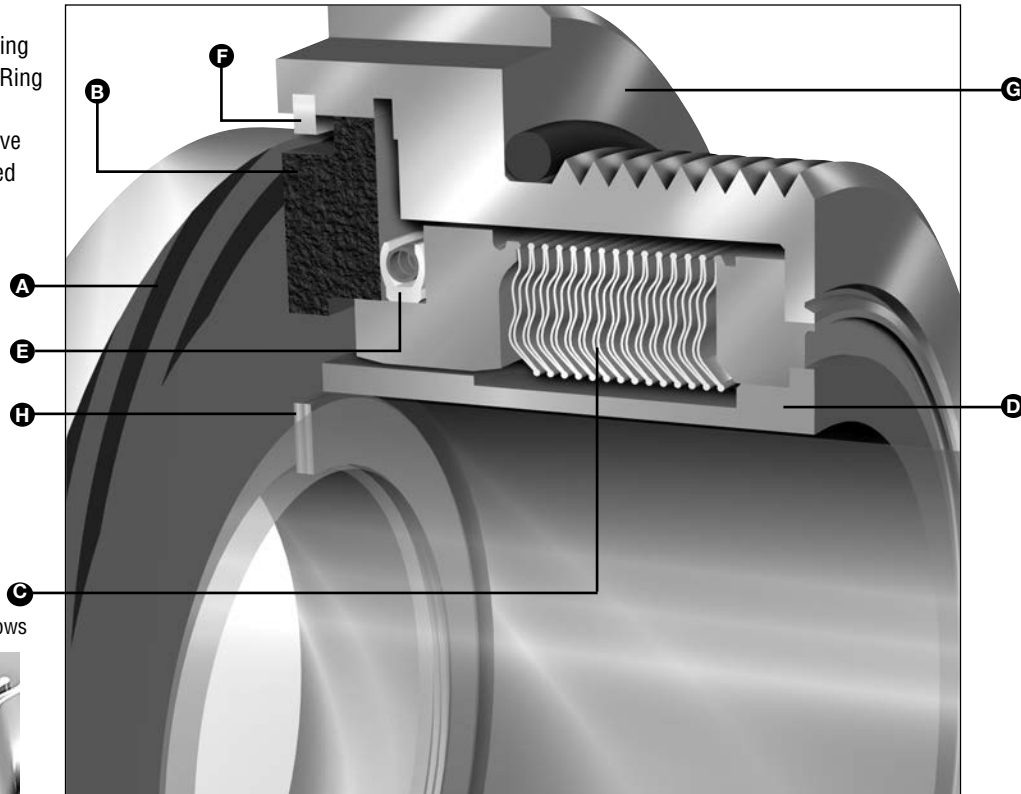


- A – Spiral-Grooved Rotor/Mating Ring
- B – Stator/Primary Ring
- C – Metal Bellows
- D – Anti-Spark Sleeve
- E – Spring-Energized Seal
- F – Retaining Ring
- G – Housing
- H – Shims



Welded Metal Bellows

Product Description

- The Type 285 is a non-contacting welded metal bellows seal for cryogenic applications.
- Thanks to its design and materials of construction, the Type 285 can safely seal the most common industrial liquid gases. It fits the most popular cryogenic pumps: site-based and road tanker pumps.

Performance Capabilities

- Temperature: -196°C/-320°F to Ambient
- Pressure: up to 7 bar g/100 psig
- Speed: up to 10,000 rpm
- End play/axial float allowance: 0.13mm/0.005" F.I.M. max.
- Shaft runout: 0.001mm per mm/0.001" per inch of shaft diameter F.I.M. max.

