

# VALVES FOR THE ENTIRE HYDROGEN VALUE CHAIN



## Valve Design for Use in Hydrogen Applications

Valve requirements in hydrogen applications are as varied as the media used — in water electrolysis plants, mainly process water on the reactant side and hydrogen as well as oxygen on the product side are used. The system is cooled via an additional cooling circuit. In addition to isolation valves such as bellows or gland seal as well as butterfly valves, which are used in all media, safety valves are required for overpressure protection and control valves for regulation.

Control valves with a stainless steel bellows stem seal are suitable for control applications where hydrogen is the medium. Valves for use in oxygen must be specially cleaned from grease and oil, then fitted with specifically

certified seals and tested. For cooling and process water, EPDM is generally used as stem sealing. Either electric or pneumatic actuators are used depending on the available operating energy, any necessary safety functions and numerous other criteria.

ARI-Armaturen offers a large choice of the required valves for water electrolysis plants — all from a single source and “Made in Germany”. As a leading international developer, manufacturer and distributor of high quality valves, ARI-Armaturen advises and supports with customised solutions and many years of experience in a wide range of applications along the entire hydrogen value chain.

## ARI® PRODUCT DIVERSITY

### Control



**Control valves**  
STEVI® Pro  
(BR 422/462, 470/471)



STEVI® Vario  
(BR 448/449)



STEVI® Smart (BR 423/463,  
425/426, 440/441, 450/451)



**Control without auxiliary power**  
PREDU®/PREDEX®/  
PRESO®/TEMPROL®

### Isolation



**Process Valves**  
ZETRIX®  
High Performance-Valves  
ZEDOX®



**Butterfly valves**  
ZESA®/GESA®/ZIVA®



**Bellows sealed valves**  
FABA® Plus, FABA® Supra I/C



**Stop valves with gland seal**  
STOBU®

### Safety



**Safety valves (DIN)**  
SAFE



**Safety valves**  
SAFE TCP



**Safety valves (API 526)**  
REYCO®



**Safety valves (ANSI)**  
REYCO® RL-Series

### Steam trapping



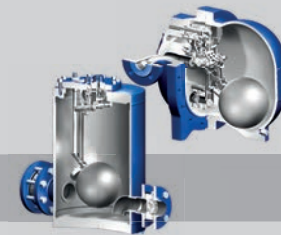
**Steam traps CONA®**  
(mechanical ball float /  
thermostatic bimetallic and  
membrane / thermodynamic),  
**monitoring systems**  
CONA® Control



**Manifolds**  
CODI® for collecting  
and diverting purpose



**Steam traps with multi-valving technology** CONA®  
“All-in-One” (incl. stop valve,  
inside strainer, back-flow  
protection, drain valve)

