

ELECTRO-HYDRAULIC ACTUATION SYSTEMS

COMBINING TECHNOLOGIES OF ELECTRIC AND HYDRAULIC ACTUATORS

Biffi Electro-Hydraulic actuators combine the simplicity and lower infrastructure costs of electric power supply with the high operating speed and mechanical failsafe capability of fluid powered actuators.

They are a modular combination of a high performance hydraulic actuator, a power unit using electric power supply to drive a hydraulic pump and motor and a dedicated electronic or electro-mechanical control system to control the actuator functions.

Ideal for use where only electric power supply is available and mechanical failsafe action is essential,

or as high modulating duty actuators, especially where high specification control, diagnostics and feedback are required, they offer the benefits of:

- Energy accumulation for emergency operation as an alternative to spring return.
- High torque and high speed capabilities.
- Easy operating time adjustment.
- High flexibility of control systems.
- Use of AC or DC electric power.
- No polluting emissions to the atmosphere.
- Smart control, diagnostics and wireless communication.
- Compliance with all Worldwide standards and legislations.

Biffi brings 60 years of actuation experience to the production of Electro-hydraulic actuators, resulting in a comprehensive range that covers all customer size and functional requirements with dedicated highly engineered products. This full range capability is ideally suited to applications in power generation, upstream, midstream and downstream oil and gas sectors.

They are simply the most durable and reliable choice.



A COMPREHENSIVE ACTUATION RANGE

Biffi's wide variety of actuation products for Electro-hydraulic applications includes a comprehensive range of high pressure rack and pinion and scotch yoke hydraulic actuators with torque ranges from 120 Nm to 750,000 Nm. Each standard actuator is suitable for temperatures of -20°F to +210°F (-30°C to +100°C) but with options down to -70°F (-60°C).

These actuators are built to last in materials that have been selected specifically to provide optimum performance and an extended service life with minimal maintenance. Their designs offer the highest cylinder pressures in their category and spring-operated versions feature an XXXL sized failsafe spring for assured performance.

This range of products is based on Biffi's proven designs, with each actuator fully customizable to meet each specific need. Each actuator is certified as suitable for use in SIL 3 applications.

RACK AND PINION ACTUATORS

RPHS are spring return hydraulic quarter-turn actuators constructed in high resilience ductile iron and suitable for a supply pressure of 220 barg.

They are for on-off and modulating control of valves in heavy duty service for any low torque quarter-turn application, with models for output torques to 2,600 Nm. A double-acting version is also available.

SCOTCH YOKE ACTUATORS

All Biffi scotch yoke actuators are available in either canted or symmetrical designs.

OLGAS-H spring-return actuators are constructed in fabricated carbon steel and suitable for supply pressures up to 350 barg. A double-acting version is also available.

LINEAR ACTUATORS

HLAS spring-return hydraulic linear valve actuators for on-off and regulating service with supply pressures up to 350 barg and thrust according to customer requirements. Every HLAS linear actuator is custom-designed to suit each individual valve. A double-acting version is also available.

COMPLETE INTEGRATED PACKAGES

Biffi's integrated actuator packages offer a wealth of benefits, including reduced oil leakage risk, as the manifold build reduces piping, eliminating potential leak paths and improving maintainability and vibration resistance. There's a range of standard or customized packages available.

APPROVALS

SAFETY INTEGRITY LEVEL

(IEC 61508-1÷7:2010)
Suitable for use in SIL 2 or SIL 3 applications depending on configuration

AREA CLASSIFICATION

ATEX II 2G T4
others available on request

ENCLOSURE STANDARDS (ACTUATOR)

(IEC 60529) - IP67M
(ANSI/NEMA 250) - NEMA 4, 4X, 6

ENCLOSURE STANDARDS (POWER UNIT AND CONTROLS)

(IEC 60529) -
IP65 or higher on request
(ANSI/NEMA 250) - NEMA 4, 4X, 6

MACHINERY DIRECTIVE

2006/42/EC

TECHNICAL SPECIFICATIONS

DESIGN PRESSURE

Rack & pinion mechanism:
220 bar g

Scotch yoke mechanism:
350 bar g maximum

SUPPLY MEDIUM

Hydraulic oil or fire-resistant fluid

OUTPUT TORQUES

Rack & pinion design:
up to 2,600 Nm

Scotch yoke design:
up to 750000 Nm

STANDARD TEMPERATURE RANGE

-20°C to +55°C
Extended temperature range
available on request.



