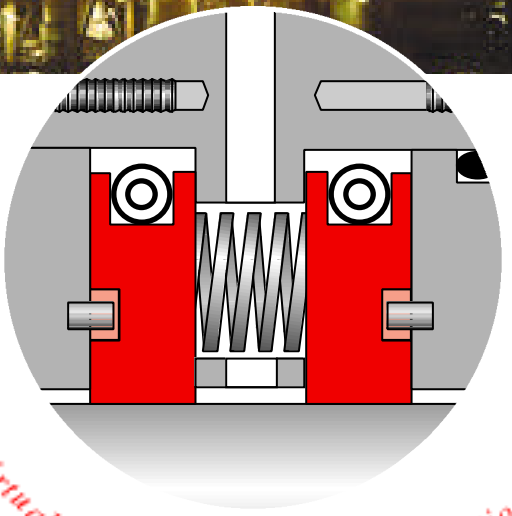
FLOWSERVE®

Flow Solutions Division

CIRCPAC Circumferential Barrier Seal



Offering a full line of fluid sealing technology for virtually every service and application

CIRCPAC - means preventing oil mist fro

What is CIRCPAC

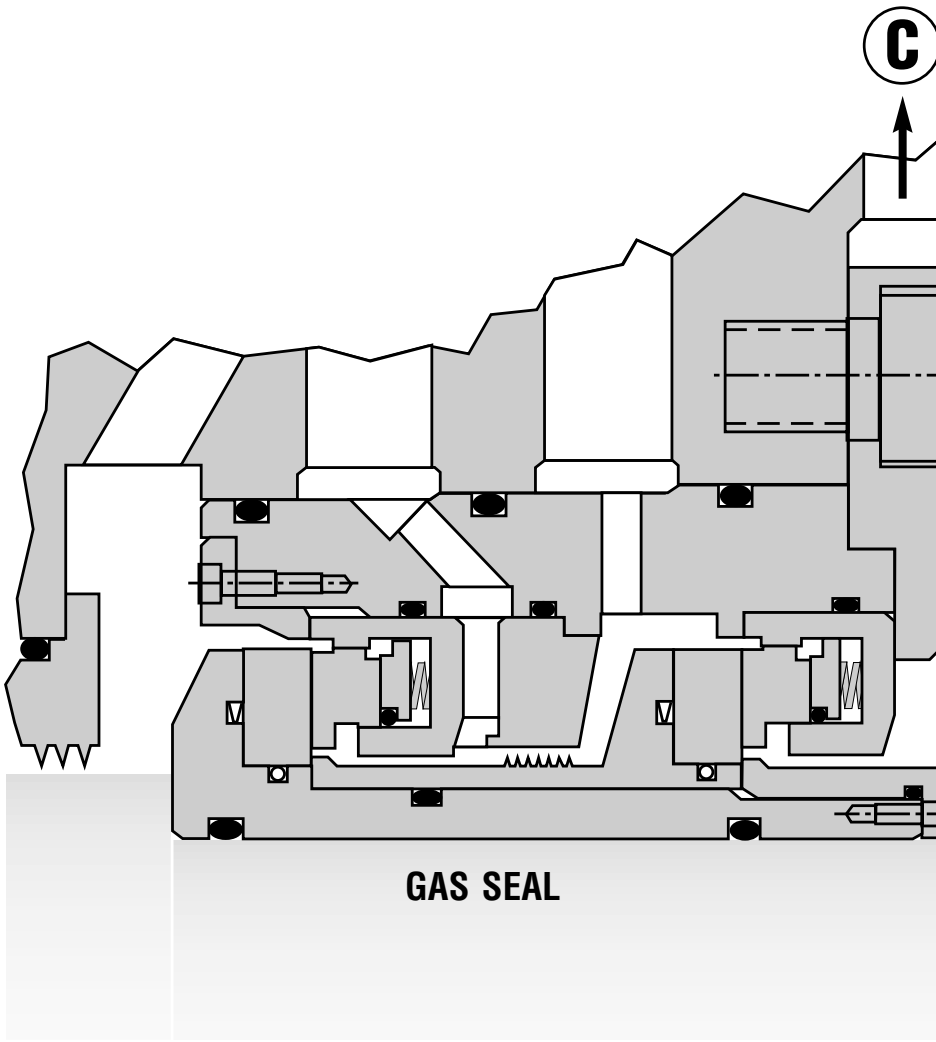
CIRCPAC is a segmented carbon ring barrier seal. The barrier seal is used in high speed centrifugal compressors to keep the bearing oil away from the gas seal. In high speed turbomachinery the oil in the bearing cavity becomes very turbulent. By providing a barrier gas flow to CIRCPAC, the velocity of gas exiting the carbon ring toward the oil creates a barrier to keep the oil from contaminating the compressor gas seal.