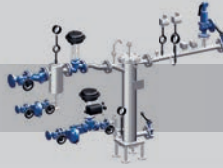


**Mechanical pump systems**  
CONLIFT®, CONA® P

### Application technology



**Pressure reducing station**  
PREsys®



**Heat exchanger**  
ENCOsys®



**Condensate return system**  
CORsys®

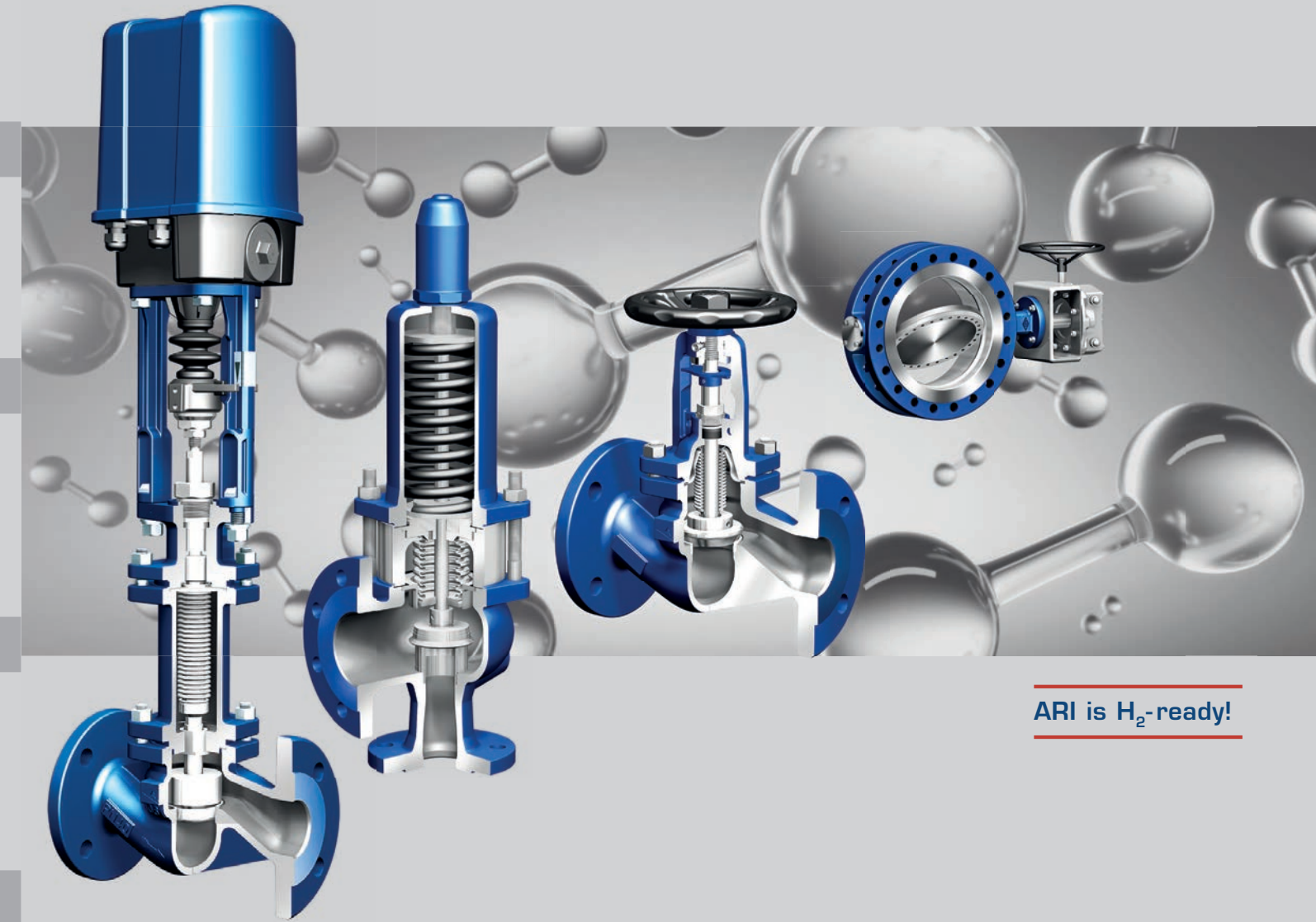


**Feedwater tank with deaerator dome**

Edition 02/2024 - Data subject to alteration

# YOUR ONE-STOP SHOP

FOR HYDROGEN APPLICATIONS



**ARI is H<sub>2</sub>-ready!**

Profit from diversity made by ARI®.  
Please don't hesitate to ask for more information!



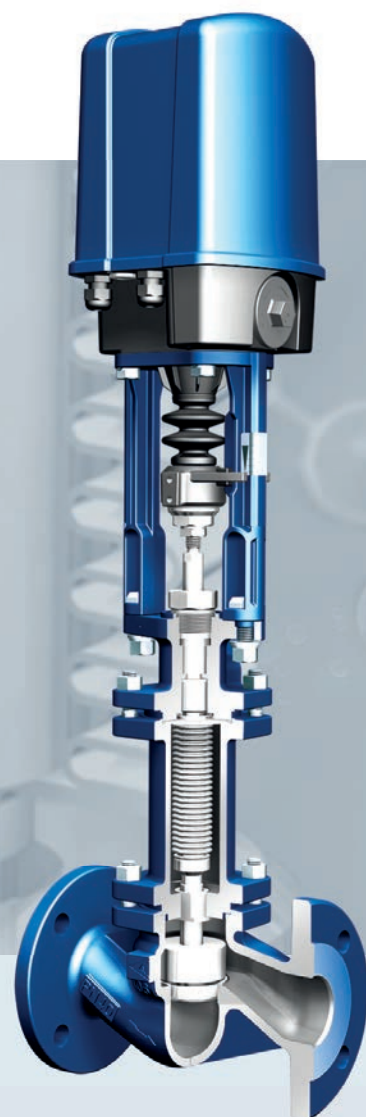
Your valve made by ARI®  
ari-armaturen.com



Your valve made by ARI®  
ari-armaturen.com



## THE RIGHT VALVE FOR YOUR APPLICATION



**STEVI®**

**Control valves - Reliable control even under critical conditions.**

**DN 15 – 500 / NPS ½" – 8" | PN 16 – 160 / Class 150 – 600 | -60 °C to +450 °C**

- Precise and high performing: optimised flow characteristic.
- Minimal noise: multi-stage trim (optional).
- Variable: reducible Kvs values.
- Safe: blow-out stem protection.
- Safe: two-ply bellows seal (optional).
- Long life: precision stem guiding.



**FABAs®**

**The bellows sealed globe valves – Extra-tight shut-off due to “cut-off effect”.**

**DN 15 – 500 / NPS ½" – 10" | PN 16 – 160 / Class 150 – 300 | -60 °C to +450 °C**

- Even greater performance due to the reinforced bellows welded to the stem rather than to the plug (vibration is not transferred directly from the plug to the bellows).
- Easy to use due to ergonomic handheel with environmentally friendly, corrosion-resistant electro-plated coating.
- Even more reliable due to the reinforced bellows (10,000 double cycles) – welded to the top part of the body.

