

# ROTARY UNIONS

## DESIGN GUIDE



## PRODUCT DISCLAIMER

The function of a rotating union is to separate the working media from the environment. Duff-Norton rotating unions are contacting seal type rotating unions and will allow leakage to some degree, as will all similarly designed and manufactured products. It is important to note the leakage of rotating unions will increase over time as the contacting seals wear. All persons specifying, installing and operating the rotating union must take note of this potential risk. The information in this catalog is supplied upon the condition the persons using Duff-Norton products will make their own determination whether this leakage may be dangerous, unsafe or cause damage of any nature whatsoever.

In no event may Duff-Norton be held responsible for unsafe operating practices of those employing Duff-Norton equipment. Users must be knowledgeable of the rotating union application and the product must never be operated outside the operating parameters given throughout this design guide. Duff-Norton rotary unions must not be used on media not specified in this design guide. If one is unsure about the safety of operating a rotating union in a particular application, it is strongly advised to contact Duff-Norton Engineering for assistance in determining suitability in the application.

### **NOTE**

Duff-Norton has made every effort to ensure that the information contained in the publication is accurate and reliable. Determining the suitability of our products for specific applications is the user's responsibility.




### **WARNING**

The equipment shown in this catalog is intended for industrial use only and should not be used to transfer media that is hazardous or toxic. Duff-Norton does not endorse the use of these products in a manner that is inconsistent with its intended use.

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 Improved with models added

## What is a Rotary Union?

A Rotary Union transfers media (water, steam, air, oil, hydraulic fluid, etc) from a stationary source to rotating machinery, such as a drum or an indexing table.

## How do I choose the best Rotary Union for my process?

Tell us about your process. We need to know:

- 1** Type of fluid or gas to be conveyed (Media).
- 2** Pressure (PSI).
- 3** Temperature (°F).
- 4** Speed (RPM).
- 5** Shaft connection (Thread size and type or flange size).
- 6** Flow rate of media (GPM).
- 7** Flow passage - mono flow or dual flow (if dual flow: stationary or rotating siphon pipe or tube).

## Rotary Union Selection Guide

Media					Pressure (psi)	Temperature (°F)	Speed (RPM)	Thread Size	Rotary Union Series	Catalog Page
Water	Steam	Hot Oil	Air	Hydraulic Fluid						
YES			YES	YES	117	250	3,500	1/8" to 1/4"	300 Series	<b>8</b>
YES			YES	YES	3,625	250	1,500	1/4" to 1"	600 Series	<b>10</b>
YES			YES	YES	435	320	5,000	1/4" to 1"	805 Series	<b>12</b>
YES				YES	200	212	3,500	1/4" to 2"	DWA Series	<b>16</b>
YES	YES	YES	YES		750	300	1,000	1/4" to 2"	5000 Series	<b>18</b>
YES	YES	YES			250	375	700	1/4" to 3"	9000 Series	<b>24</b>
YES		YES	YES		150	375	500	2" to 4" Flange	2000 Series	<b>32</b>
	YES	YES			175	600	600	1/2" to 4"	8000 Series	<b>36</b>
YES	YES	YES			250	600	700	1/4" to 3"	9000G Series	<b>42</b>
YES			YES	YES	5,880	248	3,000	1/8" to 1-1/4"	HPMC / HSMC	<b>46</b>
YES			YES	YES	2,900	250	1,500	1/4" to 1"	1600 Series	<b>50</b>
YES			YES	YES	2,900	250	1,500	1/4" to 1"	1650 Series	<b>52</b>
YES			YES	YES	5,800	392	3,000	1/4" to 1/2"	500 Series	<b>54</b>
YES			YES	YES	725	392	60	1/4" to 3"	1100 Series	<b>60</b>
YES			YES	YES	1,160	392	90	1/4" to 6"	1102 Series	<b>64</b>
YES			YES	YES	5,075	392	Swivel	1/4" to 2"	1200 Series	<b>68</b>
YES			YES		290	392	Swivel	2" to 12"	1300 Series	<b>70</b>
YES			YES	YES	5,075	248	80	1/4" to 3"	1700 Series	<b>72</b>

## APPLICATION ANALYSIS FORM

*Duff-Norton engineers will be pleased to make recommendations for your specific requirements. Complete this form and send it to Duff-Norton Company. There is no obligation for this service.*

Customer: \_\_\_\_\_  
Address: \_\_\_\_\_  
Phone Number: \_\_\_\_\_ Fax Number: \_\_\_\_\_  
Contact: \_\_\_\_\_

1. Size Required: \_\_\_\_\_ or Estimated Flow Required: \_\_\_\_\_

2. Connection (check one):  Threaded Shaft      **If Threaded Shaft, specify**  
 Quick Release      **Type:**  NPT    UNF    BSP    ISO228    Metric  
 Flange Mount      **Direction:**  Left Hand    Right Hand  
**If Flange Mount, then refer to Flange Mountings in catalog and on website**

3. Pressure: \_\_\_\_\_ psi or \_\_\_\_\_ bar      Temperature: \_\_\_\_\_ F° or \_\_\_\_\_ C°  
Does pressure or temperature fluctuate or change during operation? If so, please give maximum, minimum and description. \_\_\_\_\_

4. Speed: \_\_\_\_\_ RPM or \_\_\_\_\_ Feet Per Minute & Diameter of Roll: \_\_\_\_\_  
Does direction alternate?  Yes    No

5. Media to be used:  Water    Steam    Air    Hot Oil    Hydraulic Oil (specify type) \_\_\_\_\_  
 Other (specify) \_\_\_\_\_  
Is medium abrasive, corrosive, flammable, explosive or toxic? If so, please explain: \_\_\_\_\_

6. Check one:  Single Flow    Dual Flow    Multiport  
If Dual Flow, specify siphon size: \_\_\_\_\_ & type:  Stationary\*    Rotating  
\*If Stationary siphon, specify connection type:  
 Threaded†    Tube  
†If Threaded, specify type:  NPT    ISO228  
 Other \_\_\_\_\_  
If Multiport, specify number of ports: \_\_\_\_\_ & Port Size \_\_\_\_\_

7. How many are being used now? \_\_\_\_\_ Potential Usage? \_\_\_\_\_

8. Is competitive Joint being used now? \_\_\_\_\_ Manufacturer: Model or Type: \_\_\_\_\_  
Any problems? Please describe: \_\_\_\_\_

