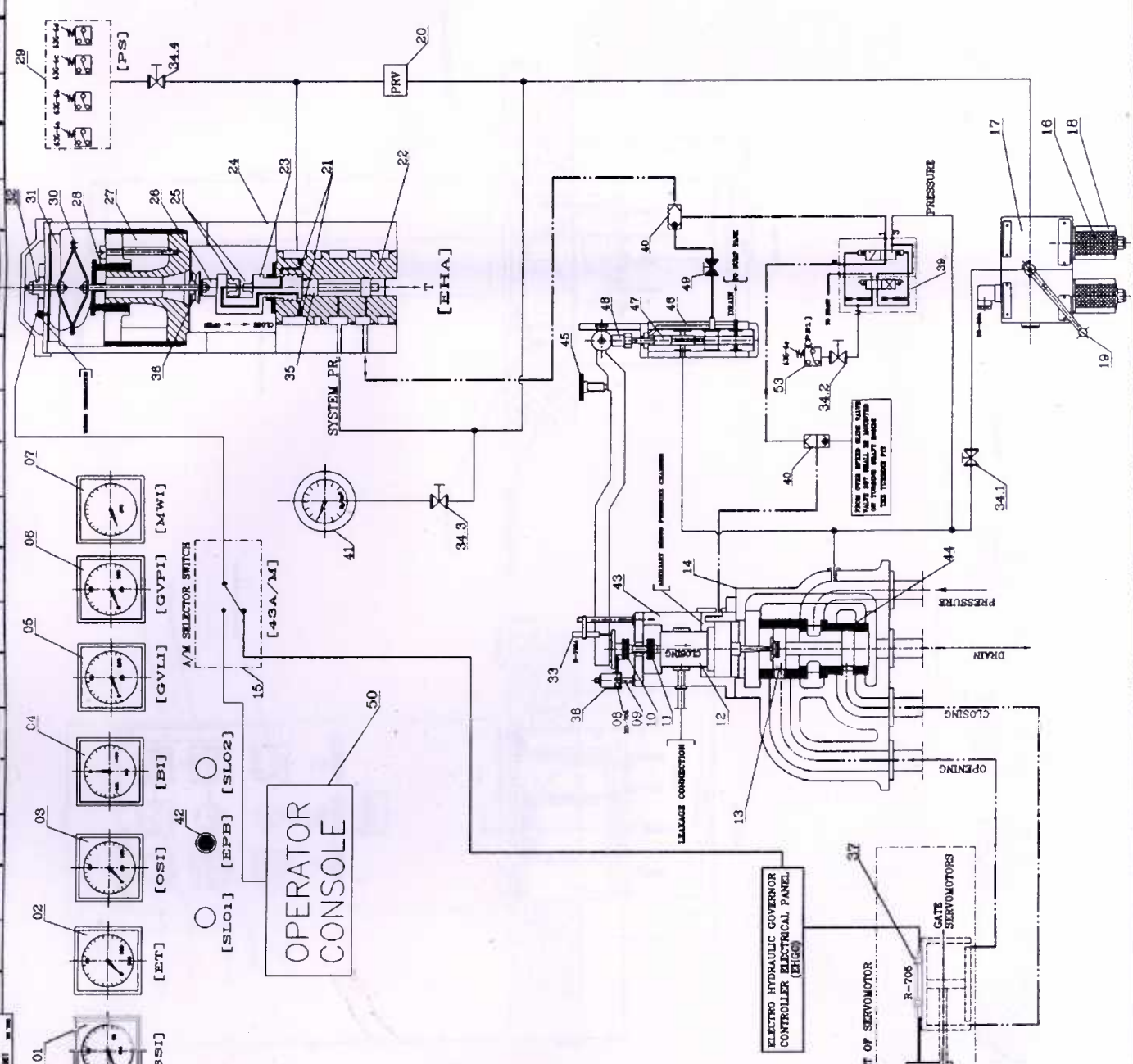




(ALL DIMENSIONS ARE IN INCHES)

