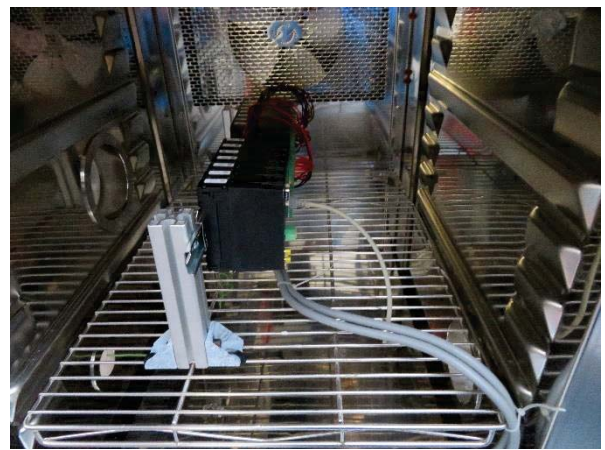




| | | | | | |
|---|---|---|---|--|---|
| Prüfbericht-Nr.: <i>Test report no.:</i> | DE22VLQQ 001 | Auftrags-Nr.: <i>Order no.:</i> | 1100543 10 P00325507 | Seite 1 von 9 Page 1 of 9 | |
| Kunden-Referenz-Nr.: <i>Client reference no.:</i> | N/A | Auftragsdatum: <i>Order date:</i> | 2021-06-25 | | |
| Auftraggeber: <i>Client:</i> | Brodersen Systems A/S, Islevdalvej 187, 2610 Rødovre, Dänemark | | | | |
| Prüfgegenstand: <i>Test item:</i> | RTU (Remote Telemetry Unit) | | | | |
| Bezeichnung / Typ-Nr.: <i>Identification / Type no.:</i> | RTU32M | | | | |
| Auftrags-Inhalt: <i>Order content:</i> | Climate tests: Cold test, dry heat test, damp heat cycle test, damp heat steady state test | | | | |
| Prüfgrundlage: <i>Test specification:</i> | IEC 60068-2-1:2007 Test Ab; IEC 60068-2-2:2007 Test Bb; IEC 60068-2-30:2005 Test Db variant 2; IEC60068-2-78:2012 | | | | |
| Wareneingangsdatum: <i>Date of sample receipt:</i> | 2022-01-07 |  | | | |
| Prüfmuster-Nr.: <i>Test sample no.:</i> | A003196762-001 to 002 | | | | |
| Prüfzeitraum: <i>Testing period:</i> | 2022-02-11 – 2022-03-04 | | | | |
| Ort der Prüfung: <i>Place of testing:</i> | Nürnberg | | | | |
| Prüflaboratorium: <i>Testing laboratory:</i> | TÜV Rheinland LGA Products GmbH | | | | |
| Prüfergebnis*: <i>Test result*:</i> | Pass | | | | |
| geprüft von: <i>tested by:</i> |  | genehmigt von: <i>authorized by:</i> |  | | |
| Datum: <i>Date:</i> | | 2022-03-14 | | | Ausstellungsdatum: <i>Issue date:</i> |
| Stellung / Position: | Sachverständige(r)/Expert | Stellung / Position: | Laborleiter / Lab manager | | |
| Sonstiges / Other: | | | | | |
| Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of the test item at delivery:</i> | | Prüfmuster vollständig und unbeschädigt <i>Test item complete and undamaged</i> | | | |
| * Legende: | 1 = sehr gut P(ass) = entspricht o.g. Prüfgrundlage(n) | 2 = gut F(ail) = entspricht nicht o.g. Prüfgrundlage(n) | 3 = befriedigend F(ail) = entspricht nicht o.g. Prüfgrundlage(n) | 4 = ausreichend N/A = nicht anwendbar | 5 = mangelhaft N/T = nicht getestet |
| * Legend: | 1 = very good P(ass) = passed a.m. test specification(s) | 2 = good F(ail) = failed a.m. test specification(s) | 3 = satisfactory F(ail) = failed a.m. test specification(s) | 4 = sufficient N/A = not applicable | 5 = poor N/T = not tested |
| <p>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>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.</i></p> | | | | | |

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Prüfbericht-Nr.: DE22VLQQ 001
Test report no.:

