

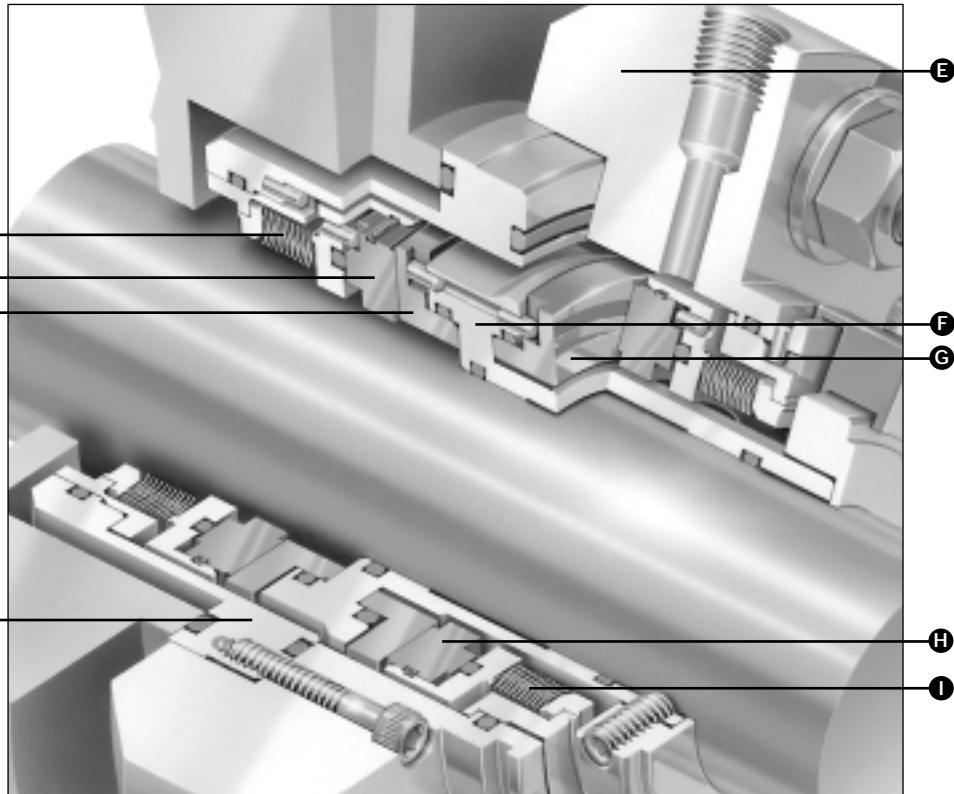


TYPE 2800MB

Sealol® Metal Bellows, Gas-Lubricated,
Non-Contacting, Dual Cartridge Seal

2800MB

- A – Inner Bellows Assembly
- B – Stator/Primary Ring
- C – Rotor/Mating Ring
- D – Inner Gland
- E – Outer Gland
- F – Sleeve
- G – Rotor/Mating Ring
- H – Stator/Primary Ring
- I – Outer Bellows Assembly



Sealol® Welded Metal Bellows



Spiral Groove Technology

Product Description

Type 2800MB is a state-of-the-art welded metal bellows, gas-lubricated, non-contacting dual seal cartridge.

- 0.0 Fugitive Emissions for Maximum Achievable Control Technology (MACT) compliance in new or existing large bore seal chambers.
- For high reliability sealing of volatile fluids in chemical and petrochemical processes.
- Dual seal alternative for positive sealing of high purity fluids without the potential for product contamination.
- Extended Seal Life
- Reduced Power Consumption
- Elimination of Wet Seal Lubrication System

Performance Capabilities

- Temperature:
-40°C to 260°C/-40°F to 500°F
(depending on elastomer used)
- Seal Chamber Pressure:
Up to 18 bar g/270 psig
(Consult Pressure Rating Limit)
- Speed:
1450 rpm minimum
3600 rpm maximum

NOTE: Conditions that vary from those listed above can be sealed using other 2800 series products.

