

# Control Systems

Gas Turbine Compressor DI-TRONICS® Model # GTC 8080

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*To safely and efficiently operate a gas turbine compressor set, the control system must be technologically advanced and capable of meeting operational challenges found in today's demanding industrial environments.*  
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Dresser-Rand Controls Systems have been designing control systems for various applications for more than 50 years and with this heritage comes a wealth of experience and know how designed into every system. The DI-TRONICS® gas turbine compressor (GTC) control system is an integrated solution incorporating all subsystems required to monitor vibration, temperature, fuel control, and other process variables to provide efficient operation of the gas turbine and associated compressor. These latest systems use the most up-to-date state-of-the-art technology as described below.

At the heart of the system is a programmable logic controller (PLC). Today's PLCs are technically advanced, have a flexible configuration, and can be programmed in many common program languages including ladder logic and IEC1131. The DI-TRONICS process control programs are ready-to-use with comprehensive documentation. Governor control and other high-level programs are developed in segregated blocks to ensure the highest level of system reliability and security.

The DI-TRONICS PLC-based controllers interface with the instrumentation of the gas turbine compressor package through an input/output (I/O) system and communicate both internally and externally in a variety of standard industry protocols.

These benefits translate into lower life cycle costs associated with spare parts, ease of operation, reduced maintenance, and comprehensive training as well as improvement in performance and throughput. In addition, the use of advanced packaging techniques provides easy access to panel internal components with the smaller panels offering a distinct advantage where space is limited.

## System Configuration and Benefits

The standard DI-TRONICS gas turbine compressor control system configuration includes the following subsystems, based on either an Allen Bradley, GE, or Triconex PLC controllers, incorporating the following standard functions:

- Freestanding NEMA 12 or equivalent enclosure
- Capacity/performance control system
- Thrust bearing axial position and temperature monitoring
- Bearing vibration and temperature monitoring
- Anti-surge control
- Pressure monitoring
- Process and auxiliaries temperature monitoring
- Oil system monitoring
- PLC with I/O and communication
- Functions include: gas turbine governor; integrated temperature monitoring; radial vibration and axial position monitoring; start, stop, alarm, and shutdown sequencing; and water wash sequencing
- Two-out-of-three voting back-up over-speed module
- Back-up over-speed switch modules (two for the gas turbine and two for the power turbine)



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## **System Communication**

Communication to external system devices is provided using the MODBUS TCP/IP protocol.

## **Hard-Wired Relay Back-up Shutdown System**

An independent hard-wired relay back-up system is installed to shut down the DI-TRONICS control system in critical situations including PLC failure, vibrations exceeding designated limits, and other critical system inputs.

## **Standard System Components**

The following components and displays are provided as part of the core system:

- 17" touch screen monitor (D-R HMI – panel mounted)
- Indicator Lights:
  - Permissive to start – Green
  - Unit running – Green
  - Common alarm – Amber
  - Common shut down – Red
  - PLC failure – Red
  - Normal stop – Blue
- Pushbuttons:
  - Unit start
  - Unit normal stop
  - Alarm silence
  - Acknowledge
  - Reset
  - Speed raise
  - Speed lower
  - ESD – pull to stop (no guard)
- Selector Switches:
  - Mode select (local/remote)
  - Speed Controls (auto/manual)
  - External light switch

## **System Options and Enhancements**

The following options are available and can be included upon request:

- Dresser-Rand ENVISION™ condition monitoring system (see separate literature)
- Additional operator pushbuttons and/or pilot lights
- Non-standard communications protocols
- RS232/485 serial communications
- DCS communications
- Hazardous area panel classification and certification
- Laptop computer (programming and maintenance device)
- Additional local operator panel
- Additional anti-surge loops
- Additional compressor casings
- Non-standard HMI systems (replace DI-TRONICS HMI)
- Intrinsically safe barriers or isolators
- Upgrade to redundant configuration
- Fire and gas monitor
- Fuel valve replacement
- Client-witnessed factory acceptance test (FAT)

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