



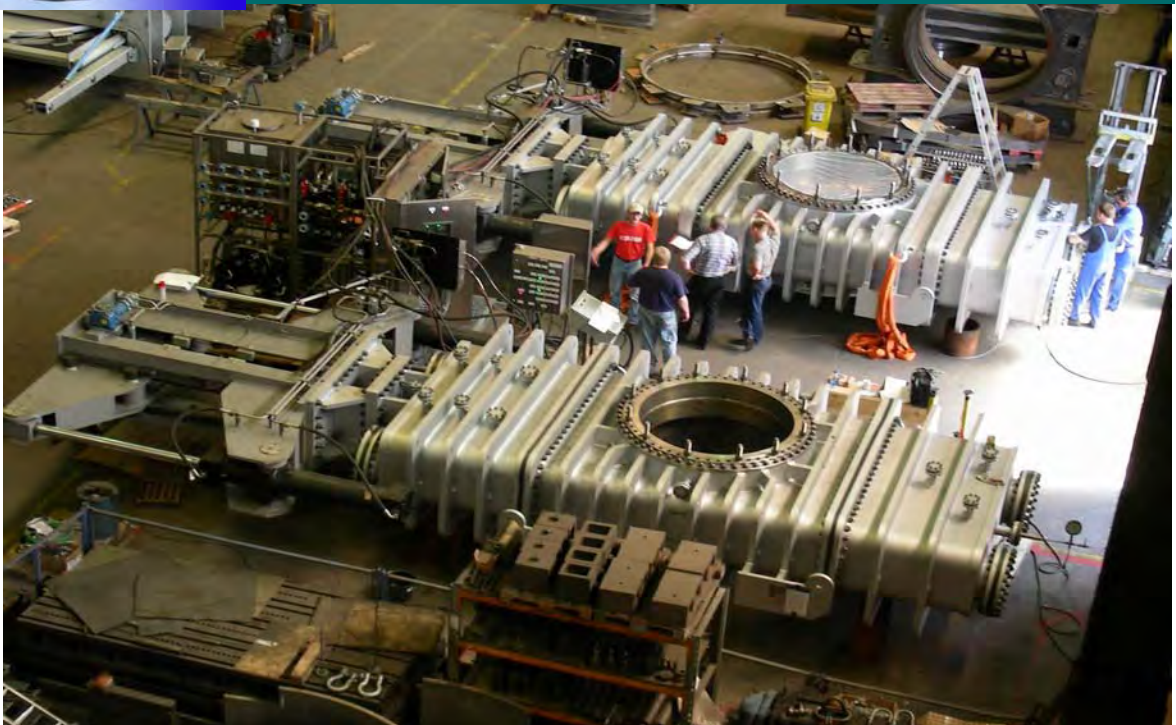
Electro-Hydraulic Actuators, Power and Control Units

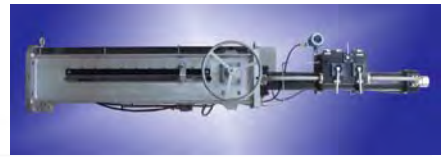
Innovative design . . . Unique field services and support



Small Self-Contained

- > Small self-contained units through large split-unit systems operating multiple actuators
- > Linear and rotary applications
- > Complete in-house design and manufacturing
- > Large staff of electrical and mechanical engineers
- > Extensive upgrading capabilities for existing systems
- > Unique, worldwide field service capabilities





About BLAC INC.

