EagleBurgmann
a member of EKK and FREUDENBERG

RELY ON EXCELLENCE

DGS

Mechanical Seals | Compressor seals | Gas-lubricated seals

Features

- Gas-lubricated
- Uni-directional or bi-directional
- Ready-to-fit cartridge unit
- Single, double, tandem and tandem with intermediate labyrinth available
- Separation seals as labyrinths, carbon rings or CobaSeal are optionally available

Functional description

TA-Luft-konform (Doppeldichtung, Tandemdichtung)

Notes

Compressor seals of the DGS series are based on a common technology and technical features, for instance O-Rings as secondary sealing elements. The different product variants are tailored to particular fields of application. The advantage over other products on the market is hidden in the detail. For example, the torque is transmitted to the rotating seat by friction forces only. And thus no holes and resulting weakening of the material are needed.

Dimensions on request.

Advantages

- Wear-free and contact-free operation
- Self-cleaning 3D gas grooves
- High gas film stiffness
- Secure cupped retainer for seat
- Available in various materials for optimized chemical resistance
- Proven, reliable and economical solution

Operating range

Shaft diameter:
d = 24.5 ... 406 mm (1.14" ... 15.98")
Pressure:
p = 0 ... 160 bar (2,320 PSI)
Design temperature:
t = -46 °C ... +230 °C
(-51 °F ... +446 °F)
Sliding velocitiy:
vg = up to 227 m/s (744 ft/s)

Materials

Seal face: Silicon carbide with DLC coating, Carbon graphite
Seat: Silicon carbide with DLC coating
Secondary seals: FKM
Metal parts: 1.4006 or other stainless steels

Other materials on request.

Available also with EagleBurgmann DiamondFace technology.

Standards and approvals

- NACE
- API 617
- API 692
- TA-Luft-konform (Doppeldichtung, Tandemdichtung)

Recommended applications

- Hydrocarbon gas
- Ammonia
- Nitrogen
- Air
- Oil and gas industry
- Refining technology
- Petrochemical industry
- LNG
- CCUS
- Hydrogen
- Sustainable plastics production
- Alternative fuels production
- Power generation
- Centrifugal compressors
- Turbo expanders
- Blowers

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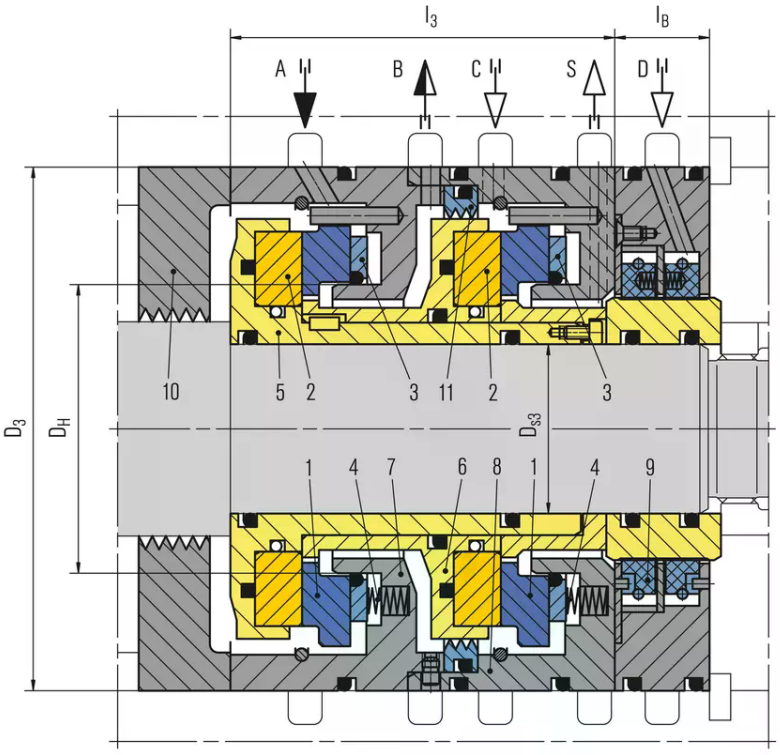
We must be notified of the exact conditions of application before we can provide any guarantee for a specific case. Subject to change.



DGS Tandem seal with intermediate labyrinth

A	Primary seal gas supply
B	Primary vent
C	Secondary gas seal supply
S	Secondary vent
D	Separation gas supply

Item	Description
1	Seal face, stationary
2	Seat, rotating
3	Thrust ring
4	Spring
5	Shaft sleeve and seat retainer
6	Intermediate sleeve
7, 8	Housing (size matched to installation space)
9	Separation seal (CSR)
10	Labyrinth
11	Intermediate labyrinth

Product links separation seals:
EagleBurgmann CSE
EagleBurgmann CSR
EagleBurgmann CobaSeal

