

**Technical data necessary to be transmitted in order to verify the compliance with technical requirements from ANRE Order 208 of 14.12.2018 approving the Technical Norm on the technical connection terms to electricity networks of public interest for generating modules, power plants consisting of generating modules and power plants consisting of offshore generating modules**

**Specifications for inverters mentioned in the provisions of Order 1287 of the Environment Ministry**

In accordance with the provisions of Regulation (EU) 2016/631 instituting a network code with respect to the grid connection requirements for generating installations<sup>i</sup> and of ANRE Order 208/14.12.2018 approving the *Technical Norm on the technical connection terms to electricity networks of public interest for generating modules, power plants consisting of generating modules and power plants consisting of offshore generating modules*<sup>ii</sup>, generating units that are put in operation (energised in order to begin the trial period) after **27.04.2019** are considered as new.

Taking into account ANRE Order 208/14.12.2018 becomes effective on **27.04.2019**, all power plants that will be energised after this date of 27.04.2019 will be considered as new and should comply with the provisions of ANRE Order 208/14.12.2018. Consequently the check-up of inverters required by the Environment Ministry's Order 1287/2018 will consist of technical review in accordance with ANRE Order 208/14.12.2018, which cancels ANRE Order 30/17.05.2013 approving the technical norm *Technical conditions for connection to electricity networks of public interest of photovoltaic power parks*.

To assist the applicants that enlist in the Environment Ministry's Order 1287/2018 *Financing Guide of the Programme to install photovoltaic panels to generate electricity in view of covering the consumption needs and deliver the surplus into the national network* and want to install photovoltaic parks of installed capacity below 1 MW, corresponding to Category A of generating modules as per ANRE Order 79/2016, we provide below a list of documents that should be transmitted to Transelectrica, UnO-DEN for review and check-up against the requirements of ANRE Order 208/2018.

- (a) General technical data of the inverter;
- (b) In order to check the requirements of **article 6 para (a)<sup>iii</sup>** the following should be provided:
  - Technical data showing the frequency range of operation;
  - Certificate of conformity issued by organisations with European credentials and recognition, which confirms the check-up of the operational frequency range and provides also the registered typical tests used in issuing the certificate;
- (c) In order to check the requirements of **article 6 para (b)<sup>iv</sup>** the following should be provided:
  - Technical data showing the operation at maximum frequency variation rate;

- Certificate of conformity issued by organisations with European credentials and recognition, which confirms the operational check-up at frequency variations and provides the registered typical tests used in issuing the certificate;

In case the certificate is issued for a frequency variation rate of 1 Hz/s and the certification for 2 Hz/s cannot be achieved until the end of 2019, a signed manufacturer statement can be sent, which confirms the specified inverter type can operate also at 2 Hz/s variation rate.

(d) In order to check the requirements of **article 7 para (a)<sup>v</sup>** the following should be provided:

- Technical data showing the operational mode when frequency rises above 50.2 Hz;
- Certificate of conformity issued by organisations with European credentials and recognition, which confirms the operational check-up to frequency variations above 50.2 Hz, according to requirements, also providing the registrations of type tests used in issuing the certificate;

(e) In order to check the requirements of **article 9<sup>vi</sup>** the following should be provided:

- Technical data showing the operational mode of the inverter when frequency drops below 49 Hz;
- Certificate of conformity issued by organisations with European credentials and recognition, which confirms the inverter operation has been checked according to requirements at frequency variations below 49 Hz and provides the registration of type tests used in issuing the certificate for this requirement;

(f) In order to check the requirement of **article 12 para (2)<sup>vii</sup>** the following should be provided:

- Technical data showing this operational mode;
- Certificate of conformity issued by organisations with European credentials and recognition, which confirms the variation rate of active power upon automatic network connection has been checked and provides the registrations of type tests used in issuing the certificate for this requirement;

(g) In order to check the requirement of **article 14<sup>viii</sup>**:

- Certificate of conformity issued by organisations with European credentials and recognition, which confirms the electricity quality has been checked: harmonics, flicker and non-symmetry, providing also the registrations of type tests used in issuing the certificate;

(h) The values of implicit protections for the frequency range and voltage range;

(i) The module of automatic network connection, after one disconnection;

*When the Notification Procedure to connect generating units and to verify the compliance of generating units with the technical requirements for connection of generating units to electricity networks of public interest has been approved and enforced, the notification process and the conformity check-up will be applied as described in the fore-mentioned procedure.*

Thus the list of inverters that comply with the provisions of ANRE Order 30/2013 will no longer be up-to-date and the conformity process will comply with the provisions of the fore-mentioned procedure.

---

<sup>i</sup> Article 3 para (1) and article 4 para (2)

<sup>ii</sup> Article 2 para (1) and article 3 para (2)

<sup>iii</sup> The generating module should remain connected to the network and operate within the frequency ranges and time periods provided in table 1A

<sup>iv</sup> The generating module should remain connected to the network and operate at the frequency variation rates of 2 Hz/s for 500 ms time interval; 1.5 Hz/s for 1 s and of 1.25 Hz/s for 2 s, depending on the technology and the short-circuit power of the system in the connection point (value specified by ORR through ATR). The protection controls in the connection point should enable the operation of the generating module for such frequency variation profiles

<sup>v</sup> Generating modules of category A should be capable to provide limited response to frequency deviations, namely frequency increases above the nominal value of 50 Hz (RFA-CR) as follows: in case of frequency rises the generating module should reduce the active power produced proportionally to the frequency variation, in accordance with figure 1A

<sup>vi</sup> The TSO determines the reduction of active power generated by the generating module against the active power produced (admissible power given by the primary source), as a consequence of frequency drop within the limits provided in figure 2A

<sup>vii</sup> The frequency range within which automatic connection is admitted, namely 47.5 ÷ 51 Hz, the voltage range (0.9 ÷ 1.1  $U_n$ ), the observation / validation time (including synchronisation) and maintenance of the measured parameters in the specified domain – maximum 300 seconds. The admitted ramp for active power increase after connection ( $\leq 20\% P_{max/min}$ ), usually 10% of  $P_{max/min}$  (the set value is selected within the range specified by the manufacturer of the generating module)

<sup>viii</sup> Regardless of the auxiliary installations that are in operation and no matter what is the generated power, the generating module should provide, as applicable, electricity quality in the connection / delimiting point in accordance with applicable standards (European standards and the performance standard for provisions of electricity transmission services and system services, namely the standard for provision of electricity distribution services, as applicable)