Design Features

- Sealol® Edge-Welded Metal Bellows
- Reverse Pressure Capability*
- Spiral Groove Technology
- Non-Contacting Design
- Simplified Support System
- Static Secondary Seal

*Patent number: 5,954,341

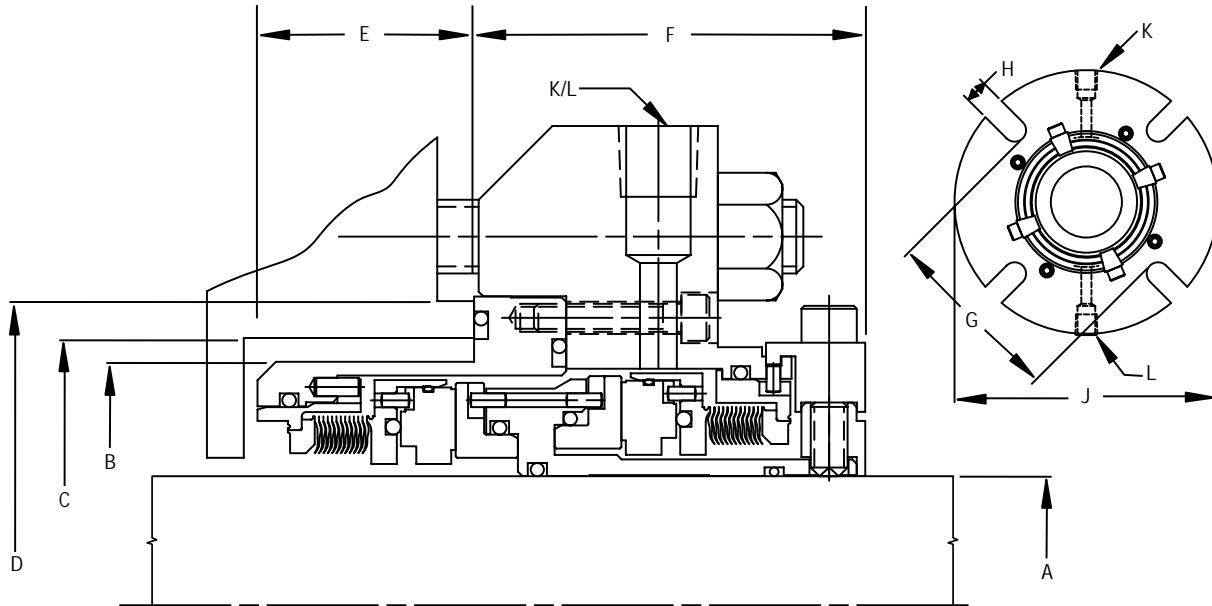
Sealol is a registered trademark of John Crane.



TYPE 2800MB

Sealol® Metal Bellows, Gas-Lubricated,
Non-Contacting, Dual Cartridge Seal

Type 2800MB Typical Arrangement/Dimensional Data



Type 2800MB Dimensional Data (ANSI Sizes, Inches)

Seal Dash Number Inner	Seal Dash Number Outer	A +.000 -.002	B +.000 -.002	C Max.	D Min.	E	F	G	H	J	K (NPT)	L (NPT)
-20	-24	1.125	2.490	2.750	3.125	1.512	2.093	3.32	.44	5.25	1/4-18	1/4-18
		Duriron										
-22	-24	1.125	2.615	2.875	3.250	1.655	1.980	3.32	.44	5.25	1/4-18	1/4-18
		Goulds										
-24	-26	1.375	2.740	2.875	3.375	1.615	1.980	3.56	.44	5.25	1/4-18	1/4-18
		Goulds										
-24	-26	1.375	2.740	2.875	3.375	1.500	2.095	3.56	.44	5.25	1/4-18	1/4-18
		Duriron										
-32	-34	1.750	3.302	3.625	4.125	1.469	2.593	4.44	.56	6.50	1/4-18	1/4-18
-34	-36	1.875	3.370	3.625	4.125	1.330	2.746	4.44	.56	6.00	1/4-18	1/4-18
-38	-40	2.125	3.677	3.875	4.375	1.708	2.521	5.31	.69	7.25	1/4-18	1/4-18
-44	-46	2.500	4.177	4.750	5.250	1.788	2.707	6.06	.69	8.00	1/4-18	1/4-18
-46	-48	2.625	4.365	4.625	5.125	1.550	2.901	5.44	.56	7.00	1/4-18	1/4-18
-48	-50	2.750	4.490	4.750	5.250	2.152	2.532	6.06	.69	8.00	1/4-18	1/4-18

