

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                     |             |                                |                                     |       |                           |       |                                                                     |  |  |           |                                                                             |  |  |           |                                                                        |  |  |           |                                                                                                 |  |  |             |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------|--------------------------------|-------------------------------------|-------|---------------------------|-------|---------------------------------------------------------------------|--|--|-----------|-----------------------------------------------------------------------------|--|--|-----------|------------------------------------------------------------------------|--|--|-----------|-------------------------------------------------------------------------------------------------|--|--|-------------|
| <b>Test report no.:</b><br><i>Prüfbericht Nr.:</i>                                                                                                                                                                                                                                                                                                                                                                                                                    | AU24WM3O 001                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <b>Order No.:</b><br><i>Auftrags-Nr.:</i>                                           | 252106509   | Page 1 of 33<br>Seite 1 von 33 |                                     |       |                           |       |                                                                     |  |  |           |                                                                             |  |  |           |                                                                        |  |  |           |                                                                                                 |  |  |             |
| <b>Client Reference No.:</b><br><i>Kunden-Referenz-Nr.:</i>                                                                                                                                                                                                                                                                                                                                                                                                           | 2569280                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>Order date:</b><br><i>Auftragsdatum:</i>                                         | 2024-05-15  |                                |                                     |       |                           |       |                                                                     |  |  |           |                                                                             |  |  |           |                                                                        |  |  |           |                                                                                                 |  |  |             |
| <b>Client:</b><br><i>Auftraggeber:</i>                                                                                                                                                                                                                                                                                                                                                                                                                                | LECO Switchgear Ltd<br>18/24 Westech Place, 0602 Glen Eden, Auckland, New Zealand                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                     |             |                                |                                     |       |                           |       |                                                                     |  |  |           |                                                                             |  |  |           |                                                                        |  |  |           |                                                                                                 |  |  |             |
| <b>Test item:</b><br><i>Prüfgegenstand:</i>                                                                                                                                                                                                                                                                                                                                                                                                                           | Main busbars, distribution busbars, neutral busbar and Protective circuit containing Earth bar, all contained in "Quantum Switchboard" ASSEMBLY.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                     |             |                                |                                     |       |                           |       |                                                                     |  |  |           |                                                                             |  |  |           |                                                                        |  |  |           |                                                                                                 |  |  |             |
| <b>Identification/ Type No.:</b><br><i>Bezeichnung / Typ-Nr.</i>                                                                                                                                                                                                                                                                                                                                                                                                      | Drawing no. "00000/QUASB/2", Rev C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                     |             |                                |                                     |       |                           |       |                                                                     |  |  |           |                                                                             |  |  |           |                                                                        |  |  |           |                                                                                                 |  |  |             |
| <b>Order content:</b><br><i>Auftrags-Inhalt:</i>                                                                                                                                                                                                                                                                                                                                                                                                                      | Electrical Safety Testing                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                     |             |                                |                                     |       |                           |       |                                                                     |  |  |           |                                                                             |  |  |           |                                                                        |  |  |           |                                                                                                 |  |  |             |
| <b>Test specification:</b><br><i>Prüfgrundlage:</i>                                                                                                                                                                                                                                                                                                                                                                                                                   | Short-circuit withstand strength testing according to Clause 10.11.5.3.3 and 10.11.5.3.5 & 10.11.5.6 of AS/NZS 61439.1:2016                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                     |             |                                |                                     |       |                           |       |                                                                     |  |  |           |                                                                             |  |  |           |                                                                        |  |  |           |                                                                                                 |  |  |             |
