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|  PHASE 3 <small>CONNECTORS</small> | <h1>Test Report</h1> |  <small>bsi. ISO 9001 Quality Management F5648709</small> | Date | 05/07/16 |
| | | | TR | 05652 |
| | | | Rotary (FRED) Clamp 800 amp testing | |
| Operator: D.Maclachlan | | This report is the property of Phase 3 Connectors Ltd and must not, without their written consent be passed on, copied or used for any other purpose | | |

Type and description of test
Rotary (FRED) Clamp. Direct Resistance With 800A Current.

Object:

The object of this test is to assess the current carrying capacity of the Rotary clamp.

Test method:

A specified test current shall be applied to the contacts of the specimen for a minimum period of 3 hours or until equilibrium is reached. (Less than 1 degree per hour).

The Clamp will be fed with 800A from the 3000A load unit via a Powersafe Line Drain 800A connector on 300mm² cable and attached to a busbar which is connected to the other side of the load unit.

Requirements:

The clamp must be capable of carrying the specified test current for a minimum period of 3 hours without exceeding the specified temperature rise.

Test Items

- 1 x Powersafe Rotary Clamp
- 1 x Powersafe 300mm Line Drain Connector
- 1 x Busbar

| Instrument | Description s/n | Expiry calibration |
|---------------------------------|---|--------------------|
| Current generation | T & R PCU1 Mk3 P.C.I.T.S. (21TE0216) | 20/01/2017 |
| External Load Unit | 3000A Loading Unit | 20/01/2017 |
| YF-160A Thermocoupler +5 probes | 060300489 | 04/02/2017 |

Recorded Results at the end of testing – (detailed hourly results and graph on pg3)

| Probe position | Temperature ° C | T (measured – ambient) | Amps |
|--|--------------------|---------------------------|------|
| Ambient | 22.1 | | |
| Cable Core (P1) | 76.0 | 53.9 | 808A |
| Connection Between Clamp & Busbar (P2) | 75.5 | 53.4 | 808A |
| Busbar (P3) | 66.1 | 44.0 | 808A |
| Clamp Insulated Body (P4) | 63.6 | 41.5 | 808A |

Maximum Allowable Temperature 125°C

Maximum Recorded Temperature Rise @ Insulated Body was 41.5°C above ambient.

Maximum Allowable Temperature Between Clamp & busbar 125°C

Maximum Recorded Temperature Rise was 53.4°C above ambient.

Conclusion: Temperature Rise within EN, BS and VDE allowable limits. PASS

All Insulation on the clamp meets with IEC 60900 (live working, hand tools for use up to 1000Vac and 1500Vdc)



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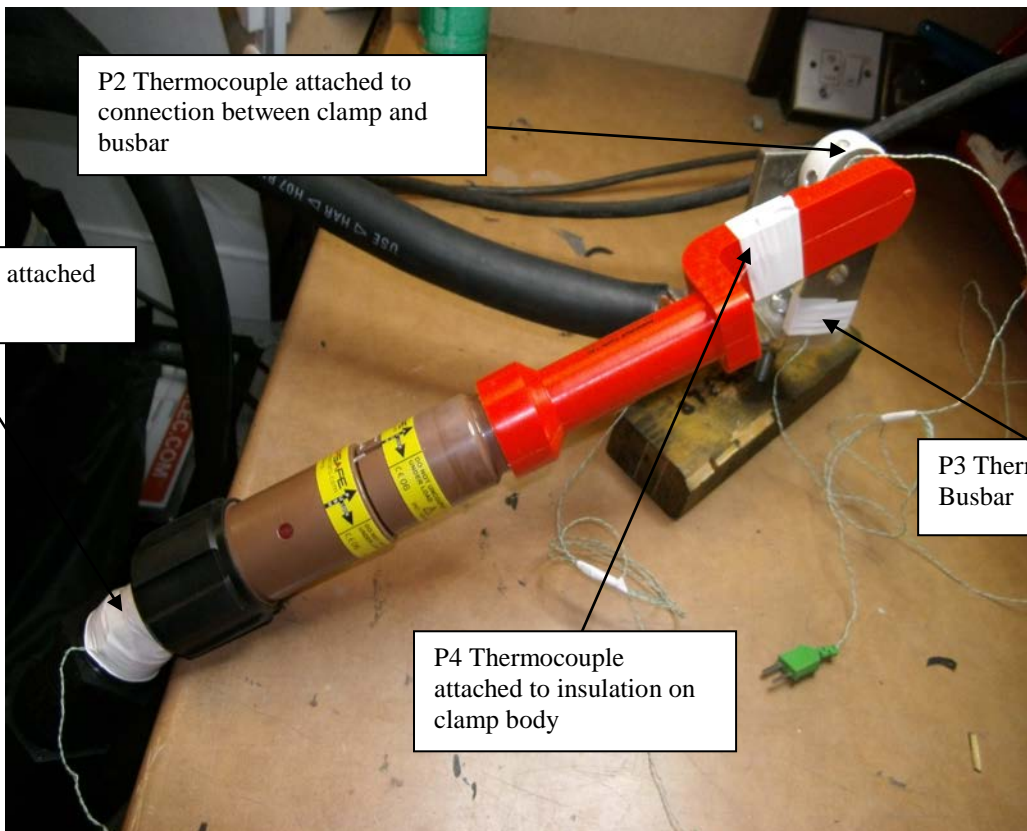
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T&R PCU1 Mk 3 P.C.I.T.S 3000A



P2 Thermocouple attached to connection between clamp and busbar

P1 Thermocouple attached to cable core

P3 Thermocouple attached to Busbar

P4 Thermocouple attached to insulation on clamp body



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| Time | Busbar | Ambient | Cable | Connection | Insulation | Amps |
|------|--------|---------|-------|------------|------------|-------|
| 0 | 12.5 | 16.9 | 11.9 | 12.5 | 12.8 | 0.0 |
| 1 | 56.5 | 25.0 | 63.0 | 66.2 | 56.5 | 806.0 |
| 2 | 61.1 | 22.0 | 73.1 | 72.3 | 60.4 | 802.0 |
| 3 | 63.5 | 15.1 | 74.2 | 73.4 | 59.9 | 809.0 |
| 4 | 63.3 | 18.1 | 73.3 | 72.5 | 60.0 | 802.0 |
| 5 | 66.0 | 22.0 | 75.0 | 75.5 | 63.4 | 804.0 |
| 6 | 65.2 | 16.9 | 76.0 | 75.3 | 62.8 | 806.0 |
| 7 | 66.1 | 22.1 | 76.0 | 75.5 | 63.6 | 809.0 |