9. Any other information regarding application and requirements of the rotating joint. Send sketches or drawings if available. \_\_\_\_\_

If you have any questions or are in need of assistance please contact our Application Engineers:

**Please send completed sheet to**

Phone: 1(800) 477-5002 • Email: [duffnorton@cmworks.com](mailto:duffnorton@cmworks.com)

P.O. Box 7010 • Charlotte, NC 28241-7010

[www.duffnorton.com](http://www.duffnorton.com)



# APPLICATIONS

## PRINTING

Ink-Feed Rolls, Ink Vibrator Rolls, Chill Rolls, Unwind Stands

## RUBBER

Banbury Mixers, Extrusion Machines, Tubers, Calendars

## STEEL

Run Out Tables, Benders, Sections, Reduction Mills, Un-Coilers, Re-Coilers

## TEXTILES

Breaker Rolls, Slashers, Dry Can Ranges, Singers, Embossers

## TIRES

Banbury Mixers, Warming Mills, Feed Mills, Sizing Mills, Custom Tire Processing Machines

## PLASTICS

Extrusion Machines, Polishing Mills, Re-Winders, Dicers, Scrap Choppers, Scrap Recyclers

## FOOD

Cereal Processing Flaking Mills, Shredders, Puffers, Cookers, Sugar Crystallizers



# 300 SERIES

SMALL ENVELOPE

GENERAL PURPOSE



## Operating Parameters

<b>MEDIA</b>	<b>PRESSURE*</b>
Air, Water	117 psi
<b>TEMPERATURE*</b>	<b>SPEED*</b>
250° F	3,500 RPM
<b>THREADS</b>	<b>MATERIAL</b>
<ul style="list-style-type: none"> <li>■ 1/8" to 1/4" NPT</li> <li>■ Machine Thread</li> <li>■ BSP &amp; BSPP Available</li> </ul>	Nickel Plated Steel

\* See Performance Charts For Details

## Features & Benefits

### High Speed Air & Water Applications

Ideal for high speed air and water applications with space constraints.

### Small Profile

Small envelope dimensions make the 300 Series suitable for use in applications with space constraints.

### Corrosion Resistant

All steel parts are nickel plated steel for corrosion resistance.

## 300 SERIES ROTARY UNIONS

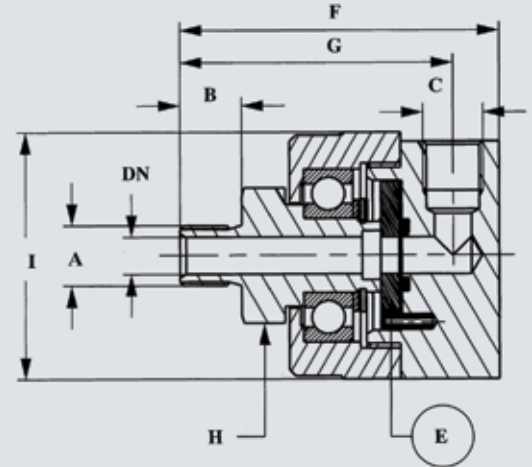
PART NUMBERS	Shaft Thread (A)	Right Hand Thread		Left Hand Thread	
		Part Number	Description	Part Number	Description
		1/8 NPT	770359C	R3S3747KNPT	770358C
	1/4 NPT	770357C	R3S2086KNPT	770356C	L3S2086KNPT
	5/8-18 UNF	770361C	R3S3862KUNF	770360C	L3S3862KUNF

\* E (Seal) 731271C



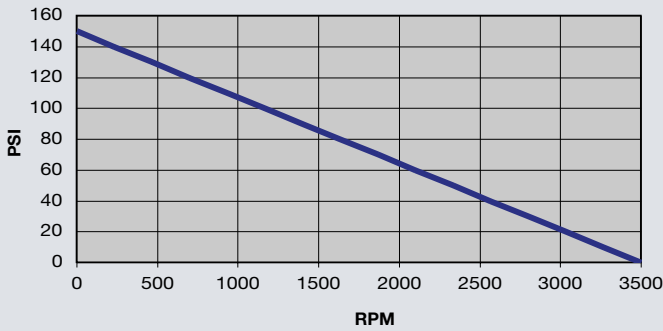
300 SERIES ROTARY UNIONS (in.)								
DIMENSIONS	Shaft Thread (A)	B	Inlet C (NPT)	DN	F	G	H	I
	1/8 NPT	0.4	1/8 (RH)	0.15	2	1.7	.75	1.5
	1/4 NPT	0.5		0.23				
	5/8-18 UNF	0.4		0.23				

\* E (Seal) 731271C

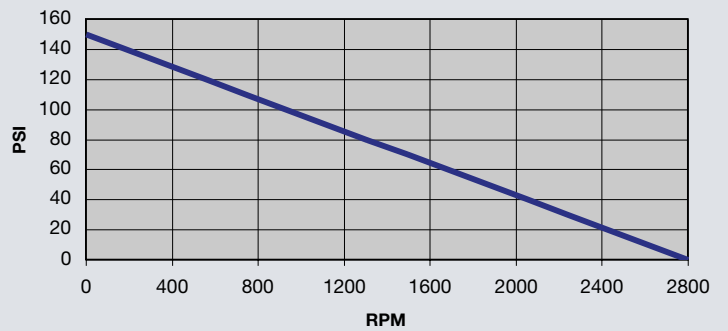


## Performance Charts

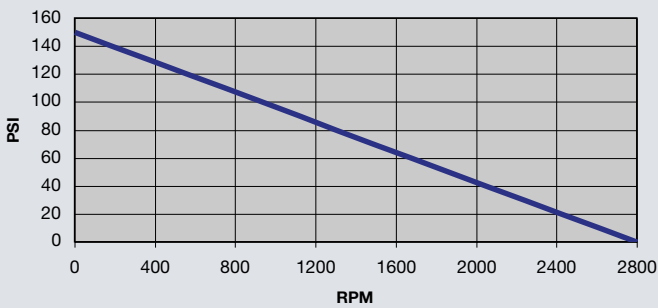
1/8"



1/4"



5/8"



■ Air & Water

# 600 SERIES

GENERAL PURPOSE



## Operating Parameters

<b>MEDIA</b>	Water, Air, Hydraulic Fluid	<b>PRESSURE*</b>	3,625 psi
<b>TEMPERATURE*</b>	250° F	<b>SPEED*</b>	1,500 RPM
<b>THREADS</b>	<ul style="list-style-type: none"> <li>1/4" to 1" NPT or MT</li> <li>BSP &amp; BSPP Available</li> </ul>	<b>MATERIAL</b>	Nickel Treated Carbon Steel Construction. Stainless Steel Models Also Available.
<b>CONFIGURATION OPTIONS</b>	Mono Flow Configurations	* See Performance Charts For Details	

## Features & Benefits

### Two Configurations Offered

Either axial (straight through) nickel plated housing or radial (90 degree) inlet with aluminum housing for maximum flexibility.

