1. **GENERAL DATA AND INFORMATION.**

|  |  |  |  |
| --- | --- | --- | --- |
| Type: | MiCOM P740 | Rated Current: | 1.00 A |
| Make : | ALSTOM | Rated Voltage: | 125 V |
| Firmware Ver.: | E2.1\_A | Aux. Voltage: | 48 – 250 V (125 V) |
|  |  | Rated Freq.: | 60 Hz |
|  |  | No. of PU : | 15 |

1. **MECHANICAL CHECK AND VISUAL INSPECTION**

|  |  |  |
| --- | --- | --- |
| **S.No** | **DESCRIPTION** | **REMARKS** |
| 1 | Inspect for physical damage / defects. |  |
| 2 | Verify connections as per approved drawing. |  |
| 3 | Check tightness of all connections. |  |

1. **ELECTRICAL TEST.**

FUNCTION TEST

|  |  |  |
| --- | --- | --- |
| **S.No** | **DESCRIPTION** | **REMARKS** |
| 1 | Case Earthing checked. |  |
| 2 | Front Communication verified by software. |  |
| 3 | Set date and time. |  |
| 4 | Binary inputs checked as per schematic. |  |
| 5 | Binary outputs checked as per schematic. |  |
| 6 | LED indications checked. |  |
| 7 | Test switch function verified. |  |
| 8 | Auxiliary DC supply checked. |  |
| 9 | CT circuit checked. |  |

1. **INPUTS, OUTPUTS AND LEDs CHECK FOR CENTRAL UNIT AND BAY UNIT:**

**4.1 CENTRAL UNIT**

|  |  |  |  |
| --- | --- | --- | --- |
| **Binary Inputs** | **Terminals** | **Function (Duty)** | **Checked** |
| OC 01 | K2-K1 | Z1A IN SERVICE |  |
| OC 02 | K4-K3 | Z2A IN SERVICE |  |
| OC 03 | K6-K5 | SPARE |  |
| OC 04 | K8-K7 | SPARE |  |
| OC 05 | K10-K9 | SPARE |  |
| OC 06 | K12-K11 | SPARE |  |
| OC 07 | K14-K13 | SPARE |  |
| OC 08 | K16-K15 | SPARE |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Binary Outputs** | **Terminals** | **Function (Duty)** | **Checked** | **Binary Outputs** | **Terminals** | **Function (Duty)** | **Checked** |
| RL01 | F2-F1 | Spare |  | RL09 | E2-E1 | Spare |  |
| RL02 | F4-F3 | Spare |  | RL10 | E4-E3 | Spare |  |
| RL03 | F6-F5 | Spare |  | RL11 | E6-E5 | Spare |  |
| RL04 | F8-F7 | Spare |  | RL12 | E8-E7 | Spare |  |
| RL05 | F10-F9 | Spare |  | RL13 | E10-E9 | Spare |  |
| RL06 | F12-F11 | Spare |  | RL14 | E12-E11 | Spare |  |
| RL07 | F15-F14(N/O) F15-F13(N/C) | Spare |  | RL15 | E15-E14(N/O) E15-E13(N/C) | Spare |  |
| RL08 | F18-F17(N/O)  D18-D16(N/C) | Spare |  | RL16 | E18-E17(N/O) D18-D16(N/C) | Spare |  |

**CENTRAL UNIT LEDS:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **LED’S** | **Function (Duty)** | **Checked** | **LED’S** | **Function (Duty)** | **Checked** |
| LED 01 | PHASE A OPTD |  | FnkeyLED 01 | Green: CZ NO Alarm  Red: circuitry fault blocking  Yellow : circuitry fault alarm |  |
| LED 02 | PHASE B OPTD |  | FnkeyLED 02 | Green: CZ NO Alarm  Red :PU circuitry fault blocking  Yellow :PU circuitry fault alarm |  |
| LED 03 | PHASE C OPTD |  | FnkeyLED 03 | SPARE |  |
| LED 04 | Green:87BB Z1 OPTD  Red:50BF Z1 OPTD  Yellow :Both |  | FnkeyLED 04 | Green :NO ALARM  Red :Z1-87BB BLOKED  Yellow :Z1-87BB &50BF BLOKED |  |
| LED 05 | Green:87BB Z2 OPTD  Red :50BF Z2 OPTD  Yellow :Both |  | FnkeyLED 05 | Green :NO ALARM  Red :Z2-87BB BLOKED  Yellow :Z2-87BB &50BF BLOKED |  |
| LED 06 | Green: Z1 healthy  Red:Z1 Blocking  Yellow :CZ Blocking |  | FnkeyLED 06 | SPARE |  |
| LED 07 | Green: Z2 healthy  Red : Z2 Blocking  Yellow: CZ Blocking |  | FnkeyLED 07 | Check Zone ALARM |  |
| LED 08 | FIBER COMM ERROR |  | FnkeyLED 08 | SPARE |  |
| Fnkey 09LED | SPARE |  | FnkeyLED 10 | RESET INDICATION CU & PU |  |

**4.2: BAY UNITS:-**

**BAY Name: PU07 (BC-2A\_ D130)(130B)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Binary Inputs** | **Terminals** | **Function (Duty)** | **Checked** |
| OC 01 | C2-C1 | CB 130 OPEN |  |
| OC 02 | C4-C3 | CB 130 CLOSE |  |
| OC 03 | C6-C5 | DS 134 OPEN |  |
| OC 04 | C8-C7 | DS 134 CLOSE |  |
| OC 05 | C10-C9 | DS 136 OPEN |  |
| OC 06 | C12-C11 | DS 136 CLOSE |  |
| OC 07 | C14-C13 | CBF INITI |  |
| OC 08 | C16-C15 | Spare |  |
| OC 09 | A2-A1 | Spare |  |
| OC 10 | A4-A3 | Spare |  |
| OC 11 | A6-A5 | Spare |  |
| OC 12 | A8-A7 | Spare |  |
| OC 13 | A10-A9 | Spare |  |
| OC 14 | A12-A11 | Spare |  |
| OC 15 | A14-A13 | Spare |  |
| OC 16 | A16-A15 | Spare |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Binary Outputs** | **Terminals** | **Function (Duty)** | **Checked** | **Binary Outputs** | **Terminals** | **Function (Duty)** | **Checked** |
| RL01 | F2-F1 | Spare |  | RL09 | E2-E1 | Spare |  |
| RL02 | F4-F3 | Spare |  | RL10 | E4-E3 | Spare |  |
| RL03 | F6-F5 | Spare |  | RL11 | E6-E5 | Spare |  |
| RL04 | F8-F7 | Spare |  | RL12 | E8-E7 | Spare |  |
| RL05 | F10-F9 | Spare |  | RL13 | E10-E9 | Spare |  |
| RL06 | F12-F11 | Spare |  | RL14 | E12-E11 | Spare |  |
| RL07 | F15-F14(N/O) F15-F13(N/C) | Spare |  | RL15 | E15-E14(N/O) E15-E13(N/C) | Spare |  |
| RL08 | F18-F17(N/O)  D18-D16(N/C) | Spare |  | RL16 | E18-E17(N/O) D18-D16(N/C) | Spare |  |

Bay Unit LEDs:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **LED’S** | **Function (Duty)** | **Checked** | **LED’S** | **Function (Duty)** | **Checked** |
| LED 01 | DS 134 CLOSE/OPEN |  | FnkeyLED 01 | SPARE |  |
| LED 02 | DS 136 CLOSE/OPEN |  | FnkeyLED 02 | SPARE |  |
| LED 03 | CB 130 CLOSE/OPEN |  | FnkeyLED 03 | SPARE |  |
| LED 04 | 87BB Trip |  | FnkeyLED 04 | IMAGE ALARM |  |
| LED 05 | CBF TRIP |  | FnkeyLED 05 | SPARE |  |
| LED 06 | CT Fail |  | FnkeyLED 06 | SPARE |  |
| LED 07 | CBF IN |  | FnkeyLED 07 | SPARE |  |
| LED 08 | FIBER COMM ERROR |  | FnkeyLED 08 | SPARE |  |
| Fnkey 09LED | SPARE |  | FnkeyLED 10 | RESET INDICATION |  |

