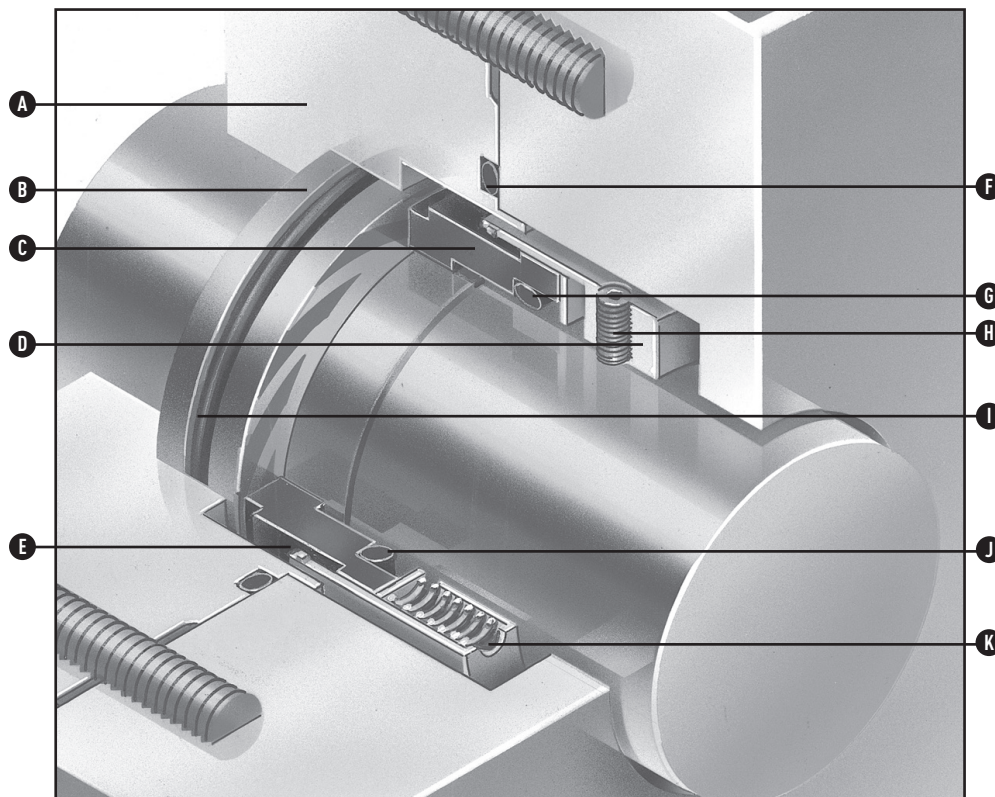


TYPE 28LD

NON-CONTACTING, DRY-RUNNING GAS SEAL

Technical Specification

- A – Gland
- B – Mating Ring
- C – Primary Ring
- D – Retainer
- E – Snap Ring
- F – O-Ring
- G – Disc
- H – Set Screw
- I – O-Ring
- J – O-Ring
- K – Spring



Spiral Groove Technology



Product Description

Dry-running gas sealing for mixers, agitators, reactors, industrial blowers and fans. This patented technology can also be applied to the primary seal on pumps incorporating repellers. Technology that revolutionized sealing for large compressors comes to low-pressure applications in a wide range of industrial equipment. High performance, long seal life and minimal, controlled leakage are assured. Type 28LD seals can be used in single, double or tandem cartridge arrangements. Multiple seals with inert buffers can be applied to toxic gas installations.