BLAC INC. engineers and constructs the highest quality electro-hydraulic linear or rotary output actuators, hydraulic controls, and hydraulic power units for industries throughout the world. Our actuator systems deliver **reliable long term continuous operation, unique features, and ease of maintenance.**

BLAC INC. products are **developed for severe service applications** that can cause other equipment to failure, such as:

- Low or High Temperature Ambient Conditions
- Environments Highly Contaminated with Dust, Catalyst, Coke Fines, Fly Ash, Corrosion or Acids
- High Humidity
- Severe Vibration

Using state-of-the-art components and construction methods, BLAC INC. personnel engineer all equipment with computer aided design, 3-D modeling, computer controlled machining centers, and in-house quality control from start to finish. BLAC INC. applications include:

Refining Applications

- Fluid Catalytic Cracking Units – Slide, Expander Turbine Butterfly, Plug Valves, Catalyst Dropout, and Goggle Valves
- Air Blower Surge and Stator Guide Vane Controls
- Wet Gas Compressor Suction Kickback Valve Controls
- Delayed Coker Unheading Valves, Vapor and Product Isolation, Switching Valves
- Digital and PLC-Based Controls
- Hydraulic Power Units, Hydraulic Control Units
- Stator Vane Actuators for Compressors and Air Blowers

Power Plant – Boiler Applications

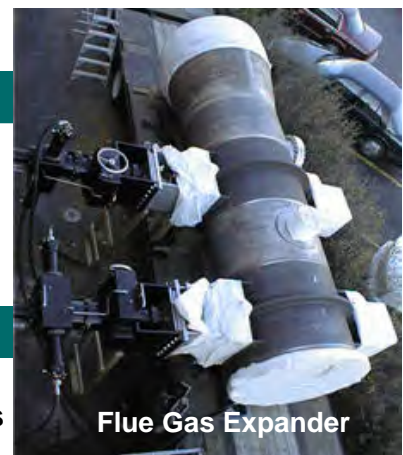
- Induced Draft and Forced Draft Fan Dampers
- Primary and Secondary Air Flow Control Dampers
- CE Boiler Corner Fired Tilt Drives
- Reheat and Superheat Spraywater Valves
- Gas Inlet and Boiler Feedwater Regulation Valves
- Startup Valve Actuator Systems
- Selective Catalyst Reduction Damper
- Inlet, Outlet and Bypass Dampers
- Fluid Coupling Modulating Drives

Power Plant – Turbine and Compressor Applications

- Control Valves For Large GE, Siemens- Westinghouse,
- Delaval Steam Turbine
- Gas Turbine Fuel Control Valves
- Gas Turbine Inlet Guide Vane Actuators – All Brands
- Combined Cycle Steam Bypass Valves and Control Valves

Pipeline and Chemical Applications

- Pipeline Gas and Product Ball, Plug and Gate Valves for On / Off, Modulating, Multiple Failsafe Modes, Redundant Controls
- Pump Surge Pressure and Surge Control





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Fluid Catalytic Cracking Unit Applications on All Major Licensee Operating Units

Recognizing that **the unexpected does happen** (and components do fail), BLAC INC. realistically approaches systems design. Our mission is to design systems that provide continued process unit operation if major components are damaged or lose functionality.

Because of our **no-nonsense methodology**, BLAC INC. is the premier supplier of slide, plug, and butterfly valve actuator systems worldwide for FCCU applications on All Major Licensee Operating Units. The BLAC INC. systems are proven to provide **long term reliability, accuracy, and true redundancy of components** to handle the situation when the unexpected occurs.

- Catalyst Slide and Plug Valves
- Double Disc Flue Gas
- Expander Inlet, Bypass and Outlet Butterfly
- Wet Gas Compressor
- Air Blower Controls



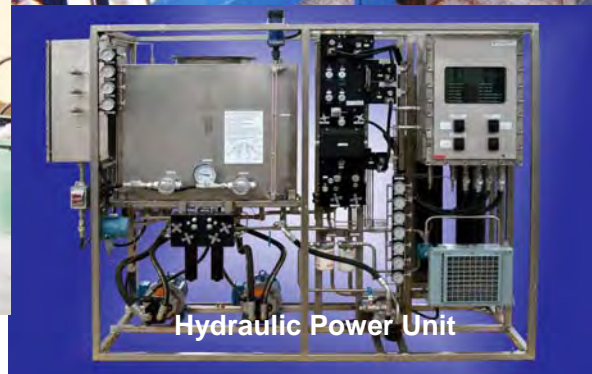
Four Hydraulic Control Stations



Largest Pendulum Diverter Valve and Actuator in the World – HPU and Accumulator Assembly – Ready for Hot Stroke Test



