

LS2100e Static Starter

fact sheet

The LS2100e Static Starter is GE's latest load-commutated inverter (LCI) drive used to start heavy-duty gas turbines. It offers improved performance, protection, operability, reliability and flexibility for your operations.

The LS2100e is available for both new unit GE heavy-duty gas turbines and retrofit applications. It can be installed to replace GE's aging Direct-o-Matic Plus static starter, or as an LS2100e Digital Front End (DFE) for modernization of GE's Innovation Series Control starters.

Member of the Mark* Vle Family

The LS2100e uses the same controller, communication architecture, operator interfaces and ControlST* software suite as the as Mark Vle family of turbine, generator and plant controls—simplifying plant operations and maintenance.

Reliability

The LS2100e hardware is designed for high reliability. Reduced card counts, the ability to quickly remove individual cells, and other design features help to minimize mean-time-to-repair. The powerful UCSB controller allows integration of system cooling control, eliminating the supplemental cooling control PLCs from prior designs. Improved hardware diagnostics and maintenance management features help improve staff productivity and insure starting reliability.

The overall starting reliability of a critical turbine-generator may be enhanced with the installation of redundant static starters. The LS2100e is designed to be applied in a one-on-one configuration or can be configured to support a multiple starter configuration where redundant starters can be used to start one or more turbines, allowing improved system flexibility and reliability.

Performance

The LS2100e provides high acceleration torque from turning gear speed, reducing unit starting times and improving starting reliability. Since static starters control the generator as a synchronous motor, there is no need for auxiliaries—saving space around the turbine base. The turbine start sequencing is coordinated between the turbine controls, exciter, and the static starter controls via a reliable high speed unit data highway. System functions are monitored via the Mark controls Human Machine Interface (HMI).

Protection

The LS2100e provides a comprehensive set of drive protective functions:

- Instantaneous overcurrent
- Bridge differential current
- Generator overvoltage
- Source bridge undervoltage and overvoltage
- Ground fault
- Bridge coolant over temperature, low resistivity, low pressure, high or low level
- Shorted thyristor
- No generator field at start

Operability

The LS2100e platform features a simplified hardware design and leverages the power of GE's ToolBoxST to create a system that has more capability, but is also easily maintained and operated. The system is operated and managed through the existing HMIs; alarms and events are time-stamped at their source by the LS2100e, then integrated with the rest of the alarm management system (along with control parameters) in a common time-coherent database. This enhances alarm resolution and analysis of the turbine-generator set as a single system. System and alarm management includes a full set of system and starting sequence summaries, thermal performance and extensive card and power converter diagnostics that include cell monitoring.





Retrofit Options

As part of a controls or starter retrofit project, GE can help design and install cross-over capability on sites where only a single static starter is currently installed. For sites with multiple starters, cross-over capabilities can be added and for sites with existing cross-over capabilities, the system can be simplified and integrated into the Mark VIe/LS2100e controls, eliminating the existing cross-over PLC.

The LS2100e DFE is part of the growing family of unit and generator control migration products that allow owners to modernize the controls at a lower cost and with less disruption than a complete rip out and replace type retrofit.

The LS2100e, coupled with GE's migration offerings for turbine and generator control, can provide access to performance software features, reset the life cycle clock on the existing hardware at a lower cost and shorter outage than conventional retrofits.

The LS2100e DFE leverages the remaining useful life of the LCI power converters, while giving owners the peace of mind of a high performance, modern, secure control architecture with a better return on investment.

Flexibility

The LS2100e can be applied as part of a new unit gas turbine installation, either as a replacement of any vintage of existing GE static starter or as a controls migration for the Innovation Series Control static starter.

Additional Benefits

- High acceleration torque
- Flexible configuration software capable of supporting a wide range of starting profiles
- Enhanced ease of operation and maintenance with a common ControlST software suite
- Full system and digital front end options to serve all starter modernization needs
- Reduced mean-time-to-repair with improved diagnostics and a simplified hardware design
- Digital front ends offer lower cost, shorter outages, and reduced risk
- Controls are part of GE's Mark VIe family with improved life cycle management capabilities
- Improved sequencing control in cross-over applications
- Improved cooling system, sequencing, and power converter status annunciation

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