

TR-05670



# Powersafe C240 Bi-Metal Connectors (500A Test)

Test Date: 18/07/16 Operator: D.Maclachlan

## TYPE AND DESCRIPTION OF TEST

POWERSAFE C240 500A BI-METAL CONNECTORS . DIRECT RESISTANCE WITH 500A CURRENT.

## OBJECTIVE

The object of this test is to assess the current carrying capacity of the Powersafe C240 Bi-Metal 500amp Connectors.

## 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 test will consist of a mated pair of Powersafe C240 Bi-Metal Connectors (Line Source to Line Drain) terminated onto 240mm<sup>2</sup> aluminium cables that are attached to the 3000amp load unit. A current of 500amps will be used for this test.

## REQUIREMENTS

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

## TEST ITEMS

- 1x Powersafe Line Source Bi-Metal Connector terminated onto 240mm<sup>2</sup> aluminium cable.
- 1x Powersafe Line Drain Bi-Metal Connector terminated onto 240mm<sup>2</sup> aluminium cable.

## EQUIPMENT USED

| INSTRUMENT          | DESCRIPTION                             | CALIBRATION EXPIRY DATE |
|---------------------|---|-------------------------|
| Current Generation  | T & R PCU1 Mk3<br>P.C.I.T.S. (21TE0216) | 20/01/2017              |
| External Load Unit  | 3000A Loading Unit                      | 20/01/2017              |
| Digital Thermometer | YF-160A Thermocoupler + 6 Probes        | 04/02/2017              |