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TYPE 2800MB

Sealol® Metal Bellows, Gas-Lubricated,
Non-Contacting, Dual Cartridge Seal

Type 2800MB Inch-Range Dimensional Data (mm)

Seal Dash Number Inner	Seal Dash Number Outer	A +0.00 -0.05	B +0.00 -0.05	C Max.	D Min.	E	F	G	H	J	K (NPT)	L (NPT)
-20	-24	28.58 Duriron	63.25	69.85	79.38	38.40	53.16	84.33	11.18	133.35	1/4-18	1/4-18
-22	-24	28.58 Goulds	66.42	73.03	82.55	42.04	50.29	84.33	11.18	133.35	1/4-18	1/4-18
-24	-26	34.93 Goulds	69.60	73.03	85.73	41.02	50.29	90.42	11.18	133.35	1/4-18	1/4-18
-24	-26	34.93 Duriron	69.60	73.03	85.73	38.10	53.21	90.42	11.18	133.35	1/4-18	1/4-18
-32	-34	44.45	83.87	92.08	104.78	37.31	65.86	112.78	14.22	165.10	1/4-18	1/4-18
-34	-36	47.63	85.60	92.08	104.78	33.78	69.75	112.78	14.22	152.40	1/4-18	1/4-18
-38	-40	53.98	93.40	98.43	111.13	43.38	64.03	134.87	17.53	184.15	1/4-18	1/4-18
-44	-46	63.50	106.10	120.65	133.35	45.42	68.76	153.92	17.53	203.20	1/4-18	1/4-18
-46	-48	66.68	110.87	117.48	130.18	39.37	73.69	138.18	14.22	177.80	1/4-18	1/4-18
-48	-50	69.85	114.05	120.65	133.35	54.66	64.31	153.92	17.53	203.20	1/4-18	1/4-18

Criteria for Installation

SHAFT/SLEEVE	LIMITS
Surface Finish	1.6µmRa/63Ra or better
Ovality/Out of Roundness (Shaft)	0.05mm/0.002"
End Play/Axial Float Allowance (Maximum Dynamic)	±0.08mm/0.003"
Runout/Out of Squareness	0.051mm/0.002"
Shaft Squareness to Housing	0.08mm/0.003"

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TYPE 2800MB

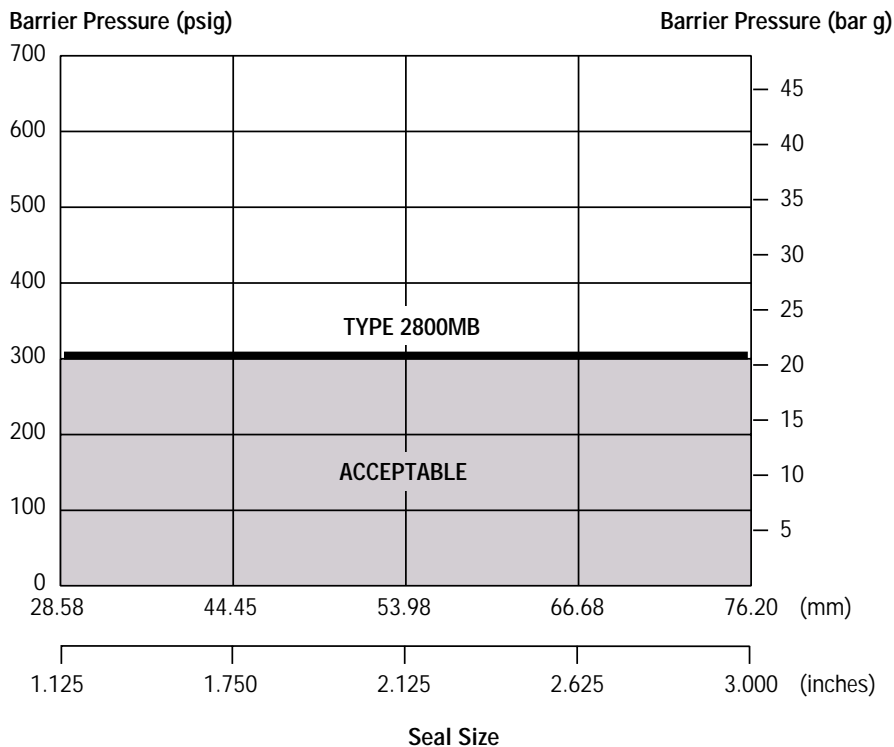
Sealol® Metal Bellows, Gas-Lubricated,
Non-Contacting, Dual Cartridge Seal

