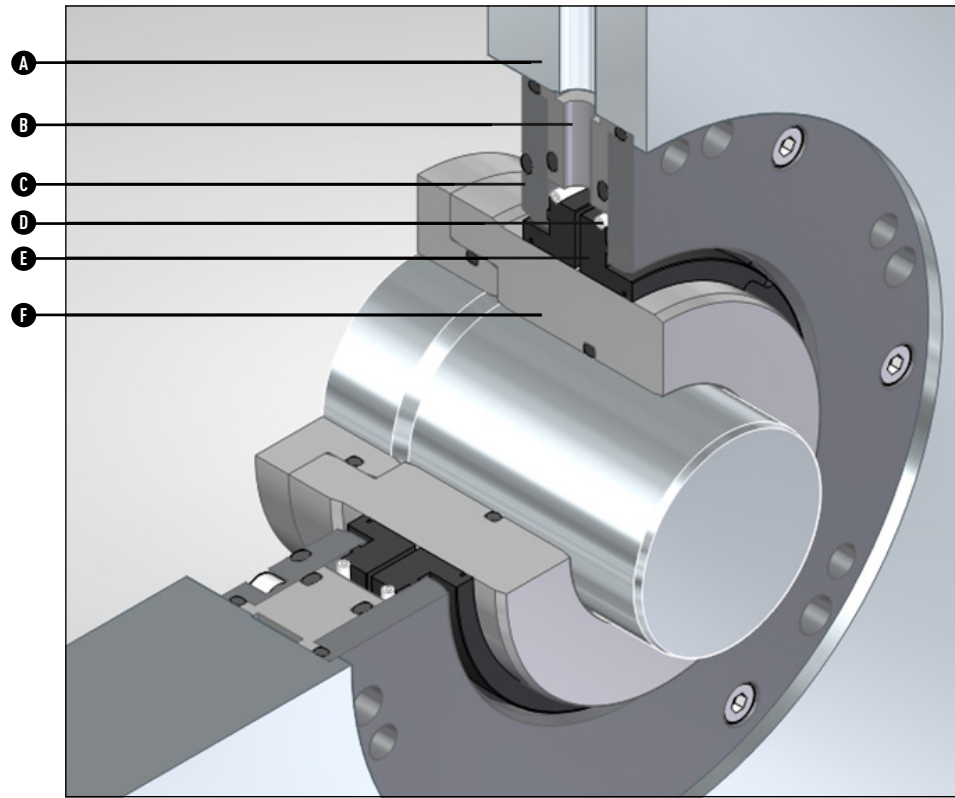


- A – Housing
- B – Retainer
- C – Clamp Plate
- D – Garter Spring
- E – Bushing segment
- F – Sleeve



### Product Description

**Type 93LR is a non-contacting carbon bushing designed to prevent the dry gas seal cartridge from ingress of bearing oil.**

- Separation gas (normally nitrogen or air) is injected between the two segmented bushings effectively creating a pressure barrier between the bearing and dry gas seal cavity.
- Segments are balanced and designed to lift off when separation gas is applied.
- Advanced materials and design ensure minimal wear.

