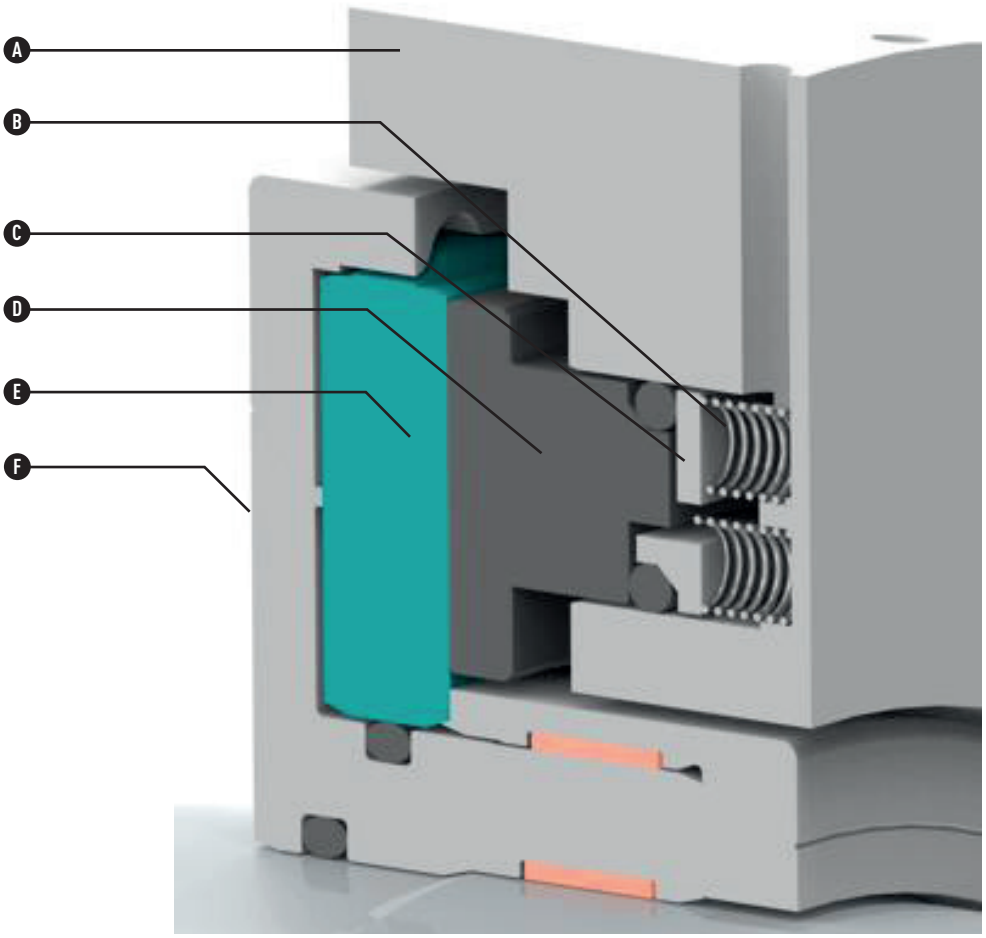
Type 93AX Coaxial Separation Seal

Technical Specification

A – Retainer
B – Springs
C – Discs
D – Primary ring
E – Mating Ring
F – Sleeve



Product Description

Type 93AX coaxial separation seal is a non-contacting coaxial separation seal designed to prevent ingress of bearing oil into the dry gas seal cartridge.

- **Separation gas (normally nitrogen or air) is injected through the stationary face into the sliding surface, forming a high stiffness film.**
- **Creates controlled leakage flows directed towards both inner and outer diameters of the seal.**
- **Optimised materials and design ensures minimal gas consumption and eliminates wear during operation**
- **In the event of separation gas supply failure, the seal will maintain non-contacting operation and effectively prevent oil migration**

Design Features

- Extremely low separation gas consumption
- Consistent consumption in both static and dynamic conditions
- Hydrostatic lift off – insensitive to slow roll operations
- Non-contacting operation under all conditions
- No oil ingress under any circumstances
- Bi-directional design
- Suitable for running with nitrogen separation gas, irrespective of dew point

