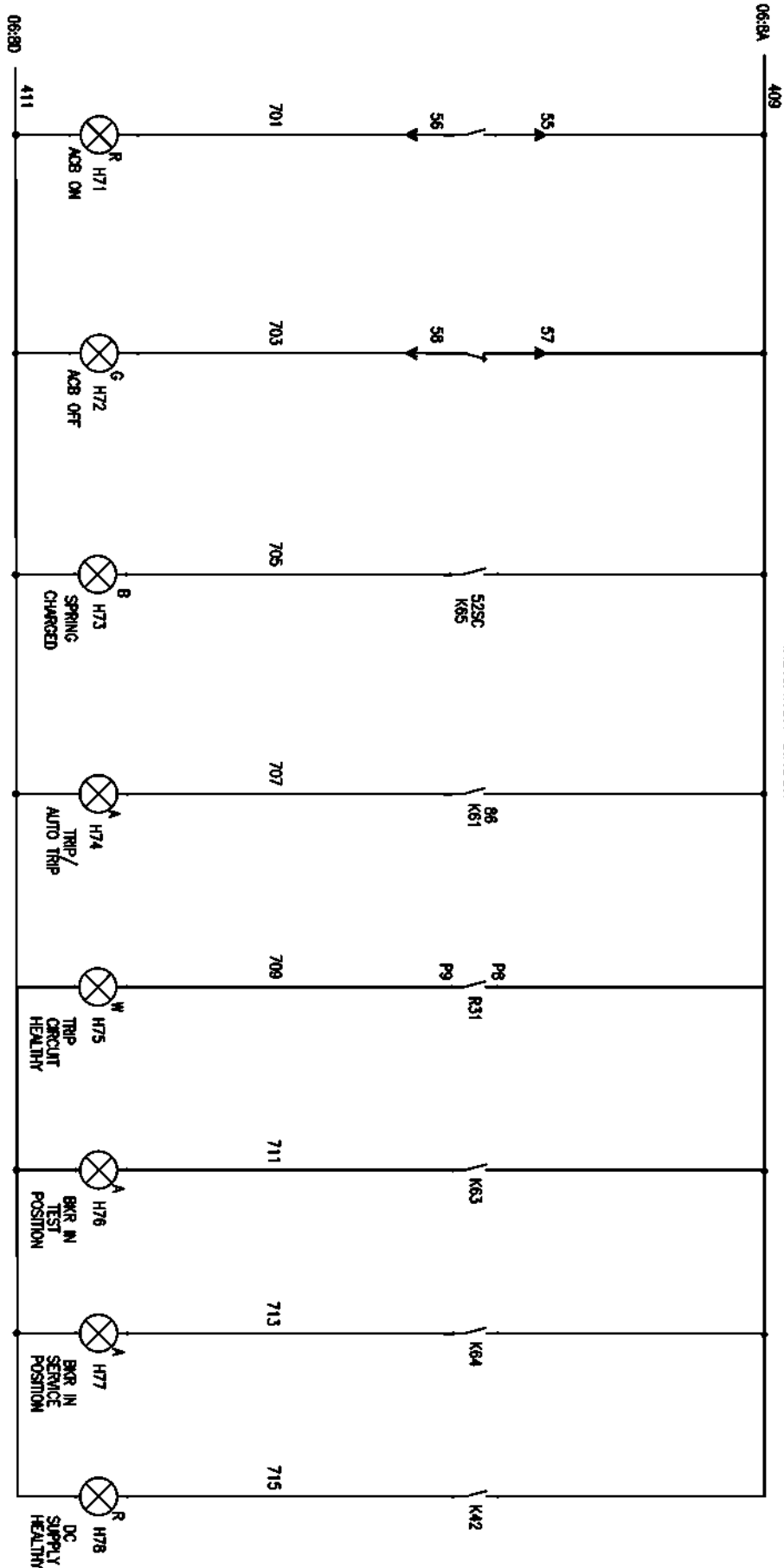
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## INDICATION CIRCUIT



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DRG. NO. EP-3-CS-047-013

INVENTORY NO.

| REV. NO. | DATE | DESCRIPTION | BY | APPD. | APPROVED | KSS | SCALE: 1/1 | JOB NO. CP-14-047 | DRG. NO. EP-3-CS-047-013 | REV. |
|----------|------|-------------|----|-------|----------|-----|------------|-------------------|--------------------------|------|
| 1        |      |             |    |       |          |     |            |                   |                          | 02   |
| 2        |      |             |    |       |          |     |            |                   |                          | 07   |
| 3        |      |             |    |       |          |     |            |                   |                          | 10   |
| 4        |      |             |    |       |          |     |            |                   |                          |      |

BHARAT HEAVY ELECTRICALS LIMITED  
ELECTRO-PROGRAMS DIVISION BANGLORE

TITLE :

CONTROL SCHEME FOR MODULE  
TYPE DAE OUTGOING FEEDER



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DRG. NO. EP-3-CS-047-013

INVENTORY NO.

| REV. NO. | DATE | DESCRIPTION | BY | APPROVED | APPROVED | KSS | DATE |
|----------|------|-------------|----|----------|----------|-----|------|
| 1        |      |             |    |          |          |     |      |
| 2        |      |             |    |          |          |     |      |
| 3        |      |             |    |          |          |     |      |
| 4        |      |             |    |          |          |     |      |

|          |     |     |
|----------|-----|-----|
| 52SP.K64 | 855 | X2  |
| 52SP.K64 | 856 | 55  |
| 52SP.K64 | 857 | 56  |
| 52SP.K64 | 858 | 57  |
| 52SP.K64 | 859 | 58  |
| 52SP.K64 | 860 | 59  |
| 52SC.K65 | 861 | 60  |
| 52SC.K65 | 862 | 61  |
| 52SC.K65 | 863 | 62  |
| 52SC.K65 | 864 | 63  |
| 52SC.K65 | 865 | 64  |
| 52SC.K65 | 866 | 65  |
| K42      | 867 | 66  |
| 868      | 868 | 67  |
| 869      | 869 | 68  |
| 870      | 870 | 69  |
| 871      | 871 | 70  |
| 872      | 872 | 71  |
| 873      | 873 | 72  |
| 874      | 874 | 73  |
| 875      | 875 | 74  |
| 876      | 876 | 75  |
| 877      | 877 | 76  |
| 878      | 878 | 77  |
| 879      | 879 | 78  |
| 880      | 880 | 79  |
|          |     | 80  |
|          |     | 81  |
|          |     | 82  |
|          |     | 83  |
|          |     | 84  |
|          |     | 85  |
|          |     | 86  |
|          |     | 87  |
|          |     | 88  |
|          |     | 0   |
|          |     | 104 |

} SPARE TERMINALS

| LEGEND  | DESCRIPTION                                 |
|---------|---------------------------------------------|
| ACB(SZ) | AIR CIRCUIT BREAKER                         |
| CT      | CURRENT TRANSFORMER                         |
| CTTB    | CURRENT TRANSFORMER TERMINAL BLOCK          |
| PT      | POTENTIAL TRANSFORMER                       |
| NL      | NEUTRAL LINK                                |
| MPCB    | MOTOR PROTECTION CIRCUIT BREAKER            |
| MCB     | MINIATURE CIRCUIT BREAKER                   |
| MFM     | MULTI FUNCTION METER                        |
| TCS     | TRIP COIL SUPERVISION                       |
| C9      | ACB TEST POSITION LIMIT SWITCH              |
| C7      | ACB SERVICE POSITION LIMIT SWITCH           |
| FCR     | ACB SPRING CHARGING LIMIT SWITCH            |
| M       | ACB SPRING CHARGING MOTOR                   |
| DCSW    | DC SWITCH                                   |
| H       | INDICATION LAMP                             |
| K11     | INTERPOSING RELAY                           |
| K12     | INTERPOSING RELAY                           |
| K       | AUXILIARY CONTACTOR                         |
| R       | NUMERICAL RELAY                             |
| RES     | RESISTOR                                    |
| D       | DIODE                                       |
| E       | EARTH                                       |
| X1, X2  | TERMINAL BLOCK                              |
| S       | SELECTOR SWITCH                             |
| TNC     | BREAKER CONTROL SWITCH (TRIP/NEUTRAL/CLOSE) |

CROSS REFERENCE EXAMPLE:

1.) 04:4D

'0' INDICATES Y-AXIS ZONE

'4' INDICATES X-AXIS ZONE

'04' INDICATES PAGE NUMBER

2.) 07:69

'0' INDICATES Y-AXIS ZONE

'6' INDICATES X-AXIS ZONE

'07' INDICATES PAGE NUMBER

COMPONENTS NUMBERING EXAMPLE:

1.) MCB41

'1' INDICATES SERIAL NUMBER OF COMPONENT ON THAT PAGE

'4' INDICATES PAGE NUMBER

'MCB' INDICATES COMPONENT NAME

2.) MCB42

'2' INDICATES SERIAL NUMBER OF COMPONENT ON THAT PAGE

'4' INDICATES PAGE NUMBER

'MCB' INDICATES COMPONENT NAME

3.) H71

'1' INDICATES SERIAL NUMBER OF COMPONENT ON THAT PAGE

'7' INDICATES PAGE NUMBER

'H' INDICATES COMPONENT NAME

BHARAT HEAVY ELECTRICALS LIMITED  
ELECTRO-PROGRAMS DIVISION BANGLORE

TITLE:

CONTROL SCHEME FOR MODULE  
TYPE DAE OUTGOING FEEDERNO. OF  
SHEETS 09SHEET  
NO. 09

JOB NO. CP-14-047

DRG. NO. EP-3-CS-047-013

REV. NO. 02

CONFIDENTIAL AND COPYRIGHTED

ORG. NO. EP-3-CS-047-014

FORM 68-271 A3

|                                                                                                                                                                                                                         |                                                           |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|
| <b>DEVELOPMENT CONSULTANTS<br/>PRIVATE LIMITED</b>                                                                                                                                                                      |                                                           |
| furnished only for general information with<br>no commitment for specific work specifications.<br>Contractor to be responsible for any errors and for<br>fulfillment of detailed requirements of contract<br>documents. |                                                           |
| ATTACH 1 2                                                                                                                                                                                                              | DATE 10.02.17                                             |
| DISSEMINATED BY: ER                                                                                                                                                                                                     |                                                           |
| 1. Detailed                                                                                                                                                                                                             | 4. Approved concept to proceed.<br>Finalisation required. |
| 2. Approved                                                                                                                                                                                                             | 5. Disapproved. For<br>resubmitting the plan.             |
| 3. Approved concept<br>as issued. Normal<br>final drawing.                                                                                                                                                              | 6. For information and<br>record only.                    |
| SEE COVERING LETTER                                                                                                                                                                                                     |                                                           |
| Left                                                                                                                                                                                                                    | Date                                                      |

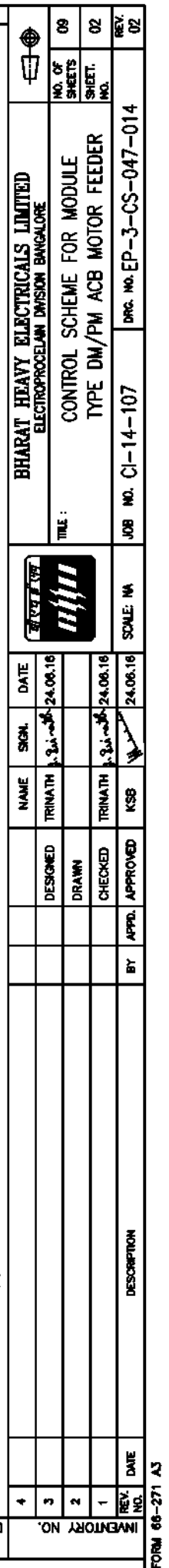
**CUSTOMER**  
**GS&C**

GUJARAT ELECTRICITY CORPORATION LIMITED  
VADODARA, GUJARAT

PROJECT:  
1x800 MW WANAKBORI THERMAL POWER STATION  
EXTENSION UNIT-8

| DRAWING NO.     | DESCRIPTION OF DRAWING                                  | SCHEME REQUIREMENT                          |
|-----------------|---------------------------------------------------------|---------------------------------------------|
| EP-3-CS-047-014 | Control Scheme for Module type DM/PM - ACB Motor Feeder | 415V ACB BREAKER FEEDER TO FEED MOTOR LOADS |

CUSTOMER CONSULTANT:  
  
DEVELOPMENT CONSULTANT PVT LTD  
KOLKATA

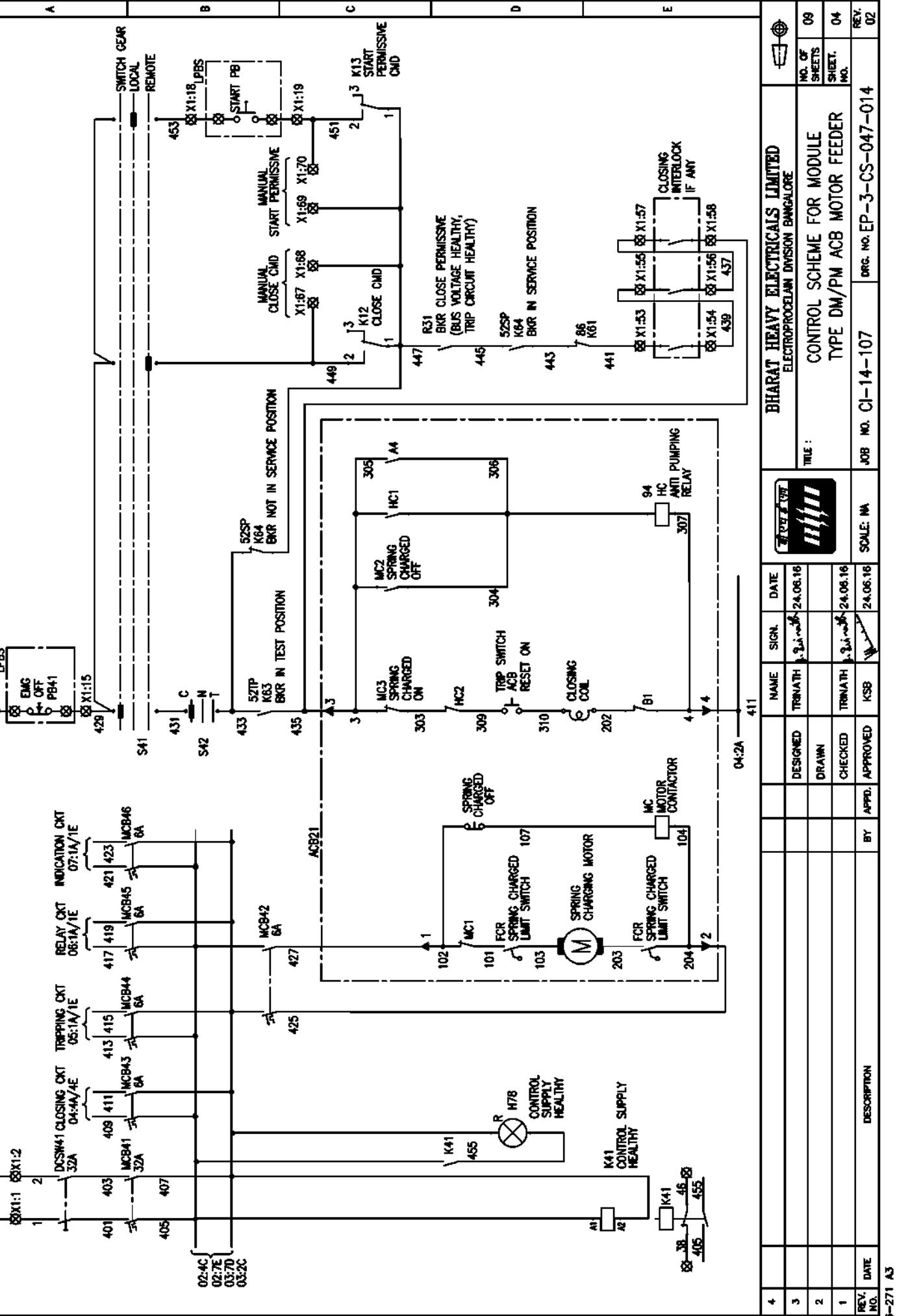




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DRG. NO. EP-3-CS-047-014

FORM 68-271 A3



| INVENTORY NO.            |  |  |  | REV. NO.                 |  |  |  |
|--------------------------|--|--|--|--------------------------|--|--|--|
| 4                        |  |  |  | 01                       |  |  |  |
| 3                        |  |  |  | 02                       |  |  |  |
| 2                        |  |  |  | 03                       |  |  |  |
| 1                        |  |  |  | 04                       |  |  |  |
| DATE                     |  |  |  | DATE                     |  |  |  |
| BY                       |  |  |  | BY                       |  |  |  |
| APPROVED                 |  |  |  | APPROVED                 |  |  |  |
| CHECKED                  |  |  |  | CHECKED                  |  |  |  |
| DRAWN                    |  |  |  | DRAWN                    |  |  |  |
| DESIGNED                 |  |  |  | DESIGNED                 |  |  |  |
| NAME                     |  |  |  | NAME                     |  |  |  |
| SIGN.                    |  |  |  | SIGN.                    |  |  |  |
| DATE                     |  |  |  | DATE                     |  |  |  |
| 24.06.16                 |  |  |  | 24.06.16                 |  |  |  |
| 24.06.16                 |  |  |  | 24.06.16                 |  |  |  |
| KSB                      |  |  |  | KSB                      |  |  |  |
| SCALE: 1:1               |  |  |  | SCALE: 1:1               |  |  |  |
| JOB NO. CI-14-107        |  |  |  | JOB NO. CI-14-107        |  |  |  |
| ORG. NO. EP-3-CS-047-014 |  |  |  | ORG. NO. EP-3-CS-047-014 |  |  |  |
| REV. 02                  |  |  |  | REV. 02                  |  |  |  |

BHARAT HEAVY ELECTRICALS LIMITED  
ELECTROPROCESS DIVISION BANGALORE  
CONTROL SCHEME FOR MODULE  
TYPE DM/PM ACB MOTOR FEEDER  
TITLE :

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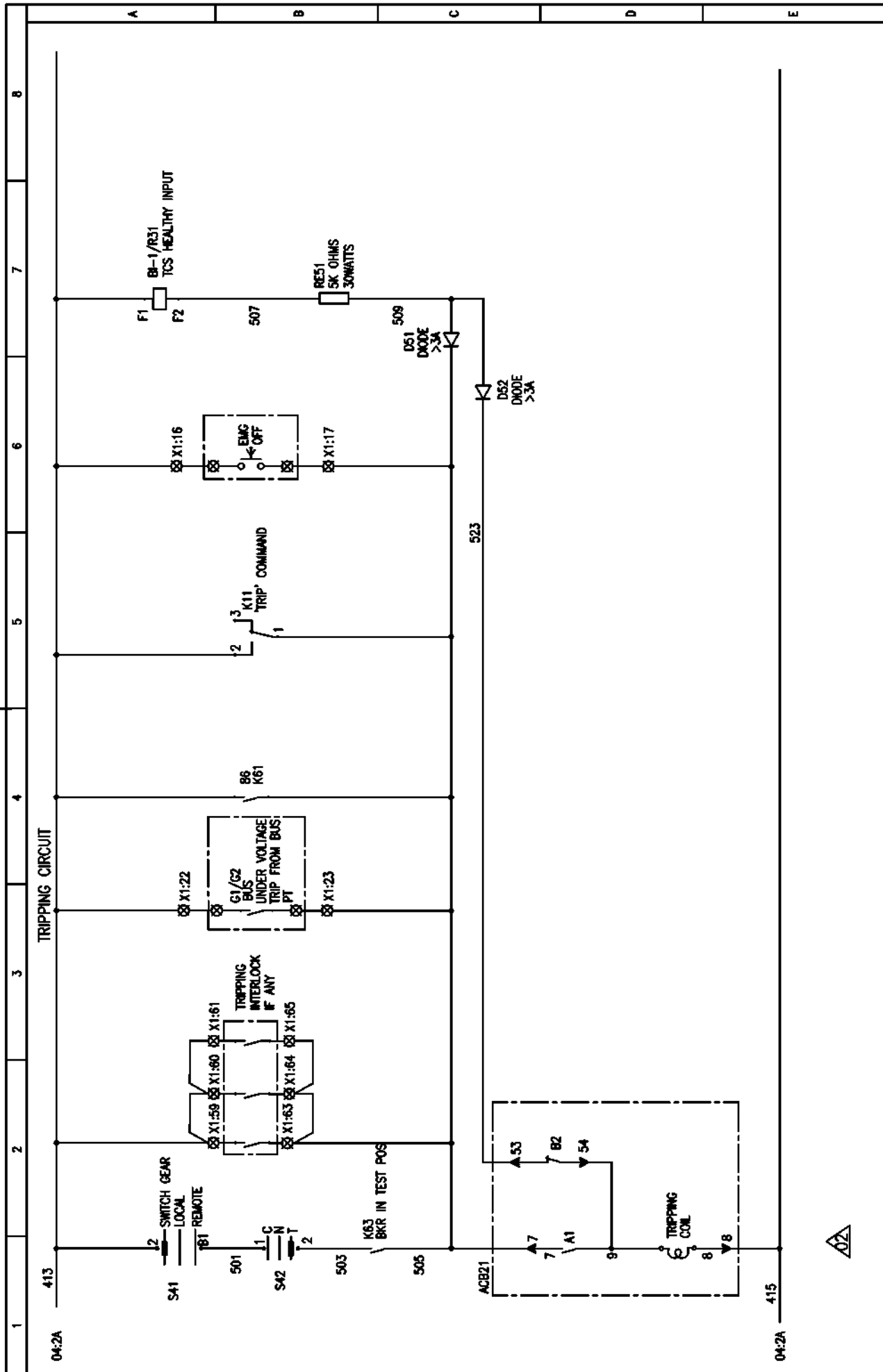
DRG. NO. EP-3-CS-047-014

| REV. NO. | DATE | DESCRIPTION |
|----------|------|-------------|
| 4        |      |             |
| 3        |      |             |
| 2        |      |             |
| 1        |      |             |

FORM 66-271 A3

FIRST ANGLE PROJECTION

ALL DIMENSIONS ARE IN MM.



|                                                                       |  |  |  |                                                                     |  |  |  |                     |  |  |  |                          |  |  |  |
|-----------------------------------------------------------------------|--|--|--|---------------------------------------------------------------------|--|--|--|---------------------|--|--|--|--------------------------|--|--|--|
| BHARAT HEAVY ELECTRICALS LIMITED<br>ELECTROPROCESS DIVISION BANGALORE |  |  |  | TITLE :<br>CONTROL SCHEME FOR MODULE<br>TYPE DM/PM ACB MOTOR FEEDER |  |  |  | NO. OF SHEETS<br>09 |  |  |  | REV. NO.<br>02           |  |  |  |
| BHARAT HEAVY ELECTRICALS LIMITED                                      |  |  |  | SCALE : NA                                                          |  |  |  | JOB NO. CI-14-107   |  |  |  | DRG. NO. EP-3-CS-047-014 |  |  |  |
| DESIGNED                                                              |  |  |  | CHECKED                                                             |  |  |  | APPROVED            |  |  |  | BY                       |  |  |  |
| NAME                                                                  |  |  |  | SIGN.                                                               |  |  |  | DATE                |  |  |  |                          |  |  |  |
| TRINATH                                                               |  |  |  | 24.06.16                                                            |  |  |  | 24.06.16            |  |  |  | 24.06.16                 |  |  |  |
| TRINATH                                                               |  |  |  | 24.06.16                                                            |  |  |  | 24.06.16            |  |  |  | 24.06.16                 |  |  |  |
| TRINATH                                                               |  |  |  | 24.06.16                                                            |  |  |  | 24.06.16            |  |  |  | 24.06.16                 |  |  |  |
| KSB                                                                   |  |  |  | 24.06.16                                                            |  |  |  | 24.06.16            |  |  |  | 24.06.16                 |  |  |  |

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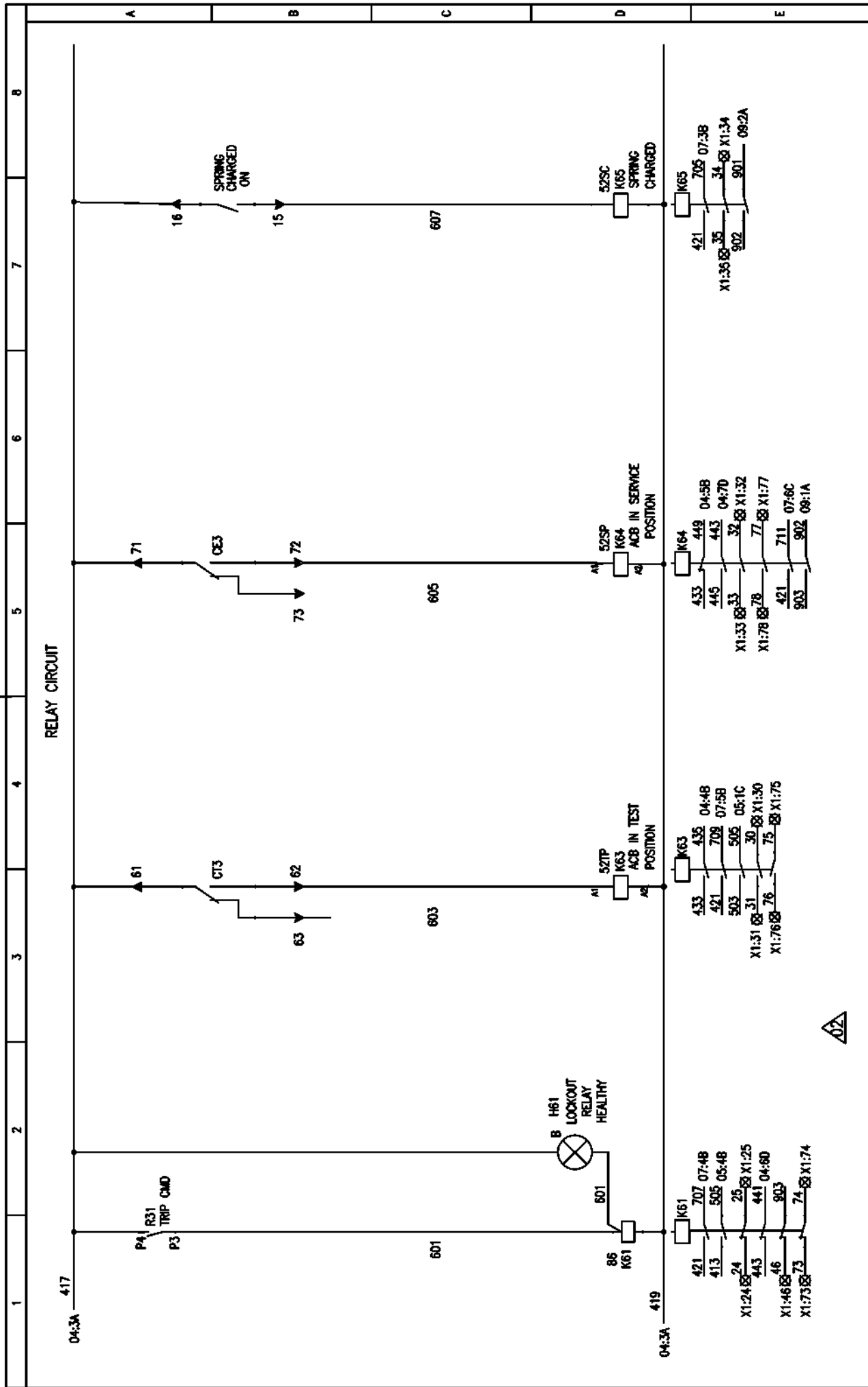
DRG. NO. EP-3-CS-047-014

INVENTORY NO.