630-66 SWITCHING CONTACT FOR GOV. PR. LOW ALARM AT 12 KG/CM2 AND BELOW  
 630-6b SWITCHING CONTACT FOR GOV. PR. HIGH ALARM AT 24 KG/CM2 AND ABOVE  
 630-6c SWITCHING CONTACT FOR GOV. PRESSURE AT 14 KG/CM2 AND ABOVE  
 630-6d SPARE  
 630-6e CLOGGING INDICATOR FOR DUPLEX FILTER  
 SWITCHING CONTACT FOR EMERGENCY INDICATION AT 30 KG/CM2 AND ABOVE

|     |  |
|-----|--|
| 53  | PRESSURE SWITCH [PS] FOR EMERGENCY INDICATION        |
| 54  | INDICATION LAMP FOR MANUAL MODE                      |
| 55  | OPERATOR CONSOLE                                     |
| 56  | ISOLATING NEEDLE VALVE (NC FOR AUTO OPERATION)       |
| 57  | ADJUSTING NUT  |
| 58  | PILOT NEEDLER SLEEVE                                 |
| 59  | PILOT SLIDE VALVE BODY                               |
| 60  | HANDLE WHEEL FOR MANUAL OPERATION                    |
| 61  | MAIN SLIDE VALVE SLEEVE                              |
| 62  | AUXILIARY SLIDE VALVE BODY                           |
| 63  | EMERGENCY PUSH BUTTON                                |
| 64  | PRESSURE GAUGE FOR SYSTEM PRESSURE                   |
| 65  | SHUTTLE VALVE  |
| 66  | SOLDWID OPERATED EMERGENCY CLOSING VALVE (20ES-306C) |
| 67  | HOUSER   |
| 68  | LOW SPRING LOWER                                     |
| 69  | PILOT VALVE NEEDLE                                   |
| 70  | ISOLATING NEEDLE VALVE                               |
| 71  | LIFT FOR MOV POSITION FEEDBACK (RT05A)               |
| 72  | NUT & SCREW  |
| 73  | ELECTRO MAGNETIC TRANSDUCER                          |
| 74  | LOW SPRING UPPER                                     |
| 75  | ELECTRONIC PRESSURE SWITCH [PS]                      |
| 76  | COIL   |
| 77  | PERMANENT MAGNET                                     |
| 78  | BAFFLE PLATE   |
| 79  | NOZZLE   |
| 80  | PILOT VALVE BODY                                     |
| 81  | NOZZLE HOLDING HEAD PIECE                            |
| 82  | PILOT VALVE SLEEVE                                   |
| 83  | THROTTLES  |
| 84  | PRESSURE REDUCING VALVE (PRV)                        |
| 85  | CHANGE OVER HANDLE FOR FILTER                        |
| 86  | KNOB   |
| 87  | DUPLEX FILTER  |
| 88  | FILTERING ELEMENT                                    |
| 89  | AUTO MANUAL SELECTOR SWITCH                          |
| 90  | MAIN SLIDE VALVE BODY                                |
| 91  | AUXILIARY SERVO MOTOR PISTON                         |
| 92  | NUT FOR LIMITING STROKE OF MSV OPENING               |
| 93  | NUT FOR LIMITING STROKE OF MSV CLOSING               |
| 94  | SUPPORT  |
| 95  | SWITCH FOR OVER SPEED PROTECTION (MS-705)            |
| 96  | MSV INDICATOR  |
| 97  | GATE POSITION INDICATOR                              |
| 98  | GATE LIMIT INDICATOR                                 |
| 99  | BALANCE INDICATOR                                    |
| 100 | OUTPUT SETTING INDICATOR                             |
| 101 | ELECTRO TACHOMETER                                   |
| 102 | SPEED SETTING INDICATOR                              |
| 103 | DESCRIPTION  |