Seite 2 von 9
Page 2 of 9


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|---|---|
| 1 | <p>Alle eingesetzten Prüfmittel waren zum angegebenen Prüfzeitraum gemäß eines festgelegten Kalibrierungsprogramms unseres Prüfhauses kalibriert. Sie entsprechen den in den Prüfprogrammen hinterlegten Anforderungen. Die Rückverfolgbarkeit der eingesetzten Prüfmittel ist durch die Einhaltung der Regelungen unseres Managementsystems gegeben. Detaillierte Informationen bezüglich Prüfkonditionen, Prüfequipment und Messunsicherheiten sind im Prüflabor vorhanden und können auf Wunsch bereitgestellt werden.</p> <p><i>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.</i></p> |
| 2 | <p>Wie vertraglich vereinbart, wurde dieses Dokument nur digital unterzeichnet. Der TÜV Rheinland hat nicht überprüft, welche rechtlichen oder sonstigen diesbezüglichen Anforderungen für dieses Dokument gelten. Diese Überprüfung liegt in der Verantwortung des Benutzers dieses Dokuments. Auf Verlangen des Kunden kann der TÜV Rheinland die Gültigkeit der digitalen Signatur durch ein gesondertes Dokument bestätigen. Diese Anfrage ist an unseren Vertrieb zu richten. Eine Umweltgebühr für einen solchen zusätzlichen Service wird erhoben.</p> <p><i>As contractually agreed, this document has been signed digitally only. TUV 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, TUV 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.</i></p> |
| 3 | <p>Prüfklausel mit der Note * wurden an qualifizierte Unterauftragnehmer vergeben und sind unter der jeweiligen Prüfklausel des Berichts beschrieben. Abweichungen von Prüfspezifikation(en) oder Kundenanforderungen sind in der jeweiligen Prüfklausel im Bericht aufgeführt.</p> <p><i>Test clauses with remark of * are subcontracted to qualified subcontractors and described under the respective test clause in the report. Deviations of testing specification(s) or customer requirements are listed in specific test clause in the report.</i></p> |
| 4 | <p>Die Entscheidungsregel für Konformitätserklärungen in diesem Prüfbericht basiert auf der "Null-Grenzwert-Regel" und der "Einfachen Akzeptanz" gemäß ILAC GC8:2019 und IEC Guide 115:2021, es sei denn, in der auf Seite 1 dieses Berichts genannten angewandten Norm ist etwas anderes festgelegt oder vom Kunden gewünscht. Dies bedeutet, dass die Messunsicherheit nicht berücksichtigt wird und daher auch nicht im Prüfbericht angegeben wird.</p> <p><i>The decision rule for statements of conformity in this test report is based on the "Zero Guard Band Rule" and "Simple Acceptance" in accordance to ILAC GC8:2019 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.</i></p> |

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| Prüfbericht-Nr.: DE22VLQQ 001 <i>Test report no.:</i> | Seite 3 von 9 Page 3 of 9 |
|---|------------------------------|

| Liste der verwendeten Prüfmittel <i>List of used test equipment</i> | | |
|---|--|--|
| Prüfmittel <i>Test equipment</i> | Prüfmittel-Nr. / ID- NR. <i>Equipment No. / ID-No.</i> | Nächste Kalibrierung <i>Next calibration</i> |
| Climate Chamber Weis WK3S-340 | 2731324 | 01/2023 |
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| Prüfmusterbeschreibung <i>Description of test samples</i> | |
|---|--|
| Produktdetails <i>Product details</i> | N/A |
| Maße / Gewicht <i>Dimensions / Weight</i> | N/A |
| Bedienelemente <i>Operating elements</i> | N/A |
| Ausstattung / Zubehör <i>Equipment / Accessories</i> | N/A |
| Verwendete Materialien <i>Used materials</i> | N/A |
| Sonstiges <i>Other</i> | Test sample(s), as well sample information, description, product details and intended usage was provided by customer. |
| Prüfmusterbereitstellung: <i>Test sample obtaining:</i> | <input checked="" type="checkbox"/> Sending by customer <input type="checkbox"/> Sampling by TÜV Rheinland Group <input type="checkbox"/> others: |

Prüfbericht-Nr.: DE22VLQQ 001
Test report no.:

| Specimen | |
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Prüfbericht-Nr.: DE22VLQQ 001
Test report no.:

Seite 5 von 9
Page 5 of 9

| 1 | Test conditions | | | | | | | |
|--|---|--|--------------|---------|---|---|--|--|
| 1.1 | <p>Test conditions for cold test according to IEC 60068-2-1:2007 Test Ab</p> <table border="1" data-bbox="225 566 1509 831"> <thead> <tr> <th data-bbox="225 566 1238 607">Requirments:</th> <th data-bbox="1243 566 1509 607">Result:</th> </tr> </thead> <tbody> <tr> <td data-bbox="225 613 1238 734"> Tmin: -45°C Duration: 16h Operation: Off </td> <td data-bbox="1243 613 1509 734"> Pass <input checked="" type="checkbox"/> Fail <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input type="checkbox"/> </td> </tr> <tr> <td colspan="2" data-bbox="225 741 1509 831"> The pass criterion is awarded in relation to functional testing of the test specimen under customer specification. </td> </tr> </tbody> </table> | | Requirments: | Result: | Tmin: -45°C Duration: 16h Operation: Off | Pass <input checked="" type="checkbox"/> Fail <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input type="checkbox"/> | The pass criterion is awarded in relation to functional testing of the test specimen under customer specification. | |
| Requirments: | Result: | | | | | | | |
| Tmin: -45°C Duration: 16h Operation: Off | Pass <input checked="" type="checkbox"/> Fail <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input type="checkbox"/> | | | | | | | |
| The pass criterion is awarded in relation to functional testing of the test specimen under customer specification. | | | | | | | | |
| 1.2 | <p>Test conditions for dry heat test according to IEC 60068-2-2:2007 Test Bb</p> <table border="1" data-bbox="225 934 1509 1198"> <thead> <tr> <th data-bbox="225 934 1238 974">Requirments:</th> <th data-bbox="1243 934 1509 974">Result:</th> </tr> </thead> <tbody> <tr> <td data-bbox="225 981 1238 1102"> Tmax: +70°C Duration: 96h Operation: Off </td> <td data-bbox="1243 981 1509 1102"> Pass <input checked="" type="checkbox"/> Fail <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input type="checkbox"/> </td> </tr> <tr> <td colspan="2" data-bbox="225 1108 1509 1198"> The pass criterion is awarded in relation to functional testing of the test specimen under customer specification. </td> </tr> </tbody> </table> | | Requirments: | Result: | Tmax: +70°C Duration: 96h Operation: Off | Pass <input checked="" type="checkbox"/> Fail <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input type="checkbox"/> | The pass criterion is awarded in relation to functional testing of the test specimen under customer specification. | |
| Requirments: | Result: | | | | | | | |
| Tmax: +70°C Duration: 96h Operation: Off | Pass <input checked="" type="checkbox"/> Fail <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input type="checkbox"/> | | | | | | | |
| The pass criterion is awarded in relation to functional testing of the test specimen under customer specification. | | | | | | | | |
| 1.3 | <p>Test conditions for damp heat cycle test according to IEC 60068-2-30:2005 Test Db variant 2</p> <table border="1" data-bbox="225 1299 1509 1626"> <thead> <tr> <th data-bbox="225 1299 1238 1339">Requirments:</th> <th data-bbox="1243 1299 1509 1339">Result:</th> </tr> </thead> <tbody> <tr> <td data-bbox="225 1346 1238 1503"> Tmax: +55°C Tmin: 25°C Duration: 12h + 12h = 1 cycle Cycles: 6 Operation: Off </td> <td data-bbox="1243 1346 1509 1503"> Pass <input checked="" type="checkbox"/> Fail <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input type="checkbox"/> </td> </tr> <tr> <td colspan="2" data-bbox="225 1509 1509 1626"> The pass criterion is awarded in relation to functional testing of the test specimen under customer specification. </td> </tr> </tbody> </table> | | Requirments: | Result: | Tmax: +55°C Tmin: 25°C Duration: 12h + 12h = 1 cycle Cycles: 6 Operation: Off | Pass <input checked="" type="checkbox"/> Fail <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input type="checkbox"/> | The pass criterion is awarded in relation to functional testing of the test specimen under customer specification. | |
| Requirments: | Result: | | | | | | | |
| Tmax: +55°C Tmin: 25°C Duration: 12h + 12h = 1 cycle Cycles: 6 Operation: Off | Pass <input checked="" type="checkbox"/> Fail <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input type="checkbox"/> | | | | | | | |
| The pass criterion is awarded in relation to functional testing of the test specimen under customer specification. | | | | | | | | |
| 1.4 | <p>Test conditions for dampe heat steady state according to IEC 60068-2-78:2012</p> <table border="1" data-bbox="225 1727 1509 2022"> <thead> <tr> <th data-bbox="225 1727 1238 1767">Requirments:</th> <th data-bbox="1243 1727 1509 1767">Result:</th> </tr> </thead> <tbody> <tr> <td data-bbox="225 1774 1238 1908"> Tmax: +40°C Rel. humidity: 93% RH Duration: 240h Operation: Off </td> <td data-bbox="1243 1774 1509 1908"> Pass <input checked="" type="checkbox"/> Fail <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input type="checkbox"/> </td> </tr> <tr> <td colspan="2" data-bbox="225 1915 1509 2022"> The pass criterion is awarded in relation to functional testing of the test specimen under customer specification. </td> </tr> </tbody> </table> | | Requirments: | Result: | Tmax: +40°C Rel. humidity: 93% RH Duration: 240h Operation: Off | Pass <input checked="" type="checkbox"/> Fail <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input type="checkbox"/> | The pass criterion is awarded in relation to functional testing of the test specimen under customer specification. | |
| Requirments: | Result: | | | | | | | |
| Tmax: +40°C Rel. humidity: 93% RH Duration: 240h Operation: Off | Pass <input checked="" type="checkbox"/> Fail <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input type="checkbox"/> | | | | | | | |
| The pass criterion is awarded in relation to functional testing of the test specimen under customer specification. | | | | | | | | |