### Wide Range Of Sizes

Available in sizes from 1/4" to 1" NPT & MT.

### High Speeds

Suitable for speeds up to 1,500 RPM.

### Bi-Directional Rotation

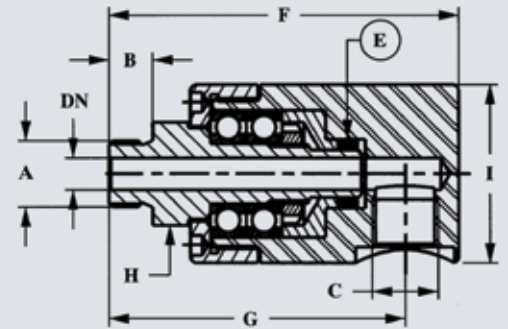
The 600 Series is equipped with a GR seal design that allows bi-directional rotation.

## 600 SERIES ROTARY UNIONS

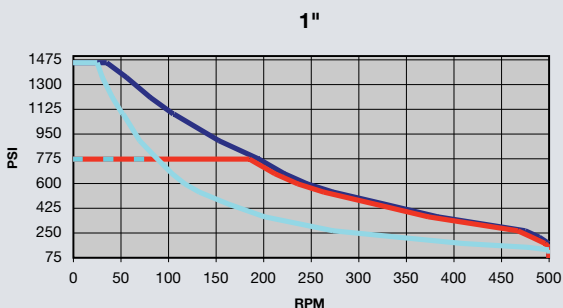
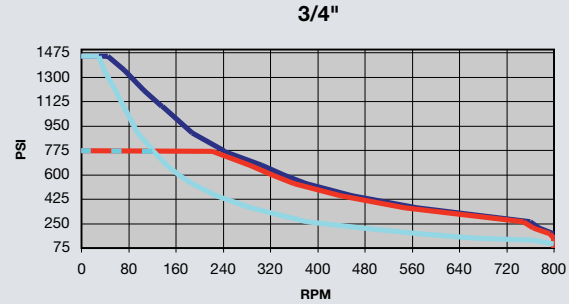
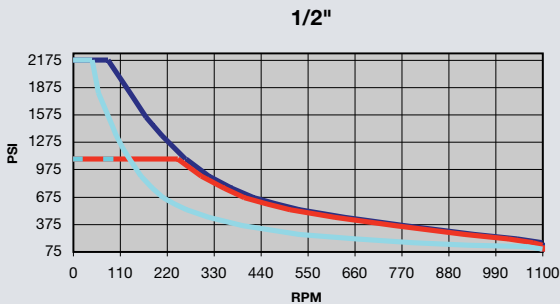
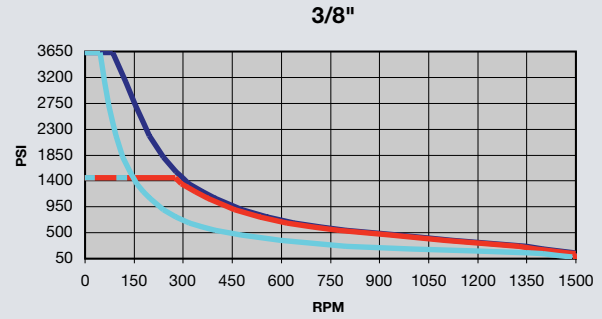
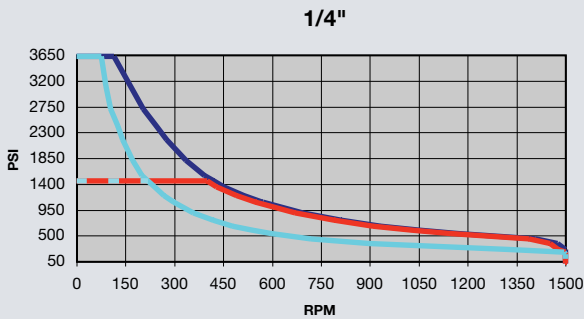
PART NUMBERS	Nominal Pipe Size	Shaft Thread (A)	Axial Inlet				Radial Inlet			
			Right Hand Thread		Left Hand Thread		Right Hand Thread		Left Hand Thread	
			Part Number	Description	Part Number	Description	Part Number	Description	Part Number	Description
1/4	1/4 NPT	<b>770363C</b>	R613JKANPT	<b>770362C</b>	L613JKANPT	<b>770383C</b>	R713JKRNPT	<b>770382C</b>	L713JKRNPT	
	5/8-18 UNF	<b>770365C</b>	R613MKAUNF	<b>770364C</b>	L613MKAUNF	<b>770385C</b>	R713MKRUNF	<b>770384C</b>	L713MKRUNF	
3/8	3/8 NPT	<b>770367C</b>	R617JKANPT	<b>770366C</b>	L617JKANPT	<b>770387C</b>	R717JKRNPT	<b>770386C</b>	L717JKRNPT	
	5/8-18 UNF	<b>770369C</b>	R617MKAUNF	<b>770368C</b>	L617MKAUNF	<b>770389C</b>	R717MKRUNF	<b>770388C</b>	L717MKRUNF	
1/2	1/2 NPT	<b>770371C</b>	R621JKANPT	<b>770370C</b>	L621JKANPT	<b>770391C</b>	R721JKRNPT	<b>770390C</b>	L721JKRNPT	
	3/4-16 UNF	<b>770373C</b>	R621MKAUNF	<b>770372C</b>	L621MKAUNF	<b>770393C</b>	R721MKRUNF	<b>770392C</b>	L721MKRUNF	
3/4	3/4 NPT	<b>770375C</b>	R627JKANPT	<b>770374C</b>	L627JKANPT	<b>770395C</b>	R727JKRNPT	<b>770394C</b>	L727JKRNPT	
	3/4-16 UNF	<b>770377C</b>	R627MKAUNF	<b>770376C</b>	L627MKAUNF	<b>770397C</b>	R727MKRUNF	<b>770396C</b>	L727MKRUNF	
1	1 NPT	<b>770379C</b>	R634JKANPT	<b>770378C</b>	L634JKANPT	<b>770399C</b>	R734JKRNPT	<b>770398C</b>	L734JKRNPT	
	1-1/2-12 UNF	<b>770381C</b>	R634MKAUNF	<b>770380C</b>	L634MKAUNF	<b>770401C</b>	R734MKRUNF	<b>770400C</b>	L734MKRUNF	

