# Certificate of compliance

| | |
|---|---|
| **Applicant:** | **Inotel Elektrik Ltd. Sti**<br>**Ostim, Turan Çiğdem Cd. No:7**<br>**06374 Yenimahalle/Ankara**<br>**Türkiye** |
| **Product:** | **Network and System Protection unit** |
| **Model:** | **GMR 100** |

**Use in accordance with regulations:**

Automatic disconnection device with single and/or three-phase mains surveillance in accordance with Engineering Recommendation G99/1 for systems with a single or three-phase parallel coupling in the public mains supply.

**Applied rules and standards:**

**Engineering Recommendation G99/1-10:2024**
Requirements for the connection of generation equipment in parallel with public distribution networks

**DIN VDE V 0124-100:2020 (5.5.2.1 Functional safety of network and system protection)**
Grid integration of generator plants - Low-voltage - Test requirements for generator units to be connected to and operated in parallel with low-voltage distribution networks

At the time of issue of this certificate, the safety concept of an aforementioned representative product corresponds to the valid safety specifications for the specified use in accordance with regulations.

| | | | |
|---|---|---|---|
| **Report number:** | **25TH0193-G99-1_0** | **Certification Program:** | **NSOP-0032-DEU-ZE-V10** |
| **Certificate number:** | **U25-0625** | **Date of issue:** | **2025-07-01** |

**Certification body**

Georg LORITZ
Lab Supervisor Energy Systems

**Accreditation**

DAkkS Deutsche Akkreditierungsstelle D-ZE-12024-01-00

Accredited certification body by Deutsche Akkreditierungsstelle GmbH (DAkkS) according to ISO/IEC 17065. The accreditation is valid only for the scope listed in the annex of the accreditation certificate D-ZE-12024-01-00. The Deutsche Akkreditierungsstelle GmbH (DAkkS) is signatory of the multilateral arrangements of EA, ILAC and IAF for mutual recognition.

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| **Compliance Verification Report** | | | | |
|---|---|---|---|---|
| **Extract from test report according to the Engineering Recommendation G99/1** | | | | |
| **Type Approval and declaration of compliance with the requirements of Engineering Recommendation G99/1.** | | | | |
| **Technology** | Network and System Protection unit | | | |
| **Manufacturer** | Inotel Elektrik Ltd. Sti | | | |
| **Address** | Ostim, Turan Çiğdem Cd. No:7<br>06374 Yenimahalle/Ankara<br>Türkiye | | | |
| **Tel** | +90 312 750 09 18 | **Fax** | -- | |
| **Email** | info@inotelelk.com | **Website** | www.inotelelk.com | |
| | | | | |
| **Model** | GMR 100 | -- | -- | -- |
| | | | | |
| Supply voltage range | 24 $V_{DC}$ – 230 $V_{AC}$ | -- | -- | -- |
| Voltage monitoring range | L/N – 0 - 410 $V_{AC}$<br>L/L - 0 - 580 $V_{AC}$ | -- | -- | -- |
| Frequency monitoring range | 40 - 60 Hz | -- | -- | -- |
| | | | | |
| **Firmware version** | GMR100-BV_V1.1 | | | |
| | | | | |
| The above stated Network and System Protection unit is tested according the requirements in the Engineering Recommendation G99/1. Any modification that affects the stated tests must be named by the manufacturer/supplier of the product to ensure that the product meets all requirements of the Engineering Recommendation G99/1. | | | | |

| **Protection. Voltage tests.** | | | | | | |
|---|---|---|---|---|---|---|
| **Phase 1** | | | | | | |
| **Function** | **Setting** | | **Trip test** | | **No trip test** | |
| | **Voltage [V]** | **Time delay [s]** | **Voltage [V]** | **Time delay [s]** | **Voltage / time** | **Confirm no trip** |
| **U/V** | 184 | 2,5 | 180,0 | 2,529 | 188V / 5,0s | No trip |
| | | | | | 180V / 2,45s | No trip |
| **O/V stage 1** | 262,2 | 1,0 | 264,0 | 1,034 | 258,2V 5,0s | No trip |
| **O/V stage 2** | 273,7 | 0,5 | 275,0 | 0,528 | 269,7V 0,95s | No trip |
| | | | | | 277,7V 0,45s | No trip |

| **Protection. Voltage tests.** | | | | | | |
|---|---|---|---|---|---|---|
| **Phase 2** | | | | | | |
| **Function** | **Setting** | | **Trip test** | | **No trip test** | |
| | **Voltage [V]** | **Time delay [s]** | **Voltage [V]** | **Time delay [s]** | **Voltage / time** | **Confirm no trip** |
| **U/V** | 184,0 | 2,5 | 180,0 | 2,529 | 188V / 5,0s | No trip |
| | | | | | 180V / 2,45s | No trip |
| **O/V stage 1** | 262,2 | 1,0 | 264,0 | 1,034 | 258,2V 5,0s | No trip |
| **O/V stage 2** | 273,7 | 0,5 | 275,0 | 0,528 | 269,7V 0,95s | No trip |
| | | | | | 277,7V 0,45s | No trip |