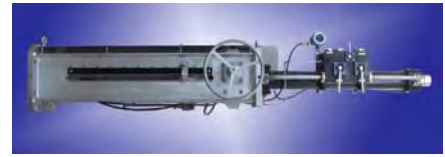
Large Butterfly Valve



Hydraulic Power Unit



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Main Steam and Gas Turbine Control Hydraulic Actuators and Hydraulic Power Units

BLAC INC. main steam and gas turbine control hydraulic actuators and hydraulic power units offer the latest technology available in the industry worldwide.

BLAC INC. control systems improve critical turbine control concerns:

- Reliability
 - Ease of Maintenance
 - Redundant Components
- **Control Valves on Large GE, Siemens-Westinghouse, and Delaval Steam and Gas Turbines**
 - **Inlet Guide Vane Actuators on GE, Siemens, and Westinghouse Gas Turbines**
 - **Stator Vane Actuators for Compressors and Air Blowers**



Pressure Control



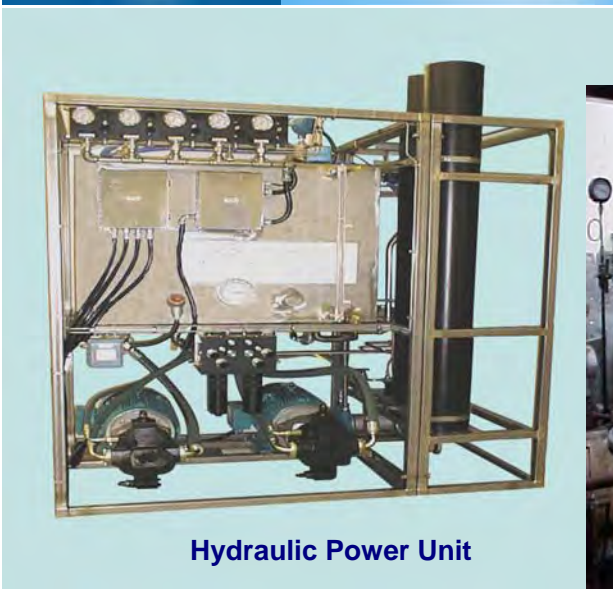
Intercept Valve Actuator



Filtration System (Steam Turbine)



Flue Gas Control



Hydraulic Power Unit



MHC Conversion to EHC Drive Systems



Inlet Guide Vane



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Delayed Coker Upper and Lower Deheading Actuator Systems

BLAC INC. is the new standard for coker deheading actuator systems. Present in our coker equipment is the same proven technology used in thousands of our FCCU applications.

- Redundant Mechanical Controls
- Redundant Electrical and Electronic Controls
- Ease of Maintenance
- Customizable Systems

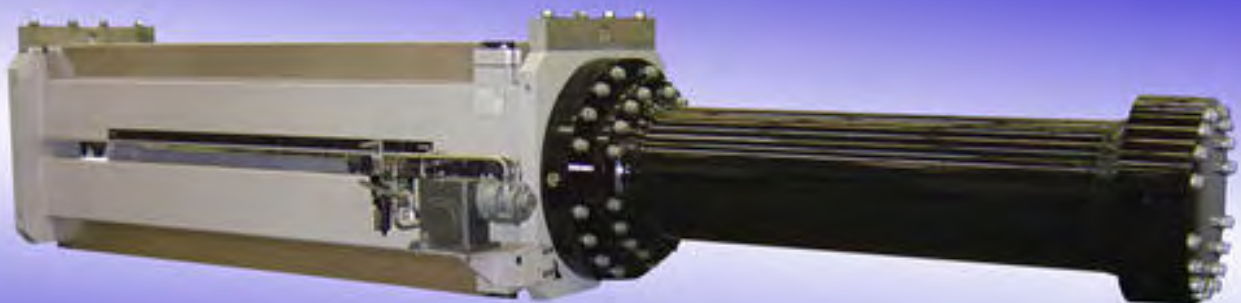
- Upper and Lower Deheading Valve Systems
- Vapor and Product Isolation
- Switching Valve Actuators
- PLC-Based Controls
- Hydraulic Power Units



