

High-power multi-threaded variable frequency drive system

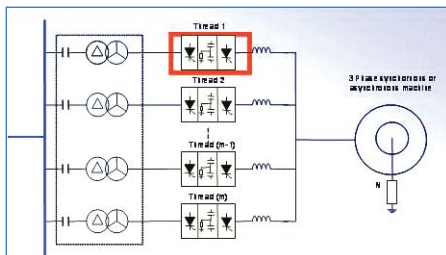


ASI – Ansaldo Sistemi Industriali – Silcovert GN

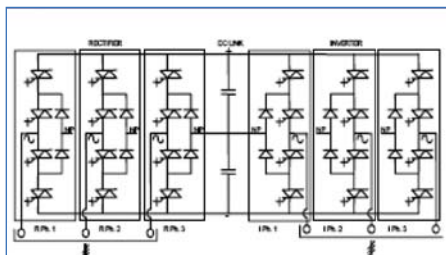
IGCT-based VFD system

The Steadfast System is a variable frequency drive system designed to meet the specific requirements of the most critical processes of the LNG and natural gas sectors.

- High reliability
- Low harmonics
- Low torque ripple



Multi-threads drive architecture

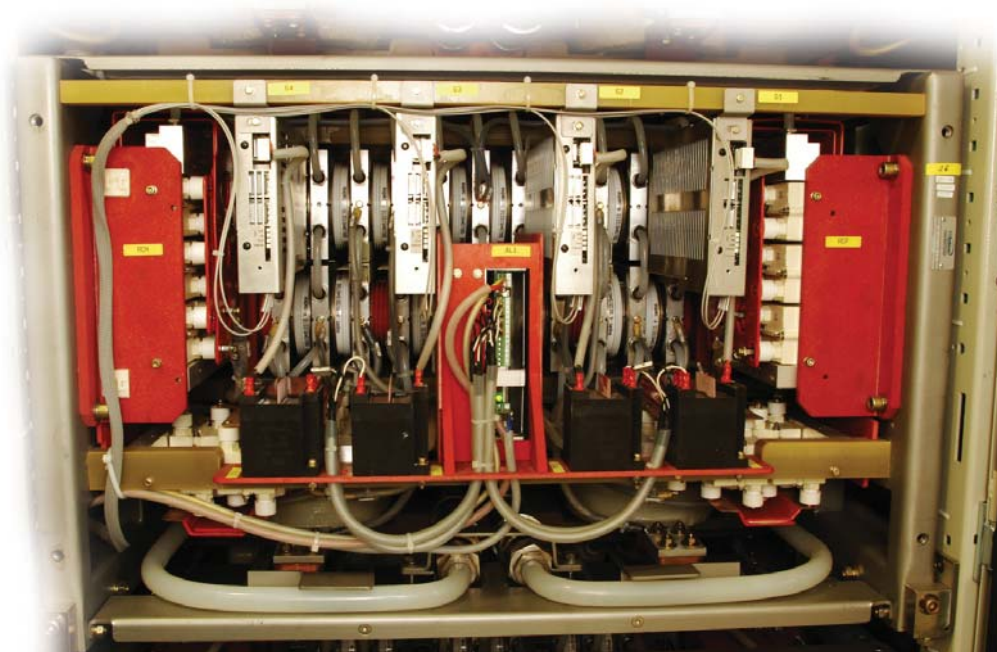


Basic VFD module: 3L NPC drive

The oil and gas industry is one of the most challenging in the world, and our customers rely on us for advanced technologies, services and expert support to help them achieve the high levels of performance necessary for success.

Steadfast is the latest step in our commitment to improve electrical system performance. It combines GE's expertise in controls and applications with Ansaldo Sistemi Industriali's (ASI) established know-how in power electronics and motor design. Steadfast System 40 is a major step forward – delivering higher performance, reliability and efficiency for compressor applications in the 12-35 MW power range.

The system hardware has a proven record with many units installed worldwide, delivering over 300,000 KVA. The new control in the Active Front End configuration allows very low harmonic currents and high power factor on the grid side, without filter and power factor compensation, and low harmonic distortion on the converter output. This results in low torque ripple (i.e. 2%) for an optimized mechanical integration of the entire shaft line (motor, compressor, gear, gas turbine).



IGCT power module

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Product features

The Steadfast VFD System is based on IGCT power component technology. The IGCT is a thyristor family component with low conduction and switching losses, high reliability (good thermal behavior and safe operability due to the press pack housing), suitable for high-power applications. Its multi-threaded configuration parallels two, three or four ASI Silcovert GN™ drives to increase the system's power level up to 35 MW.

The new GE-patented control strategy is based on the interleaving technique. By phase shifting the carrier in each module, our design ensures smoothness of the voltage / current waveforms, and minimizes Total Harmonic Distortion (on either motor or grid side) and torque ripple.

The high-power capacity of the IGCT technology reduces the number of components required. The resulting system is therefore less complex and more reliable than other VFD configurations available on the market in the same power range.

In short, Steadfast System is a robust and highly reliable solution for gas compression applications.

Validation campaign

Steadfast's rigorous validation campaign included numerous analyses through simulations, lab tests on scaled prototypes, and field tests of a full-size prototype.

Specialized engineering teams were involved from ASI and a number of GE businesses (Oil & Gas, Energy Consulting, Global Research, Energy Control & Power Electronics).

Validation was conducted at ASI's facilities in Milan and Genoa as well as GE's plant in Massa where the prototype underwent extensive testing in a back-to-back configuration with a motor coupled to a synchronous generator up to 32 MW mechanical power. The VFD system was also tested with the motor coupled to the axial compressor of a Frame 9 gas turbine, replicating the operating conditions of a typical LNG train.

Contact

For more information, contact your GE representative or visit www.ge.com/oilandgas



Test rig at GE's Oil & Gas testing facility, Massa, Italy



imagination at work