Stand alone CIRCPAC

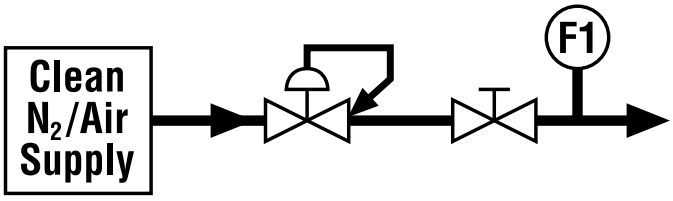
CIRCPAC can also be used as a cost effective 'stand alone' carbon ring seal (see back side). A multiple carbon ring configuration can be utilized in low pressure applications where the very low leakage of a conventional gas seal is not required.

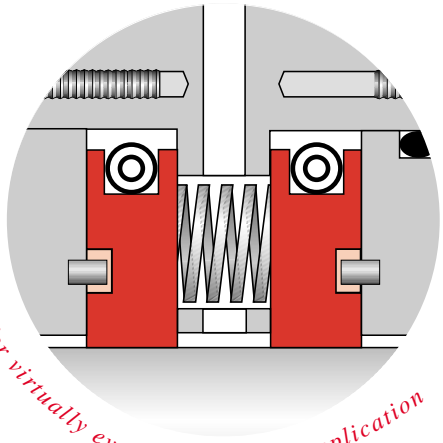
Optimized Reliability

This seal optimizes design life by providing a clearance between the sleeve and the carbon bushings. This clearance eliminates wear and dramatically extends equipment life. This design philosophy complements the non-contacting GASPAC compressor gas seal providing many years of trouble-free performance. Why compromise compressor life with poor barrier seal life? The CIRCPAC has often been reused after seal inspection in many different applications.



