



# COMPACT ACTUATORS



# A WORLD OF EXPERIENCE

Biffi is a leading manufacturer of valve automation solutions with 60 years' experience and a global presence, offering a comprehensive selection of standard as well as specially designed actuation systems. The range includes electric, pneumatic, hydraulic, direct gas, gas-hydraulic, electro-hydraulic, compact, subsea actuators and control systems with a full complement of accessories suitable for a wide range of applications.

The highest standards of product reliability and quality are guaranteed by advanced manufacturing facilities combining lean principles with continuous quality auditing and a zero harm work ethic. Local presence and after sales support teams worldwide ensure meeting the day-to-day flow control requirements of every plant or process.

**Biffi's commitment to the highest ethical standards in our daily business practices is recognized by the achievement of the following certifications:**

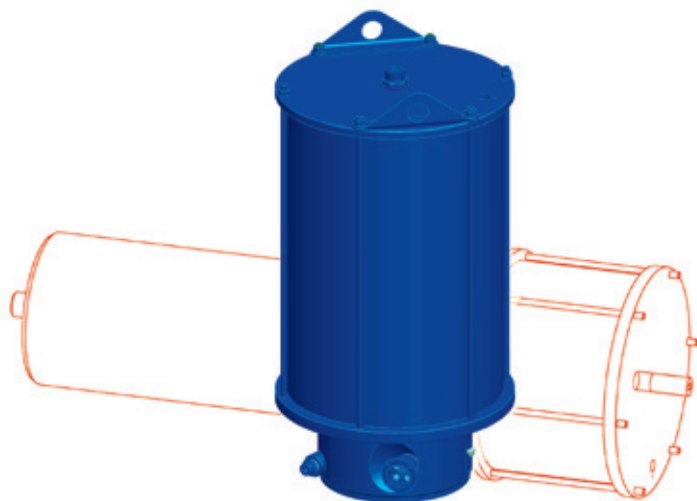
**ISO 9001** - Quality management system

**SA 8000** - Social accountability standard

**ISO 14001** - Environmental management system

**BS OHSAS 18001** - Occupational health and safety assessment





## COMPACT DESIGN OFFERS MANY BENEFITS

Biffi compact actuators are the ideal solution where space is limited.

They offer a reduced actuator footprint that maximizes efficiency and optimizes overall equipment dimensions. In addition to reduced total cost of ownership.

### TP PNEUMATIC AND TH HYDRAULIC QUARTER TURN ACTUATORS

Compact Series TP and TH actuators have a unique helical slot design, which transforms the linear movement of a piston into a quarter-turn rotation, generating high break torques to actuate large valves. With its spring integrated into the cylinder, it is very compact with the same dimensions whether for double acting or spring return; spring to open or spring to close operations.

They are suitable for both on-off and modulating control in heavy-duty service in the harshest environmental and operating conditions.

Hydraulic version TH is certified IP68M for installation up to 100m water depth.

Variable and constant profiles have been developed to meet a wide range of requirements, minimizing actuator footprint size and maximizing output torque. Customizable helical profiles can be supplied to suit valve-specific torque profiles.

### LINEAR PNEUMATIC AND HYDRAULIC ACTUATORS

For linear actuation requirements the compact PLA-C (pneumatic) and HLA-C (hydraulic) single and multi spring actuators are available.

### TYPICAL APPLICATIONS

- Offshore platforms
- Onshore terminals
- Tank farms
- FPSO
- CALM  
(Catenary Anchor Leg Mooring)
- SALM  
(Single Anchor Leg Mooring)
- PLEM  
(Pipeline End Manifold)
- Oil refineries
- Power plants



### TECHNICAL SPECIFICATIONS

#### SUPPLY PRESSURE

3.0 to 10.0 barg (pneumatic)  
up to 250 barg (hydraulic)

#### DESIGN PRESSURE

12.0 barg (pneumatic)  
300 barg (hydraulic)

#### SUPPLY MEDIUM

Air, nitrogen and mineral oil

#### OUTPUT

up to 300,000 Nm (quarter turn)  
up to 8,000,000 N (linear)

#### AMBIENT TEMPERATURE

STANDARD RANGE  
-20°C to 100°C

LOW TEMPERATURE RANGE  
-60°C to +100°C

#### APPROVALS

##### SAFETY INTEGRITY LEVEL

(IEC 61508-1÷7:2010): SIL3 capable

##### HAZARDOUS AREA

European Directive ATEX  
(2014/34/EU) mechanical compliant

##### ENCLOSURE STANDARDS

(IEC 60529): IP66/IP67M IP68M (TH)

##### MACHINERY DIRECTIVE

2006/42/EC

##### PED DIRECTIVE

2014/68/EU



MHP Manual Override



ACCUTRAK Position Monitor



QUANTUM Control Monitor

## A FULL RANGE OF ACCESSORIES

Compact actuators are available with a wide range of options and accessories, including a manual handpump, control and monitoring devices and complete control systems, to ensure that your actuator is ideally suited for each application. If you have a specific requirement please contact your local sales office.

### HYDRAULIC MANUAL OVERRIDE (MHP)

Efficient manual operation through an hydraulic hand pump also allows accurate adjustment of actuator stroke time independently in the opening and closing directions. Hydraulic flow regulators guarantee smooth operation across the stroke.

### POSITION MONITORS, CONTROL MONITORS AND POSITIONERS

Compact actuators are available with a comprehensive range of devices which represent the latest technology for the monitoring and control of automated quarter turn valves.

- Analog and intelligent positioners for actuator calibration, position feedback, performance verification and valve status intelligence.
- Fully certified range of position monitors, connected directly to the output drive, showing the exact valve position.
- Range of control monitors with integrated solenoid valves eliminates the need for costly adaptors to mount solenoids onto larger type actuators.
- Wireless valve monitoring systems.