Materials of Construction

SEAL COMPONENTS	MATERIALS	
	Standard	Options
Description		
Stator/Primary Ring	Metal-Filled Carbon	Sintered Silicon Carbide (Inboard only)
Rotor/Mating Ring	Sintered Silicon Carbide	—
Sleeve Gland Plate	316 Stainless Steel	Alloy C-276 (UNS N10276)
O-Ring	Fluorocarbon	Ethylene Propylene Perfluoroelastomer
Bellows	Alloy 718 (UNS N07718)	—

Pressure Rating Limits

- For pressures higher than 21 bar g/300 psig, apply the: Type 2800HP (S-2800HP)*
- For standard bore equipment or constrained space, apply the: Type 2800E (S-2800E)
- For high solids applications, apply the: Type 2800EX
- For slow speed applications, apply the: Type 2800SS**



- Differential Barrier Gas Pressure minimum 2 bar/30 psi > seal chamber pressure.

- Minimum Barrier Gas Pressure 4 bar/60 psi recommended.

The Basic Pressure Rating is based on a standard seal installed according to the criteria given in this data sheet at a minimum speed of 1450 rpm, and according to generally accepted industrial practices.

Contact John Crane Engineering for process services outside this range and with more detailed application information in order to obtain the actual dynamic pressure rating.

* Patent number: 5,681,047

** Patent pending

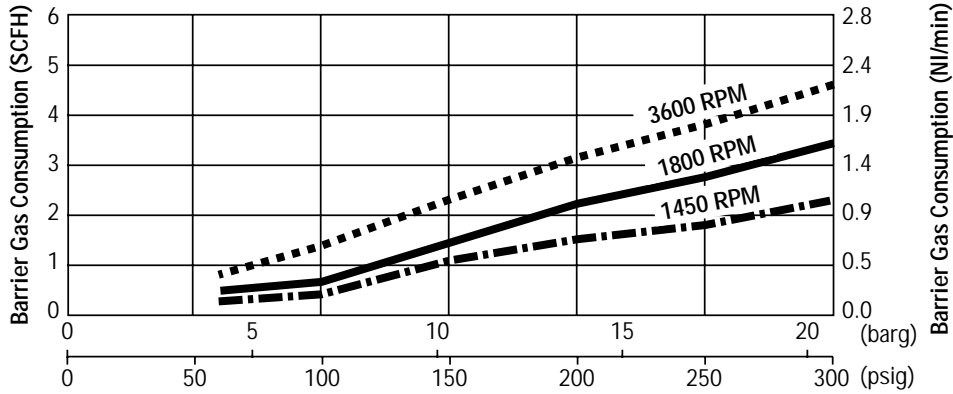


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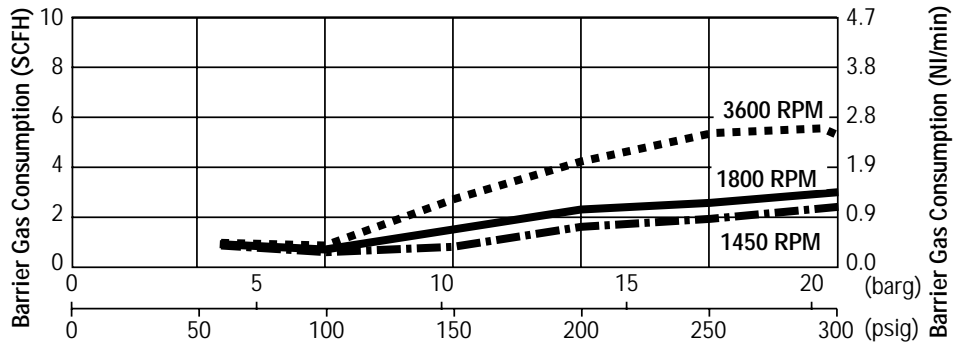
Sealol® Metal Bellows, Gas-Lubricated,
Non-Contacting, Dual Cartridge Seal