FORM 66-271 A3

FIRST ANGLE PROJECTION

ALL DIMENSIONS ARE IN MM.



| BHARAT HEAVY ELECTRICALS LIMITED |  |  |  | ELECTROPORCELAIN DIVISION BANGALORE                   |  |  |  |
|----------------------------------|--|--|--|-------------------------------------------------------|--|--|--|
| TITLE :                          |  |  |  | CONTROL SCHEME FOR MODULE TYPE DM/PM ACB MOTOR FEEDER |  |  |  |
| NO. OF SHEETS                    |  |  |  | 09                                                    |  |  |  |
| SHEET NO.                        |  |  |  | 06                                                    |  |  |  |
| REV. NO.                         |  |  |  | 02                                                    |  |  |  |
| JOB NO. CI-14-107                |  |  |  | DRG. NO. EP-3-CS-047-014                              |  |  |  |
| SCALE: 1A                        |  |  |  | DATE: 24.06.16                                        |  |  |  |
| NAME: TRINATH                    |  |  |  | SIGN: [Signature]                                     |  |  |  |
| DESIGNED                         |  |  |  | DATE: 24.06.16                                        |  |  |  |
| DRAWN                            |  |  |  | DATE: 24.06.16                                        |  |  |  |
| CHECKED                          |  |  |  | DATE: 24.06.16                                        |  |  |  |
| APPROVED                         |  |  |  | DATE: 24.06.16                                        |  |  |  |
| BY: [Signature]                  |  |  |  | DATE: 24.06.16                                        |  |  |  |
| DESCRIPTION                      |  |  |  | DATE: 24.06.16                                        |  |  |  |







三

**DRG. NO.**

**FORM 68-271 A3**

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DRG. NO. EP-3-CS-047-022

INVENTORY NO.  
REV. NO. 01  
DATE 24.08.16  
DESCRIPTION  
FORM 68-271 A3

|                                                                                                                                                                                                                              |                                                     |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|
| <b>DEVELOPMENT CONSULTANTS<br/>PRIVATE LIMITED</b>                                                                                                                                                                           |                                                     |
| Respected Sir,<br>Enclosed only for your consideration with<br>constant feedback and specifications.<br>Contractor to be responsible for any error and for<br>fulfillment of detailed requirements of contract<br>documents. |                                                     |
| AGREED BY: <b>DATA 10.02.17</b>                                                                                                                                                                                              |                                                     |
| DISTRIBUTED BY: BR                                                                                                                                                                                                           |                                                     |
| 2. Designated                                                                                                                                                                                                                | 6. Approved for project<br>Implementation required. |
| 3. Approved                                                                                                                                                                                                                  | 7. Designated for<br>implementation.                |
| 4. Approved for<br>implementation<br>and closing.                                                                                                                                                                            | 8. For information and<br>noted only.               |
| <b>SEE COVERING LETTER</b>                                                                                                                                                                                                   |                                                     |
| Date: _____                                                                                                                                                                                                                  |                                                     |

CUSTOMER:  
**GSECL**  
GUJARATH ELECTRICITY CORPORATION LIMITED  
VADODARA, GUJARATH

PROJECT:  
1x800 MW WANAKBORI THERMAL POWER STATION  
EXTENSION UNIT-8

| DRAWING NO.     | DESCRIPTION OF DRAWING                                                                                            | SCHEME REQUIREMENT                              |
|-----------------|-------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|
| EP-3-CS-047-022 | Control Scheme for Module type<br>AF/BF/CF/DF/EF/GF/HF/IF/JF/KE/LF MCCB (O/G) (E3) - 3Ph.<br>MCCB Outgoing Feeder | 415V MCCB O/G FEEDER FOR 3PHASE<br>PHASE LOADS. |

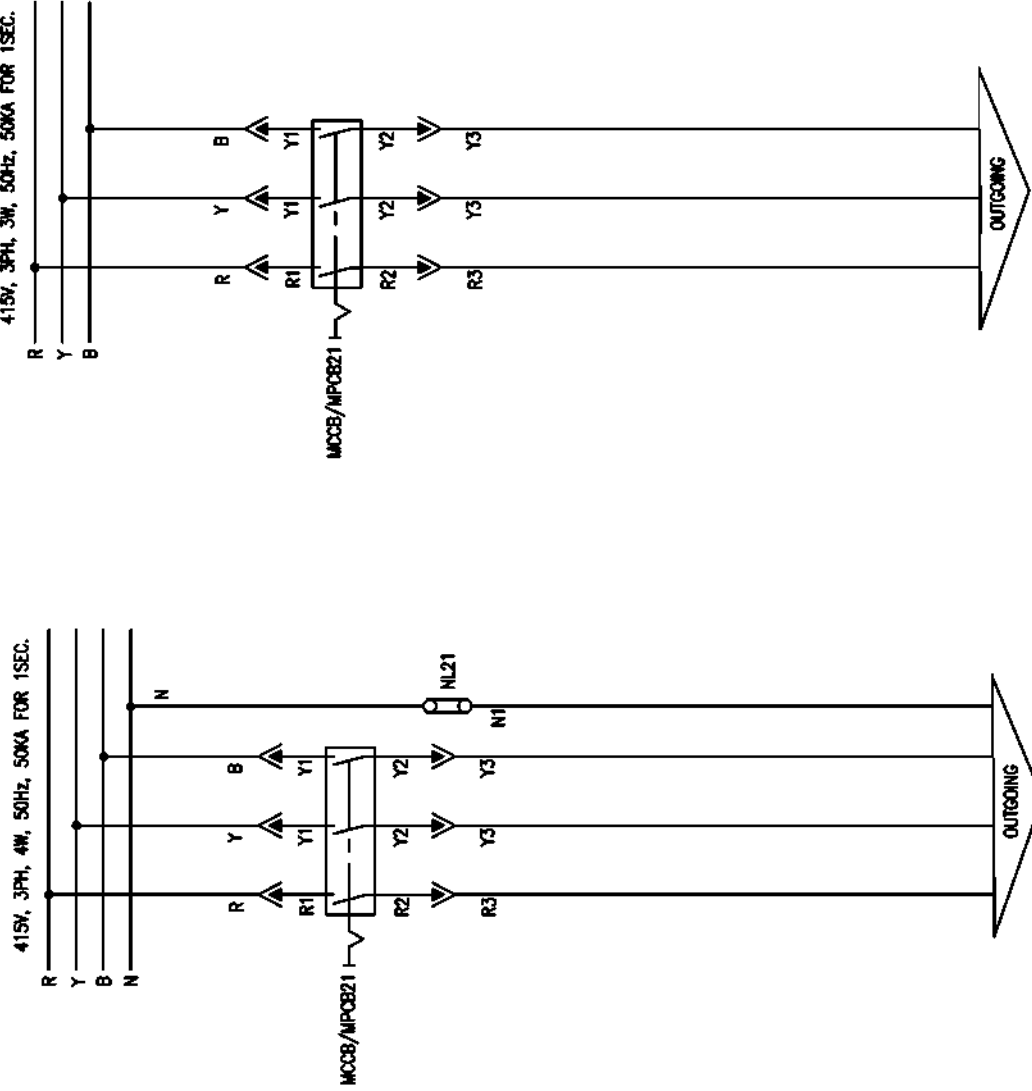
CUSTOMER CONSULTANT:  
  
DEVELOPMENT CONSULTANT PVT LTD  
KOLKATA

|                                                                          |  |  |  |                          |  |
|--------------------------------------------------------------------------|--|--|--|--------------------------|--|
| BHARAT HEAVY ELECTRICALS LIMITED<br>ELECTROPORCELAINS DIVISION BANGALORE |  |  |  | N.D. OF SHEETS 02        |  |
| TITLE : CONTROL SCHEME FOR MODULE<br>TYPE 3-PHASE MCCB OUTGOING FEEDERS  |  |  |  | SHEET NO. 01             |  |
| SCALE: NA                                                                |  |  |  | JDB NO. CP-14-047        |  |
| REV. NO. 01                                                              |  |  |  | DRG. NO. EP-3-CS-047-022 |  |

FIRST ANGLE PROJECTION

ALL DIMENSIONS ARE IN MM

1 2 3 4 5 6 7 8



NOTE:-

MPOB WILL BE PROVIDED FOR THE FEEDER WHERE RATING IS APPLICABLE KW UP TO 30KW.

MCCB WILL BE PROVIDED FOR THE FEEDER WHERE RATING IS APPLICABLE IN AMPERE AND FOR THE FEEDERS WHERE RATING IS APPLICABLE IN KW FOR FEEDER GREATER THAN 30KW.



**BHARAT HEAVY ELECTRICALS LIMITED**  
ELECTROPROCESS DIVISION BANGALORE

TITLE : CONTROL SCHEME FOR MODULE  
TYPE 3-PHASE MCCB OUTGOING FEEDERS



| NO. OF SHEETS | SHEET NO. | REV. NO. |
|---------------|-----------|----------|
| 02            | 02        | 01       |

JOB NO. CP-14-047 DRG. NO. EP-3-CS-047-022

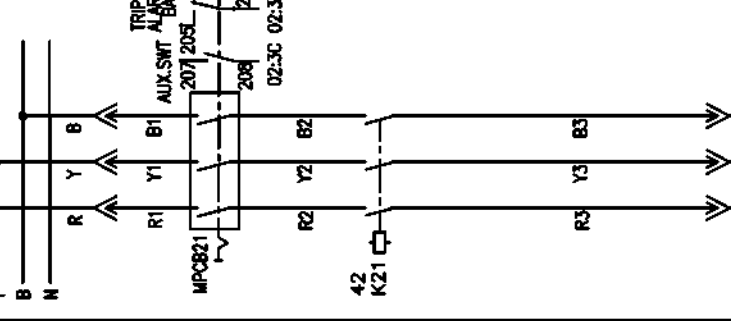
SCALE: 1/1

DATE: 24.06.16

DATE: 24.06.16

DATE: 24.06.16



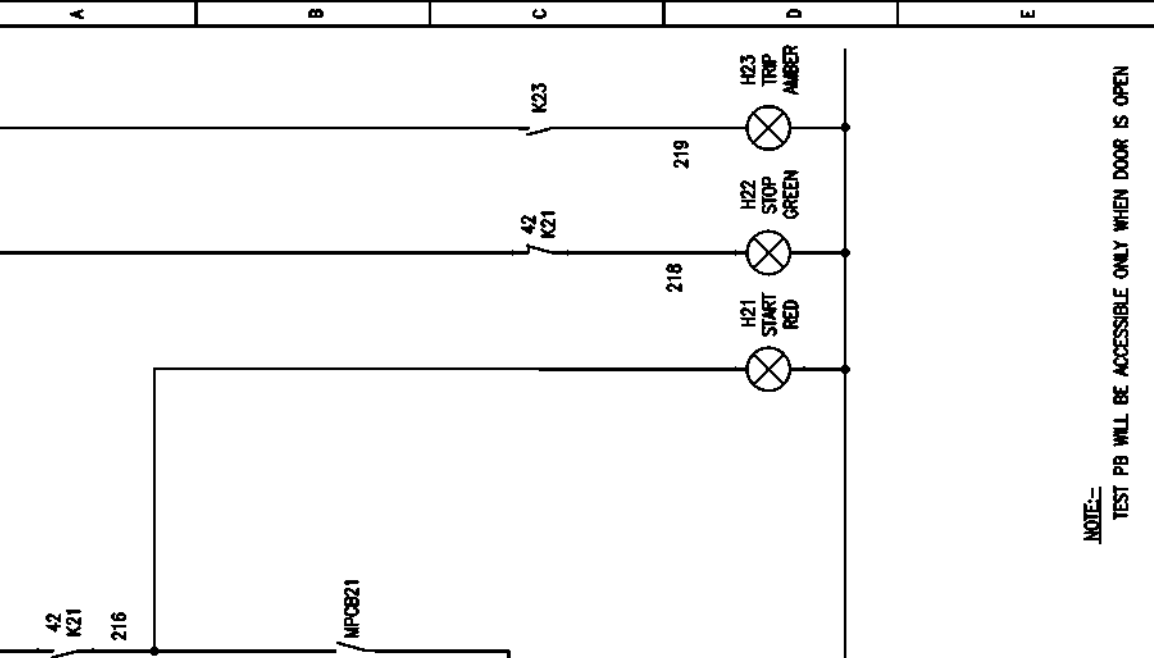


POSITIONS OF DISCONNECTORS

- MAKE CONTACT IN BOTH SERVICE & TEST POSITION
- MAKE CONTACT IN TEST POSITION ONLY
- MAKE CONTACT IN SERVICE POSITION ONLY

NOTE:-  
TEST PB WILL BE ACCESSIBLE ONLY WHEN DOOR IS OPEN

| REV. NO.                                                                                                             | DATE     | DESCRIPTION                                    | BY | APPROVED | NAME    | SIGN. | DATE     | SCALE | JOB NO. | CP-14-047 | ORG. NO. | EP-3-CS-047-025 | REV. NO. |
|----------------------------------------------------------------------------------------------------------------------|----------|------------------------------------------------|----|----------|---------|-------|----------|-------|---------|-----------|----------|-----------------|----------|
| 04                                                                                                                   | 12.07.16 | REVISED IN LINE WITH PEM COMMENTS DTD:12.07.16 |    |          |         |       |          |       |         |           |          |                 | 01       |
| 03                                                                                                                   |          |                                                |    |          | TRINATH |       | 23.06.16 |       |         |           |          |                 | 03       |
| 02                                                                                                                   |          |                                                |    |          | TRINATH |       | 23.06.16 |       |         |           |          |                 | 02       |
| BHARAT HEAVY ELECTRICALS LIMITED<br>ELECTROPROCESS DIVISION BANGALORE                                                |          |                                                |    |          |         |       |          |       |         |           |          |                 |          |
| TITLE : POWER AND CONTROL SCHEME<br>UNIDIRECTIONAL MOTOR FEEDER BELOW 30KW<br>CONTROLLED FROM: ATIS/DOCOMS/PLC (DK2) |          |                                                |    |          |         |       |          |       |         |           |          |                 |          |



ALL DIMENSIONS ARE IN MM.

FIRST ANGLE PROJECTION

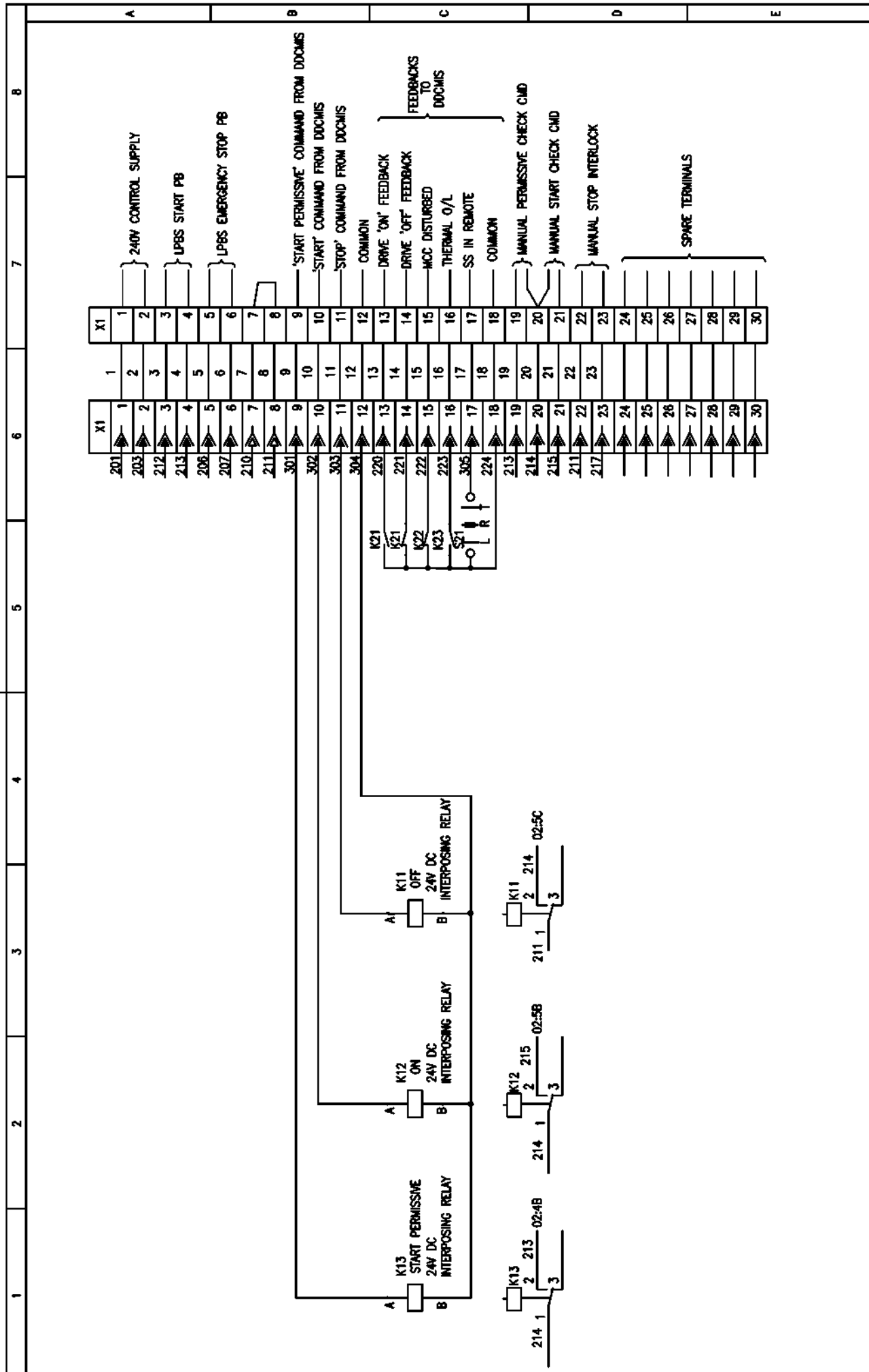
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EP-3-CS-047-025

DRG. NO.

ALL DIMENSIONS ARE IN MM.

FIRST ANGLE PROJECTION



| INVENTORY NO.                                  |          |          |    | DRG. NO.                                |      |    |          |
|------------------------------------------------|----------|----------|----|-----------------------------------------|------|----|----------|
| 4                                              |          |          |    |                                         |      |    |          |
| 3                                              |          |          |    |                                         |      |    |          |
| 2                                              |          |          |    |                                         |      |    |          |
| 01                                             | 12.07.16 | REV. NO. | 04 | 12.07.16                                | DATE | 04 | 12.07.16 |
| DESCRIPTION                                    |          |          |    | BY                                      |      |    |          |
| REVISED IN LINE WITH PEM COMMENTS DTD:12.07.16 |          |          |    | APPROVED                                |      |    |          |
|                                                |          |          |    | CHECKED                                 |      |    |          |
|                                                |          |          |    | DRAWN                                   |      |    |          |
|                                                |          |          |    | DESIGNED                                |      |    |          |
|                                                |          |          |    | NAME                                    |      |    |          |
|                                                |          |          |    | SIGN.                                   |      |    |          |
|                                                |          |          |    | DATE                                    |      |    |          |
|                                                |          |          |    | SCALE: 1/1                              |      |    |          |
|                                                |          |          |    | JOB NO. CP-14-047                       |      |    |          |
|                                                |          |          |    | ORG. NO. EP-3-CS-047-025                |      |    |          |
|                                                |          |          |    | TITLE :                                 |      |    |          |
|                                                |          |          |    | POWER AND CONTROL SCHEME                |      |    |          |
|                                                |          |          |    | UNIDIRECTIONAL MOTOR FEEDER BELOW 30KW  |      |    |          |
|                                                |          |          |    | CONTROLLED FROM: ATRIS/DOCMIS/PLC (DK2) |      |    |          |
|                                                |          |          |    | NO. OF SHEETS 03                        |      |    |          |
|                                                |          |          |    | SHEET NO. 03                            |      |    |          |
|                                                |          |          |    | REV. 01                                 |      |    |          |



BHARAT HEAVY ELECTRICALS LIMITED  
ELECTROPROCESSING DIVISION BANGALORE

EP-3-CS-047-026

---

## THE CONVENTION

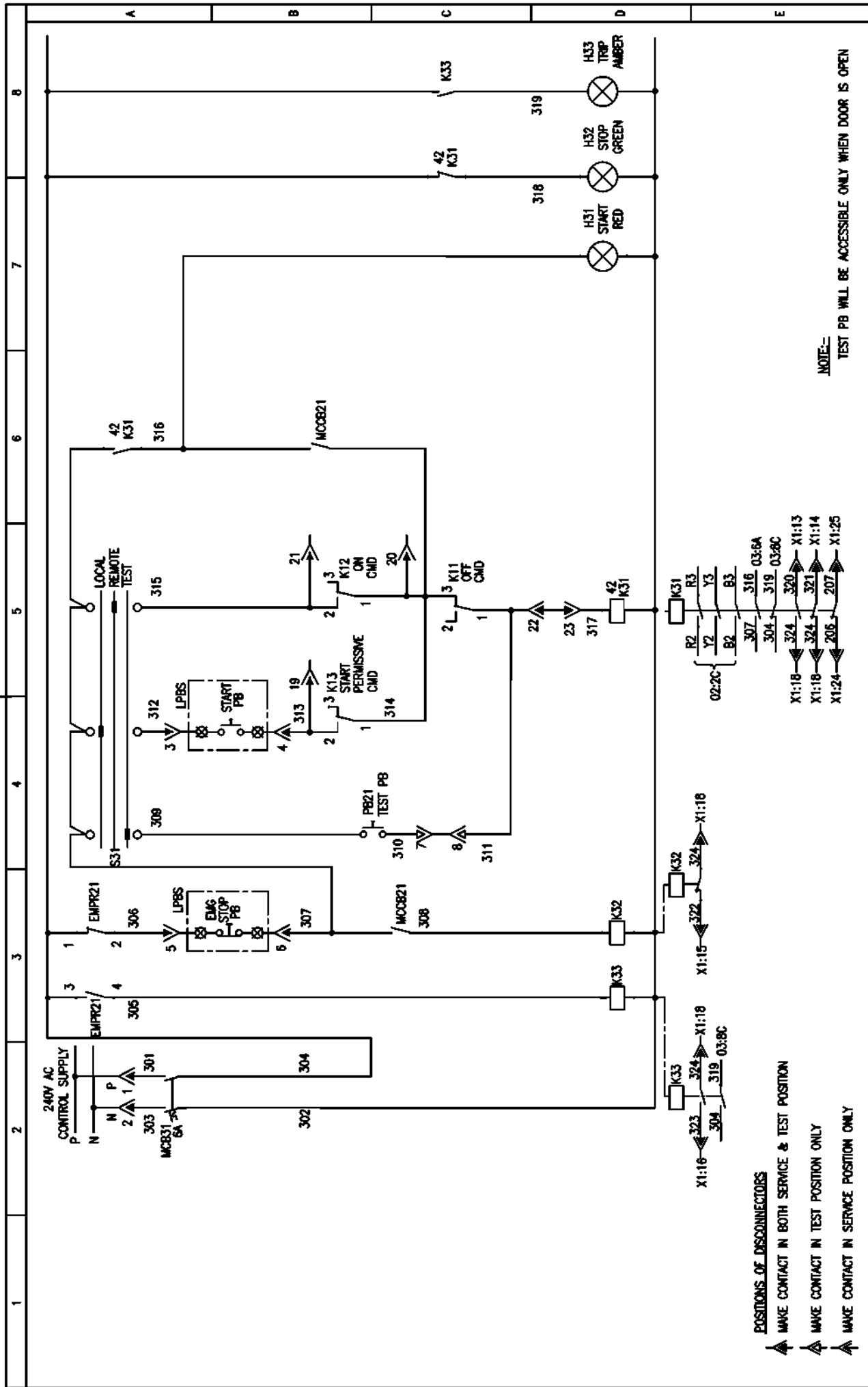
**DEVELOPMENT CONSULTANT PVT LTD**  
**KOLKATA**

[illegible]



ALL DIMENSIONS ARE IN MM.

FIRST ANGLE PROJECTION



NOTE:-  
TEST PB WILL BE ACCESSIBLE ONLY WHEN DOOR IS OPEN

| INVENTORY NO.                    |  |  |  | REV. NO.                                                                                                                        |  |  |  |
|----------------------------------|--|--|--|---------------------------------------------------------------------------------------------------------------------------------|--|--|--|
| 4                                |  |  |  | 05                                                                                                                              |  |  |  |
| 3                                |  |  |  | 03                                                                                                                              |  |  |  |
| 2                                |  |  |  | 01                                                                                                                              |  |  |  |
| 1                                |  |  |  |                                                                                                                                 |  |  |  |
| DESCRIPTION                      |  |  |  | DATE                                                                                                                            |  |  |  |
| BY                               |  |  |  | APPROVED                                                                                                                        |  |  |  |
| CHECKED                          |  |  |  | DRAWN                                                                                                                           |  |  |  |
| DESIGNED                         |  |  |  | DATE                                                                                                                            |  |  |  |
| NAME                             |  |  |  | SIGN.                                                                                                                           |  |  |  |
| TRINATH                          |  |  |  | 18.08.16                                                                                                                        |  |  |  |
| DATE                             |  |  |  | 18.08.16                                                                                                                        |  |  |  |
| SCALE: 1/1                       |  |  |  | JOB NO. CP-14-047                                                                                                               |  |  |  |
| ORG. NO. EP-3-CS-047-026         |  |  |  | REV. 01                                                                                                                         |  |  |  |
| BHARAT HEAVY ELECTRICALS LIMITED |  |  |  | ELECTROPROCESS DIVISION BANGALORE                                                                                               |  |  |  |
| TITLE :                          |  |  |  | POWER AND CONTROL SCHEME UNIDIRECTIONAL MOTOR FEEDER FROM 30KW TO 110KW (INCLUDING 110KW) CONTROLLED FROM: ATR/DOOMS/PLC (DK21) |  |  |  |

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EP-3-CS-047-026

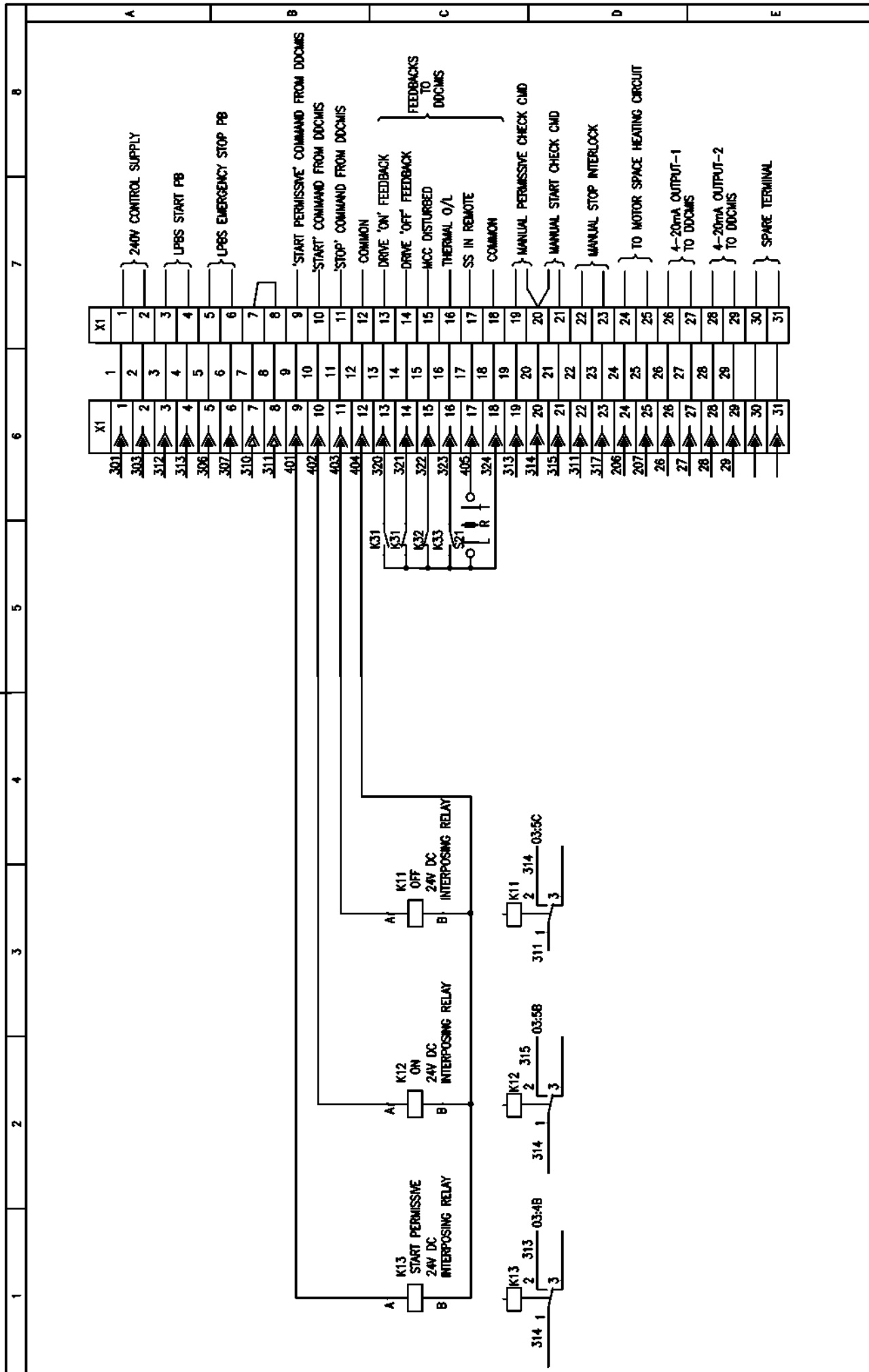
DRG. NO.

| REV. NO. | DATE | DESCRIPTION | BY | APPR. | CHECKED | DRAWN | DESIGNED | NAME    | SIGN.    | DATE     |
|----------|------|-------------|----|-------|---------|-------|----------|---------|----------|----------|
| 4        |      |             |    |       |         |       |          |         |          |          |
| 3        |      |             |    |       |         |       |          | TRINATH | 18.08.16 | 18.08.16 |
| 2        |      |             |    |       |         |       |          |         |          |          |
| 1        |      |             |    |       |         |       |          | TRINATH | 18.08.16 | 18.08.16 |

FORM 68-271 A3

FIRST ANGLE PROJECTION

ALL DIMENSIONS ARE IN MM.



|                                                                                                                                         |           |                                                                                 |         |
|-----------------------------------------------------------------------------------------------------------------------------------------|-----------|---------------------------------------------------------------------------------|---------|
|                                                                                                                                         |           | <b>BHARAT HEAVY ELECTRICALS LIMITED</b><br>ELECTROPROCESSING DIVISION BANGALORE |         |
| TITLE : POWER AND CONTROL SCHEME UNIDIRECTIONAL MOTOR FEEDER FROM 30KW TO 110KW (INCLUDING 110KW) CONTROLLED FROM: ATR/DDCMS/PLC (DK21) |           | NO. OF SHEETS: 05<br>SHEET NO.: 04                                              |         |
| JOB NO. CP-14-047                                                                                                                       | SCALE: NA | DRG. NO. EP-3-CS-047-026                                                        | REV. 01 |

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EP-3-CS-047-026

DRG. NO.

INVENTORY NO.

REV. NO.

DATE

DESCRIPTION

BY

APPROVED

DESIGNED

DRAWN

CHECKED

APPROVED

NAME

SIGN.

DATE



BHARAT HEAVY ELECTRICALS LIMITED

ELECTROPROCESS DIVISION BANGALORE

POWER AND CONTROL SCHEME UNIDIRECTIONAL MOTOR FEEDER FROM 30KW TO 110KW (INCLUDING 110KW) CONTROLLED FROM: ATR/DOOMS/PLC (DK21)

TITLE :

NO. OF SHEETS

SHEET NO.