### LIMIT SWITCH BOXES

Limit switch boxes are rugged yet compact assemblies, designed for direct mounting onto the actuators for accurate indication of valve position.

- Weatherproof or explosionproof enclosures provide full environmental protection.
- Anodized / painted aluminum or stainless steel enclosures also available.

- Independently adjustable switches wired to a terminal block, for full angular valve travel.
- Switches and terminals suitable for use in intrinsically safe circuits available.
- External position indicator mounted on the top of the enclosure as standard.
- Indicators protected by a transparent cover or Beacon® type indicators with a wide range of colors, which are visible at a distance, also available.





IMVS2



Digital EPIC-2 Explosionproof



Digital EPIC-2 Intrinsically Safe

## INTEGRATED VALVE MONITORING SYSTEMS (IMVS2 AND DIGITAL EPIC-2)

### INTEGRATED VALVE MONITORING SYSTEMS

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.

Digital EPIC-2 is an intelligent valve position transmitter designed especially for safety valves. Its advanced diagnostics functions enable emergency shutdown (ESD), partial

stroke testing (PST), solenoid operated valve testing (SOVT) and full stroke testing (FST) to be carried out efficiently and reliably, to ensure effective maintenance of Safety Integrity Levels (SIL) up to level 3.

Automated partial stroke tests (PST) minimize disruption to the process by extending the intervals between a plant's full closure tests while maintaining the required SIL level. Valve position signal, functioning pressure signals and other optional external signals are monitored and processed by microprocessor-based logic mounted inside these devices.

### CONTROL SYSTEMS

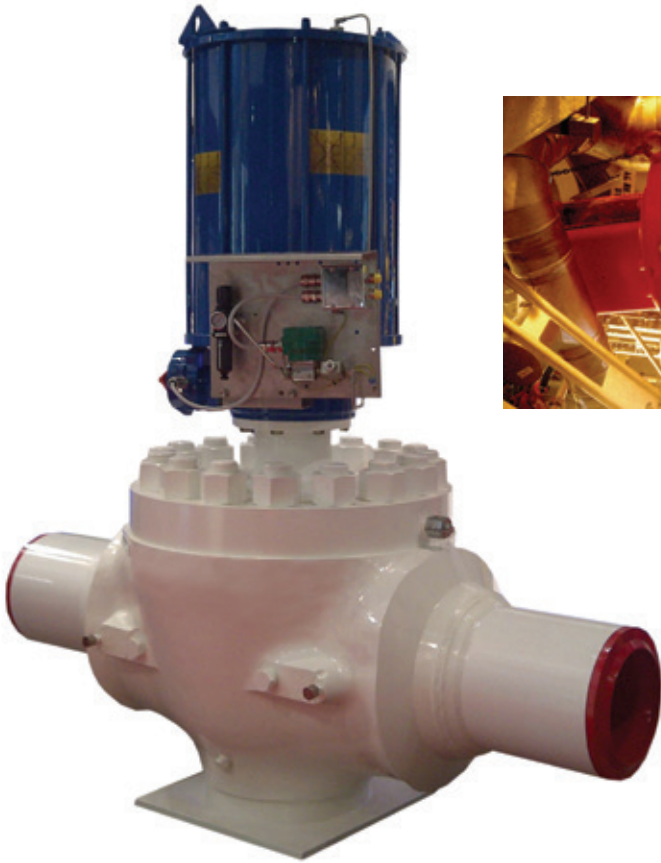
Advanced engineering technology is used to design and manufacture pneumatic controls and accessories, based on customer specifications and application requirements. The most stringent needs for control modes, operating conditions and customization can be met through the correct

selection of schematics, components, materials and protection treatments.

The control system can include devices for automatic operation or 'stay put' in case of emergency – electric or pneumatic supply failure, high temperature, low or high pipeline pressure etc.

Specially designed control systems can be supplied for heavy duty service or specific working conditions – low working temperature, sour gas supply, special emergency operation, etc.

- On-off or modulating actuator service.
- Local or remote actuator control via electric or pneumatic signals.
- Panel mounted or enclosed in a weatherproof cabinet.
- Separate or assembled onto the actuator.
- Mounts to actuator housing via dedicated supports.



## ENGINEERED FOR PERFORMANCE

### ROBUST CONSTRUCTION

Compact actuators are built to last in materials that have been selected specifically to provide optimum performance and an extended service life with minimal maintenance.

Totally enclosed housings are in fabricated carbon steel, to provide maximum strength.

### MINIMAL FRICTION

Friction is minimized through the use of an electroless nickel-plated and polished cylinder.

### MAXIMUM CORROSION RESISTANCE

The use of hard chrome plated alloy steels and electroless nickel-plated carbon steels inside the cylinder provide maximum corrosion resistance, extending service life. Bolting, nuts and stoppers are provided in 316 stainless steel. The actuator is provided with a Norsok approved protection coating for off-shore/marine applications.

### ACCURATE PERFORMANCE

- Adjustable end stopper (angular adjustment  $90^\circ \pm 5^\circ$ ), which is operated easily using standard tools, is situated under the main flange and protected against water ingress by sealed covers
- Direct coupling to ISO 5211 or customized valve interface on request
- Direct connection between actuator's output shaft and valve's position indicator
- Spare part easy to access for maintenance operations





## EXCEPTIONAL ENGINEERING EXPERTISE

For applications outside those covered by the standard range, the company has the facilities, unrivalled experience and engineering expertise that enable it to create custom-made solutions to meet specific needs. Working closely with customers and end-users, tailor made solutions can be engineered to cover the most stringent applications and operating conditions.





Biffi reserves the right to modify product designs and specifications without any notice.

**Biffi Italia Srl**

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