TRI-CON
ROTARY PROCESS VALVE

- Triple Eccentric
- Zero Leakage
- Metal Seated
- Self-centering Disc
- Frictionless Closing
- Inherently Firesafe
- SIL 3
This TRI-CON Series demands a high level of expertise and high quality machining. With experience gained in research, development, machining and manufacturing since the company was formed in 1977 we ensure the TRI-CON Series will meet or exceed the demanding specifications required by the industry standards.

The Company’s Quality Assurance is certified to ISO 9001:2008, however this is not our final goal. The sealing members being the laminated seal ring and the solid seat, are manufactured in stainless steel. Therefore, the TRI-CON valve has become one of the most globally applied valves in the market.

The valve has been widely proven in high demanding industries: from oxygen to exhausted gases, cryogenic and superheated steam and is also widely used in chemical process industries.

The valve is used extensively in the petro-chemical and chemical industry for process and control providing excellent flow characteristics. The sealing design eliminates breakaway torques.

The mono flanged bodies according to API 609 and DIN EN 558 and the double flanged bodies according to ISO 5752, B16.10 and DIN EN 558 also butt weld valves are within the standard series.
The Zwick Armaturen capability includes process valves of the TRI-CON Series as well as a wide range of special valves.

Zwick Armaturen has designed a zero leakage bushing (patented) that will ensure no line media will migrate into the bushing cavity. This design has been proven in the severest of applications where other designs have failed due to fouling or galling of the bushing and shaft.

The high tech construction meets the demands for firesafe (API and BS), for requirements “TA Luft II” and for tightness in both flow directions under full class conditions.

We are able to offer outstanding technical support and service to meet your special valve requirements. Quick delivery, competitive pricing and full customer service are additional advantages of our company.

Our quality is your benefit! According to this principle we do our utmost to satisfy your requests. Due to continuous development and research we guarantee that we are your partner now and for the future.

Considered Standards:

<table>
<thead>
<tr>
<th>Calculation:</th>
<th>Face to Face dimensions:</th>
<th>Flanged Connection:</th>
<th>Testing:</th>
<th>Quality Insurance:</th>
</tr>
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<tbody>
<tr>
<td>• TRD 110, DIN 3840</td>
<td>• DIN EN 558</td>
<td>• DIN 2501</td>
<td>Leaking rate according to</td>
<td>• DIN/ISO 9001:2008</td>
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<tr>
<td>• ASME SEC. VIII</td>
<td>• ISO 5752</td>
<td>• ISO 7005</td>
<td>• DIN EN 12266, Rate A</td>
<td>• DIN EN 12266, Rate A</td>
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<tr>
<td>• ASME SEC. III</td>
<td>• MSS-SP-68</td>
<td>• PN 10,16,25,40,64,100</td>
<td>• API 607, BS 6755, Rate A</td>
<td>• API 598</td>
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<td>• ANSI B31.1</td>
<td>• API 609</td>
<td>• ANSI B16.5</td>
<td>• API</td>
<td>• DIN/ISO 9001:2008</td>
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<td>• ANSI B31.3</td>
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<td>• CL 150-300-600</td>
<td>• MSS SP-44</td>
<td>• EN 29001</td>
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<tr>
<td>• API 609</td>
<td></td>
<td>• API</td>
<td>• CL 150-300-600-900</td>
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</table>

Marking:
- EN 12266
- MSS SP-25

The standard shaft sealing meets the requirements of the emission according to “TA Luft II”.

The Zwick Armaturen Company - in the centre of Europe.
Triple Eccentric Valve with Superior Operating Characteristics

With its triple eccentric design and metal-to-metal sealing, the TRI-CON Series guarantees an ideal valve design.

- True cone in cone sealing
- Frictionless operating
- Low torques
- Constant closing angle on the total circumference

The operating characteristics and the tightness of the valve are not influenced by high differences in temperatures and pressure fluctuations because of the triple eccentric geometry and the valves’ special features.

Maximum service life is achieved by eliminating any “rubbing” between the laminated seal around the total circumference during seating which enables a frictionless opening and closing. This guarantees full tightness and low operating torques.

