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Applications in a Desalination Plant

Valves and Automation Components in a desalination plant have to be selected very carefully, as many of the applications require high quality and long service life. Whether it is highly corrosive seawater or sensitive potable water - the selection of suitable materials on a top quality level must be the first criteria when choosing components.

EBRO offers a wide range of valves and actuators for all the tasks in such plants. Soft seated for low pressure lines – high performance valves for high pressure – we offer a suitable, top quality solution for all the applications.
Applications in a Desalination Plant

Seawater intake

Potable water storage & distribution

Brine disposal

Seawater intake
Thanks to their design and material diversity, centrally mounted, shaft protected, soft seated shut-off and control valves are almost universally usable. Whether the medium is water, powder or gas – with a broad range of materials and our expertise based on 40 years of experience, we can offer you the optimal solution for your application.

### Z 011-A
Universally usable wafer-type butterfly valve in accordance with EN-593. Due to the diversity of base materials available, this valve is suitable for various fields of application.

### Z 014-A
Lug-type butterfly valve with tapped holes. This design enables downstream pipe dismantling. Series Z 014-B: Butterfly valve with vulcanized-in liner up to DN 300 available.

### F 012-A / F 012-K1
Double-flanged butterfly valve suitable for use in cooling and industrial water circuits in seawater desalination. The vulcanised-in liner is suitable for operating pressures up to max. 25 bar.

<table>
<thead>
<tr>
<th>Nominal diameter:</th>
<th>DN 20 - DN 600</th>
<th>DN 20 - DN 600</th>
<th>DN 50 – DN 2000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Face-to-face:</td>
<td>EN 558 Series 20</td>
<td>EN 558 Series 20</td>
<td>EN 558 Series 13</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>ISO 5752 Series 13</td>
</tr>
<tr>
<td>Flange accommodation:</td>
<td>EN 1092 PN 6/10/16 ASME Class 150 AS 4087 PN 16</td>
<td>EN 1092 PN 6/10/16 ASME Class 150 AS 4087 PN 16</td>
<td>EN 1092 PN 6/10/16/25 ASME B16.5 / B16.47 ASME Class 150 ASME Class 300 AS/NZS 4087 PN 16 / PN21 / PN35 Others on request</td>
</tr>
<tr>
<td>Flange Surface Design:</td>
<td>EN 1092 Form A/B ASME RF, FF</td>
<td>EN 1092 Form A/B ASME RF, FF</td>
<td>EN 1092 Form A/B ASME RF, FF</td>
</tr>
<tr>
<td>Tightness check:</td>
<td>EN 12266 (Leakage rate A) ISO 5208, Category 3</td>
<td>EN 12266 (Leakage rate A) ISO 5208, Category 3</td>
<td>EN 12266 (Leakage rate A) ISO 5208, Category 3</td>
</tr>
<tr>
<td>Temperature range:</td>
<td>-40 °C to + 200 °C (depending on pressure, medium and material)</td>
<td>-40 °C to + 200 °C (depending on pressure, medium and material)</td>
<td>-40 °C to + 200 °C (depending on pressure, medium and material)</td>
</tr>
<tr>
<td>Max. Operating pressure:</td>
<td>max. 16 bar</td>
<td>max. 16 bar</td>
<td>max. 25 bar</td>
</tr>
<tr>
<td>Vacuum:</td>
<td>up to 1 mbar absolute</td>
<td>up to 1 mbar absolute</td>
<td>up to 1 mbar absolute</td>
</tr>
</tbody>
</table>
**Soft Seated Valves**

**SHAFT RETAINER**
The shaft retainer guarantees blow-out protection for the shaft.

**CONVEX SHAPE OF THE LINER**
This feature absorbs the deformation of the liner when mounted between flanges and avoids damage and increasing torques.