Redundant
Cylinder Lower
Deheading
Actuator



Upper / Lower Deheading PLC Controls



Single Cylinder Upper / Lower Deheading Actuators



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Boilers

BLAC INC. actuators improve process control efficiency by controlling accurately to the command setpoint.

If the existing process is controlled to $\pm 3.0\%$ (because of inaccurate actuator response), then the improvement that comes from the control of 0.1% is dramatic.

Effectively, boiler oscillations are reduced by 2.9% for this example -- providing significant improvements.

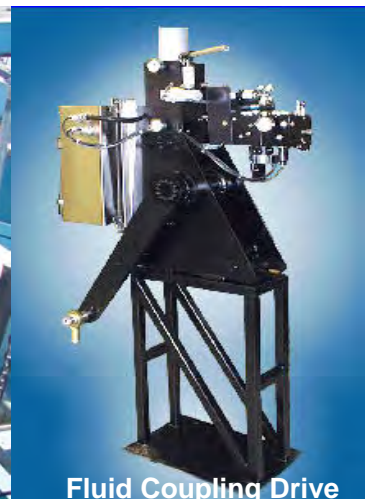
- Induced Draft and Forced Draft Dampers
- Primary and Secondary Air Flow Control Dampers
- CE Boiler Corner Fired Tilt Drives
- Reheat and Superheat Spraywater
- Fuel Gas and Boiler Feedwater Regulation Valves
- Startup Valve Actuator Systems
- Selective Catalyst Reduction Inlet, Outlet, and Bypass Dampers
- Fluid Coupling Modulating Drives



START-UP VALVE ACTUATOR



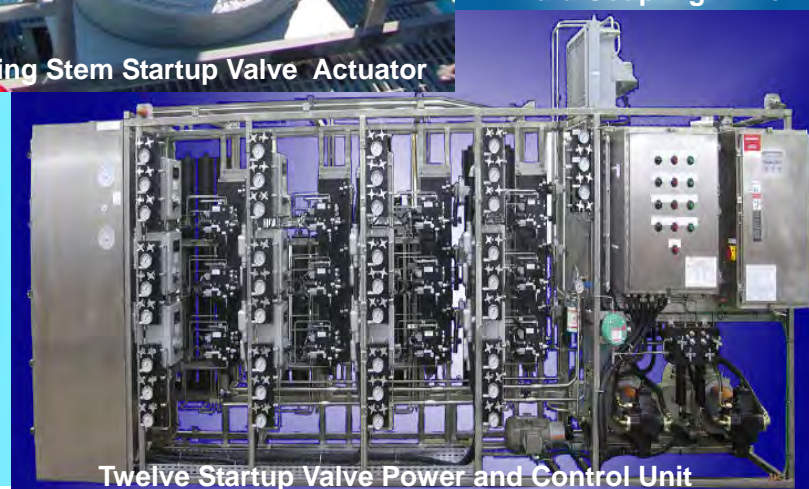
Rising Stem Startup Valve Actuator



Fluid Coupling Drive



Five Startup Valve HPCU



Twelve Startup Valve Power and Control Unit



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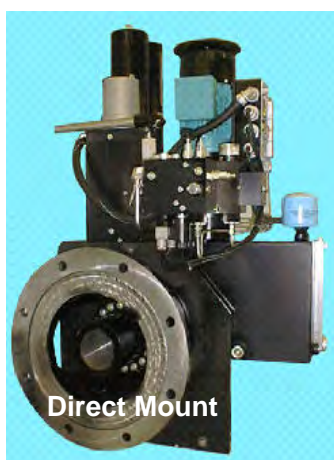


