ECO-RTG – A revolutionary new drive concept.

Saving energy – and money

solutions
FOR DIESEL ELECTRIC CRANES

SIEMENS
Using energy wisely

Whenever cranes are needed -- terminals, industry or shipyards --, the transportation of loads requires high-performance equipment that operate with great precision and safety. Availability, reliability and maintainability are crucial factors -- not to mention cost-effectiveness.

The new ECO-RTG system meets all these challenges. The drive system stores energy generated during load-lowering and braking, then releases it during hoisting or accelerating. The efficient design allows most of the energy stored during lowering to be available for use.
Substantially reduced operating costs

The patented ECO-RTG significantly lowers operating costs, while giving you the same powerful, reliable service you would expect from a conventional crane. Manufacturers as well as terminal and dock operators will see the benefits:

**Advantages for users**
- Reduced fuel consumption saves money
- Regenerative braking reduces need for brake maintenance
- New generator and propulsion technology enables less engine maintenance, longer engine life
- Water/glycol cooling decreases maintenance of drive components
- Enhanced, patented energy management ensures efficient operation
- Elimination of unnecessary high-speed idling saves fuel
- Lower emissions of noise and fumes help meet environmental regulations

**Advantages for manufacturers**
- Standard modular design reduces number of parts required
- Smaller-sized power pack results in smaller engine compartment

Field tests show that terminal operators can save more than 50% of fuel consumption, based on the same operating conditions and throughput as conventional RTG cranes. With the optional ultra-capacitor, savings up to 70% are possible. Other manufacturers also offer energy-saving solutions/systems, but they provide maximum energy savings potential, which is significantly lower. These savings will more than offset the initial higher investment of the ECO-RTG system within a short period.
The key to the new technology of ECO-RTG is the custom-made digital control unit (DICO) and the DUO inverters. The DICO calculates energy consumption and regulates motor revolutions accordingly. This ensures an intelligent supply of energy, so the motor always operates efficiently.

One DUO unit powers the DC busbar. The DICO is connected through a controller area network (CAN) bus system. Converters can be used as rectifier or inverter. One DUO unit consists of two different inverters (output 2 x 120 kVA). Also included are one or two phases for connection of a braking unit (if no energy storage is available). The units are extremely rugged in design and can be mounted next to the diesel engine in the motor compartment.

**Major features**
- Durable industrial construction, IP54 housing
- Full IGBT switching devices (unique 8-phase design)
- Integrated power electronics for brake resistors
- Integrated control unit for optimal power management
- Built-in control of multiple energy storage systems
- Enclosed chassis-mounted units, maximum relative humidity 100 %
- Small frame-sized power units, water/glycol-cooled
- Tested acc. to IEC 68-2-30 (damp heat), IEC 68-2-49 (corrosion) and IEC 68-2-11 (salt mist)

**ECO-RTG: Configured for success**

- Operating temperatures from –25 °C to +70 °C possible
- Permanent-magnet generators

In sum, the ECO-RTG system offers multiple benefits. Besides the huge fuel-saving potential, the reductions in emissions and noise will revolutionize the RTG container handling business.
Reducing fuel consumption, safeguarding the environment

Every year, more than 200 million containers travel across the waters from seaport to seaport. Because gantry cranes play a crucial role in loading and unloading goods, the port and shipping industries require cranes that offer high availability and reliability as well as low maintenance. With rising oil prices and increasingly stringent environmental regulations across the globe, it makes sense to invest in low-emission, energy-efficient container handling equipment.

To address these issues, Siemens Cranes and APM Terminals have jointly developed a revolutionary drive system for rubber-tired gantry (RTG) cranes. The ECO-RTG system is highly energy-efficient, promising to reduce fuel consumption for terminal operators significantly, thereby lowering both emissions and operational costs.

Built with time-tested expertise

The technology builds on the rugged drive Siemens developed for use in hybrid vehicles since 1995. This proven concept, used in hybrid traction systems for buses and propulsion systems for ships, relies on DUO inverters. Field tests of these hybrid drives during real operations on the ECO-RTG prototype at APM Terminals Algeciras, Spain, show fuel consumption savings of more than 50%. The ECO-RTG also requires less maintenance and fewer fuel stops than conventional gantry cranes.

With more than a century of experience in the delivery of electrical traction equipment, Siemens is committed to deliver state-of-the-art solutions that minimize impact on the environment.
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