**SOLID DISC/SHAFT**
Secure disc/shaft connection. No bolts, no wear.

**POLISHED SEALING SURFACES**
Disc edges fully machined.

**MULTIPLE BEARINGS**
The shafts have multiple bearings. Optimal guidance even after many years of use.

**DOUBLE SIDED PROFILES**
Double sided profiles ensure the sleeve/body engagement in the outer body recess.

**BED GROOVE DESIGN**
The liner is embedded in the body. This prevents movement when operated.

**APPLICATIONS**
- Seawater Intake
- Pretreatment
- Low pressure RO-lines
- Post-treatment
- Potable water (storage/distribution)

**CERTIFICATES**
- DVGW
- WRAS
- NSF
- AEL
- SIL

**BODY & COATING**
Precision machined bodies form the basis for perfect sealing of the liner and precise positioning of the shaft. All working surfaces fully machined. High protection against environmental influences. Coating acc. to C3 or C4 for indoor use, CSM coating for outdoor use.
High operating pressures and extreme temperatures – wherever other valves reach their physical limits, this series is the ideal solution. The double eccentric design of the valve disc, high-quality materials and outstanding workmanship ensure safety even in extreme conditions of use. Different sealing systems enable an optimal solution for the respective field of application.

Nominal diameter:
- **HP 111**
  - DN 50 - DN 1200
- **HP 114**
  - DN 50 - DN 1200
- **HP 112**
  - DN 80 - DN 600

Face-to-face:
- **HP 111**: EN 558 Series 20, Series 25
  - ISO 5752 Series 20
  - ASME Class 150
  - AS 4087 PN 16/21
- **HP 114**: EN 558 Series 20, Series 25
  - ISO 5752 Series 20
  - ASME Class 150
  - AS 4087 PN 16/21
- **HP 112**: EN 558 Series 13
  - Others upon request

Flange accommodation:
- **HP 111**: EN 1092 PN 10/16/25/40
  - ASME Class 150
  - AS 4087 PN 16/21
- **HP 114**: EN 1092 PN 10/16/25/40
  - ASME Class 150
  - AS 4087 PN 16/21
- **HP 112**: EN 1092 PN 10/16/25/40
  - ASME Class 150
  - ASME Class 300
  - AS 4087 PN 16/21

Flange Surface Design:
- **HP 111**: EN 1092 Form A/B
  - ASME RF, FF
- **HP 114**: EN 1092 Form A/B
  - ASME RF, FF
- **HP 112**: EN 1092 Form A/B
  - ASME RF, FF

Leak testing for R-PTFE Seat:
- **HP 111**: EN 12266 (Leakage Rate A)
  - EN 12266 (Leakage Rate A)
  - EN 12266 (Leakage Rate A)
- **HP 114**: EN 12266 (Leakage Rate B)
  - ISO 5208, Category 3
  - EN 12266 (Leakage Rate B)
  - ISO 5208, Category 3
- **HP 112**: EN 12266 (Leakage Rate B)
  - ISO 5208, Category 3

Temperature range:
- **HP 111**: –60°C to +600°C (depending on pressure, medium and material)
- **HP 114**: –60°C to +600°C (depending on pressure, medium and material)
- **HP 112**: –60°C to +600°C (depending on pressure, medium and material)

Operating pressure:
- **HP 111**: max. 40 bar up to DN 150
  - > DN 150 max. 25 bar
- **HP 114**: max. 40 bar up to DN 150
  - > DN 150 max. 25 bar
- **HP 112**: max. 40 bar up to DN 150
  - > DN 150 max. 25 bar

Vacuum:
- **HP 111**: up to 1 mbar absolute
- **HP 114**: up to 1 mbar absolute
- **HP 112**: up to 1 mbar absolute
## High Performance Valves

**Applications**
- High Pressure lines
- Reverse Osmosis

**Certificates**
- TÜV
- DGRL
- CRS
- CCS

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**Body**
A solid one-piece body made of high-grade stainless steel guarantees maximum protection against environmental influences.

**Force-Locked Connection**
Between disc and shaft. Low shear stresses thanks to tangentially arranged tapered pins.

**Maintenance-Free Bearing**
For all nominal diameters maintenance-free, overlong corrosion and temperature-resistant bearings are used for exact centering of the valve discs.

**Straight Through Shaft**
Ensures maximum bending strength.

**Inconel Seat Ring**
The Inconel seat ring guarantees absolute tightness and compensates for wear. The seat ring can be replaced without disassembling the shaft and valve disc. Alternative: R-PTFE or Fire-safe

**Valve Disc**
The valve disc has a double eccentric bearing design, resulting in low torques and low wear. All sealing surfaces are machined.

**Clamping Ring**
Protects the seat ring from abrasion and erosion.
EBRO PTFE-lined shut-off and control valves are designed for use in chemically aggressive leaches and acids, for example. The minimum 3 mm thick lining comprising virgin PTFE ensures optimal permeation protection. In conjunction with the double shaft seal, this series offers maximum operational safety, even with corrosive and toxic media.