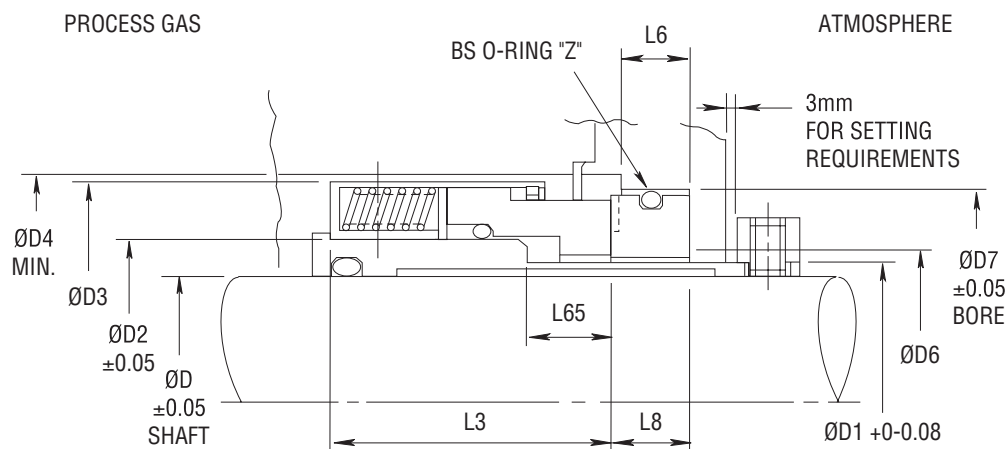
Performance Capabilities

- Temperature: -40°F to 500°F/-40°C to 260°C
 - Pressure: To 15.5 Bar g/225 PSI g
 - Speed: To 5,000 fpm/25 m/s
- For vacuum or high pressure services, consult John Crane.

Design Features

- Patented partial spiral groove pattern on seal pumps gas inward toward the ungrooved portion. This compressed gas cushion separates the faces. Gas loss and heat generation are reduced dramatically; gas contamination by buffering liquids is eliminated.
- No lubrication: Dry-running technology ends need for seal face lubrication, halting frequent maintenance and concern with product contamination of a lubricating liquid.
- Non-contacting operation: The inward pumping action of the spiral grooves gives rise to gas pressure between the faces, and the pressure acts to separate the two faces.
- Unidirectional rotation, operates in one direction of rotation only. Seals are available for clockwise or counterclockwise shaft rotation.
- Recommended as safety backups for liquid seals on unattended pump stations. In a tandem arrangement, the Type 28LD requires no liquid lubrication, but needs to be vented through a check valve, and can be simply monitored by a pressure switch. It lowers starting/running torque and power consumption when replacing a contacting seal.

Type 28LD Typical Single Seal Arrangement/Dimensional Data



Type 28LD Dimensional Data (mm)

