API 682 4th edition
Category 1
Configurations

Configuration
2NC-CS
API piping plans applicable for 2NC-CS configuration

**Process side**

**Plan 02**
Closed-ended seal chamber with no recirculation of flushed fluid. Flush connections plugged.

**Plan 03**
Circulation between the seal chamber and the pump created by the design of the seal chamber. Flush connections plugged.

**Plan 04**
Extensively supplied buffer gas for arrangement 2 unpressurized containment seals (2CW-CS and 2NC-CS). Buffer gas is maintained at a pressure lower than the seal chamber pressure. The buffer gas pressure should not exceed 0.7 bar (10 PSI).

**Plan 05**
A containment seal chamber drain for non-condensing leakage on arrangement 2 unpressurized containment seals (2CW-CS and 2NC-CS). Useful if the pumped fluid does not condense at ambient temperatures.

**Plan 07**
Tapped connections for the purchaser’s use e.g., for future use of buffer gas.

**Plan 09**
Engineered piping plan not defined by other existing plans.

**Between seals**

**Plan 01**
Contains the seal circuit of the containment seal for arrangement 2 unpressurized containment seals (2CW-CS and 2NC-CS). The sealed fluid is recirculated in the containment seal chamber.

**Plan 06**
Circulation between the seal chamber and the pump created by the design of the seal chamber. Flush connections plugged.

**Engineered Seals**

Beyond API specifications, EagleBurgmann offers a comprehensive range of engineered seals tailored to customer’s specification. Please inquire.

EagleBurgmann seal supply systems and components

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<td>Engineered to customer’s specifications</td>
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EagleBurgmann mechanical seals applicable for this configuration

<table>
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<th>Seal type A</th>
<th>Seal type B</th>
<th>Seal type C</th>
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<tbody>
<tr>
<td>Balanced pusher seals</td>
<td>Metal bellows seals with O-Rings</td>
<td>Metal bellows seals with flexible graphite</td>
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</table>

EagleBurgmann is one of the leading international system providers of sealing technology. For more than 20 years we have been actively contributing our expertise to developing and implementing the API 682 standard for the selection and application of seals and supply systems in centrifugal and rotary pumps.

**Solutions for more safety and productivity**

The new 4th edition of API 682 is in line with the latest achievements and current developments. EagleBurgmann offers the widest portfolio of seals and seal supply systems acc. to API 682 4th edition, and consequently has the optimum product for each API-compliant requirement.

Technically mature, practical solutions that provide significantly greater safety and process reliability in refining technology, petrochemical, oil & gas and chemical industries.

**Important note**

All the technical specifications are based on extensive tests and our many years of experience. However, the diversity of possible applications means that they can serve as guide values only.

It should be noted that the external valves of each sealing system cannot be opened at the same time because of their location. Furthermore, the operating range of each specified product depends on the respective shaft diameter, upstream and downstream pressure and other particular parameters.

A guarantee can only be given in the individual case of the actual condition of application as is and these are settled in a special agreement. Where a specific condition of operation is assumed, an agreement consulting with our specialist engineers is necessary.

Subject to change.
**Features**
- API 682 Category 2 und 3, Type A, Arrangement 2 seal
- Dual seal in face-to-back arrangement
- Cartridge unit
- Rotating multiple springs
- Universally applicable both for retrofits or original equipment
- Efficient stock keeping due to standardized components
- Extended selection of materials
- Metal parts also in special materials available
- Designed for vaporizing media
- Operation close to vapor pressure

**Advantages**
- Universally applicable both for retrofits or original equipment
- Efficient stock keeping due to standardized components
- Extended selection of materials available
- Designed for vaporizing media
- Operation close to vapor pressure

**Recommended applications**
- Refining technology
- Petrochemical industry
- Chemical industry
- Oil and gas industry
- Media with gaseous leakage
- API 610/ISO 13709 pumps
- Process pumps

**Operating range (see note on page 3)**
- Shaft diameter: \( d_1 = 20 \ldots 110 \text{ mm (0.79” \ldots 4.33”)}\)
- Pressure: \( p_1 = 20 \text{ bar (290 PSI)} \)
- Temperature: \( t = –40 \text{ °C} \ldots +176 \text{ °C (–40 °F} \ldots +350 °F) \)
- Sliding velocity: \( v_g = 4 \ldots 23 \text{ m/s (13 \ldots 76 ft/s)} \)
- Axial motion: \( \pm 1.0 \text{ mm} \)

