# Certificate of compliance

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|---|---|
| **Applicant:** | **TommaTech GmbH**<br>**Zeppelinstr. 14**<br>**85748 Garching b.München,**<br>**Germany** |
| **Product:** | **Photovoltaic inverter** |
| **Model:** | **Trio Inova 3K, Trio Inova 4K,**<br>**Trio Inova 5K, Trio Inova 6K,**<br>**Trio Inova 7K, Trio Inova 8K,**<br>**Trio Inova 9K, Trio Inova 10K,**<br>**Trio Inova 12K, Trio Inova 15K** |

**The device is designed to work as a generation unit of the type: A**

Inverter for three-phase parallel connection to the public grid. The network monitoring and disconnection device is an integral part of the above-mentioned model.

**Applied rules and standards:**

**EN 50549-1:2019/A1:2023**
Requirements for parallel connection of installations with distribution networks - Part 1: Connection to an LV distribution network - Production of installations up to and including Type B

4.4 Normal operating range
4.5 Immunity to disturbances
4.6 Active response to frequency deviation
4.7 Power response to voltage variations and voltage changes
4.8 EMC and power quality
4.9 Interface protection
4.10 Connection and starting to generate electrical power
4.11 Ceasing and reduction of active power on set point
4.13 Requirements regarding single fault tolerance of interface protection system and interface switch

**EN 50549-10:2022**
Requirements for generating plants to be connected in parallel with distribution networks - Part 10: Tests for conformity assessment of generating units

**Compliance with the parameters in Annex C of the standard**
(see appendix parameter table)

**Commission Regulation (EU) 2016/631 of 14 April 2016**
Establishing a network code on requirements for grid connection of generators (NC RFG).
Type approval for generation units to use in Type A plants.

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:** **CWXK-ESH-P26020665**
**Certification Program:** **NSOP-0032-DEU-ZE-ES-V10**
**Certificate number:** **U26-0300**
**Date of issue:** **2026-04-09**

**Certification body**

Domenik Koll
Head of Energy Systems Germany

**Accreditation**

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

| **Type Approval and declaration of compliance with the requirements of EN 50549-1 and Commission Regulation (EU) 2016/631 of 14 April 2016** | | | | |
|---|---|---|---|---|
| **Manufacturer** | TommaTech GmbH<br>Zeppelinstr. 14<br>85748 Garching b.München,<br>Germany | | | |
| | | | | |
| **Product type** | Photovoltaic inverter | | | |
| | | | | |
| **Static converter model** | Trio Inova 3K | Trio Inova 4K | Trio Inova 5K | Trio Inova 6K |
| **Input DC (photovoltaic)** | | | | |
| MPP voltage range [V] | 120-1000 | 120-1000 | 120-1000 | 120-1000 |
| Max. DC input voltage [V] | 1100 | 1100 | 1100 | 1100 |
| Max. DC input current [A] | 20/20 | 20/20 | 20/20 | 20/20 |
| **Output AC** | | | | |
| Rated AC voltage [V] | 230V,3L/N/PE<br>50/60Hz | 230V,3L/N/PE<br>50/60Hz | 230V,3L/N/PE<br>50/60Hz | 230V,3L/N/PE<br>50/60Hz |
| Max. output current [A] | 4,8 | 6,4 | 8,0 | 9,6 |
| Nom. converter output ($P_{NINV}$) [kW] | 3,0 | 4,0 | 5,0 | 6,0 |
| Max. apparent power [kVA] | 3,3 | 4,4 | 5,5 | 6,6 |
| | | | | |
| **Static converter model** | Trio Inova 7K | Trio Inova 8K | Trio Inova 9K | Trio Inova 10K |
| **Input DC (photovoltaic)** | | | | |
| MPP voltage range [V] | 120-1000 | 120-1000 | 120-1000 | 120-1000 |
| Max. DC input voltage [V] | 1100 | 1100 | 1100 | 1100 |
| Max. DC input current [A] | 20/20 | 20/20 | 20/20 | 20/20 |
| **Output AC** | | | | |
| Rated AC voltage [V] | 230V,3L/N/PE<br>50/60Hz | 230V,3L/N/PE<br>50/60Hz | 230V,3L/N/PE<br>50/60Hz | 230V,3L/N/PE<br>50/60Hz |
| Max. output current [A] | 11,2 | 12,8 | 14,4 | 16,0 |
| Nom. converter output ($P_{NINV}$) [kW] | 7,0 | 8,0 | 9,0 | 10,0 |
| Max. apparent power [kVA] | 7,7 | 8,8 | 9,9 | 11,0 |
| | | | | |