| <b>Date of sample receipt:</b><br><i>Wareneingangsdatum:</i>                                                                                                                                                                                                                                                                                                                                                                                                          | 2024-05-20                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |             |                                |                                     |       |                           |       |                                                                     |  |  |           |                                                                             |  |  |           |                                                                        |  |  |           |                                                                                                 |  |  |             |
| <b>Test sample No.:</b><br><i>Prüfmuster-Nr.:</i>                                                                                                                                                                                                                                                                                                                                                                                                                     | A003725028-001                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                     |             |                                |                                     |       |                           |       |                                                                     |  |  |           |                                                                             |  |  |           |                                                                        |  |  |           |                                                                                                 |  |  |             |
| <b>Testing period:</b><br><i>Prüfzeitraum:</i>                                                                                                                                                                                                                                                                                                                                                                                                                        | 2024-05-06                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                     |             |                                |                                     |       |                           |       |                                                                     |  |  |           |                                                                             |  |  |           |                                                                        |  |  |           |                                                                                                 |  |  |             |
| <b>Place of testing:</b><br><i>Ort der Prüfung:</i>                                                                                                                                                                                                                                                                                                                                                                                                                   | TÜV Rheinland Australia Pty. Ltd.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                     |             |                                |                                     |       |                           |       |                                                                     |  |  |           |                                                                             |  |  |           |                                                                        |  |  |           |                                                                                                 |  |  |             |
| <b>Testing laboratory:</b><br><i>Prüflaboratorium:</i>                                                                                                                                                                                                                                                                                                                                                                                                                | TÜV Rheinland Australia Pty. Ltd.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                     |             |                                |                                     |       |                           |       |                                                                     |  |  |           |                                                                             |  |  |           |                                                                        |  |  |           |                                                                                                 |  |  |             |
| <b>Test result*:</b><br><i>Prüfergebnis*:</i>                                                                                                                                                                                                                                                                                                                                                                                                                         | Pass                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                     |             |                                |                                     |       |                           |       |                                                                     |  |  |           |                                                                             |  |  |           |                                                                        |  |  |           |                                                                                                 |  |  |             |
| <b>created by:</b><br><i>erstellt von:</i>                                                                                                                                                                                                                                                                                                                                                                                                                            | Gurpreet Singh                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <b>authorized by: /</b><br><i>genehmigt von:</i>                                    | Shuai Shao  |                                |                                     |       |                           |       |                                                                     |  |  |           |                                                                             |  |  |           |                                                                        |  |  |           |                                                                                                 |  |  |             |
| <b>Date:</b> 2024-07-22<br><i>Datum:</i>                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <b>Issue Date:</b> 2024-09-06<br><i>Ausstellungsdatum:</i>                          |             |                                |                                     |       |                           |       |                                                                     |  |  |           |                                                                             |  |  |           |                                                                        |  |  |           |                                                                                                 |  |  |             |
| <b>Position / Stellung:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                           | Expert                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>Position / Stellung:</b>                                                         | Expert      |                                |                                     |       |                           |       |                                                                     |  |  |           |                                                                             |  |  |           |                                                                        |  |  |           |                                                                                                 |  |  |             |