600 SERIES AXIAL INLET (in.)									
DIMENSIONS	Nominal Pipe Size	Shaft Thread (A)	B	Inlet Thread C (NPT)	DN	Seal Design (E)	Overall Length (F)	Flats (H)	Outside Diameter (I)
	1/4	1/4 NPT	.47	1/4	.19	466787C	2.79	.74	1.49
		5/8-18 UNF							
	3/8	3/8 NPT	.43	3/8	.31	466789C	3.14	1.06	1.77
		5/8-18 UNF							
	1/2	1/2 NPT	.55	1/2	.51	466792C	4.05	1.25	2.36
		3/4-16 UNF							
	3/4	3/4 NPT	.70	3/4	.70	466794C	5.35	1.37	2.95
		3/4-16 UNF							
	1	1 NPT	.74	1	.86	466792C	6.41	1.73	3.70
1-1/2-12 UNF									

600 SERIES RADIAL INLET (in.)										
DIMENSIONS	Nominal Pipe Size	Shaft Thread (A)	B	Inlet Thread C (NPT)	DN	Seal Design (E)	Overall Length (F)	Radial Design (G)	Flats (H)	Outside Diameter (I)
	1/4	1/4 NPT	.47	1/4	.19	466787C	2.79	2.26	.74	1.49
		5/8-18 UNF								
	3/8	3/8 NPT	.43	3/8	.31	466789C	3.14	2.93	1.06	1.77
		5/8-18 UNF								
	1/2	1/2 NPT	.55	1/2	.51	466792C	4.05	3.48	1.25	2.36
		3/4-16 UNF								
	3/4	3/4 NPT	.70	3/4	.70	466794C	5.35	4.56	1.37	2.95
		3/4-16 UNF								
	1	1 NPT	.74	1	.86	466792C	6.41	5.35	1.73	3.70
1-1/2-12 UNF										



## Performance Charts



Performance charts are for oil, grease or similar lubricating media. For media such as water or air, reduce the maximum recommended speed as follows:

For water, multiply speed by 0.67  
For air, multiply speed by 0.33

Maximum recommended speeds are found on the horizontal axis.

- Steel Axial Connection
- Steel Radial Connection
- Stainless Steel
- Stainless Steel Radial Connection

# 805 SERIES

GENERAL PURPOSE



## Operating Parameters

### MEDIA

Air, Hydraulic Fluid, Water,  
Non-Toxic Gasses, Oil

### PRESSURE\*

435 psi  
(725 psi with seal option E2)

### TEMPERATURE\*

320° F

### SPEED\*

5,000 RPM

### THREADS

- 1/4" to 1" NPT
- MT & Metric
- BSP & BSPP Available

### MATERIAL

Aluminum Housing With A  
Stainless Steel Shaft. Also  
Available In All Stainless Steel  
Construction.

### CONFIGURATION OPTIONS

Mono Flow and Dual Flow  
Configurations Available

\* See Performance Charts  
For Details

## Features & Benefits

### Flexible

Suitable for a wide range of applications.

### Mono Flow Models

Offered in sizes 1/4" to 1".

### Dual Flow Models

Offered in sizes 1/2" to 1".

### Seal Options

Two seal options are offered:

#### ■ Seal Option E1 (Standard)

The carbon graphite seal ring against  
ceramic face ring design can be used  
at pressures up to 435 psi.

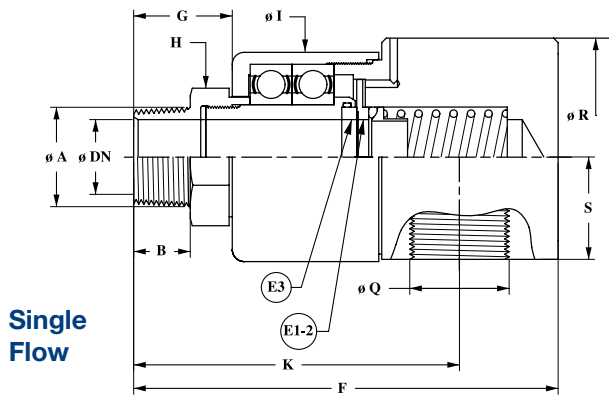
#### ■ Seal Option E2 (Optional)

The stainless steel seal ring against  
ceramic face ring design can be used  
at pressures up to 725 psi.

