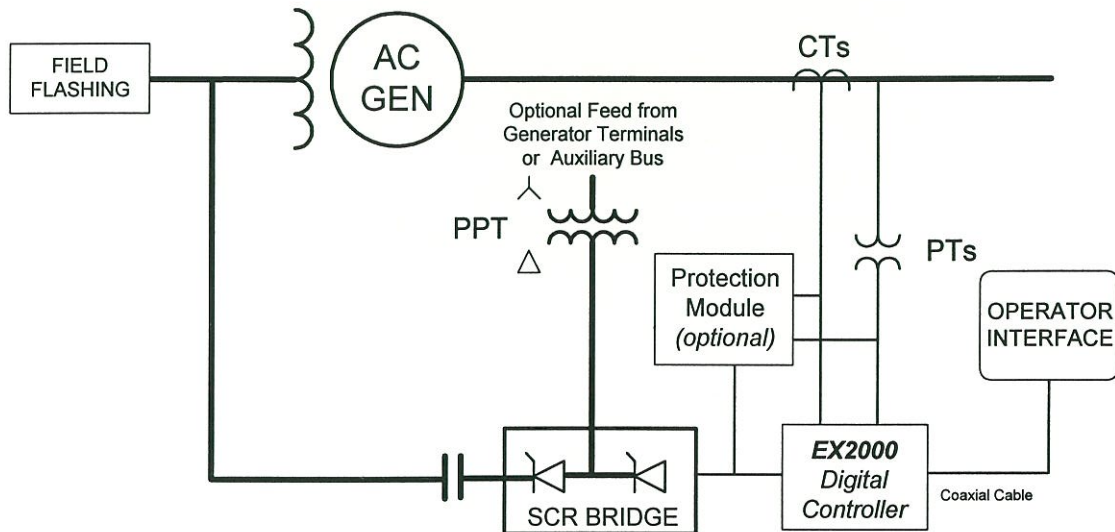




## EX2000P POTENTIAL SOURCE EXCITATION SYSTEM

### Fact Sheet for Retrofit Applications



EX2000P Simplified One-Line Diagram

The EX2000P is a digital, static, potential source excitation system, 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 EX2000P

- 99.98% Availability
- Replaces Old and Failing Components
- Full Digital Design
- Improved Performance
- Exceeds IEEE 421 for HIR Exciter
- 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 EX2000P system comes equipped with a full-wave, inverting, thyristor bridge which supplies excitation power to the rotating field winding of the main AC generator. 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 EX2000P to maintain 99.98% availability.

Complete redundancy is available through the Hot Backup option. With this option, control and power conversion is transferred online to the spare or Hot Backup module "on-the-fly" without a change in the generators' current operating point.

## Standard Features & Functions

- Three-Phase, full wave inverting SCR bridge
- Thyristor bridge circuit filtering
- Thyristor bridge conduction monitor
- Diagnostic display panel
- Operator control simulator
- Shaft voltage suppressor circuit
- Surge Protection
- Field De-Excitation Circuit
- Over Excitation Limiter (OEL)
- Automatic Voltage Regulator (AVR)
- AVR Software Reference Adjusters
- Manual Voltage Regulator (FVR)
- FVR Software Reference Adjusters
- Bi-directional AutoTracking Function
- Volts per Hertz Limiter (V/Hz LIM)
- Reactive Current Compensation (RCC/ARCC)
- Dual source internal bulk power supply
- Three Phase Voltage Sensing
- Two Phase Current Sensing
- Field flashing circuit when required
- PT and CT Isolation Switches
- Output DC Field Contactor
- 100 millivolt shunt for generator field
- User-Friendly Operator Interface
- Strip Heaters
- Input Power Potential Transformer (PPT)
- NEMA-I Enclosure

## 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.

### Applications

- Steam Turbine Generators
- Gas Turbine Generators
- Hydro Turbine Generators
- Synchronous Condensers
- GE and Non-GE Units

## Optional Features & Functions

- Power System Stabilizer (PSS)
- Hot Backup Spare PCM
- Volts per Hertz Protection (24G)
- Under Excitation Limiter (UEL)
- Sensing PT Failure Detector (PTFD)
- Field Ground Detector (64F)
- VAR/PF Controller
- Voltage Matching
- Field Temperature Calculation
- Data Link with GE's MARK V Turbine Control
- 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. Exciter Phase Unbalance (EUT)
- 4-20mA Programmable Analog Outputs
- Dry Contact I/O Cards
- Crowbar Circuit (Hydro Units Only)
- Monitoring and Trending Software
- PLC-based Digital Interface
- Installation Design Engineering Package
- PSS Tuning Study

### EX2000P Retrofits

- Replaces Shaft and Gear Driven Exciters
- Replaces MG Sets
- Replaces Older Static Exciters
- Can Replace Brushless Exciters\*
- Eliminates Amplidynes
- Eliminates Diactors (Carbon Piles)
- Eliminates Commutator Maintenance

\* Requires addition of collector rings on generator field.

### EX2000P Enclosure Information\*

Configuration	Width (≤1000A)	Width (1001-2000A)	Weight (lbs)
Simplex	96"	108"	3,780
Simplex with Protection Module	108"	132"	4,000
Hot Backup	168"	192"	7,100

\* All enclosures are 20"D. Enclosure height varies from 90" to 112" depending upon options and configurations.



GE Drive Systems and Turbine Control