1. **GENERAL DATA AND INFORMATION:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Feeder/Bay No |  |  | Rated Voltage |  |
| Bay Name |  | Aux: Supply |  |
| Manufacturer |  | Serial No: |  |
| Model No | P139/40TE | Designation |  |
| CT ratio |  | Frequency | 60HZ |
| VT ratio |  |  |  |  |

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

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

1. **OPERATING DC SUPPLY CURRENT**:

|  |  |  |  |
| --- | --- | --- | --- |
| DC VOLT. (V) | DC CURRENT W/O FAULT(mA) | DC CURRENT DURING FAULT(mA) | CALCULATED WATT(W) |
|  |  |  |  |

(relays de-energized/energized): 40 TE case: approx. 12.6 W / 34.1 W

(relays de-energized/energized): 84 TE case: approx. 14.5 W / 42.3 W

*Technical Data page : 2-17*

1. **ELECTRICAL TESTS:**

(With relay energized condition)

|  |  |
| --- | --- |
| Measured auxiliary supply. |  |
| Clock set at local time. |  |
| Time maintained when auxiliary supply removed. |  |
| Relay healthy (green) LED working. |  |
| Trip (red) LED working. |  |

 *Note for testing :*

Load rating: continuous 4 Inom

for 10 s: 30 Inom

for 1 s: 100 Inom

Nominal surge current: 250 Inom

**5. INPUTS AND OUTPUTS TESTS:**

**Binary inputs:**

|  |  |  |
| --- | --- | --- |
| Type | BI | Result |
| X 241 | U\_1…. U\_24 |  |
| V | U\_1 …. U\_4 |  |
| X | U\_01...U\_06 |  |

**Binary Output :**

|  |  |  |
| --- | --- | --- |
| Type | BO | Result |
| V | K\_1……..K8 |  |
| X | K\_01…..K\_06 |  |

1. **MEASUREMENTS ACCURACY CHECKS:**

|  |  |  |
| --- | --- | --- |
| Applied Value | Expected Value ( A ) | Displayed value ( A ) |
| 0.1In | 80 |  |
| 0.5In | 400 |  |
| 1 In | 800 |  |
| 1.5In | 1200 |  |

*Deviation measurement* : ± 1 % at 20°C

*Technical Data page : 2-14*

|  |  |  |  |
| --- | --- | --- | --- |
| Elements | Trigger | Reset Ratio | Time Deviation |
| Phase Over current element & Earth fault | ± 5 % | approx. 0.95 | DMT: ± 1% + 20 ms to 40 msIDMT: ± 5 % + 10 to 25 ms at I>2Iref |

Note: for "extremely inverse" IEC characteristics and for thermal overload characteristics:

± 7.5 % + 10 to 20 ms

Operate time for relay is ≤40 ms,

 *Technical Data page : 2-11……2-13*

1. **DT PICK UP AND DROP OFF ( I> & IN> Sensitivity Test ) :**

|  |  |  |  |
| --- | --- | --- | --- |
| Current Setting | OVER CURRENT RELAY | Current Setting | E/F RELAY |
| R | Y | B | Reset Ratio |
| P/U | D/O | P/U | D/O | P/U | D/O | P/U | D/O | Ratio |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |

1. **DT TIME CHARACTERISTIC TEST ( I> & IN> ) :**

|  |  |  |
| --- | --- | --- |
| Time Setting (s) | OVER CURRENT RELAY | E/F RELAY |
| R | Y | B |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

1. **DT PICK UP AND DROP OFF ( I>> & IN>> Sensitivity Test ) :**

|  |  |  |  |
| --- | --- | --- | --- |
| Current Setting | OVER CURRENT RELAY | Current Setting | E/F RELAY |
| R | Y | B | Reset Ratio |
| P/U | D/O | P/U | D/O | P/U | D/O | P/U | D/O | Ratio |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |

1. **DT TIME CHARACTERISTIC TEST ( I>> & IN>> ) :**

|  |  |  |
| --- | --- | --- |
| Time Setting (s) | OVER CURRENT RELAY | E/F RELAY |
| R | Y | B |
|  |  |  |  |  |
|  |  |  |  |  |

1. **DT PICK UP AND DROP OFF (I>>> & IN>>> Sensitivity Test ) :**

|  |  |  |  |
| --- | --- | --- | --- |
| Current Setting | OVER CURRENT RELAY | Current Setting | E/F RELAY |
| R | Y | B | Reset Ratio |
| P/U | D/O | P/U | D/O | P/U | D/O | P/U | D/O | Ratio |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |

1. **DT TIME CHARACTERISTIC TEST (I>>> & IN>>> ) :**

|  |  |  |
| --- | --- | --- |
| Time Setting (s) | OVER CURRENT RELAY | E/F RELAY |
| R | Y | B |
|  |  |  |  |  |
|  |  |  |  |  |

1. **IDMT CHARACTERISTICS TEST ( I> & IN> ) :**

Time multiplier = 1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Function | Current Setting | Injected Current (A) | Calculated Value (s) | Operating Time (s) |
| R | Y | B | N |
| IEC SI Curve | 0.2In | 2\*Is | 10.02 |  |  |  |  |
| 0.2In | 10\*Is | 2.970 |  |  |  |  |
| IEC VI Curve | 0.2In | 2\*Is | 13.5 |  |  |  |  |
| 0.2In | 10\*Is | 1.5 |  |  |  |  |
| IEC EI Curve | 0.2In | 2\*Is | 26.67 |  |  |  |  |
| 0.2In | 10\*Is | 0.808 |  |  |  |  |
| IEC LTI Curve | 0.2In | 2\*Is | 120 |  |  |  |  |
| 0.2In | 10\*Is | 13.33 |  |  |  |  |

1. **TIME MULTIPLIER TESTS ( IN> ) :**

IN> = 0.2In

Iinject = 2 Is Curve : SI

|  |  |  |
| --- | --- | --- |
| Time multiplier | N | Calculated Value |
|  |  |  |
|  |  |  |

1. **BREAKER FAILURE PROTECTION ( 50BF )**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Phase | Current ( A ) | Stage 1 | Stage 2 | Remark |
| Set | Pickup | Drop off | Set | Optd | Set | Optd |
| R |  |  |  |  |  |  |  |  |
| Y |  |  |  |  |
| B |  |  |  |  |
| R |  |  |  |  |  |  |  |  |
| Y |  |  |  |  |
| B |  |  |  |  |

* Communication with PC Check : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Event Record Check : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Disturbance Record Check : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_