1. **GENERAL DATA AND INFORMATION :**

|  |  |  |  |
| --- | --- | --- | --- |
| Panel Name |  | Aux. Voltage |  |
| Bay Name |  | Serial No. |  |
| Manufacturer |  | Order No. |  |
| Rated Current in Service |  | Frequency |  |
| Opto I/P volts |  | CT Ratio |  |
| Designation |  | Location |  |

[..\WorkInstructions\64.pdf](file:///D:\Removable%20Disk\DHRAN%20CENTRAL\WorkInstructions\64.pdf)

**2. MECHANICAL CHECKS AND VISUAL INSPECTION:**



**3. RELAY CHECKS (With Relay De-energized):**

|  |  |  |
| --- | --- | --- |
| SERIAL NO. | Relay Checks | Result |
| 1 | Visual Inspection / Rating Information |  |
| 2 | Case Earthling |  |
| 3 | Wiring against Diagram |  |
| 4 | Watchdog contacts (F11-F12 closed, F13-F14 open) |  |

**4. RELAY CHECKS (With Relay Energized):**

|  |  |  |
| --- | --- | --- |
| SERIAL NO. | Relay Checks | Result |
| 1 | Watchdog contacts (F11-F12 opened, F13-F14 closed) |  |
| 2 | Alarm (yellow) LED – to check make Test Mode enable under Commissioning Test menu. |  |
| 3 | Out of service (yellow) LED – to check make Test Mode enable under Commissioning Test menu. |  |
| 4 | Trip (red) LED – apply any fault to produce any trip condition |  |

**5. INPUT OPTO-ISOLATORS CHECKS (With Relay Energized):**

GO TO SYSTEM DATA COLUMN FOR CHECKING STATUS OF INPUTS

|  |  |  |  |
| --- | --- | --- | --- |
| SERIAL NO. | INPUT NO | DESCRIPTION | REMARKS |
| 1 | OPTO 1(D2-D1) | FUSE FAIL BLOCK |  |
| 2 | OPTO 2(D4-D3) | TRIP NOT ISOLATE |  |
| 3 | OPTO 3(D6-D5) | TRIP NOT ISOLATE |  |
| 4 | OPTO 4(D8-D7) | 86T-2 OPTD |  |
| 5 | OPTO 5(D10-D9) | 86T-2 SUPV OPTD |  |
| 6 | OPTO 6(D12-D11) | 86T-4 OPTD |  |
| 7 | OPTO 7(D14-D13) | 86T-4 SUPV. OPTD |  |
| 8 | OPTO 8(D16-D15) | SPARE |  |

**6. OUTPUT RELAYS CHECKS (With Relay Energized):**

Note: Go to Commissioning Test, Test mode, Test Pattern mode and select each relay to be tested by Apply Contact Test.

|  |  |  |  |
| --- | --- | --- | --- |
| **SL.NO** | **OUTPUT NO** | **DESCRIPTION** | **RESULT**  **Contact Checked** |
| 1 | RL1(E1-E2) | TOC TRIP |  |
| 2 | RL2(E3-E4) | INST OC TRIP |  |
| 3 | RL3(E5-E6) | SPARE |  |
| 4 | RL4(E7-E8-E9) | SPARE |  |
| 5 | RL5(E10-E11-E12) | SPARE |  |
| 6 | RL6(E13-E14-E15) | SPARE |  |
| 7 | RL7(E16-E17-E18) | SPARE |  |
| 8 | RL8(B1-B2) | SPARE |  |
| 9 | RL9(B3-B4) | SPARE |  |
| 10 | RL10(B5-B6) | SPARE |  |
| 11 | RL11(B7-B8) | SPARE |  |
| 12 | RL12(B9-B10) | SPARE |  |
| 13 | RL13(B11-B12) | SPARE |  |
| 14 | RL14(B13-B14-B15) | SPARE |  |
| 15 | RL15(B16-B17-B18) | SPARE |  |