| **Static converter model** | Trio Inova 12K | Trio Inova 15K | -- | -- |
|---|---|---|---|---|
| **Input DC (photovoltaic)** | | | | |
| MPP voltage range [V] | 120-1000 | 120-1000 | -- | -- |
| Max. DC input voltage [V] | 1100 | 1100 | -- | -- |
| Max. DC input current [A] | 20/20 | 20/26 | -- | -- |
| **Output AC** | | | | |
| Rated AC voltage [V] | 230V,3L/N/PE 50/60Hz | 230V,3L/N/PE 50/60Hz | -- | -- |
| Max. output current [A] | 19,2 | 24,0 | -- | -- |
| Nom. converter output ($P_{NINV}$) [kW] | 12,0 | 15,0 | -- | -- |
| Max. apparent power [kVA] | 13,2 | 16,5 | -- | -- |

| **Interface protection system and interface switch (Network and system protection "NS-protection")** | |
|---|---|
| **Type of protection** | integrated NS-protection |
| **Assigned to generation unit type** | Trio Inova 3K, Trio Inova 4K,<br>Trio Inova 5K, Trio Inova 6K,<br>Trio Inova 7K, Trio Inova 8K,<br>Trio Inova 9K, Trio Inova 10K,<br>Trio Inova 12K, Trio Inova 15K |
| **Integrated interface switch** | Type of switching equipment 1: Relay (Model HF161F-W)<br>Type of switching equipment 2: Relay (Model HF161F-W) |
| | Note: The output is switched off by the inverter bridge and two relay in series in each line and neutral. |
| **Software** | |
| **Firmware version** | 5612-0326 |

**Note**

The settings of the product are password protected adjustable.

In case the generators are used with an external protection device, the protection settings of the inverters are to be adjusted according to the manufacturer's declaration.

The above stated generators are tested according to the requirements in the EN 50549-1 and the Commission Regulation (EU) 2016/631 of 14 April 2016. 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.

**Type Approval and declaration of compliance with the requirements of EN 50549-1 and Commission Regulation (EU) 2016/631 of 14 April 2016**

**Parameter Table**

| | |
|---|---|
| **Name of parameter set** | EN50549-1&EN50549-10 |
| **Specific technical requirement** | EN50549-10 |

| **Clause of EN 50549-1** | **Parameter** | **Remarks / additional information[b]** | **setting range** | **default settings used** | |
|---|---|---|---|---|---|
| 4.3.2 Interface switch | Single fault tolerance for interface switch | | yes \| no | yes | |
| 4.4.2 Operating frequency range | 47,0 – 47,5 Hz Duration | | 0 s – 20 s | 0s | |
| | 47,5 – 48,5 Hz Duration | | 30 – 90 min | 30 min | |
| | 48,5 – 49,0 Hz Duration | | 30 – 90 min | 30 min | |
| | 49,0 – 51,0 Hz Duration | | not configurable | unlimited | |
| | 51,0 – 51,5 Hz Duration | | 30 – 90 min | 30 min | |
| | 51, 5 – 52 Hz Duration | | 0 – 15 min | 0 s | |
| 4.4.3 Minimal requirement for active power delivery at under frequency | Reduction threshold | | not configurable<br>49,0 Hz – 49,5 Hz | Electronic inverter, no power reduction take place<br>49,5 Hz | |
| | Maximum reduction rate | | not configurable<br>2 – 10% $P_M$/Hz | ≤ 2 %<br>10% $P_M$/Hz | |
| 4.4.4 Continuous operating voltage range | Upper limit | | not configurable<br>1,0 $U_n$ – 2,0 $U_n$ | 1,10 $U_n$ | |
| | Lower limit | | not configurable<br>0,9 $U_n$ – 1,0 $U_n$ | 0,85 $U_n$, | |
| 4.5.2 Rate of change of frequency (ROCOF) immunity | ROCOF withstand capability (defined with a sliding measurement window of 500 ms)<br>non-synchronous generating technology (inverter):<br>synchronous generating technology: | | not configurable<br>0 – 10 Hz/s<br>yes<br>no | 2 Hz/s | |
| 4.5.3.2 Generating plant with non-synchronous generating technology (FRT) | Fault recovery of active power (times calculated from the removal of the short circuit) | | configurable | 1 s | |
| | Voltage-Time-Diagram | | see Figure 6 of EN 50549-1:2019 | Time [s] | U [p.u.] |
| | | | | 0,00 | 0,20 |
| | | | | 0,15 | 0,20 |
| | | | | 1,50 | 0,85 |
| | | | | 180 | 0,85 |
| | | | | 180 | 0,90 |
| 4.5.4 Over-voltage ride through (OVRT) | Voltage-Time-Diagram | | not configurable see Figure 8 of EN 50549-1:2019 | Time [s] | U [p.u.] |
| | | | | 0,0 | 1,25 |
| | | | | 0,1 | 1,25 |