REV. NO.

05

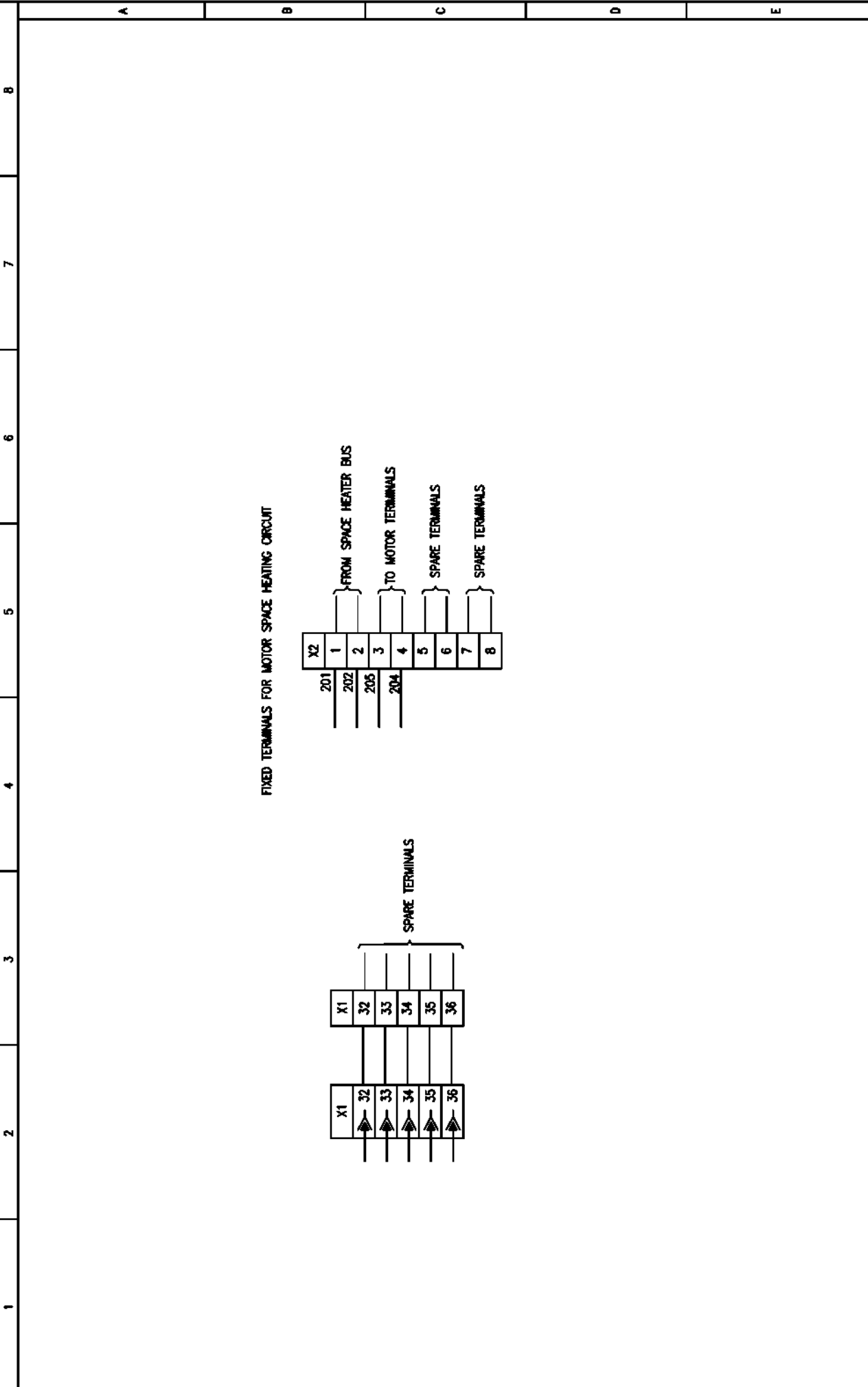
05

01

FORM 68-271 A3

ALL DIMENSIONS ARE IN MM

FIRST ANGLE PROJECTION



DEVELOPMENT CONSULTANTS  
PRIVATE LIMITED

Reviewed only for general correspondence with  
client's drawings and specifications.  
Contractor to be responsible for any error and for  
fulfillment of detailed requirements of various  
drawings.

AGENCY 2  
DISTRIBUTED BY: BR

1. Issued

2. Approved

3. Approved except  
as noted. Revised  
and checked.

4. Approved except  
as noted. Revised  
and checked.

5. Approved. For  
corresponding items  
No modification required.

6. For information and  
noted only.

SEE COVERING LETTER

Date: 1



CUSTOMER:  
GUJARAT ELECTRICITY CORPORATION LIMITED  
VADODARA, GUJARAT

PROJECT:  
1x800 MW WANAKBORI THERMAL POWER STATION  
EXTENSION UNIT-8

CUSTOMER CONSULTANT:



DEVELOPMENT CONSULTANT PVT LTD  
KOLKATA

| DRAWING NO.     | DESCRIPTION OF DRAWING                                                                                                                            | SCHEME REQUIREMENT                                                                                                                    |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| EP-3-CS-047-033 | Control Scheme for Module type<br>AR/BR/CR/DR/ER/FR/GR/HR/IR/JR/KR/LR for Bi-directional motor<br>Feeder Below 30KW Controlled from ATR/DDCMS/PLC | 415V MPCB CONTACTOR OPERATED<br>O/G FEEDER FOR THREE PHASE BI-<br>DIRECTIONAL DRIVE LOADS BELOW<br>30KW CONTROLLED FROM<br>DDCMS/PLC. |



BHARAT HEAVY ELECTRICALS LIMITED  
ELECTROPERCELAIRS DIVISION BANGALORE

TITLE :  
POWER AND CONTROL SCHEME  
BI-DIRECTIONAL MOTOR FEEDER BELOW 30KW  
CONTROLLED FROM: ATR/DDCMS/PLC (DN)



|               |                 |
|---------------|-----------------|
| NO. OF SHEETS | 05              |
| SHEET NO.     | 01              |
| REV.          | 01              |
| JOB NO.       | CP-14-047       |
| DRG. NO.      | EP-3-CS-047-033 |

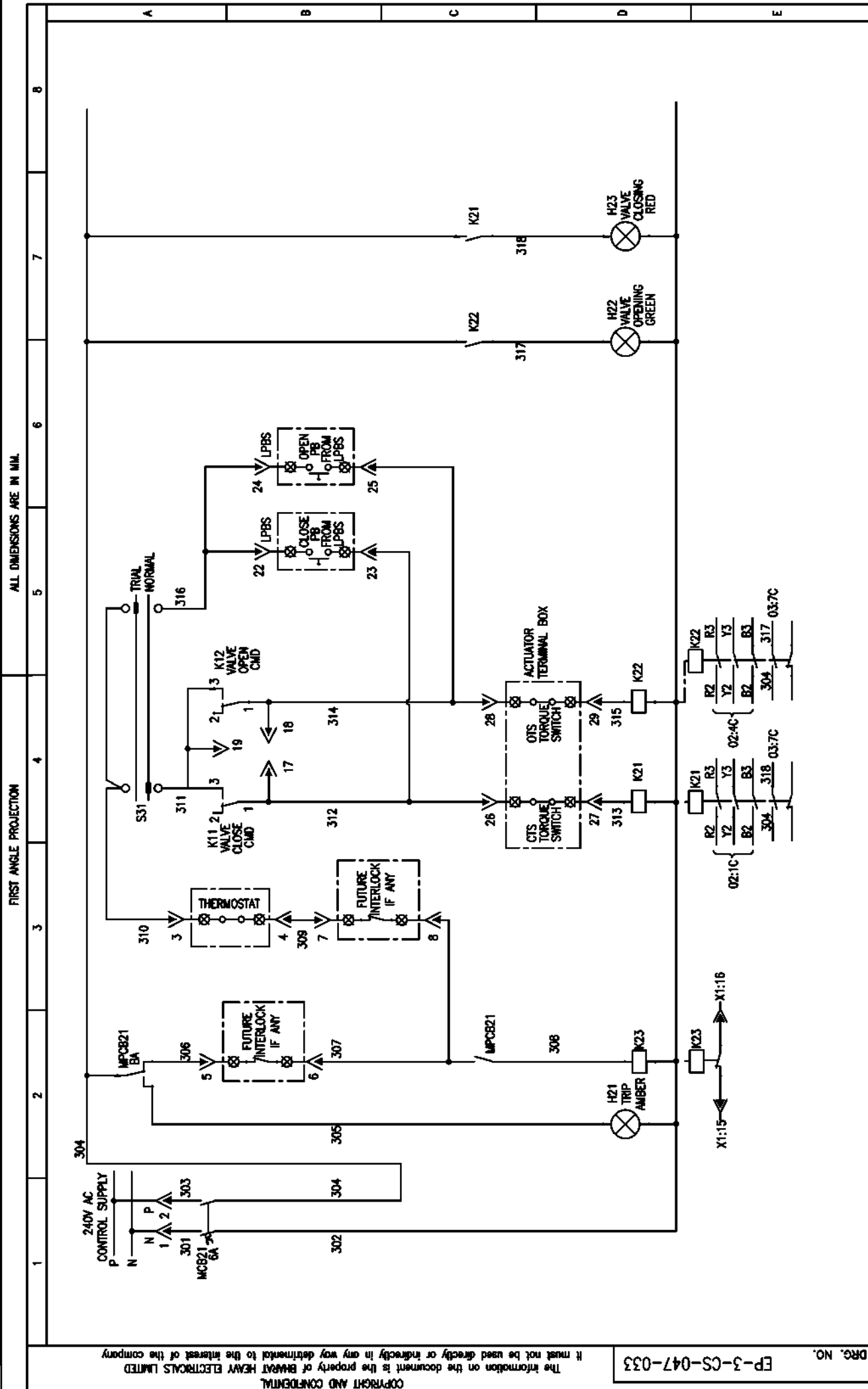


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EP-3-CS-047-033

DRG. NO.

| REV. NO. | DATE | DESCRIPTION | BY | APPR. | CHKD | DESIGNED | NAME    | SIGN.    | DATE     | BHARAT HEAVY ELECTRICALS LIMITED<br>ELECTROPROCESS DIVISION BANGALORE |                   | TITLE :<br>POWER AND CONTROL SCHEME<br>BI-DIRECTIONAL MOTOR FEEDER BELOW 30KW<br>CONTROLLED FROM: ATIS/DOCMIS/PLC (DM) |  | NO. OF SHEETS | SHEET NO. | REV. |
|----------|------|-------------|----|-------|------|----------|---------|----------|----------|-----------------------------------------------------------------------|-------------------|------------------------------------------------------------------------------------------------------------------------|--|---------------|-----------|------|
| 4        |      |             |    |       |      |          |         |          |          |                                                                       |                   |                                                                                                                        |  | 05            |           | 01   |
| 3        |      |             |    |       |      |          | TRINATH | 28.07.16 | 28.07.16 |                                                                       |                   |                                                                                                                        |  |               |           |      |
| 2        |      |             |    |       |      |          |         |          |          |                                                                       |                   |                                                                                                                        |  |               |           |      |
| 0A       |      |             |    |       |      |          | TRINATH | 28.07.16 | 28.07.16 |                                                                       |                   |                                                                                                                        |  |               |           |      |
| REV. NO. | DATE | DESCRIPTION | BY | APPR. | CHKD | DESIGNED | NAME    | SIGN.    | DATE     | SCALE: 1/1                                                            | JOB NO. CP-14-047 | ORG. NO. EP-3-CS-047-033                                                                                               |  |               |           |      |



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EP-3-CS-047-033

DWG. NO.

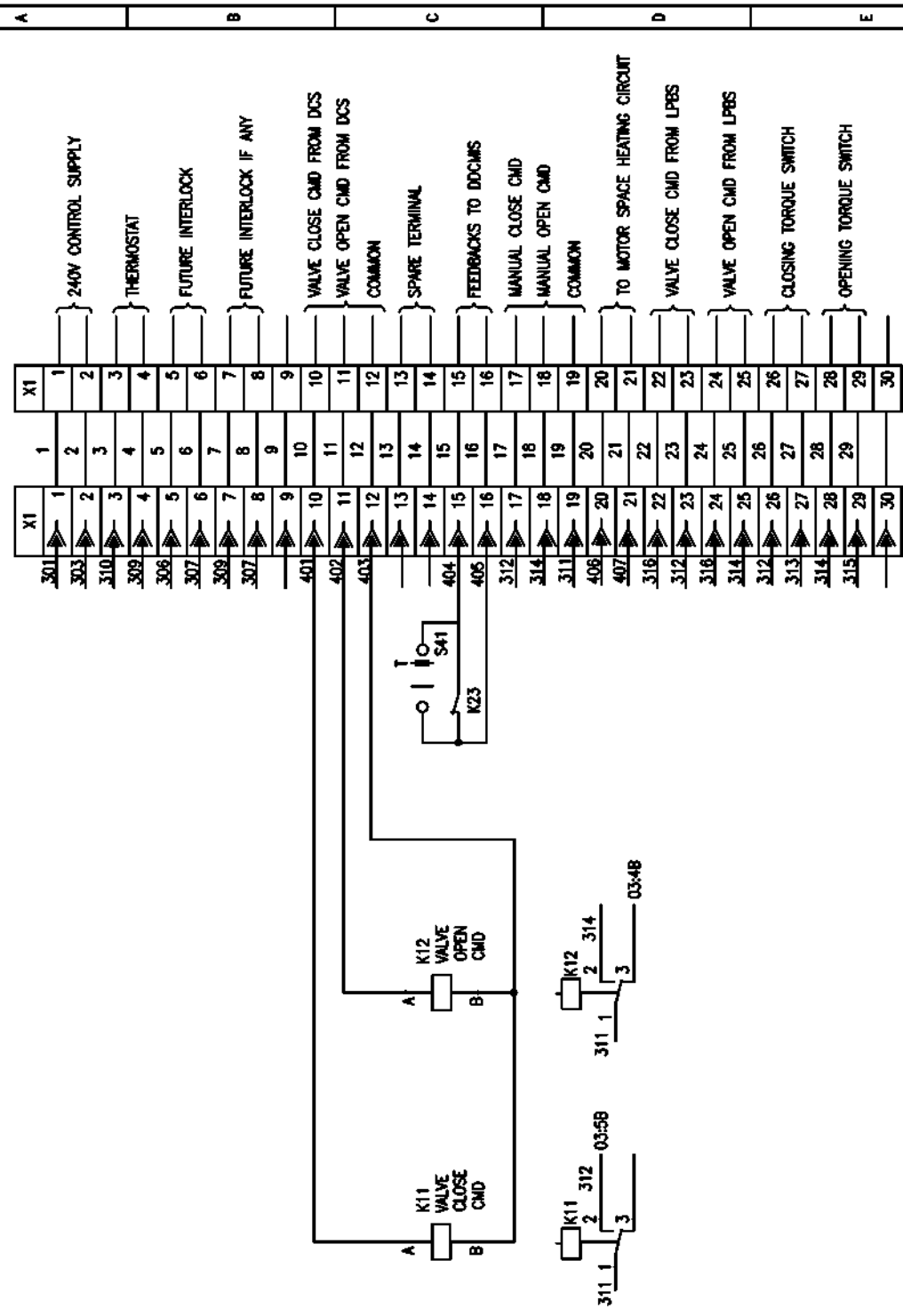
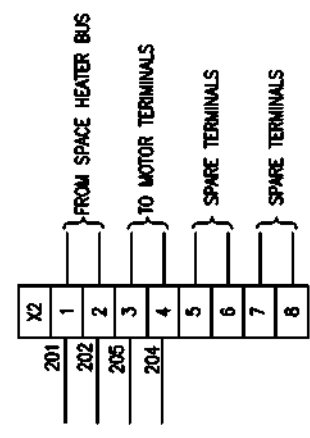
| REV. NO. | DATE | DESCRIPTION | BY | APPD. | CHECKED | DRAWN | DESIGNED | NAME    | SIGN.    | DATE     |
|----------|------|-------------|----|-------|---------|-------|----------|---------|----------|----------|
| 4        |      |             |    |       |         |       |          |         |          |          |
| 3        |      |             |    |       |         |       |          | TRINATH | 28.07.16 | 28.07.16 |
| 2        |      |             |    |       |         |       |          |         |          |          |
| 04       |      |             |    |       |         |       |          | TRINATH | 28.07.16 | 28.07.16 |

FORM 66-271 A3

FIRST ANGLE PROJECTION

ALL DIMENSIONS ARE IN MM.

FIXED TERMINALS FOR MOTOR SPACE HEATING CIRCUIT



| REV. NO. | DATE | DESCRIPTION | BY | APPD. | CHECKED | DRAWN | DESIGNED | NAME | SIGN. | DATE |
|----------|------|-------------|----|-------|---------|-------|----------|------|-------|------|
| 05       |      |             |    |       |         |       |          |      |       |      |
| 04       |      |             |    |       |         |       |          |      |       |      |

DRG. NO. EP-3-CS-047-033



SCALE: 1:1

JOB NO. CP-14-047

ORG. NO. EP-3-CS-047-033

POWER AND CONTROL SCHEME

BI-DIRECTIONAL MOTOR FEEDER BELOW 30KW

CONTROLLED FROM: ATRIS/DOCMIS/PLC (DM)

NO. OF SHEETS 05

SHEET NO. 04

REV. 01

BHARAT HEAVY ELECTRICALS LIMITED

ELECTROPROCESS DIVISION BANGALORE

FIRST ANGLE PROJECTION

ALL DIMENSIONS ARE IN MM

| 1       | 2                                           | 3 | 4 | 5 | 6 | 7 | 8 |
|---------|---------------------------------------------|---|---|---|---|---|---|
| LEGEND  | DESCRIPTION                                 |   |   |   |   |   |   |
| ACB(52) | AIR CIRCUIT BREAKER                         |   |   |   |   |   |   |
| CT      | CURRENT TRANSFORMER                         |   |   |   |   |   |   |
| CTTB    | CURRENT TRANSFORMER TERMINAL BLOCK          |   |   |   |   |   |   |
| PT      | POTENTIAL TRANSFORMER                       |   |   |   |   |   |   |
| NL      | NEUTRAL LINK                                |   |   |   |   |   |   |
| MPCB    | MOTOR PROTECTION CIRCUIT BREAKER            |   |   |   |   |   |   |
| MCB     | MINIATURE CIRCUIT BREAKER                   |   |   |   |   |   |   |
| MCCB    | MOULDED CASE CIRCUIT BREAKER                |   |   |   |   |   |   |
| MCB     | MINIATURE CIRCUIT BREAKER                   |   |   |   |   |   |   |
| CTD     | CURRENT TRANSFORMER                         |   |   |   |   |   |   |
| VTD     | VOLTAGE TRANSFORMER                         |   |   |   |   |   |   |
| TCS     | TRIP COIL SUPERVISION                       |   |   |   |   |   |   |
| C9      | ACB TEST POSITION LIMIT SWITCH              |   |   |   |   |   |   |
| C7      | ACB SERVICE POSITION LIMIT SWITCH           |   |   |   |   |   |   |
| FOR     | ACB SPRING CHARGING LIMIT SWITCH            |   |   |   |   |   |   |
| M       | ACB SPRING CHARGING MOTOR                   |   |   |   |   |   |   |
| DCSW    | DC SWITCH                                   |   |   |   |   |   |   |
| H       | INDICATION LAMP                             |   |   |   |   |   |   |
| K11     | INTERPOSING RELAY                           |   |   |   |   |   |   |
| K12     | INTERPOSING RELAY                           |   |   |   |   |   |   |
| K       | AUXILIARY CONTACTOR                         |   |   |   |   |   |   |
| R       | NUMERICAL RELAY                             |   |   |   |   |   |   |
| RES     | RESISTOR                                    |   |   |   |   |   |   |
| D       | DIODE                                       |   |   |   |   |   |   |
| E       | EARTH                                       |   |   |   |   |   |   |
| X1, X2  | TERMINAL BLOCK                              |   |   |   |   |   |   |
| S       | SELECTOR SWITCH                             |   |   |   |   |   |   |
| TNC     | BREAKER CONTROL SWITCH (TRIP/NEUTRAL/CLOSE) |   |   |   |   |   |   |

| LEGEND | DESCRIPTION                  |
|--------|------------------------------|
| 51     | OVER CURRENT                 |
| 51N    | EARTH FAULT                  |
| 51SN   | SENSITIVE GROUND EARTH FAULT |
| 64     | RESTRICTED EARTH FAULT       |
| 98     | FUSE FAILURE                 |
| 27     | UNDER VOLTAGE                |
| 74     | TRIP CIRCUIT SUPERVISION     |
| 30     | TRIP ANNUNCIATION            |

CROSS REFERENCE EXAMPLE:

- 1.) 04:4D  
D'INDICATES Y-AXIS ZONE  
4'INDICATES X-AXIS ZONE  
04'INDICATES PAGE NUMBER
- 2.) 07:6B  
B'INDICATES Y-AXIS ZONE  
6'INDICATES X-AXIS ZONE  
07'INDICATES PAGE NUMBER
- COMPONENTS NUMBERING EXAMPLE:
- 1.) MCB41  
1'INDICATES SERIAL NUMBER OF COMPONENT ON THAT PAGE  
4'INDICATES PAGE NUMBER  
MCB'INDICATES COMPONENT NAME
- 2.) MCB42  
2'INDICATES SERIAL NUMBER OF COMPONENT ON THAT PAGE  
4'INDICATES PAGE NUMBER  
MCB'INDICATES COMPONENT NAME
- 3.) H71  
1'INDICATES SERIAL NUMBER OF COMPONENT ON THAT PAGE  
7'INDICATES PAGE NUMBER  
H'INDICATES COMPONENT NAME
- 4.) N T  
NORMAL-TRAIL SELECTOR SWITCH
- 5.) 42 K21 MI 42 K22  
MECHANICAL INTERLOCK OPERATED SWITCH

|                                  |  |  |  |                                        |  |  |  |                          |  |  |  |
|----------------------------------|--|--|--|----------------------------------------|--|--|--|--------------------------|--|--|--|
| Bharat Heavy Electricals Limited |  |  |  | ELECTROPORCELAIN DIVISION BANGALORE    |  |  |  | NO. OF SHEETS 05         |  |  |  |
| TITLE :                          |  |  |  | POWER AND CONTROL SCHEME               |  |  |  | 05                       |  |  |  |
|                                  |  |  |  | BI-DIRECTIONAL MOTOR FEEDER BELOW 30KW |  |  |  | 06                       |  |  |  |
|                                  |  |  |  | CONTROLLED FROM: ATIS/DDCIS/PLC (DM)   |  |  |  | REV. 01                  |  |  |  |
| SCALE: 1/1                       |  |  |  | JOB NO. CP-14-047                      |  |  |  | DRG. NO. EP-3-CS-047-033 |  |  |  |
| DATE: 28.07.16                   |  |  |  | SIGN: [Signature]                      |  |  |  | DATE: 28.07.16           |  |  |  |
| DESIGNED: TRINATH                |  |  |  | NAME: TRINATH                          |  |  |  | DATE: 28.07.16           |  |  |  |
| DRAWN: [Signature]               |  |  |  | NAME: KSB                              |  |  |  | DATE: 28.07.16           |  |  |  |
| CHECKED: [Signature]             |  |  |  | NAME: KSB                              |  |  |  | DATE: 28.07.16           |  |  |  |
| APPROVED: [Signature]            |  |  |  | NAME: KSB                              |  |  |  | DATE: 28.07.16           |  |  |  |
| BY: [Signature]                  |  |  |  | NAME: KSB                              |  |  |  | DATE: 28.07.16           |  |  |  |
| DESCRIPTION                      |  |  |  | DESCRIPTION                            |  |  |  | DESCRIPTION              |  |  |  |

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DRG. NO. EP-3-CS-047-036

INVENTORY NO. 4  
REV. NO. 3  
2  
1

FORM 66-271 A3

**DEVELOPMENT CONSULTANTS**  
**PRIVATE LIMITED**

Issued only for general information with contract details and specifications. Contractor to be responsible for any errors and for fulfillment of detailed requirements of contract documents.

**ACTION : 6 DATE : 10.02.17**  
**TESTIFIED BY : BR**

|                               |                                      |
|-------------------------------|--------------------------------------|
| 1. Drawn                      | 4. Approved (as per contract)        |
| 2. Approved                   | 5. Disapproved (as per contract)     |
| 3. Approved (as per contract) | 6. For information and final closing |

**SEE COVERING LETTER**  
Date : 10.02.17



CUSTOMER:  
GUJARAT ELECTRICITY CORPORATION LIMITED  
VADODARA, GUJARAT

PROJECT:  
1x800 MW WANAKBORI THERMAL POWER STATION  
EXTENSION UNIT-8

CUSTOMER CONSULTANT:  
  
DEVELOPMENT CONSULTANT PVT LTD  
KOLKATA

| DRAWING NO.     | DESCRIPTION OF DRAWING                          | SCHEME REQUIREMENT              |
|-----------------|-------------------------------------------------|---------------------------------|
| EP-3-CS-047-036 | Control Scheme for Module type G1 BUS PT module | BUS PT MODULE FOR PMCC/PCC/ACDB |

|                                                                          |  |  |  |                                                               |                          |                     |
|--------------------------------------------------------------------------|--|--|--|---------------------------------------------------------------|--------------------------|---------------------|
| BHARAT HEAVY ELECTRICALS LIMITED<br>ELECTROPOWERLAINS DIVISION BANGALORE |  |  |  | TITLE :<br>CONTROL SCHEME FOR MODULE<br>TYPE G1 BUS PT MODULE |                          | NO. OF SHEETS<br>03 |
| SCALE : HA                                                               |  |  |  | JOB NO. CP-14-047                                             | DRG. NO. EP-3-CS-047-036 | SHEET NO.<br>01     |
| DATE : 24.06.16                                                          |  |  |  | BY : KSB                                                      | APPD. : KSB              | REV. NO.<br>01      |
| NAME : TRINATH                                                           |  |  |  | SIGN. : [Signature]                                           | DATE : 24.06.16          |                     |
| DESIGNED : TRINATH                                                       |  |  |  | CHECKED : TRINATH                                             | APPROVED : KSB           |                     |
| DRAWN : TRINATH                                                          |  |  |  | CHECKED : TRINATH                                             | APPROVED : KSB           |                     |
| DATE : 24.06.16                                                          |  |  |  | SIGN. : [Signature]                                           | DATE : 24.06.16          |                     |

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DRG. NO. EP-3-CS-047-036

INVENTORY NO.  
REV. NO.  
DATE

FORM 66-271 A3

ALL DIMENSIONS ARE IN MM.

FIRST ANGLE PROJECTION

1 2 3 4 5 6 7 8

# BUS SECTION-A

415V, 3200A, 3PHASE, 4WIRE 50HZ,50KA FOR 1SEC

R Y B N

MPCB21 6A

PT21-23 415/10 V 100VA, CL:0.5

NL21 E70

NL22 E90

MCB21 16A

201 203 205 207 209 211 213 215 217 219 221 223 225

X1:1 X1:2 X1:3 X1:4 X1:10 X1:21

TO BC / TO DGCP

TO ECP SYNC CKT

4-20mA DUAL OUTPUT

212 22 324

VTD31

VTD

V1V2 + - 1 2 3 4

V21

VOLTMETER

PT INPUT MULTISUPPLY RS-485

L1 L2 L3 L4 +L -N + -SG

227 229

MCB22 6A

231 233

220V DC 04:1B

RS 485

X1:17 X1:18

TO OG FEEDER-1 RELAY

TO OG FEEDER-2 RELAY

RS485

FROM 220V DC CONTROL BUS

4-20mA DUAL OUTPUT

TO ECP SYNC CKT

SPARE TERMINALS

213 215 217 219 221 223 225 227 229 231 233

X1 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32

BUS PT-A VOLTAGE TO IC-1

BUS PT-A VOLTAGE TO BC

BUS PT-A MCB/MPCB ON TO IC-1

BUS PT UNHEALTHY

NOTE:-  
THIS DRAWING IS ALSO APPLICABLE FOR BUS SECTION-B(BUS PT-B)



BHARAT HEAVY ELECTRICALS LIMITED  
ELECTROPORCELAIN DIVISION BANGALORE

TITLE :  
CONTROL SCHEME FOR MODULE  
TYPE G1 BUS PT MODULE

NO. OF SHEETS  
03

SHEET NO.  
02

REV.  
01



SCALE: 1/10

JAGADISH

TRINATH

DESIGNED  
DRAWN  
CHECKED  
APPROVED

DATE  
24.06.16  
24.06.16

SIGN.

NAME

BY

APPROVED

DESCRIPTION

DATE

REV. NO.

NO. OF SHEETS

SHEET NO.

REV.

1

2

3

4

5

6

7

8

ALL DIMENSIONS ARE IN MM

FIRST ANGLE PROJECTION

LEGEND

DESCRIPTION

PT

POTENTIAL TRANSFORMER

MPCB

MOTOR PROTECTION CIRCUIT BREAKER

MCB

MINIATURE CIRCUIT BREAKER

V

VOLTMETER

X1

TERMINAL BLOCK

NL

NEUTRAL LINK

CROSS REFERENCE EXAMPLE:

1.) 02-70

'C' INDICATES Y-AXIS ZONE

'7' INDICATES X-AXIS ZONE

'02' INDICATES PAGE NUMBER

COMPONENTS NUMBERING EXAMPLE:

1.) MPCB21

'1' INDICATES SERIAL NUMBER OF COMPONENT ON THAT PAGE

'2' INDICATES PAGE NUMBER

'MPCB' INDICATES COMPONENT NAME

2.) K21

'1' INDICATES SERIAL NUMBER OF COMPONENT ON THAT PAGE

'2' INDICATES PAGE NUMBER

'K' INDICATES COMPONENT NAME

DRG. NO. EP-3-CS-047-036

INVENTORY NO.