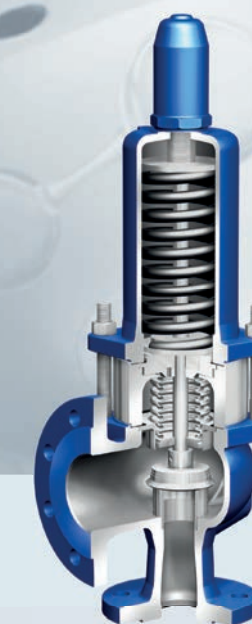


**STOBUs®**

**The gland sealed stop valve – Variable, easy to maintain, durable.**

**DN 15 – 500 / NPS ½" – 20" | PN 16 – 160 / Class 150 – 300 | -60 °C to +450 °C**

- Optimum leak-tightness internally due to ideal plug/seat hardness combination and to the outside due to a chambered yoke gasket.
- Ideal handling due to non-rising handwheel and easy tightening via gland seal stuffing box.
- Easy to service due to swing mounted bolts fixed to the bonnet.
- Certified safety due to spring loaded stop valve with gland seal acc. to ISO 15848-1 / TA Luft



**SAFE/REYCO®**

**Direct acting safety valves with spring acc. EN (SAFE) and ASME/API (REYCO®).**

**DN 15 – 250 / NPS ½" – 8" | PN 16 – 100 / Class 150 – 2500 | -60 °C to +450 °C (SAFE) | -196 °C to +538 °C (REYCO®)**

- Accurate response and high performance due to advanced design features.
- All series DN 15 up to DN 250 also available in stainless steel (incl. stainless steel bellows).
- Fulfills tightness requirements acc. ISO 15848-1.
- SAFE: Type approved acc. ISO 4126-1, VdTÜV 100, TRD, AD2000-A2, ASME Sec. XIII (formerly Sec. VIII).
- REYCO®: Type approved acc. ASME Code Sec. XIII (formerly Sec. VIII), API 526 and certified acc. ISO 4126-1.



**ZETRIX®**

**The ARI process valve – Triple offset for challenging applications.**

**DN 80 – 1400 / NPS 3" – 56" | PN 10 – 100 / Class 150 – 600 | -60 °C to +550 °C**

- Reliably tight due to the triple offset disc design (maximum closing force with minimum effort).
- Versatile use due to the “smart” sealing ring (uniform closing force, the ring is self-aligning and free-floating on the sealing surface).
- Durable due to the stellited seat (Stellite™ No. 21) as standard.
- Rotary movement without wear or friction (seat and sealing ring) due to the optimised contact angles. Design: EN 12516, ASME B16.34, API 609.
- Approvals: Firesafe, ISO 15848-1 / TA Luft, SIL, ATEX, EAC.



**GESAs®/ZESAs®**

**Butterfly valve, soft sealed and maintenance-free.**

**DN 25 – 600 | PN 6 – 16 | -10 °C to +130 °C**

- Lug type (GESAs®) or wafer type (ZESAs®).
- Standard EPDM liner, stainless steel washer and shaft with hollow spindle for optional thermal gauge.
- EPDM with DIN DVGW Registration for drinking water.
- Mounting flange acc. to EN ISO 5211 for easy actuator mounting.

### For Highest Requirements on Leak-Tightness – Internally and Externally

We use the term “H<sub>2</sub>-ready” to describe valves that have been thoroughly tested for direct contact with the medium hydrogen. In addition to the physicochemical resistance of the materials used, the highest requirements apply to leak-tightness – both internally and to atmosphere.

The internal leak-tightness of metal-seated globe valves is achieved due to the “cut-off effect” (line contact sealing of the conical plug on the seat ring), which ensures that the valve closes tightly even when only little force is applied. ARI-Armaturen confirms internal leak-tightness by testing according to EN 12266, leakage rate A. Testing to other standards such as API 598 is possible at the customer's request.

In addition to air/nitrogen, these tests can also be carried out using helium or – in consultation with the customer – forming gas as the test fluid. External leak-tightness

is ensured by seals that have been tried and tested over many years and are certified in accordance with ISO 15848-1, respectively TA Luft. Particularly for stem seal systems, ARI-Armaturen for many years offers a comprehensive portfolio of bellows seal technologies, serving a broad range of industries. The double-wall bellows used are designed for up to 100,000 double cycles, depending on the series. Customized maintenance-free bellows solutions are, for example, equipped with reinforced bellows welded to the upper part of the body or with a bellows cover for increased resistance to water hammer. ARI-Armaturen additionally offers a ISO 15848-1 / TA Luft packing with spring-loaded gland seal for various globe and quarter turn valves to ensure optimal external leak-tightness.