Schematic for a recommended barrier gas supply system with flow control





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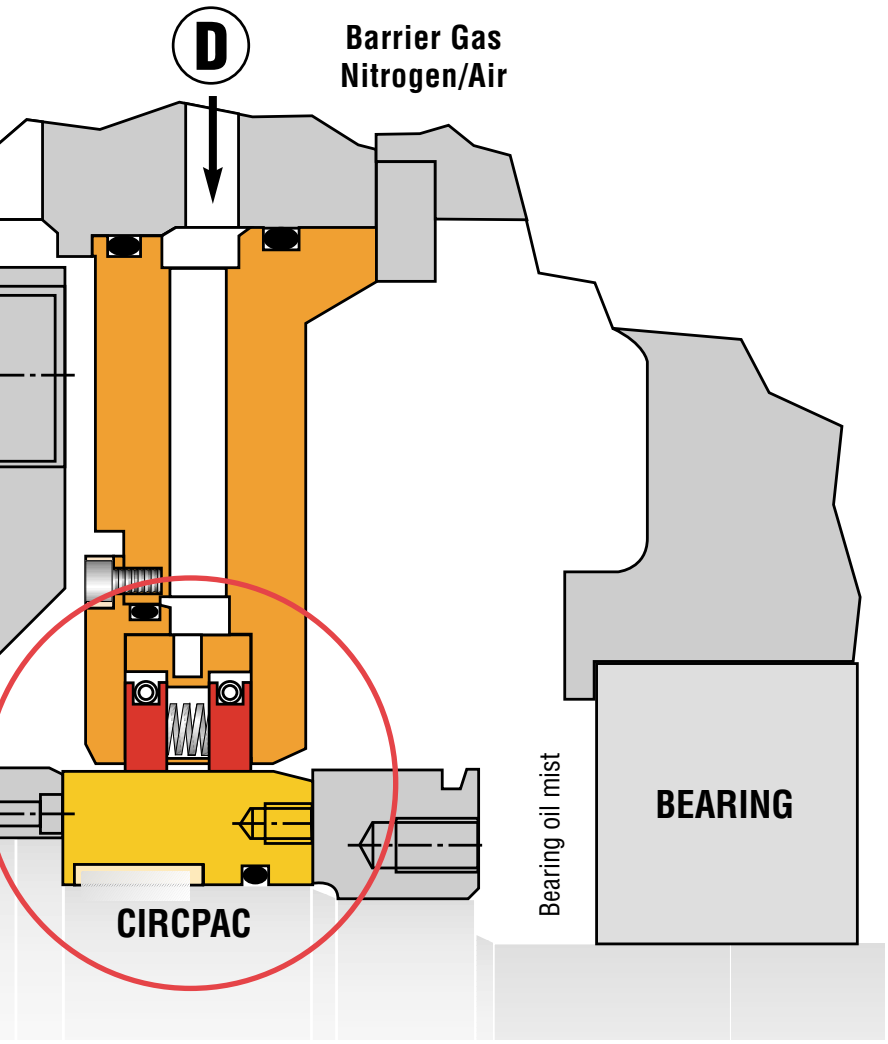
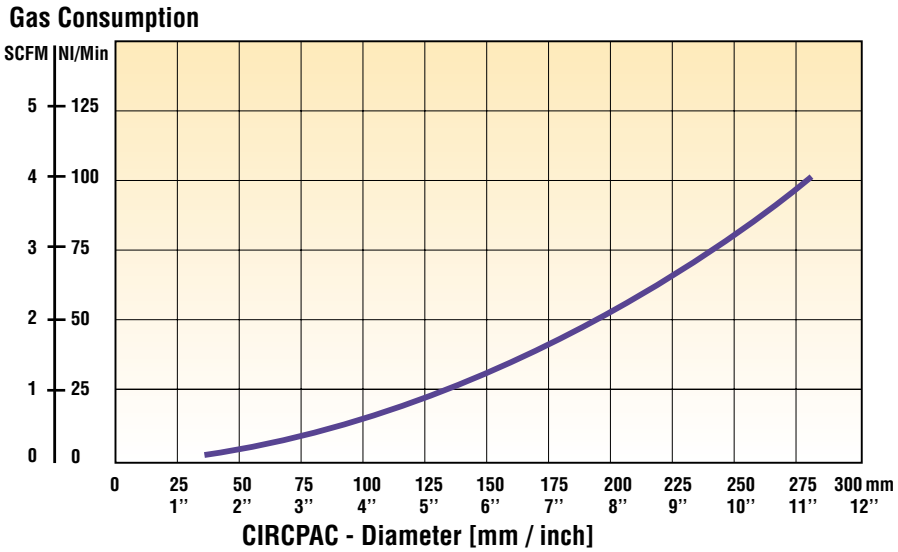
m contaminating your gas seal - saving money



Barrier gas consumption, flow controlled

Example for a required amount of Nitrogen or Air to be supplied to a Circpac with two carbon rings for constant axial gas flow velocity of 5 m/s



Features/Benefits

- protects the gas seal from bearing oil mist
- low heat generation - high operational safety and reliability
- long useful life - low-cost solution
- shorter length than labyrinth sealless space needed at same gas flow
- designed to prevent process gas leakage into the bearing oil
- close tolerance with reduced leakage over labyrinth seals