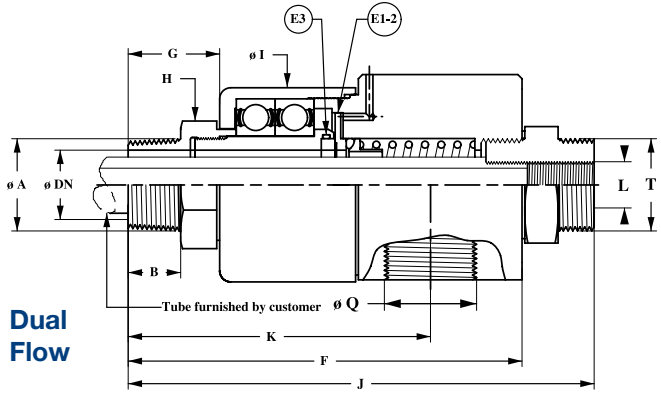
805 SERIES ROTARY UNION • MONO FLOW						
PART NUMBERS	Nominal Pipe Size	Shaft Thread (A)	Right Hand		Left Hand	
			Part Number	Description	Part Number	Description
PART NUMBERS	1/4	1/4 NPT	<b>760150C</b>	R813SR5NPT	<b>760155C</b>	L813SR5NPT
		1/4 BSP	<b>760152C</b>	R813SR5BSP	<b>760157C</b>	L813SR5BSP
		1/4 BSPP	<b>760153C</b>	R813SR5BSPP	<b>760158C</b>	L813SR5BSPP
		5/8-18 UNF	<b>760151C</b>	R813SR5UNF	<b>760156C</b>	L813SR5UNF
		M14xP1.5	<b>760154C</b>	R813SR5M	<b>760159C</b>	L813SR5M
	3/8	3/8 NPT	<b>760170C</b>	R817SR5NPT	<b>760175C</b>	L817SR5NPT
		3/8 BSP	<b>760172C</b>	R817SR5BSP	<b>760177C</b>	L817SR5BSP
		3/8 BSPP	<b>760173C</b>	R817SR5BSPP	<b>760178C</b>	L817SR5BSPP
		5/8-18 UNF	<b>760171C</b>	R817SR5UNF	<b>760176C</b>	L817SR5UNF
		M16xP1.5	<b>760174C</b>	R817SR5M	<b>760179C</b>	L817SR5M
	1/2	1/2 NPT	<b>760190C</b>	R821SR5NPT	<b>760195C</b>	L821SR5NPT
		1/2 BSP	<b>760192C</b>	R821SR5BSP	<b>760197C</b>	L821SR5BSP
		1/2 BSPP	<b>760193C</b>	R821SR5BSPP	<b>760198C</b>	L821SR5BSPP
		3/4-16 UNF	<b>760191C</b>	R821SR5UNF	<b>760196C</b>	L821SR5UNF
		M22xP1.5	<b>760194C</b>	R821SR5M	<b>760199C</b>	L821SR5M
	3/4	3/4 NPT	<b>760210C</b>	R827SR5NPT	<b>760215C</b>	L827SR5NPT
		3/4 BSP	<b>760212C</b>	R827SR5BSP	<b>760217C</b>	L827SR5BSP
		3/4 BSPP	<b>760213C</b>	R827SR5BSPP	<b>760218C</b>	L827SR5BSPP
		1-1/16-12 UNF	<b>760211C</b>	R827SR5UNF	<b>760216C</b>	L827SR5UNF
		M25xP1.5	<b>760214C</b>	R827SR5M	<b>760219C</b>	L827SR5M
1	1 NPT	<b>760230C</b>	R834SR5NPT	<b>760235C</b>	L834SR5NPT	
	1 BSP	<b>760232C</b>	R834SR5BSP	<b>760237C</b>	L834SR5BSP	
	1 BSPP	<b>760233C</b>	R834SR5BSPP	<b>760238C</b>	L834SR5BSPP	
	1-1/2-12 UNF	<b>760231C</b>	R834SR5UNF	<b>760236C</b>	L834SR5UNF	
	M35xP1.5	<b>760234C</b>	R834SR5M	<b>760239C</b>	L834SR5M	

805 SERIES ROTARY UNION • DUAL FLOW						
PART NUMBERS	Nominal Pipe Size	Shaft Thread (A)	Right Hand Thread		Left Hand Thread	
			Part Number	Description	Part Number	Description
PART NUMBERS	1/2	1/2 NPT	<b>760250C</b>	R921SR5NPT	<b>760255C</b>	L921SR5NPT
		1/2 BSP	<b>760252C</b>	R921SR5BSP	<b>760257C</b>	L921SR5BSP
		1/2 BSPP	<b>760253C</b>	R921SR5BSPP	<b>760258C</b>	L921SR5BSPP
		3/4-16 UNF	<b>760251C</b>	R921SR5UNF	<b>760256C</b>	L921SR5UNF
		M22xP1.5	<b>760254C</b>	R921SR5M	<b>760259C</b>	L921SR5M
	3/4	3/4 NPT	<b>760270C</b>	R927SR5NPT	<b>760275C</b>	L927SR5NPT
		3/4 BSP	<b>760272C</b>	R927SR5BSP	<b>760277C</b>	L927SR5BSP
		3/4 BSPP	<b>760273C</b>	R927SR5BSPP	<b>760278C</b>	L927SR5BSPP
		1-1/16-12 UNF	<b>760271C</b>	R927SR5UNF	<b>760276C</b>	L927SR5UNF
		M25xP1.5	<b>760274C</b>	R927SR5M	<b>760279C</b>	L927SR5M
	1	1 NPT	<b>760290C</b>	R934SR5NPT	<b>760295C</b>	L934SR5NPT
		1 BSP	<b>760292C</b>	R934SR5BSP	<b>760297C</b>	L934SR5BSP
		1 BSPP	<b>760293C</b>	R934SR5BSPP	<b>760298C</b>	L934SR5BSPP
		1-1/2-12 UNF	<b>760291C</b>	R934SR5UNF	<b>760296C</b>	L934SR5UNF
		M35xP1.5	<b>760294C</b>	R934SR5M	<b>760299C</b>	L934SR5M

# 805 SERIES



**Single Flow**



**Dual Flow**

805 SERIES ROTARY UNION • MONO FLOW (in.)													
DIMENSIONS	Nominal Pipe Size	Shaft Thread (A)	Inlet Thread (Q)*	Shaft Thread Length (B)	DN	F	G	H	I	K	R	S	
	1/4	1/4 NPT	NPT	0.43	0.31	3.14	.74	.86	1.49	2.55	1.73	.76	
		1/4 BSP	BSP										2.75
		1/4 BSPP	BSPP			3.34	.94						
		5/8-18 UNF	NPT							2.71			
	M14xP1.5	BSP	2.91										
	3/8	3/8 NPT		NPT	.43	.39	3.42	.82	1.02	1.65	2.71	1.81	.78
		3/8 BSP	BSP	3.62									
		3/8 BSPP	BSPP				4.17	.98			2.36		
		5/8-18 UNF	NPT	4.37									
	M16xP1.5	BSP	3.74		2.91	1.29							
	1/2	1/2 NPT		NPT			.55	.55	4.17	.98		1.25	2.16
1/2 BSP		BSP	4.37	1.18							3.58		
1/2 BSPP		BSPP							4.80	1.10			
3/4-16 UNF		NPT	5.19	1.49	4.13								
M22xP1.5	BSP	5.59				1.22	3.14	1.33					
3/4	3/4 NPT		NPT	.62	.78				4.80	1.10	1.37	2.48	3.74
	3/4 BSP	BSP	5.19			1.49							
	3/4 BSPP	BSPP							5.59	1.22			3.14
	1-1/16-12 UNF	NPT	5.98			1.61	4.64						
M25xP1.5	BSP	5.98		1.61	4.64								
1	1 NPT		NPT			.74	.98	5.59	1.22	1.61	2.75	4.25	
	1 BSP	BSP	5.98	1.61	4.64								
	1 BSPP	BSPP						5.98	1.61			4.64	
	1-1/2-12 UNF	NPT	5.98	1.61	4.64								
M35xP1.5	BSP	5.98				1.61	4.64						