**BAY Name: PU08 (BC-1A\_D130) (130A)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Binary Inputs** | **Terminals** | **Function (Duty)** | **Checked** |
| OC 01 | B2-B1 | CB 130 OPEN |  |
| OC 02 | B4-B3 | CB 130 CLOSE |  |
| OC 03 | B6-B5 | DS 134 OPEN |  |
| OC 04 | B8-B7 | DS 134 CLOSE |  |
| OC 05 | B10-B9 | DS 136 OPEN |  |
| OC 06 | B12-B11 | DS 136 CLOSE |  |
| OC 07 | B14-B13 | CBF INIT |  |
| OC 08 | B16-B15 | Spare |  |
| OC 09 | C2-C1 | Spare |  |
| OC 10 | C4-C3 | Spare |  |
| OC 11 | C6-C5 | Spare |  |
| OC 12 | C8-C7 | Spare |  |
| OC 13 | C10-C9 | Spare |  |
| OC 14 | C12-C11 | Spare |  |
| OC 15 | C14-C13 | Spare |  |
| OC 16 | C16-C15 | Spare |  |
| OC 17 | D2-D1 | Spare |  |
| OC 18 | D4-D3 | Spare |  |
| OC 19 | D6-D5 | Spare |  |
| OC 20 | D8-D7 | Spare |  |
| OC 21 | D10-D9 | Spare |  |
| OC 22 | D12-D11 | Spare |  |
| OC 23 | D14-D13 | Spare |  |
| OC 24 | D16-D15 | Spare |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Binary Outputs** | **Terminals** | **Function (Duty)** | **Checked** | **Binary Outputs** | **Terminals** | **Function (Duty)** | **Checked** |
| RL01 | F2-F1 | Spare |  | RL09 | E2-E1 | Spare |  |
| RL02 | F4-F3 | Spare |  | RL10 | E4-E3 | Spare |  |
| RL03 | F6-F5 | Spare |  | RL11 | E6-E5 | Spare |  |
| RL04 | F8-F7 | Spare |  | RL12 | E8-E7 | Spare |  |
| RL05 | F10-F9 | Spare |  | RL13 | E10-E9 | Spare |  |
| RL06 | F12-F11 | Spare |  | RL14 | E12-E11 | Spare |  |
| RL07 | F15-F14(N/O) F15-F13(N/C) | Spare |  | RL15 | E15-E14(N/O) E15-E13(N/C) | Spare |  |
| RL08 | F18-F17(N/O)  D18-D16(N/C) | Spare |  | RL16 | E18-E17(N/O) D18-D16(N/C) | Spare |  |

**Bay Unit LEDs:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **LED’S** | **Function (Duty)** | **Checked** | **LED’S** | **Function (Duty)** | **Checked** |
| LED 01 | DS 134 CLOSE/OPEN |  | FnkeyLED 01 | OC PHASE A OPTD |  |
| LED 02 | DS 136 CLOSE/OPEN |  | FnkeyLED 02 | OC PHASE B OPTD |  |
| LED 03 | CB 130 CLOSE/OPEN |  | FnkeyLED 03 | OC PHASE C OPTD |  |
| LED 04 | 87BB Trip |  | FnkeyLED 04 | IMAGE ALARM |  |
| LED 05 | CBF TRIP |  | FnkeyLED 05 | OC START |  |
| LED 06 | CT Fail |  | FnkeyLED 06 | OC OPTD |  |
| LED 07 | CBF INITI |  | FnkeyLED 07 | EF START |  |
| LED 08 | FIBER COMM ERROR |  | FnkeyLED 08 | EF OPTD |  |
| Fnkey 09LED | CBF from CU |  | FnkeyLED 10 | RESET INDICATION |  |

**BAY Name: PU09 (BS-2B\_D220) (220B)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Binary Inputs** | **Terminals** | **Function (Duty)** | **Checked** |
| OC 01 | B2-B1 | CB 220 OPEN |  |
| OC 02 | B4-B3 | CB 220 CLOSE |  |
| OC 03 | B6-B5 | DS 226A OPEN |  |
| OC 04 | B8-B7 | DS 226A CLOSE |  |
| OC 05 | B10-B9 | DS 226B OPEN |  |
| OC 06 | B12-B11 | DS 226B CLOSE |  |
| OC 07 | B14-B13 | CBF INIT |  |
| OC 08 | B16-B15 | Spare |  |
| OC 09 | C2-C1 | Spare |  |
| OC 10 | C4-C3 | Spare |  |
| OC 11 | C6-C5 | Spare |  |
| OC 12 | C8-C7 | Spare |  |
| OC 13 | C10-C9 | Spare |  |
| OC 14 | C12-C11 | Spare |  |
| OC 15 | C14-C13 | Spare |  |
| OC 16 | C16-C15 | Spare |  |
| OC 17 | D2-D1 | Spare |  |
| OC 18 | D4-D3 | Spare |  |
| OC 19 | D6-D5 | Spare |  |
| OC 20 | D8-D7 | Spare |  |
| OC 21 | D10-D9 | Spare |  |
| OC 22 | D12-D11 | Spare |  |
| OC 23 | D14-D13 | Spare |  |
| OC 24 | D16-D15 | Spare |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Binary Outputs** | **Terminals** | **Function (Duty)** | **Checked** | **Binary Outputs** | **Terminals** | **Function (Duty)** | **Checked** |
| RL01 | F2-F1 | Spare |  | RL09 | E2-E1 | Spare |  |
| RL02 | F4-F3 | Spare |  | RL10 | E4-E3 | Spare |  |
| RL03 | F6-F5 | Spare |  | RL11 | E6-E5 | Spare |  |
| RL04 | F8-F7 | Spare |  | RL12 | E8-E7 | Spare |  |
| RL05 | F10-F9 | Spare |  | RL13 | E10-E9 | Spare |  |
| RL06 | F12-F11 | Spare |  | RL14 | E12-E11 | Spare |  |
| RL07 | F15-F14(N/O) F15-F13(N/C) | Spare |  | RL15 | E15-E14(N/O) E15-E13(N/C) | Spare |  |
| RL08 | F18-F17(N/O)  D18-D16(N/C) | Spare |  | RL16 | E18-E17(N/O) D18-D16(N/C) | Spare |  |

**Bay Unit LEDs:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **LED’S** | **Function (Duty)** | **Checked** | **LED’S** | **Function (Duty)** | **Checked** |
| LED 01 | DS 226A CLOSE/OPEN |  | FnkeyLED 01 | CBF from CU |  |
| LED 02 | DS 226B CLOSE/OPEN |  | FnkeyLED 02 | SPARE |  |
| LED 03 | CB 220 CLOSE/OPEN |  | FnkeyLED 03 | SPARE |  |
| LED 04 | 87BB Trip |  | FnkeyLED 04 | IMAGE ALARM |  |
| LED 05 | CBF TRIP |  | FnkeyLED 05 | SPARE |  |
| LED 06 | CT Fail |  | FnkeyLED 06 | SPARE |  |
| LED 07 | CBF INIT |  | FnkeyLED 07 | SPARE |  |
| LED 08 | FIBER COMM ERROR |  | FnkeyLED 08 | SPARE |  |
| Fnkey 09LED | SPARE |  | FnkeyLED 10 | RESET INDICATION |  |

**4.2: BAY Name: PU10 (BS-1B D120)(120B)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Binary Inputs** | **Terminals** | **Function (Duty)** | **Checked** |
| OC 01 | B2-B1 | CB 120 OPEN |  |
| OC 02 | B4-B3 | CB 120 CLOSE |  |
| OC 03 | B6-B5 | DS 124A OPEN |  |
| OC 04 | B8-B7 | DS 124A CLOSE |  |
| OC 05 | B10-B9 | DS 124B OPEN |  |
| OC 06 | B12-B11 | DS 124B CLOSE |  |
| OC 07 | B14-B13 | CBF INIT |  |
| OC 08 | B16-B15 | Spare |  |
| OC 09 | C2-C1 | Spare |  |
| OC 10 | C4-C3 | Spare |  |
| OC 11 | C6-C5 | Spare |  |
| OC 12 | C8-C7 | Spare |  |
| OC 13 | C10-C9 | Spare |  |
| OC 14 | C12-C11 | Spare |  |
| OC 15 | C14-C13 | Spare |  |
| OC 16 | C16-C15 | Spare |  |
| OC 17 | D2-D1 | Spare |  |
| OC 18 | D4-D3 | Spare |  |
| OC 19 | D6-D5 | Spare |  |
| OC 20 | D8-D7 | Spare |  |
| OC 21 | D10-D9 | Spare |  |
| OC 22 | D12-D11 | Spare |  |
| OC 23 | D14-D13 | Spare |  |
| OC 24 | D16-D15 | Spare |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Binary Outputs** | **Terminals** | **Function (Duty)** | **Checked** | **Binary Outputs** | **Terminals** | **Function (Duty)** | **Checked** |
| RL01 | F2-F1 | Spare |  | RL09 | E2-E1 | Spare |  |
| RL02 | F4-F3 | Spare |  | RL10 | E4-E3 | Spare |  |
| RL03 | F6-F5 | Spare |  | RL11 | E6-E5 | Spare |  |
| RL04 | F8-F7 | Spare |  | RL12 | E8-E7 | Spare |  |
| RL05 | F10-F9 | Spare |  | RL13 | E10-E9 | Spare |  |
| RL06 | F12-F11 | Spare |  | RL14 | E12-E11 | Spare |  |
| RL07 | F15-F14(N/O) F15-F13(N/C) | Spare |  | RL15 | E15-E14(N/O) E15-E13(N/C) | Spare |  |
| RL08 | F18-F17(N/O)  D18-D16(N/C) | Spare |  | RL16 | E18-E17(N/O) D18-D16(N/C) | Spare |  |