**Materials**
- Seal rings: Blister resistant carbon, Silicon carbide SSiC (Q1), RBSiC (Q2)
- Mating rings: Silicon carbide SSiC (Q1), RBSiC (Q2)
- Secondary seals: EPDM (E), NBR (P), FKM (V), FFKM (K)
- Springs: Hastelloy® C-4 (M)* and C-276 (M5)
- Metal parts: CrNiMo steel 316 (G) or equivalent

**Recommended piping plans**
- Process side: 02, 03
- Between seals: 71, 72, 76

**Item**
- 1.1.1, 2.1.1 Seal ring
- 1.1.2, 2.1.2 Driver
- 1.1.3, 2.1.3 Thrust ring
- 1.1.4, 1.3, 2.1.4, 2.3 O-Ring
- 1.1.5, 2.1.5 Spring
- 1.1.6, 12 Set screw
- 1.2, 2.2 Mating ring
- 2.1.6 Driver
- 3 Seal sleeve
- 4 Gland plate
- 6 Inset
- 8 Fixing ring
- 9 Setting device
- 10 Hexagon bolt
- 11 Set ring

**CSV**  Containment seal vent
**CSD**  Containment seal drain
**GBI**  Gas buffer IN
GSS6000 Gas supply system

**Features**
- Safe operation due to incorporated pressure regulator with upstream filter
- System mounted on a plate
- Easy wall or rack mounting

**Advantages**
- Coalescing filter with integrated sight-glass for monitoring liquid level to ensure safe operation even in case of poor gas quality.
- Rigid base frame for easy rack mounting.
- Wide range of flow monitoring to ensure utmost reliability of mechanical seals.

**Recommended applications**
- Refining technology
- Oil and gas industry
- Petrochemical industry
- Chemical industry
- Power plant technology

**Functional description**
Buffered, gas-lubricated mechanical seals may only be used in conjunction with adequately pressurized gas (e.g. from a closed circular nitrogen pipeline provided by the operator). The minimum pressure overlay level ($\Delta p$) is specified for the individual seal types.

Main GSS functions:
- Filtering of the buffer and flushing gas
- Flow monitoring

Typical tasks for the GSS:
- Gas flushing for single seals
- Gas supply for tandem seals

**Notes**
Design, calculation and production acc. to ASME VIII, Div. 1. 3rd party inspection and other certificates on request.

**Installation**

**Product variants**

<table>
<thead>
<tr>
<th>Designation</th>
<th>GSS6000A4M001-B0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure Equipment Directive</td>
<td>ASME</td>
</tr>
<tr>
<td>Allowable pressure</td>
<td>40 bar (580 PSI)</td>
</tr>
<tr>
<td>Allowable temperature</td>
<td>-39 °C to +50 °C ((-4 °F \text{ to } +122 °F))</td>
</tr>
<tr>
<td>Metal parts</td>
<td>316L</td>
</tr>
<tr>
<td>Process connections</td>
<td>Flange 1/2&quot;, 600 lbs</td>
</tr>
</tbody>
</table>

Other versions on request.

1. Design data, permissible working values depend on the actual conditions of service.
SPP6 Leakage detection system

Features

The EagleBurgmann leakage control systems of the SPP6000-A4 range consist of a pressure transmitter which is supplied together with a block and bleed valve as well as an orifice and drain valve.

Advantages

- Compact design
- Easy to integrate in existing piping systems

Recommended applications

- Refining technology
- Oil and gas industry
- Petrochemical industry
- Chemical industry
- Power plant technology

Functional description

The SPP6000-A4 leakage control system is used to detect leakage from single seals. In case of a seal failure, the SPP6000-A4 is required to monitor excessive leakage. If the seal leakage exceeds a certain value, the bushing/orifice will limit the amount of leakage leaving the seal gland. Consequently the pressure will increase on the upstream side of the inner bushing. The pressure is monitored by means of the transmitter which will provide information about seal performance and seal failure.