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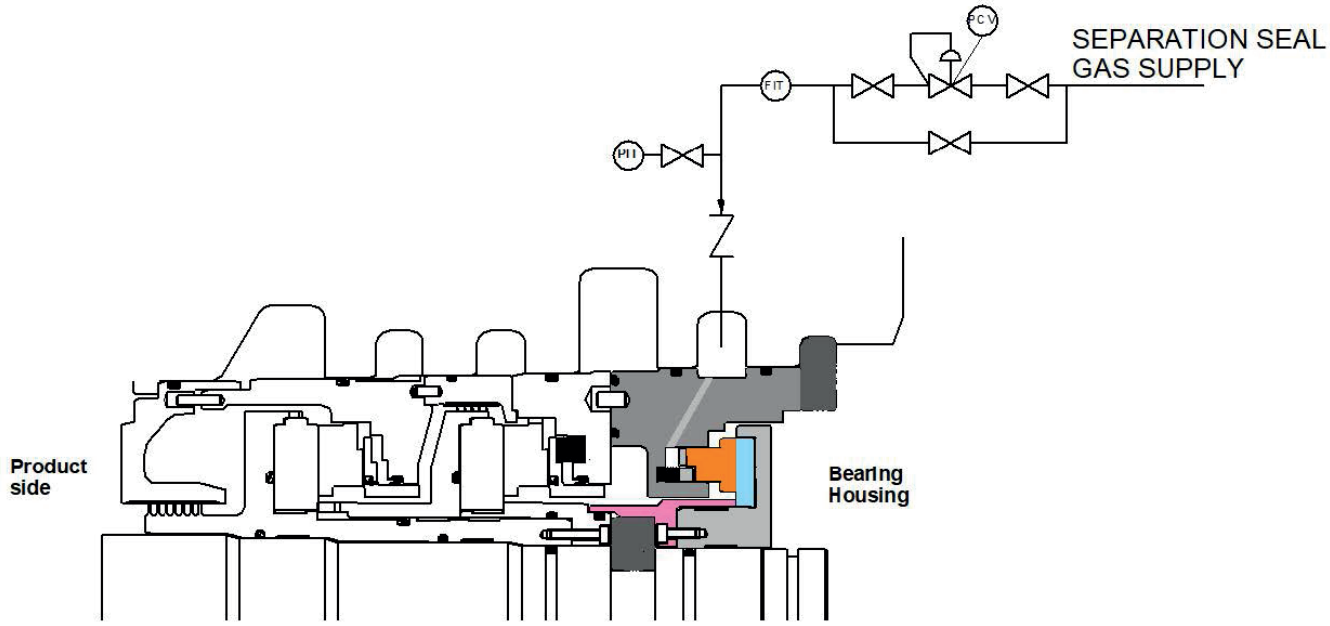
Performance Capabilities			
Size range	100 to 225 mm/4 to 8.85 in		
Temperature	25°C to 180°C/-13°F to 356°F		
Speed	Up to 145 m/s/475 fps (on inner balance diameter)		
Pressure	Design: 2.5 to 8 bar/36 to 116 psi	Separation gas operating differential pressure: 2.5 to 4.5 bar/36 to 65 psi	Maximum sealing integrity: 70 bar/1015 psi
Gases	Nitrogen	Air	
Vibration levels	Compliance with API 617 and ISO7919-3		
Standards	NACE	API 692	

For alternative conditions, consult John Crane Engineering

Typical Arrangement with a Tandem Seal



Reference: API 692 see Part 3, Annex B—Module M1

Prior to replacing an existing separation seal with the Type 93AX coaxial separation seal model, conduct a thorough comparison between the current system configuration and the manufacturer-recommended specifications. The following critical factors must be evaluated:

1. Pressure Regulator Compatibility

Verify that the selected pressure regulator aligns with the operational parameters of the Type 93AX coaxial separation seal. Inadequate regulator specifications may compromise system integrity.

2. Supply Pressure Requirements

If nitrogen injection to the Type 93AX coaxial seal is maintained at **4 bar (g)**, the recommended on-site supply pressure is **≥6 bar (g)**. This margin accounts for orifice pressure drop and guarantees stable performance under dynamic conditions.

3. Bearing Housing Overpressure Risk Assessment

In the event of seal failure, the bearing housing may be subjected to the full nitrogen supply pressure (4 bar).

For alternative scenarios, consult John Crane Engineering.

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Materials of Construction

Seal Component Description	Standard Materials
Primary ring	Carbon
Mating ring	Silicon Carbide
Spring	Elgiloy
Secondary Sealing Elements	Fluoroelastomer
Housing and rotor assembly	410 stainless steel

Alternative materials are available, consult John Crane Engineering.

Performance Recommendations

Separation gas specification

- Filtration: 1 micron (Beta Ratio, $\beta 1 \geq 1000$)

As per API 692 Part 3 Paragraph 7.6.

- Proper consideration must be given as to the possibility of explosive mixtures.

Operating Environment

- Bearing housing should be well drained.
- Bearing housing should not be pressurised.
- Consideration should be given to the secondary vent piping as not to cause an excessive back pressure.
- Oil exiting the bearing cavity directed at the separation seal should be noted at design.

Alternative Options

Type 93AX coaxial separation seal is normally supplied as a single cartridge separation seal as depicted in this data sheet.

Please consult John Crane Engineering for alternative solutions.

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

Europe
United Kingdom
Tel: 44-1753-224000

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

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

Asia Pacific
Singapore
Tel: 65-6518-1800