Seal Size (mm)	Seal Size Code	Seal Size Code	D	D1	D2	D3	D4	D6	D7	L3	L6	L8	L65	Z
1.000	0254	0190	12.70	19.1	25.40	39.9	43.0	22.0	38.10	33.3	9.5	10.3	12.3	218
1.125	0285	0222	15.87	22.2	28.57	43.1	46.0	25.5	41.27	34.9	9.5	11.1	12.3	220
1.250	0317	0254	19.05	25.4	31.75	47.9	51.0	28.5	47.62	34.9	9.5	11.1	12.7	223
1.375	0349	0285	22.22	28.6	34.92	51.1	54.0	32.0	50.80	35.7	9.5	11.1	12.7	224
1.500	0381	0317	25.40	31.8	38.10	54.2	57.0	35.0	53.97	36.5	9.5	11.1	12.7	225
1.625	0412	0349	28.57	34.9	41.27	60.6	63.5	38.0	57.15	44.5	9.5	11.1	14.3	226
1.750	0444	0381	31.75	38.1	44.45	63.8	67.0	41.5	60.32	44.5	9.5	11.1	14.3	227
1.875	0476	0412	34.92	41.3	47.62	66.9	70.0	44.5	63.50	44.5	11.1	12.7	14.3	228
2.000	0508	0444	38.10	44.5	50.80	70.1	73.0	47.5	66.67	44.5	11.1	12.7	14.3	229
2.125	0539	0476	41.27	47.6	53.97	76.5	79.5	51.0	73.02	52.4	11.1	12.7	15.9	231
2.250	0571	0508	44.45	50.8	57.15	79.6	82.5	54.0	76.20	52.4	11.1	12.7	15.9	232
2.375	0603	0539	47.62	54.0	60.32	82.8	86.0	57.0	79.37	52.4	12.7	14.3	15.9	233
2.500	0635	0571	50.80	57.2	63.50	86.0	89.0	60.5	82.55	52.4	12.7	14.3	15.9	234
2.625	0666	0603	53.97	60.3	66.67	89.2	92.0	63.5	85.72	52.4	12.7	14.3	17.5	235
2.750	0698	0635	57.15	63.5	69.85	92.3	95.5	67.5	88.90	52.4	12.7	14.3	17.5	236
2.875	0730	0666	60.32	66.7	73.02	95.5	98.5	70.5	92.07	52.4	14.3	15.9	17.5	237
3.000	0762	0698	63.50	69.9	76.20	97.1	100.0	74.0	95.25	52.4	14.3	15.9	17.5	238
3.125	0793	0730	66.67	73.0	79.37	100.3	103.5	77.0	98.42	52.4	14.3	15.9	17.5	239
3.250	0825	0762	69.85	76.2	82.55	105.0	108.0	81.0	101.60	52.4	14.3	15.9	17.5	240
3.375	0857	0793	73.02	79.4	85.72	108.2	111.0	84.0	104.78	52.4	16.7	19.8	17.5	241
3.500	0889	0825	76.20	82.6	88.90	111.4	114.5	87.5	107.95	52.4	16.7	19.8	17.5	242
3.625	0920	0857	79.37	85.7	92.07	114.6	117.5	90.5	111.13	52.4	16.7	19.8	17.5	243
3.750	0952	0889	82.55	88.9	95.25	117.7	120.5	93.5	114.30	52.4	16.7	19.8	17.5	244
3.875	0984	0920	85.72	92.1	98.42	120.9	124.0	96.0	117.48	52.4	16.7	19.8	17.5	245
4.000	1016	0952	88.90	95.3	101.60	124.1	127.0	100.0	120.65	52.4	16.7	19.8	17.5	246
4.125	1047	0984	92.07	98.4	104.78	127.3	130.5	103.0	123.83	52.4	16.7	19.8	17.5	247
4.250	1079	1016	95.25	101.6	107.95	133.6	136.5	106.5	127.00	52.4	16.7	19.8	17.5	248
4.375	1111	1047	98.42	104.8	111.13	136.8	140.0	109.5	130.18	52.4	16.7	19.8	17.5	249