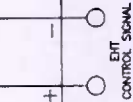
| SL.NO. | ABBREVIATION     | DESCRIPTION   |
|--------|------------------|---|
| 1      | L1, L2           | FLUORESCENT TUBE LIGHTS, 11 WATT  |
| 2      | K701             | SWITCH FOR ITEM NOS. 1 & 2, 5 AMPS.   |
| 3      | SSI              | SPEED SETTING INDICATOR, INPUT 4-20 mA, SCALE 45-50-55 Hz.  |
| 4      | ET               | ELECTRO TACHOMETER, INPUT 4-20 mA, SCALE 0-100 Hz.  |
| 5      | OSI              | OUTPUT SETTING INDICATOR, INPUT 4-20 mA, SCALE 0-100%.  |
| 6      | BI               | BALANCE INDICATOR, INPUT (-)3 -0- (+)3 V DC, SCALE (-)100-0- (+)100 mA.   |
| 7      | GVLI             | GATE LIMIT INDICATOR, INPUT 4-20 mA, SCALE 0-100%.  |
| 8      | GVPI             | GATE POSITION INDICATOR, INPUT 4-20 mA, SCALE 0-100%.   |
| 9      | R705             | LVDT FOR GV POSITION FEEDBACK, MOUNTED ON GV SERVO MOTOR, 24 VDC INPUT, 4-20mA OUTPUT   |
| 10     | R705a            | LVDT FOR MDV POSITION FEEDBACK, MOUNTED ON MDV, 24 VDC INPUT, 4-20mA OUTPUT   |
| 11     | EHT              | ELECTRO HYDRAULIC TRANSDUCER.   |
| 12     | 20ES-3E, 20ES-3R | EMERGENCY STOP/ RESET SOLENOID, 220V DC. 3/2 DIRECTIONAL CONTROL VALVE, OPERATING VOLTAGE : 220V DC   |
| 13     | A/M SS           | AUTO / MANUAL SELECTOR SWITCH, 2 POSITION, 6 POLES  |
| 14     | MS705            | LIMIT SWITCH ON MDV FOR OVER SPEED PROTECTION.  |
| 15     | D1, D2           | DIODE   |
| 16     | PRESSURE SWITCH  | ELECTRONIC PRESSURE SWITCH WITH 4 INDEPENDANT SETABLE RELAY CONTACTS.<br>63G-6 - RELAY-1 RELAY1-SET FOR 12 KG/CM AND BELOW FOR GOV. PRESSURE LOW ALARM.<br>63G-6a - RELAY-2 RELAY2-SET FOR 24 KG/CM AND ABOVE FOR GOV. PRESSURE HIGH ALARM<br>63G-6b - RELAY-3 RELAY1-SET FOR 14 KG/CM AND ABOVE FOR M/C STARTING INTERLOCK<br>63G-6c - RELAY-4 SPARE |
| 17     | EPB              | EMERGENCY STOP PUSH BUTTON  |
| 18     | 33-88a           | CONTACT OF CLOGGING INDICATOR MOUNTED ON DUPLEX FILTER  |
| 19     | MWI              | MW INDICATOR, INPUT 4-20 mA, SCALE 0-100%.  |
| 20     | SL01, SL02       | INDICATION LAMPS, 24 VDC INPUT SUPPLY, SL01-GREEN COLOR, SL02-RED COLOR   |
| 21     | PLC CONTROLLER   | OPERATOR CONSOLE FOR MANUAL OPERATION   |
| 22     | PRESSURE SWITCH  | 63G-6e PRESSURE SWITCH FOR EMERGENCY VALVE OPERATE INDICATION   |
| 23     | Q1               | MCB, 240 VAC, 10 A, 2 POLE  |
| 24     | Q2               | MCB, 24 VDC, 6 A, 2 POLE  |