Product variants

<table>
<thead>
<tr>
<th>Designation</th>
<th>SPP6000-A4</th>
<th>SPP6000-A4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process connections</td>
<td>Flange 3/4&quot;, 600 lbs</td>
<td>Flange 3/4&quot;, 600 lbs</td>
</tr>
<tr>
<td>Pressure range</td>
<td>0 ... 55 bar (0 ... 798 PSI)</td>
<td>0 ... 55 bar (0 ... 798 PSI)</td>
</tr>
<tr>
<td>Calibration range</td>
<td>0 ... 16 bar (0 ... 232 PSI)</td>
<td>0 ... 40 bar (0 ... 580 PSI)</td>
</tr>
<tr>
<td>Allowable temperature</td>
<td>-29 °C ... +120 °C (-20 °F ... +248 °F)</td>
<td>-29 °C ... +120 °C (-20 °F ... +248 °F)</td>
</tr>
<tr>
<td>Wetted parts</td>
<td>316L</td>
<td>316L</td>
</tr>
</tbody>
</table>

Item Description

A From mechanical seal
B To vapor collection system
C Drain

Other versions on request.

1) Design data, permissible working values depend on the actual conditions of service.
Our service modules

The modular seal service offered through TotalSealCare is as individual as are the demands of our customers. The range of services spans complete maintenance of all installed seals, through to stock management, as well as engineering, training and electronic data documentation.

Our TotalSealCare services consist of individual modules from which we assemble individualized service packages.

You can benefit from our many years of experience and expertise in all areas of seal technology, and our major store of practical knowledge.

Consulting & engineering

After establishing and analyzing all of the seals in a system, we work out standardization concepts based on the as-is status. The results we are hoping for are to reduce the number of seal types, sizes and materials used, and to improve the key figures of the system. We advise you relating to codes of practice and statutory regulations, and indicate what actions need to be taken.

Maintenance

In the plant or in the service center, qualified fitters and technicians look after all the aspects of seal maintenance: installation, startup, servicing, conversion, overhaul and repair. We record and document functionally relevant data (fault causes, measures for repair, costs). This means it is possible to assess seal operating times and maintenance costs on a continuous basis, thereby defining measures for extending service intervals.

On-site service

Our on-site service includes the components of an overhaul service, conversions and service container. We deploy a service unit directly on your premises: equipped with the basic suite of seals or a stock of seals discussed with you in advance, and staffed by qualified personnel. On-site, our work includes producing the necessary gaskets, ensuring that the documentation is complete and advising our customers on selecting and installing seals. Our range of services is rounded off by complete conversions (e.g. acc. to TA-Luft).

Inventory management

Based on your individual requirements and the applicable quality regulations, we develop a concept for inventory management of complete seals and spare parts. Furthermore, we optimize stocking on site or in the EagleBurgmann service center. In this way, you can reduce your administration overhead and concentrate on your key operations.

Seminars & training

We offer an extensive range of continuing education programs in seal technology. For service and maintenance personnel, skilled staff and engineers from various branches of industry such as refining, chemicals, power generation, foodstuffs, paper and pharmaceuticals. Our range includes group seminars, individual training and seminars specifically tailored to your requirements. At our premises or at a location of your choice.

Technical analysis & support

A team of seal specialists is responsible for rectifying process malfunctions or “bad actors”. The latest methods such as thermography or data logging are used for diagnosing positions that are critical for the operation of the system and for working out measures to rectify them. In our research and development centers, we perform realistic tests on test rigs or in original pumps. The objective is to extend the MTBF and to increase system serviceability by individual and constructive solutions.

Service agreements

We offer our customers specific agreements that can be combined from the six service modules. Whether for individual seal systems, critical process elements, specific system areas or an extensive seal service for complete plants: the modular structure of our service makes it possible to satisfy individual requirements. With our tried-and-tested monitoring instrument, SEPRO, we can also record all data relevant for the seals for documentation and evaluation purposes.
EagleBurgmann is one of the internationally leading companies for industrial sealing technology. Our products are used everywhere where safety and reliability are important: in the oil and gas industry, refining technology, the petrochemical, chemical and pharmaceutical industries, food processing, power, water, mining, pulp & paper, aerospace and many other spheres. Every day, more than 6,000 employees contribute their ideas, solutions and commitment towards ensuring that customers all over the world can rely on our seals. Our modular TotalSealCare service underlines our strong customer orientation and offers tailor-made services for every application.

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