| <b>Other /</b><br><i>Sonstiges:</i>                                                                                                                                                                                                                                                                                                                                                                                                                                   | <table border="1"> <tr> <td>Rated operational voltage (<math>U_e</math>)</td> <td>415 V</td> <td>Rated frequency (<math>f_n</math>)</td> <td>50 Hz</td> </tr> <tr> <td colspan="3">Rated withstand short circuit current (<math>I_{cw}</math>) for Main busbars</td> <td>36 kA, 1s</td> </tr> <tr> <td colspan="3">Rated withstand short circuit current (<math>I_{cw}</math>) for Distribution busbars</td> <td>36 kA, 1s</td> </tr> <tr> <td colspan="3">Rated withstand short circuit current (<math>I_{cw}</math>) for Neutral busbars</td> <td>24 kA, 1s</td> </tr> <tr> <td colspan="3">Rated withstand short circuit current (<math>I_{cw}</math>) for Protective circuit containing Earth bar.</td> <td>24 kA, 0.1s</td> </tr> </table> |                                                                                     |             |                                | Rated operational voltage ( $U_e$ ) | 415 V | Rated frequency ( $f_n$ ) | 50 Hz | Rated withstand short circuit current ( $I_{cw}$ ) for Main busbars |  |  | 36 kA, 1s | Rated withstand short circuit current ( $I_{cw}$ ) for Distribution busbars |  |  | 36 kA, 1s | Rated withstand short circuit current ( $I_{cw}$ ) for Neutral busbars |  |  | 24 kA, 1s | Rated withstand short circuit current ( $I_{cw}$ ) for Protective circuit containing Earth bar. |  |  | 24 kA, 0.1s |
| Rated operational voltage ( $U_e$ )                                                                                                                                                                                                                                                                                                                                                                                                                                   | 415 V                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Rated frequency ( $f_n$ )                                                           | 50 Hz       |                                |                                     |       |                           |       |                                                                     |  |  |           |                                                                             |  |  |           |                                                                        |  |  |           |                                                                                                 |  |  |             |
| Rated withstand short circuit current ( $I_{cw}$ ) for Main busbars                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                     | 36 kA, 1s   |                                |                                     |       |                           |       |                                                                     |  |  |           |                                                                             |  |  |           |                                                                        |  |  |           |                                                                                                 |  |  |             |
| Rated withstand short circuit current ( $I_{cw}$ ) for Distribution busbars                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                     | 36 kA, 1s   |                                |                                     |       |                           |       |                                                                     |  |  |           |                                                                             |  |  |           |                                                                        |  |  |           |                                                                                                 |  |  |             |
| Rated withstand short circuit current ( $I_{cw}$ ) for Neutral busbars                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                     | 24 kA, 1s   |                                |                                     |       |                           |       |                                                                     |  |  |           |                                                                             |  |  |           |                                                                        |  |  |           |                                                                                                 |  |  |             |
| Rated withstand short circuit current ( $I_{cw}$ ) for Protective circuit containing Earth bar.                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                     | 24 kA, 0.1s |                                |                                     |       |                           |       |                                                                     |  |  |           |                                                                             |  |  |           |                                                                        |  |  |           |                                                                                                 |  |  |             |
| Refer to page 3 for more details.                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                     |             |                                |                                     |       |                           |       |                                                                     |  |  |           |                                                                             |  |  |           |                                                                        |  |  |           |                                                                                                 |  |  |             |
| <b>Condition of the test item at delivery:</b><br><i>Zustand des Prüfgegenstandes bei Anlieferung:</i>                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Test item complete and undamaged                                                    |             |                                |                                     |       |                           |       |                                                                     |  |  |           |                                                                             |  |  |           |                                                                        |  |  |           |                                                                                                 |  |  |             |
| <p>* Legend: P(ass) = passed a.m. test specification(s) F(ail) = failed a.m. test specification(s) N/A = not applicable N/T = not tested</p> <p>* Legende: P(ass) = entspricht o.g. Prüfgrundlage(n) F(ail) = entspricht nicht o.g. Prüfgrundlage(n) N/A = nicht anwendbar N/T = nicht getestet</p>                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                     |             |                                |                                     |       |                           |       |                                                                     |  |  |           |                                                                             |  |  |           |                                                                        |  |  |           |                                                                                                 |  |  |             |
| <p><b>This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</b></p> <p><i>Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens.</i></p> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                     |             |                                |                                     |       |                           |       |                                                                     |  |  |           |                                                                             |  |  |           |                                                                        |  |  |           |                                                                                                 |  |  |             |

