EDI

Open up your GE JENBACHER gas engine for more flexibility

Increasing the efficiency of gas engines in the context of modernization and new cogeneration plant operating concepts demands stable and performance-enhancing components as well as a more open and flexible gas engine control system. One that can keep the engine operating safely at the limit of its mechanical repowered parts while at the same time integrating it seamlessly into the cogeneration plant or into a whole network of plants. With our GE ENGINE specialized control system EDI, system upgrades are straightforward while providing more options for your individual specifications.

ENGINES

- GE Jenbacher series 3, 4 and 6 gas engines
- 400 to 3500 kW output range
- 12 to 20 cylinders
- Biogas, natural gas or special gases

ACTUATORS

- Exhaust gas turbocharger with compressor bypass
- Throttle valve and mixer actuators
- Control valves and flaps

ECI DISTRIBUTION

COMPLETE CONTROL SYSTEM FOR COGENERATION PLANTS:
CONSTANTLY FLEXIBLE, ALWAYS EXPANDABLE

THE EDI PRINCIPLE

EDI our tailor-made engine controller for GE Jenbacher gas engines is a specialized control system which is open for all types of expansion. Functions, modules and subsystems harmonize with a high performance user interface to form a single unit.

Our application for GE Jenbacher engines covers all your known requirements and is available for repowered gas engines series 3, 4 and 6. We assist in any demand from staff training and parts to service and remote solutions.

EDI is based on classic PLC components. A wide range of interfaces make them an ideal control center for integrating all types of components. To control gas engines in cogeneration plants, sensors and actuators are needed that cannot be connected to a classic PLC. This is where the AVAT technology software and hardware modules, e. g. against knocking and misfire, came into use.

Your new engine control system is delivered with all circuit diagrams, installation instructions and descriptions of functional characteristics.

PLANTS

- Stationary cogeneration plants
- Containerized system or installation in permanent structures
- Synchronous AC generator, low or medium voltage
- Island mode and grid-parallel operation
- Grid code compliance
- Auxiliary control covers GE Jenbacher scope of supply

E²PILOT
User terminal with 15" capacitive touchscreen, adapted to the plant operator's needs. Rapid overview of engine and peripherals. Interactive operating log and configurable trending function.

GRID PROTECTION
Grid and generator monitoring, synchronizing and generator protection. Measurement of U, I, f, P and phase angle. Integral grid protection functions fulfill active and reactive power demands and synchronization criteria.

E²KNOCKCON-c20
Reliably detects combustion knock of any individual cylinder from the signals of established piezo knock sensors.

CPU
Robust industrial controller as the control system's basis. Ethernet interface for visualization, SCADA system and virtual power plants technology.

REMOTE SERVICES
AVAT VPN ROUTER guaranties fast and secure remote access via Internet. ECI-Distribution offers remote assistance, reporting and smartphone based alarm management on request.

SERVICE TOOL
The software for ambitious service technicians. Task orientated graphical user interface for commissioning, controller adjustment, troubleshooting and maintenance, etc.

CONTROL CABINET
All control system modules will be integrated in the existing control cabinet in short time. In most cases, I/O modules and engine cabling can be reused.

SUMMARY

ADVANTAGES

- A more flexible control system for performance-enhanced GE gas engines in the context of plant modernization
- More possibilities to change your engine settings
- Reliable knocking and misfire detection included
- Grid and generator protection on board
- Powerful built-in diagnostic and service tools
- One system for the engine and the auxiliaries
- Flexibly expandable and adaptable at all times
- Update availability over many years
- Independent and fast service
- Professional support and consulting for plant optimization
- Proven technologies from the large engine field
- Staff with many years of Jenbacher engine experience

FUNCTIONS

- Control of engine speed, power and air/gas mixture
- Start/Stop sequences for island and grid-parallel operation
- Compressor bypass control and ignition management
- High selectivity knock control of individual cylinders
- Misfire detection with automatic power reduction down to engine shutdown
- Monitoring of all sensors and measured values
- CAN connection to the ignition system
- Cogeneration plant control (peripherals)
- Control and monitoring of all cooling and heating circuits
- Fan control for dry and hybrid coolers
- Control of flow-side temperature even in part load operation

THE WORLD IS ALREADY COMPLEX ENOUGH
IT'S GOOD FOR ONCE TO HAVE HIGH PERFORMANCE PARTNERS

Developing high efficiency engine components with the aim of improving the life time of spare parts as well as the overall engine performance is our daily business. For the benefit of the customer we reduce maintenance costs and improve the efficiency and reliability of all kinds of gas engines. By optimizing existing technologies and developing new concepts, we maximize generation output with least emissions. In cooperation with our partners, we are capable of refurbishing and upgrading engines.

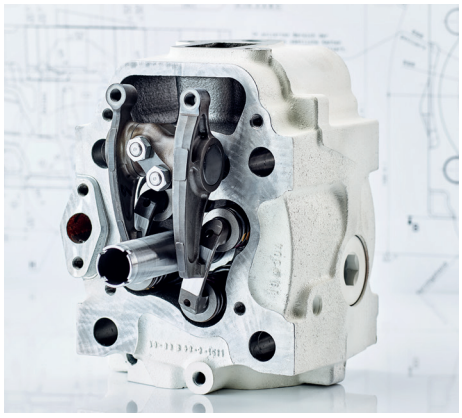
AVAT
OUR ENGINEERING PARTNER FOR GE ENGINE RETROFIT CONTROL SYSTEMS

EDI is based on the open and flexible engine control system, known as "openECS", by AVAT. The company has been a trusted partner to the gas engine industry for more than 25 years and is also the developer and manufacturer of the TEM-Evo controllers built on MWM gas engines in thousands of cogeneration plants.

AVAT offers a wide spectrum of Energy Automation Solutions

- Technology leader in control systems and technology modules for large gas engines and cogeneration plants with more than 8,500 engine controllers in operation worldwide and extensive experience gained from projects with a total exceeding 12,500 MW installed electric power.
- AVAT also serves public- and private-sector utilities and cogeneration-plant manufacturers, developing smart solutions for the automation and control of decentralized energy systems.
- AVAT's solutions include multi-purpose control technology for heat, gas, water and electricity; energy management; and aggregation of decentralized energy sources to create virtual power plants.

AVAT | THE ENERGY ENGINEERING COMPANY



EDI & EVE
A PERFECT COUPLE

The EVE_3 Efficiency Upgrade Package in combination with our control system EDI yields a future-proof system plus a significant increase in performance.

- ECI 4 valve cylinder head – efficiency increase 2,5% absolute -5,9 % less gas consumption *)
- ECI piston and piston ring
- ECI liner and ECI scraper ring
- ECI-JER/3 prechamber spark plug
- NO_x <250mg@5%O_2 (1/2 TA-Luft)

*) @1 MW, biogas calorific value 5 kWh/m³ GE Jenbacher series 3 gas engines

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ECI DISTRIBUTION