Damper Applications for Boilers and Furnaces

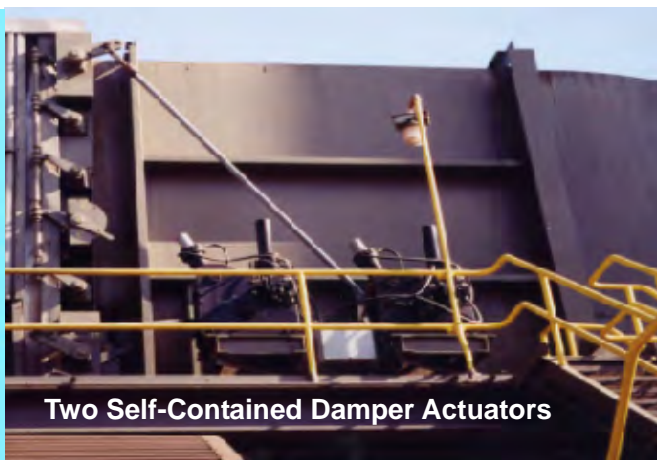
BLAC INC. actuators will meet the harshest real world specifications

0.1% of stroke (linear or rotary) -- for accurate damper control under load conditions and at full rated speed.

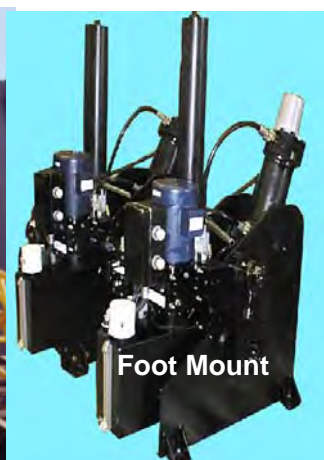
- **Induced Draft and Forced Draft**
- **Primary and Secondary Air Flow Control Damper**
- **CE Boiler Corner Fired Tilt Drives**
- **Selective Catalyst Reduction Systems Inlet, Outlet, and Bypass Dampers**



Direct Mount



Two Self-Contained Damper Actuators



Foot Mount

Gas and Liquid Pipeline Applications

BLAC INC. actuators provide modulating or on-off control with ultimate reliability.

Practically any speed of operation is available.

Any failsafe position is available with multiple failsafe options.

- **Pump Discharge and Distribution Control Valve Applications**
- **Isolation Valve Actuators**
- **Surge Control Actuators**
- **Surveillance Site**
- **Failsafe Applications**



Hydraulic Power Unit



Hydraulic Ball Valve Actuator



Self Contained Valve Actuators



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BLAC INC. – Unique in Field Services and Support

Available 24 x 7 x 365 for field service, parts, and manufacturing worldwide

- **Engineering** – 11 Staff Engineers including mechanical, instrumentation and DCS Interface
- **Documentation** – Includes updates to critical service manuals and drawings for all equipment manufacturers
- **Preventative Maintenance Program** – Proven long term program for continuous operation
- **Upgrades** – Existing upgrade designs for all equipment manufacturers
- **Planning** – Comprehensive Pre-Turn-around planning program
- **Manpower** – Available manpower for simultaneous turn-around without hiring contract labor
- **Job Site Repair Shops** – (2) 40' Portable repairs shops which may include filtration carts, pressure test carts, and on-site hose fabrication
- **Field Service Warranty** – Parts and labor repair warranty for repairs and upgrades performed during turn-around activities
- **Job Site Training** – Portable Actuator System Training Unit provides a fully functioning training system for plant unit operators and technicians.



Portable Job Site Workshops



Training Unit



Training Unit Trailer