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| 1. **GENERAL INFORMAYION :**  |  |  |  |  |  | | --- | --- | --- | --- | --- | | Serial No. |  |  | Rated Voltage | 100/110/120 VAC | | Make |  | Aux. Voltage | 80 – 260 VAC/DC | | ORDER NO. | RS 611 051 - DA | MODEL NO. | SPAJ 160 C | | Frequency | 60 Hz | Designation | 50/51/51NUB | | Rated Current | 1A & 5A |  | Neu. CT Ratio | 10/5A |  1. **MECHANICAL CHECKS AND VISUAL INSPECTION:**  |  |  |  | | --- | --- | --- | | ITEM | DESCRIPTION | CHECKED | | 1 | Inspect for physical damage / defects. |  | | 2 | Check tightness of all connections. |  | | 3 | Test Switch checked for correct function. |  | | 4 | Watchdog contact. |  |  ELECTRICAL TESTS: With relay energized condition  |  |  |  | | --- | --- | --- | | ITEM | DESCRIPTION | CHECKED | | 1 | Measured auxiliary supply. |  | | 2 | Clock set at local time. |  | | 3 | Time maintained when auxiliary supply removed. |  | | 4 | Relay healthy (green) LED working. |  | | 5 | Trip (red) LED working. |  |  1. **ELECTRICAL TESTS:**    1. **MEASUREMENT TEST:**  |  |  |  |  | | --- | --- | --- | --- | | Phase | Applied Current (A) | Measured Current (A) | %Error | | R | 1 A |  |  | | Y | 1 A |  |  | | B | 1 A |  |  |  PHASE OVERLOAD PICKUP & DROP OFF TSET:OVERLOAD PROTECTION STAGE Ib> PICKUP & DROP OFF:  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | PHASE | SET CURRENT (Ib>) | PICKUP (A) | DROP OFF (A) | DROP OFF/PICKUP RATIO | LIMITS | | R | 0.3 In |  |  |  | > 0.95 | | Y | 0.3 In |  |  |  | > 0.95 | | B | 0.3 In |  |  |  | > 0.95 |  * + 1. **OVERLOAD PROTECTION STAGE Ib> OPERATING TIME TEST (INVERSE DMT):**  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | SET CURRENT (Ib>) | K VALUE | INJECTEDCURRENT (2xIb>) | MEASURED TIME (ms) | | | LIMITS | | R | Y | B | | 0.3 In | 0.2 | 0.6 |  |  |  | 35 – 135 (ms) |   Accuracy: Ib> Operating Time Accuracy: ±10% of theoretical value or ±50ms OVERLOAD PROTECTION STAGE Ia> PICKUP & DROP OFF:  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | PHASE | SET CURRENT (Ia>) | PICKUP (A) | DROP OFF (A) | DROP OFF/PICKUP RATIO | LIMITS | | R | 80% Ia |  |  |  | > 0.95 | | Y | 80% Ia |  |  |  | > 0.95 | | B | 80% Ia |  |  |  | > 0.95 |  * + 1. **OVERLOAD PROTECTION STAGE Ia> OPERATING TIME TEST (DEFINITE TIME):**  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | SET CURRENT (Ib>) | TIME SET (min) | INJECTEDCURRENT (2xIa>) | MEASURED TIME (sec) | | | LIMITS | | R | Y | B | | 80% Ia | 0.5 | 0.6 |  |  |  | 29.4 – 30.6 |   Accuracy: Ia> Operating Time Accuracy: ±2% of set value. UNDERCURRENT (37) PICKUP & DROP OFF TSET:UNDERCURRENT PROTECTION PICKUP & DROP OFF:  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | PHASE | SET CURRENT | PICKUP (A) | DROP OFF (A) | DROP OFF/PICKUP RATIO | LIMITS | | R | 0.4 In |  |  |  | < 1.1 | | Y | 0.4 In |  |  |  | < 1.1 | | B | 0.4 In |  |  |  | < 1.1 |  * + 1. **UNDERCURRENT PROTECTION OPERATING TIME TEST:**  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | SET CURRENT (Ib>) | TIME SET (sec) | MEASURED TIME (sec) | | | LIMITS | | R | Y | B | | 0.3 In | 3.0 |  |  |  | 2.94 – 3.06 (sec) |   Accuracy: I< Operating Time Accuracy: ±2% of SET value or ±75ms   * + 1. **RECONNECTION INHBIT TIMING TEST:**  |  |  | | --- | --- | | RECONNECTION INHBIT TIME SET (sec) | MEASURED TIME (sec) | | 30.0 |  |  NEUTRAL UNBALANCE CURRENT (NUB) PICKUP & DROP OFF TSET:NEUTRAL UNBALANCE STAGE-1 (ΔI1) PICKUP & DROP OFF:  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | PHASE | SET CURRENT (ΔI1) | PICKUP (A) | DROP OFF (A) | DROP OFF/PICKUP RATIO | LIMITS | | **IN** | 10 % In |  |  |  | > 0.9 |  * + 1. **NEUTRAL UNBALANCE STAGE-1 (ΔI1)** **TIME TEST (DMT):**  |  |  |  |  |  | | --- | --- | --- | --- | --- | | SET CURRENT (ΔI1) | SET TIME (sec) | INJECTEDCURRENT (2xΔI1) | MEASURED TIME (sec) | LIMITS | | 10% In | 10 | 1 |  | 9.8 – 10.2 (sec) |   Accuracy: ΔI1 Operating Time Accuracy: ±2% of set value or ±75ms NEUTRAL UNBALANCE STAGE-2 (ΔI2) PICKUP & DROP OFF:  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | PHASE | SET CURRENT (ΔI2) | PICKUP (A) | DROP OFF (A) | DROP OFF/PICKUP RATIO | LIMITS | | **IN** | 20 % In |  |  |  | > 0.9 |  * + 1. **NEUTRAL UNBALANCE STAGE-1 (ΔI1)** **TIME TEST (DMT):**  |  |  |  |  |  | | --- | --- | --- | --- | --- | | SET CURRENT (ΔI1) | K VALUE | INJECTEDCURRENT (2xΔI2) | MEASURED TIME (msec) | LIMITS | | 20% In | 0.5 | 2 |  | 465 - 535 (msec) |   T(s) = K x 101.2 / (100 x ΔI / ΔI2) – 97) + 0.02  Accuracy: ΔI2 Operating Time Accuracy: ±7.5% of set value or ±35ms |