| **Protection. Voltage tests.** | | | | | | |
|---|---|---|---|---|---|---|
| **Phase 3** | | | | | | |
| **Function** | **Setting** | | **Trip test** | | **No trip test** | |
| | **Voltage [V]** | **Time delay [s]** | **Voltage [V]** | **Time delay [s]** | **Voltage / time** | **Confirm no trip** |
| **U/V** | 184,0 | 2,5 | 180,0 | 2,515 | 188V / 5,0s | No trip |
| | | | | | 180V / 2,45s | No trip |
| **O/V stage 1** | 262,2 | 1,0 | 264,0 | 1,020 | 258,2V 5,0s | No trip |
| **O/V stage 2** | 273,7 | 0,5 | 275,0 | 0,534 | 269,7V 0,95s | No trip |
| | | | | | 277,7V 0,45s | No trip |
| Note. For Voltage tests the Voltage required to trip is the setting ±3,45V. The time delay can be measured at a larger deviation than the minimum required to operate the protection. The No trip tests need to be carried out at the setting ±4V and for the relevant times as shown in the table above to ensure that the protection will not trip in error. | | | | | | |

| **Protection. Frequency tests.** | | | | | | |
|---|---|---|---|---|---|---|
| **Function** | **Setting** | | **Trip test** | | **No trip test** | |
| | **Frequency [Hz]** | **Time delay [s]** | **Frequency [Hz]** | **Time delay [s]** | **Frequency / time** | **Confirm no trip** |
| **U/F stage 1** | 47,5 | 20,0 | 47,50 | 20,026 | 47,7Hz / 30s | No trip |
| **U/F stage 2** | 47 | 0,5 | 46,99 | 0,512 | 47,2Hz / 19,5s | No trip |
| | | | | | 46,8Hz / 0,45s | No trip |
| **O/F stage 2** | 52 | 0,5 | 52,0 | 0,514 | 51,8Hz / 120s | No trip |
| | | | | | 52,2Hz / 0,45s | No trip |
| Note. For Frequency Trip tests the Frequency required to trip is the setting ±0,1Hz. In order to measure the time delay a larger deviation than the minimum required to operate the projection can be used. The "No-trip tests" need to be carried out at the setting ±0,2Hz and for the relevant times as shown in the table above to ensure that the protection will not trip in error. | | | | | | |

| **Protection. Re-connection timer.** | |
|---|---|
| Test should prove that the reconnection sequence starts in no less than 20 seconds for restoration of voltage and frequency to within the stage 1 settings of table 10.1. | |
| **Over Voltage** | |
| **Time delay setting [s]** | **Measured delay [s]** |
| 20 | 20,056 |
| **Under Voltage** | |
| **Time delay setting [s]** | **Measured delay [s]** |
| 20 | 20,013 |
| **Over Frequency** | |
| **Time delay setting [s]** | **Measured delay [s]** |
| 20 | 20,177 |
| **Under Frequency** | |
| **Time delay setting [s]** | **Measured delay [s]** |
| 20 | 20,145 |

| | Checks on no reconnection when voltage or frequency is brought to just outside stage 1 limits of table 1. | | | |
|---|---|---|---|---|
| | At 266,2V | At 180,0V | At 47,4Hz | At 52,1Hz |
| **Confirmation that the Generating Unit does not re-connect.** | No reconnection | No reconnection | No reconnection | No reconnection |

| **Protection. Frequency change, Stability test.** | | | | |
|---|---|---|---|---|
| | **Start Frequency [Hz]** | **Change** | **Test Duration** | **Confirm no trip** |
| **Positive Vector Shift** | 49,5 | +50 degrees | | No trip |
| **Negative Vector Shift** | 50,5 | -50 degrees | | No trip |
| **Positive Frequency drift** | 49,0 to 51,0 | +0,95Hz/sec | 2,1s | No trip |
| **Negative Frequency drift** | 51,0 to 49,0 | -0,95Hz/sec | 2,1s | No trip |

| **Self Monitoring – Solid state switching.** | **N/A** |
|---|---|
| It has been verified that in the event of the solid state switching device failing to disconnect the Power Park Module, the voltage on the output side of the switching device is reduced to a value below 50 volts within 0,5 seconds. | N/A |
| Note.<br>Unit does not provide a solid state disconnection device.<br>The unit is a disconnection device with mechanical separation in the use of relays with feedback contact.<br>Therefore, voltage direct drop to 0V when relay contact open.<br>The disconnection device is comply with 4.1 function safety of the VDE 0126-1-1. | |

| | **Wiring functional tests: If required by paragraph 15.2.1.** | **N/A** |
|---|---|---|
| Confirm that the relevant test schedule is attached (tests to be undertaken at time of commissioning). | | N/A |
| **Note:**<br>The Network and System Protection unit was tested in a test laboratory. The correct wiring functional test in the field has to be done by the responsible person for the installation of the plant. | | |

| **Cyber security** | **P** |
|---|---|
| Confirm that the Manufacturer or Installer of the Micro-generator has provided a statement describing how the Micro-generator has been designed to comply with cyber security requirements, as detailed in 9.7. | Yes |
| Note. Different levels of access, all are password protected, only certain parameters can be changed on maintenance level. Manufacturer information provided, see test report. | |

| **Logic Interface (input port) Required by paragraph 11.1.3.1** | **P** |
|---|---|
| Confirm that an input port is provided and can be used to reduce the Active Power output to zero | Yes |
| Note.<br>Only remote off state possible due to Network and System Protection unit. | |
| Provide high level description of logic interface, e.g. details in 11.1.3.1 such as AC or DC signal | Yes |

**31)Y2 REMOTE OFF STATE:**




Specifies remote connection breaker opening information.

0: Not used.
1: (activates 24V for 1sec.)