**Bay Unit LEDs:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **LED’S** | **Function (Duty)** | **Checked** | **LED’S** | **Function (Duty)** | **Checked** |
| LED 01 | DS 124A CLOSE/OPEN |  | FnkeyLED 01 | CBF from CU |  |
| LED 02 | DS 124B CLOSE/OPEN |  | FnkeyLED 02 | SPARE |  |
| LED 03 | CB 120 CLOSE/OPEN |  | FnkeyLED 03 | SPARE |  |
| LED 04 | 87BB Trip |  | FnkeyLED 04 | IMAGE ALARM |  |
| LED 05 | CBF TRIP |  | FnkeyLED 05 | SPARE |  |
| LED 06 | CT Fail |  | FnkeyLED 06 | SPARE |  |
| LED 07 | CBF INIT |  | FnkeyLED 07 | SPARE |  |
| LED 08 | FIBER COMM ERROR |  | FnkeyLED 08 | SPARE |  |
| Fnkey 09LED | SPARE |  | FnkeyLED 10 | RESET INDICATION |  |

**BAY Name: PU11 (D01)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Binary Inputs** | **Terminals** | **Function (Duty)** | **Checked** |
| OC 01 | B2-B1 | CB 105 OPEN |  |
| OC 02 | B4-B3 | CB 105 CLOSE |  |
| OC 03 | B6-B5 | DS 104 OPEN |  |
| OC 04 | B8-B7 | DS 104 CLOSE |  |
| OC 05 | B10-B9 | DS 106 OPEN |  |
| OC 06 | B12-B11 | DS 106 CLOSE |  |
| OC 07 | B14-B13 | CBF INIT |  |
| OC 08 | B16-B15 | Spare |  |
| OC 09 | C2-C1 | Spare |  |
| OC 10 | C4-C3 | Spare |  |
| OC 11 | C6-C5 | Spare |  |
| OC 12 | C8-C7 | Spare |  |
| OC 13 | C10-C9 | Spare |  |
| OC 14 | C12-C11 | Spare |  |
| OC 15 | C14-C13 | Spare |  |
| OC 16 | C16-C15 | Spare |  |
| OC 17 | D2-D1 | Spare |  |
| OC 18 | D4-D3 | Spare |  |
| OC 19 | D6-D5 | Spare |  |
| OC 20 | D8-D7 | Spare |  |
| OC 21 | D10-D9 | Spare |  |
| OC 22 | D12-D11 | Spare |  |
| OC 23 | D14-D13 | Spare |  |
| OC 24 | D16-D15 | Spare |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Binary Outputs** | **Terminals** | **Function (Duty)** | **Checked** | **Binary Outputs** | **Terminals** | **Function (Duty)** | **Checked** |
| RL01 | F2-F1 | Spare |  | RL09 | E2-E1 | Spare |  |
| RL02 | F4-F3 | Spare |  | RL10 | E4-E3 | Spare |  |
| RL03 | F6-F5 | Spare |  | RL11 | E6-E5 | Spare |  |
| RL04 | F8-F7 | Spare |  | RL12 | E8-E7 | Spare |  |
| RL05 | F10-F9 | Spare |  | RL13 | E10-E9 | Spare |  |
| RL06 | F12-F11 | Spare |  | RL14 | E12-E11 | Spare |  |
| RL07 | F15-F14(N/O) F15-F13(N/C) | Spare |  | RL15 | E15-E14(N/O) E15-E13(N/C) | Spare |  |
| RL08 | F18-F17(N/O)  D18-D16(N/C) | Spare |  | RL16 | E18-E17(N/O) D18-D16(N/C) | Spare |  |

Bay Unit LEDs:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **LED’S** | **Function (Duty)** | **Checked** | **LED’S** | **Function (Duty)** | **Checked** |
| LED 01 | DS 104 CLOSE/OPEN |  | FnkeyLED 01 | CBF from CU |  |
| LED 02 | DS 106 CLOSE/OPEN |  | FnkeyLED 02 | SPARE |  |
| LED 03 | CB 105 CLOSE/OPEN |  | FnkeyLED 03 | SPARE |  |
| LED 04 | 87BB Trip |  | FnkeyLED 04 | IMAGE ALARM |  |
| LED 05 | CBF TRIP |  | FnkeyLED 05 | SPARE |  |
| LED 06 | CT Fail |  | FnkeyLED 06 | SPARE |  |
| LED 07 | CBF INIT |  | FnkeyLED 07 | SPARE |  |
| LED 08 | FIBER COMM ERROR |  | FnkeyLED 08 | SPARE |  |
| Fnkey 09LED | SPARE |  | FnkeyLED 10 | RESET INDICATION |  |

**BAY Name: PU12 (D03)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Binary Inputs** | **Terminals** | **Function (Duty)** | **Checked** |
| OC 01 | B2-B1 | CB 305 OPEN |  |
| OC 02 | B4-B3 | CB 305 CLOSE |  |
| OC 03 | B6-B5 | DS 304 OPEN |  |
| OC 04 | B8-B7 | DS 304 CLOSE |  |
| OC 05 | B10-B9 | DS 306 OPEN |  |
| OC 06 | B12-B11 | DS 306 CLOSE |  |
| OC 07 | B14-B13 | CBF INIT |  |
| OC 08 | B16-B15 | Spare |  |
| OC 09 | C2-C1 | Spare |  |
| OC 10 | C4-C3 | Spare |  |
| OC 11 | C6-C5 | Spare |  |
| OC 12 | C8-C7 | Spare |  |
| OC 13 | C10-C9 | Spare |  |
| OC 14 | C12-C11 | Spare |  |
| OC 15 | C14-C13 | Spare |  |
| OC 16 | C16-C15 | Spare |  |
| OC 17 | D2-D1 | Spare |  |
| OC 18 | D4-D3 | Spare |  |
| OC 19 | D6-D5 | Spare |  |
| OC 20 | D8-D7 | Spare |  |
| OC 21 | D10-D9 | Spare |  |
| OC 22 | D12-D11 | Spare |  |
| OC 23 | D14-D13 | Spare |  |
| OC 24 | D16-D15 | Spare |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Binary Outputs** | **Terminals** | **Function (Duty)** | **Checked** | **Binary Outputs** | **Terminals** | **Function (Duty)** | **Checked** |
| RL01 | F2-F1 | Spare |  | RL09 | E2-E1 | Spare |  |
| RL02 | F4-F3 | Spare |  | RL10 | E4-E3 | Spare |  |
| RL03 | F6-F5 | Spare |  | RL11 | E6-E5 | Spare |  |
| RL04 | F8-F7 | Spare |  | RL12 | E8-E7 | Spare |  |
| RL05 | F10-F9 | Spare |  | RL13 | E10-E9 | Spare |  |
| RL06 | F12-F11 | Spare |  | RL14 | E12-E11 | Spare |  |
| RL07 | F15-F14(N/O) F15-F13(N/C) | Spare |  | RL15 | E15-E14(N/O) E15-E13(N/C) | Spare |  |
| RL08 | F18-F17(N/O)  D18-D16(N/C) | Spare |  | RL16 | E18-E17(N/O) D18-D16(N/C) | Spare |  |

Bay Unit LEDs:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **LED’S** | **Function (Duty)** | **Checked** | **LED’S** | **Function (Duty)** | **Checked** |
| LED 01 | DS 304 CLOSE/OPEN |  | FnkeyLED 01 | CBF from CU |  |
| LED 02 | DS 306 CLOSE/OPEN |  | FnkeyLED 02 | SPARE |  |
| LED 03 | CB 305 CLOSE/OPEN |  | FnkeyLED 03 | SPARE |  |
| LED 04 | 87BB Trip |  | FnkeyLED 04 | IMAGE ALARM |  |
| LED 05 | CBF TRIP |  | FnkeyLED 05 | SPARE |  |
| LED 06 | CT Fail |  | FnkeyLED 06 | SPARE |  |
| LED 07 | CBF INIT |  | FnkeyLED 07 | SPARE |  |
| LED 08 | FIBER COMM ERROR |  | FnkeyLED 08 | SPARE |  |
| Fnkey 09LED | SPARE |  | FnkeyLED 10 | RESET INDICATION |  |

**BAY Name: PU13 (D05)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Binary Inputs** | **Terminals** | **Function (Duty)** | **Checked** |
| OC 01 | B2-B1 | CB 505 OPEN |  |
| OC 02 | B4-B3 | CB 505 CLOSE |  |
| OC 03 | B6-B5 | DS 504 OPEN |  |
| OC 04 | B8-B7 | DS 504 CLOSE |  |
| OC 05 | B10-B9 | DS 506 OPEN |  |
| OC 06 | B12-B11 | DS 506 CLOSE |  |
| OC 07 | B14-B13 | CBF INIT |  |
| OC 08 | B16-B15 | Spare |  |
| OC 09 | C2-C1 | Spare |  |
| OC 10 | C4-C3 | Spare |  |
| OC 11 | C6-C5 | Spare |  |
| OC 12 | C8-C7 | Spare |  |
| OC 13 | C10-C9 | Spare |  |
| OC 14 | C12-C11 | Spare |  |
| OC 15 | C14-C13 | Spare |  |
| OC 16 | C16-C15 | Spare |  |
| OC 17 | D2-D1 | Spare |  |
| OC 18 | D4-D3 | Spare |  |
| OC 19 | D6-D5 | Spare |  |
| OC 20 | D8-D7 | Spare |  |
| OC 21 | D10-D9 | Spare |  |
| OC 22 | D12-D11 | Spare |  |
| OC 23 | D14-D13 | Spare |  |
| OC 24 | D16-D15 | Spare |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Binary Outputs** | **Terminals** | **Function (Duty)** | **Checked** | **Binary Outputs** | **Terminals** | **Function (Duty)** | **Checked** |
| RL01 | F2-F1 | Spare |  | RL09 | E2-E1 | Spare |  |
| RL02 | F4-F3 | Spare |  | RL10 | E4-E3 | Spare |  |
| RL03 | F6-F5 | Spare |  | RL11 | E6-E5 | Spare |  |
| RL04 | F8-F7 | Spare |  | RL12 | E8-E7 | Spare |  |
| RL05 | F10-F9 | Spare |  | RL13 | E10-E9 | Spare |  |
| RL06 | F12-F11 | Spare |  | RL14 | E12-E11 | Spare |  |
| RL07 | F15-F14(N/O) F15-F13(N/C) | Spare |  | RL15 | E15-E14(N/O) E15-E13(N/C) | Spare |  |
| RL08 | F18-F17(N/O)  D18-D16(N/C) | Spare |  | RL16 | E18-E17(N/O) D18-D16(N/C) | Spare |  |