3

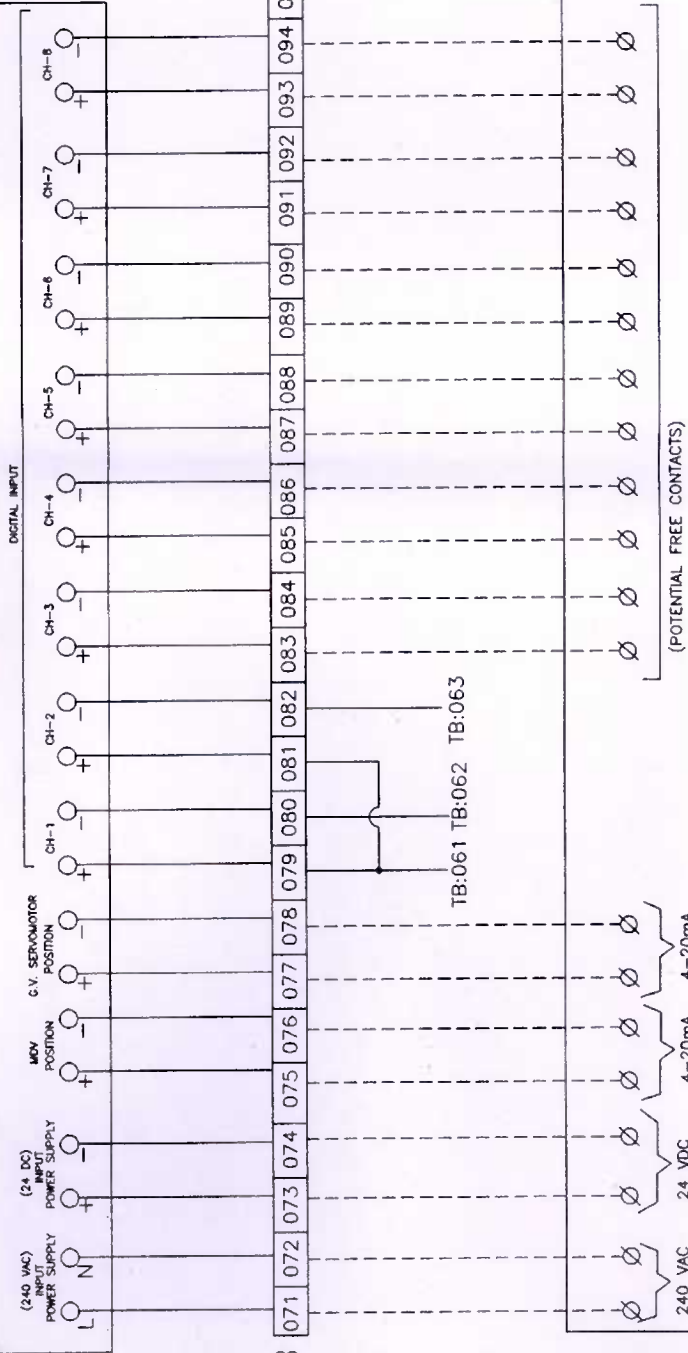
|   |             |           |             |  |             |                                  |             |
|---|-------------|-----------|-------------|--|-------------|----------------------------------|-------------|
| REV. DATE                                       | ALT. CHOICE | REV. DATE | ALT. CHOICE | REV. DATE  | ALT. CHOICE | REV. DATE                        | ALT. CHOICE |
|   | APPD        |           | APPD        |  | APPD        |                                  | APPD        |
| NAME  |             | SIGN      |             | DATE   |             | SHEET TITLE                      |             |
| PREP. VKN                                       |             | / /       |             | 3. 10. 13  |             | WIRING DIAGRAM OF                |             |
| CHKD. AP  |             | / /       |             | 3. 10. 13  |             | HYDRO MECHANICAL CABINET         |             |
| APPD. DH  |             | / /       |             | 3. 10. 13  |             | PROJECT- BANSAGAR TONS HEP (R&M) |             |
| BHARAT HEAVY ELECTRICALS LTD.<br>BHOPAL (INDIA) |             |           |             | BHEL NO. 3 20839 150 18<br>SHT. NO. 06 NO. OF SHT. 06<br>REV. 00 |             |                                  |             |

# OPERATOR CONSOLE

TO SHT NO. 2.2  
TB:03 TB:04



# OPERATOR CONSOLE



### DIGITAL INPUT:

- CH-1 : CONTROL IN AUTO MODE
- CH-2 : CONTROL IN MANUAL MODE
- CH-3 : SET POINT RAISE COMMAND
- CH-4 : SET POINT LOWER COMMAND
- CH-5 : GCB CLOSED FEEDBACK
- CH-6 : SPARE
- CH-7 : SPARE
- CH-8 : SPARE

