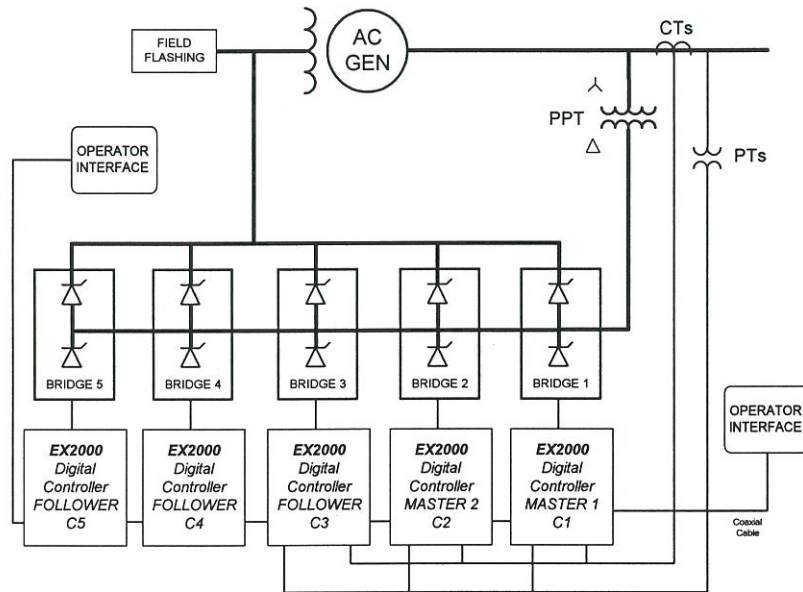




EX2000M MULTI-BRIDGE EXCITATION SYSTEM

Fact Sheet for New Unit Applications



EX2000M Simplified One-Line Diagram

The EX2000M is a digital, static, multi-bridge 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 EX2000M

- 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 EX2000M system comes equipped with up to a maximum of five (5) full-wave, full-inverting, thyristor bridges which supply 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 EX2000M to maintain 99.98% availability.

Complete redundancy is available through the Master-Master Fault Tolerant Control option. This option provides triple modular redundancy (TMR) for both control and power conversion. Also, the On-Line Maintenance option can be added to provide the capability of repairing the exciter with the generator on-line.

Standard Features & Functions

- Up to Five Three-Phase, full wave SCR bridges
- Thyristor bridge circuit filtering
- Thyristor bridge conduction monitor
- Diagnostic display panel
- Shaft voltage suppressor circuit
- Surge Protection
- Field De-Excitation Circuit
- Field Ground Detector (64F)
- Over Excitation Limiter (OEL)
- Under Excitation Limiter (UEL)
- 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)
- Volts per Hertz Protection (24G)
- Generator Overvoltage Protection (59G)
- Off-Line Over Excitation Protection (OLOT)
- On-Line Over Excitation Protection (OET)
- Loss of Excitation Protection (40)
- Exciter Phase Unbalance Protection (EUT)
- Reactive Current Compensation (RCC/ARCC)
- Sensing PT Failure Detector (PTFD)
- Field Temperature Calculation
- Data Link with GE's MARK V Turbine Control
- Multiple Dual source bulk power supplies
- Three Phase Voltage Sensing
- Two Phase Current Sensing
- Field flashing circuit (*when required*)
- PT and CT Isolation Switches
- Multiple 100 millivolt shunts
- User-Friendly Operator Interface
- 4-20 mA Programmable Analog Outputs
- Strip Heaters
- Input Power Potential Transformer (PPT)
- NEMA-I Enclosure

Applications

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

Optional Features & Functions

- Power System Stabilizer (PSS)
- Master-Master Fault Tolerant Control
- On-Line Maintenance
- 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.

EX2000 Product Line

Model	Description	Amps
EX2000P	Potential Source Exciter	2,000
EX2000C	Compound Source Exciter	2,000
EX2000PC	Partial Compound Source Exciter (No Magnetics, i.e. PPT, PCT, LR)	2,000
EX2000M	Multi-Bridge Potential Source Exciter	10,000
EX2000AR	Alterrex Regulator	1,000
EX2000BR	Brushless Exciter Regulator	100
EX2000DR	DC Exciter Regulator	100
EX2000SR	SCT-PPT Regulator	10

EX2000M Enclosure Information*

Configuration	Amps (Simplex/ Master-Master)	Width	Weight (lbs)
3 Bridges	6,000/4,000	246"	21,210
4 Bridges	8,000/6,000	294"	28,000
5 Bridges	10,000/8,000	318"	34,790

* All enclosures are 104"H x 46"D



GE Drive Systems and Turbine Control