Bay Unit LEDs:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **LED’S** | **Function (Duty)** | **Checked** | **LED’S** | **Function (Duty)** | **Checked** |
| LED 01 | DS 504 CLOSE/OPEN |  | FnkeyLED 01 | CBF from CU |  |
| LED 02 | DS 506 CLOSE/OPEN |  | FnkeyLED 02 | SPARE |  |
| LED 03 | CB 505 CLOSE/OPEN |  | FnkeyLED 03 | SPARE |  |
| LED 04 | 87BB Trip |  | FnkeyLED 04 | IMAGE ALARM |  |
| LED 05 | CBF TRIP |  | FnkeyLED 05 | SPARE |  |
| LED 06 | CT Fail |  | FnkeyLED 06 | SPARE |  |
| LED 07 | CBF INIT |  | FnkeyLED 07 | SPARE |  |
| LED 08 | FIBER COMM ERROR |  | FnkeyLED 08 | SPARE |  |
| Fnkey 09LED | SPARE |  | FnkeyLED 10 | RESET INDICATION |  |

**BAY Name: PU14 (D07)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Binary Inputs** | **Terminals** | **Function (Duty)** | **Checked** |
| OC 01 | B2-B1 | CB 705 OPEN |  |
| OC 02 | B4-B3 | CB 705 CLOSE |  |
| OC 03 | B6-B5 | DS 704 OPEN |  |
| OC 04 | B8-B7 | DS 704 CLOSE |  |
| OC 05 | B10-B9 | DS 706 OPEN |  |
| OC 06 | B12-B11 | DS 706 CLOSE |  |
| OC 07 | B14-B13 | CBF INIT |  |
| OC 08 | B16-B15 | Spare |  |
| OC 09 | C2-C1 | Spare |  |
| OC 10 | C4-C3 | Spare |  |
| OC 11 | C6-C5 | Spare |  |
| OC 12 | C8-C7 | Spare |  |
| OC 13 | C10-C9 | Spare |  |
| OC 14 | C12-C11 | Spare |  |
| OC 15 | C14-C13 | Spare |  |
| OC 16 | C16-C15 | Spare |  |
| OC 17 | D2-D1 | Spare |  |
| OC 18 | D4-D3 | Spare |  |
| OC 19 | D6-D5 | Spare |  |
| OC 20 | D8-D7 | Spare |  |
| OC 21 | D10-D9 | Spare |  |
| OC 22 | D12-D11 | Spare |  |
| OC 23 | D14-D13 | Spare |  |
| OC 24 | D16-D15 | Spare |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Binary Outputs** | **Terminals** | **Function (Duty)** | **Checked** | **Binary Outputs** | **Terminals** | **Function (Duty)** | **Checked** |
| RL01 | F2-F1 | Spare |  | RL09 | E2-E1 | Spare |  |
| RL02 | F4-F3 | Spare |  | RL10 | E4-E3 | Spare |  |
| RL03 | F6-F5 | Spare |  | RL11 | E6-E5 | Spare |  |
| RL04 | F8-F7 | Spare |  | RL12 | E8-E7 | Spare |  |
| RL05 | F10-F9 | Spare |  | RL13 | E10-E9 | Spare |  |
| RL06 | F12-F11 | Spare |  | RL14 | E12-E11 | Spare |  |
| RL07 | F15-F14(N/O) F15-F13(N/C) | Spare |  | RL15 | E15-E14(N/O) E15-E13(N/C) | Spare |  |
| RL08 | F18-F17(N/O)  D18-D16(N/C) | Spare |  | RL16 | E18-E17(N/O) D18-D16(N/C) | Spare |  |

**Bay Unit LEDs:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **LED’S** | **Function (Duty)** | **Checked** | **LED’S** | **Function (Duty)** | **Checked** |
| LED 01 | DS 704 CLOSE/OPEN |  | FnkeyLED 01 | CBF from CU |  |
| LED 02 | DS 706 CLOSE/OPEN |  | FnkeyLED 02 | SPARE |  |
| LED 03 | CB 705 CLOSE/OPEN |  | FnkeyLED 03 | SPARE |  |
| LED 04 | 87BB Trip |  | FnkeyLED 04 | IMAGE ALARM |  |
| LED 05 | CBF TRIP |  | FnkeyLED 05 | SPARE |  |
| LED 06 | CT Fail |  | FnkeyLED 06 | SPARE |  |
| LED 07 | CBF INIT |  | FnkeyLED 07 | SPARE |  |
| LED 08 | FIBER COMM ERROR |  | FnkeyLED 08 | SPARE |  |
| Fnkey 09LED | SPARE |  | FnkeyLED 10 | RESET INDICATION |  |

**BAY Name: PU15 (D09)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Binary Inputs** | **Terminals** | **Function (Duty)** | **Checked** |
| OC 01 | B2-B1 | CB 905 OPEN |  |
| OC 02 | B4-B3 | CB 905 CLOSE |  |
| OC 03 | B6-B5 | DS 904 OPEN |  |
| OC 04 | B8-B7 | DS 904 CLOSE |  |
| OC 05 | B10-B9 | DS 906 OPEN |  |
| OC 06 | B12-B11 | DS 906 CLOSE |  |
| OC 07 | B14-B13 | CBF INIT |  |
| OC 08 | B16-B15 | Spare |  |
| OC 09 | C2-C1 | Spare |  |
| OC 10 | C4-C3 | Spare |  |
| OC 11 | C6-C5 | Spare |  |
| OC 12 | C8-C7 | Spare |  |
| OC 13 | C10-C9 | Spare |  |
| OC 14 | C12-C11 | Spare |  |
| OC 15 | C14-C13 | Spare |  |
| OC 16 | C16-C15 | Spare |  |
| OC 17 | D2-D1 | Spare |  |
| OC 18 | D4-D3 | Spare |  |
| OC 19 | D6-D5 | Spare |  |
| OC 20 | D8-D7 | Spare |  |
| OC 21 | D10-D9 | Spare |  |
| OC 22 | D12-D11 | Spare |  |
| OC 23 | D14-D13 | Spare |  |
| OC 24 | D16-D15 | Spare |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Binary Outputs** | **Terminals** | **Function (Duty)** | **Checked** | **Binary Outputs** | **Terminals** | **Function (Duty)** | **Checked** |
| RL01 | F2-F1 | Spare |  | RL09 | E2-E1 | Spare |  |
| RL02 | F4-F3 | Spare |  | RL10 | E4-E3 | Spare |  |
| RL03 | F6-F5 | Spare |  | RL11 | E6-E5 | Spare |  |
| RL04 | F8-F7 | Spare |  | RL12 | E8-E7 | Spare |  |
| RL05 | F10-F9 | Spare |  | RL13 | E10-E9 | Spare |  |
| RL06 | F12-F11 | Spare |  | RL14 | E12-E11 | Spare |  |
| RL07 | F15-F14(N/O) F15-F13(N/C) | Spare |  | RL15 | E15-E14(N/O) E15-E13(N/C) | Spare |  |
| RL08 | F18-F17(N/O)  D18-D16(N/C) | Spare |  | RL16 | E18-E17(N/O) D18-D16(N/C) | Spare |  |

Bay Unit LEDs:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **LED’S** | **Function (Duty)** | **Checked** | **LED’S** | **Function (Duty)** | **Checked** |
| LED 01 | DS 904 CLOSE/OPEN |  | FnkeyLED 01 | CBF from CU |  |
| LED 02 | DS 906 CLOSE/OPEN |  | FnkeyLED 02 | SPARE |  |
| LED 03 | CB 905 CLOSE/OPEN |  | FnkeyLED 03 | SPARE |  |
| LED 04 | 87BB Trip |  | FnkeyLED 04 | IMAGE ALARM |  |
| LED 05 | CBF TRIP |  | FnkeyLED 05 | SPARE |  |
| LED 06 | CT Fail |  | FnkeyLED 06 | SPARE |  |
| LED 07 | CBF INIT |  | FnkeyLED 07 | SPARE |  |
| LED 08 | FIBER COMM ERROR |  | FnkeyLED 08 | SPARE |  |
| Fnkey 09LED | SPARE |  | FnkeyLED 10 | RESET INDICATION |  |