### ANALOG INPUT:

- CH-1 : MDV POSITION FEEDBACK
- CH-2 : GATE SERVOMOTOR POSITION FEEDBACK

### INPUT POWER SUPPLY:

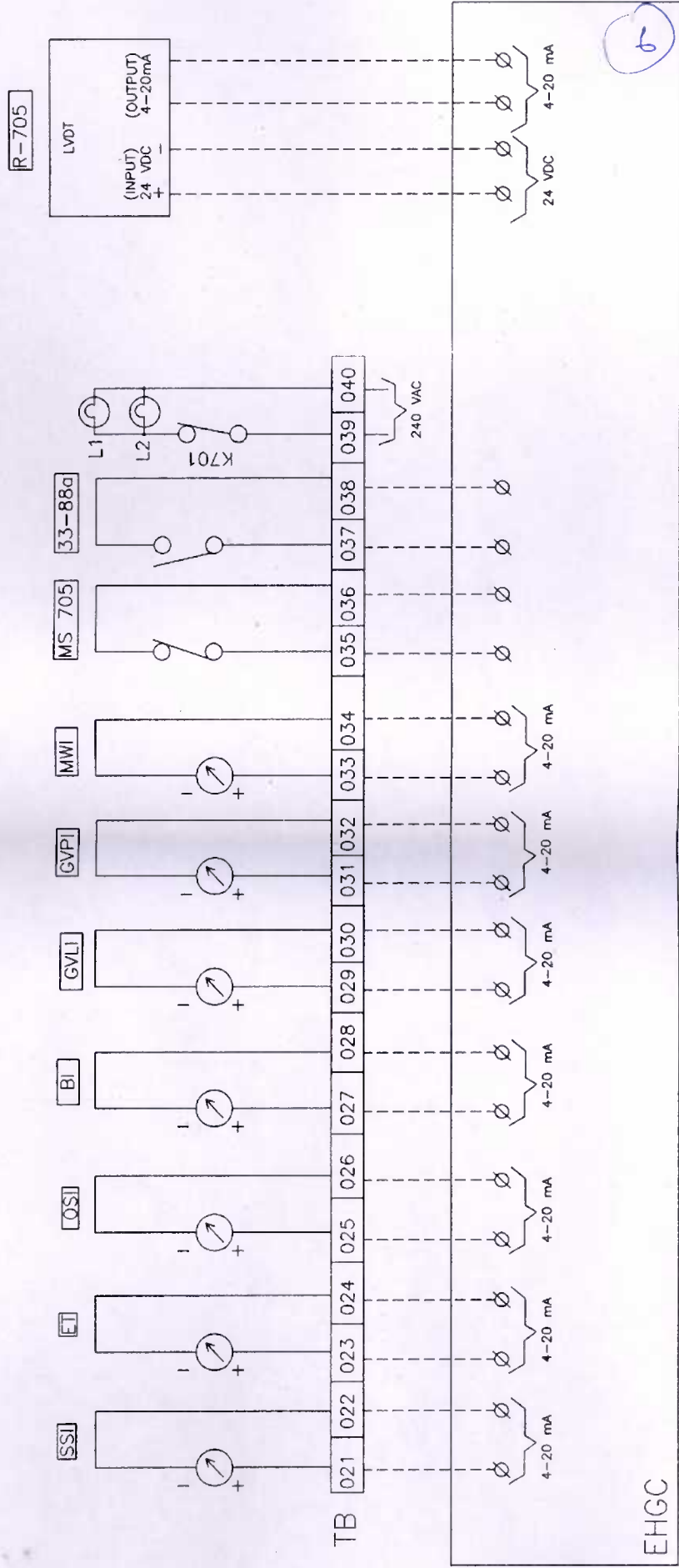
1. 24 VDC : FIELD SUPPLY
2. 240 VAC : CONTROL SUPPLY