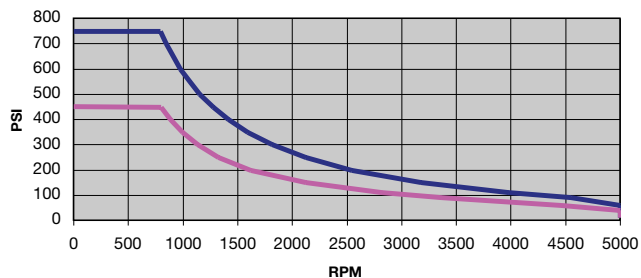
\* All inlet threads are right hand threads

805 SERIES ROTARY UNION • DUAL FLOW (in.)															
DIMENSIONS	Nominal Pipe Size	Shaft Thread (A)	Inlet Thread (Q)*	Shaft Thread Length (B)	DN	F	G	H	I	J	K	L (NPT)	R	S	T (NPT)
	1/2	1/2 NPT	NPT	.55	.55	4.17	.98	1.25	2.16	5.23	3.38	1/8	2.36	1.02	.50
		1/2 BSP	BSP												
		1/2 BSPP	BSPP			4.80	1.10			5.94	3.74				
		3/4-16 UNF	NPT												
	M22xP1.5	BSP	5.59	1.22	3.14	1.33									
	3/4	3/4 NPT					NPT	.62	.78			4.80	1.10	1.37	2.48
		3/4 BSP	BSP	5.19			1.49			4.13					
		3/4 BSPP	BSPP								5.59	1.22	3.14		
		1-1/16-12 UNF	NPT	5.98	1.61	4.64									
	M25xP1.5	BSP	5.98				1.61	4.64							
	1	1 NPT		NPT	.74	.98			5.59	1.22	1.61	2.75		4.25	3.14
1 BSP		BSP	5.98	1.61			4.64								
1 BSPP		BSPP						5.98	1.61	4.64					
1-1/2-12 UNF		NPT	5.98	1.61			4.64								
M35xP1.5	BSP	5.98			1.61	4.64									

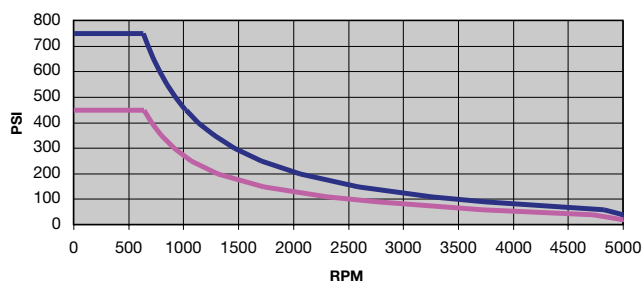
\* All inlet threads are right hand threads

## Performance Charts

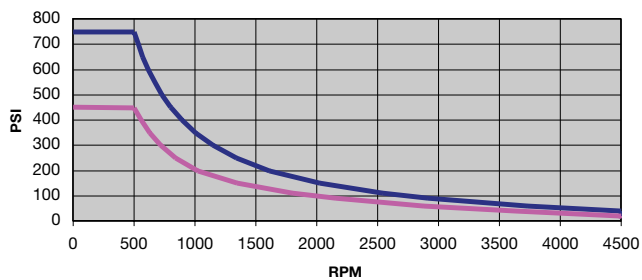
1/4"



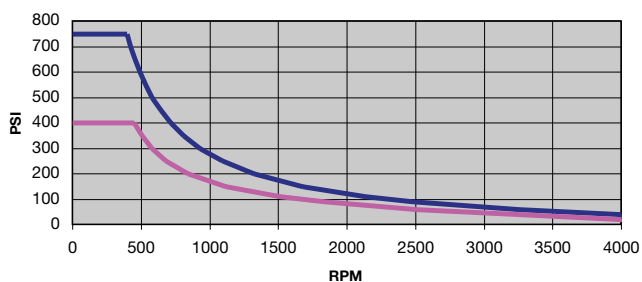
3/8"



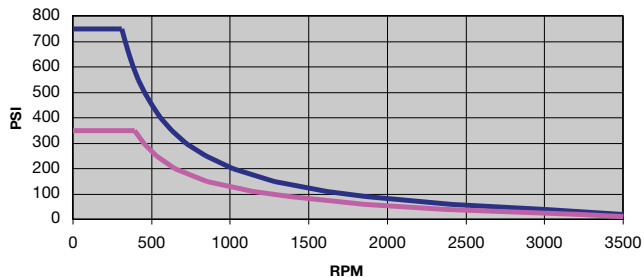
1/2"



3/4"



1"



Stainless Steel  
 Standard Materials

**NEW**



# DWA SERIES

GENERAL PURPOSE

## Operating Parameters

### SPEED

1750 RPM,  
1750 - 3500 RPM:  
Reduce pressure rating 20%

### TEMPERATURE

158° F (70° C)  
159° F - 212° F (71° C - 100° C):  
Reduce pressure rating 15%

### PRESSURE

200 psi, (1.38 MPa)  
180 psi - 2" size only  
(1.24 MPa)

### MEDIA

Water, non-corrosive fluids  
and oils

### THREADS

1/2" to 2" NPT  
BSP & BSPP Available

## Features & Benefits

### Long Life

Silicon carbide / carbon graphite seal faces provide long service life.