**BAY Name: PU16 (D11)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Binary Inputs** | **Terminals** | **Function (Duty)** | **Checked** |
| OC 01 | B2-B1 | CB 1105 OPEN |  |
| OC 02 | B4-B3 | CB 1105 CLOSE |  |
| OC 03 | B6-B5 | DS 1104 OPEN |  |
| OC 04 | B8-B7 | DS 1104 CLOSE |  |
| OC 05 | B10-B9 | DS 1106 OPEN |  |
| OC 06 | B12-B11 | DS 1106 CLOSE |  |
| OC 07 | B14-B13 | CBF INIT |  |
| OC 08 | B16-B15 | Spare |  |
| OC 09 | C2-C1 | Spare |  |
| OC 10 | C4-C3 | Spare |  |
| OC 11 | C6-C5 | Spare |  |
| OC 12 | C8-C7 | Spare |  |
| OC 13 | C10-C9 | Spare |  |
| OC 14 | C12-C11 | Spare |  |
| OC 15 | C14-C13 | Spare |  |
| OC 16 | C16-C15 | Spare |  |
| OC 17 | D2-D1 | Spare |  |
| OC 18 | D4-D3 | Spare |  |
| OC 19 | D6-D5 | Spare |  |
| OC 20 | D8-D7 | Spare |  |
| OC 21 | D10-D9 | Spare |  |
| OC 22 | D12-D11 | Spare |  |
| OC 23 | D14-D13 | Spare |  |
| OC 24 | D16-D15 | Spare |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Binary Outputs** | **Terminals** | **Function (Duty)** | **Checked** | **Binary Outputs** | **Terminals** | **Function (Duty)** | **Checked** |
| RL01 | F2-F1 | Spare |  | RL09 | E2-E1 | Spare |  |
| RL02 | F4-F3 | Spare |  | RL10 | E4-E3 | Spare |  |
| RL03 | F6-F5 | Spare |  | RL11 | E6-E5 | Spare |  |
| RL04 | F8-F7 | Spare |  | RL12 | E8-E7 | Spare |  |
| RL05 | F10-F9 | Spare |  | RL13 | E10-E9 | Spare |  |
| RL06 | F12-F11 | Spare |  | RL14 | E12-E11 | Spare |  |
| RL07 | F15-F14(N/O) F15-F13(N/C) | Spare |  | RL15 | E15-E14(N/O) E15-E13(N/C) | Spare |  |
| RL08 | F18-F17(N/O)  D18-D16(N/C) | Spare |  | RL16 | E18-E17(N/O) D18-D16(N/C) | Spare |  |

Bay Unit LEDs:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **LED’S** | **Function (Duty)** | **Checked** | **LED’S** | **Function (Duty)** | **Checked** |
| LED 01 | DS 1104 CLOSE/OPEN |  | FnkeyLED 01 | CBF from CU |  |
| LED 02 | DS 1106 CLOSE/OPEN |  | FnkeyLED 02 | SPARE |  |
| LED 03 | CB 1105 CLOSE/OPEN |  | FnkeyLED 03 | SPARE |  |
| LED 04 | 87BB Trip |  | FnkeyLED 04 | IMAGE ALARM |  |
| LED 05 | CBF TRIP |  | FnkeyLED 05 | SPARE |  |
| LED 06 | CT Fail |  | FnkeyLED 06 | SPARE |  |
| LED 07 | CBF INIT |  | FnkeyLED 07 | SPARE |  |
| LED 08 | FIBER COMM ERROR |  | FnkeyLED 08 | SPARE |  |
| Fnkey 09LED | SPARE |  | FnkeyLED 10 | RESET INDICATION |  |

**BAY Name: PU17(D13)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Binary Inputs** | **Terminals** | **Function (Duty)** | **Checked** |
| OC 01 | B2-B1 | CB 1305 OPEN |  |
| OC 02 | B4-B3 | CB 1305 CLOSE |  |
| OC 03 | B6-B5 | DS 1304 OPEN |  |
| OC 04 | B8-B7 | DS 1304 CLOSE |  |
| OC 05 | B10-B9 | DS 1306 OPEN |  |
| OC 06 | B12-B11 | DS 1306 CLOSE |  |
| OC 07 | B14-B13 | CBF INIT |  |
| OC 08 | B16-B15 | Spare |  |
| OC 09 | C2-C1 | Spare |  |
| OC 10 | C4-C3 | Spare |  |
| OC 11 | C6-C5 | Spare |  |
| OC 12 | C8-C7 | Spare |  |
| OC 13 | C10-C9 | Spare |  |
| OC 14 | C12-C11 | Spare |  |
| OC 15 | C14-C13 | Spare |  |
| OC 16 | C16-C15 | Spare |  |
| OC 17 | D2-D1 | Spare |  |
| OC 18 | D4-D3 | Spare |  |
| OC 19 | D6-D5 | Spare |  |
| OC 20 | D8-D7 | Spare |  |
| OC 21 | D10-D9 | Spare |  |
| OC 22 | D12-D11 | Spare |  |
| OC 23 | D14-D13 | Spare |  |
| OC 24 | D16-D15 | Spare |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Binary Outputs** | **Terminals** | **Function (Duty)** | **Checked** | **Binary Outputs** | **Terminals** | **Function (Duty)** | **Checked** |
| RL01 | F2-F1 | Spare |  | RL09 | E2-E1 | Spare |  |
| RL02 | F4-F3 | Spare |  | RL10 | E4-E3 | Spare |  |
| RL03 | F6-F5 | Spare |  | RL11 | E6-E5 | Spare |  |
| RL04 | F8-F7 | Spare |  | RL12 | E8-E7 | Spare |  |
| RL05 | F10-F9 | Spare |  | RL13 | E10-E9 | Spare |  |
| RL06 | F12-F11 | Spare |  | RL14 | E12-E11 | Spare |  |
| RL07 | F15-F14(N/O) F15-F13(N/C) | Spare |  | RL15 | E15-E14(N/O) E15-E13(N/C) | Spare |  |
| RL08 | F18-F17(N/O)  D18-D16(N/C) | Spare |  | RL16 | E18-E17(N/O) D18-D16(N/C) | Spare |  |

Bay Unit LEDs:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **LED’S** | **Function (Duty)** | **Checked** | **LED’S** | **Function (Duty)** | **Checked** |
| LED 01 | DS 1304 CLOSE/OPEN |  | FnkeyLED 01 | CBF from CU |  |
| LED 02 | DS 1306 CLOSE/OPEN |  | FnkeyLED 02 | SPARE |  |
| LED 03 | CB 1305 CLOSE/OPEN |  | FnkeyLED 03 | SPARE |  |
| LED 04 | 87BB Trip |  | FnkeyLED 04 | IMAGE ALARM |  |
| LED 05 | CBF TRIP |  | FnkeyLED 05 | SPARE |  |
| LED 06 | CT Fail |  | FnkeyLED 06 | SPARE |  |
| LED 07 | CBF INIT |  | FnkeyLED 07 | SPARE |  |
| LED 08 | FIBER COMM ERROR |  | FnkeyLED 08 | SPARE |  |
| Fnkey 09LED | SPARE |  | FnkeyLED 10 | RESET INDICATION |  |

**BAY Name: PU18 (D15)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Binary Inputs** | **Terminals** | **Function (Duty)** | **Checked** |
| OC 01 | B2-B1 | CB 1505 OPEN |  |
| OC 02 | B4-B3 | CB 1505 CLOSE |  |
| OC 03 | B6-B5 | DS 1504 OPEN |  |
| OC 04 | B8-B7 | DS 1504 CLOSE |  |
| OC 05 | B10-B9 | DS 1506 OPEN |  |
| OC 06 | B12-B11 | DS 1506 CLOSE |  |
| OC 07 | B14-B13 | CBF INIT |  |
| OC 08 | B16-B15 | Spare |  |
| OC 09 | C2-C1 | Spare |  |
| OC 10 | C4-C3 | Spare |  |
| OC 11 | C6-C5 | Spare |  |
| OC 12 | C8-C7 | Spare |  |
| OC 13 | C10-C9 | Spare |  |
| OC 14 | C12-C11 | Spare |  |
| OC 15 | C14-C13 | Spare |  |
| OC 16 | C16-C15 | Spare |  |
| OC 17 | D2-D1 | Spare |  |
| OC 18 | D4-D3 | Spare |  |
| OC 19 | D6-D5 | Spare |  |
| OC 20 | D8-D7 | Spare |  |
| OC 21 | D10-D9 | Spare |  |
| OC 22 | D12-D11 | Spare |  |
| OC 23 | D14-D13 | Spare |  |
| OC 24 | D16-D15 | Spare |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Binary Outputs** | **Terminals** | **Function (Duty)** | **Checked** | **Binary Outputs** | **Terminals** | **Function (Duty)** | **Checked** |
| RL01 | F2-F1 | Spare |  | RL09 | E2-E1 | Spare |  |
| RL02 | F4-F3 | Spare |  | RL10 | E4-E3 | Spare |  |
| RL03 | F6-F5 | Spare |  | RL11 | E6-E5 | Spare |  |
| RL04 | F8-F7 | Spare |  | RL12 | E8-E7 | Spare |  |
| RL05 | F10-F9 | Spare |  | RL13 | E10-E9 | Spare |  |
| RL06 | F12-F11 | Spare |  | RL14 | E12-E11 | Spare |  |
| RL07 | F15-F14(N/O) F15-F13(N/C) | Spare |  | RL15 | E15-E14(N/O) E15-E13(N/C) | Spare |  |
| RL08 | F18-F17(N/O)  D18-D16(N/C) | Spare |  | RL16 | E18-E17(N/O) D18-D16(N/C) | Spare |  |