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### Remarks

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|---|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | The equipment used during the specified testing period was calibrated according to our test laboratory calibration program. The equipment fulfils the requirements included in the relevant standards. The traceability of the test equipment used is ensured by compliance with the regulations of our management system. Detailed information regarding test conditions, equipment and measurement uncertainty is available in the test laboratory and could be provided on request.                                                |
| 2 | As contractually agreed, this document has been signed digitally only. TÜV Rheinland has not verified and unable to verify which legal or other pertaining requirements are applicable for this document. Such verification is within the responsibility of the user of this document. Upon request by its client, TÜV Rheinland can confirm the validity of the digital signature by a separate document. Such request shall be addressed to our Sales department. An environmental fee for such additional service will be charged. |
| 3 | Test clauses with remark of * are subcontracted to qualified subcontractors and described under the respective test clause in the report.<br>Deviations of testing specification(s) or customer requirements are listed in specific test clause in the report.                                                                                                                                                                                                                                                                        |
| 4 | The decision rule for statements of conformity in this test report is based on the "Zero Guard Band Rule" and "Simple Acceptance" in accordance with ILAC G8:2019 and IEC Guide 115:2021, unless otherwise specified in the applied standard mentioned on Page 1 of this report or requested by the customer. This means that measurement uncertainty is not taken in account and hence also not declared in the test report                                                                                                          |
| 5 | This test report is based on assessment and tests applied to the specific test item(s) as submitted by the client. TÜV Rheinland Australia disclaims any and all responsibility or obligation for any other item.                                                                                                                                                                                                                                                                                                                     |

### History of revision:

N/A

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### Product description

|   |                                 |                                                                                                                                                                                                                                                                                       |
|---|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | <b>Product details:</b>         | Refer to the test item description below.                                                                                                                                                                                                                                             |
| 2 | <b>Dimensions / Weight:</b>     | [W x H x D] (mm): Refer to the drawing                                                                                                                                                                                                                                                |
| 3 | <b>Operating elements:</b>      | N/A                                                                                                                                                                                                                                                                                   |
| 4 | <b>Equipment / Accessories:</b> | The equipment was tested without any optional accessory or ancillary equipment installed. Hence, this report does not cover parameters that are influenced by the installation of optional accessory or ancillary equipment that might affect safety in the meaning of this standard. |
| 5 | <b>Used materials:</b>          | Refer to the drawing for details.                                                                                                                                                                                                                                                     |
| 6 | <b>Other:</b>                   | N/A                                                                                                                                                                                                                                                                                   |
| 7 | <b>Test sample obtaining:</b>   | <input checked="" type="checkbox"/> Sending by customer <input type="checkbox"/> Sampling by TÜV Rheinland Group<br><input type="checkbox"/> others:                                                                                                                                  |

#### Description of the test item:

The test sample provided is an ASSEMBLY containing 3 tiers (1 to 3) from left to right. Tier 1 contains an incoming circuit comprising of incoming unit feeding the main busbars on the top segment. Tier 2 consists of several outgoing units connected onto a chassis which is fed via the main busbars located in the top segment. The middle compartment of tier 2 contains another outgoing unit of MCCB. Tier 3 is a cable zone. The assembly has external surface doors and internal polycarbonate shielded cover. The external doors are closed and locked using screws. Refer to the drawing "00000/QUASB/ (1 to 4)", Rev C and photos for more details.

#### Busbars

| Test   | Test item            | Busbars dimensions (per phase)      | Busbars centres | Busbars supports*                | No. of supports | Support centres      |
|--------|----------------------|-------------------------------------|-----------------|----------------------------------|-----------------|----------------------|
| Test 1 | Main busbars         | 1 x 42 mm x 12 mm<br>Length: 2 m    | 85 mm           | GRP U-PROFILE -/<br>Fibrolux –   | 2               | Refer to the drawing |
| Test 2 | Distribution busbars | 1 x 42 mm x 12 mm<br>Length: 1.35 m | 75 mm           | GRP U-PROFILE -/<br>Fibrolux –   | 3               | 415   400            |
| Test 3 | Neutral busbar       | 1 x 42 mm x 12 mm<br>Length: 1.1 m  | N/A             | Camsco SM-55 INSULATOR<br>M10*55 | 3               | 370   400            |
| Test 4 | Earth busbar         | 1 x 40 mm x 6.3 mm                  | N/A             | Camsco SM-55 INSULATOR<br>M10*55 | 7               | Refer to the drawing |

\*Note: The manufacturer of the supports was not verified by TÜV Rheinland.

For more details refer to the drawings.