REV. NO.

DATE

BY

APPROVED

DATE

DESCRIPTION

4

3

2

1

NAME

SIGN.

DATE

DESIGNED

DRAWN

CHECKED

APPROVED

JAGADISH

TRINATH

KSB

24.08.16

24.08.16

24.08.16

BHARAT HEAVY ELECTRICALS LIMITED

ELECTROPORCELAINS DIVISION BANGALORE

TITLE :

CONTROL SCHEME FOR MODULE

TYPE G1 BUS PT MODULE

NO. OF SHEETS

03

SHEET NO.

03

REV.

01

DRG. NO. EP-3-CS-047-036

FORM 68-271 A3

CONFIDENTIAL AND COPYRIGHTED

ORG. NO.

FORM 88-271 A3

2

**GS&C**  
CUSTOMER

VADODARA, GUJARATH

1x800 MW WANAKBORI THERMAL POWER STATION  
EXTENSION UNIT-8

### SCHEME REQUIREMENT

DEVELOPMENT CONSULTANT PVT LTD  
KOLKATA

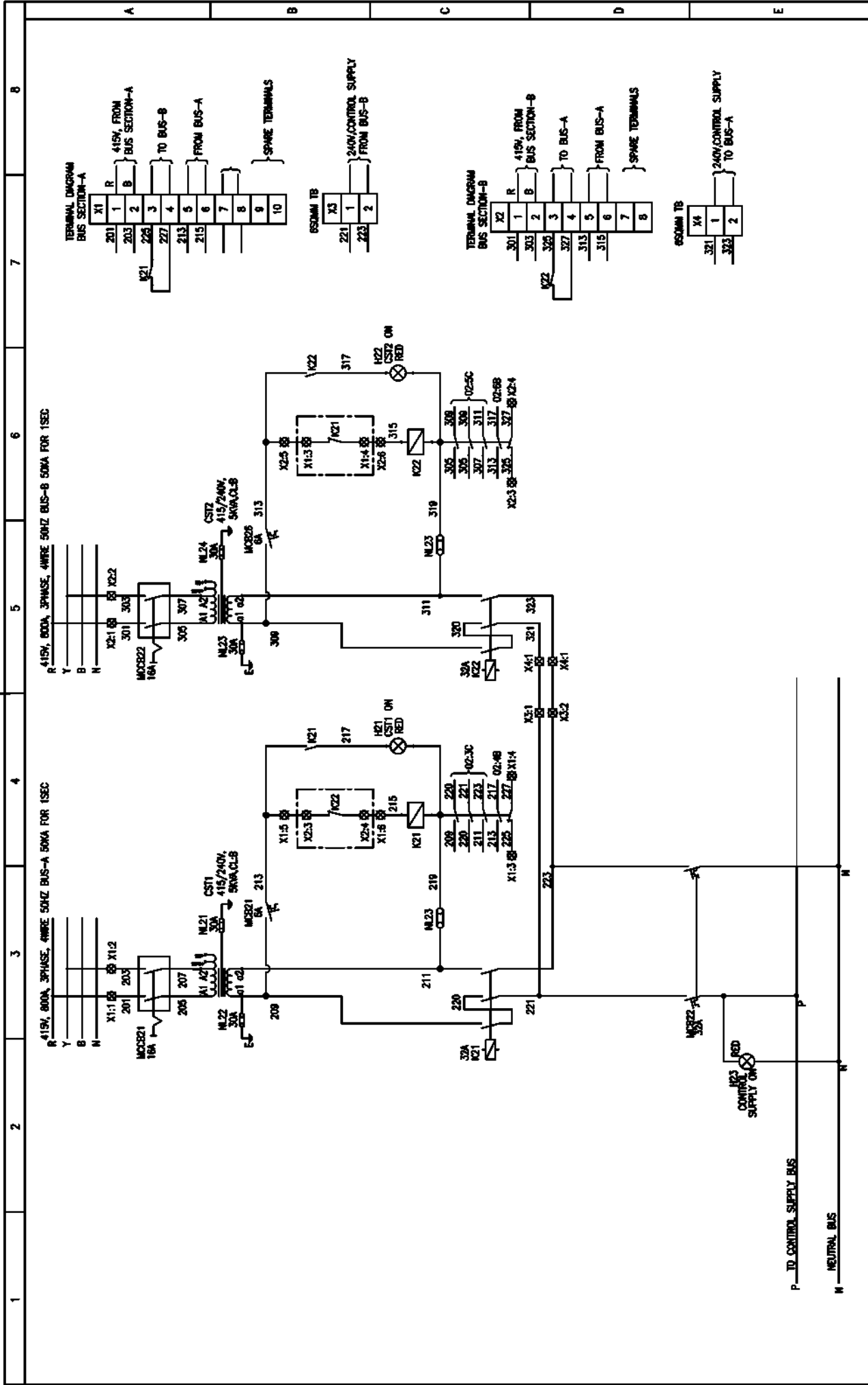
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DWG. NO. EP-3-CS-047-039

FORM 66-271 A3

FIRST ANGLE PROJECTION

ALL DIMENSIONS ARE IN MM.



| INVENTORY NO.                                  |          |    |          | REV. NO.                 |          |    |          |
|------------------------------------------------|----------|----|----------|--------------------------|----------|----|----------|
| 4                                              |          |    |          | 01                       |          |    |          |
| 3                                              |          |    |          | 02                       |          |    |          |
| 2                                              |          |    |          | 03                       |          |    |          |
| 01                                             | 12.07.16 | 04 | 12.07.16 | 01                       | 12.07.16 | 04 | 12.07.16 |
| REVISION IN LINE WITH PWD COMMENTS DTR12.07.16 |          |    |          | REV. NO.                 |          |    |          |
| BY                                             |          |    |          | DESCRIPTION              |          |    |          |
| APPROVED                                       |          |    |          | DATE                     |          |    |          |
| CHECKED                                        |          |    |          | BY                       |          |    |          |
| DRAWN                                          |          |    |          | APPROVED                 |          |    |          |
| DESIGNED                                       |          |    |          | DATE                     |          |    |          |
| NAME                                           |          |    |          | SIGN.                    |          |    |          |
| TRINATH                                        |          |    |          | DATE                     |          |    |          |
| 24.06.16                                       |          |    |          | 24.06.16                 |          |    |          |
| 24.06.16                                       |          |    |          | 24.06.16                 |          |    |          |
| KSB                                            |          |    |          | KSB                      |          |    |          |
| SCALE: 1/1                                     |          |    |          | JOB NO. CP-14-047        |          |    |          |
| Bharat Heavy Electricals Limited               |          |    |          | DRG. NO. EP-3-CS-047-039 |          |    |          |
| ELECTROPEREJANS DMSION BANGALORE               |          |    |          | NO. OF SHEETS            |          |    |          |
| TITLE :                                        |          |    |          | SHEET. NO.               |          |    |          |
| CONTROL SCHEME FOR MODULE                      |          |    |          | REV. 01                  |          |    |          |
| TYPE CS-AC CONTROL SUPPLY MODULE               |          |    |          |                          |          |    |          |



ORG. NO. EP-3-CS-047-041

**CUSTOMER**  
**GS&C**

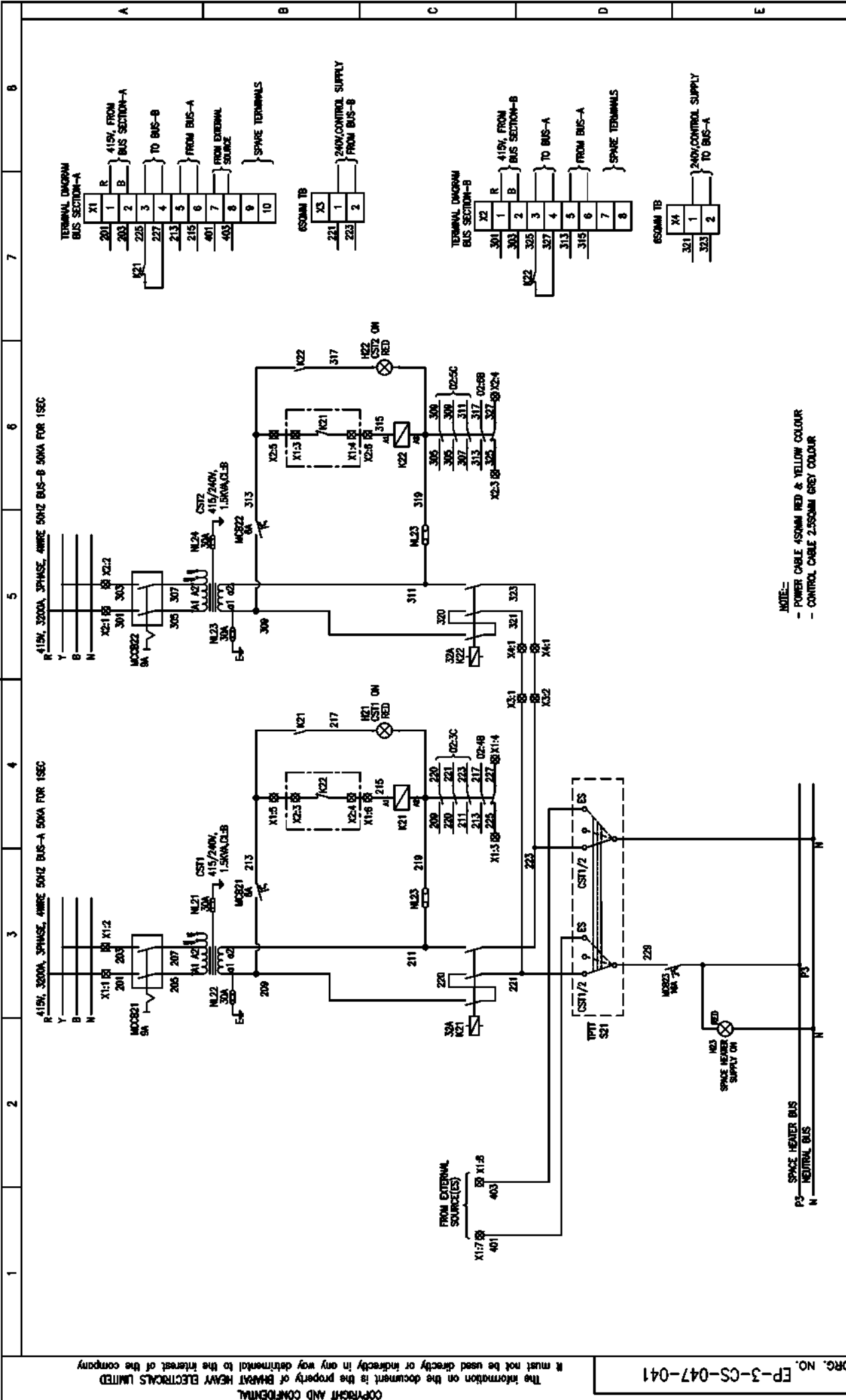
PROJECT:  
1x800 MW WANAKBORI THERMAL POWER STATION  
EXTENSION UNIT-8

**DEVELOPMENT CONSULTANT PVT LTD**  
**KOLKATA**

[illegible]

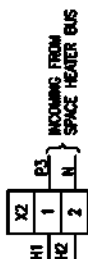
ALL DIMENSIONS ARE IN MM.

FIRST ANGLE PROJECTION



| INVENTORY NO. |  |  |  | REV. NO.                            |  |  |  |
|---------------|--|--|--|-------------------------------------|--|--|--|
| 4             |  |  |  | 1                                   |  |  |  |
| 3             |  |  |  | 2                                   |  |  |  |
| 2             |  |  |  | 3                                   |  |  |  |
| 1             |  |  |  | 4                                   |  |  |  |
| DESCRIPTION   |  |  |  | BY                                  |  |  |  |
|               |  |  |  | APPROVED                            |  |  |  |
|               |  |  |  | CHECKED                             |  |  |  |
|               |  |  |  | DRAWN                               |  |  |  |
|               |  |  |  | DESIGNED                            |  |  |  |
|               |  |  |  | NAME                                |  |  |  |
|               |  |  |  | SIGN.                               |  |  |  |
|               |  |  |  | DATE                                |  |  |  |
|               |  |  |  | SCALE: NA                           |  |  |  |
|               |  |  |  | JOB NO. CP-14-047                   |  |  |  |
|               |  |  |  | DRG. NO. EP-3-CS-047-041            |  |  |  |
|               |  |  |  | REV. NO.                            |  |  |  |
|               |  |  |  | SHEET NO.                           |  |  |  |
|               |  |  |  | NO. OF SHEETS                       |  |  |  |
|               |  |  |  | TITLE :                             |  |  |  |
|               |  |  |  | CONTROL SCHEME FOR MODULE TYPE      |  |  |  |
|               |  |  |  | IT PANEL SPACE HEATER WITH INDOOR   |  |  |  |
|               |  |  |  | AND SOCKET                          |  |  |  |
|               |  |  |  | ELECTROPORCELAIN DIVISION BANGALORE |  |  |  |
|               |  |  |  | BHARAT HEAVY ELECTRICALS LIMITED    |  |  |  |

EP-3-CS-047-041



**NOTE: DOOR SWITCH IS 'NO' WHEN  
CALBE ALLEY DOOR IS CLOSED.**

### COMPONENTS NUMBERING EXAMPLE:

- 1.) W00821  
 \_\_\_\_\_ '1' INDICATES SERIAL NUMBER OF COMPONENT ON THAT PAGE  
 \_\_\_\_\_ '2' INDICATES PAGE NUMBER  
 \_\_\_\_\_ 'A' POB INDICATES COMPONENT NAME
- 2.) H21  
 \_\_\_\_\_ '1' INDICATES SERIAL NUMBER OF COMPONENT ON THAT PAGE  
 \_\_\_\_\_ '2' INDICATES PAGE NUMBER  
 \_\_\_\_\_ 'K' INDICATES COMPONENT NAME

[illegible]



**BHARAT HEAVY ELECTRICALS LIMITED**  
**ELECTROPORCELAINS DIVISION**  
**BANGALORE – 560012**

**1X800MW WANAKBORI STPP AHP & CHP PACKAGE**

**MAIN PRICE SCHEDULE\_ANNEXURE-A**

| Sl. No.      | MATERIAL CODE | MATERIAL DESCRIPTION                           | UNIT | Qty | UNIT PRICE | TOTAL PRICE |
|--------------|---------------|------------------------------------------------|------|-----|------------|-------------|
| 1            | ELWANKCHP001  | 415V WT MCC (CHP MCC-1) Near Wagon Tippler     | EA   | 1   |            |             |
| 2            | ELWANKCHP002  | 415V CHP MCC-2 (CH MCC) Near Crusher House     | EA   | 1   |            |             |
| 3            | ELWANKCHP003  | 415V TP-4 MCC (CHP MCC-3) Near TP-4            | EA   | 1   |            |             |
| 4            | ELWANKAHP004  | 415V AWRS MCC (AHS MCC-3) (Ash Dyke area)      | EA   | 1   |            |             |
| 5            | ELWANKAHP005  | 415V SILO MCC (AHS MCC-2) (Near Fly ash Silo)  | EA   | 1   |            |             |
| 6            | ELWANKAHP006  | 415V AHS MCC (AHS MCC-1) Near TP-6             | EA   | 1   |            |             |
| 7            | ELWANKCMN007  | SITE MODIFICATION CHARGES (ANNEXURE-D)         | LOT  | 1   |            |             |
| 8            | ELWANKCMN008  | ERECTION AND COMMISSIONING SPARES (ANNEXURE-C) | LOT  | 1   |            |             |
| 10           | ELWANKCMN009  | TOOLS & TACKLES (ANNEXURE-E)                   | LOT  | 1   |            |             |
| 11           | ELWANKCMN010  | SITE MODIFICATION ITEMS AS 1% OF TOTAL COST    | LOT  | 1   |            |             |
| <b>TOTAL</b> |               |                                                |      |     |            |             |

**NOTES:**

1. SUMMATION OF ALL UNIT RATES OF MODULES SHALL BE EQUIVALENT TO TOTAL BOARD COST QUOTED, VARIANCE OF +/- 5% IS ACCEPTABLE. BEYOND 5% OFFER WILL NOT BE CONSIDER AS VALID OFFER. IN UNIT ADDITION-DELETION PRICES, PRICES QUOTED FOR COMPONENTS SHALL BE AS PER LIST PRICE OF CONCERNED MANUFACTURE **R**. IF ANY ABNORMAL PRICES ON HIGHER SIDE OBSERVED OFFER MAY BE REJECTED.

2. ALL LT PCC/ MCC/ DBs SHALL BE SUPPLIED ALONGWITH THE INTEGRAL BASE FRAMES(MIN 75MM), FOUNDATION BOLTS, CABLE GLANDS & LUGS AND TOOLS & TACKLES AS MENTIONED IN DIFFERENT SECTIONS.

3. ITEM WISE PRICES WITH DESCRIPTION AND RATING OF EACH ITEM COMPLYING TO LIST FURNISHED IN THE SCHEDULE OF UNIT PRICES SHALL BE FURNISHED IN SCHEDULE OF UNIT PRICE.

4. ADDITION/DELETION OF QUANTITIES SHALL BE APPLICABLE AT THE QUOTED PRICE. THE UNIT RATE OF SUPPLY OF ALL EQUIPMENTS & SERVICES QUOTED BY THE BIDDER SHALL BE FIRM FOR A VARIATION OF QUANTITIES, WHICH MAY BE TO THE EXTENT OF ±30% OF THE TOTAL CONTRACT VALUE DERIVED ON THE BASIS OF ORDERED QUANTITY. SUM OF INDIVIDUAL MODULE SHALL EQUAL TO BOARD PRICE.

5. Price of components for Panels, E&C spres, Tools and Tackles are to be quoted in Unit Price Schedule given in specification.

**a. COMPLETE DIMENSIONS OF ALL THE BOARDS INCLUDING NO OF ACB, MCC. GA DRAWING SHALL BE DULY SUBMITTED FOR ALL BOARDS.**

**b. DIMENSIONS OF EACH TYPE OF PANEL.**

**c. MODULE SIZE OF EACH TYPE OF FEEDER.**

**d. MINIMUM CLEARANCES REQUIRED ON ALL SIDES FOR EACH TYPE OF PANEL.**

**e. NO. of VERTICALS (including PCC, MCC etc.) of EACH PANELS TO BE GIVEN, ELSE YOUR OFFER WILL BE REJECTED..**

6. DOUBLE COMPRESSION, NICKLE PLATED BRASS CABLE GLANDS & HEAVY DUTY LUGS OF APPROVED MAKE FOR EXTERNAL POWER, CONTROL & EARTHING CONNECTIONS AT SUPPLIED EQUIPMENT END AND FOUNDATION BOLT **S** ARE IN THE SCOPE OF BIDDER. BIDDER TO QUOTE ALL EQUIPMENT WITH CABLE GLANDS, LUGS AND FOUNDATION BOLTS.



**1X800 MW WANAKBORI Supercritical  
Thermal Power Project CHP & AHP PACKAGE**

**TECHNICAL SPECIFICATION FOR  
LOW VOLTAGE SWITCHGEAR  
(ANNEXURE-B)**

SPECIFICATION NO. EPD-TS-CPBG-14047-  
AHP\_CHP

VOLUME

SECTION

REV NO. 00

DATE :06/10/2017

SHEET 1 OF 1

**ANNEXURE-B  
SITE MODIFICATION CHARGES  
(MATERIAL CODE: ELWANKCMN007)**

| SL.NO. | DETAILS                                                                                | QUANTITY | UNIT PRICE | TOTAL PRICE |
|--------|----------------------------------------------------------------------------------------|----------|------------|-------------|
| 1      | LUMP SUM ALL INCLUSIVE CHARGES PER VISIT FOR SKILLED TECHNICIAN (EXCEPT DAILY CHARGES) | 3 VISITS |            |             |
| 2      | LUMP SUM ALL INCLUSIVE DAILY CHARGES FOR SKILLED TECHNICIAN                            | 15 DAYS  |            |             |
| 3      | LUMP SUM ALL INCLUSIVE CHARGES PER VISIT FOR SERVICE ENGINEER (EXCEPT DAILY CHARGES)   | 3 VISITS |            |             |
| 4      | LUMP SUM ALL INCLUSIVE DAILY CHARGES FOR SERVICE ENGINEER                              | 30 DAYS  |            |             |
|        |                                                                                        |          | TOTAL      |             |

**NOTES:**

- 1) AMOUNT PAYABLE FOR SKILLED TECHNICIAN PER VISIT TO SITE = VISIT CHARGES AS PER SL. NO. 1 ABOVE + (DAILY CHARGES AS PER SL. NO. 2 ABOVE X NO. OF DAYS AT SITE) (TO BE CERTIFIED BY BHEL SITE)**
- 2) AMOUNT PAYABLE FOR SERVICE ENGINEER PER VISIT TO SITE = VISIT CHARGES AS PER SL. NO. 3 ABOVE + (DAILY CHARGES AS PER SL. NO. 4 ABOVE X NO. OF DAYS AT SITE) (TO BE CERTIFIED BY BHEL SITE)**



**1X800 MW WANAKBORI Supercritical  
Thermal Power Project AHP & CHP  
Package  
TECHNICAL SPECIFICATION FOR  
LOW VOLTAGE SWITCHGEAR**

SPECIFICATION NO. : EPD-TS-CPBG-14047-AHP\_CHP

VOLUME

SECTION -

REVISION  
0

DATE: 21/10/2017

SHEET 1 OF 1

**ERECTION & COMMISSIONING SPARES  
ANNEXURE-C  
MATERIAL CODE: ELWANKCMN008**

| S.No.    | ITEM / COMPONENT                                             | UNIT | Qty | UNIT PRICE (EX-WORKS) | TOTAL PRICE |
|----------|--------------------------------------------------------------|------|-----|-----------------------|-------------|
| <b>1</b> | <b>MCCB/MPCB</b>                                             |      |     |                       |             |
|          | 16A                                                          | No   | 2   |                       |             |
|          | 32A                                                          | No   | 2   |                       |             |
|          | 100A                                                         | No   | 2   |                       |             |
|          | 160A                                                         | No   | 2   |                       |             |
|          | 250A                                                         | No   | 2   |                       |             |
|          | 400A                                                         | No   | 2   |                       |             |
|          | 630A                                                         | No   | 2   |                       |             |
| <b>2</b> | <b>POWER CONTACTORS</b>                                      |      |     |                       |             |
|          | Contactors (110V AC)                                         |      |     |                       |             |
|          | 16A                                                          | No.  | 5   |                       |             |
|          | 32A                                                          | No.  | 5   |                       |             |
|          | 63A                                                          | No.  | 5   |                       |             |
|          | 80A                                                          | No.  | 5   |                       |             |
|          | 115A                                                         | No.  | 5   |                       |             |
|          | 185A                                                         | No.  | 5   |                       |             |
|          | 265A                                                         | No.  | 5   |                       |             |
|          | 400A                                                         | No.  | 5   |                       |             |
| <b>3</b> | <b>AUXILIARY CONTACTORS</b>                                  |      |     |                       |             |
|          | 2NO + 2NC AC                                                 | No   | 15  |                       |             |
|          | 2NO + 2NC DC                                                 | No   | 15  |                       |             |
|          | 3NO + 1NC AC                                                 | No   | 15  |                       |             |
|          | 3NO + 1NC DC                                                 | No   | 15  |                       |             |
| <b>4</b> | <b>PUSH BUTTONS with 2NO+2NC</b>                             | Nos  | 50  |                       |             |
| <b>5</b> | <b>INDICATING CLUSTER LED of each Type, Rating and Color</b> | Nos. | 50  |                       |             |
| <b>6</b> | <b>control switch (each type and rating)</b>                 | Nos  | 10  |                       |             |
| <b>7</b> | <b>Meters of each type &amp; rating</b>                      | No.  | 5   |                       |             |



**1X800MW WANAKBORI Supercritical Thermal  
Power Project AHP & CHP PACKAGE**

**TECHNICAL SPECIFICATION FOR  
LOW VOLTAGE SWITCHGEAR  
PRICE SCHEDULE FOR TOOLS & TACKLES**

SPECIFICATION NO.  
EPD-TS-CPBG-14047-AHP\_CHP

VOLUME NO. :

SECTION :

REV NO. : 00 DATE 06/10/2017

SHEET : 1 OF 1

**ANNEXURE-D**  
**TOOLS & TACKLES AND ACCESSORIES**  
**MATERIAL CODE: ELWANKCMN009**

| SL.<br>NO. | ITEM DESCRIPTION                            | QUANTI<br>TY | UNIT<br>PRICE<br>(EX.<br>WORKS) | TOTAL<br>PRICE (EX.<br>WORKS) |
|------------|---------------------------------------------|--------------|---------------------------------|-------------------------------|
| 1          | BREAKER LIFTING<br>AND HANDLING<br>TROLLEY  | 6 NO'S       |                                 |                               |
| 2          | MODULE RACKING<br>HANDLE FOR<br>BREAKERS    | 12 NO'S      |                                 |                               |
| 3          | MODULE RACKING<br>HANDLE FOR MCC<br>MODULES | 20 NO'S      |                                 |                               |
| 4.         | ELECTRICAL TOOLS<br>KIT                     | 2 SET        |                                 |                               |
| 5.         | MECHNICAL TOOLS<br>KIT                      | 2 SET        |                                 |                               |

|                                                                                   |                                                                                                                                                        |                                               |                  |
|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|------------------|
|  | <b>1X800 MW WANAKBORI Supercritical<br/>Thermal Power Project AHP &amp; CHP<br/>Package<br/>TECHNICAL SPECIFICATION FOR<br/>LOW VOLTAGE SWITCHGEAR</b> | SPECIFICATION NO. : EPD-TS-CPBG-14047-AHP_CHP |                  |
|                                                                                   |                                                                                                                                                        | VOLUME                                        |                  |
|                                                                                   |                                                                                                                                                        | SECTION -                                     |                  |
|                                                                                   |                                                                                                                                                        | REVISION<br>0                                 | DATE: 21/10/2017 |

## ANNEXURE-E

| SL.NO.   | ITEM DESCRIPTION                                             | MODEL NO./ ITEM DESCRIPTION | UNIT PRICE (Rs.) |
|----------|--------------------------------------------------------------|-----------------------------|------------------|
| <b>1</b> | <b>INCOMING FEEDER UNIT</b>                                  |                             |                  |
| a)       | ACB Incomer to PCC/PMCC from Trafo. - Module Type DAET (I/C) |                             |                  |
|          | 630A                                                         |                             |                  |
|          | 1000A                                                        |                             |                  |
|          | 1600A                                                        |                             |                  |
|          | 2000A                                                        |                             |                  |
|          | 2500A                                                        |                             |                  |
|          | 3000A                                                        |                             |                  |
|          | 4000A                                                        |                             |                  |
| b)       | ACB Incomer to MCC - Module Type DAE/ DAEN/ AE (I/C)         |                             |                  |
|          | 630A                                                         |                             |                  |
|          | 800A                                                         |                             |                  |
|          | 1000A                                                        |                             |                  |
|          | 1600A                                                        |                             |                  |
|          | 2000A                                                        |                             |                  |
|          | 2500A                                                        |                             |                  |
|          | 3000A                                                        |                             |                  |
| c)       | MCCB Incomer for MCC / ACDB – Module Type EM3 (I/C)          |                             |                  |
|          | Upto 63A – Fixed Type                                        |                             |                  |
|          | 125A – Fixed Type                                            |                             |                  |
|          | 200A – Fixed Type                                            |                             |                  |
|          | 250A – Fixed Type                                            |                             |                  |
|          | 400A – Fixed Type                                            |                             |                  |
|          | 630A – Fixed Type                                            |                             |                  |
|          | Upto 63A – Drawout Type                                      |                             |                  |
|          | 125A – Drawout Type                                          |                             |                  |
|          | 200A – Drawout Type                                          |                             |                  |
|          | 250A – Drawout Type                                          |                             |                  |
|          | 400A – Drawout Type                                          |                             |                  |
|          | 630A – Drawout Type                                          |                             |                  |
| d)       | SFU Incomer for MCC / ACDB – Module Type EM3 (I/C)           |                             |                  |
|          | Upto 63A – Fixed Type                                        |                             |                  |
|          | 125A – Fixed Type                                            |                             |                  |
|          | 200A – Fixed Type                                            |                             |                  |
|          | 250A – Fixed Type                                            |                             |                  |
|          | 400A – Fixed Type                                            |                             |                  |
|          | 630A – Fixed Type                                            |                             |                  |
|          | Upto 63A – Drawout Type                                      |                             |                  |
|          | 125A – Drawout Type                                          |                             |                  |
|          | 200A – Drawout Type                                          |                             |                  |