**Nominal diameter:**
- T 211-A: DN (40)50 - DN 300
- T 214-A: DN (40)50 - DN 300
- T 212-A: DN 350 – DN 900

**Face-to-face:**
- T 211-A: EN 558 Series 20 ISO 5752 Series 20 API 609 Table 2
- T 214-A: EN 558 Series 20 ISO 5752 Series 20 API 609 Table 2
- T 212-A: EN 558 Series 20 ISO 5752 Series 20 API 609 Table 2

**Flange accommodation:**
- T 211-A: EN 1092 PN 10/16 ASME Class 150 AS 4087
- T 214-A: EN 1092 PN 10/16 ASME Class 150 AS 4087
- T 212-A: EN 1092 PN 10/16 ASME Class 150 AS 4087

**Flange Surface Design:**
- T 211-A: EN 1092, Form A/B ASME RF, FF
- T 214-A: EN 1092, Form A/B ASME RF, FF
- T 212-A: EN 1092 Form A/B ASME RF, FF

**Tightness check:**
- T 211-A: EN 12266 (Leakage Rate A)
- T 214-A: EN 12266 (Leakage Rate A)
- T 212-A: EN 12266 (Leakage Rate A)

**Temperature range:**
- T 211-A: –40 °C to + 200 °C (depending on pressure, medium and material)
- T 214-A: –40 °C to + 200 °C (depending on pressure, medium and material)
- T 212-A: –40 °C to + 200 °C (depending on pressure, medium and material)

**Max. Operating pressure:**
- T 211-A: max. 10 bar (16 bar for spec. version)
- T 214-A: max. 10 bar (16 bar for spec. version)
- T 212-A: max. 10 bar (16 bar for spec. version)

**Vacuum:**
- T 211-A: up to 1 mbar absolute
- T 214-A: up to 1 mbar absolute
- T 212-A: up to 1 mbar absolute
PTFE Valves

- **Chemical dosing lines**
- **Pretreatment**

** Shaft Bearing:**
All nominal diameters have a multiple, maintenance-free shaft bearing.

** Body & Coating:**
Precision machined bodies form the basis for perfect sealing of the liner and precise positioning of the shaft. All working surfaces fully machined. High Protection against environmental influences. Coating acc. to C3 or C4 for indoor use, C5M coating for outdoor use.

** Internal Bodyscrew:**
The bodyscrew is mounted within the body and thus protected against corrosion.

** Ball Principle:**
The proven seal according to the ball principle between disc and PTFE liner ensures reliable long-term operation, without critical transitions.

** PTFE Liner:**
The PTFE liner is isostatically pressed and at least 3 mm thick. The broad, chambered sealing strips also serve as a double-sided flange seal.

** Safety Seal:**
The one-piece, blow-out proof shaft/disc is coated with PFA including the safety seal. The disc is covered with at least 3mm. All sealing surfaces are machined.

** Double Seals:**
Double seals as standard on both shaft ducts. Primary seal (= main seal) achieved by prestressing through maintenance-free set of stainless steel disc springs. Secondary seal (= EBRO safety seal) is safely achieved through a matched combination of a PTFE-Chevron seal and an additional O-ring.

** Certificates:**
- TÜV
- PED
- SIL
The scotch-yoke principle in the EB actuators exactly matches the valve torque characteristics, thus reducing size and air consumption.

A compact series of electric actuators for open/close and control functions.

EB-SYS & EB-SYD
The scotch-yoke principle in the EB actuators exactly matches the valve torque characteristics, thus reducing size and air consumption.

E65 - E210
A compact series of electric actuators for open/close and control functions.