Type 2800MB Barrier Gas Consumption

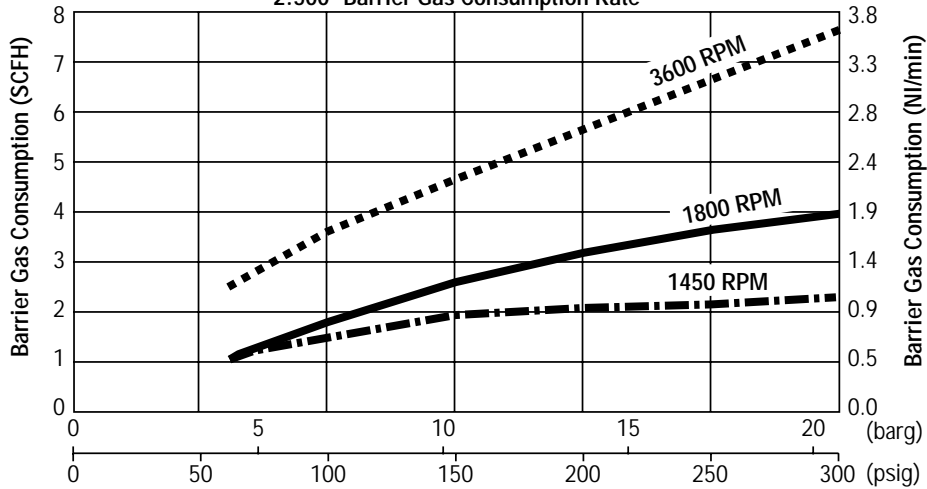
1.375" Barrier Gas Consumption Rate



1.750" Barrier Gas Consumption Rate



2.500" Barrier Gas Consumption Rate



NOTES:

1. Curves are to be used as a **guide only**. Actual consumption rates may vary.
2. Total barrier gas consumption with 30 psi (2 bar) pressure differential across inner seal.
3. Consumption based on ambient temperature.
4. Atmospheric pressure flow indicated by flowmeter at gas inlet is compressed gas and therefore considerably less.
5. Consult John Crane Engineering if specific application gas consumption data is required.



TYPE 2800MB

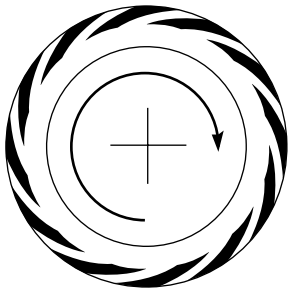
Sealol® Metal Bellows, Gas-Lubricated,
Non-Contacting, Dual Cartridge Seal

Non-Contacting Operation

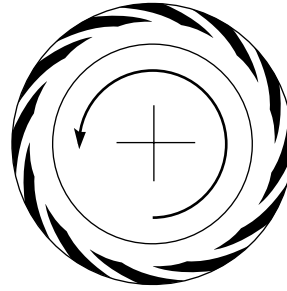
The Type 2800MB uses Spiral Groove technology developed and patented* by John Crane. The Rotors/Mating Rings are micro-machined with a groove pattern. When the pump shaft turns, a band of high pressure barrier gas is created between the seal faces. This lifts the seal faces and creates a non-contacting dynamic seal.

No friction, no heat, no wear, and no cooling requirements provide a sealing technology that is revolutionary. Process fluids that are thermally sensitive can now be reliably sealed. Ultra-pure process fluids are not exposed to seal barrier liquid — only a small amount of barrier gas (user's choice: nitrogen, CO₂, etc.).

Shaft Rotation is Clockwise



Shaft Rotation is Counterclockwise



*Patent numbers: 4,212,475; 5,735,853; 5,713,578; 5,039,113

*Rotor/Mating Ring is rotating

Sealol Welded Metal Bellows

Sealol Bellows Design Features

- Optimum 45° Tilt Angle
- Three-Sweep Radius
- Nesting Ripple Plate Design
- Static Secondary Seal
- Light Spring Loads

Sealol Bellows Benefits

- Uniform Plate Rigidity and Stress Distribution
- Enhanced Fatigue Strength
- Pressure Balanced by Design
- Eliminates Problems Associated with Dynamic O-rings