## ANNEXURE-E

| SL.NO.                   | ITEM DESCRIPTION                                                         | MODEL NO./ ITEM DESCRIPTION | UNIT PRICE (Rs.) |
|--------------------------|--------------------------------------------------------------------------|-----------------------------|------------------|
|                          | 250A – Drawout Type                                                      |                             |                  |
|                          | 400A – Drawout Type                                                      |                             |                  |
|                          | 630A – Drawout Type                                                      |                             |                  |
| e)                       | 220V DCDB Incomer from charger - Module type CH (I/C)                    |                             |                  |
|                          | 150A – CH Fixed Type                                                     |                             |                  |
|                          | 200A – CH Fixed Type                                                     |                             |                  |
|                          | 400A – CH Fixed Type                                                     |                             |                  |
|                          | 630A – CH Fixed Type                                                     |                             |                  |
|                          | 1250A – CH Fixed Type                                                    |                             |                  |
|                          | 150A – CH Drawout Type                                                   |                             |                  |
|                          | 200A – CH Drawout Type                                                   |                             |                  |
|                          | 400A – CH Drawout Type                                                   |                             |                  |
|                          | 630A – CH Drawout Type                                                   |                             |                  |
| f)                       | 220V DC Fuse DB Incomer from DCDB - Module type H2                       |                             |                  |
|                          | 32A                                                                      |                             |                  |
|                          | 50A                                                                      |                             |                  |
|                          | 63A                                                                      |                             |                  |
| g)                       | 415V AC MCCB DB Incomer– Module Type H3                                  |                             |                  |
|                          | 32A                                                                      |                             |                  |
|                          | 63A                                                                      |                             |                  |
|                          | 125A                                                                     |                             |                  |
| h)                       | ACB Incomer to Emergency Board - Module Type DAEG/ DAEGN (I/C)           |                             |                  |
|                          | 1600A                                                                    |                             |                  |
|                          | 2500A                                                                    |                             |                  |
|                          | 3000A                                                                    |                             |                  |
| <b>2 BUSCOUPLER UNIT</b> |                                                                          |                             |                  |
| a)                       | ACB Buscoupler to PCC/PMCC/MCC from Trafo. - Module Type DAET/ DAE (B/C) |                             |                  |
|                          | 630A                                                                     |                             |                  |
|                          | 800A                                                                     |                             |                  |
|                          | 1000A                                                                    |                             |                  |
|                          | 1600A                                                                    |                             |                  |
|                          | 2000A                                                                    |                             |                  |
|                          | 2500A                                                                    |                             |                  |
|                          | 3000A                                                                    |                             |                  |
|                          | 4000A                                                                    |                             |                  |
| b)                       | MCCB Buscoupler for MCC / ACDB – Module Type EM3 (B/C)                   |                             |                  |
|                          | Upto 63A – Fixed Type                                                    |                             |                  |
|                          | 125A – Fixed Type                                                        |                             |                  |
|                          | 200A – Fixed Type                                                        |                             |                  |
|                          | 250A – Fixed Type                                                        |                             |                  |
|                          | 400A – Fixed Type                                                        |                             |                  |
|                          | 630A – Fixed Type                                                        |                             |                  |
|                          | Upto 63A – Drawout Type                                                  |                             |                  |
|                          | 125A – Drawout Type                                                      |                             |                  |
|                          | 200A – Drawout Type                                                      |                             |                  |
|                          | 250A – Drawout Type                                                      |                             |                  |

## ANNEXURE-E

| SL.NO.     | ITEM DESCRIPTION                                                                  | MODEL NO./ ITEM DESCRIPTION | UNIT PRICE (Rs.) |
|------------|-----------------------------------------------------------------------------------|-----------------------------|------------------|
|            | 400A – Drawout Type                                                               |                             |                  |
|            | 630A – Drawout Type                                                               |                             |                  |
| c)         | SFU Buscoupler for MCC / ACDB – Module Type EM3 (B/C)                             |                             |                  |
|            | Upto 63A – Fixed Type                                                             |                             |                  |
|            | 125A – Fixed Type                                                                 |                             |                  |
|            | 200A – Fixed Type                                                                 |                             |                  |
|            | 250A – Fixed Type                                                                 |                             |                  |
|            | 400A – Fixed Type                                                                 |                             |                  |
|            | 630A – Fixed Type                                                                 |                             |                  |
|            | Upto 63A – Drawout Type                                                           |                             |                  |
|            | 125A – Drawout Type                                                               |                             |                  |
|            | 200A – Drawout Type                                                               |                             |                  |
|            | 250A – Drawout Type                                                               |                             |                  |
|            | 400A – Drawout Type                                                               |                             |                  |
|            | 630A – Drawout Type                                                               |                             |                  |
| d)         | 220V DCDB Buscoupler from charger - Module type DC & HD (B/C)                     |                             |                  |
|            | 150A – DC & HD Fixed Type                                                         |                             |                  |
|            | 200A – DC & HD Fixed Type                                                         |                             |                  |
|            | 400A – DC & HD Fixed Type                                                         |                             |                  |
|            | 630A – DC & HD Fixed Type                                                         |                             |                  |
|            | 1250A – DC & HD Fixed Type                                                        |                             |                  |
|            | 150A – DC & HD Drawout Type                                                       |                             |                  |
|            | 200A – DC & HD Drawout Type                                                       |                             |                  |
|            | 400A – DC & HD Drawout Type                                                       |                             |                  |
|            | 630A – DC & HD Drawout Type                                                       |                             |                  |
|            | 1250A – DC & HD Drawout Type                                                      |                             |                  |
| e)         | ACB BUSCOUPLER to Emergency Board - Module Type DAEG (B/C)                        |                             |                  |
|            | 1600A                                                                             |                             |                  |
|            | 2500A                                                                             |                             |                  |
|            | 3000A                                                                             |                             |                  |
| <b>3</b>   | <b>Outgoing ACB supply feeder - Module Type DAE/DAE-TIE (O/G)</b>                 |                             |                  |
|            | 630A                                                                              |                             |                  |
|            | 800A                                                                              |                             |                  |
|            | 1000A                                                                             |                             |                  |
|            | 1600A                                                                             |                             |                  |
|            | 3000A                                                                             |                             |                  |
| <b>4</b>   | <b>Outgoing ACB motor feeder - Module Type DM/PM (controlled from DDCMIS/PLC)</b> |                             |                  |
|            | 110KW                                                                             |                             |                  |
|            | 130KW                                                                             |                             |                  |
|            | 150KW                                                                             |                             |                  |
| <b>5.1</b> | <b>DOL Motor Starter - Unidirectional Drive(MPCB CONTROLLED) - Drawout Type</b>   |                             |                  |
| a)         | Module Type K2 (Controlled from LPBS)                                             |                             |                  |
|            | Upto 5.5KW                                                                        |                             |                  |

## ANNEXURE-E

| SL.NO. | ITEM DESCRIPTION                                             | MODEL NO./ ITEM DESCRIPTION | UNIT PRICE (Rs.) |
|--------|--------------------------------------------------------------|-----------------------------|------------------|
|        | 5.6 - 7.0KW                                                  |                             |                  |
|        | 7.1 - 14.9KW                                                 |                             |                  |
| b)     | Module Type K21 (Controlled from LPBS)                       |                             |                  |
|        | 15 - 22KW                                                    |                             |                  |
|        | 22.1 - 30.0KW                                                |                             |                  |
|        | 30.1 - 37.0KW                                                |                             |                  |
|        | 37.1 - 45KW                                                  |                             |                  |
|        | 45.1 - 55.0KW                                                |                             |                  |
|        | 55.1 - 75KW                                                  |                             |                  |
|        | 75.1 - 90KW                                                  |                             |                  |
| c)     | Module Type K1 (Controlled from MCC)                         |                             |                  |
|        | Upto 5.5KW                                                   |                             |                  |
|        | 5.6 - 7.0KW                                                  |                             |                  |
|        | 7.1 - 14.9KW                                                 |                             |                  |
| d)     | Module Type K11 (Controlled from MCC)                        |                             |                  |
|        | 15 - 22KW                                                    |                             |                  |
|        | 22.1 - 30.0KW                                                |                             |                  |
|        | 30.1 - 37.0KW                                                |                             |                  |
|        | 37.1 - 45KW                                                  |                             |                  |
|        | 45.1 - 55.0KW                                                |                             |                  |
|        | 55.1 - 75KW                                                  |                             |                  |
|        | 75.1 - 90KW                                                  |                             |                  |
| e)     | Module Type DK2/PK2/AK2 (Controlled from DDCMIS/PLC/ATRS)    |                             |                  |
|        | Upto 5.5KW                                                   |                             |                  |
|        | 5.6 - 7.0KW                                                  |                             |                  |
|        | 7.1 - 14.9KW                                                 |                             |                  |
| f)     | Module Type DK21/PK21/AK21 (Controlled from DDCMIS/PLC/ATRS) |                             |                  |
|        | 15 - 22KW                                                    |                             |                  |
|        | 22.1 - 30.0KW                                                |                             |                  |
|        | 30.1 - 37.0KW                                                |                             |                  |
|        | 37.1 - 45KW                                                  |                             |                  |
|        | 45.1 - 55.0KW                                                |                             |                  |
|        | 55.1 - 75KW                                                  |                             |                  |
|        | 75.1 - 90KW                                                  |                             |                  |
| g)     | Module Type DK2E/PK2E/AK2E (Controlled from DDCMIS/PLC/ATRS) |                             |                  |
|        | Upto 5.5KW                                                   |                             |                  |
|        | 5.6 - 7.0KW                                                  |                             |                  |
|        | 7.1 - 14.9KW                                                 |                             |                  |

## ANNEXURE-E

| SL.NO.     | ITEM DESCRIPTION                                                                | MODEL NO./ ITEM DESCRIPTION | UNIT PRICE (Rs.) |
|------------|---------------------------------------------------------------------------------|-----------------------------|------------------|
|            | h) Module Type DK21E/PK21E/AK21E (Controlled from DDCMIS/PLC/ATRS)              |                             |                  |
|            | 15 - 22KW                                                                       |                             |                  |
|            | 22.1 - 30.0KW                                                                   |                             |                  |
|            | 30.1 - 37.0KW                                                                   |                             |                  |
|            | 37.1 - 45KW                                                                     |                             |                  |
|            | 45.1 - 55.0KW                                                                   |                             |                  |
|            | 55.1 - 75KW                                                                     |                             |                  |
|            | 75.1 - 90KW                                                                     |                             |                  |
| <b>5.2</b> | <b>DOL Motor Starter - Unidirectional Drive(MCCB CONTROLLED) - Drawout Type</b> |                             |                  |
|            | a) Module Type K2 (Controlled from LPBS)                                        |                             |                  |
|            | Upto 5.5KW                                                                      |                             |                  |
|            | 5.6 - 7.0KW                                                                     |                             |                  |
|            | 7.1 - 14.9KW                                                                    |                             |                  |
|            | b) Module Type K21 (Controlled from LPBS)                                       |                             |                  |
|            | 15 - 22KW                                                                       |                             |                  |
|            | 22.1 - 30.0KW                                                                   |                             |                  |
|            | 30.1 - 37.0KW                                                                   |                             |                  |
|            | 37.1 - 45KW                                                                     |                             |                  |
|            | 45.1 - 55.0KW                                                                   |                             |                  |
|            | 55.1 - 75KW                                                                     |                             |                  |
|            | 75.1 - 90KW                                                                     |                             |                  |
|            | c) Module Type K1 (Controlled from MCC)                                         |                             |                  |
|            | Upto 5.5KW                                                                      |                             |                  |
|            | 5.6 - 7.0KW                                                                     |                             |                  |
|            | 7.1 - 14.9KW                                                                    |                             |                  |
|            | d) Module Type K11 (Controlled from MCC)                                        |                             |                  |
|            | 15 - 22KW                                                                       |                             |                  |
|            | 22.1 - 30.0KW                                                                   |                             |                  |
|            | 30.1 - 37.0KW                                                                   |                             |                  |
|            | 37.1 - 45KW                                                                     |                             |                  |
|            | 45.1 - 55.0KW                                                                   |                             |                  |
|            | 55.1 - 75KW                                                                     |                             |                  |
|            | 75.1 - 90KW                                                                     |                             |                  |
|            | e) Module Type DK2/PK2/AK2 (Controlled from DDCMIS/PLC/ATRS)                    |                             |                  |
|            | Upto 5.5KW                                                                      |                             |                  |
|            | 5.6 - 7.0KW                                                                     |                             |                  |
|            | 7.1 - 14.9KW                                                                    |                             |                  |
|            | f) Module Type DK21/PK21/AK21 (Controlled from DDCMIS/PLC/ATRS)                 |                             |                  |

## ANNEXURE-E

| SL.NO.     | ITEM DESCRIPTION                                                              | MODEL NO./ ITEM DESCRIPTION | UNIT PRICE (Rs.) |
|------------|-------------------------------------------------------------------------------|-----------------------------|------------------|
|            | 15 - 22KW                                                                     |                             |                  |
|            | 22.1 - 30.0KW                                                                 |                             |                  |
|            | 30.1 - 37.0KW                                                                 |                             |                  |
|            | 37.1 - 45KW                                                                   |                             |                  |
|            | 45.1 - 55.0KW                                                                 |                             |                  |
|            | 55.1 - 75KW                                                                   |                             |                  |
|            | 75.1 - 90KW                                                                   |                             |                  |
| g)         | Module Type DK2E/PK2E/AK2E (Controlled from DDCMIS/PLC/ATRS)                  |                             |                  |
|            | Upto 5.5KW                                                                    |                             |                  |
|            | 5.6 - 7.0KW                                                                   |                             |                  |
|            | 7.1 - 14.9KW                                                                  |                             |                  |
| h)         | Module Type DK21E/PK21E/AK21E (Controlled from DDCMIS/PLC/ATRS)               |                             |                  |
|            | 15 - 22KW                                                                     |                             |                  |
|            | 22.1 - 30.0KW                                                                 |                             |                  |
|            | 30.1 - 37.0KW                                                                 |                             |                  |
|            | 37.1 - 45KW                                                                   |                             |                  |
|            | 45.1 - 55.0KW                                                                 |                             |                  |
|            | 55.1 - 75KW                                                                   |                             |                  |
|            | 75.1 - 90KW                                                                   |                             |                  |
| <b>6.1</b> | <b>RDOL Motor Starter – Bidirectional Drive(MPCB CONTROLLED) Drawout Type</b> |                             |                  |
| a)         | Module Type DN1/ PN1/ AN1 (Controlled from DDCMIS/PLC/ATRS)                   |                             |                  |
|            | Upto 5.5KW                                                                    |                             |                  |
|            | 5.6 - 7.0KW                                                                   |                             |                  |
|            | 7.1 - 14.9KW                                                                  |                             |                  |
| a)         | Module Type DN21/ PN21/ AN21 (Controlled from DDCMIS/PLC/ATRS)                |                             |                  |
|            | 15 - 22KW                                                                     |                             |                  |
|            | 22.1 - 30.0KW                                                                 |                             |                  |
| <b>6.2</b> | <b>RDOL Motor Starter – Bidirectional Drive(MCCB CONTROLLED) Drawout Type</b> |                             |                  |
| a)         | Module Type DN1/ PN1/ AN1 (Controlled from DDCMIS/PLC/ATRS)                   |                             |                  |
|            | Upto 5.5KW                                                                    |                             |                  |
|            | 5.6 - 7.0KW                                                                   |                             |                  |
|            | 7.1 - 14.9KW                                                                  |                             |                  |
| a)         | Module Type DN21/ PN21/ AN21 (Controlled from DDCMIS/PLC/ATRS)                |                             |                  |
|            | 15 - 22KW                                                                     |                             |                  |
|            | 22.1 - 30.0KW                                                                 |                             |                  |
| <b>7</b>   | <b>Contactor control heater FEEDER(Module Type EA3) - Drawout Type</b>        |                             |                  |
|            | Upto 5.5KW                                                                    |                             |                  |
|            | 5.6 - 7.0KW                                                                   |                             |                  |
|            | 7.1 - 14.9KW                                                                  |                             |                  |
|            | 15 - 22KW                                                                     |                             |                  |

## ANNEXURE-E

| SL.NO.   | ITEM DESCRIPTION                                              | MODEL NO./ ITEM DESCRIPTION | UNIT PRICE (Rs.) |
|----------|---------------------------------------------------------------|-----------------------------|------------------|
|          | 22.1 - 30.0KW                                                 |                             |                  |
|          | 30.1 - 37.0KW                                                 |                             |                  |
|          | 37.1 - 45KW                                                   |                             |                  |
|          | 45.1 - 55.0KW                                                 |                             |                  |
|          | 55.1 - 75KW                                                   |                             |                  |
|          | 75.1 - 90KW                                                   |                             |                  |
| <b>8</b> | <b>Outgoing MCCB controlled feeders</b>                       |                             |                  |
| a)       | Outgoing MCCB controlled supply feeder - Module Type E3 (O/G) |                             |                  |
|          | upto 10A - Fixed type                                         |                             |                  |
|          | 16A - Fixed type                                              |                             |                  |
|          | 25A - Fixed type                                              |                             |                  |
|          | 32A - Fixed type                                              |                             |                  |
|          | 63A - Fixed type                                              |                             |                  |
|          | 125A - Fixed type                                             |                             |                  |
|          | 160A - Fixed type                                             |                             |                  |
|          | 200A - Fixed type                                             |                             |                  |
|          | 250A - Fixed type                                             |                             |                  |
|          | 400A - Fixed type                                             |                             |                  |
|          | 600A - Fixed type                                             |                             |                  |
|          | upto 10A - Drawout type                                       |                             |                  |
|          | 16A - Drawout type                                            |                             |                  |
|          | 25A - Drawout type                                            |                             |                  |
|          | 32A - Drawout type                                            |                             |                  |
|          | 63A - Drawout type                                            |                             |                  |
|          | 125A - Drawout type                                           |                             |                  |
|          | 160A - Drawout type                                           |                             |                  |
|          | 200A - Drawout type                                           |                             |                  |
|          | 250A - Drawout type                                           |                             |                  |
|          | 400A - Drawout type                                           |                             |                  |
|          | 600A - Drawout type                                           |                             |                  |
| B)       | Outgoing MCCB controlled supply feeder - Module Type E2 (O/G) |                             |                  |
|          | upto 10A - Fixed type                                         |                             |                  |
|          | 16A - Fixed type                                              |                             |                  |
|          | 25A - Fixed type                                              |                             |                  |
|          | 32A - Fixed type                                              |                             |                  |
|          | 63A - Fixed type                                              |                             |                  |
|          | 125A - Fixed type                                             |                             |                  |
|          | 160A - Fixed type                                             |                             |                  |
|          | 200A - Fixed type                                             |                             |                  |
|          | 250A - Fixed type                                             |                             |                  |
|          | 400A - Fixed type                                             |                             |                  |
|          | 600A - Fixed type                                             |                             |                  |
|          | upto 10A - Drawout type                                       |                             |                  |
|          | 16A - Drawout type                                            |                             |                  |
|          | 25A - Drawout type                                            |                             |                  |
|          | 32A - Drawout type                                            |                             |                  |
|          | 63A - Drawout type                                            |                             |                  |
|          | 125A - Drawout type                                           |                             |                  |
|          | 160A - Drawout type                                           |                             |                  |
|          | 200A - Drawout type                                           |                             |                  |
|          | 250A - Drawout type                                           |                             |                  |
|          | 400A - Drawout type                                           |                             |                  |

## ANNEXURE-E

| SL.NO.    | ITEM DESCRIPTION                                                | MODEL NO./ ITEM DESCRIPTION | UNIT PRICE (Rs.) |
|-----------|-----------------------------------------------------------------|-----------------------------|------------------|
|           | 600A - Drawout type                                             |                             |                  |
| C)        | Double pole MCCB controlled 1-ph feeder - E1 (O/G)              |                             |                  |
|           | 16A - Fixed type                                                |                             |                  |
|           | 32A - Fixed type                                                |                             |                  |
|           | 63A - Fixed type                                                |                             |                  |
|           | 125A - Fixed type                                               |                             |                  |
|           | 16A - Drawout type                                              |                             |                  |
|           | 32A - Drawout type                                              |                             |                  |
|           | 63A - Drawout type                                              |                             |                  |
|           | 125A - Drawout type                                             |                             |                  |
| <b>9</b>  | <b>1-Ph MCB controlled outgoing feeder (H1) from AC MCCB DB</b> |                             |                  |
|           | 10A                                                             |                             |                  |
|           | 16A                                                             |                             |                  |
|           | 32A                                                             |                             |                  |
| <b>10</b> | <b>220V DC Outgoing MCB feeders</b>                             |                             |                  |
| a)        | 220V DC Outgoing feeder (X1)                                    |                             |                  |
|           | 2A - Fixed type                                                 |                             |                  |
|           | 4A - Fixed type                                                 |                             |                  |
|           | 6A - Fixed type                                                 |                             |                  |
|           | 10A - Fixed type                                                |                             |                  |
|           | 16A - Fixed type                                                |                             |                  |
|           | 25A - Fixed type                                                |                             |                  |
|           | 32A - Fixed type                                                |                             |                  |
|           | 50A - Fixed type                                                |                             |                  |
|           | 63A - Fixed type                                                |                             |                  |
|           | 100A - Fixed type                                               |                             |                  |
|           | 125A - Fixed type                                               |                             |                  |
|           | 2A - Drawout type                                               |                             |                  |
|           | 4A - Drawout type                                               |                             |                  |
|           | 6A - Drawout type                                               |                             |                  |
|           | 10A - Drawout type                                              |                             |                  |
|           | 16A - Drawout type                                              |                             |                  |
|           | 25A - Drawout type                                              |                             |                  |
|           | 32A - Drawout type                                              |                             |                  |
|           | 50A - Drawout type                                              |                             |                  |
|           | 63A - Drawout type                                              |                             |                  |
|           | 100A - Drawout type                                             |                             |                  |
|           | 125A - Drawout type                                             |                             |                  |
| B)        | 220V DC Outgoing MCB feeder (X2)                                |                             |                  |
|           | 200A - Fixed type                                               |                             |                  |
|           | 250A - Fixed type                                               |                             |                  |
|           | 400A - Fixed type                                               |                             |                  |
|           | 500A - Fixed type                                               |                             |                  |
|           | 630A - Fixed type                                               |                             |                  |
|           | 200A - Drawout type                                             |                             |                  |

## ANNEXURE-E

| SL.NO.    | ITEM DESCRIPTION                        | MODEL NO./ ITEM DESCRIPTION | UNIT PRICE (Rs.) |
|-----------|-----------------------------------------|-----------------------------|------------------|
|           | 250A - Drawout type                     |                             |                  |
|           | 400A - Drawout type                     |                             |                  |
|           | 500A - Drawout type                     |                             |                  |
|           | 630A - Drawout type                     |                             |                  |
| <b>11</b> | <b>220V DC Outgoing SFU feeders</b>     |                             |                  |
| A)        | 220V DC Outgoing feeder (X1)            |                             |                  |
|           | 2A - Fixed type                         |                             |                  |
|           | 4A - Fixed type                         |                             |                  |
|           | 6A - Fixed type                         |                             |                  |
|           | 10A - Fixed type                        |                             |                  |
|           | 16A - Fixed type                        |                             |                  |
|           | 25A - Fixed type                        |                             |                  |
|           | 32A - Fixed type                        |                             |                  |
|           | 50A - Fixed type                        |                             |                  |
|           | 63A - Fixed type                        |                             |                  |
|           | 100A - Fixed type                       |                             |                  |
|           | 125A - Fixed type                       |                             |                  |
|           | 2A - Drawout type                       |                             |                  |
|           | 4A - Drawout type                       |                             |                  |
|           | 6A - Drawout type                       |                             |                  |
|           | 10A - Drawout type                      |                             |                  |
|           | 16A - Drawout type                      |                             |                  |
|           | 25A - Drawout type                      |                             |                  |
|           | 32A - Drawout type                      |                             |                  |
|           | 50A - Drawout type                      |                             |                  |
|           | 63A - Drawout type                      |                             |                  |
|           | 100A - Drawout type                     |                             |                  |
|           | 125A - Drawout type                     |                             |                  |
| B)        | 220V DC Outgoing SFU feeder (X2)        |                             |                  |
|           | 200A - Fixed type                       |                             |                  |
|           | 250A - Fixed type                       |                             |                  |
|           | 400A - Fixed type                       |                             |                  |
|           | 500A - Fixed type                       |                             |                  |
|           | 630A - Fixed type                       |                             |                  |
|           | 200A - Drawout type                     |                             |                  |
|           | 250A - Drawout type                     |                             |                  |
|           | 400A - Drawout type                     |                             |                  |
|           | 500A - Drawout type                     |                             |                  |
|           | 630A - Drawout type                     |                             |                  |
| <b>12</b> | <b>Common Auxiliary Module</b>          |                             |                  |
| a)        | PT module                               |                             |                  |
| i         | Bus PT module for PCC/PMCC-G1 Type      |                             |                  |
| ii        | Bus PT module for Emergency MCC-G2 Type |                             |                  |
| iii       | Bus PT DCDB-S Type                      |                             |                  |

## ANNEXURE-E

| SL.NO.    | ITEM DESCRIPTION                                                                             | MODEL NO./ ITEM DESCRIPTION | UNIT PRICE (Rs.) |
|-----------|----------------------------------------------------------------------------------------------|-----------------------------|------------------|
| iv)       | Bus PT module for MCC-VM Type                                                                |                             |                  |
| b)        | Space heater and Power Socket - TT                                                           |                             |                  |
| c.1)      | 110V AC control supply module – Type CS (consisting of 415/110V control Trafo.)              |                             |                  |
|           | 1KVA                                                                                         |                             |                  |
|           | 2KVA                                                                                         |                             |                  |
|           | 2.5KVA                                                                                       |                             |                  |
|           | 3KVA                                                                                         |                             |                  |
|           | 5KVA                                                                                         |                             |                  |
|           | 7.5KVA                                                                                       |                             |                  |
|           | 10KVA                                                                                        |                             |                  |
| c.2)      | 240 V AC control supply module – type CS (consisting of 415/240V control Trafo.)             |                             |                  |
|           | 1KVA                                                                                         |                             |                  |
|           | 2KVA                                                                                         |                             |                  |
|           | 2.5KVA                                                                                       |                             |                  |
|           | 3KVA                                                                                         |                             |                  |
|           | 5KVA                                                                                         |                             |                  |
|           | 7.5KVA                                                                                       |                             |                  |
|           | 10KVA                                                                                        |                             |                  |
| d)        | 240V AC motor space heater module                                                            |                             |                  |
| e)        | 220V DC supply module<br>(for receiving 220V DC supply)                                      |                             |                  |
| f)        | 24 V winding heating module                                                                  |                             |                  |
| g)        | Alarm module                                                                                 |                             |                  |
| h)        | Test supply module                                                                           |                             |                  |
| I)        | 240 V AC Panel Space heating supply module – type SH (consisting of 415/240V control Trafo.) |                             |                  |
|           | 1KVA                                                                                         |                             |                  |
|           | 2KVA                                                                                         |                             |                  |
|           | 2.5KVA                                                                                       |                             |                  |
|           | 3KVA                                                                                         |                             |                  |
|           | 5KVA                                                                                         |                             |                  |
|           | 7.5KVA                                                                                       |                             |                  |
|           | 10KVA                                                                                        |                             |                  |
| <b>13</b> | <b>Contactor controlled MCCB Incomer for MCC / ACDB – Module Type CC (I/C)</b>               |                             |                  |
|           | Upto 63A – Fixed Type                                                                        |                             |                  |
|           | 125A – Fixed Type                                                                            |                             |                  |
|           | 200A – Fixed Type                                                                            |                             |                  |
|           | 250A – Fixed Type                                                                            |                             |                  |
|           | 400A – Fixed Type                                                                            |                             |                  |
|           | 630A – Fixed Type                                                                            |                             |                  |
|           | Upto 63A – Drawout Type                                                                      |                             |                  |
|           | 125A – Drawout Type                                                                          |                             |                  |
|           | 200A – Drawout Type                                                                          |                             |                  |
|           | 250A – Drawout Type                                                                          |                             |                  |
|           | 400A – Drawout Type                                                                          |                             |                  |
|           | 630A – Drawout Type                                                                          |                             |                  |

## ANNEXURE-E

| SL.NO.    | ITEM DESCRIPTION                                                                         | MODEL NO./ ITEM DESCRIPTION | UNIT PRICE (Rs.) |
|-----------|------------------------------------------------------------------------------------------|-----------------------------|------------------|
| <b>14</b> | <b>Empty Panel with Horizontal &amp; Vertical Busbar, Support &amp; Auxiliary Busbar</b> |                             |                  |
| a)        | MCC Panel (Double Front Drawout Type)                                                    |                             |                  |
|           | 250 / 250A                                                                               |                             |                  |
|           | 400 / 400A                                                                               |                             |                  |
|           | 630 / 630A                                                                               |                             |                  |
|           | 800 / 630A                                                                               |                             |                  |
|           | 1000 / 630A                                                                              |                             |                  |
|           | 1600 / 630A                                                                              |                             |                  |
|           | 2000 / 630A                                                                              |                             |                  |
|           | 2500 / 630A                                                                              |                             |                  |
|           | 3000 / 630A                                                                              |                             |                  |
|           | 4000 / 630A                                                                              |                             |                  |
| b)        | MCC Panel (Double Front Fixed Type)                                                      |                             |                  |
|           | 250 / 250A                                                                               |                             |                  |
|           | 400 / 400A                                                                               |                             |                  |
|           | 630 / 630A                                                                               |                             |                  |
|           | 800 / 630A                                                                               |                             |                  |
|           | 1000 / 630A                                                                              |                             |                  |
|           | 1600 / 630A                                                                              |                             |                  |
|           | 2000 / 630A                                                                              |                             |                  |
|           | 2500 / 630A                                                                              |                             |                  |
|           | 3000 / 630A                                                                              |                             |                  |
|           | 4000 / 630A                                                                              |                             |                  |
| c)        | 220V DCDB Panel (Double Front Fixed type)                                                |                             |                  |
|           | UPTO 630A (with 630A VBB)                                                                |                             |                  |
|           | 1000A (with 630A VBB)                                                                    |                             |                  |
|           | 1600A (with 630A VBB)                                                                    |                             |                  |
| d)        | 220V DCDB Panel (Double Front Drawout type)                                              |                             |                  |
|           | UPTO 630A (with 630A VBB)                                                                |                             |                  |
|           | 1000A (with 630A VBB)                                                                    |                             |                  |
|           | 1600A (with 630A VBB)                                                                    |                             |                  |
| <b>15</b> | <b>Empty Panel With Horizontal &amp; Vertical Busbar, Support &amp; Auxiliary Busbar</b> |                             |                  |
| a)        | PCC Panel (Single Front Drawout Type)                                                    |                             |                  |
|           | 1600 / 1600A                                                                             |                             |                  |
|           | 2000 / 2000A                                                                             |                             |                  |
|           | 2500 / 2500A                                                                             |                             |                  |
|           | 3000 / 3000A                                                                             |                             |                  |
|           | 4000 / 4000A                                                                             |                             |                  |
| b)        | MCC Panel (Single Front Drawout Type)                                                    |                             |                  |
|           | 250 / 250A                                                                               |                             |                  |
|           | 400 / 400A                                                                               |                             |                  |
|           | 630 / 630A                                                                               |                             |                  |
|           | 800 / 630A                                                                               |                             |                  |
|           | 1000 / 630A                                                                              |                             |                  |