Bay Unit LEDs:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **LED’S** | **Function (Duty)** | **Checked** | **LED’S** | **Function (Duty)** | **Checked** |
| LED 01 | DS 1504 CLOSE/OPEN |  | FnkeyLED 01 | CBF from CU |  |
| LED 02 | DS 1506 CLOSE/OPEN |  | FnkeyLED 02 | SPARE |  |
| LED 03 | CB 1505 CLOSE/OPEN |  | FnkeyLED 03 | SPARE |  |
| LED 04 | 87BB Trip |  | FnkeyLED 04 | IMAGE ALARM |  |
| LED 05 | CBF TRIP |  | FnkeyLED 05 | SPARE |  |
| LED 06 | CT Fail |  | FnkeyLED 06 | SPARE |  |
| LED 07 | CBF INIT |  | FnkeyLED 07 | SPARE |  |
| LED 08 | FIBER COMM ERROR |  | FnkeyLED 08 | SPARE |  |
| Fnkey 09LED | SPARE |  | FnkeyLED 10 | RESET INDICATION |  |

**SECONDARY INJECTION TEST:**

**5.1: CHECK OF THE INPUT CURRENT TRANSFORMERS.**

- Measurements are taken as per Bus Zone selection by relative Disconnector closing in the bay.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **BAY NO.** | **CT**  **RATIO**  **[A]** | **CURRENT INJECTED [A]** | | | **CURRENT MEASURED  in CU [A]** | | | **CURRENT MEASURED in PU [A]** | | | | **ISOLATOR** | **MEAS. ZONES** |
| **Rph** | **Yph** | **Bph** | **Rph** | **Yph** | **Bph** | **Rph** | **Yph** | **Bph** | **IN** |  |  |
| **D130-1A** | 4000/1 | 0.5 | 0.75 | 1 |  |  |  |  |  |  |  | BOTH&CB | Z1A |
| **D130-2A** | 4000/1 | 0.5 | 0.75 | 1 |  |  |  |  |  |  |  | BOTH&CB | Z2A |
| **D120-1B** | 4000/1 | 0.5 | 0.75 | 1 |  |  |  |  |  |  |  | BOTH&CB | Z1A |
| **D120-2B** | 4000/1 | 0.5 | 0.75 | 1 |  |  |  |  |  |  |  | BOTH&CB | Z2A |
| **D01** | 4000/1 | 0.5 | 0.75 | 1 |  |  |  |  |  |  |  | 104 | Z1A |
| 0.5 | 0.75 | 1 |  |  |  |  |  |  |  | 106 | Z2A |
| **D03** | 4000/1 | 0.5 | 0.75 | 1 |  |  |  |  |  |  |  | 304 | Z1A |
| 0.5 | 0.75 | 1 |  |  |  |  |  |  |  | 306 | Z2A |
| **D05** | 4000/1 | 0.5 | 0.75 | 1 |  |  |  |  |  |  |  | 504 | Z1A |
| 0.5 | 0.75 | 1 |  |  |  |  |  |  |  | 506 | Z2A |
| **D07** | 4000/1 | 0.5 | 0.75 | 1 |  |  |  |  |  |  |  | 704 | Z1A |
| 0.5 | 0.75 | 1 |  |  |  |  |  |  |  | 706 | Z2A |
| **D09** | 4000/1 | 0.5 | 0.75 | 1 |  |  |  |  |  |  |  | 904 | Z1A |
| 0.5 | 0.75 | 1 |  |  |  |  |  |  |  | 906 | Z2A |
| **D11** | 4000/1 | 0.5 | 0.75 | 1 |  |  |  |  |  |  |  | 1104 | Z1A |
| 0.5 | 0.75 | 1 |  |  |  |  |  |  |  | 1106 | Z2A |
| **D13** | 4000/1 | 0.5 | 7 | Z3 |
| 0.5 | 0.75 | 1 |  |  |  |  |  |  |  | 1304 | Z1A |
| 0.5 | 0.75 | 1 |  |  |  |  |  |  |  | 1306 | Z2A |
| **D15** | 4000/1 | 0.5 | 0.75 | 1 |  |  |  |  |  |  |  | 1504 | Z1A |
|  | 0.5 | 0.75 | 1 |  |  |  |  |  |  |  | 1506 | Z2A |

**5.2: ID>1 THRESHOLD (CIRCUITRY FAULT CURRENT) TEST**

ID>1 = 100 A

tID>1 = 3 s

K ID>1 = 30%

* Set ID>1 alarm timer to 100 ms.
* Applied a current on R phase of each PU and increase the current till appear the circuitry fault alarm*.* (Output relay of CU “circuitry fault”)
* Repeat the same for Y & B phase.
* Measure the ID>1 Alarm as per the setting.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **BAY NO.** | **CT RATIO [A]** | **ID>1 Set Value[A]** | **tID>1 Set[Sec]** | **Measured pickup Value [A]** | | | **Measured Time at 2\* I D>1 [Sec]** | | |
| **R, Y, B** | **R, Y, B** | **Rph** | **Yph** | **Bph** | **Rph** | **Yph** | **Bph** |
| D130-1A | 4000/1 | 100 | 3 |  |  |  |  |  |  |
| D130-2A | 4000/1 | 100 | 3 |  |  |  |  |  |  |
| D120-1B | 4000/1 | 100 | 3 |  |  |  |  |  |  |
| D220-2B | 4000/1 | 100 | 3 |  |  |  |  |  |  |
| D01 | 4000/1 | 100 | 3 |  |  |  |  |  |  |
| D03 | 4000/1 | 100 | 3 |  |  |  |  |  |  |
| D05 | 4000/1 | 100 | 3 |  |  |  |  |  |  |
| D07 | 4000/1 | 100 | 3 |  |  |  |  |  |  |
| D09 | 4000/1 | 100 | 3 |  |  |  |  |  |  |
| D11 | 4000/1 | 100 | 3 |  |  |  |  |  |  |
| D13 | 4000/1 | 100 | 3 |  |  |  |  |  |  |
| D15 | 4000/1 | 100 | 3 |  |  |  |  |  |  |

**5.3: ID>2 THRESHOLD (TRIPPING CURRENT) TEST:**

ID>2 = 48000 A

K2 = 60%

Applied a current on R phase of each PU and increase the current until the trip of PU

Repeat the same for Y & B phase.

* Measure the tripping Time.
* The tripping time is less than one cycle (<20 ms).

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Panel Ref/  Bay No** | **CT RATIO [A/A]** | **ID>2 Primary (A)** | **ID>2 Setting Calculated  Sec.value (A)** | **Measured Pickup Value [A]** | | | **Measured Time at 2\*ID>2 Pickup Value [ms]** | | |
| **Rph** | **Yph** | **Bph** | **Rph** | **Yph** | **Bph** |
| D130-1A | 4000/1 | 4800 | 1.2 |  |  |  |  |  |  |
| D130-2A | 4000/1 | 4800 | 1.2 |  |  |  |  |  |  |
| D120-1B | 4000/1 | 4800 | 1.2 |  |  |  |  |  |  |
| D220-2B | 4000/1 | 4800 | 1.2 |  |  |  |  |  |  |
| D01 | 4000/1 | 4800 | 1.2 |  |  |  |  |  |  |
| D03 | 4000/1 | 4800 | 1.2 |  |  |  |  |  |  |
| D05 | 4000/1 | 4800 | 1.2 |  |  |  |  |  |  |
| D07 | 4000/1 | 4800 | 1.2 |  |  |  |  |  |  |
| D09 | 4000/1 | 4800 | 1.2 |  |  |  |  |  |  |
| D11 | 4000/1 | 4800 | 1.2 |  |  |  |  |  |  |
| D13 | 4000/1 | 4800 | 1.2 |  |  |  |  |  |  |
| D15 | 4000/1 | 4800 | 1.2 |  |  |  |  |  |  |

**5.4: TEST OF ISOLATOR ALARM OPTIONS.**

|  |  |  |  |
| --- | --- | --- | --- |
| **Panel Ref/  Bay No** | **Q1 Alarm** | **Q2 Alarm** | **CB Alarm** |
| D130-1A |  |  |  |
| D130-2A |  |  |  |
| D120-1B |  |  |  |
| D220-2B |  |  |  |
| D01 |  |  |  |
| D03 |  |  |  |
| D05 |  |  |  |
| D07 |  |  |  |
| D09 |  |  |  |
| D11 |  |  |  |
| D13 |  |  |  |
| D15 |  |  |  |

**5.5. -BUS BAR PROTECTION SLOPE TEST:**

I Diff

K2 = KCZ

ID>2 = IDCZ>2

K1

ID>1

I Bias

Ibias = A

* Inject the current as per the following:

I1 => on R Phase of PU No. 1

I2 => on R phase of PU No.2

* By using ramping technique, increase current in one bay and decrease in the other until get the diff value.