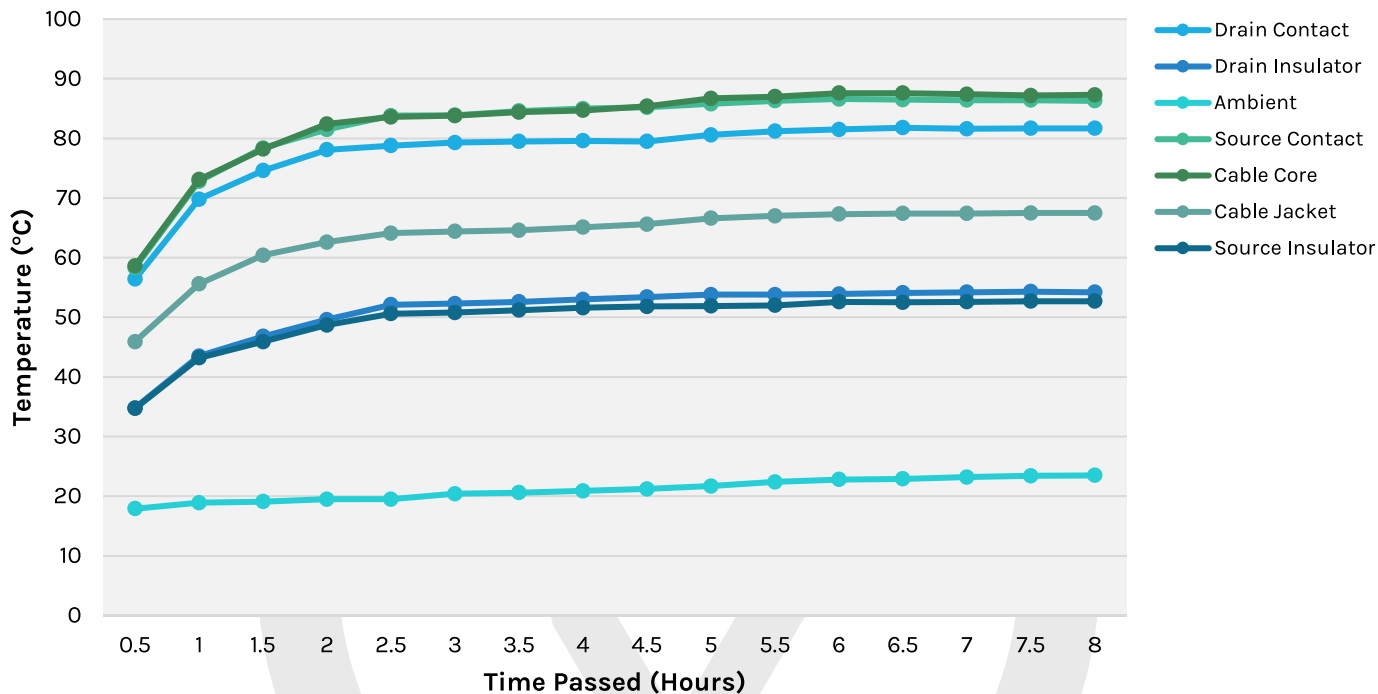


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| TIME | DRAIN CON. | DRAIN INSULATOR | AMBIENT | SOURCE CON. | CABLE CORE | CABLE JACKET | SOURCE INSULATOR | AMPS |
|------|------------|-----------------|---------|-------------|------------|--------------|------------------|------|
| 0.5  | 56.4       | 34.8            | 17.9    | 58.3        | 58.6       | 45.9         | 34.7             | 505  |
| 1    | 69.8       | 43.5            | 18.8    | 72.8        | 73.1       | 55.6         | 43.2             | 510  |
| 1.5  | 74.6       | 46.8            | 19.1    | 78.4        | 78.2       | 60.4         | 45.9             | 509  |
| 2    | 78.1       | 49.6            | 19.5    | 81.5        | 82.4       | 62.6         | 48.7             | 508  |
| 2.5  | 78.8       | 52.1            | 19.5    | 83.8        | 83.6       | 64.1         | 50.6             | 507  |
| 3    | 79.3       | 52.3            | 20.4    | 83.9        | 83.8       | 64.6         | 50.8             | 504  |
| 3.5  | 79.5       | 52.6            | 20.6    | 84.6        | 84.4       | 64.6         | 51.2             | 506  |
| 4    | 79.6       | 53.0            | 20.9    | 85.0        | 84.7       | 65.1         | 51.6             | 506  |
| 4.5  | 79.5       | 53.4            | 21.2    | 85.2        | 85.4       | 65.6         | 51.8             | 505  |
| 5    | 80.6       | 53.8            | 21.7    | 85.8        | 86.7       | 66.6         | 51.9             | 507  |
| 5.5  | 81.2       | 53.8            | 22.4    | 86.3        | 87.0       | 67.0         | 52.0             | 505  |
| 6    | 81.5       | 53.9            | 22.8    | 86.6        | 87.6       | 67.3         | 52.6             | 505  |
| 6.5  | 81.8       | 54.1            | 22.9    | 86.5        | 87.6       | 67.4         | 52.5             | 505  |
| 7    | 81.6       | 54.2            | 23.2    | 86.4        | 87.4       | 67.4         | 52.6             | 504  |
| 7.5  | 81.7       | 54.3            | 23.4    | 86.4        | 87.2       | 67.5         | 52.7             | 505  |
| 8    | 81.7       | 54.2            | 23.5    | 86.3        | 87.3       | 67.5         | 52.7             | 505  |

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## FINAL RESULTS

| PROBE POSITION        | TEMPERATURE (C) | T (MEASURED-AMBIENT) | AMPS |
|-----------------------|-----------------|----------------------|------|
| Ambient               | 23.5            | N/A                  | N/A  |
| Cable Jacket (P1)     | 67.5            | 44.0                 | 505A |
| Drain Insulator (P2)  | 54.2            | 30.7                 | 505A |
| Source Insulator (P3) | 52.7            | 29.2                 | 505A |
| Source Contact (P4)   | 86.3            | 62.8                 | 505A |
| Cable Core (P5)       | 87.3            | 63.8                 | 505A |
| Drain Contact (P6)    | 81.7            | 58.2                 | 505A |

## CONCLUSION

| MEASUREMENT  | RESULT |
|--|--------|
| Maximum Allowable Temperature                                      | 125°C  |
| Maximum Recorded Temperature Rise @ Insulator Body (above ambient) | 30.7°C |
| Maximum Allowable Temperature of Contacts                          | 125°C  |
| Maximum Recorded Temperature Rise (above ambient)                  | 62.8°C |
| TEMPERATURE RISE WITHIN EN, BS AND VDE ALLOWABLE LIMITS.           | PASS   |



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