Special features

- non-contacting design - no wear
- bi-directional operation - reduces the stock
- simple (uncomplicated) design - low-cost solution

CIRCPAC Operation

Flow controlled

CIRCPAC requires a gas flow to provide proper operation. Because the seal is a clearance device, flow can be minimized by using a flow control device. (Using a flow control device will also simplify the maintenance of the flow). To ensure an effective barrier seal, a minimum flow that results in a gas velocity of 5 m/s is recommended. The simplest way to maintain this flow is with a flow control device. Another requirement for reliable operation is making sure that the ambient pressure on the bearing side of CIRCPAC is always equal to or less than the ambient pressure between the gas seal and CIRCPAC.

Pressure controlled

If flow to CIRCPAC is pressure regulated, the barrier seal will work with a very low pressure requirement. Pressures in the 0.3 to 0.5 bar range will work but additional barrier gas will be consumed.

Technical Information and Operating Parameters

Standard operating parameters

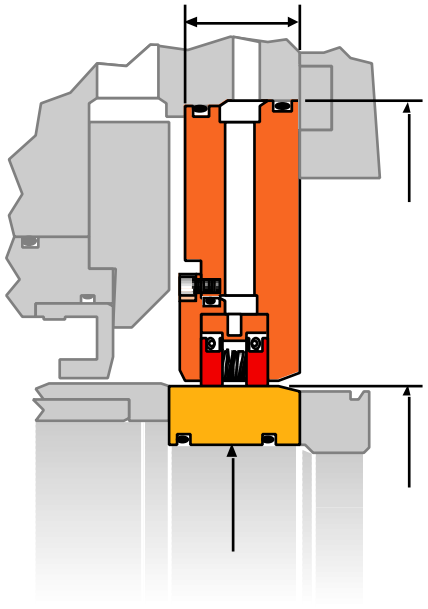
Temperature maximum: 80°C (180°F)
Pressure maximum: 5 bar (70 psi) depending on diameter

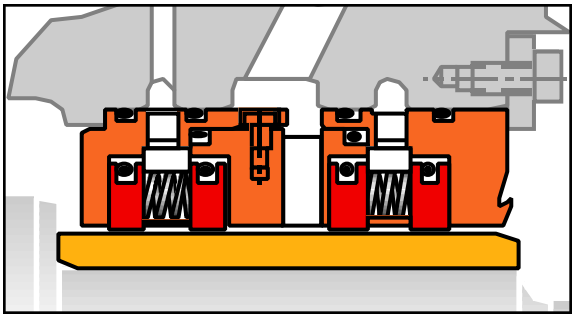
Higher parameters available

Standard materials

Carbon, Stainless Steel, Fluoroelastomers, Perfluoroelastomers

Dimensional Data





Metric (mm)

D1	D0*	D2* min	L1
80	50	150	40
90	60	160	40
100	70	170	40
110	80	180	40
120	90	190	40
130	100	200	40
140	110	210	40
150	120	220	50
160	130	240	50
180	140	260	50
200	160	290	60
230	180	320	60
250	200	340	70
280	230	370	70

Imperial (inch)

D1	D0*	D2* min	L1
3.125	2.000	5.875	1.500
3.500	2.375	6.250	1.500
4.000	2.750	6.750	1.500
4.375	3.150	7.125	1,500
4.750	3.500	7.500	1.500
5.125	4.000	7.875	1.500
5.500	4.375	8.250	1.500
8.875	4.750	8.750	2.000
6.250	5.125	9.500	2.000
7.125	5.500	10.250	2.000
7.875	6.250	11.500	2.375
9.125	7.125	12.500	2.375
9.875	7.875	13.375	2.750
11.000	9.125	14.500	2.750

*CIRCPAC can be adapted to an existing cavity or shaft according to customer specifications.

Also available as
Stand alone CIRCPAC, e.g. as double arrangement

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For more information about the wide array of Flowserve fluid sealing options available to you, contact your Flowserve Product Representative. Also visit the Flowserve Compressor Seal Group at our corporate web site, www.flowserve.com