1. Idiff > ( K2 \* Ibias ), Idiff > (KCZ \* Ibais )
2. Idiff > ( ID>2), Idiff (IDCZ>2 )

IDCZ>2

=

ID>2

Ibias =

KCZ

K2

1. Idiff > K x Ibias
2. Idiff > Id>2

**I Bias = I1 + I 2**

**I Diff = I1 – I 2**

**Slope K = I Diff operated / I Bias.**

* Discrimination zone slop testing-

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Phase | D05/ PU13 | D13/ PU17 | Ibias | EXP. Idiff | Operated Idiff  ZONE 1A  DS Q1 close | Operated Idiff  ZONE 2A  DS Q2 close |
| CT Ratio | 4000/1 | 4000/1 |
| PH-R | 1 | 1 | 2 | 1.2 |  |  |
| PH-R | 1.5 | 1.5 | 3 | 1.8 |  |  |
| PH-R | 2 | 2 | 4 | 2.4 |  |  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Phase | D05/ PU13 | D13/ PU17 | Ibias | EXP. Idiff | Operated Idiff  ZONE 1A  DS Q1 close | Operated Idiff  ZONE 2A  DS Q2 close |
| CT Ratio | 4000/1 | 4000/1 |
| PH-Y | 1 | 1 | 2 | 1.2 |  |  |
| PH-Y | 1.5 | 1.5 | 3 | 1.8 |  |  |
| PH-Y | 2 | 2 | 4 | 2.4 |  |  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Phase | D05/ PU13 | D13/ PU17 | Ibias | EXP. Idiff | Operated Idiff  ZONE 1A  DS Q1 close | Operated Idiff  ZONE 2A  DS Q2 close |
| CT Ratio | 4000/1 | 4000/1 |
| PH-B | 1 | 1 | 2 | 1.2 |  |  |
| PH-B | 1.5 | 1.5 | 3 | 1.8 |  |  |
| PH-B | 2 | 2 | 4 | 2.4 |  |  |

* Check zone slop testing-

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Phase | D05/ PU13 | D13/ PU17 | Ibias | EXP. Idiff | Operated Idiff |
| CT Ratio | 4000/1 | 4000/1 |
| PH-R | 2 | 2 | 4 | 1.2 |  |
| PH-R | 3 | 3 | 6 | 1.8 |  |
| PH-R | 3.5 | 3.5 | 7 | 2.1 |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Phase | D05/ PU13 | D13/ PU17 | Ibias | EXP. Idiff | Operated Idiff |
| CT Ratio | 4000/1 | 4000/1 |
| PH-Y | 2 | 2 | 4 | 1.2 |  |
| PH-Y | 3 | 3 | 6 | 1.8 |  |
| PH-Y | 3.5 | 3.5 | 7 | 2.1 |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Phase | D05/ PU13 | D13/ PU17 | Ibias | EXP. Idiff | Operated Idiff |
| CT Ratio | 4000/1 | 4000/1 |
| PH-B | 2 | 2 | 4 | 1.2 |  |
| PH-B | 3 | 3 | 6 | 1.8 |  |
| PH-B | 3.5 | 3.5 | 7 | 2.1 |  |

**5.6 BREAKER FAIL PROTECTION**

**Breaker Failure Protection:Pickup & Drop-off & Timing Test for external initiation**

Settings: ***T3,4=150ms I<=0.1 A***

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **PU No.** | **Phase** | *Circuit Breaker Failure* | | | | | **Relay LED** | **Remarks** |
| **I Set (A)** | **P/U (A)** | **D/O (A)** | **Stg – 4 (m sec)** | **Inter trip from other PU(m sec)** |
| **PU7**  **D130B**  **(2A)** | R | 0.1 |  |  |  |  | CBF |  |
| Y |  |  |  |  | CBF |  |
| B |  |  |  |  | CBF |  |
| **PU8**  **D130A**  **(1A)** | R | 0.1 |  |  |  |  | CBF |  |
| Y |  |  |  |  | CBF |  |
| B |  |  |  |  | CBF |  |
| **PU9**  **D220B**  **(2B)** | R | 0.1 |  |  |  |  | CBF |  |
| Y |  |  |  |  | CBF |  |
| B |  |  |  |  | CBF |  |
| **PU10**  **D120B**  **(1B)** | R | 0.1 |  |  |  |  | CBF |  |
| Y |  |  |  |  | CBF |  |
| B |  |  |  |  | CBF |  |
| **PU11**  **D01** | R | 0.1 |  |  |  |  | CBF |  |
| Y |  |  |  |  | CBF |  |
| B |  |  |  |  | CBF |  |
| **PU12**  **D03** | R | 0.1 |  |  |  |  | CBF |  |
| Y |  |  |  |  | CBF |  |
| B |  |  |  |  | CBF |  |
| **PU13**  **D05** | R | 0.1 |  |  |  |  | CBF |  |
| Y |  |  |  |  | CBF |  |
| B |  |  |  |  | CBF |  |
| **PU14**  **D07** | R | 0.1 |  |  |  |  | CBF |  |
| Y |  |  |  |  | CBF |  |
| B |  |  |  |  | CBF |  |
| **PU15**  **D09** | R | 0.1 |  |  |  |  | CBF |  |
| Y |  |  |  |  | CBF |  |
| B |  |  |  |  | CBF |  |
| **PU16**  **D11** | R | 0.1 |  |  |  |  | CBF |  |
| Y |  |  |  |  | CBF |  |
| B |  |  |  |  | CBF |  |
| **PU17**  **D13** | R | 0.1 |  |  |  |  | CBF |  |
| Y |  |  |  |  | CBF |  |
| B |  |  |  |  | CBF |  |
| **PU18**  **D15** | R | 0.1 |  |  |  |  | CBF |  |
| Y |  |  |  |  | CBF |  |
| B |  |  |  |  | CBF |  |

**5.6 BREAKER FAIL PROTECTION**

**Breaker Failure Protection:Pickup & Drop-off & Timing Test for Internal initiation**

Settings: ***T2=150ms I<=0.1 A***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **PU No.** | **Phase** |  | | *Circuit Breaker Failure* | | **Relay LED** | **Remarks** |
| **I Set (A)** | **BB-TRIP (m sec)** | | **Stg – 2 (m sec)** |
| **PU7**  **D130B**  **(2A)** | R | 0.1 |  | |  | CBF |  |
| Y |  | |  | CBF |  |
| B |  | |  | CBF |  |
| **PU8**  **D130A**  **(1A)** | R | 0.1 |  | |  | CBF |  |
| Y |  | |  | CBF |  |
| B |  | |  | CBF |  |
| **PU9**  **D220B**  **(2B)** | R | 0.1 |  | |  | CBF |  |
| Y |  | |  | CBF |  |
| B |  | |  | CBF |  |
| **PU10**  **D120B**  **(1B)** | R | 0.1 |  | |  | CBF |  |
| Y |  | |  | CBF |  |
| B |  | |  | CBF |  |
| **PU11**  **D01** | R | 0.1 |  | |  | CBF |  |
| Y |  | |  | CBF |  |
| B |  | |  | CBF |  |
| **PU12**  **D03** | R | 0.1 |  | |  | CBF |  |
| Y |  | |  | CBF |  |
| B |  | |  | CBF |  |
| **PU13**  **D05** | R | 0.1 |  | |  | CBF |  |
| Y |  | |  | CBF |  |
| B |  | |  | CBF |  |
| **PU14**  **D07** | R | 0.1 |  | |  | CBF |  |
| Y |  | |  | CBF |  |
| B |  | |  | CBF |  |
| **PU15**  **D09** | R | 0.1 |  | |  | CBF |  |
| Y |  | |  | CBF |  |
| B |  | |  | CBF |  |
| **PU16**  **D11** | R | 0.1 |  | |  | CBF |  |
| Y |  | |  | CBF |  |
| B |  | |  | CBF |  |
| **PU17**  **D13** | R | 0.1 |  | |  | CBF |  |
| Y |  | |  | CBF |  |
| B |  | |  | CBF |  |
| **PU18**  **D15** | R | 0.1 |  | |  | CBF |  |
| Y |  | |  | CBF |  |
| B |  | |  | CBF |  |

**5.7. TOPOLOGY**

**Bus Coupler-A Function with 2 CT:**

**Case 1:-**

**Fault fed from BUS 1A to BUS2A via Bus coupler-A**

. BB1A DISCONNECTOR ON

.

BB2A DISCONNECTOR OFF

. CIRCUIT BREAKER ON

. Q1 Q2 Q1 Q2 Q1 Q2 CT LOCATION

. CURRENT FLOW PATH

.

305 105 T1 T2 FAULT LOCATION

. T1 T1 130

D03 D01 D130

Faulty busbar trips immediately (Bus-2A & D01) 16 ms

**Case 2:-**

**Fault fed from BUS2A to BUS1A via Bus coupler-1**

. BB1A DISCONNECTOR ON

.

BB2A DISCONNECTOR OFF

. CIRCUIT BREAKER ON

. Q1 Q2 Q1 Q2 Q1 Q2 CT LOCATION

. CURRENT FLOW PATH

.

