

Translated English of Chinese Standard: GB/T40102-2021

www.ChineseStandard.net → Buy True-PDF → Auto-delivery.

Sales@ChineseStandard.net

GB

NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA

ICS 27.160

CCS F 12

GB/T 40102-2021

**Test Code of Connecting to Power System for Solar
Thermal Power Plants**

太阳能热发电站接入电力系统检测规程

Issued on: May 21, 2021

Implemented on: December 1, 2021

Issued by: State Administration for Market Regulation;

**Standardization Administration of the People's Republic of
China.**

Table of Contents

Foreword.....	3
1 Scope.....	4
2 Normative References	4
3 Terms and Definitions	4
4 Basic Rules	5
5 Measuring Instruments	5
6 Start-up and Shutdown Tests	5
7 Excitation System Parameter Test	6
8 PSS Parameter Setting Test	6
9 Speed Control System Parameter Test.....	6
10 Generator Leading Phase Test	6
11 Primary Frequency Modulation Test.....	7
12 AGC System Test.....	8
13 AVC System Test.....	9

Test Code of Connecting to Power System for Solar Thermal Power Plants

1 Scope

This Standard specifies the methods for the start-up and shutdown test, excitation system parameter test, power system stabilizer parameter setting test, speed control system parameter test, generator leading phase test, primary frequency modulation test, automatic power generation control system test and automatic voltage control system test of connecting to power system for solar thermal power plants.

This Standard is applicable to thermal storage type of solar thermal power plants using steam turbine generator set.

2 Normative References

The content of the following documents constitutes indispensable clauses of this document through normative references in the text. In terms of references with a specified date, only versions with a specified date are applicable to this document. In terms of references without a specified date, the latest version (including all the modifications) is applicable to this document.

GB/T 20840.2 Instrument Transformers - Part 2: Additional Requirements for Current Transformers

GB/T 20840.3 Instrument Transformers - Part 3: Additional Requirements for Inductive Voltage Transformers

GB/T 40103 Technical Requirement of Connecting to Power System for Solar Thermal Power Station

DL/T 1167 Guide for Modeling Generator Excitation System

DL/T 1231 Guide for Setting Test of Power System Stabilizer

DL/T 1235 Guide for Modeling and Testing of Generator's Prime Mover and Governor

DL/T 1523 Guide on Leading Power Factor Operation Test of Synchronous Generator

3 Terms and Definitions

The terms and definitions defined in GB/T 40103 are applicable to this document.

- a) Set the generator set to enter the start-up procedure;
- b) Actuate the data acquisition device;
- c) Set the load; on the outlet side of the generator set, continuously measure and record the active power of the entire start-up process;
- d) Calculate the time for the load to rise to the set value.

6.2 Shutdown Test

The test shall be carried out in accordance with the following steps:

- a) Start the normal shutdown procedure;
- b) Actuate the data acquisition device;
- c) On the outlet side of the generator set, continuously measure and record the active power of the entire shutdown process;
- d) Calculate the load reduction rate.

7 Excitation System Parameter Test

The method for the excitation system parameter test of the solar thermal generator set shall comply with the stipulations of DL/T 1167.

8 PSS Parameter Setting Test

The method for the PSS parameter setting test of the solar thermal generator set shall comply with the stipulations of DL/T 1231.

9 Speed Control System Parameter Test

The method for the speed control system parameter test of the solar thermal generator set shall comply with the stipulations of DL/T 1235. The test conditions should be $30\%P_N$, $65\%P_N$ and $90\%P_N$.

NOTE: P_N is the rated power of the generator set.

10 Generator Leading Phase Test

The method for the leading phase test of the solar thermal generator set shall comply with the stipulations of DL/T 1523. The test conditions should be $30\%P_N$, $65\%P_N$ and $90\%P_N$.

12 AGC System Test

12.1 Test Conditions

Before AGC system performance test, the system shall satisfy the following conditions:

- a) The error of the load command signal between the grid dispatching and the generator set shall be within $\pm 0.2\%$; the transmission of other communication signals shall be normal;
- b) The logic of the AGC auxiliary control of the generator set shall be correct;
- c) The main control systems of the generator set shall be operated in an automatic mode. During the test, the primary frequency modulation function of the generator set should be disabled.

12.2 Stable Load Performance Test

The test shall be conducted in accordance with the following steps:

- a) The stable load performance test shall respectively be carried out within two load ranges: $70\%P_N \sim 100\%P_N$ and $20\%P_N \sim 40\%P_N$;
- b) It shall be ensured that within the period of 20 min before the test, and during the test, there shall be no obvious internal and external disturbances in the main control systems of the generator set;
- c) Actuate the data acquisition device; record the output active power of the generator set;
- d) Maintain the AGC load command or the generator set's load command unchanged; the time length of the test shall not be less than 1 h;
- e) Calculate the steady-state error of the load.

12.3 Variable load performance test

The test shall be conducted in accordance with the following steps:

- a) It shall be ensured that within the period of 20 min before the test, and within the period of 20 min after the end of the test, there shall be no obvious internal and external disturbances in the main control systems (excluding the load command) of the generator set;
- b) The amplitude of the AGC command change shall be selected between $5\%P_N \sim 20\%P_N$;
- c) Actuate the data acquisition device; record the output active power of the

This is an excerpt of the PDF (Some pages are marked off intentionally)

Full-copy PDF can be purchased from 1 of 2 websites:

1. <https://www.ChineseStandard.us>

- SEARCH the standard ID, such as GB 4943.1-2022.
- Select your country (currency), for example: USA (USD); Germany (Euro).
- Full-copy of PDF (text-editable, true-PDF) can be downloaded in 9 seconds.
- Tax invoice can be downloaded in 9 seconds.
- Receiving emails in 9 seconds (with download links).

2. <https://www.ChineseStandard.net>

- SEARCH the standard ID, such as GB 4943.1-2022.
- Add to cart. Only accept USD (other currencies - <https://www.ChineseStandard.us>).
- Full-copy of PDF (text-editable, true-PDF) can be downloaded in 9 seconds.
- Receiving emails in 9 seconds (with PDFs attached, invoice and download links).

Translated by: Field Test Asia Pte. Ltd. (Incorporated & taxed in Singapore. Tax ID: 201302277C)

About Us (Goodwill, Policies, Fair Trading...): <https://www.chinesestandard.net/AboutUs.aspx>

Contact: Wayne Zheng, Sales@ChineseStandard.net

Linkin: <https://www.linkedin.com/in/waynezhengwenrui/>

----- The End -----