Design Features/Benefits

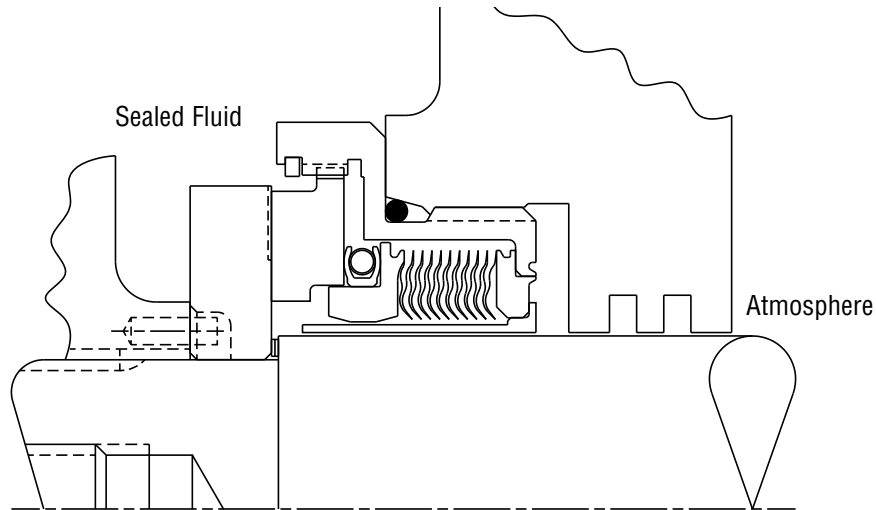
- No face wear under normal operating conditions
- Specially designed stationary bellows
- Floating stator
- Compact design
- Meets liquid oxygen (LOX) safety standards
- Anti-spark sleeve and retaining ring
- Reduced power consumption
- Minimal product loss
- Available as cartridge seal

Applications

Industrial liquid gases, including:

- Oxygen
- Nitrogen
- Argon

Type 285 Typical Arrangement



Materials of Construction

SEAL COMPONENTS	STANDARD MATERIALS
Rotor/Mating Ring	Tungsten Carbide
Stator/Primary Ring	Carbon
Spring-Energized Seal	Virgin PTFE, Cobalt Chrome Alloy Spring
Anti-Spark Sleeve	Tin Bronze
Metal Bellows	Alloy 718 (Alloy 625 End Fittings)
Retaining Ring	Nickel-Copper Alloy
Shims	Copper Alloy
Other Metal Parts	316L Stainless Steel

Seal Welded Metal Bellows

Seal design features

- Optimum 45° tilt angle
- Three-sweep radius
- Nesting ripple plate design
- Light spring loads

Seal bellows benefits

- Uniform plate rigidity and stress distribution
- Enhanced fatigue strength
- Self-cleaning through flexing/slicing action
- Pressure-balanced by design

John Crane Non-contacting Technology

John Crane Design Features

- Uni-directional pattern
- Non-contacting operation
- Superior film stiffness

John Crane Spiral Groove Technology Benefits

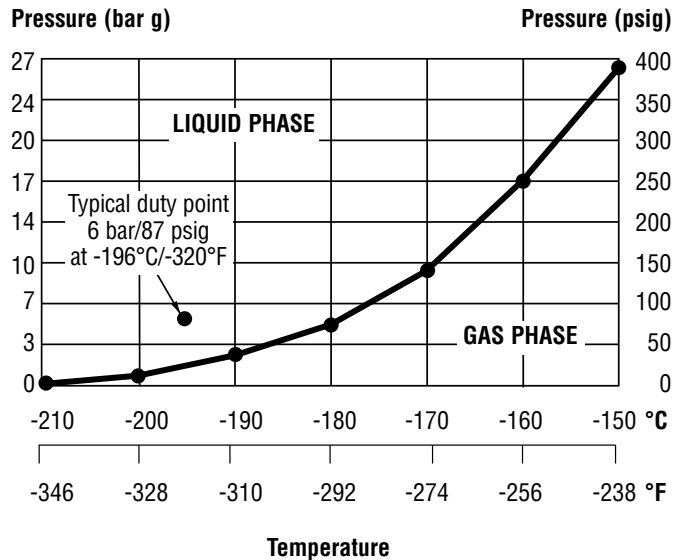
- Eliminates face wear under normal operating conditions
- Increases mean time between planned maintenance (MTBPM)
- Minimizes product loss
- Reduces power consumption
- Eliminates Lubrication Support Systems Required with Labyrinth Seals

Characteristics of Cryogenic Fluids

Boiling Points

At atmospheric pressure	°C	°F
Oxygen	-183	-297
Nitrogen	-196	-320
Argon	-186	-303

Vapor Pressure Curve for Nitrogen





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