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| Prüfbericht-Nr.: DE22VLQQ 001 Test report no.: | |
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| 2 | Agreements: |
| | <p>The test specimens are subjected to the tests in the position of use.</p> <p>The test specimens are mounted on the clamping platen by the customer and made available for testing.</p> <p>The monitoring, assessment and documentation of the electrical function values is carried out with the customer's own measuring equipment.</p> <p>The function must be checked after each temperature/climate test. The exact function test must be determined by the customer.</p> <p>A detailed functional test is carried out by the customer.</p> |

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| 3 | Test procedure: |
| | <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">Functional test</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">Test according to 1.1</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">Functional test</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">Test according to 1.2</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">Functional test</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">Test according to 1.3</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">Functional test</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">Test according to 1.4</div> <div style="border: 1px solid black; padding: 5px;">Functional test</div> |

| | |
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| 4 | Measurement results – remarks: |
| | <p>The function of the specimen is given before and after all tests.</p> |

ANLAGE zum Prüfbericht-Nr.: DE22VLQQ 001
APPENDIX to Test Report No.:

Seite 7 von 9
Page 7 of 9

FOTO-DOKUMENTATION
PHOTO-DOCUMENTATION

Bild / Picture 1: Test setup



Bild / Picture 2: Example functional test after all tests



ANLAGE zum Prüfbericht-Nr.: DE22VLQQ 001
APPENDIX to Test Report No.:

Seite 8 von 9
Page 8 of 9

FOTO-DOKUMENTATION
PHOTO-DOCUMENTATION

Bild / Picture 3: Climate diagram cold test according to 1.1

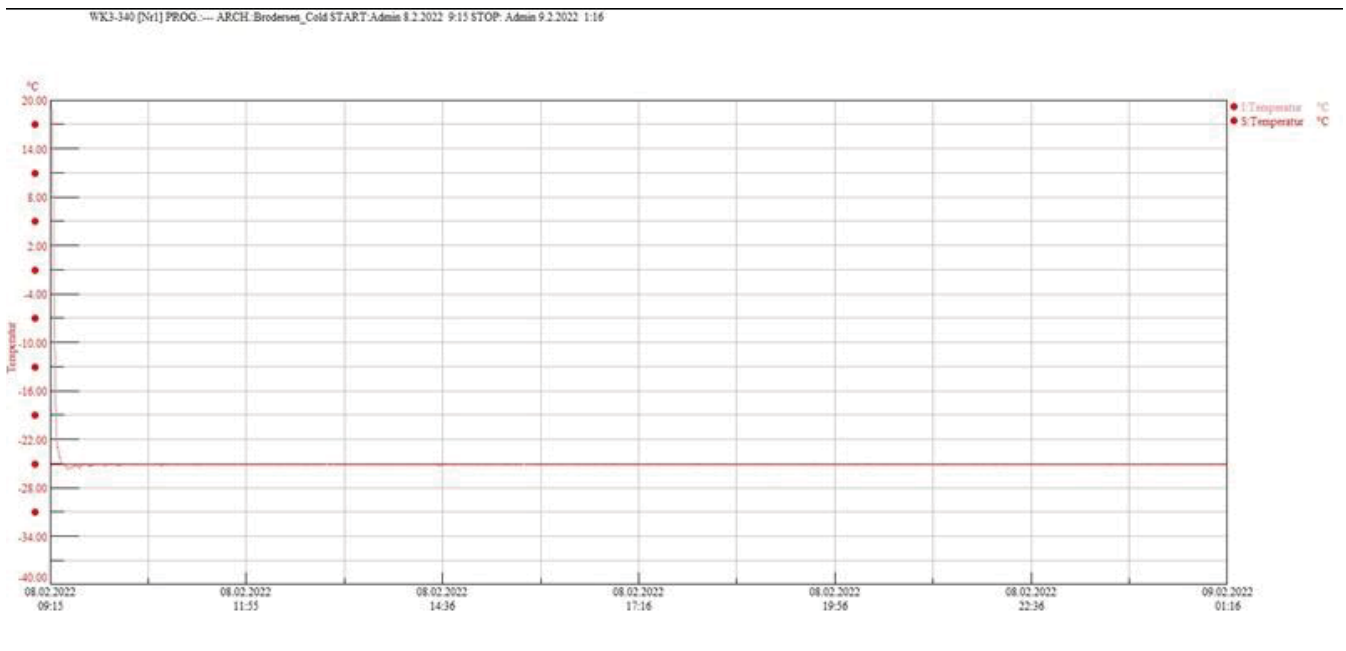


Bild / Picture 4: Climate diagram dry heat test according to 1.2