### Design Features

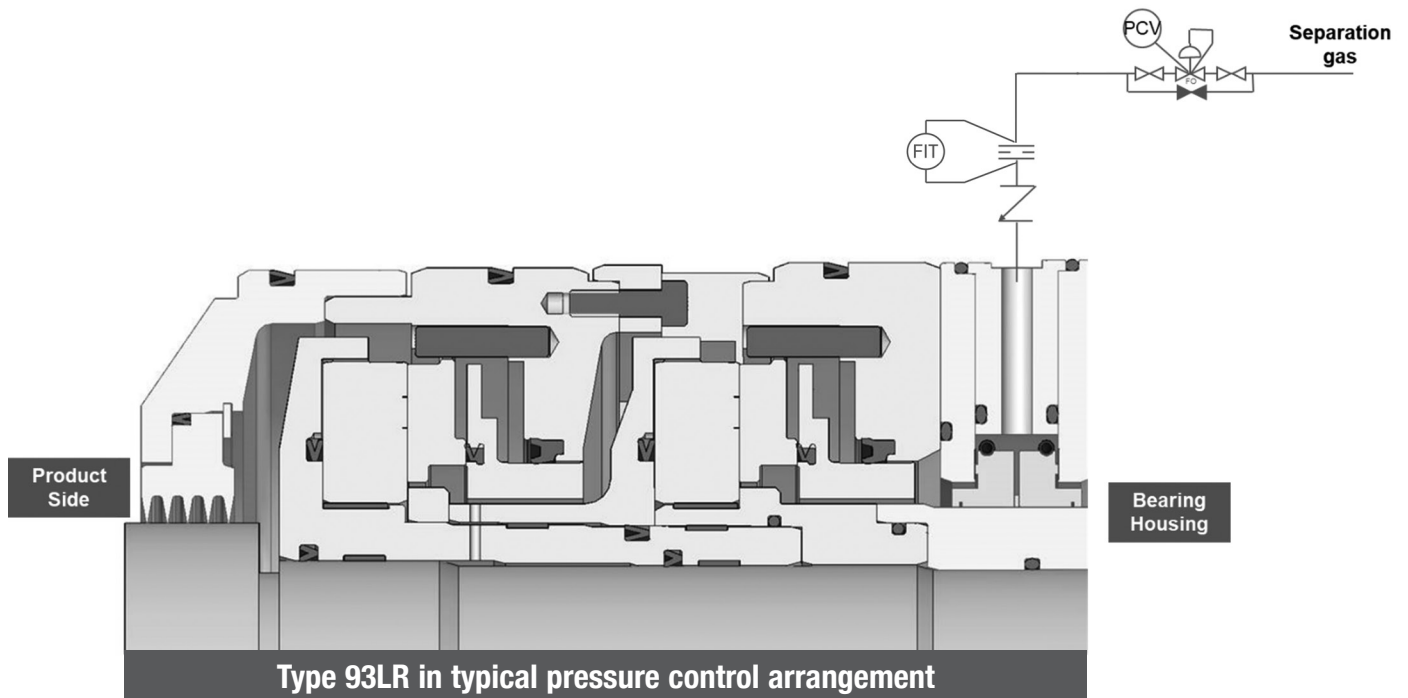
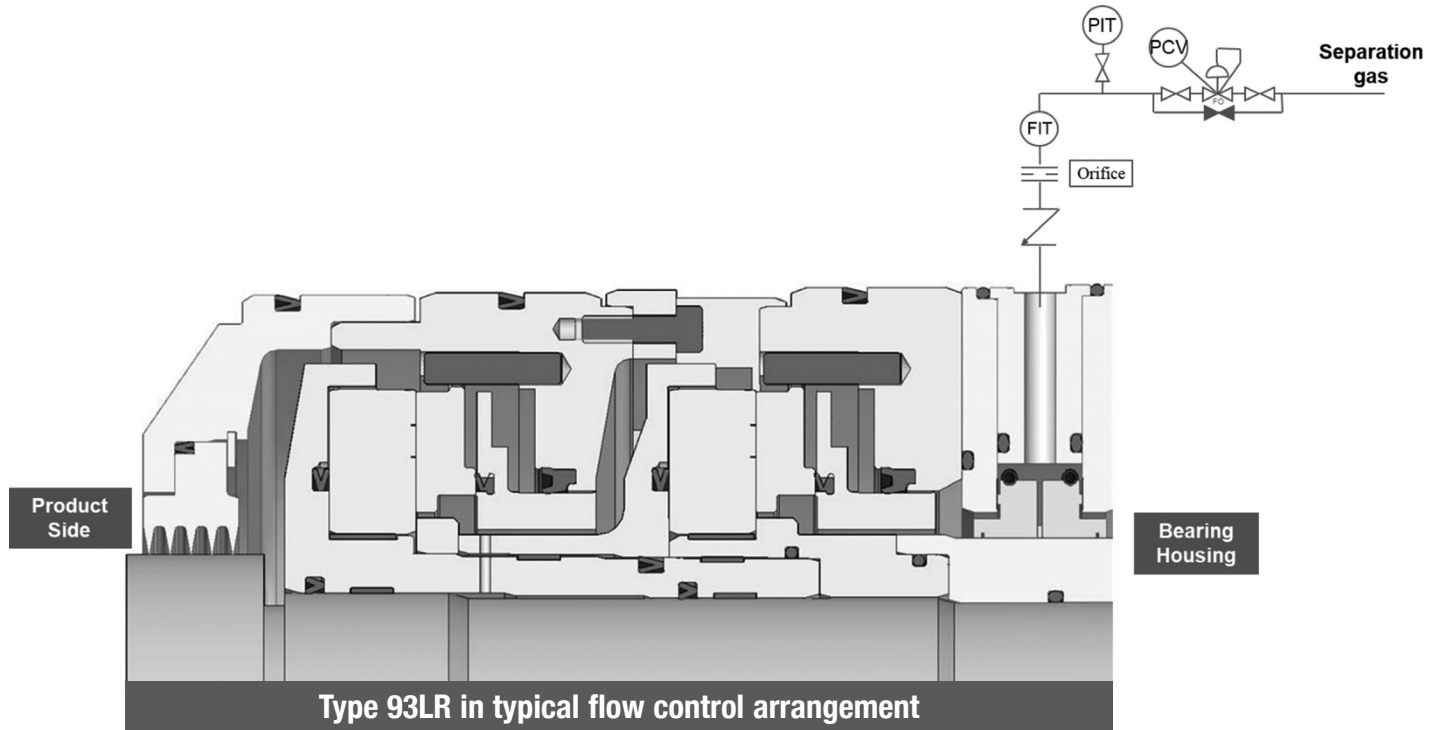
- Low separation gas consumption in both pressure and flow control methodologies.
- Minimised effects of temperature on separation gas consumption.
- Bi-directional design.
- Specially designed segmented joints to improve consumption efficiency.
- Suitable for running with nitrogen separation gas, irrespective of dew point.
- Suitable for slow roll conditions.
- Close fit to shaft/sleeve when supply pressure is off.