NOTE: For larger sizes consult John Crane

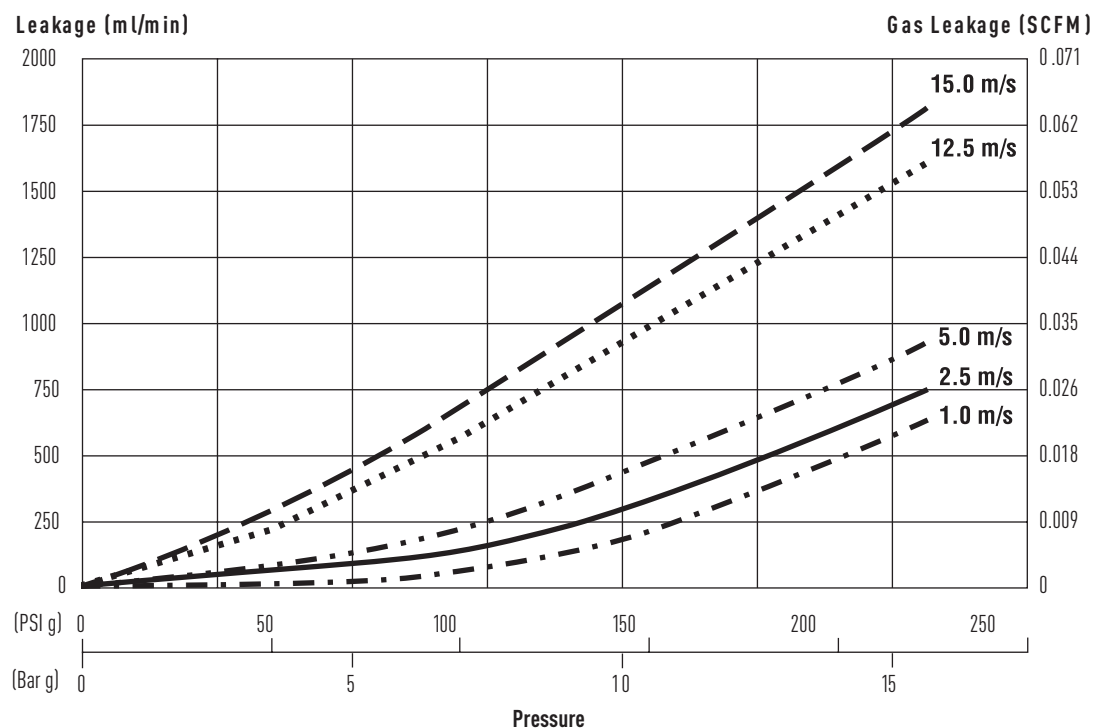


TYPE 28LD

NON-CONTACTING, DRY-RUNNING GAS SEAL

Technical Specification

Type 28LD Leakage Curves



Leakage curves are to be used as a guide only. Actual leakage rates may vary.
Consult John Crane if specific application leakage data is required.

Materials of Construction

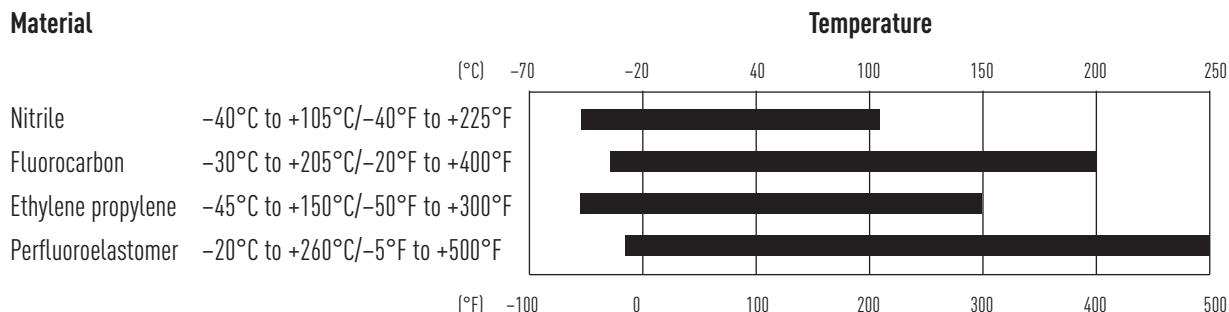
SEAL COMPONENTS	MATERIALS	
Description	Standard	Options
Primary Ring/Face	Antimony Impregnated Carbon (9048)	Extreme Corrosion Carbon (9031)* Carbon (9028) Nickel Chrome Impregnated Carbon (9060) **
Mating Ring/Seat	Tungsten Carbide (9205)	Silicone Carbide (9221)
Spring	Alloy C-276 (0690)	—
Gland Plate	316 Stainless Steel (0550)	Alloy C-276 (0690)
Sleeve		Alloy 20CB3 SS (0560)
Collar		Monel (1800)
Retainer		Titanium (1955)
Disc		Hastelloy B-3 (0680)
O-Ring	Fluorocarbon (9549)	Low Temp Perfluoroelastomer (9579) High Temp Perfluoroelastomer (9580) Ethylene Propylene (9561) Buna-N (9501) Neoprene (9523)