## ANNEXURE-E

| SL.NO.    | ITEM DESCRIPTION                                                                       | MODEL NO./ ITEM DESCRIPTION | UNIT PRICE (Rs.) |
|-----------|----------------------------------------------------------------------------------------|-----------------------------|------------------|
|           | 1600 / 630A                                                                            |                             |                  |
|           | 2000 / 630A                                                                            |                             |                  |
|           | 2500 / 630A                                                                            |                             |                  |
|           | 3000 / 630A                                                                            |                             |                  |
|           | 4000 / 630A                                                                            |                             |                  |
| c)        | MCC Panel (Single Front Fixed Type )                                                   |                             |                  |
|           | 250 / 250A                                                                             |                             |                  |
|           | 400 / 400A                                                                             |                             |                  |
|           | 630 / 630A                                                                             |                             |                  |
|           | 800 / 630A                                                                             |                             |                  |
|           | 1000 / 630A                                                                            |                             |                  |
|           | 1600 / 630A                                                                            |                             |                  |
|           | 2000 / 630A                                                                            |                             |                  |
|           | 2500 / 630A                                                                            |                             |                  |
|           | 3000 / 630A                                                                            |                             |                  |
|           | 4000 / 630A                                                                            |                             |                  |
| d)        | 220V DCDB Panel (Single Front Fixed Type)                                              |                             |                  |
|           | UPTO 630A (with 630A VBB)                                                              |                             |                  |
|           | 1000A (with 630A VBB)                                                                  |                             |                  |
|           | 1600A (with 630A VBB)                                                                  |                             |                  |
| e)        | 220V DCDB Panel (Single Front Fixed Type)                                              |                             |                  |
|           | UPTO 630A (with 630A VBB)                                                              |                             |                  |
|           | 1000A (with 630A VBB)                                                                  |                             |                  |
|           | 1600A (with 630A VBB)                                                                  |                             |                  |
| <b>16</b> | <b>ACB Panel with Horizontal &amp; Vertical Busbar, Support &amp; Auxiliary Busbar</b> |                             |                  |
|           | 630 / 630A                                                                             |                             |                  |
|           | 800 / 630A                                                                             |                             |                  |
|           | 800 / 800A                                                                             |                             |                  |
|           | 1000 / 630A                                                                            |                             |                  |
|           | 1000 / 800A                                                                            |                             |                  |
|           | 1000 / 1000A                                                                           |                             |                  |
|           | 1600 / 630A                                                                            |                             |                  |
|           | 1600 / 800A                                                                            |                             |                  |
|           | 1600 / 1000A                                                                           |                             |                  |
|           | 1600 / 1600A                                                                           |                             |                  |
|           | 2000 / 630A                                                                            |                             |                  |
|           | 2000 / 800A                                                                            |                             |                  |
|           | 2000 / 1000A                                                                           |                             |                  |
|           | 2000 / 1600A                                                                           |                             |                  |
|           | 2000 / 2000A                                                                           |                             |                  |
|           | 2500 / 630A                                                                            |                             |                  |
|           | 2500 / 800A                                                                            |                             |                  |
|           | 2500 / 1000A                                                                           |                             |                  |
|           | 2500 / 1600A                                                                           |                             |                  |

## ANNEXURE-E

| SL.NO.    | ITEM DESCRIPTION                          | MODEL NO./ ITEM DESCRIPTION | UNIT PRICE (Rs.) |
|-----------|-------------------------------------------|-----------------------------|------------------|
|           | 2500 / 2000A                              |                             |                  |
|           | 2500 / 2500A                              |                             |                  |
|           | 3000 / 630A                               |                             |                  |
|           | 3000 / 800A                               |                             |                  |
|           | 3000 / 1000A                              |                             |                  |
|           | 3000 / 1600A                              |                             |                  |
|           | 3000 / 2000A                              |                             |                  |
|           | 3000 / 2500A                              |                             |                  |
|           | 3000 / 3000A                              |                             |                  |
|           | 4000 / 630A                               |                             |                  |
|           | 4000 / 800A                               |                             |                  |
|           | 4000 / 1000A                              |                             |                  |
|           | 4000 / 1600A                              |                             |                  |
|           | 4000 / 2000A                              |                             |                  |
|           | 4000 / 2500A                              |                             |                  |
|           | 4000 / 3000A                              |                             |                  |
|           | 4000 / 4000A                              |                             |                  |
| <b>17</b> | <b>Dummy Panel (500MM)</b>                |                             |                  |
|           | UPTO 630A                                 |                             |                  |
|           | 800A                                      |                             |                  |
|           | 1000A                                     |                             |                  |
|           | 1600A                                     |                             |                  |
|           | 2000A                                     |                             |                  |
|           | 2500A                                     |                             |                  |
|           | 3000A                                     |                             |                  |
|           | 4000A                                     |                             |                  |
| <b>18</b> | <b>Unit Prices For Circuit Components</b> |                             |                  |
| a)        | Air Circuit Breaker without releases      |                             |                  |
|           | 630A MDO                                  |                             |                  |
|           | 800A MDO                                  |                             |                  |
|           | 1000A MDO                                 |                             |                  |
|           | 630A ACB, 3P, EDO, AC                     |                             |                  |
|           | 800A ACB, 3P, EDO, AC                     |                             |                  |
|           | 1000A ACB, 3P, EDO, AC                    |                             |                  |
|           | 4000A ACB, 3P, EDO, AC                    |                             |                  |
|           | 3200A ACB, 3P, EDO, AC                    |                             |                  |
|           | 2500A ACB, 3P, EDO, AC                    |                             |                  |
|           | 2000A ACB, 3P, EDO, AC                    |                             |                  |
|           | 1600A ACB, 3P, EDO, AC                    |                             |                  |
|           | 1250A ACB, 3P, EDO, AC                    |                             |                  |
|           | 1250A ACB, 2P, MDO, DC                    |                             |                  |
| b)        | MCCB, 2NO+2NC AUX, FSC                    |                             |                  |
|           | 16A                                       |                             |                  |
|           | 25A                                       |                             |                  |

## ANNEXURE-E

| SL.NO. | ITEM DESCRIPTION                   | MODEL NO./ ITEM DESCRIPTION | UNIT PRICE (Rs.) |
|--------|------------------------------------|-----------------------------|------------------|
|        | 32A                                |                             |                  |
|        | 63A                                |                             |                  |
|        | 80A                                |                             |                  |
|        | 115A                               |                             |                  |
|        | 150A                               |                             |                  |
|        | 185A                               |                             |                  |
|        | 265A                               |                             |                  |
|        | 315A                               |                             |                  |
|        | 400A                               |                             |                  |
|        | 630A                               |                             |                  |
| c)     | MCCB, 2NO+2NC AUX, ASC             |                             |                  |
|        | 16A                                |                             |                  |
|        | 25A                                |                             |                  |
|        | 32A                                |                             |                  |
|        | 63A                                |                             |                  |
|        | 80A                                |                             |                  |
|        | 115A                               |                             |                  |
|        | 150A                               |                             |                  |
|        | 185A                               |                             |                  |
|        | 265A                               |                             |                  |
|        | 315A                               |                             |                  |
|        | 400A                               |                             |                  |
|        | 630A                               |                             |                  |
| d)     | MCCB with LSIG release             |                             |                  |
|        | 200A                               |                             |                  |
|        | 250A                               |                             |                  |
|        | 300A                               |                             |                  |
|        | 350A                               |                             |                  |
|        | 400A                               |                             |                  |
|        | 630A                               |                             |                  |
| e)     | MCCB - Motorized with LSIG release |                             |                  |
|        | 200A                               |                             |                  |
|        | 250A                               |                             |                  |
|        | 300A                               |                             |                  |
|        | 350A                               |                             |                  |
|        | 400A                               |                             |                  |
|        | 630A                               |                             |                  |
| f)     | POWER FUSE LINK FOR SFU (AC) - TPN |                             |                  |
|        | Upto 16A                           |                             |                  |
|        | 25A                                |                             |                  |
|        | 32A                                |                             |                  |
|        | 63A                                |                             |                  |
|        | 125A                               |                             |                  |
|        | 250A                               |                             |                  |

## ANNEXURE-E

| SL.NO. | ITEM DESCRIPTION                       | MODEL NO./ ITEM DESCRIPTION | UNIT PRICE (Rs.) |
|--------|----------------------------------------|-----------------------------|------------------|
|        | 400A                                   |                             |                  |
|        | 630A                                   |                             |                  |
| g)     | POWER FUSE LINK FOR SFU (DC) - DP      |                             |                  |
|        | Upto 16A                               |                             |                  |
|        | 25A                                    |                             |                  |
|        | 40A                                    |                             |                  |
|        | 50A                                    |                             |                  |
|        | 60A                                    |                             |                  |
|        | 80A                                    |                             |                  |
|        | 100A                                   |                             |                  |
|        | 200A                                   |                             |                  |
|        | 300A                                   |                             |                  |
|        | 400A                                   |                             |                  |
|        | 630A                                   |                             |                  |
| h)     | SFU WITHOUT POWER FUSE LINK (AC) - TPN |                             |                  |
|        | Upto 16A                               |                             |                  |
|        | 25A                                    |                             |                  |
|        | 32A                                    |                             |                  |
|        | 63A                                    |                             |                  |
|        | 125A                                   |                             |                  |
|        | 250A                                   |                             |                  |
|        | 400A                                   |                             |                  |
|        | 630A                                   |                             |                  |
| i)     | SFU WITHOUT POWER FUSE LINK (DC) - DP  |                             |                  |
|        | Upto 16A                               |                             |                  |
|        | 25A                                    |                             |                  |
|        | 40A                                    |                             |                  |
|        | 50A                                    |                             |                  |
|        | 60A                                    |                             |                  |
|        | 80A                                    |                             |                  |
|        | 100A                                   |                             |                  |
|        | 200A                                   |                             |                  |
|        | 300A                                   |                             |                  |
|        | 400A                                   |                             |                  |
|        | 630A                                   |                             |                  |
| j)     | HRC Fuse Links (Offset tag Type)       |                             |                  |
|        | Upto 10A                               |                             |                  |
|        | 16A                                    |                             |                  |
|        | 25A                                    |                             |                  |
|        | 32A                                    |                             |                  |
|        | 50A                                    |                             |                  |
|        | 63A                                    |                             |                  |
| k)     | HRC Fuse DIN Type (Blade Contact)      |                             |                  |
|        | Upto 10A                               |                             |                  |

## ANNEXURE-E

| SL.NO. | ITEM DESCRIPTION        | MODEL NO./ ITEM DESCRIPTION | UNIT PRICE (Rs.) |
|--------|-------------------------|-----------------------------|------------------|
|        | 16A                     |                             |                  |
|        | 20A                     |                             |                  |
|        | 32A                     |                             |                  |
|        | 36A                     |                             |                  |
|        | 50A                     |                             |                  |
|        | 63A                     |                             |                  |
|        | 80A                     |                             |                  |
|        | 100A                    |                             |                  |
|        | 125A                    |                             |                  |
|        | 160A                    |                             |                  |
|        | 200A                    |                             |                  |
|        | 250A                    |                             |                  |
|        | 315A                    |                             |                  |
|        | 400A                    |                             |                  |
|        | Control Fuse Link       |                             |                  |
|        | l) Power contactor (AC) |                             |                  |
|        | 16A                     |                             |                  |
|        | 25A                     |                             |                  |
|        | 32A                     |                             |                  |
|        | 63A                     |                             |                  |
|        | 80A                     |                             |                  |
|        | 115A                    |                             |                  |
|        | 150A                    |                             |                  |
|        | 185A                    |                             |                  |
|        | 265A                    |                             |                  |
|        | 315A                    |                             |                  |
|        | 400A                    |                             |                  |
|        | m) Power contactor (DC) |                             |                  |
|        | 16A                     |                             |                  |
|        | 25A                     |                             |                  |
|        | 32A                     |                             |                  |
|        | 63A                     |                             |                  |
|        | 80A                     |                             |                  |
|        | 115A                    |                             |                  |
|        | 150A                    |                             |                  |
|        | 185A                    |                             |                  |
|        | 265A                    |                             |                  |
|        | 400A                    |                             |                  |
|        | n) Fuse Base            |                             |                  |
|        | UPTO 20A                |                             |                  |
|        | 32A                     |                             |                  |
|        | 50/63A                  |                             |                  |
|        | 100A                    |                             |                  |
|        | 250A                    |                             |                  |

## ANNEXURE-E

| SL.NO. | ITEM DESCRIPTION             | MODEL NO./ ITEM DESCRIPTION | UNIT PRICE (Rs.) |
|--------|------------------------------|-----------------------------|------------------|
|        | 400A                         |                             |                  |
|        | 630A                         |                             |                  |
|        | o) Auxiliary contactor AC/DC |                             |                  |
|        | i) AC Aux. contactor         |                             |                  |
|        | 2NO + 2NC                    |                             |                  |
|        | 3NO + 3NC                    |                             |                  |
|        | 4NO + 4NC                    |                             |                  |
|        | 6NO + 6NC                    |                             |                  |
|        | ii) DC Aux. contactor        |                             |                  |
|        | 2NO + 2NC                    |                             |                  |
|        | 3NO + 3NC                    |                             |                  |
|        | 4NO + 4NC                    |                             |                  |
|        | 6NO + 6NC                    |                             |                  |
|        | p) Protection Relay          |                             |                  |
|        | VAGM 23                      |                             |                  |
|        | CTU 12                       |                             |                  |
|        | CTU 32                       |                             |                  |
|        | VTT 11                       |                             |                  |
|        | VAG 11                       |                             |                  |
|        | VAA 11                       |                             |                  |
|        | VAJHM 13                     |                             |                  |
|        | VAJHM 23                     |                             |                  |
|        | CDGM-12                      |                             |                  |
|        | CAG 12                       |                             |                  |
|        | CAG 34                       |                             |                  |
|        | CCUM 21                      |                             |                  |
|        | CDG 11                       |                             |                  |
|        | CDG 31                       |                             |                  |
|        | CDG 61                       |                             |                  |
|        | VDG 14                       |                             |                  |
|        | CDV 62                       |                             |                  |
|        | CAG 14                       |                             |                  |
|        | VAX 31                       |                             |                  |
|        | CAG 37                       |                             |                  |
|        | CAEM-21                      |                             |                  |
|        | VAG-21                       |                             |                  |
|        | VAJC-11                      |                             |                  |
|        | CTMM-501                     |                             |                  |
|        | MOTPRO                       |                             |                  |
|        | VAA21                        |                             |                  |
|        | VTT12                        |                             |                  |
|        | VTIG                         |                             |                  |
|        | VTU21                        |                             |                  |

## ANNEXURE-E

| SL.NO. | ITEM DESCRIPTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | MODEL NO./ ITEM DESCRIPTION | UNIT PRICE (Rs.) |
|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|------------------|
|        | NUMERICAL RELAY FOR PROTECTION, T/C SUPERVISION, LOGIC, METERING FUNCTION & WITH CHECK SYNCHRONIZATION, REF PROTECTION, FUSE FAILURE, ENERGY METERING, OVER LOAD PROTECTION, 50, 50N, 51, 51N, 27, 98, 86, 25, 95, 30A, 30B, 64R                                                                                                                                                                                                                                                                                                                                                                                                          |                             |                  |
|        | SEF NUMERICAL RELAY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                             |                  |
|        | NUMERICAL RELAY FOR PROTECTION, T/C SUPERVISION, LOGIC, METERING FUNCTION & WITH CHECK SYNCHRONIZATION, FUSE FAILURE, ENERGY METERING, OVER LOAD PROTECTION 50, 50N, 51, 51N, 27, 98, 86, 25, 95, 30A, 30B                                                                                                                                                                                                                                                                                                                                                                                                                                |                             |                  |
|        | NUMERICAL RELAY FOR PROTECTION, T/C SUPERVISION, LOGIC, METERING FUNCTION & WITH CHECK SYNCHRONIZATION, FUSE FAILURE, 50, 50N, 51, 51N, 27, 98, 86, 25, 95, 30A, 30B                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                             |                  |
|        | NUMERICAL RELAY FOR PROTECTION, T/C SUPERVISION, LOGIC, METERING FUNCTION & WITH CHECK SYNCHRONIZATION, FUSE FAILURE, ENERGY METERING, OVER LOAD PROTECTION 50, 50N, 51, 51N, 27, 98, 86, 25, 95, 30A, 30B, DG PROTECTION (Like Neutral Under-voltage-27N, Power Direction / Reverse Power (Islanding)-32, Negative Phase Sequence Over-current (Phase unbalance, reverse phase sequence) -46, , Negative Sequence Voltage -47, Ground Over-voltage trip or ground over-current trip-51G, Instantaneous Over-voltage trip (ferro-resonance)-59, Over-voltage trip-59T, Neutral over-voltage-59N, Over/Under Frequency trip-81O/ 81U etc.) |                             |                  |
|        | NUMERICAL RELAY FOR PROTECTION, T/C SUPERVISION, LOGIC, METERING FUNCTION & FUSE FAILURE, OVER LOAD PROTECTION 50, 50N, 51, 51N, 27, 98, 86, 95, 30A, 30B                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                             |                  |
|        | NUMERICAL RELAY FOR PROTECTION, T/C SUPERVISION-95, LOGIC, METERING FUNCTION & FUSE FAILURE-98, OVER LOAD PROTECTION, LOCKED ROTOR PROTECTION-14, RESTART INHIBIT PROTECTION-49, NEGATIVE SEQUENCE PROTECTION-46, 50, 50N, 51, 51N, 27, 86, 30A, 30B                                                                                                                                                                                                                                                                                                                                                                                      |                             |                  |
|        | Communicable type Numerical relay for O/C, E/F, TC Supervision on IEC-61850 protocol                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                             |                  |
|        | Communicable type Numerical relay for O/C, E/F, Check Synchronization, TC Supervision on IEC-61850 protocol                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                  |
|        | Communicable type Numerical relay for Voltage control O/C, 3Phase O/C, Reverse power, Differential, Neutral Displacement, E/F, U/V, O/V protection, Check Synchronization, TC Supervision on IEC-61850 protocol                                                                                                                                                                                                                                                                                                                                                                                                                           |                             |                  |
|        | Communicable type Numerical relay for Under voltage, Over voltage etc. on IEC-61850 protocol                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                             |                  |
|        | Communicable type Numerical relay for E/F protection for DCDB on IEC-61850 protocol                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                             |                  |
|        | Communicable type Numerical relay for composite motor protection including TC Supervision on IEC-61850 protocol                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                             |                  |
|        | Communicable type Numerical relay for Neutral Displacement on IEC-61850 protocol                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                             |                  |
|        | Communicable type Numerical relay for O/C, E/F, TC Supervision on Modbus protocol                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                             |                  |
|        | Communicable type Numerical relay for O/C, E/F, Check Synchronization, TC Supervision on Modbus protocol                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                             |                  |
|        | Communicable type Numerical relay for Voltage control O/C, 3Phase O/C, Reverse power, Differential, Neutral Displacement, E/F, U/V, O/V protection, Check Synchronization, TC Supervision on Modbus protocol                                                                                                                                                                                                                                                                                                                                                                                                                              |                             |                  |
|        | Communicable type Numerical relay for Under voltage, Over voltage etc. on Modbus protocol                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                             |                  |
|        | Communicable type Numerical relay for E/F protection for DCDB on Modbus protocol                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                             |                  |
|        | Communicable type Numerical relay for composite motor protection including TC Supervision on Modbus protocol                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                             |                  |
|        | Communicable type Numerical relay for Neutral Displacement on Modbus protocol                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                             |                  |

## ANNEXURE-E

| SL.NO. | ITEM DESCRIPTION                                                                                  | MODEL NO./ ITEM DESCRIPTION | UNIT PRICE (Rs.) |
|--------|---------------------------------------------------------------------------------------------------|-----------------------------|------------------|
|        | Numerical Check synchronising Relay                                                               |                             |                  |
|        | Check synchronising Relay Type-SKE11 or better                                                    |                             |                  |
|        | Guard Relay                                                                                       |                             |                  |
|        | NUMERICAL RELAY Over current and Earth fault                                                      |                             |                  |
|        | BATTERY EARTH FAULT RELAY, 1-7mA, NOMINAL VOLTAGE-220V DC, 1DV, 2NO S/R, FLUSH                    |                             |                  |
|        | OVERLOAD RELAY, NOMINAL VOLTAGE-220V DC, O/V VLTAGE SETTING-110%, 1/4NV, 1NO+1NC S/R              |                             |                  |
|        | UNDER VOLTAGE RELAY, NOMINAL VOLTAGE-220V DC, U/V SETTING-80%, AUX..- 240V AC, 1/2NH, 1NO+2NC S/R |                             |                  |
|        | JAMING RELAY - CAG17                                                                              |                             |                  |
| q)     | Bimetal Thermal O/L Relays                                                                        |                             |                  |
| i)     | Thermal O/L relay with SPP - OLR                                                                  |                             |                  |
|        | Upto 5.5KW                                                                                        |                             |                  |
|        | 5.6 to 11KW                                                                                       |                             |                  |
|        | 11.1 to 22KW                                                                                      |                             |                  |
|        | 22.1 to 45KW                                                                                      |                             |                  |
|        | 45.1 to 75KW                                                                                      |                             |                  |
|        | 75 to 110KW                                                                                       |                             |                  |
| ii)    | <b>Heavy Duty</b> Thermal O/L relay with SPP - OLR                                                |                             |                  |
|        | Upto 5.5KW                                                                                        |                             |                  |
|        | 5.6 to 11KW                                                                                       |                             |                  |
|        | 11.1 to 22KW                                                                                      |                             |                  |
|        | 22.1 to 45KW                                                                                      |                             |                  |
|        | 45.1 to 75KW                                                                                      |                             |                  |
|        | 75 to 110KW                                                                                       |                             |                  |
| r)     | Timer (DC)                                                                                        |                             |                  |
|        | ON DELAY TIMER, 0.5-5SEC., 220V DC, 2NO+2NC                                                       |                             |                  |
|        | ON DELAY TIMER, 1.0-10SEC. 220V DC, 2NO+2NC                                                       |                             |                  |
|        | 240VAC MTR RESTART CONTROL TIMER (.2-60SECS)                                                      |                             |                  |
|        | 240VAC ON DELAY TIMER(1-10SECNS)WITH 1NO                                                          |                             |                  |
|        | 220VDC ON DELAY TIMER(.5-5SECS) WITH 1NO                                                          |                             |                  |
|        | 220VDC ON DELAY TIMER(0.5-5SECS)WITH 3NO                                                          |                             |                  |
|        | 220VDC ON DELAY TIMER(1-10SECS) WITH 3NO                                                          |                             |                  |
| s)     | Meter                                                                                             |                             |                  |
|        | AC ammeter (Digital)                                                                              |                             |                  |
|        | AC ammeter (Analog) linear scale                                                                  |                             |                  |
|        | AC ammeter (Analog) compressed scale                                                              |                             |                  |
|        | DC ammeter (Digital)                                                                              |                             |                  |
|        | DC ammeter (Analog)                                                                               |                             |                  |
|        | AC voltmeter (Digital)                                                                            |                             |                  |
|        | DC voltmeter (Analog)                                                                             |                             |                  |
|        | Wattmeter (3 Phase)                                                                               |                             |                  |
|        | Wattmeter (1 Phase)                                                                               |                             |                  |
|        | TVM meter                                                                                         |                             |                  |
|        | DIGITAL ENERGY METER                                                                              |                             |                  |

## ANNEXURE-E

| SL.NO. | ITEM DESCRIPTION                                                                   | MODEL NO./ ITEM DESCRIPTION | UNIT PRICE (Rs.) |
|--------|------------------------------------------------------------------------------------|-----------------------------|------------------|
|        | Frequency meter                                                                    |                             |                  |
|        | Synchroscope                                                                       |                             |                  |
|        | Differential Voltmeter                                                             |                             |                  |
|        | Differential Frequency meter                                                       |                             |                  |
|        | Multifunction digital Energy meter with RS485 Port (0.2 Acc. Class)                |                             |                  |
|        | Multifunction digital Energy meter with RS485 Port (0.5 Acc. Class)                |                             |                  |
|        | Multifunction digital Energy meter with RS485 Port (1.0 Acc. Class)                |                             |                  |
| t)     | Single Phase Preventor Relay                                                       |                             |                  |
| u)     | MCB                                                                                |                             |                  |
|        | 6A, 4P 415V AC                                                                     |                             |                  |
|        | 6A DP, 240V AC                                                                     |                             |                  |
|        | 10A DP, 240V AC                                                                    |                             |                  |
|        | 16A DP, 240V AC                                                                    |                             |                  |
|        | 32A DP, 240V AC                                                                    |                             |                  |
|        | 6A DP, 110V AC                                                                     |                             |                  |
|        | 10A DP, 110V AC                                                                    |                             |                  |
|        | 16A DP, 110V AC                                                                    |                             |                  |
|        | 32A DP, 110V AC                                                                    |                             |                  |
|        | 16A DP, 220V DC                                                                    |                             |                  |
|        | 6A DP, 220V DC                                                                     |                             |                  |
|        | 6A DP, 240V AC                                                                     |                             |                  |
|        | 10A SP, 240V AC                                                                    |                             |                  |
|        | 16A SP, 240V AC                                                                    |                             |                  |
|        | 32A SP, 240V AC                                                                    |                             |                  |
|        | 6A SP, 110V AC                                                                     |                             |                  |
|        | 10A SP, 110V AC                                                                    |                             |                  |
|        | 16A SP, 110V AC                                                                    |                             |                  |
|        | 32A SP, 110V AC                                                                    |                             |                  |
|        | 16A SP, 220V DC                                                                    |                             |                  |
|        | 6A SP, 220V DC                                                                     |                             |                  |
| v)     | SWITCH & PUSH BUTTON                                                               |                             |                  |
|        | BREAKER CONTROL SWITCH, 16A,220V DC, 2CLOSE+2TRIP                                  |                             |                  |
|        | DC ISOLATING SWITCH 16A,220V DC, DP, BASE MTG.                                     |                             |                  |
|        | 16A,240V AC SELECTOR SWITCH 3WAY, 4POLE, FLUSH MTG                                 |                             |                  |
|        | 25A,240V AC SELECTOR SWITCH 3WAY, 4POLE, FLUSH MTG                                 |                             |                  |
|        | 16A,240V AC SELECTOR SWITCH 2WAY, 2POLE, FLUSH MTG                                 |                             |                  |
|        | NORMAL/ TRIAL SEL. SWITCH, 2POLE , 2WAY, 10A 240V AC, FLUSH MTG,                   |                             |                  |
|        | MCC/ NORMAL/ TRIAL SEL. SWITCH, 2POLE ,3WAY, 10A 240V AC, FLUSH MTG                |                             |                  |
|        | SWGR/ REMOTE SEL. SWITCH 3POLE 2WAY,16A 220V DC, FLUSH MTG                         |                             |                  |
|        | SWGR/ NORMAL/ TRIAL SEL. SWITCH, 3POLE, 3WAY, 16A 220V DC, FLUSH MTG.              |                             |                  |
|        | NORMAL/ TRIAL SEL. SWITCH, 2POLE , 2WAY, 10A 240V AC, FLUSH MTG, LOCKABEL TYPE     |                             |                  |
|        | MCC/ NORMAL/ TRIAL SEL. SWITCH, 2POLE ,3WAY, 10A 240V AC, FLUSH MTG, LOCKABEL TYPE |                             |                  |