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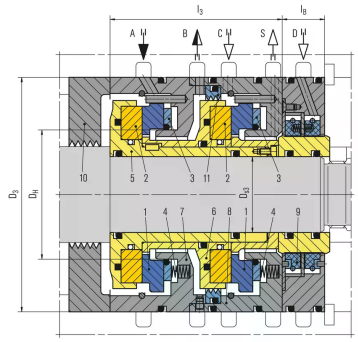
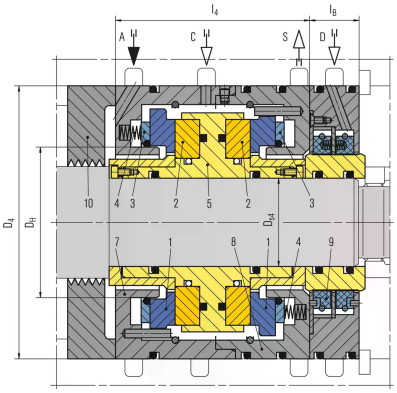
Installation, details, options



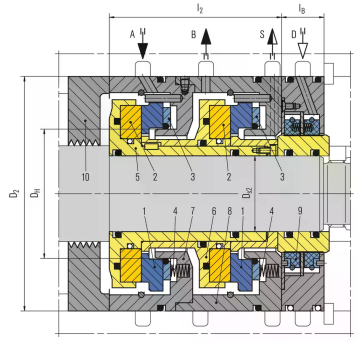
DGS Tandem seal with intermediate labyrinth
Application: where product leakage to the atmosphere is unacceptable, e.g. H2, ethylene or propylene compressors. With this type of seal, the product pressure to be sealed is reduced via the seal on the process side. The entire process gas leakage is routed to the flare via connection "B". The bearing side seal is pressurized with secondary seal gas (nitrogen) via connection "C". The pressure of the secondary seal gas ensures the flow through the labyrinth to the flare/tapping point.

A Primary seal gas supply
B Primary vent
C Secondary gas seal supply
S Secondary vent
D Separation gas supply



DGS Double seal
Application: where product leakage to the atmosphere/flare is unacceptable or for low pressure applications. Seal gas leakage into the product needs to be permitted (seal gas pressure p3 > p1). This is used when a neutral seal gas is available at the appropriate pressure. Typical applications can be found in the chemical and petrochemical industries, e.g. in HC gas compressors. A seal gas, e.g. nitrogen at a pressure higher than the product pressure, is supplied between the seals via connection "C". Part of the seal gas leakage dissipates to the bearing side, while the other part goes to the product.

A Buffer gas supply
C Seal gas supply
S Vent
D Separation gas supply



DGS Tandem seal
Application: where no N2 is available and minimal process gas leakage to the atmosphere is acceptable, e.g. gas pipeline compressors. The seal on the bearing side is intended as a safety seal. The tandem arrangement offers particularly good operational safety. The process side and bearing side seals are able to withstand the full pressure. In normal operation, only the process side seal reduces the full pressure. The space between the process side and bearing side seals is routed to the flare via connection "B". The pressure to be sealed on the bearing side corresponds to the flare pressure. There is thus very little leakage to the bearing side or to the vent. If the primary seal fails, the secondary seal is activated as a back-up and operates at primary seal conditions.

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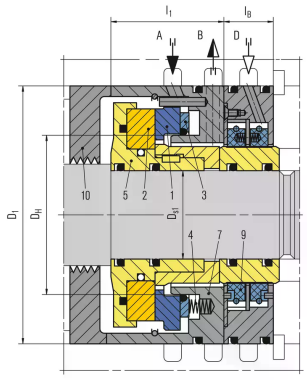

A Primary seal gas supply
B Primary vent
S Secondary vent
D Separation gas supply

DGS Single seal
Application: where leakage of the product into the atmosphere is not harmful, e.g. from air or nitrogen compressors or the axial cavity does not allow a tandem seal (e.g. geared compressors). This version allows process gas leakage to the corresponding flare / vent connection. Primary seal leakage is dissipated with the separation gas to the vent. The gas to be sealed must also be filtered and routed to the seal chamber via connection "A". The resulting flow from the sealed space to the impeller side prevents contaminated / wet gas reaching the Dry Gas Seal on the process gas side, e.g. towards the labyrinth.

A Seal gas supply
B Vent
D Separation gas supply

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Product variants

DGS22
The DGS22 seal series is the new standard for single shaft centrifugal compressors with sealing pressures up to 120 bar (1,740 PSI). The series has an established and robust design with standardized core parts. Furthermore, it is characterized by a short axial length and very low leakage rates. The DGS22 is an advancement of the DGS20 series.

Operating range
Shaft diameter:
d = 102,5 mm ... 360 mm (4.04"... 14.17")
Pressure: p = up to 120 bar (1,740 PSI)
Design temperature:
t = -46 °C ... +230 °C
(-51 °F ... +446 °F)
Sliding velocity:
vg = up to 220 m/s (656 ft/s)

Materials
Seal face: Silicon carbide with DLC coating; optionally available with DiamondFace coating
Seat: Silicon carbide with DLC coating; optionally available with DiamondFace coating
Secondary seals: FKM or other elastomers depending on product gas composition
Metal parts: 1.4006 or other stainless steels

DGS20
Seals of the DGS20 series are the standard for medium pressures up to 120 bar (1,740 PSI). They have proven their suitability in thousands of applications worldwide. The seals are very rugged and are based on a mature design concept.