### Non-corrosive

Aluminum housing with stainless steel shaft.

### Smooth Running

High precision ball bearings for smooth running and long life, even at high speeds.

### Maintenance Free

No maintenance required.

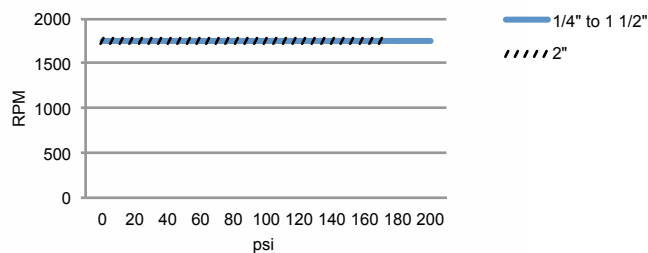
### Internal Protection

Internal bearing protection and vented body to prevent lubricant washout.

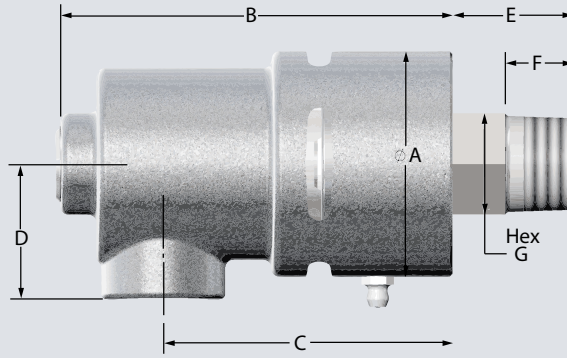
### Economical

Cost effective for general purpose applications.

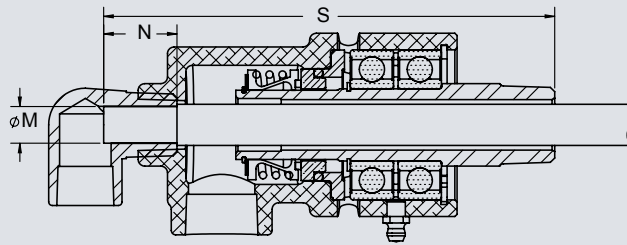
## Performance Charts







DWA SERIES MONO FLOW										
Thread size	Part Numbers		Dimensions: in. (cm)							
	Right Hand	Left Hand	A	B	C	D	E	F	G	
1/2"	NPT	192003036	192003037	2.31 (5.87)	4.03 (10.24)	3.03 (7.70)	1.30 (3.30)	1.23 (3.12)	0.75 (1.91)	1.00 (2.54)
	BSP	192011116	192011118							
	BSPP	192011119	192011120							
3/4"	NPT	192003038	192003039	2.50 (6.35)	4.35 (11.05)	3.21 (8.15)	1.50 (3.81)	1.33 (3.38)	0.75 (1.91)	1.12 (2.84)
	BSP	192011121	192011122							
	BSPP	192011123	192011124							
1"	NPT	192003040	192003041	3.25 (8.26)	4.93 (12.52)	3.53 (8.97)	1.75 (4.45)	1.50 (3.81)	0.94 (2.39)	1.50 (3.81)
	BSP	192011125	192011126							
	BSPP	192011127	192011128							
1-1/2"	NPT	192003042	192003043	4.00 (10.16)	5.91 (15.01)	4.16 (10.57)	2.20 (5.59)	2.30 (5.84)	1.06 (2.69)	2.25 (5.72)
	BSP	192011129	192011130							
	BSPP	192011131	192011132							
2"	NPT	192003044	192003045	4.50 (11.43)	6.32 (16.05)	4.38 (11.13)	2.45 (6.22)	2.61 (6.63)	1.12 (2.84)	2.50 (6.35)
	BSP	192011133	192011134							
	BSPP	192011135	192011136							



DWA SERIES DUAL FLOW										
Nominal Pipe Size	Siphon size	Elbows for Stationary Siphon Tubes				Elbows for Rotating Siphon Tubes				
		Part Number	"M"	"N"	Length "S"	Part Number	"M"	"N"	Length "S"	
1/2"	1/8" NPT	465408C	3/8 (0.95)	1.00 (2.54)	5.66 (14.38)	451245C	0.370/0.371 (0.940/0.942)	1.00 (2.54)	5.84 (14.83)	
	3/8" Dia. Tubing	465410C			5.84 (14.83)					
3/4"	1/8" NPT	465401C	1/2 (1.27)	1.00 (2.54)	5.97 (15.16)	451243C	0.495/0.496 (1.257/1.260)	1.00 (2.54)	6.15 (15.62)	
	1/4" NPT	465402C			6.11 (15.52)					
	1/2" Dia. Tubing	465404C			6.15 (15.62)					
1"	1/4" NPT	465411C	5/8 (1.59)	1.00 (2.54)	6.85 (17.40)	451246C	0.612/0.619 (1.554/1.572)	1.00 (2.54)	6.89 (17.50)	
	3/8" NPT	465412C			6.72 (17.07)					
	5/8" Dia. Tubing	465413C			6.89 (17.50)					
1-1/2"	1/2" NPT	465405C	1 (2.54)	1.50 (3.81)	8.45 (21.46)	451244C	0.743/0.745 (1.887/1.892)	1.50 (3.81)	9.02 (22.91)	
	3/4" NPT	465406C			8.40 (21.34)					
	1" Dia. Tubing	465407C			9.02 (22.91)					
2"	1/2" NPT	465405C	1 (2.54)	1.50 (3.81)	9.17 (23.29)	451244C	0.998/1.000 (2.535/2.540)	1.50 (3.81)	9.75 (24.77)	
	3/4" NPT	465406C			9.12 (23.16)					
	1" Dia. Tubing	465407C			9.75 (24.77)					

NOTE: Elbows with BSP threads available in all sizes - contact the factory for information

# 5000 SERIES

STAINLESS STEEL

GENERAL PURPOSE



**MODELS  
ADDED**

## Operating Parameters

### MEDIA

Water, Steam, Hot Oil, Air

### PRESSURE \*

750 psi (Water), 120 psi (Steam)  
100 psi (Hot Oil), 300 psi (Air)

### TEMPERATURE \*

300° F (Water), 350° F (Steam), 395° F (Hot Oil)

### SPEED \*

1,000 RPM (NPT), 3,600 RPM (MT)

### THREADS

- 1/4" to 2" NPT
- BSP, BSPP & Metric Threads Available

### MATERIAL

300 Grade Stainless Steel

### CONFIGURATION OPTIONS

Mono Flow and Dual Flow Configurations Available

*\* See Performance Charts  
For Details*

## Features & Benefits

### Corrosion Resistant

300 Grade stainless steel construction for superior corrosion resistance.

### Long Service Life

Two precision bearings keep the 5000 Series seal faces perfectly aligned to extend the life of the 5000 Series Rotary Union.