EHB/EHBS



EHB/EHBS



MORIN EHP

EHB/EHBS AND EHP LOW TORQUE COMPACT SOLUTION

EHB/EHBS and EHP electro hydraulic actuators are used to operate quarter turn valves in on-off applications in locations where electric power only is available and neither instrument air nor hydraulic supply is available.

EHB/EHBS is the Biffi compact solution supplied to operate low torque valves as an alternative to electric actuators when spring fail action is mandatory.

Specifically for the North American market, Morin EHP actuators are constructed in high resilience ductile iron and suitable for a supply pressure of 2250 psi. Available in spring-return format.

This unit includes the following main parts:

- Actuator and where requested, adaptation to the valve and limit switch box.
- Integrated Hydraulic Power Unit (HPU), including electric motor/pump group, manual pump, junction box and limit switch box.

A SMART version is available.

MAIN ADVANTAGES

- Minimized oil leakage risk, as the manifold build reduces piping, eliminating potential leak paths and improving maintainability and vibration resistance.
- Easy setting and maintenance.
- Hydraulic manual override as standard.
- Local and remote operation as standard.
- Low power consumption.
- Reduced fail capacity as fewer components involved.



EHA/EHAS



EHA/EHAS



EHA/EHAS

EHA/EHAS HIGH TORQUE MODULAR SOLUTION

The EHA/EHAS electro hydraulic actuator is used to operate quarter turn valves in on-off applications in locations where electric power only is available and neither instrument air nor hydraulic supply is available.

EHA/EHAS includes the following main parts:

- The actuator and, where requested, adaptation to the valve and limit switch box.
- Hydraulic Power Unit (HPU), including electric motor/pump group, manual pump, hydraulic accumulator bladder type, electric control panel and control system.

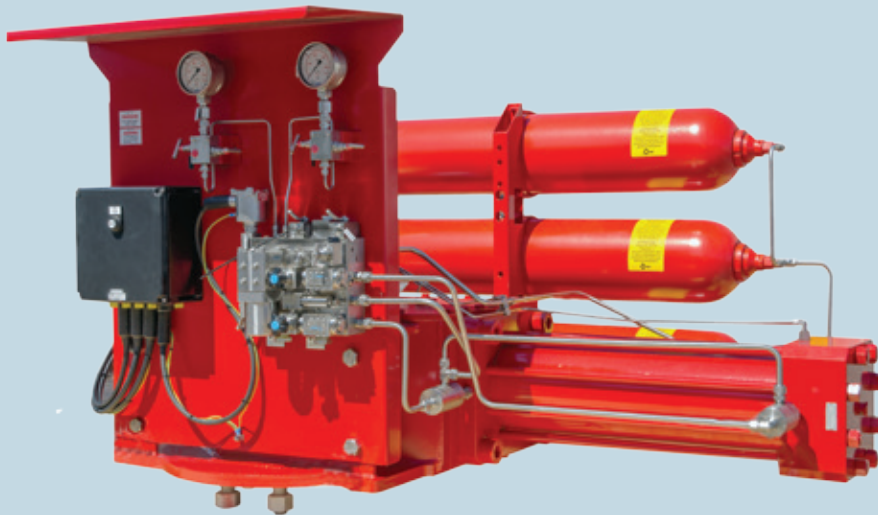
EHA is supplied with actuator, HPU and all selected options assembled in a single unit, ready to be mounted onto the valve. To operate the valve the user has to provide the electric supply to electric motor and other electrical components.

A SMART version is available.

MAIN ADVANTAGES

- Minimized oil leakage risk, as the manifold build reduces piping, eliminating potential leak paths and improving maintainability and vibration resistance.
- Easy setting and maintenance.
- Accumulator allows instantaneous response to commands. Redundant accumulators available on request.
- Poppet type SOVs guarantee tight shutoff with improved energy saving.
- Double relief valve and hydraulic filters improve reliability, durability and safety, providing protection to the motor and system against a wide range of possible failures.
- SS316/L on critical parts as standard to avoid potential corrosion.
- 316L stainless steel cabinet and oil tank as standard.
- 316/316L stainless steel tubing & 316 fittings.
- Hydraulic manual override as standard.