* For Extreme Corrosion Service Only. Barrier pressure must be below 100 PSI g

** For FDA Requirement Only

Elastomer Temperature Limits

Material



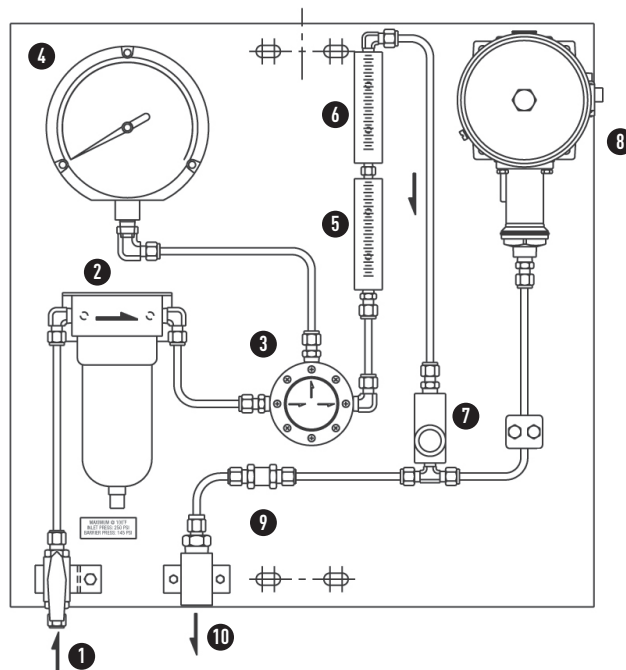
Criteria for Installation

SHAFT/SLEEVE	LIMITS
Surface Finish	32Ra
Ovality/Out of Roundness (Shaft)	0.05 mm/0.002"
End play/ axial float allowance	±0.78 mm/0.03" TIR
Runout/Out of Squareness	0.05 mm/0.002" TIR
Shaft Squareness to Housing	0.13 mm/0.005" TIR

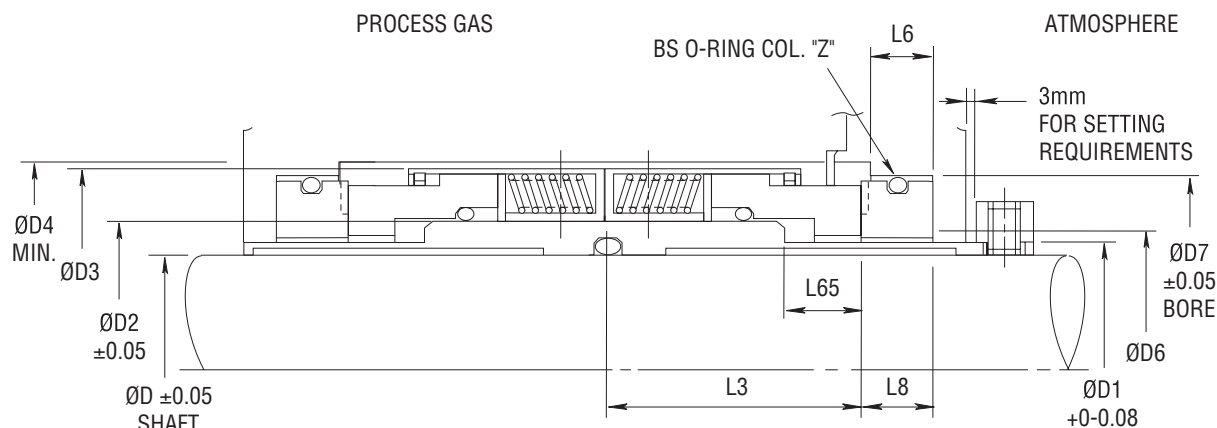
Barrier Supply Systems

- 1 – Ball valve from source
- 2 – Coalescing filter
- 3 – Regulator
- 4 – Pressure indicator
- 5 – Flow meter-normal flow
- 6 – Flow meter-high flow
- 7 – Flow switch (optional)
- 8 – Pressure switch (optional)
- 9 – Check valve
- 10 – Connection to seal

For Barrier Supply System Information, refer to John Crane Lemco.



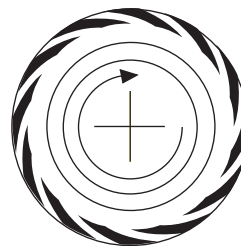
Type 28LD Double Seal Arrangement



Mating Ring Spiral Groove Pattern



Shaft rotation is counterclockwise, facing spiral groove pattern. Seat is stationary.



Shaft rotation is clockwise, facing spiral groove pattern. Seat is stationary.