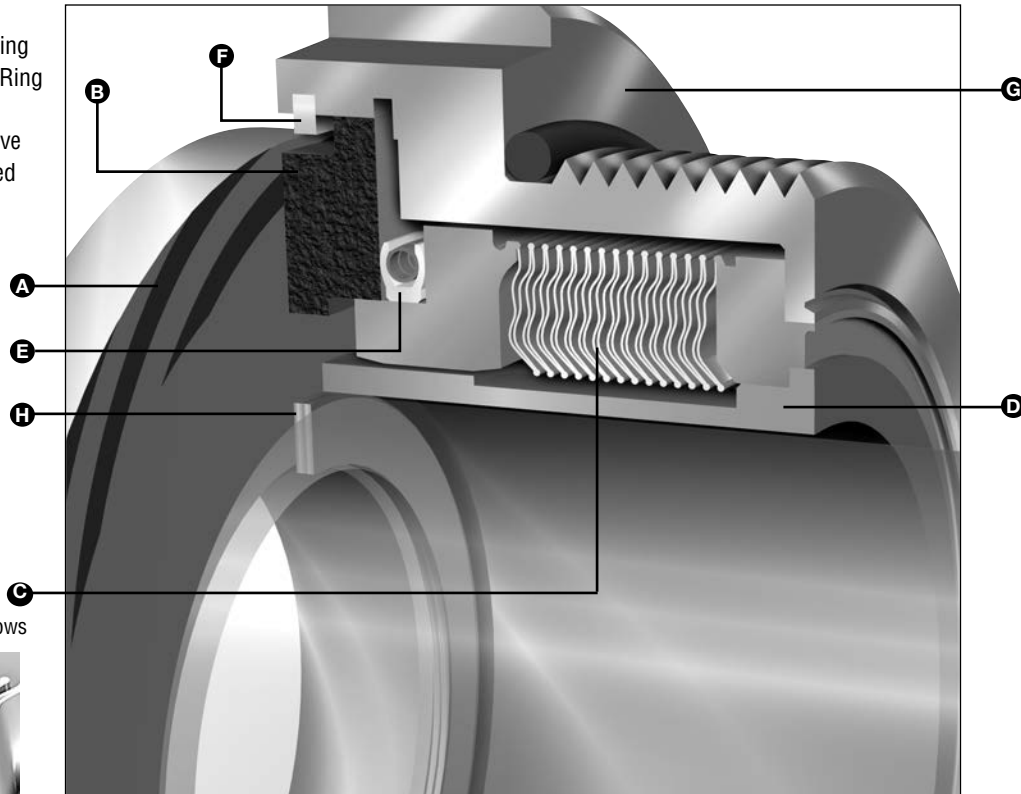


- A – Spiral-Grooved Rotor/Mating Ring
- B – Stator/Primary Ring
- C – Metal Bellows
- D – Anti-Spark Sleeve
- E – Spring-Energized Seal
- F – Retaining Ring
- G – Housing
- H – Shims



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

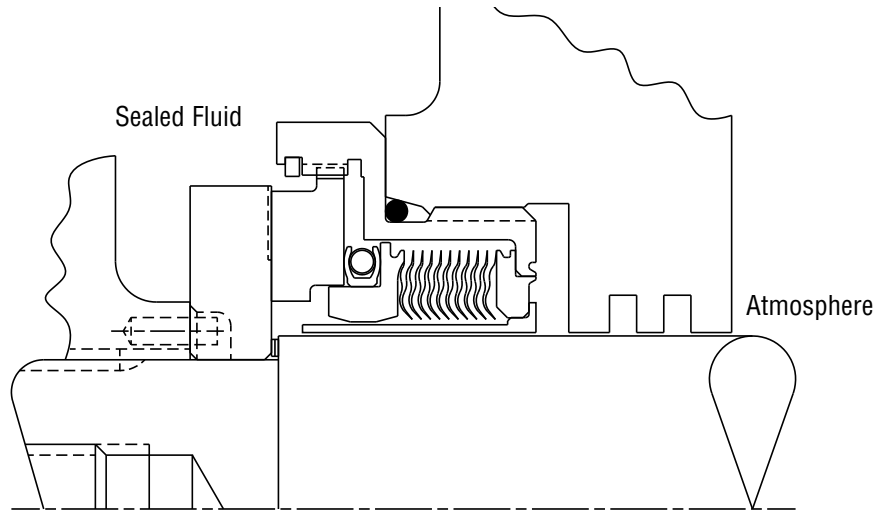
- No face wear under normal operating conditions
- Specially designed stationary bellows
- Floating stator
- Compact design
- Meets liquid oxygen (LOX) safety standards
- Anti-spark sleeve and retaining ring
- Reduced power consumption
- Minimal product loss
- Available as cartridge seal

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

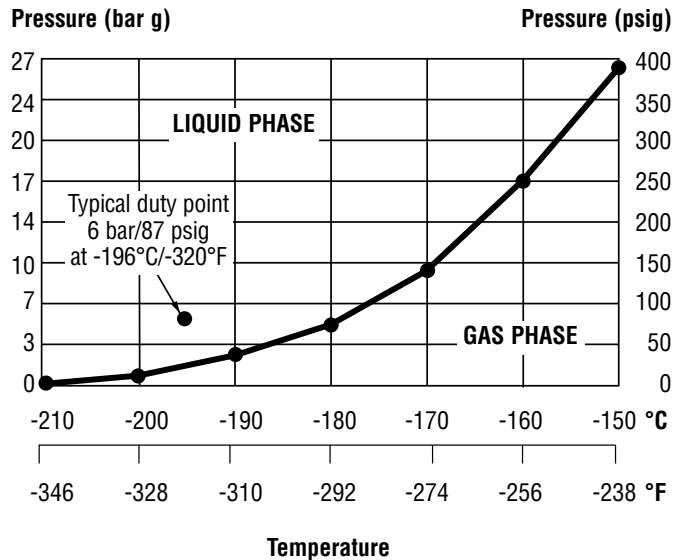
- Eliminates face wear under normal operating conditions
- Increases mean time between planned maintenance (MTBPM)
- Minimizes product loss
- Reduces power consumption
- Eliminates Lubrication Support Systems Required with Labyrinth Seals

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





North America
 United States of America
 Tel: 1-847-967-2400
 Fax: 1-847-967-3915

Europe
 United Kingdom
 Tel: 44-1753-224000
 Fax: 44-1753-224224

Latin America
 Brazil
 Tel: 55-11-3371-2500
 Fax: 55-11-3371-2599

Middle East & Africa
 United Arab Emirates
 Tel: 971-481-27800
 Fax: 971-488-62830

Asia Pacific
 Singapore
 Tel: 65-6518-1800
 Fax: 65-6518-1803

If the products featured will be used in a potentially dangerous and/or hazardous process, your John Crane representative should be consulted prior to their selection and use. In the interest of continuous development, John Crane Companies reserve the right to alter designs and specifications without prior notice. It is dangerous to smoke while handling products made from PTFE. Old and new PTFE products must not be incinerated. ISO 9001 and ISO14001 Certified, details available on request.