- Local and remote operation as standard.
- Low power consumption.
- Reduced fail capacity as fewer components involved.



EHT/EHTS



EHT/EHTS



ECU 1000

EHT/EHTS TAILOR MADE ELECTRO-HYDRAULIC ACTUATORS

Combining Biffi's electro-hydraulic actuator range with a powerful ECU-1000 electronic controller creates the EHT/EHTS, a fully customized solution.

These smart packages provide electronic management of the actuator, presenting the high specification control, diagnostics and feedback ideal for critical service failsafe applications or for high modulating duties.

Enclosed in either an IP or EX proof cabinet, their functions include open/close or modulating commands, speed regulation, PST, multiple status diagnostics, data logging and bus capabilities, all of which and more are achieved via user-friendly interfaces.

A SMART version is available.

STANDARD CONTROL FUNCTIONS

- Accurate positioning of modulating actuator (heavy duty, low drain-heavy duty, stepping).
- Control of integral HPU with single or dual pump. Automatic control of electrical pumps.
- Control of on-off actuator operation.
- Partial Stroke Testing.
- Input characterization.
- ESD function.
- Stay in position by optional SOV.
- Outputs to control servovalves, proportional valves, on-off solenoid operated valves (SOVs), hydraulic pumps, electrical motor.
- Inputs to read 4-20mA transmitters and switches.
- Optional module to drive proportional valves by PWM signals.

FEATURES

- Local, hardwired and BUS remote control.
- Local operator interface with graphic OLED display and pushbuttons.
- Full local parameterization.
- Configuration data saved in 3 separated permanent memories.
- 2 watch-dog timers working in parallel.
- Real time clock and battery to maintain date and time.
- Bluetooth wireless communication.
- Failure, alarm, event, connection loggers.
- Graph, recorder and signatures.
- BIFFI-Assistant software tool for connecting a PC to the actuator via Bluetooth or RS232.

HYDRAULIC POWER UNITS AND CONTROL SYSTEMS

The Hydraulic Power Unit is the element that transforms the electric power supply into hydraulic pressure suitable to operate up to the largest actuators. The engineering and design of the power unit are critical to ensure that the actuator will have the necessary power at the time it's needed to operate safely, smoothly and within the defined performance parameters.

The control system allows precise actuator command and control to cover correctly the required functions of both the process and the plant. A typical HPU for on-off service mounted on the actuator, will include:

- Oil tank in 316 SS.
- Electric motor/pump group, suitable for 3ph, 1ph or DC power supply. Motor start and stop are controlled automatically to ensure sufficient power supply is always available, with minimum power consumption. Relief valves and oil filters are also included to safeguard the system against overpressure or contamination risk, guaranteeing improved operating life and reliability.
- Accumulators sized for a minimum of 2 actuator piston strokes (one by oil, one by spring), allowing immediate actuator response with respect to direct motor and SOV control configurations.
- Robust, vibration resistant hydraulic manifold limits external piping reducing potential leak paths for safe, clean operation with minimum maintenance.
- Hydraulic tubing and double ferrule fittings in SS316L.
- Electric control panel collects power unit electric I/O providing customer with simple, single point of interface.

Component materials can be in carbon or stainless steel according to customer requirements and extensive

customizations can be carried out to meet all and any customer needs.

INTEGRATED VALVE MONITORING SYSTEMS (IMVS2)

The IMVS2 is a fully automated partial stroking, smart valve and actuator diagnostic system capable of operating all actuator sizes without flow restriction or the need for costly additional equipment.

It is an electronic device that provides operational, safety and diagnostic functions through a single or double acting actuator mounted on a valve driven by an external single or redundant solenoid valve. It enables diagnostic functions, including partial stroke test and continuous monitoring of valve actuator pressure and position, to be carried out with the valve on-line and in service with no disruption to the process.



HYDRAULIC POWER UNIT



IMVS2



ELECTRONIC CONTROL DEVICE
ECU-1000



Biffi reserve the the right to change product designs and specifications without notice.

Biffi Italia S.r.L.

Località Caselle San Pietro, 420, 29017 Fiorenzuola d'Arda (PC) ITALY Ph: +39 (0)523 944 411 E-mail: biffi_italia@biffi.it www.biffi.it

VCPBR-03391-EN 16/10