## ANNEXURE-E

| SL.NO. | ITEM DESCRIPTION                                                                     | MODEL NO./ ITEM DESCRIPTION | UNIT PRICE (Rs.) |
|--------|--------------------------------------------------------------------------------------|-----------------------------|------------------|
|        | SWGR/ REMOTE SEL. SWITCH 3POLE 2WAY,16A 220V DC, FLUSH MTG.LOCKABLE TYPE             |                             |                  |
|        | SWGR/ NORMAL/ TRIAL SEL. SWITCH, 3POLE, 3WAY, 16A 220V DC, FLUSH MTG., LOCKABLE TYPE |                             |                  |
|        | AMMETER SELECTOR SWITCH                                                              |                             |                  |
|        | VOLTMETER SELECTOR SWITCH                                                            |                             |                  |
|        | TOGGLE SWITCH 5A, 240V AC                                                            |                             |                  |
|        | AC SWITCH SPST-5A,240V AC                                                            |                             |                  |
|        | 10A, 220V DC SWITCH                                                                  |                             |                  |
|        | Door Limit switch                                                                    |                             |                  |
|        | Ammeter selector switch                                                              |                             |                  |
|        | Voltmeter selector switch                                                            |                             |                  |
|        | Synchronisation selector switch                                                      |                             |                  |
|        | Trip selector switch                                                                 |                             |                  |
|        | Push Button                                                                          |                             |                  |
|        | 2NO + 2NC Shrouded                                                                   |                             |                  |
|        | 1NO + 1NC Shrouded                                                                   |                             |                  |
|        | 2NO + 2NC Mushroom head stayput                                                      |                             |                  |
|        | 2NO + 2NC Lockable type                                                              |                             |                  |
| w)     | Indicating Lamp Assembly (LED Type)                                                  |                             |                  |
|        | 240V AC-GREEN                                                                        |                             |                  |
|        | 240V AC-RED                                                                          |                             |                  |
|        | 240V AC- AMBER                                                                       |                             |                  |
|        | 110V AC-GREEN                                                                        |                             |                  |
|        | 110V AC-RED                                                                          |                             |                  |
|        | 110V AC- AMBER                                                                       |                             |                  |
|        | 220V DC-WHITE                                                                        |                             |                  |
|        | 220V DC-RED                                                                          |                             |                  |
|        | 220V DC-GREEN                                                                        |                             |                  |
|        | 220V DC-BLUE                                                                         |                             |                  |
|        | 220V DC- AMBER                                                                       |                             |                  |
|        | 63.5V AC-RED                                                                         |                             |                  |
|        | 63.5V AC-YELLOW                                                                      |                             |                  |
|        | 63.5V AC-BLUE                                                                        |                             |                  |
| x)     | CT                                                                                   |                             |                  |
| i)     | Metering CT                                                                          |                             |                  |
|        | Upto 75/1A                                                                           |                             |                  |
|        | 100/1A                                                                               |                             |                  |
|        | 125/1A                                                                               |                             |                  |
|        | 150/1A                                                                               |                             |                  |
|        | 200/1A                                                                               |                             |                  |
|        | 250/1A                                                                               |                             |                  |
|        | 300/1A                                                                               |                             |                  |
|        | 400/1A                                                                               |                             |                  |
|        | 500/1A                                                                               |                             |                  |

## ANNEXURE-E

| SL.NO. | ITEM DESCRIPTION     | MODEL NO./ ITEM DESCRIPTION | UNIT PRICE (Rs.) |
|--------|----------------------|-----------------------------|------------------|
|        | 630/1A               |                             |                  |
|        | 800/1A               |                             |                  |
|        | 1000/1A              |                             |                  |
|        | 1250/1A              |                             |                  |
|        | 1600/1A              |                             |                  |
|        | 2000/1A              |                             |                  |
|        | 2500/1A              |                             |                  |
|        | 3000/1A              |                             |                  |
|        | 4000/1A              |                             |                  |
| ii)    | Protection CT (5P20) |                             |                  |
|        | Upto 75/1A           |                             |                  |
|        | 100/1A               |                             |                  |
|        | 125/1A               |                             |                  |
|        | 150/1A               |                             |                  |
|        | 200/1A               |                             |                  |
|        | 250/1A               |                             |                  |
|        | 300/1A               |                             |                  |
|        | 400/1A               |                             |                  |
|        | 500/1A               |                             |                  |
|        | 630/1A               |                             |                  |
|        | 800/1A               |                             |                  |
|        | 1000/1A              |                             |                  |
|        | 1250/1A              |                             |                  |
|        | 1600/1A              |                             |                  |
|        | 2000/1A              |                             |                  |
|        | 2500/1A              |                             |                  |
|        | 3000/1A              |                             |                  |
|        | 4000/1A              |                             |                  |
|        | 630/5A               |                             |                  |
|        | 800/5A               |                             |                  |
|        | 1000/5A              |                             |                  |
|        | 1250/5A              |                             |                  |
|        | 1600/5A              |                             |                  |
|        | 2000/5A              |                             |                  |
|        | 2500/5A              |                             |                  |
|        | 3000/5A              |                             |                  |
|        | 4000/5A              |                             |                  |
| iii)   | PS Class CT          |                             |                  |
|        | 1600/1A              |                             |                  |
|        | 2500/1A              |                             |                  |
|        | 3000/1A              |                             |                  |
|        | 4000/1A              |                             |                  |
|        | 1600/5A              |                             |                  |
|        | 2500/5A              |                             |                  |

## ANNEXURE-E

| SL.NO. | ITEM DESCRIPTION                                                                 | MODEL NO./ ITEM DESCRIPTION | UNIT PRICE (Rs.) |
|--------|----------------------------------------------------------------------------------|-----------------------------|------------------|
|        | 3000/5A                                                                          |                             |                  |
|        | 4000/5A                                                                          |                             |                  |
| y)     | Voltage Transformer                                                              |                             |                  |
| i)     | 415/ $\sqrt{3}$ : 110/ $\sqrt{3}$ V, 1ph, 50VA                                   |                             |                  |
| ii)    | 415/ $\sqrt{3}$ : 110/ $\sqrt{3}$ V, 1ph, 100VA                                  |                             |                  |
| iii)   | 415/ $\sqrt{3}$ : 240/ $\sqrt{3}$ V, 1ph, 50VA                                   |                             |                  |
| iv)    | 415/ $\sqrt{3}$ : 240/ $\sqrt{3}$ V, 1ph, 100VA                                  |                             |                  |
| z)     | Toggle switch (16A)                                                              |                             |                  |
| aa)    | Secondary Isolating Contact Block                                                |                             |                  |
| ab)    | Control Terminal (Fixed)                                                         |                             |                  |
| ac)    | Thermostat                                                                       |                             |                  |
| ad)    | CONTROL TRANSFORMER                                                              |                             |                  |
|        | 415/240V,CL-E, 1 KVA                                                             |                             |                  |
|        | 415/240V,CL-E, 2KVA                                                              |                             |                  |
|        | 415/240V,CL-E, 2.5KVA                                                            |                             |                  |
|        | 415/240V,CL-E, 3KVA                                                              |                             |                  |
|        | 415/240V,CL-E, 5KVA                                                              |                             |                  |
|        | 415/240V,CL-E, 10KVA                                                             |                             |                  |
|        | 415/110V,CL-E, 1 KVA                                                             |                             |                  |
|        | 415/110V,CL-E, 2KVA                                                              |                             |                  |
|        | 415/110V,CL-E, 2.5KVA                                                            |                             |                  |
|        | 415/110V,CL-E, 3KVA                                                              |                             |                  |
|        | 415/110V,CL-E, 5KVA                                                              |                             |                  |
|        | 415/110V,CL-E, 10KVA                                                             |                             |                  |
| ac)    | 4-20mA Dual o/p, Aux sup 220V DC, 1A, Current Transducer                         |                             |                  |
|        | 4-20mA Dual o/p, Aux sup 240V AC, 1A, Current Transducer                         |                             |                  |
|        | 4-20mA Dual o/p, Aux sup 110V AC, 1A, Current Transducer                         |                             |                  |
|        | 4-20mA Dual o/p, Aux sup 220V DC, VoltageTransducer, PTR 415/110V                |                             |                  |
|        | 4-20mA Dual o/p, Aux sup 240V AC, VoltageTransducer, PTR 415/110V                |                             |                  |
|        | 4-20mA Dual o/p, Aux sup 110V AC, VoltageTransducer, PTR 415/110V                |                             |                  |
|        | 4-20mA Dual o/p, Aux sup 220V DC, FrequencyTransducer, PTR 415/110V              |                             |                  |
|        | 4-20mA Dual o/p, Aux sup 220V DC, Input 0-75mV DC, Current Transducer-DC         |                             |                  |
|        | 4-20mA Dual o/p, Aux sup 240V AC, Input Voltage 0-220V DC, Voltage Transducer-DC |                             |                  |
| ad)    | 4-20mA Dual Output kW transducer                                                 |                             |                  |
| ae)    | 4-20mA Dual Output kVA transducer                                                |                             |                  |
| af)    | 4-20mA Dual Output PF transducer                                                 |                             |                  |
| ag)    | 4-20mA Dual Output Frequency transducer                                          |                             |                  |
| ah)    | Interposing relay RE 302 or Eqvt with freewheeling diode & LED                   |                             |                  |
| ai)    | Laptop PC alongwith software & hardware                                          |                             |                  |
| aj)    | 3 PIN SOCKET - 5A, 110V AC, 3PIN                                                 |                             |                  |
| ak)    | THERMOSTATE, DIAL TYPE                                                           |                             |                  |
| am)    | SPACE HEATER                                                                     |                             |                  |
| an)    | CFL WITH HOLDER                                                                  |                             |                  |
| ao)    | NEUTRAL LINK                                                                     |                             |                  |

## ANNEXURE-E

| SL.NO.    | ITEM DESCRIPTION                                       | MODEL NO./ ITEM DESCRIPTION | UNIT PRICE (Rs.) |
|-----------|--------------------------------------------------------|-----------------------------|------------------|
|           | 20A FOR CONTROL CKT. & POWER CKT. UPTO 25A MCCB RATING |                             |                  |
|           | 32A FOR 50A MCCB RATING                                |                             |                  |
|           | 63A FOR 100A & 125A MCCB RATING                        |                             |                  |
|           | 125A FOR 250A MCCB RATING                              |                             |                  |
|           | 250A FOR 400A & 500A MCCB RATING                       |                             |                  |
| ap)       | CASTLE KEY INTERLOCK FOR MCCB - 3LOCK+2KEY             |                             |                  |
| aq)       | MECHANICAL INTERLOCK FOR POWER CONTACTOR               |                             |                  |
|           | 16A                                                    |                             |                  |
|           | 25A                                                    |                             |                  |
|           | 32A                                                    |                             |                  |
|           | 63A                                                    |                             |                  |
|           | 80A                                                    |                             |                  |
|           | 115A                                                   |                             |                  |
|           | 150A                                                   |                             |                  |
|           | 185A                                                   |                             |                  |
|           | 265A                                                   |                             |                  |
|           | 315A                                                   |                             |                  |
|           | 400A                                                   |                             |                  |
| ar)       | AUX. CONTACTOR                                         |                             |                  |
|           | 2NO+2NC, CV-220V DC                                    |                             |                  |
|           | 4NO, CV-220V DC                                        |                             |                  |
|           | 2NO+2NC, CV-240V AC                                    |                             |                  |
|           | 3NO+1NC, CV-240V AC                                    |                             |                  |
|           | 2NO+2NC, CV-110V AC                                    |                             |                  |
|           | 3NO+1NC, CV-110V AC                                    |                             |                  |
|           | 1NO + 1NC 240V AC                                      |                             |                  |
|           | 1NO + 1NC 110V AC                                      |                             |                  |
|           | 1NO + 1NC 220V DC                                      |                             |                  |
|           | 1NO 240V AC                                            |                             |                  |
|           | 1NO 110V AC                                            |                             |                  |
|           | 1NO 220V DC                                            |                             |                  |
| as)       | ISOLATING TRANSFORMER-15kVA                            |                             |                  |
|           | ISOLATING TRANSFORMER-20kVA                            |                             |                  |
|           | ISOLATING TRANSFORMER-25kVA                            |                             |                  |
|           | ISOLATING TRANSFORMER-30kVA                            |                             |                  |
| <b>19</b> | <b>Foundation Frame</b>                                |                             |                  |
| a)        | MCC panel                                              |                             |                  |
|           | upto 1600A (SF)                                        |                             |                  |
|           | 2500A (SF)                                             |                             |                  |
|           | 3000A (SF)                                             |                             |                  |
|           | 4000A (SF)                                             |                             |                  |
|           | upto 1600A (DF)                                        |                             |                  |
|           | 2500A (DF)                                             |                             |                  |
|           | 3000A (DF)                                             |                             |                  |

## ANNEXURE-E

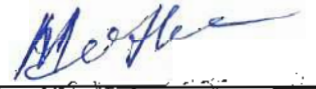
| SL.NO.    | ITEM DESCRIPTION                                        | MODEL NO./ ITEM DESCRIPTION | UNIT PRICE (Rs.) |
|-----------|---------------------------------------------------------|-----------------------------|------------------|
|           | 4000A (DF)                                              |                             |                  |
| b)        | 220V DCDB panel                                         |                             |                  |
|           | SF                                                      |                             |                  |
|           | DF                                                      |                             |                  |
| c)        | PCC / PMCC panel                                        |                             |                  |
|           | upto 1600A                                              |                             |                  |
|           | 2500A                                                   |                             |                  |
|           | 3000A                                                   |                             |                  |
|           | 4000A                                                   |                             |                  |
| <b>20</b> | <b>Connection from PMCC/MCC panel to PMCC/MCC panel</b> |                             |                  |
|           | 250A                                                    |                             |                  |
|           | 400A                                                    |                             |                  |
|           | 630A                                                    |                             |                  |
|           | 800A                                                    |                             |                  |
|           | 1000A                                                   |                             |                  |
|           | 1600A                                                   |                             |                  |
|           | 2500A                                                   |                             |                  |
|           | 3000A                                                   |                             |                  |
|           | 4000A                                                   |                             |                  |
| <b>21</b> | <b>Cable Glands &amp; Lugs:</b>                         |                             |                  |
| a)        | <b>Single Compression Cable Glands for cable sizes:</b> |                             |                  |
|           | 2C X 2.5 Sq. mm.                                        |                             |                  |
|           | 3C X 2.5 Sq. mm.                                        |                             |                  |
|           | 5C X 2.5 Sq. mm.                                        |                             |                  |
|           | 7C X 2.5 Sq. mm.                                        |                             |                  |
|           | 12C X 2.5 Sq. mm.                                       |                             |                  |
|           | 16C X 2.5 Sq. mm.                                       |                             |                  |
|           | 2C X 10 Sq. mm.                                         |                             |                  |
|           | 2C X 16 Sq. mm.                                         |                             |                  |
|           | 2C X 25 Sq. mm.                                         |                             |                  |
|           | 2C X 35 Sq. mm.                                         |                             |                  |
|           | 2C X 50 Sq. mm.                                         |                             |                  |
|           | 2C X 70 Sq. mm.                                         |                             |                  |
|           | 2C X 95 Sq. mm.                                         |                             |                  |
|           | 3C X 2.5 Sq. mm.                                        |                             |                  |
|           | 3C X 10 Sq. mm.                                         |                             |                  |
|           | 3C X 16 Sq. mm.                                         |                             |                  |
|           | 3C X 25 Sq. mm.                                         |                             |                  |
|           | 3C X 35 Sq. mm.                                         |                             |                  |
|           | 3C X 50 Sq. mm.                                         |                             |                  |
|           | 3C X 70 Sq. mm.                                         |                             |                  |
|           | 3C X 95 Sq. mm.                                         |                             |                  |
|           | 3C X 150 Sq. mm.                                        |                             |                  |
|           | 3C X 185 Sq. mm.                                        |                             |                  |

## ANNEXURE-E

| SL.NO. | ITEM DESCRIPTION                                           | MODEL NO./ ITEM DESCRIPTION | UNIT PRICE (Rs.) |
|--------|------------------------------------------------------------|-----------------------------|------------------|
|        | 3C X 240 Sq. mm.                                           |                             |                  |
|        | 3.5C X 25 Sq. mm.                                          |                             |                  |
|        | 3.5C X 50 Sq. mm.                                          |                             |                  |
|        | 3.5C X 70 Sq. mm.                                          |                             |                  |
|        | 3.5C X 300 Sq. mm.                                         |                             |                  |
|        | 3.5C X 240 Sq. mm.                                         |                             |                  |
|        | 3.5C X 185 Sq. mm.                                         |                             |                  |
|        | 3.5C X 95 Sq. mm.                                          |                             |                  |
|        | 4C X 16 Sq. mm.                                            |                             |                  |
|        | 4C X 35 Sq. mm.                                            |                             |                  |
|        | 1C X 400 Sq. mm.                                           |                             |                  |
|        | 1C X 630 Sq. mm.                                           |                             |                  |
|        | <b>b) Double Compression Cable Glands for cable sizes:</b> |                             |                  |
|        | 2C X 2.5 Sq. mm.                                           |                             |                  |
|        | 3C X 2.5 Sq. mm.                                           |                             |                  |
|        | 5C X 2.5 Sq. mm.                                           |                             |                  |
|        | 7C X 2.5 Sq. mm.                                           |                             |                  |
|        | 12C X 2.5 Sq. mm.                                          |                             |                  |
|        | 16C X 2.5 Sq. mm.                                          |                             |                  |
|        | 2C X 10 Sq. mm.                                            |                             |                  |
|        | 2C X 16 Sq. mm.                                            |                             |                  |
|        | 2C X 25 Sq. mm.                                            |                             |                  |
|        | 2C X 35 Sq. mm.                                            |                             |                  |
|        | 2C X 50 Sq. mm.                                            |                             |                  |
|        | 2C X 70 Sq. mm.                                            |                             |                  |
|        | 2C X 95 Sq. mm.                                            |                             |                  |
|        | 3C X 2.5 Sq. mm.                                           |                             |                  |
|        | 3C X 10 Sq. mm.                                            |                             |                  |
|        | 3C X 16 Sq. mm.                                            |                             |                  |
|        | 3C X 25 Sq. mm.                                            |                             |                  |
|        | 3C X 35 Sq. mm.                                            |                             |                  |
|        | 3C X 50 Sq. mm.                                            |                             |                  |
|        | 3C X 70 Sq. mm.                                            |                             |                  |
|        | 3C X 95 Sq. mm.                                            |                             |                  |
|        | 3C X 150 Sq. mm.                                           |                             |                  |
|        | 3C X 185 Sq. mm.                                           |                             |                  |
|        | 3C X 240 Sq. mm.                                           |                             |                  |
|        | 3.5C X 25 Sq. mm.                                          |                             |                  |
|        | 3.5C X 50 Sq. mm.                                          |                             |                  |

| <b>ANNEXURE-E</b> |                                                                                                 |                                    |                         |
|-------------------|-------------------------------------------------------------------------------------------------|------------------------------------|-------------------------|
| <b>SL.NO.</b>     | <b>ITEM DESCRIPTION</b>                                                                         | <b>MODEL NO./ ITEM DESCRIPTION</b> | <b>UNIT PRICE (Rs.)</b> |
|                   | 3.5C X 70 Sq. mm.                                                                               |                                    |                         |
|                   | 3.5C X 300 Sq. mm.                                                                              |                                    |                         |
|                   | 3.5C X 240 Sq. mm.                                                                              |                                    |                         |
|                   | 3.5C X 185 Sq. mm.                                                                              |                                    |                         |
|                   | 3.5C X 95 Sq. mm.                                                                               |                                    |                         |
|                   | 4C X 16 Sq. mm.                                                                                 |                                    |                         |
|                   | 4C X 35 Sq. mm.                                                                                 |                                    |                         |
|                   | 1C X 400 Sq. mm.                                                                                |                                    |                         |
|                   | 1C X 630 Sq. mm.                                                                                |                                    |                         |
| c)                | <b>Cable Lugs for sizes:</b>                                                                    |                                    |                         |
|                   | 2.5 Sq. mm.                                                                                     |                                    |                         |
|                   | 10 Sq. mm.                                                                                      |                                    |                         |
|                   | 16 Sq. mm.                                                                                      |                                    |                         |
|                   | 25 Sq. mm.                                                                                      |                                    |                         |
|                   | 35 Sq. mm.                                                                                      |                                    |                         |
|                   | 50 Sq. mm.                                                                                      |                                    |                         |
|                   | 70 Sq. mm.                                                                                      |                                    |                         |
|                   | 95 Sq. mm.                                                                                      |                                    |                         |
|                   | 120 Sq. mm.                                                                                     |                                    |                         |
|                   | 150 Sq. mm.                                                                                     |                                    |                         |
|                   | 185 Sq. mm.                                                                                     |                                    |                         |
|                   | 240 Sq. mm.                                                                                     |                                    |                         |
|                   | 300 Sq. mm.                                                                                     |                                    |                         |
|                   | 400 Sq. mm.                                                                                     |                                    |                         |
|                   | 630 Sq. mm.                                                                                     |                                    |                         |
| 22                | <b>Module Name plate</b>                                                                        |                                    |                         |
| 23                | <b>Wires for Secondary wiring:</b>                                                              |                                    |                         |
| a)                | 1.5 Sq. mm. per meter                                                                           |                                    |                         |
| b)                | 2.5 Sq. mm. per meter                                                                           |                                    |                         |
| c)                | 4.0 Sq. mm. per meter                                                                           |                                    |                         |
| 24                | <b>Control Terminal for Secondary wiring suitable for cable size:</b>                           |                                    |                         |
| a)                | 0.5 Sq. mm.                                                                                     |                                    |                         |
| b)                | 1.5 Sq. mm.                                                                                     |                                    |                         |
| c)                | 2.5 Sq. mm.                                                                                     |                                    |                         |
| 25                | <b>ISMC channels</b>                                                                            |                                    |                         |
| a)                | ISMC 75 channel per meter                                                                       |                                    |                         |
| a)                | ISMC 100 channel per meter                                                                      |                                    |                         |
| 26                | <b>ANY OTHER ITEM WHICH MAY BE REQUIRED FOR ADDITION / DELETION DURING DETAILED ENGINEERING</b> |                                    |                         |

|  |                                          | <b>MANUFACTURER:</b><br><b>BHARAT HEAVY ELECTRICALS LTD.- ELECTROPORCELAINS DIVISION</b><br><b>BANGALORE 560012</b> |          | <b>MANUFACTURING QUALITY PLAN</b>                                    |                                                                                |                            | <b>CUSTOMER: M/S Gujarat State Electricity Corporation Ltd</b><br><b>Consultant : DEVELOPMENT CONSULTANTS.</b><br><br><b>PROJECT: 1x800 MW STPP.WANAKBORI Project.</b><br><br><b>Document No: EP-3-QP-047-001</b> |                  |        |   |   |         |
|-----------------------------------------------------------------------------------|------------------------------------------|---------------------------------------------------------------------------------------------------------------------|----------|----------------------------------------------------------------------|--------------------------------------------------------------------------------|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|--------|---|---|---------|
|                                                                                   |                                          |                                                                                                                     |          | <b>ITEM :</b><br><b>L V SWITCH GEARS/ LPBS/ LOCAL MOTOR STARTERS</b> | <b>QP NO.:61/15-16 (R1)</b><br><b>DATE:22.02.2016</b><br><b>PAGE : 1 OF 11</b> |                            |                                                                                                                                                                                                                   |                  |        |   |   |         |
| SL. NO                                                                            | COMPONENT & OPERATIONS                   | CHARACTERISTICS                                                                                                     | CATSS    | TYPE OF CHECK                                                        | QUANTUM OF CHECK                                                               | REFERENCE DOCUMENT         | ACCEPTANCE NORMS                                                                                                                                                                                                  | FORMAT OF RECORD | AGENCY |   |   | REMARKS |
| I.                                                                                | 2.                                       | 3.                                                                                                                  | 4.       | 5.                                                                   | 6.                                                                             | 7.                         | 8.                                                                                                                                                                                                                | 9.               | M      | T | C | 11.     |
| 1                                                                                 | BOUGHT OUT ITEMS (ELECTRICAL COMPONENTS) |                                                                                                                     |          |                                                                      |                                                                                |                            |                                                                                                                                                                                                                   |                  |        |   |   |         |
| 1.1                                                                               | SHEET STEEL                              | A. DIMENSION                                                                                                        | MAJOR    | MECH                                                                 | 100%                                                                           | PO SPEC, DRGS.             | PO SPEC, DRGS.                                                                                                                                                                                                    | LOG BOOK         | P      |   |   |         |
|                                                                                   |                                          | B. SURFACE FINISH & CHECK FOR WAVINESS / FLATNESS                                                                   | MAJOR    | VISUAL                                                               | 100%                                                                           | -DO-                       | -DO-                                                                                                                                                                                                              | LOG BOOK         | P      |   |   |         |
|                                                                                   |                                          | C. TENSILE AND BENDING TEST                                                                                         | MAJOR    | MECH                                                                 | 100%                                                                           | -DO-                       | -DO-                                                                                                                                                                                                              | TC               | V      |   |   |         |
| 1.2                                                                               | AIR CIRCUIT BREAKER                      | VERIFICATION OF MAKE, TYPE RATING                                                                                   | MAJOR    | VISUAL                                                               | 100%                                                                           | TECH SPEC AND APPROVED DRG | IS 13947, TECH SPEC AND APPROVED DRG                                                                                                                                                                              | SUPPLIER TC      | P      |   |   |         |
|                                                                                   |                                          | ROUTINE TEST                                                                                                        | CRITICAL | ELECT                                                                | 100%                                                                           |                            |                                                                                                                                                                                                                   | SUPPLIER TC      | P      | V | V |         |
| 1.3                                                                               | MCCB                                     | VERIFICATION OF MAKE, TYPE, RATING<br>FUNCTIONAL CHECK                                                              | MAJOR    | ELECT                                                                | 100%                                                                           | SPEC AND APPROVED DRG      | SPEC AND APPROVED DRG                                                                                                                                                                                             | LOG BOOK         | P      |   |   |         |

|                                                                                                                        |                                                                                                           |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|
| <br><b>MANUFACTURER'S SIGNATURE</b> | <b>LEGEND:</b> M: MANUFACTURER BHEL, T: CONSULTANT, C: CUSTOMR<br>P: PERFORM, W: WITNESS, V: VERIFICATION |
|                                                                                                                        |                                                                                                           |

|                                                                                                                                                                                                                                                       |                                                    |             |  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|-------------|--|
| <b>DEVELOPMENT CONSULTANTS PRIVATE LIMITED</b><br>Reviewed only for general conformance with contract drawings and specifications.<br>Contractor to be responsible for any errors and for fulfillment of detailed requirements of contract documents. |                                                    |             |  |
| ACTION : 2                                                                                                                                                                                                                                            |                                                    | DATE: 04.16 |  |
| DISTRIBUTED BY: SKB/BR                                                                                                                                                                                                                                |                                                    |             |  |
| 1 Distributed                                                                                                                                                                                                                                         | 4 Approved except as noted. Resubmission required. |             |  |
| 2 Approved                                                                                                                                                                                                                                            | 5 Disapproved. See accompanying letter.            |             |  |
| 3 Approved except as noted. Forward final drawing.                                                                                                                                                                                                    | 6 For information and record only.                 |             |  |
| SEE COVERING LETTER                                                                                                                                                                                                                                   |                                                    |             |  |
| Letter Ref. No.                                                                                                                                                                                                                                       |                                                    | Date :      |  |

|                    |                      |
|--------------------|----------------------|
|                    |                      |
| <b>APPROVED BY</b> | <b>APPROVAL SEAL</b> |

| MANUFACTURER:<br>BHARAT HEAVY ELECTRICALS<br>LTD.- ELECTROPORCELAINS<br>DIVISION<br>BANGALORE 560012 |                                            |                                                        | MANUFACTURING QUALITY<br>PLAN                             |                   |                  | CUSTOMER: M/S Gujarat State Electricity Corporation Ltd<br>Consultant : DEVELOPMENT CONSULTANTS.<br><br>PROJECT: 1x800 MW STPP.WANAKBORI Project.<br><br>Document No: EP-3-QP-047-001 |                                      |                  |        |   |   |         |
|------------------------------------------------------------------------------------------------------|--------------------------------------------|--------------------------------------------------------|-----------------------------------------------------------|-------------------|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|------------------|--------|---|---|---------|
| ITEM :<br>L V SWITCH GEARS/<br>LPBS/ LOCAL MOTOR<br>STARTERS                                         |                                            |                                                        | QP NO.:61/15-16 (R1)<br>DATE:22.02.2016<br>PAGE : 2 OF 11 |                   |                  |                                                                                                                                                                                       |                                      |                  |        |   |   |         |
| SL. NO                                                                                               | COMPONENT & OPERATIONS                     | CHARACTERISTICS                                        | CATSS                                                     | TYPE OF CHECK     | QUANTUM OF CHECK | REFERENCE DOCUMENT                                                                                                                                                                    | ACCEPTANCE NORMS                     | FORMAT OF RECORD | AGENCY |   |   | REMARKS |
|                                                                                                      |                                            |                                                        |                                                           |                   |                  |                                                                                                                                                                                       |                                      |                  | M      | T | C |         |
| 1.                                                                                                   | 2.                                         | 3.                                                     | 4.                                                        | 5.                | 6.               | 7.                                                                                                                                                                                    | 8.                                   | 9.               | 10.    |   |   | 11.     |
| 1.4                                                                                                  | D) ROTARY SWITCHES (CONTROL AND SELECTOR ) | VERIFICATION OF MAKE, TYPE, RATING<br>FUNCTIONAL CHECK | MAJOR                                                     | FUNCTIONAL        | 10%              | TECH SPEC AND APPROVED DRG                                                                                                                                                            | TECH SPEC AND APPROVED DRG           | LOG BOOK         | P      |   |   |         |
| 1.5                                                                                                  | E) DOOR , TOGGLE & TNC SWITCH              | VERIFICATION OF MAKE, TYPE, RATING<br>FUNCTIONAL CHECK | MAJOR                                                     | VISUAL            | 10%              | TECH SPEC AND APPROVED DRG                                                                                                                                                            | TECH SPEC AND APPROVED DRG           | LOG BOOK         | P      |   |   |         |
| 1.6                                                                                                  | FUSE SWITCH UNITS                          | VERIFICATION OF MAKE, TYPE, RATING<br>FUNCTIONAL CHECK | MAJOR                                                     | FUNCTIONAL        | 10%              | IS 13947, TECH SPEC AND APPROVED DRG                                                                                                                                                  | IS 13947, TECH SPEC AND APPROVED DRG | LOG BOOK         | P      |   |   |         |
| 1.7                                                                                                  | ETHERNET SWITCH                            | MAKE, MODEL, FUNCTIONAL CHECK                          | MAJOR                                                     | ELECT             | 100%             | TECH SPEC AND APPROVED DRG                                                                                                                                                            | TECH SPEC AND APPROVED DRG           | SUPPLIER TC      | P      | V | V |         |
| 1.8                                                                                                  | CONTROL TRANSFORMER                        | MAKE, RATING, VOLTAGE, RATIO & CLASS                   | MAJOR                                                     | VISUAL NAME PLATE | 100%             | IS 121021 (81)                                                                                                                                                                        | IS 121021(87)                        | SUPPLIER TC      | P      |   |   |         |
| 1.9                                                                                                  | CURRENT TRANSFORMER CTS                    | MAKE, TYPE, RATING RATIO                               | MAJOR                                                     | VISUAL NAME PLATE | 100%             | IS 2705 (92)                                                                                                                                                                          | IS 2705(92)                          | SUPPLIER TC      | P      |   |   |         |

