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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1. GENERAL DATA AND INFORMATION:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Panel No. | **RB.UF** |  | Designation | U04.5001(81UF1) |
| Serial No. | **1VHR91083810** | Rated Voltage | 125 VDC |
| Make |  | Aux. Voltage | 48 – 250 VAC/DC |
| DWG. & SH. No. | CD-268541 | Frequency | 50 – 60 Hz |
| VT Ratio | 132000/115V |  |  |

2. MECHANICAL CHECKS AND VISUAL INSPECTION:

|  |  |  |
| --- | --- | --- |
| ITEM | DESCRIPTION | CHECKED |
| 1 | Inspect for physical damage / defects. | OK |
| 2 | Verify Connections as per approved drawings. | OK |
| 3 | Check tightness of all connections. | OK |
| 5 | Check apparatus lists. | OK |
| 6 | Check ferrules | OK |
| 7 | Test Switch checked for correct function. | OK |
| 8 | Check case earthing. | OK |

3. ELECTRICAL TESTS: With relay energized condition

|  |  |  |
| --- | --- | --- |
| ITEM | DESCRIPTION | CHECKED |
| 1 | Measured auxiliary supply. | OK |
| 2 | Clock set at local time. | OK |
| 3 | Time maintained when auxiliary supply removed. | OK |
| 5 | Relay healthy (green) LED working. | OK |
| 6 | Trip (red) LED working. | OK |

3.1 OPERATING DC SUPPLY CURRENT:

|  |  |  |  |
| --- | --- | --- | --- |
| DC Volt (V) | DC CurrentWithout Fault (mA) | DC CurrentDuring Fault (mA) | Calculated WATT (W) |
| 125 VDC |  |  |  |

**(Relays /energized):** < 12.0 W (**nominal**)/< 18.0 W (**max**) Technical Data page: 7254. INPUTS AND OUTPUTS TESTS:**INPUT OPTO-ISOLATORS CHECKS (With Relay Energized):** Test Procedure: Go to CONFIGURATION - MONITORING, I/O STATUS, then go to BINARY INPUTS VALUES ( X130 (AIM) – X110 (BIO) )to check the values after giving pulse on each BI.

|  |  |  |  |
| --- | --- | --- | --- |
| **OPTO INPUT NO.** | **TEST METHOD****(Energize only one at a time with** **125V DC Station Battery voltage)** | **RESULT****Display FALSE to TURE** | **REMARKS** |
| **X110** |
| BI 1 | ENERGIZE TB NO. X110 : 1 – 2 |  | SPARE |
| BI 2 | ENERGIZE TB NO. X110 : 3 – 4 |  | SPARE |
| BI 3 | ENERGIZE TB NO. X110 : 5 – 6C |  | **BUS-A OUT** |
| BI 4 | ENERGIZE TB NO. X110 : 7 – 6C |  | SPARE |
| BI 5 | ENERGIZE TB NO. X110 : 8 – 9C |  | SPARE |
| BI 6 | ENERGIZE TB NO. X110 : 10 – 9C |  | SPARE |
| BI 7 | ENERGIZE TB NO. X110 : 11 – 12C |  | SPARE |
| BI 8 | ENERGIZE TB NO. X110 : 13 – 12C |  | SPARE |
| **X130** |
| BI 1 | ENERGIZE TB NO. X130 : 1 – 2 |  | SPARE |
| BI 2 | ENERGIZE TB NO. X130 : 3 – 4 |  | SPARE |
| BI 3 | ENERGIZE TB NO. X130 : 5 – 6 |  | SPARE |
| BI 4 | ENERGIZE TB NO. X130 : 7 – 8 |  | SPARE |

**OUTPUT RELAYS CHECKS (With Relay Energized):**Test Procedure: Go to IED CONFIGURATION, TESTS, IED TEST, TEST MODE : ON, then go to BINARY OUTPUTS-CHANGE THE POSITION OF EACH BO FROM FULSE TO TURE FROM HMI,then check contact resistance.