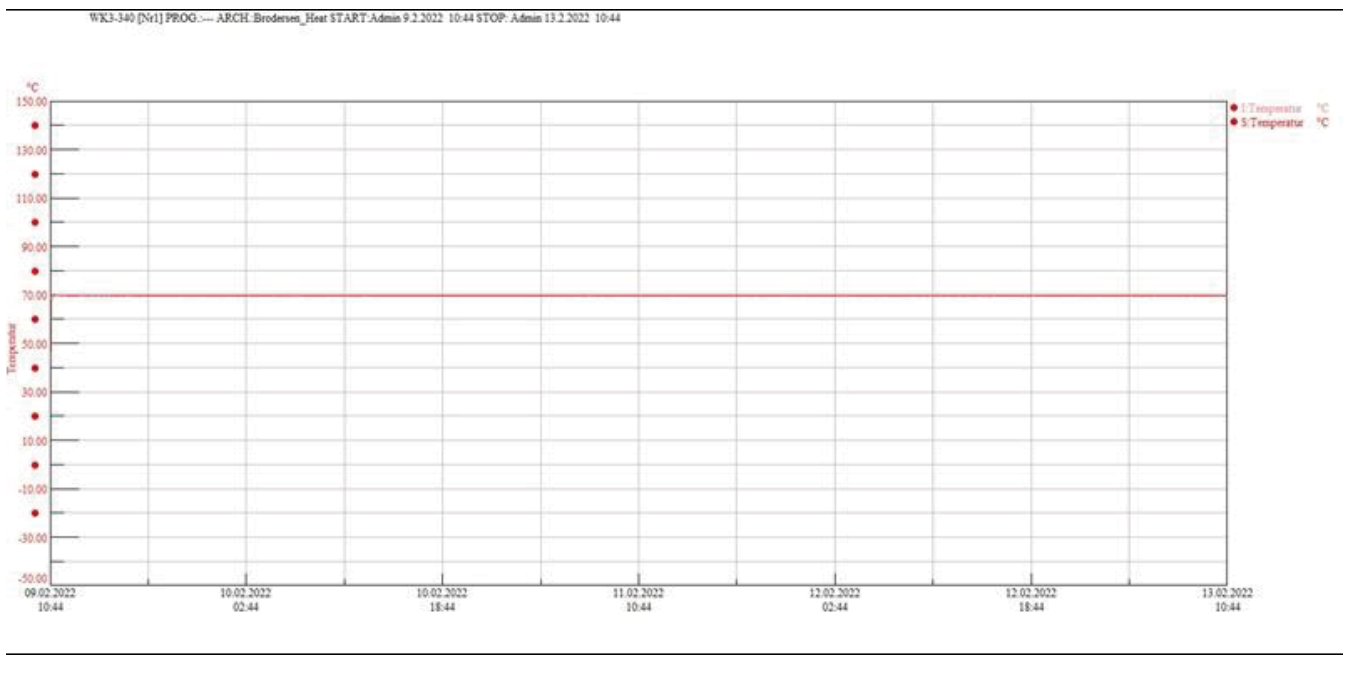


FOTO-DOKUMENTATION
PHOTO-DOCUMENTATION

Bild / Picture 5: Climate diagram damp heat cycle test according to 1.3

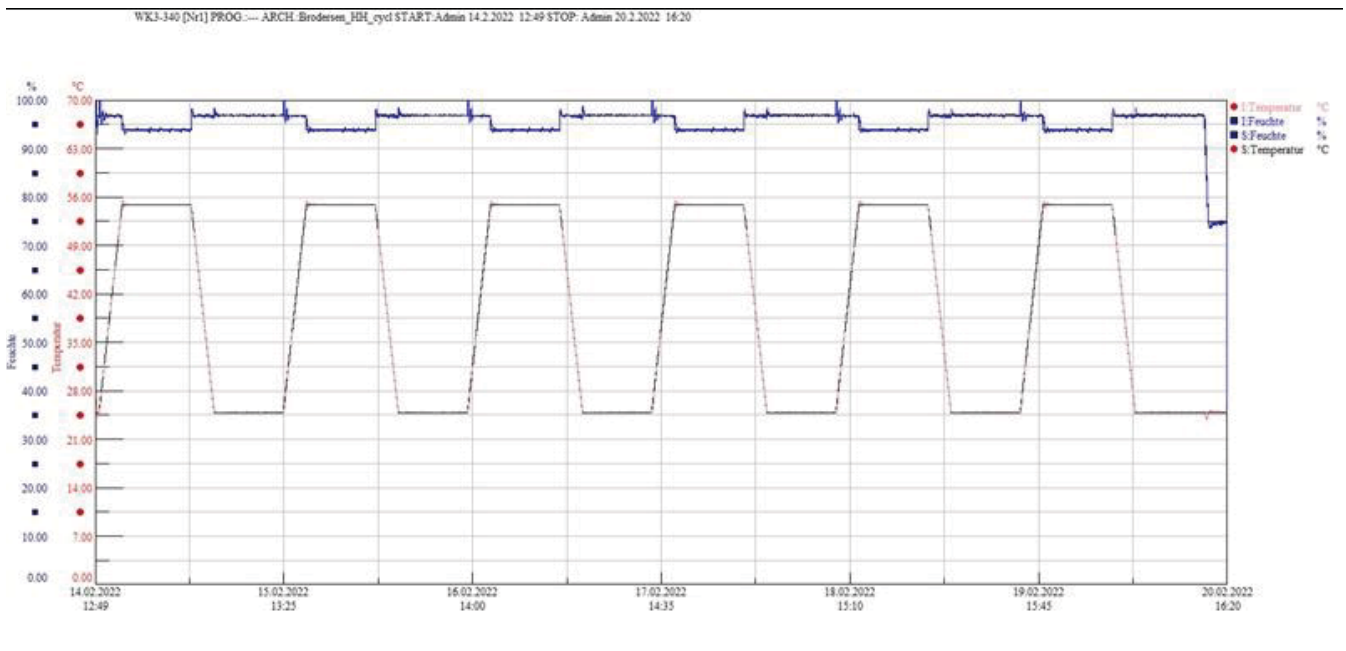


Bild / Picture 6: Climate diagram damp heat steady state test according to 1.4