| | | | | | |
|---|---|---|---|---|---|
| | | | | 0,1 | 1,20 |
| | | | | 5,0 | 1,20 |
| | | | | 5,0 | 1,15 |
| | | | | 60,0 | 1,15 |
| | | | | 60,0 | 1,10 |
| 4.5.5 Phase jump immunity | Phase jump immunity | | not configurable | 20° | |
| 4.6.1 Power response to over frequency (LFSM-O) | Threshold frequency $f_1$ | | 50,2 Hz – 52,0 Hz | 50,2 Hz | |
| | Droop | | 2% – 12% | 5% | |
| | Power reference | | $P_M$ \| Pmax | $P_M$ for other nonsynchronous Generating technology | |
| | Intentional delay | | 0 s – 2 s | 0 s | |
| | Deactivation threshold fstop | | 50,0 Hz – f1 | deactivated | |
| | Deactivation time $t_{stop}$ | | 0 s – 600 s | - | |
| | Acceptance of staged disconnection | | yes \| no | yes | |
| 4.6.2 Power response to under frequency (LFSM-U) | Threshold frequency $f_1$ | | yes \| no | yes | |
| | Droop | | 49,8 Hz – 46,0 Hz | 49,8 Hz | |
| | Power reference | | 2 % – 12% | 5% | |
| | Intentional delay | | 0 s – 2 s | 0 s | |
| 4.7.2.2 Capabilities | Active factor range overexcited | | 0,90 – 1 / 48% $P_d$ - 0<br>0,95 – 1 / 33% $P_d$ - 0 | 0,95 – 1 / 33% Pd - 0 | |
| | Active factor range underexcited | | 0,90 – 1 / 48% $P_d$ - 0<br>0,95 – 1 / 33% $P_d$ - 0 | 0,95 – 1 / 33% Pd - 0 | |
| 4.7.2.3 Control modes | Enabled control mode | | Q setp.<br>Q(U)<br>Q(P)<br>cos φ setp.<br>cos φ (P) | activated<br>deactivated<br>deactivated<br>deactivated<br>deactivated | |
| 4.7.2.3.2 Set point control modes | Q setpoint and excitation | | 0 – 48 % $P_D$, 0 – 33 % $P_D$ | 0 | |
| | cos φ setpoint and excitation | | 1 – 0,9 | 1 | |
| 4.7.2.3.3 Voltage related control modes | Characteristic curve | | cos φ (P)<br>Q(P) | deactivated<br>deactivated | |
| | Time constant | | 3 s – 60 s | 10 s | |
| | Min cos φ | | 0,0 – 1 | 0,9 | |
| | Lock in power | | 0% – 20% | deactivated | |
| | Lock out power | | 0% – 20% | deactivated | |
| 4.7.2.3.4 Power related control mode | Characteristic curve | | Q(U)<br>P(U) | Q(U) (three-phase inverter)<br>0,00…-0,436<br>0,92…-0,436<br>0,94…0,0<br>1,06…0,0 | |