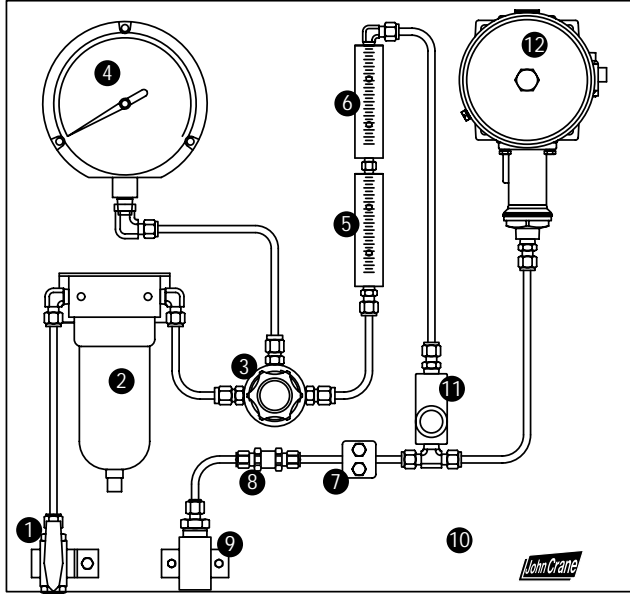


TYPE 2800MB

Sealol® Metal Bellows, Gas-Lubricated, Non-Contacting, Dual Cartridge Seal

Barrier Gas Supply Systems

Available from John Crane in both standard Tamperproof Enclosure and Panel Mounted Designs.



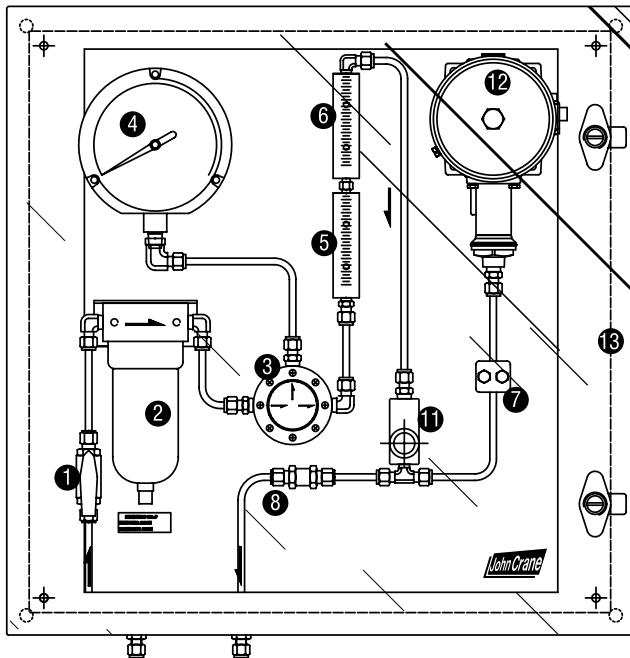
Barrier Supply ↑
Seal Chamber ↓

Standard Components

- 1 Isolating Ball Valve
- 2 Coalescing Filter
- 3 Pressure Regulator
- 4 Pressure Gauge
- 5 Flow Meter (Low Range)
- 6 Flow Meter (High Range)
- 7 Tubing Clamp
- 8 Check Valve
- 9 Coupling (To Seal Piping)
- 10 Back Panel

Options

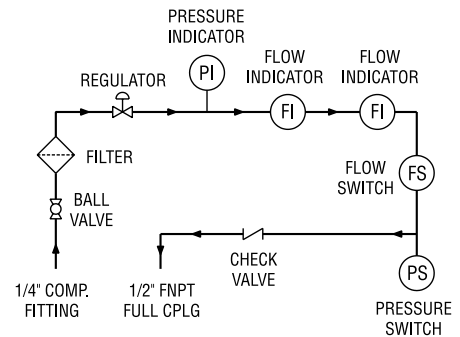
- 11 Flow Switch
- 12 Pressure Switch
- 13 Enclosure
 - Isolast™ and Kalrez® for the Check Valve Seat Material
 - Stand
 - Enclosures are also available in a NEMA 4X Enclosure (as shown)
 - Gas Amplifier/Booster Systems
 - Pressure Tracking Regulators



Further application information is available from John Crane.

Instrumentation requirements which differ from the panels pictured can be accommodated. Contact John Crane Engineering.

GAS FLOW SCHEMATIC



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Isolast is a trademark of Forsheda Palmer Chenard.
Kalrez is a registered trademark of DuPont.



TYPE 2800MB

Sealol® Metal Bellows, Gas-Lubricated,
Non-Contacting, Dual Cartridge Seal



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Morton Grove, Illinois USA

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