

# Accelerating the Transition to a H<sub>2</sub> Future



## Product H<sub>2</sub> Service

Safely operate the valve used in hydrogen service granting high reliability, fast closing and SIL 3 protection level





## Opportunities

Hydrogen can support a growing energy demand while reducing the CO<sub>2</sub> footprint

- Decarbonize sectors where it is difficult to meaningfully reduce emissions
- Today's technology is ready to safely produce, store, move and use hydrogen in many ways
- Storage stabilizes variable output of renewables for supply / demand dependability

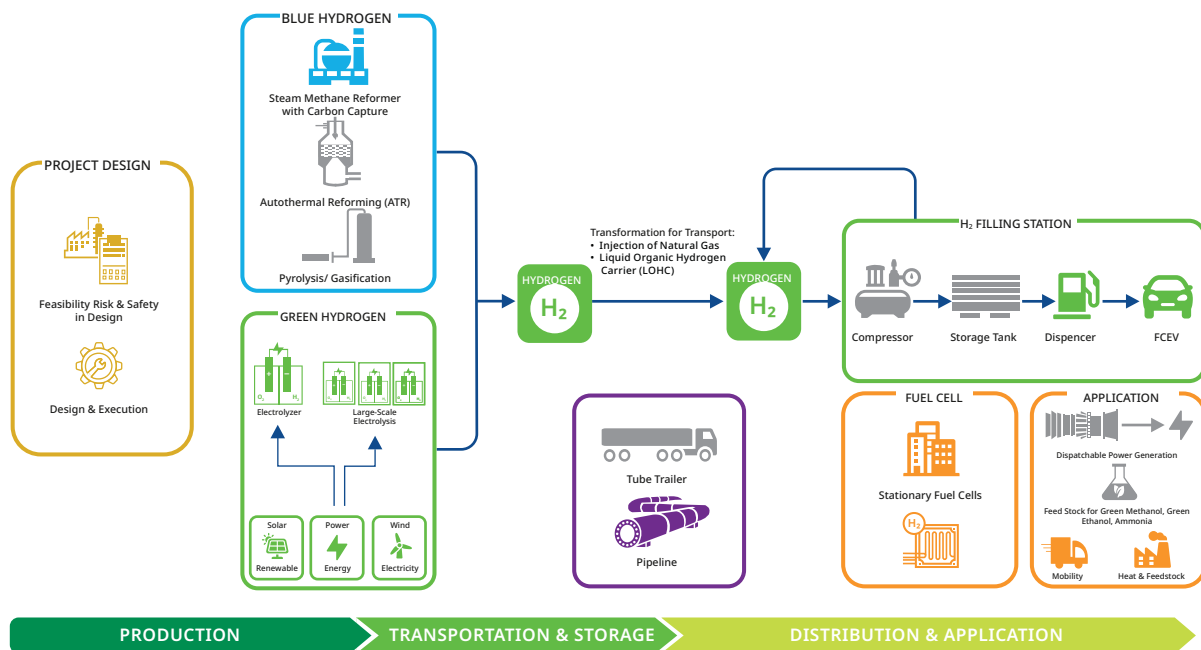


## Challenges

Hydrogen currently sourced from natural gas and coal; low-carbon energy sourcing still costly

- Production of renewable and H<sub>2</sub> energy cost prohibitive for mass adoption
- Interdependence of H<sub>2</sub> value chain requires concurrent development / adoption across many sectors— widespread adoption is slow
- Scale of adoption insufficient to drive cost-efficient manufacturing for critical infrastructure like electrolyzers, fuel cells and refueling equipment

## Hydrogen Value Chain



## Robust, versatile, high performing actuators with fail safe capability

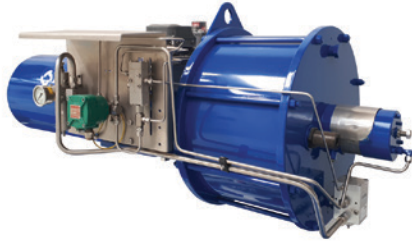
Biffi is an actuator producer with more than 60 years of experience and world wide presence. It can provide solution for Production, transportation and distribution application in collaboration with others partners. In the H<sub>2</sub> service the actuator is installed on top of the valve and not in direct contact with the H<sub>2</sub>.

As a consequence the H<sub>2</sub> is not intentionally released in the air and the protection level is granted by the correct explosion proof protection that is IIB+-H<sub>2</sub> as a minimum.

The H<sub>2</sub> release free solution guarantee to have a zero environmental impact and a better cost control because the H<sub>2</sub> production is today cost sensitive.

# Pneumatic low-pressure and Hydraulic solutions

## Pneumatic Scotch yoke actuators

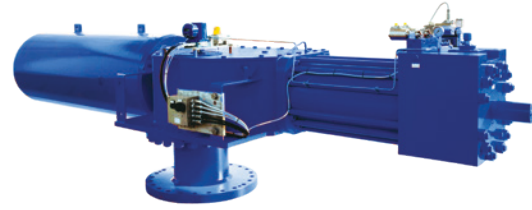


### ALGA ALGAs and QA vers

ALGA-ALGAS pneumatic scotch yoke actuators are suitable for quarter-turn valves up to the largest sizes, thanks to an efficient design and to high break-out torque. The QA version with damper performs fail stroking in less than 1 second.

- Design pressure: 12 bar g (174 psi)
- Double acting torque: up to 750.000 Nm (6,630,000 Lb in)
- Spring ending torque: up to 235.000 Nm (2,078,000 Lb in)

## Hydraulic Scotch yoke actuators



### OLGA-H OLGAS-H and QA vers

Efficient design and high break-out torque make OLGA OLGA-H and OLGAS OLGAS-H hydraulic actuators suitable for most quarter-turn valves and larger heavy-duty applications.

- Design pressure: up to 350 bar g (5,076 psi)
- Double acting torque: up to 1.000.000 Nm (8,850,745 Lb in)
- Spring ending torque: up to 235.000 Nm (2,079,000 Lb in)

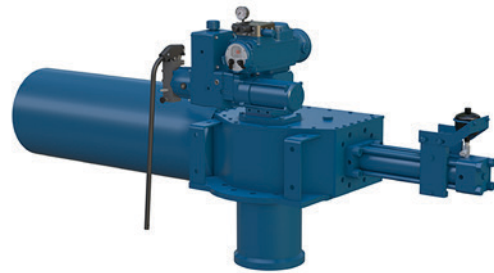
All actuators are available in double-acting and spring return versions for any linear or quarter-turn valves.

## SMART Electro-Hydraulic actuators

### Biffi EHO-SA or EHO-DA

Efficient design and high break-out torque make the self contained SMART EHO electro-hydraulic solution suitable for most quarterturn valves and larger heavy-duty applications.

- Design pressure: up to 350 bar g (5,076 psi)
- Double acting torque: up to 60.000 Nm (531,045 Lb in)
- Spring ending torque: up to 75.000 Nm (663,806 Lb in)



## Electric solutions

For completing the range of solutions, it is possible to use the electric actuator in combination with a specific gear.

## Multi-turn actuators

### ICON3000

Smart multi-turn actuator with advanced communication technology, data management and reliable operation.

- Torque: 30 to 1.440 Nm (265 to 12,745 Lb in)
- Voltages: 24 V DC to 690 V AC (3 phase)
- Temperature range : -20°C to +85°C (-76°F to +185°F)
- Speed range: 12 to 173 rpm
- A Manager diagnostic software compatibility
- Low power version available 30Nm (265 Lb-in) / 24VDC / 1,3A



# Biffi is a reliable partner for complete actuation solutions



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