|  |  |  |  |
| --- | --- | --- | --- |
| **OUTPUT RELAY No.** | **TEST METHOD****(Energize only one relay at a time by****Test ON in ‘IED TEST’)** | **RESULT****Contact Checked****≤ 0.2Ω** | **REMARKS** |
| **X100** |
| PO1 | CONTACT OPERATED X100 : 6 – 7 (N/O) |  | **UF OPTD (STG-1)** |
| PO2 | CONTACT OPERATED X100 : 8 – 9 (N/O) |  | **UF OPTD (STG-2)** |
| SO1 | CONTACT OPERATED X100 : 10 – 11 /10 - 12 (C/O) |  | SPARE |
| SO2 | CONTACT OPERATED X100 : 13 – 14 (N/O) |  | SPARE |
| PO3 | CONTACT OPERATED X100 : 16 – 17 (N/O) |  | **UF OPTD (STG-3)** |
| PO4 | CONTACT OPERATED X100 : 21 – 22 (N/O) |  | **UF OPTD (STG-4)** |
| IRF | CONTACT OPERATED X100 : 3 – 4 (N/O) |  | WATCHDOG |
| **X110** |
| SO1 | CONTACT OPERATED X110 : 14 – 16 /14 - 15 (C/O) |  | SPARE |
| SO2 | CONTACT OPERATED X110 : 17 – 19 /17 - 18 (C/O) |  | SPARE |
| SO3 | CONTACT OPERATED X110 : 20 – 22 /20 - 21 (C/O) |  | SPARE |
| SO4 | CONTACT OPERATED X110 : 23 – 24 (N/O) |  | SPARE |

**INDICATION LED TEST****LED Checks:**Go to MONITORING,PROGRAMMABLE LEDS to view the physical position of the LED.

|  |  |  |
| --- | --- | --- |
| **OPTO Input Number** | **Result Display On or Off** | **Function** |
| LED 1 |  | **UF OPTD (STG-1)** |
| LED 2 |  | **UF OPTD (STG-2)** |
| LED 3 |  | **UF OPTD (STG-3)** |
| LED 4 |  | **UF OPTD (STG-4)** |
| LED 5 |  | **BUS-A OUT** |
| LED 6 |  | SPARE |
| LED 7 |  | SPARE |
| LED 8 |  | SPARE |

5. MEASUREMENTS ACCURACY CHECKS:

|  |  |  |
| --- | --- | --- |
| Applied Frequency | Measured Frequency | %Error |
| 59.50 |  | 0.0% |
| 59.30 |  | 0.0% |
| 59.00 |  | 0.0% |
| 58.50 |  | 0.0% |
| 58.30 |  | 0.0% |

**6. UNDERFREQUENCY PROTECTION (81) PICK UP & DROP OFF :**

|  |  |
| --- | --- |
| Frequency Set (Hz) | Actual Frequency –Hz |
| Stage-1 | Stage-2 | Stage-3 | Stage-4 |
| P/U | D/O | P/U | D/O | P/U | D/O | P/U | D/O |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |

**7. UNDERFREQUENCY PROTECTION (81) TIMING :**

|  |  |
| --- | --- |
| Set Time (sec) | Actual Time –sec |
| Stage-1 | Stage-2 | Stage-3 | Stage-4 |
|  |  |  |  |  |
|  |  |  |  |  |

 **TECHNICAL DATA :** as per technical manual page : 339

|  |  |
| --- | --- |
| Characteristic | Value |
| Operation Accuracy | f>/f< | ±10 mHz |
| Start Time | f>/f< | < 80 ms |
| Reset Time | < 150 ms |
| Operation Time Accuracy | ±1.0% of the set value or ±30 ms |

|  |  |  |
| --- | --- | --- |
| 1 | Communication with PC |  |
| 2 | Event Record Check |  |
| 3 | Disturbance Record Check |  |

**FINAL SETTING**

|  |  |  |
| --- | --- | --- |
| **STAGE NO.** | **FREQUENCY SETTING** | **TIME DELAY SETTING** |
| STAGE -1 |  |  |
| STAGE -2 |  |  |
| STAGE -3 |  |  |
| STAGE -4 |  |  |

**6. UNDERFREQUENCY PROTECTION (81) PICK UP & DROP OFF :**

|  |  |
| --- | --- |
| Frequency Set (Hz) | Actual Frequency –Hz |
| Stage-1 | Stage-2 | Stage-3 | Stage-4 |
| P/U | D/O | P/U | D/O | P/U | D/O | P/U | D/O |
|  |  |  |  |  |  |  |  |  |

**7. UNDERFREQUENCY PROTECTION (81) TIMING :**

|  |  |
| --- | --- |
| Set Time (sec) | Actual Time –sec |
| Stage-1 | Stage-2 | Stage-3 | Stage-4 |
|  |  |  |  |  |

 |