<table>
<thead>
<tr>
<th>Specification</th>
<th>EB-SYS &amp; EB-SYD</th>
<th>E65 - E210</th>
</tr>
</thead>
<tbody>
<tr>
<td>Torque range:</td>
<td>27 - 9768 Nm (based on supply pressure of 6 bar)</td>
<td>Actuation time from 0° - to 90°:</td>
</tr>
<tr>
<td>End positions:</td>
<td>exactly adjustable between -8°/3°</td>
<td>Rated torque:</td>
</tr>
<tr>
<td>Limit switch- and Control</td>
<td>VDI / VDE 3845</td>
<td>Rated current:</td>
</tr>
<tr>
<td>Control valve-fitting:</td>
<td>min. 2,5 bar, max. 8 bar</td>
<td>Starting current:</td>
</tr>
<tr>
<td>Control air:</td>
<td>Filtered compressed air dry or lubricated.</td>
<td>Power consumption:</td>
</tr>
<tr>
<td>Temperature range:</td>
<td>-20°C to +80°C (standard) -40°C to +80°C (low temperature) -15°C to +120°C (high temperature)</td>
<td>Rated voltage:</td>
</tr>
<tr>
<td>Cylinder liner:</td>
<td>high quality marine grade Aluminium alloy, hard anodized. Other coatings upon request</td>
<td>Frequency:</td>
</tr>
<tr>
<td>Duty cycle:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protection class:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Automated valves play a central role in process technology: They regulate flow rates, lock product flows and release pipes. The challenge is the fact that the valve and actuator perfectly harmonize with each other. The automation technology simplifies complex systems, ensures a lower error rate and thus speeds up work.

<table>
<thead>
<tr>
<th>Control Elements</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SBU Advanced</strong></td>
</tr>
<tr>
<td>Smart Valve Monitoring via Bluetooth interface. Continuous checking of the main functions of valve and actuator.</td>
</tr>
<tr>
<td><strong>EP 100</strong></td>
</tr>
<tr>
<td>The analog positioner EP 100 with input signal 4..20 mA serves to activate single or double acting pneumatic quarter turn actuators.</td>
</tr>
<tr>
<td><strong>EP 501</strong></td>
</tr>
<tr>
<td>Compact positioner for assembly with rotary and linear actuators with digital display.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Temperature range:</th>
<th>-20°C to +70°C</th>
<th>-40 to +80°C</th>
<th>0°C to +60°C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adjustment range:</td>
<td>0 to 240º</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Power supply:</td>
<td>24VDC ±10%</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Body:</td>
<td>Aluminium (powder coated)</td>
<td>Aluminium lacquered with DD-Coating</td>
<td>Aluminium (plastic coated)</td>
</tr>
<tr>
<td>Contact termination:</td>
<td>Spring Type Terminal</td>
<td>Pneumatic &amp; Electric</td>
<td>Threaded ports G ¼</td>
</tr>
<tr>
<td>Screws:</td>
<td>Stainless steel</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Output signals:</td>
<td>Digital outputs 24 VDC</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Protection class:</td>
<td>IP 68 according to EN 60529</td>
<td>IP 65</td>
<td>IP 65/67 acc. to EN 60529</td>
</tr>
<tr>
<td>Positioner system:</td>
<td>-</td>
<td>Single- and doubleacting</td>
<td>Single- or double acting</td>
</tr>
<tr>
<td>Power consumption:</td>
<td>max. 200mA</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Interface:</td>
<td>Bluetooth</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Solenoid valve:</td>
<td>24 VDC, max 5W</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Operating voltage:</td>
<td>24VDC ±10%</td>
<td>-</td>
<td>24VDC ±10%</td>
</tr>
</tbody>
</table>
As an acknowledged partner in international plant engineering, we are thoroughly committed to optimising the quality of our high-end products in respect of performance and lifecycle costs.

A quality management system - first certified to ISO 9001 in 1993 - that is consistently focused on continuous improvement, together with highly motivated staff, ensures the consistent implementation of international standards.

The conformity of our premium-class products with the Pressure Equipment Directive and documentation according to the Machinery Directive provide the basis for instantly verifiable quality - a formula that has served our satisfied customers well for the past four decades.
The companies EBRO ARMATUREN and Stafsjö Valves are acknowledged partners to the international plant construction industry. EBRO butterfly valves and actuators fulfill the highest demands of industrial plant construction in complex and sensitive applications. For many years, Stafsjö has been one of the leading producers of high-quality knife-gate valves for the paper and pulp industry, water and sewage technology, biogas plants and other processing industries.

The merger of the two companies in 2006 brought our customers an additional level of cross-sector expertise, in practically all industrial applications. As owner-managed family businesses, both Stafsjö and EBRO aim to achieve sustainable economic success. This is why we are continuously investing in research and development on one hand and in the technical expertise of our employees on the other.

**The result is top quality and reliability.**
THE WORLD OF EBRO ARMATUREN
Our international network

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