**7. LED INDICATORS CHECK:**

|  |  |  |  |
| --- | --- | --- | --- |
| **SL.NO** | **LED NO** | **DESCRIPTION** | **REMARKS** |
| 1 | LED 1 | PHASE A START |  |
| 2 | LED 2 | PHASE B START |  |
| 3 | LED 3 | PHASE C START |  |
| 4 | LED 4 | TOC TRIP |  |
| 5 | LED 5 | INST.OC TRIP |  |
| 6 | LED 6 | SPARE |  |
| 7 | LED 7 | SPARE |  |
| 8 | LED 8 | SPARE |  |

**8. Testing at Final Settings:**

Issue #: Date:

CT Primary Amps: A CT Secondary Amps: A

In = 1.0A

**8.1Measurement Test:**

****

****

**8.2Over Current Protection:**

PICK-UP AND DROP-OFF TEST FOR STAGE 1 (I>1):

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Current Setting Is | R-Phase | | Y-Phase | | B-Phase | |
| Pick-up | Drop-off | Pick-up | Drop-off | Pick-up | Drop-off |
| 1.00 A |  |  |  |  |  |  |

Pick-up : Setting +/- 5% , Drop-off : 0.95 x setting +/- 5%

Timing Test FOR STAGE 1 (I>1):

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Current setting Is | Curve Setting | TMS | Injected current(A) | Op. Time Calculated sec | Actual Op. Time sec | | |
| R-Phase | Y-Phase | B-Phase |
| 1.00A | SI |  |  |  |  |  |  |

Definite time stages : +/-40 ms or 2%, whichever is greater

Inverse time stages : +/-40 ms or 5%, whichever is greater

PICK-UP AND DROP-OFF TEST FOR STAGE 2 (I>3):

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Current Setting Is | R-Phase | | Y-Phase | | B-Phase | |
| TRIP | NO TRIP | TRIP | NO TRIP | TRIP | NO TRIP |
| 5.00 A |  |  |  |  |  |  |

Pick-up : Setting +/- 5% , Drop-off : 0.95 x setting +/- 5%

Timing Test FOR STAGE 2 (I>3):

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Current Setting = Is x In (Amps)** | **Set Time (ms)** | **Operating time at 2 x I Set in (ms)** | | |
| **R** | **Y** | **B** |
| I>3 =5 | 0ms |  |  |  |

**8.3 Earth Fault Protection:**

PICK-UP AND DROP-OFF TEST FOR STAGE 1 (IN>1):

|  |  |  |
| --- | --- | --- |
| Current Setting Is | Neutral | |
| Pick-up | Drop-off |
|  |  |  |

Pick-up : Setting +/- 5% , Drop-off : 0.95 x setting +/- 5%

Timing Test FOR STAGE 1 (IN>1):

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Current setting Is | Curve Setting | TMS | Injected current(A) | Op. Time Calculated sec | Actual Op. Time sec |
| Neutral |
| 0.200A | SI |  |  |  |  |

Definite time stages : +/-40 ms or 2%, whichever is greater

Inverse time stages : +/-40 ms or 5%, whichever is greater

PICK-UP AND DROP-OFF TEST FOR STAGE 2 (IN>3):

|  |  |  |
| --- | --- | --- |
| Current Setting Is | Neutral | |
| TRIP | NO TRIP |
|  |  |  |

Pick-up : Setting +/- 5% , Drop-off : 0.95 x setting +/- 5%

Timing Test FOR STAGE 2 (IN>3):

|  |  |  |
| --- | --- | --- |
| **Current Setting = Is x In (Amps)** | **Set Time (ms)** | **Operating time at 2 x I Set in (ms)** |
| **Neutral** |
| I>3 = 5 |  |  |

**Test Equipment Detail:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Sl. No | Description | Make | Equipment Sl .No | Calibration Date | Calibration Due Date |
|  |  |  |  |  |  |
|  |  |  |  |  |  |