105 305 T1 T2 FAULT LOCATION

. T1 T1 130

D01 D03 D130

Faulty busbar trips immediately (Bus-1A & D01) 16 ms

**INTERNAL FAULT IN BUS COUPLER**

**Case 1:-**

**No current passing in T2 of Bus coupler.**

. BB1A DISCONNECTOR ON

.

BB2A DISCONNECTOR OFF

. CIRCUIT BREAKER ON

. Q1 Q2 Q1 Q2 Q1 Q2 CT LOCATION

. CURRENT FLOW PATH

.

305 107 T1 T2 FAULT LOCATION

. T1 T1 130

D03 D01 D130

Faulty Busbar B/C1A & B/C 2A trips immediately 16 ms

Faulty Busbar D03 trips after Delay 84 ms

**Case 2:-**

**No current passing in T1 of Bus coupler.**

. BB1A DISCONNECTOR ON

.

BB2A DISCONNECTOR OFF

. CIRCUIT BREAKER ON

. Q1 Q2 Q1 Q2 Q1 Q2 CT LOCATION

. CURRENT FLOW PATH

.

105 307 T1 T2 FAULT LOCATION

. T1 T1 130

D01 D03 D130

Faulty Busbar B/C1A & B/C2A trips immediately 16 ms

Faulty Busbar D03 trips after time delay 77 ms

**TESTING OF EXTERNAL FAULT**

**Bus coupler with 2 CT:**

**Case 1:**

. BB1A DISCONNECTOR ON

.

BB2A DISCONNECTOR OFF

. CIRCUIT BREAKER ON

. Q1 Q2 Q1 Q2 Q1 Q2 CT LOCATION

. CURRENT FLOW PATH

.

105 307 T1 T2 FAULT LOCATION

. T1 T1 130

D01 D03 D130

No TRIP (Stable condition) OK

**Case 2:**

. BB1A DISCONNECTOR ON

.

BB2A DISCONNECTOR OFF

. CIRCUIT BREAKER ON

. Q1 Q2 Q1 Q2 Q1 Q2 CT LOCATION

. CURRENT FLOW PATH

.

105 307 T1 T2 FAULT LOCATION

. T1 T1 130

D01 D03 D130

No TRIP (Stable condition) OK

**BUS COUPLER-B FUNCTION WITH 2 CT:**

**Case 1:-**

**Fault fed from BUS 1B to BUS2B via Bus coupler-B**

. BB1B DISCONNECTOR ON

.

BB2B DISCONNECTOR OFF

. CIRCUIT BREAKER ON

. Q1 Q2 Q1 Q2 Q1 Q2 CT LOCATION

. CURRENT FLOW PATH

.

205 405 T1 T2 FAULT LOCATION

. T1 T1 230

D02 D04 D230

Faulty busbar trips immediately (Bus-2B & D04) 16 ms

**Case 2:-**

**Fault fed from BUS2A to BUS1A via Bus coupler-1**

. BB1B DISCONNECTOR ON

.

BB2B DISCONNECTOR OFF

. CIRCUIT BREAKER ON

. Q1 Q2 Q1 Q2 Q1 Q2 CT LOCATION

. CURRENT FLOW PATH

.

405 205 T1 T2 FAULT LOCATION

. T1 T1 230

D04 D02 D230

Faulty busbar trips immediately (Bus-1A & D04) 16 ms

**INTERNAL FAULT IN BUS COUPLER**

**Case 1:-**

**No current passing in T2 of Bus coupler.**

. BB1B DISCONNECTOR ON

.

BB2B DISCONNECTOR OFF

. CIRCUIT BREAKER ON

. Q1 Q2 Q1 Q2 Q1 Q2 CT LOCATION

. CURRENT FLOW PATH

.

405 207 T1 T2 FAULT LOCATION

. T1 T1 130

D04 D02 D230

Faulty Busbar B/C1B & B/C 2B trips immediately 16 ms

Faulty Busbar D04 trips after Delay 84 ms

**Case 2:-**

**No current passing in T1 of Bus coupler.**

. BB1B DISCONNECTOR ON

.

BB2B DISCONNECTOR OFF

. CIRCUIT BREAKER ON

. Q1 Q2 Q1 Q2 Q1 Q2 CT LOCATION

. CURRENT FLOW PATH

.

205 405 T1 T2 FAULT LOCATION

. T1 T1 230

D02 D04 D130

Faulty Busbar B/C1B & B/C2B trips immediately 16 ms

Faulty Busbar D04 trips after time delay 77 ms

**TESTING OF EXTERNAL FAULT**

**Bus coupler with 2 CT:**

**Case 1:**

. BB1B DISCONNECTOR ON

.

BB2B DISCONNECTOR OFF

. CIRCUIT BREAKER ON

. Q1 Q2 Q1 Q2 Q1 Q2 CT LOCATION

. CURRENT FLOW PATH

.

205 405 T1 T2 FAULT LOCATION

. T1 T1 230

D02 D04 D230

No TRIP (Stable condition) OK

**Case 2:**

. BB1B DISCONNECTOR ON

.

BB2B DISCONNECTOR OFF

. CIRCUIT BREAKER ON

. Q1 Q2 Q1 Q2 Q1 Q2 CT LOCATION

. CURRENT FLOW PATH

.

205 405 T1 T2 FAULT LOCATION

. T1 T1 230

D02 D04 D230

No TRIP (Stable condition) OK

**BUS SECTION FUNCTION WITH 2 CT**

**Condition A**

Fault fed from BUS1A to BUS1C via Bus section

. BB1A BB1C DISCONNECTOR ON

. DISCONNECTOR OFF

. BB2A BB2C CIRCUIT BREAKER ON

. CT LOCATION

. CURRENT FLOW DIRECTION

. Q1 Q2 Q1 Q2 Q1 Q2 FAULT LOCATION

.

T 1 T2

. B/S

. 105 206

.

BUS SECTION

. T1 T1

.

. D01 D02

Faulty busbar trips immediately (B/S-1B & D02) 15 ms

**Condition B**

Fault fed from BUS1C to BUS1A via Bus section

. BB1A BB1C DISCONNECTOR ON

. DISCONNECTOR OFF

. BB2A BB2C CIRCUIT BREAKER ON

. CT LOCATION

. CURRENT FLOW DIRECTION

. Q1 Q2 Q1 Q2 Q1 Q2 FAULT LOCATION

.

T1 T2

. B/S

. 105 205

.

BUS SECTION

. T1 T1

. D01 D02

Faulty busbar trips immediately (Bus-1A & D01) 16 ms

**INTERNAL FAULT IN BUS SECTION BETWEEN 2 CT’s**

**No current passing in T2 of Bus section.**

. BB1A BB1C DISCONNECTOR ON

. DISCONNECTOR OFF

. BB2A BB2C CIRCUIT BREAKER ON

. CT LOCATION

. CURRENT FLOW DIRECTION

. Q1 Q2 Q1 Q2 Q1 Q2 FAULT LOCATION

.

T 1 T2

. B/S

. 105 2205

.

BUS SECTION

. T1 T1

.

. D105 D205

Faulty Busbar trips immediately B/S-1A& B/S-1B 15 ms

Faulty Busbar Trips Delayed D02 80 ms

**No current passing in T1 of Bus section .**

. BB1A BB1C DISCONNECTOR ON

. DISCONNECTOR OFF

. BB2A BB2C CIRCUIT BREAKER ON

. CT LOCATION

. CURRENT FLOW DIRECTION

. Q1 Q2 Q1 Q2 Q1 Q2 FAULT LOCATION

.

T1 T2

. B/S

. A605 A606

.

BUS SECTION

. T1 T1

. D01 D02

Faulty Busbar trips immediately B/S-1A& B/S-1B 15 ms

Faulty Busbar Trips Delayed D01 80 ms

**TESTING OF EXTERNAL FAULT WITH BUS SECTION CLOSED**

**Condition A**

. BB1A BB1C DISCONNECTOR ON

. DISCONNECTOR OFF

. BB2A BB2C CIRCUIT BREAKER ON

. CT LOCATION

. CURRENT FLOW DIRECTION

. Q1 Q2 Q1 Q2 Q1 Q2 FAULT LOCATION

.

T 1 T2

. B/S

. 105 205

.

BUS SECTION

. T1 T1

.

. D01 D02

No Trip (Stable condition) OK

**Condition B**

. BB1A BB1C DISCONNECTOR ON

. DISCONNECTOR OFF

. BB2A BB2C CIRCUIT BREAKER ON

. CT LOCATION

. CURRENT FLOW DIRECTION

. Q1 Q2 Q1 Q2 Q1 Q2 FAULT LOCATION

.

T1 T2

. B/S

. 105 206

.

BUS SECTION

. T1 T1

. D01 D02

No Trip (Stable condition) OK

**TESTING OF Internal FAULT WITH BUS SECTION-2 isolators CLOSED**

. BB2A BB2B DISCONNECTOR ON

. DISCONNECTOR OFF

. BB1A BB1B CIRCUIT BREAKER ON

. CT LOCATION

. CURRENT FLOW DIRECTION

. Q2 Q1 Q1 Q2 Q2 Q1 FAULT LOCATION

.

T 1 T2

. 105 205

.

BUS SECTION

. T1 T1

.

. D01 D02

Busbar Trips all connected bays instantaneously ( D01 & D02 ). 16 ms