Leakage Comparison:

<table>
<thead>
<tr>
<th>Valve Size</th>
<th>TRI-CON API 598 Resilient</th>
<th>Gate Valve API 598 Metal</th>
<th>H.P. Butterfly Valve ANSI Class VI</th>
<th>TRI-CON API 6D</th>
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<tbody>
<tr>
<td>Inch</td>
<td>DN</td>
<td>Liquid</td>
<td>Air</td>
<td>Liquid</td>
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<tr>
<td>3”</td>
<td>80</td>
<td>0</td>
<td>0</td>
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<td>4”</td>
<td>100</td>
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<td>6”</td>
<td>150</td>
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<td>0</td>
<td>12</td>
</tr>
<tr>
<td>8”</td>
<td>200</td>
<td>0</td>
<td>0</td>
<td>20</td>
</tr>
<tr>
<td>10”</td>
<td>250</td>
<td>0</td>
<td>0</td>
<td>20</td>
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<td>12”</td>
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<td>14”</td>
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<td>16”</td>
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<td>18”</td>
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<tr>
<td>20”</td>
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<tr>
<td>40”</td>
<td>1000</td>
<td>0</td>
<td>0</td>
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</tbody>
</table>

Notes: Allowable gate valve leakage per API 598 6th Ed. 1990. Leakage comparisons are measured in drops / minute for liquid and in bubbles / minute for air. 1 drop = 0.0625 cm³ / 1 bubble = 0.15 cm³
## Standard Bill of Materials

<table>
<thead>
<tr>
<th>Pos.</th>
<th>Part</th>
<th>Carbon Steel Design</th>
<th>Stainless Steel Design</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Body</td>
<td>ASTM A216 WCB / A516 Gr.60</td>
<td>ASTM A351 CF8M / CF8C / A276 Gr.316 Ti</td>
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<tr>
<td>2</td>
<td>Body Seat</td>
<td>ASTM A276 Gr.316 Ti</td>
<td>ASTM A351 CF8M / CF8C / A276 Gr.316 Ti</td>
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<td>3</td>
<td>Disc</td>
<td>ASTM A216 WCB / A516 Gr.60</td>
<td>ASTM A351 CF8M / CF8C / A276 Gr.316 Ti</td>
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<tr>
<td>4</td>
<td>Clamp Ring</td>
<td>ASTM A516 Gr.60</td>
<td>ASTM A276 Gr.316 Ti</td>
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<tr>
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<td>Solid lamination</td>
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<td>Solid lamination</td>
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<tr>
<td>5</td>
<td>Laminated Seal</td>
<td>ASTM A276 Gr.316 Ti / Graphite</td>
<td>ASTM A276 Gr.316 Ti / Graphite</td>
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<tr>
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<td>Solid lamination</td>
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<td>Solid lamination</td>
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<td>6</td>
<td>Shaft</td>
<td>ASTM A276 Type 431</td>
<td>ASTM A276 Type 431</td>
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<td>7</td>
<td>Lower Bearing Bush</td>
<td>ASTM A582 Type 303 hardchromed</td>
<td>ASTM A582 Type 303 hardchromed</td>
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<td>Zero leakage bearing</td>
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<td>Zero leakage bearing</td>
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<tr>
<td>8</td>
<td>Gland Packing</td>
<td>Carbon Fibre</td>
<td>Carbon Fibre</td>
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<tr>
<td>9</td>
<td>Gland Follower</td>
<td>ASTM A582 Type 303</td>
<td>ASTM A276 Gr.316 Ti</td>
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<tr>
<td>10</td>
<td>Gland Packing</td>
<td>Graphite</td>
<td>Graphite</td>
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<tr>
<td>11</td>
<td>Upper Bearing Bush</td>
<td>ASTM A582 Type 303 hardchromed</td>
<td>ASTM A582 Type 303 hardchromed</td>
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<tr>
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<tr>
<td>12</td>
<td>Cover Seal</td>
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<tr>
<td>13</td>
<td>Cover</td>
<td>ASTM A516 Gr.60</td>
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<td>14</td>
<td>Cover Screw</td>
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<tr>
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<td>Gland Adjust. Nut</td>
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<tr>
<td>17</td>
<td>Gland Plate</td>
<td>ASTM A516 Gr.60 / CF8M</td>
<td>ASTM A351 CF8M</td>
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<tr>
<td>18</td>
<td>Clamp Ring Screw</td>
<td>ASTM A193 Gr.B8</td>
<td>ASTM A193 Gr.B8</td>
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<tr>
<td>19</td>
<td>Gasket</td>
<td>Graphite</td>
<td>Graphite</td>
</tr>
<tr>
<td>20</td>
<td>Shaft Retainer</td>
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<td>ASTM A276 Gr.316 Ti hardchromed</td>
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<td></td>
<td>ASTM A276 Type 440 B hardened</td>
<td>ASTM A276 Type 440 B hardened</td>
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<tr>
<td>21</td>
<td>Cross Pin</td>
<td>ASTM A276 Gr.316 Ti</td>
<td>ASTM A276 Gr.316 Ti</td>
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<tr>
<td>22</td>
<td>Disc Drive Key</td>
<td>ASTM A276 Gr.316 Ti</td>
<td>ASTM A276 Gr.316 Ti</td>
</tr>
<tr>
<td>23</td>
<td>Thrust Ring</td>
<td>ASTM A276 T440B hardened</td>
<td>ASTM A276 Gr.316 Ti</td>
</tr>
</tbody>
</table>
## Comparative Features to Gate and Ball Valves

- **Zero Leakage**
  Rigid bi-directional testing (API 598, API 6D) confirms the ability of TRI-CON valves to prevent leakage.