Operating range
Shaft diameter:
d = 24.5 ... 102,4 mm (0.96"... 4.04")
Pressure: p = 20 ... 120 bar (290 ... 1,740 PSI)
Design temperature:
t = -46 °C ... +230 °C
(-51 °F ... +446 °F)
Sliding velocity:
vg = up to 227 m/s (744 ft/s)

Materials
Seal face: Silicon carbide with DLC coating; optionally available with DiamondFace coating
Seat: Silicon carbide with DLC coating; optionally available with DiamondFace coating
Secondary seals: FKM or other elastomers depending on product gas composition
Metal parts: 1.4006 or other stainless steels

DGS21
Seals of the DGS21 series offer the lowest leakages of the elastomer-based DGS platform. They are therefore suitable for applications with high demands on low leakage. As some parts of the high-pressure PDGS series are used in the DGS21 series, the seal can be applied up to a pressure of 160 bar (2,320 PSI).

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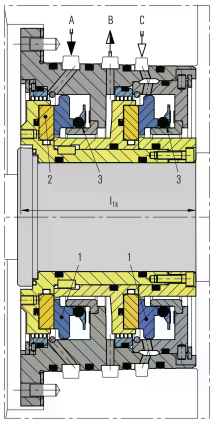
Operating range
Shaft diameter:
d = 51.5 ... 262 mm (2.03"... 10.31")
Pressure:
p = 50 ... 160 bar (725 ... 2,320 PSI)
Design temperature:
t = -46 °C ... +230 °C
(-51 °F ... +446 °F)
Sliding velocity: vg = up to 227 m/s (744 ft/s)

Materials
Seal face: Silicon carbide with DLC coating
Seat: Silicon carbide with DLC coating
Secondary seals: FKM or other elastomers depending on product gas composition
Metal parts: 1.4006 or other stainless steels



DGS25
The DGS25 gas seal series was developed for use in high-speed geared turbo compressors. Due to the special lightweight construction of the core parts and the extremely short working length design, the DGS25 covers the full spectrum of market requirements: Operation at extremely low pressures, robustness to machine vibrations and low impeller overhang. Dangerous stimulation of the core parts by omnipresent machine vibrations are prevented by their low mass or inertia. In addition, the overhang of the impeller from the bearing can be greatly reduced, thus decisively improving rotor dynamics. This enables mechanical run tests without pressure up to 227 m/s seal circumferential speed. No complex pressurization is necessary, open loop tests are child's play. In addition to the use in geared turbo compressors, the DGS25 can also be used in very short installation spaces. This is particularly often the case when compressors are upgraded from oil to gas seals to reduce emissions and operating costs and increase safety and availability.

Operating range
Shaft diameter:
d = 24.5 ... 102.5 mm (0.96"... 4.03")
Pressure:
p = up to 50 bar (... 725 PSI)
Design temperature:
t = -46 °C ... +230 °C
(-51 °F ... +446 °F)
Sliding velocity: vg = up to 227 m/s (744 ft/s)

Project specific special designs possible

Materials
Stationary seal face: Silicon carbide with DLC-coating, DiamondFace-coating optional
Rotating seal face (Seat): Silicon carbide with DLC-coating, DiamondFace-coating optional
Secondary seals: FKM or other elastomers, depending on product gas composition
Metal parts: 1.4006 or other stainless steels

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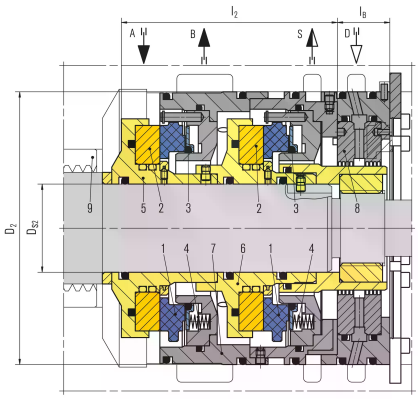

Drawing items
1 Shortened stationary seal face
2 Shortened rotating seal face (seat)
3 Thick dynamic O-ring
l1K Shortened installation space

A Seal gas supply
B Vent
C Separation gas supply

DGS32
Due to the cost effective design, simple components and a hard/soft sliding material combination the DGS32 represents a reliable and economical solution for applications with partial contact of seal faces. This include, for example, slow-roll and turning operation (steam turbine driven compressors) or long and very frequent start/stop cycles.

Operating range
Shaft diameter:
d = 27.4 ... 406 mm (1.08"... 15.98")
Pressure: p = 0 ... 120 bar (0 ... 1,740 PSI)
Design temperature:
t = -46 °C ... +230 °C
(-51 °F ... +446 °F)
Sliding velocity:
vg = 0 ... 140 m/s (0 ... 295 ft/s)

Materials
Seal face: Carbon graphite
Seat: Silicon carbide
Secondary seals: FKM or other elastomers depending on product gas composition
Metal parts: 1.4006 or other stainless steels

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