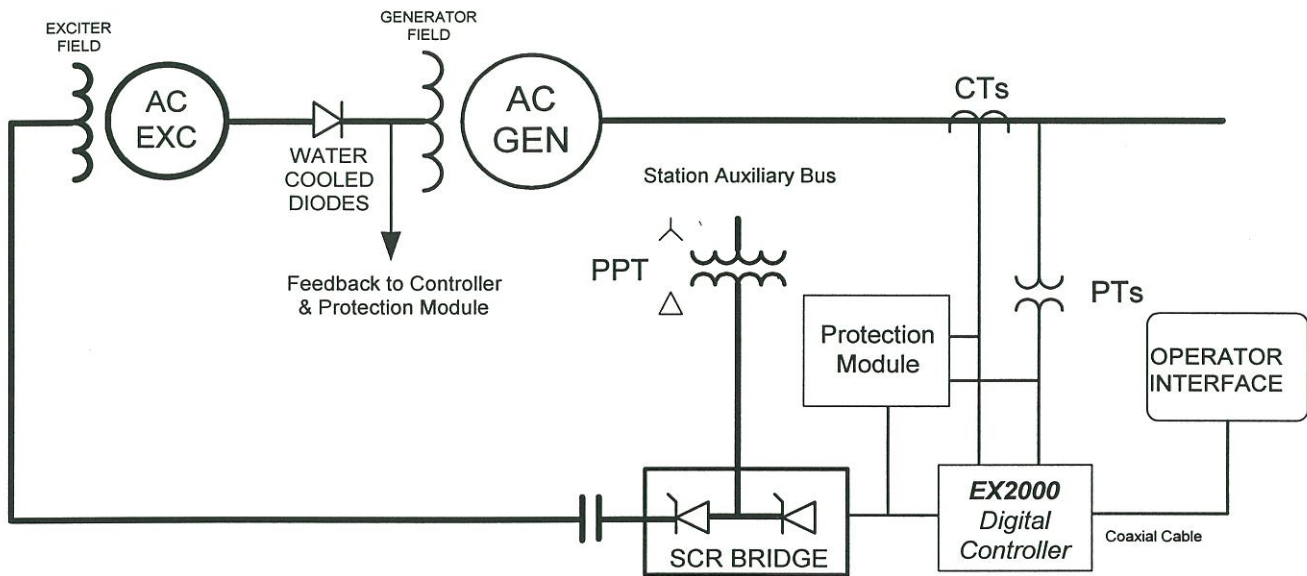




## EX2000AR ALTERREX VOLTAGE REGULATOR

### Fact Sheet for Retrofit Applications



EX2000AR Simplified One-Line Diagram

The EX2000AR is a digital, static, AC exciter voltage regulator, utilizing the latest hardware and software technology. To meet customer and operational requirements, a full range of control and protection functions are available for the product.

#### Benefits of EX2000AR

- 99.98% Availability
- Replaces Old and Failing Components
- Full Digital Design
- Improved Performance
- Meets IEEE 421 Guidelines
- Built-in Diagnostic System
- Built-in Control Simulator
- Faster System Checkout
- Reduced Maintenance
- High Degree of Accuracy,  $\pm 0.25\%$
- Configurable with a PC

The EX2000AR system comes equipped with a full-wave, inverting, thyristor bridge which supplies excitation power to the rotating field winding of the Alterrex exciter. In addition, all control and protective functions are implemented in the system software. There are no moving parts, such as motor operated setpoint adjusters, as are found in the older excitation systems. Digital technology coupled with over 35 years of GE static exciter design experience allows the EX2000AR to maintain 99.98% availability.

## Standard Features & Functions

- Three-Phase, full wave inverting SCR bridge
- Thyristor bridge circuit filtering
- Thyristor bridge conduction monitor
- Diagnostic display panel
- Operator control simulator
- Generator Shaft voltage suppressor circuit
- Exciter Shaft Voltage suppresser circuit
- Surge Protection
- Exciter Field De-Excitation Circuit
- Generator Field Ground Detector (64F)
- Exciter Field Ground Detector (64E)
- Generator Over Excitation Limiter (GOEL)
- Exciter Over Excitation Limiter (EOEL)
- Generator Under Excitation Limiter (UEL)
- Automatic Voltage Regulator (AVR)
- AVR Software Reference Adjusters
- Manual Voltage Regulator (FVR)
- FVR Software Reference Adjusters
- Bi-directional AutoTracking Function
- High Speed Exciter Control Loop
- Volts per Hertz Limiter (V/Hz LIM)
- Reactive Current Compensation (RCCARCC)
- Sensing PT Failure Detector (PTFD)
- Generator Field Temperature Calculation
- Exciter Field Temperature Calculation
- Independent Protection Module with:
  - a. Volts/Hertz (24G)
  - b. Generator Overvoltage (59G)
  - c. Off-Line Overexcitation (OLOT)
  - d. On-Line Overexcitation (OET)
  - e. Loss of Excitation (40)
  - f. Regulator Phase Unbalance (EUT)
- Multiple dual source bulk power supplies
- Three Phase Voltage Sensing
- Two Phase Current Sensing
- PT and CT Isolation Switches
- Output DC Field Contactor
- 100 millivolt shunt for generator field
- 100 millivolt shunt for exciter field
- User-Friendly Operator Interface
- 4-20 mA Programmable Analog Outputs
- Dry Contact I/O Cards
- Strip Heaters
- Input Power Potential Transformer (PPT)
- NEMA-I Enclosure

### Applications

- GE Steam Turbine Generators with Alterrex Exciters.
- Non-GE Generators with large rotating AC exciters, simliar to Alterrex.

## Optional Features & Functions

- Power System Stabilizer (PSS)
- VAR/PF Controller
- Voltage Matching
- Data Link with GE's MARK V Turbine Control
- Monitoring and Trending Software
- PLC-based Digital Interface
- Installation Design Engineering Package
- PSS Tuning Study

## Product History

The first EX2000 exciter was shipped in April 1993. Since that time an average of over 120 units per year have been shipped between retrofit and new unit applications. This unprecedented volume is a strong indicator of the products' market acceptance and dominance.

### EX2000AR Retrofits

- Replaces Alterrex Regulators
- Replaces Existing Field Ground Detectors
- Eliminates Amplidynes
- Eliminates 70P and 90P MOVAs
- Eliminates Rotary Transfer Switches
- Eliminates the need for TIL 961
- Improved Protection Functions

### EX2000AR Enclosure Information\*

Configuration	Width	Weight
Simplex with Protection Module	168"	4,200 lbs

\* All enclosures are 20"D. Enclosure height varies from 90" to 103" depending upon options and configurations.



GE Motors &  
Industrial Systems