| | | | | |
|---|---|---|---|---|
| | | | | 1,08…0,436<br>1,20…0,436<br>P(U) deactivated |
| 4.7.4.2.2 Zero current mode for converter connected generating technology | Enabling | | enable \| disable | disable |
| | Static voltage range overvoltage | | 100% Un – 120% Un | 120% Un |
| | Static voltage range undervoltage | | 20% Un – 100% Un | 50% Un |
| 4.9.3 Requirements on voltage and frequency protection | Threshold for protection as dedicated device [in A or kW, kVA] | | 33 A<br>Note: Rated current of internal safety device! | Internal safety device |
| | Undervoltage threshold stage 1 | | 0,2 $U_n$ – 1 $U_n$ | 0,85 $U_n$ |
| | Undervoltage operate time stage 1 | | 0,1 s – 100 s | 1,2 – 1,5 s |
| | Undervoltage threshold stage 2 | | 0,2 $U_n$ – 1 $U_n$ | N/A |
| | Undervoltage operate time stage 2 | | 0,1 s – 5 s | N/A |
| | Overvoltage threshold stage 1 | | 1,0 $U_n$ – 1,2 $U_n$ | 1,15 $U_n$ |
| | Overvoltage operate time stage 1 | | 0,1 s – 100 s | 0,1 – 0,2 s |
| | Overvoltage threshold stage 2 | | 1,0 $U_n$ – 1,3 $U_n$ | 1,25 $U_n$ (N/A) |
| | Overvoltage operate time stage 2 | | 0,1 s – 5 s | 0,1 s (N/A) |
| | Overvoltage threshold 10 min mean protection[a] | | 1,0 $U_n$ – 1,15 $U_n$ | 1,10 $U_n$ |
| | Overvoltage operate time 10 min mean protection[a] | | 0,04 s – 10,00 s | 10 min (update every 3s) |
| | Underfrequency threshold stage 1 | | 47,0 Hz – 50,0 Hz | 47,5 Hz |
| | Underfrequency operate time stage 1 | | 0,1 s – 100 s | 0,3 s – 0,5 s |
| | Underfrequency threshold stage 2 | | 47,0 Hz – 50,0 Hz | N/A |
| | Underfrequency operate time stage 2 | | 0,1 s – 5 s | N/A |
| | Overfrequency threshold stage 1 | | 50,0 Hz – 52,0 Hz | 52,0 Hz |
| | Overfrequency operate time stage 1 | | 0,1 s – 100 s | 0,3 s – 0,5 s |
| | Overfrequency threshold stage 2 | | 50,0 Hz – 52,0 Hz | N/A |
| | Overfrequency operate time stage 2 | | 0,1 s – 5,0 s | N/A |

| | | | | |
|---|---|---|---|---|
| | Loss of mains according EN 62116 (LoM) | | 0 s – 6000 s | ROCOF 2,5 Hz/s (0,5 s)<br>active 2 s (5 s) |
| 4.10.2 Automatic reconnection after tripping | Lower frequency | | 47,0 Hz – 50,0 Hz | 49,5 Hz |
| | Upper frequency | | 50,0 Hz – 52,0 Hz | 50,2 Hz |
| | Lower voltage | | 50% $U_n$ – 100 % $U_n$ | 85% $U_n$, 90% $U_c$ |
| | Upper voltage | | 100% $U_n$ – 120% $U_n$ | 110% $U_n$ |
| | Observation time | | 10 s – 600 s | 60 s |
| | Active power increase gradient | | 6% – 3000% / min | 10% / min |
| 4.10.3 Starting to generate electrical power | Lower frequency | | 47,0 Hz – 50,0 Hz | 49,5 Hz |
| | Upper frequency | | 50,0 Hz – 52,0 Hz | 50,1 Hz |
| | Lower voltage | | 50% – 100% $U_n$ | 85% $U_n$, 90% $U_c$ |
| | Upper voltage | | 100% – 120% $U_n$ | 110% $U_n$ |
| | Observation time | | 10 s – 600 s | 60 s |
| | Active power increase gradient | | 6% – 3000% / min | disabled |
| 4.11.1 Ceasing active power | Remote operation of the logic interface | | RS485, WiFi, local | |
| 4.11.2 Reduction of active power on set point | Remote operation<br>NOTE: If yes further definition is provided by the DSO | | RS485, WiFi, local | |