|                                                                                       |  |                                                                                                            |  |
|---------------------------------------------------------------------------------------|--|------------------------------------------------------------------------------------------------------------|--|
|  |  | <b>LEGEND:</b> M: MANUFACTURER BHEL, T: CONSULTANT, C: CUSTOMER<br>P: PERFORM, W: WITNESS, V: VERIFICATION |  |
|                                                                                       |  | APPROVED BY                                                                                                |  |
|                                                                                       |  | APPROVAL SEAL                                                                                              |  |









| MANUFACTURING QUALITY PLAN |                        | MANUFACTURER:<br>BHARAT HEAVY ELECTRICALS<br>LTD.- ELECTROPOWERCELLAINS<br>DIVISION<br>BANGALORE 560012 |          | ITEM :<br>L V SWITCH GEARS/<br>LPBS/ LOCAL MOTOR<br>STARTERS |                                | QP NO:61/IS-16 (RI)<br>DATE:22.02.2016<br>PAGE : 7 OF 11 |                                   | CUSTOMER: M/S Gujarat State Electricity Corporation Ltd<br>Consultant : DEVELOPMENT CONSULTANTS.<br><br>PROJECT: 1x800 MW STPP.WANAKBORI Project.<br><br>Document No: EP-3-QP-047-001 |             |   |         |  |
|----------------------------|------------------------|---------------------------------------------------------------------------------------------------------|----------|--------------------------------------------------------------|--------------------------------|----------------------------------------------------------|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|---|---------|--|
| SL. NO                     | COMPONENT & OPERATIONS | CHARACTERISTICS                                                                                         | CATSS    | TYPE OF CHECK                                                | QUANTUM OF CHECK               | REFERENCE DOCUMENT                                       | ACCEPTANCE NORMS                  | FORMAT OF RECORD                                                                                                                                                                      | AGENCY      |   | REMARKS |  |
| 1.                         | 2.                     | 3.                                                                                                      | 4.       | 5.                                                           | 6.                             | 7.                                                       | 8.                                | 9.                                                                                                                                                                                    | 10.         |   | 11.     |  |
| 2.4                        | GASKET                 | MATERIAL TYPE                                                                                           | MAJOR    | VISUAL                                                       | 1 SAMPLE OF EACH TYPE AND SIZE | IS 11149 TECH SPEC / APPROVED DRG                        | IS 11149 TECH SPEC / APPROVED DRG | LOG BOOK                                                                                                                                                                              | P           |   |         |  |
|                            |                        | DIMENSION, SHORE HARDNESS, FLAME TEST                                                                   | MAJOR    | MEASURE /PHY                                                 | -DO-                           | -DO-                                                     | -DO-                              | -DO-                                                                                                                                                                                  | SUPPLIER TC | P |         |  |
|                            |                        | DIMENSION, TYPE                                                                                         | MAJOR    | VISUAL/ MEASURE                                              | 100%                           | APPROVED DRG, IS 8623                                    | APPROVED DRG, IS 8623             | LOG BOOK                                                                                                                                                                              | P           |   |         |  |
| 2.5                        | ENCLOSURE/ DRAWOUTS    | COLOUR (PAINT SHADE), SURFACE FINISH                                                                    | MAJOR    | VISUAL                                                       | 100%                           | APPROVED DRG/SHADE CARD                                  | APPROVED DRG/SHADE CARD           | LOG BOOK                                                                                                                                                                              | P           |   |         |  |
|                            |                        | PAINT THICKNESS AND ADHESION TEST                                                                       | MAJOR    | TEST                                                         | RANDOM                         | IS 6005/APPROVED DRG                                     | IS 6005/APPROVED DRG              | LOG BOOK                                                                                                                                                                              | P           |   |         |  |
|                            |                        | 7 TANK PROCESS                                                                                          | MAJOR    | CHEMICAL                                                     | MANFR STD                      | MANFR STD/ IS 6005                                       | MANFR STD/ IS 6005                | SUPPLIER TC                                                                                                                                                                           | V           |   |         |  |
| 2.6                        | GENERAL ASSEMBLY       | BUS BAR CLEARANCES                                                                                      | MAJOR    | MESH                                                         | 100%                           | PO SPEC, DRG, IS 8623                                    | PO SPEC, DRG, IS 8623             | LOG BOOK                                                                                                                                                                              | P           |   |         |  |
|                            |                        | SHROUDING OF POWER TERMINALS                                                                            | CRITICAL | VISUAL                                                       | 100%                           | PO SPEC, DRG, IS 8623                                    | PO SPEC, DRG, IS 8623             | LOG BOOK                                                                                                                                                                              | P           |   |         |  |

|                                                                                                                                       |  |                                                                                                           |               |  |
|---------------------------------------------------------------------------------------------------------------------------------------|--|-----------------------------------------------------------------------------------------------------------|---------------|--|
| <br><b>MANUFACTURER SIGNATURE</b><br><b>DATE</b> |  | <b>LEGEND:</b> M: MANUFACTURER BHEL, T: CONSULTANT, C: CUSTOMR<br>P: PERFORM, W: WITNESS, V: VERIFICATION |               |  |
|                                                                                                                                       |  | APPROVED BY                                                                                               | APPROVAL SEAL |  |

MONAPPA  
11/01/2016

| MANUFACTURER:<br>BHARAT HEAVY ELECTRICALS<br>LTD.- ELECTROPORCELAINS<br>DIVISION<br>BANGALORE 560012 |                                                                                                                                                                                 |                 |       | MANUFACTURING QUALITY<br>PLAN                                |                                                                                           |                            |                            | CUSTOMER: M/S Gujarat State Electricity Corporation Ltd<br>Consultant : DEVELOPMENT CONSULTANTS.<br><br>PROJECT: 1x800 MW STPP.WANAKBORI Project.<br><br>Document No: EP-3-QP-047-001 |                 |   |   |                             |
|------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-------|--------------------------------------------------------------|-------------------------------------------------------------------------------------------|----------------------------|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|---|---|-----------------------------|
|                   |                                                                                                                                                                                 |                 |       | ITEM :<br>L V SWITCH GEARS/<br>LPBS/ LOCAL MOTOR<br>STARTERS |                                                                                           |                            |                            | QP NO.:6/15-16 (RI)<br>DATE:22.02.2016<br>PAGE: 8 OF 11                                                                                                                               |                 |   |   |                             |
|                                                                                                      |                                                                                                                                                                                 |                 |       |                                                              |                                                                                           |                            |                            |                                                                                                                                                                                       |                 |   |   |                             |
| SL. NO                                                                                               | COMPONENT & OPERATIONS                                                                                                                                                          | CHARACTERISTICS | CATSS | TYPE OF CHECK                                                | QUANTUM OF CHECK                                                                          | REFERENCE DOCUMENT         | ACCEPTANCE NORMS           | FORMAT OF RECORD                                                                                                                                                                      | AGENCY<br>M T C |   |   | REMARKS                     |
| 1.                                                                                                   | 2.                                                                                                                                                                              | 3.              | 4.    | 5.                                                           | 6.                                                                                        | 7.                         | 8.                         | 9.                                                                                                                                                                                    | 10.             |   |   | 11.                         |
| 3. FINAL INSPECTION                                                                                  |                                                                                                                                                                                 |                 |       |                                                              |                                                                                           |                            |                            |                                                                                                                                                                                       |                 |   |   |                             |
| 3.1                                                                                                  | VERIFICATION OF DEMENSION OF VERTICALS, SHEET. VISUAL CHECK FOR VERTICALITY, ALIGNMENT OF PANELS.                                                                               | MAJOR           |       | VISUAL & MEASUR                                              | 100%                                                                                      | AS PER APPROVED DRG.GA     | AS PER APPROVED GA DRG     | LOG BOOK                                                                                                                                                                              | P               | W | W |                             |
| 3.2                                                                                                  | VERIFICATION OF PAINT FINISH, SHADE, THICKNESS & ADHESION TEST                                                                                                                  | MAJOR           |       | VISUAL AND MEASUR                                            | 100% FOR SHADE AND FINISH<br>2-3 SAMPLES FOR THICKNESS AND ADHESION<br>2-3 SAMPLES/ BOARD | AS PER IS/ APPROVED DRG GN | AS PER IS/ APPROVED DRG GN | INSPECTION REPORT                                                                                                                                                                     | P               | W | W | RANDOM SAMPLES BY CUSTOMER. |
| 3.3                                                                                                  | VERIFICATION OF BUSBAR (MAIN, CONTROL AND AUX). MATERIAL, COLOR CODING, PHASE SEQUENCE IDENTIFICATION, PROVISION OF COLOR (R-Y-B) / BLACK HEAT SHRINKING SLEEVE. & EARTH BUSBAR | CRITICAL        |       | VISUAL AND MEASUR                                            | 10%                                                                                       | APPROVED DRG GA            | APPROVED DRG GA            | INSPECTION REPORT                                                                                                                                                                     | P               | W | W |                             |
| 3.4                                                                                                  | MEASUREMENT OF TIGHTENING TORQUE OF BUSBAR JOINTS BY TROQUE WRENCH                                                                                                              | CRITICAL        |       | MECH                                                         | 10%                                                                                       | AS PER TORQUE TABLE.       | AS PER TORQUE TABLE        | INSPECTION REPORT                                                                                                                                                                     | P               | W | W | RANDOM SAMPLES BY CUSTOMER. |

|                                                                                                                        |  |                                                                                                           |  |             |               |
|------------------------------------------------------------------------------------------------------------------------|--|-----------------------------------------------------------------------------------------------------------|--|-------------|---------------|
| <br><b>MANUFACTURER SIGNATURE</b> |  | <b>LEGEND:</b> M: MANUFACTURER BHEL, T: CONSULTANT, C: CUSTOMR<br>P: PERFORM, W: WITNESS, V: VERIFICATION |  |             |               |
|                                                                                                                        |  |                                                                                                           |  | APPROVED BY | APPROVAL SEAL |

| MANUFACTURER:<br>BHARAT HEAVY ELECTRICALS<br>LTD.- ELECTROPORCELAINS<br>DIVISION<br>BANGALORE. 560012 |                                                                                                                                     | MANUFACTURING QUALITY<br>PLAN |       | CUSTOMER: M/S Gujarat State Electricity Corporation Ltd<br>Consultant : DEVELOPMENT CONSULTANTS.<br><br>PROJECT: 1x800 MW STPP, WANAKBORI Project.<br><br>Document No: EP-3-QP-047-001 |                             |                                              |                                              |                   |        |   |         |                            |
|-------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|----------------------------------------------|----------------------------------------------|-------------------|--------|---|---------|----------------------------|
| SL. NO                                                                                                | COMPONENT & OPERATIONS                                                                                                              | CHARACTERISTICS               | CATSS | TYPE OF CHECK                                                                                                                                                                          | QUANTUM OF CHECK            | REFERENCE DOCUMENT                           | ACCEPTANCE NORMS                             | FORMAT OF RECORD  | AGENCY |   | REMARKS |                            |
| 1.                                                                                                    | 2.                                                                                                                                  | 3.                            | 4.    | 5.                                                                                                                                                                                     | 6.                          | 7.                                           | 8.                                           | 9.                | M      | T | C       |                            |
| 3.5                                                                                                   | BUS BAR SUPPORT ARRANGEMENT, CENTRE TO CENTRE DISTANCE (CREEPAGE DISTANCE)                                                          |                               | MAJOR | VISUAL AND MEASUR                                                                                                                                                                      | 10%                         | APPROVED DRG GA                              | APPROVED DRG GA                              | INSPECTION REPORT | P      | W | W       | RANDOM SAMPLES BY CUSTOMER |
| 3.6                                                                                                   | MOUNTING ARRANGEMENT OF COMPONENTS AND COMPONENT IDENTIFICATION FOR MAKE, TYPE, RATING AND LAYOUT                                   |                               | MAJOR | VISUAL                                                                                                                                                                                 | 10% FOR EACH TYPE OF MODULE | APPROVED DRG/MANFR STD                       | APPROVED DRG/MANFR STD                       | INSPECTION REPORT | P      | W | W       | RANDOM SAMPLES BY CUSTOMER |
| 3.7                                                                                                   | VERIFICATION OF CONTROL WIRING, TERMINAL ARRANGEMENT AND FERRULING                                                                  |                               | MAJOR | VISUAL                                                                                                                                                                                 | 100%                        | APPROVED DRG/MANFR STD                       | APPROVED DRG/MANFR STD                       | INSPECTION REPORT | P      | W | W       |                            |
| 3.8                                                                                                   | VERIFICATION OF SINGLE LINE DIAGRAM COMPONENTS AND LEGENDS                                                                          |                               | MAJOR | VISUAL                                                                                                                                                                                 | 100%                        | APPROVED DRG SLD                             | APPROVED DRG SLD                             | INSPECTION REPORT | P      | W | W       |                            |
| 3.9                                                                                                   | VERIFICATION OF MOUNTING ARRANGEMENT OF COMPONENT, IDENTIFICATION OF COMPONENT AND VERIFICATION OF MAKE, TYPE & RATING (AS PER BOM) |                               | MAJOR | VISUAL                                                                                                                                                                                 | 100%                        | AS PER APPROVED DRG(SCHEME) AND APPROVED BOM | AS PER APPROVED DRG(SCHEME) AND APPROVED BOM | INSPECTION REPORT | P      | W | W       |                            |
| 3.10                                                                                                  | VERIFICATION OF DOOR INTERLOCK AND DEFEAT INTERLOCK                                                                                 |                               | MAJOR | PHYSICAL                                                                                                                                                                               | 10%                         | APPROVED GN                                  | APPROVED GN                                  | INSPECTION REPORT | P      | W | W       | RANDOM SAMPLES BY CUSTOMER |







**1X800 MW WANAKBORI**  
**Supercritical Thermal Power Project**  
**AHP & CHP PACKAGE**  
**TECHNICAL SPECIFICATION FOR**  
**LOW VOLTAGE SWITCHGEAR**

SPECIFICATION NO: EPD-TS-CPBG-14047-AHP\_CHP

VOLUME NO. :

SECTION :

REV NO. : 00 DATE: 06.10.2017

SHEET :

## DRAWINGS AND DOCUMENTS DISTRIBUTION SCHEDULE

### NO. OF DRAWINGS/DOCUMENTS REQUIRED FROM VENDOR

| SL.NO. | DESCRIPTION                                           | PRINTS | CD-ROM | MANUALS |
|--------|-------------------------------------------------------|--------|--------|---------|
| 1      | DRAWING /DOCUMENTS –FIRST SUBMISSION                  | 0      |        |         |
| 2      | DRAWING /DOCUMENTS-SUBSEQUENT REVISED SUBMISSION      | 0      |        |         |
| 3      | DRAWING /DOCUMENTS-FINAL (AFTER CATEGORY –I APPROVAL) | 2      | 2      |         |
| 4      | DRAWING AS BUILT                                      | 7      | 5      |         |
| 5      | O/M MANUAL-DRAFT                                      |        |        | 1       |
| 6      | O/M MANUAL-FINAL                                      |        | 3      | 7       |
| 7      | TYPE TEST CERTIFICATES                                | 1      |        |         |



**1X800 MW WANAKBORI Supercritical  
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PACKAGE  
TECHNICAL SPECIFICATION FOR  
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VOLUME NO.  
SECTION :  
REV NO. : 00  
SHEET : Page 1 of 3

**LIST OF CODES & STANDARDS**  
**ANNEXURE-F**

**Notes:**

1 Equipment, accessories, components, material and tests shall confirm, to the specifications of latest revision of applicable standards.

2 Equipment, accessories, components, material and tests shall confirm, in general, to the Specifications of

☒ IS

☐ BS

☐ IEC

Unless marked otherwise in the list below. Applicable standards are to be ticked ☐

**LV Switch gear: –**

|    |                                                                         |                                                           |                                                                                |                                       |
|----|-------------------------------------------------------------------------|-----------------------------------------------------------|--------------------------------------------------------------------------------|---------------------------------------|
| 1  | Switchgear General Requirements                                         | <input checked="" type="checkbox"/> IS : 4237             | <input type="checkbox"/> BS : 162                                              | <input type="checkbox"/> IEC :        |
| 2  | Factory built assemblies of LV Switchgear control gear                  | <input checked="" type="checkbox"/> IS : 8623             | <input type="checkbox"/> BS:5486                                               | <input type="checkbox"/> IEC : 439    |
| 3  | Selection , installation and maintenance of switchgear and control gear | <input checked="" type="checkbox"/> IS : 10118            | <input type="checkbox"/> :                                                     | <input type="checkbox"/> IEC :        |
| 4  | Busbar main connections and accessories                                 | <input checked="" type="checkbox"/> IS: 5578              | <input type="checkbox"/> BS : 159                                              | <input type="checkbox"/> IEC :        |
| 5  | Rail mounting in switchgear and control gear installation               | <input checked="" type="checkbox"/> IS :11039             | <input type="checkbox"/> BS :                                                  | <input type="checkbox"/> IEC : 715    |
| 6  | Marking and identification of conductor and appartatus terminal         | <input checked="" type="checkbox"/> IS:11053              | <input type="checkbox"/> BS :                                                  | <input type="checkbox"/> IEC :        |
| 7  | Marking of insulated conductors                                         | <input checked="" type="checkbox"/> IS: 5578              | <input type="checkbox"/> BS :                                                  | <input type="checkbox"/> IEC : 391    |
| 8  | Item designation                                                        | <input checked="" type="checkbox"/> IS :8270              | <input type="checkbox"/> BS :                                                  | <input type="checkbox"/> IEC :        |
| 9  | Climate proofing of electrical equipment                                | <input checked="" type="checkbox"/> IS: 3202              | <input type="checkbox"/> BS : CP 1014                                          | <input type="checkbox"/> IEC :        |
| 10 | Degree of protection ( enclosure)                                       | <input checked="" type="checkbox"/> IS:13947              | <input type="checkbox"/> BS :                                                  | <input type="checkbox"/> IEC : 144    |
| 11 | Wrought aluminium & Al. alloys                                          | <input checked="" type="checkbox"/> IS:5082               | <input type="checkbox"/> BS: 2898                                              | <input type="checkbox"/> IEC : 114    |
| 12 | Copper of busbars                                                       | <input checked="" type="checkbox"/> IS :                  | <input type="checkbox"/> BS :                                                  | <input type="checkbox"/> IEC : 28     |
| 13 | LV circuit breakers                                                     | <input checked="" type="checkbox"/> IS :2516<br>Pt. I& II | <input type="checkbox"/> BS: 4752<br><input type="checkbox"/> BS:3871<br>SEC 1 | <input type="checkbox"/> IEC : 157 -1 |
| 14 | Starters                                                                | <input checked="" type="checkbox"/> IS : 8544             | <input type="checkbox"/> BS: 4941                                              | <input type="checkbox"/> IEC : 292-1  |
| 15 | Identification of terminals of contractors and associated overload      | <input checked="" type="checkbox"/> IS :10705             | <input type="checkbox"/> BS:                                                   | <input type="checkbox"/> IEC : 158-1C |
| 16 | Air break switch                                                        | <input checked="" type="checkbox"/> IS :4064              | <input type="checkbox"/> BS: 5419                                              | <input type="checkbox"/> IEC : 408    |
| 17 | Contactors                                                              | <input checked="" type="checkbox"/> IS:2959               | <input type="checkbox"/> BS: 775                                               | <input type="checkbox"/> IEC : 158-1  |
| 18 | HRC catridge fuses                                                      | <input checked="" type="checkbox"/> IS:13703              | <input type="checkbox"/> BS: 88                                                | <input type="checkbox"/> IEC : 269-1  |



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|    |                                                                                       |                                               |                                    |                                    |
|----|---------------------------------------------------------------------------------------|-----------------------------------------------|------------------------------------|------------------------------------|
| 19 | Indicating instruments                                                                | <input checked="" type="checkbox"/> IS:1248   | <input type="checkbox"/> BS: 89    | <input type="checkbox"/> IEC : 51  |
| 20 | Dimensions for panel mounted indicating instruments                                   | <input checked="" type="checkbox"/> IS:2419   | <input type="checkbox"/> BS:       | <input type="checkbox"/> IEC :     |
| 21 | AC electricity meters                                                                 | <input checked="" type="checkbox"/> IS:722    | <input type="checkbox"/> BS: 5685  | <input type="checkbox"/> IEC : 521 |
| 22 | Relays                                                                                | <input checked="" type="checkbox"/> IS:3231   | <input type="checkbox"/> BS:142    | <input type="checkbox"/> IEC : 255 |
| 23 | Static protective relays                                                              | <input checked="" type="checkbox"/> IS :8686  | <input type="checkbox"/> BS:       | <input type="checkbox"/> IEC :     |
| 24 | Current transformers                                                                  | <input checked="" type="checkbox"/> IS :2705  | <input type="checkbox"/> BS: 3938  | <input type="checkbox"/> IEC : 185 |
| 25 | Voltage tranformers                                                                   | <input checked="" type="checkbox"/> IS: 3941  | <input type="checkbox"/> BS: 3941  | <input type="checkbox"/> IEC :     |
| 26 | LV Control Transformers                                                               | <input checked="" type="checkbox"/> IS: 12021 | <input type="checkbox"/> BS :      | <input type="checkbox"/> IEC :     |
| 27 | Miniature circuit breakers                                                            | <input checked="" type="checkbox"/> IS: 8828  | <input type="checkbox"/> BS : 3871 | <input type="checkbox"/> IEC :     |
| 28 | Control switches & push button                                                        | <input checked="" type="checkbox"/> IS: 13947 | <input type="checkbox"/> BS:       | <input type="checkbox"/> IEC :     |
| 29 | Thermostatic Bimetals                                                                 | <input checked="" type="checkbox"/> IS: 8588  | <input type="checkbox"/> BS:       | <input type="checkbox"/> IEC :     |
| 30 | Phosphating of iron & steel                                                           | <input checked="" type="checkbox"/> IS: 6005  | <input type="checkbox"/> BS: 3189  | <input type="checkbox"/> IEC :     |
| 31 | "Colours for ready mixed paints and enamels"                                          | <input checked="" type="checkbox"/> IS: 5     | <input type="checkbox"/> BS:       | <input type="checkbox"/> IEC :     |
| 32 | Environmental tests                                                                   | <input checked="" type="checkbox"/> IS: 2106  | <input type="checkbox"/> BS:       | <input type="checkbox"/> IEC :     |
| 33 | Maintenance & field testing of relays                                                 | <input checked="" type="checkbox"/> IS:9124   | <input type="checkbox"/> BS:       | <input type="checkbox"/> IEC :     |
| 34 | Specification for PVC insulated cables for working voltage upto & including 1100volts | <input checked="" type="checkbox"/> IS: 694   | <input type="checkbox"/> BS:       | <input type="checkbox"/> IEC :     |



**1X800 MW WANAKBORI Supercritical  
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**LPB & Local Starters:-**

|   |                                                            |                                                       |                                     |                                    |
|---|------------------------------------------------------------|-------------------------------------------------------|-------------------------------------|------------------------------------|
| 1 | Factory built assemblies of LV Switchgear and control gear | <input checked="" type="checkbox"/> IS: 8623 PART -II | <input type="checkbox"/> BS :5486   | <input type="checkbox"/> IEC : 439 |
| 2 | Degree of protection                                       | <input checked="" type="checkbox"/> IS: 13947         | <input type="checkbox"/> BS :5420   | <input type="checkbox"/> IEC : 144 |
| 3 | Push button                                                | <input checked="" type="checkbox"/> IS: 13947         | <input type="checkbox"/> BS :       | <input type="checkbox"/> IEC : 337 |
| 4 | Climatic proofing of electrical equipment                  | <input checked="" type="checkbox"/> IS: 3202          | <input type="checkbox"/> BS :CP1014 | <input type="checkbox"/> IEC :     |
| 5 | AC motors starters for voltage not exceeding 1000 V        | <input checked="" type="checkbox"/> IS: 8544          | <input type="checkbox"/> BS : 4941  | <input type="checkbox"/> IEC : 292 |
| 6 | Code of practice for phosphating iron & steel              | <input checked="" type="checkbox"/> IS: 6005          | <input type="checkbox"/> BS :3189   | <input type="checkbox"/> IEC :     |
| 7 | Colour for ready mixed paints & enamels                    | <input checked="" type="checkbox"/> IS: 5             | <input type="checkbox"/> :          | <input type="checkbox"/> IEC :     |

| SR. NO. | DETAILS OF EQUIPMENT/SYSTEM                                  | FINAL APPROVED VENDOR                                                                                                                                       |
|---------|--------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
|         | <b>ELECTRICAL</b>                                            |                                                                                                                                                             |
| 1       | Protective Relays                                            | ABB, JYOTI, SIEMENS, ESSUN & RAY, ROLLE, GEC, ALSTOM, L&T, CSEG,<br><br>MAKE OF MAIN PROTECTIVE RELAY SHALL BE RESTRICTED TO AREVA/ABB/ SIEMENS AS PER NIT. |
| 2       | AUXILIARY RELAY                                              | L&T, SIEMENS, ABB, SCHNEIDER, GE, C&S, ALSTOM                                                                                                               |
| 3       | OVER LOAD RELAY/ THERMAL OVER LOAD RELAY/LOCAL MOTOR STARTER | L&T, SIEMENS, ABB, SCHNEIDER, GE, C&S, ALSTOM                                                                                                               |
| 4       | PROTECTIVE RELAY/ MOTOR PROTECTION RELAY                     | ABB, ALSTOM, GEC, EASUN, Siemens, Areva                                                                                                                     |
| 5       | TIMER/ AUXILIARY CONTROL RELAY                               | ABB, BCH, GEC, L&T, ALSTOM, SIEMENS, TELEMATIQUE & CONTROLS.                                                                                                |
| 6       | INTER POSING RELAY FOR COMMANDS O/P TO MCC                   | JYOTI, H&B, GEC, ALSTOM, OEN, OMRON, HONEYWELL<br><br>ENGLISH ELECTRICAL, SIEMENS, ABB                                                                      |
| 7       | MCCB                                                         | L&T, SIEMENS, ABB, SCHNEIDER, GE, C&S, ALSTOM                                                                                                               |
| 8       | MCB                                                          | L&T, SIEMENS, ABB, SCHNEIDER, GE, C&S, ALSTOM                                                                                                               |
| 9       | FUSES & FUSES SWITCH ON / OFF SWITCHES /HRC FUSES WITH BASE  | L&T, SIEMENS, ABB, SCHNEIDER, GE, C&S, ALSTOM                                                                                                               |
| 10      | SWITCH SOCKET OUTLET INDUSTRIAL                              | BCH, BEST & CROMPTON, CGL, GEC, REY ROLLE, BARN, ANCHOR.                                                                                                    |
| 11      | AMMETER & VOLTMETER                                          | AUTOMATIC ELECTRIC, ABB, IMP, MECO, L&T, RISHAB, SILKANS                                                                                                    |
| 12      | METAL CLADE PLUG & SOCKET (INCLUDING WELDING SOCKET)         | BCH, BEST & CROMPTON, CGL, EE, REY ROLLE, BARN, EASUN                                                                                                       |
| 13      | CONTROL/ SELECTOR SWITCH                                     | BCH, GEC, ALSTOM, JYOTI, KEYCEE, RECOM, RICO, SWITRON, ABB, L&T, SIEMENS, KROUS-NAIMER SALZER                                                               |
| 14      | PUSH BUTTONS                                                 | BCH, GEC, ALSTOM, L&T, TELKNIC, SIEMENS, VAISHNO, RASS                                                                                                      |

| SR. NO. | DETAILS OF EQUIPMENT/SYSTEM | FINAL APPROVED VENDOR                                                                                                          |
|---------|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------|
|         | <b>ELECTRICAL</b>           |                                                                                                                                |
|         |                             | CONTROL                                                                                                                        |
| 15      | TERMINAL BLOCK              | CONNECTWELL, ELEMAX, TECHNOPLAST , TOSHA, VINPAR, PHOENIX, WAGO                                                                |
| 17      | CT's & PT's                 | A.E., ABB, ASEA, G&W, GUJARAT PLUGIN (DIGITRONICS), JYOTI, KAPPA, , ECS, SIEMENS,AVK-SEG & CONTROLS, PRECISE,INSUTECH., PRAYOG |
| 18      | CONTROL TRANSFORMER         | A.E., AMAN , GUJARAT PLUGIN (DIGITRONICS), GUJ.TRANSFORMER, INDUSTRIAL PRAYOG, NEG, LOGICSTAT ,AVK-SEG & CONTROLS ,PRECISE     |
| 19      | LT AIR C.B.                 | L&T, SIEMENS,ABB, SCHNEIDER, GE, C&S, ALSTOM                                                                                   |
| 21      | CONTACTOR                   | L&T, SIEMENS,ABB, SCHNEIDER, GE, C&S, ALSTOM                                                                                   |
| 22      | INDICATING METERS           | AUTOMATIC ELECTRONIC LTD; GEC, ALSTOM, L&T, IMP, MECO RISHABH / CONZERV/ENERCON                                                |
| 23      | CABLE GLAND                 | BRACO, COMET, CONTRACT, HARDWARE INDUSTRIES, ELECT ENG; LAPP                                                                   |