### Performance Capabilities

- Size range: 40 to 335 mm / 1.57 to 13.19 in (with sleeve to fit all metric or imperial shaft sizes).
- Operating temperature: -50°C to 200°C / -58°F to 392°F.
- Speed: Up to 130 m/s / 430 fps.
- Pressure: Design: 0.1 to 5 bar / 1.5 to 72.5 psi  
Separation gas operating differential pressure: 0.1 to 0.5 bar / 1.5 to 7.3 psi  
Maximum sealing integrity: 35 bar / 508 psi.
- Gases: Nitrogen, air.
- Vibration levels: Compliance with API 617 and ISO7919-3.

For alternative conditions, consult John Crane Engineering.

### Typical Arrangement with a Tandem Seal



### Materials of Construction

| SEAL COMPONENT DESCRIPTION               | STANDARD MATERIALS  |
|------------------------------------------|---------------------|
| Bushing Segments                         | Carbon              |
| Axial spring                             | Stainless Steel     |
| Radial springs                           | Stainless steel     |
| Housing Assembly<br>Clamp Plate Assembly | 410 Stainless Steel |
| Secondary sealing elements               | Fluoroelastomer     |

Alternative materials are available, consult John Crane Engineering.

### Performance Recommendations

#### Separation gas specification

- Filtration: 10 microns and dry.
- 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 pressurized.
- 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 Applications

Type 93LR is normally supplied as a double separation seal as depicted in this data sheet.

Please consult John Crane Engineering.