(5)

| REV.  | DATE | ALT'D | REV. | DATE | REV. | DATE     | NAME      | SIGN     | DATE     | SHEET | TITLE  |
|---|------|-------|------|------|------|----------|-----------|----------|----------|-------|--|
|   |      | CHKD  |      |      |      |          | PREP. VKN |          | 10.10.15 | 5     | <b>WIRING DIAGRAM OF<br/>HYDRO MECHANICAL CABINET</b><br><br>PROJECT-BANSAGAR TONS HEP (R&M) |
|   |      | APPD  |      |      |      | CHKD. AP |           | 10.10.15 |          | 6     |  |
|   |      |       |      |      |      | APPD. DH |           | 10.10.15 |          | 7     |  |
| BHARAT HEAVY ELECTRICALS LTD.<br>BHOPAL (INDIA) |      |       |      |      |      |          |           |          |          |       | REV.   |
| BHEL NO. 3 20839 150 18                         |      |       |      |      |      |          |           |          |          |       | REV.   |
| SHT. NO. 05 NO. OF SHT. 00                      |      |       |      |      |      |          |           |          |          |       | REV.   |
| DEPT. HTE CODE 402                              |      |       |      |      |      |          |           |          |          |       | REV.   |



|                         |                    |                          |                   |                      |                         |              |                       |                       |                   |  |
|-------------------------|--------------------|--------------------------|-------------------|----------------------|-------------------------|--------------|-----------------------|-----------------------|-------------------|--|
| SPEED SETTING INDICATOR | ELECTRO TACHOMETER | OUTPUT SETTING INDICATOR | BALANCE INDICATOR | GATE LIMIT INDICATOR | GATE POSITION INDICATOR | MW INDICATOR | OVER SPEED PROTECTION | DUPLEX FILTER CLOGGED | ILLUMINATION LAMP | LVDT FOR GV SERVOMOTOR POSITION FEEDBACK |
|-------------------------|--------------------|--------------------------|-------------------|----------------------|-------------------------|--------------|-----------------------|-----------------------|-------------------|--|



|  |       |      |      |  |       |      |      |  |       |      |      |                   |       |      |      |           |       |      |      |
|--|-------|------|------|--|-------|------|------|--|-------|------|------|-------------------|-------|------|------|-----------|-------|------|------|
| REV. DATE                                    | ALT D | CHKD | APPD | REV. DATE                                  | ALT D | CHKD | APPD | REV. DATE  | ALT D | CHKD | APPD | REV. DATE         | ALT D | CHKD | APPD | REV. DATE | ALT D | CHKD | APPD |
|  |       |      |      |  |       |      |      |  |       |      |      |                   |       |      |      |           |       |      |      |
| SIGN. & DATE                                 |       |      |      | REF. DRG. NO.                              |       |      |      | IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY |       |      |      | INVENTORY NO.     |       |      |      |           |       |      |      |
| SHEET TITLE                                  |       |      |      | WIRING DIAGRAM OF HYDRO MECHANICAL CABINET |       |      |      | PROJECT-BANSAGAR TONS HEP (R&M)  |       |      |      | DEPT HTE CODE     |       |      |      |           |       |      |      |
| NAME SIGN DATE                               |       |      |      | PREP. VKN 15.10.12                         |       |      |      | CHKD. AP 15.10.12  |       |      |      | APPD. DH 15.10.12 |       |      |      |           |       |      |      |
| SHEET NO. 7                                  |       |      |      | NO. OF SHT. 06                             |       |      |      | REV. 00  |       |      |      | REV. 00           |       |      |      |           |       |      |      |
| BHEL NO. 3 20839 150 18                      |       |      |      | SHT. NO. 03                                |       |      |      | NO. OF SHT. 06   |       |      |      | REV. 00           |       |      |      |           |       |      |      |
| BHARAT HEAVY ELECTRICALS LTD. BHOPAL (INDIA) |       |      |      |  |       |      |      |  |       |      |      |                   |       |      |      |           |       |      |      |