- **Resilient Metal Seat**
  Even in the most severe applications, metal seating provides long-term zero leakage.

- **Quarter-Turn Operation**
  Stress on piping is reduced while automation is simplified. Compared with other designs, fugitive emissions are substantially reduced.

- **All-Metal Construction**
  TRI-CON all-metal construction provides greater resistance to higher temperatures.

- **Inherently Firesafe**
  Zero leakage and all-metal construction makes TRI-CON valves inherently firesafe.

- **Patented Seal Bearing**
  TRI-CON offers zero to low ppm performance out of the stem packing.

- **Zero-PPM Performance**
  A superior bearing and bushing design combats the migration of particulates.

- **Bi-Directional**
  TRI-CON valves are bi-directional and provide zero leakage shutoff.

- **Non-Rubbing Design**
  The unique triple eccentric conical seating eliminates rubbing and wear throughout the quarter turn operation.

- **Available ANSI B16.10 Face-to-Face**
  TRI-CON allows direct replacement of most gate, ball and globe valves.

- **Available API 609, Face-to-Face**
  The TRI-CON design allows operators to easily upgrade from double eccentric high performance (H.P.) butterfly valves.

- **Lightweight**
  Reduce piping stress and maintenance while also lowering construction costs.

- **ANSI 150/300/600/900 - DIN PN 10/16/25/40/64/100**
  TRI-CON valves are available in familiar gate and ball valve pressure standards.

- **Sizes DN 50 (2”) to DN 1800 (72”)**
  TRI-CON has the right sized valve for nearly all applications.

- **Cryogenic to -196°C**
  Get the low temperature performance you need.

- **High Temperature to 815°C**
  TRI-CON valves offer better shutoff performance than with soft-seated valves.

- **Ease of Automation**
  TRI-CON quarter-turn valves require less time and cost to automate.

- **Fast Operation**
  Closing times as fast as 0.15 seconds.
Range of Applications

TRI-CON valves are suited for severe service conditions in isolation, on/off, modulating control and ESD applications where reliability and tightness is critical. From applications with oxygen up to exhausted gases, cryogenic and superheated steam and also in widely used chemical processes, TRI-CON valves are proven throughout a wide range of industries.

Range of Body Styles

The right housing for your application.

Model F
Double flange
DIN EN 558/F4
• Simple Mounting
• DN80-1600
• PN10-100

Model S
Butt weld SI
• No flange tightness problems
• DN80-1600
• PN10-100
• 3” - 64”
• ANSI 150-600

Model D/I
Double flange
ISO 5752/F16
• World-wide standard
• DN50-1800
• PN10-100
• 2” - 72”
• ANSI 150-900

Model B
Double flange
ANSI B16.10
• Gate valve replacement
• 3” - 30”
• ANSI 150-600

Model A/L
Lugged Type
API 609 T2/DIN EN 558
• Compact design
• DN50-1000
• PN10-100
• 2” - 40”
• ANSI 150-900
A Proven Design with Excellent Characteristics

Special characteristics:

Self-centering disc
The construction guarantees the optimal position of the laminated seal against the seat. Jamming due to thermal expansion is eliminated.

Torque transmission with keys
The disc is keyed to the shaft not pinned, providing equal torque transmission and eliminating the danger of pins shearing off.

Ideal lamination and disc design
The strong disc with its elliptical supporting surface offers the best fixing of the lamination. The zero leakage is achieved by the special machining of the lamination.

Supported bearing bushings
The optimal position of the bearing reduces the bending of the shaft. This guarantees bi-directional tightness under maximum differential pressure.

General characteristics:
- Triple eccentric design
- Metal seating
- Zero leakage
- Pressure classes according to ANSI 150/300/600/900 and DIN PN 10/16/25/40/64/100
- Full bi-directional shut off according to API and DIN EN 558, zero leakage
- Temperature range -196˚C up to +815˚C
- Size range from 2” - 72” (DN 50-1800)
- Fugitive emission control acc. to “TA-Luft II”

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