### Dual Flow Option

With the addition of an elbow, the 5000 Series can become dual flow.

### Balanced Mechanical Seal Design

The balanced mechanical seal design of the 5000 series allows for optimal operation with a wide variety of media.

### Replaceable Cartridge

Integrated cartridge design makes repairs fast and easy reducing maintenance costs.

### Multiple Seal Design Options

All sizes are available with three seal options for better wear resistance

#### ■ 5000 Series Standard

Carbon graphite against a ceramic coated steel seal design offers long life.

#### ■ 5000 ASM Series (Consult Factory)

The tungsten carbide face ring against a siliconized graphite seal ring design is used for abrasive applications.

Duff-Norton's Series 5000ASM features Advanced Seal Materials for abrasive applications, where softer sealing faces are subject to grooving. The ASM seal is a tungsten carbide face ring against a siliconized graphite seal ring, offering unsurpassed protection against grooving in applications where other materials fail.

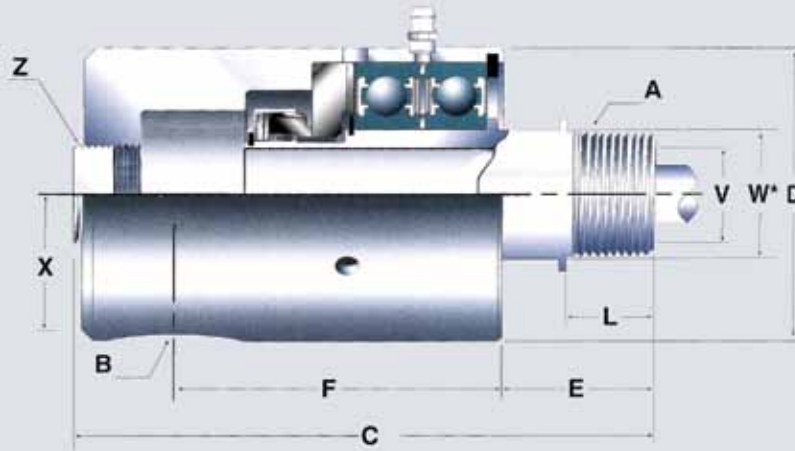
5000 SERIES ROTARY UNIONS • NPT, UNS, UN THREADS • MONO FLOW								
PART NUMBERS	Nominal Pipe Size	Shaft Thread (A)	5000 Series Standard					
			Right Hand			Left Hand		
			Part Number	Description	Repair Cartridge	Part Number	Description	Repair Cartridge
	1/4	1/4 NPT	<b>750625C</b>	R5000P	451671C	<b>750624C</b>	L5000P	451670C
	3/8	3/8 NPT	<b>750110C</b>	R5100P	451251C	<b>750109C</b>	L5100P	451250C
		5/8-18 UNF	<b>750142C</b>	R5124P	451253C	<b>750141C</b>	L5124P	451252C
	1/2	1/2 NPT	<b>750112C</b>	R5200P	451258C	<b>750111C</b>	L5200P	451257C
		3/4-16 UNF	<b>750147C</b>	R5224P	451260C	<b>750146C</b>	L5224P	451259C
		Quick Release	<b>750150C</b>	Q5200P	451263C	<b>750150C</b>	Q5200P	451263C
	3/4	3/4 NPT	<b>750089C</b>	R5300P	451265C	<b>750088C</b>	L5300P	451264C
		1-14 UNS	<b>750152C</b>	R5324P	451267C	<b>750151C</b>	L5324P	451266C
		Quick Release	<b>750155C</b>	Q5300P	451270C	<b>750155C</b>	Q5300P	451270C
	1	1 NPT	<b>750114C</b>	R5400P	451272C	<b>750113C</b>	L5400P	451271C
		1-1/2-12 UNF	<b>750157C</b>	R5424P	451274C	<b>750156C</b>	L5424P	451273C
		Quick Release	<b>750160C</b>	Q5400P	451277C	<b>750160C</b>	Q5400P	451277C
	1-1/4	1-1/4 NPT	<b>750116C</b>	R5500P	451279C	<b>750115C</b>	L5500P	451278C
		1-3/4-12 UN	<b>750162C</b>	R5524P	451281C	<b>750161C</b>	L5524P	451280C
		Quick Release	<b>750165C</b>	Q5500P	451284C	<b>750165C</b>	Q5500P	451284C
	1-1/2	1-1/2 NPT	<b>750118C</b>	R5600P	451286C	<b>750117C</b>	L5600P	451285C
		2-12 UN	<b>750167C</b>	R5624P	451288C	<b>750166C</b>	L5624P	451287C
		Quick Release	<b>750170C</b>	Q5600P	451291C	<b>750170C</b>	Q5600P	451291C
	2	2 NPT	<b>750120C</b>	R5700P	451293C	<b>750119C</b>	L5700P	451292C
		2-1/2-12 UN	<b>750172C</b>	R5724P	451295C	<b>750171C</b>	L5724P	451294C
		Quick Release	<b>750175C</b>	Q5700P	451298C	<b>750175C</b>	Q5700P	451298C

5000 SERIES ROTARY UNIONS • METRIC THREADS • MONO FLOW								
PART NUMBERS	Nominal Pipe Size	Shaft Thread (A)	5000 Series Standard					
			Right Hand			Left Hand		
			Part Number	Description	Repair Cartridge	Part Number	Description	Repair Cartridge
	1/4	1/4-19 BSP	<b>750362C</b>	R5000P-20	451673C	<b>750361C</b>	L5000P-20	451672C
		1/4-19 BSPP	<b>750738C</b>	R5000P-19	451666C	<b>750737C</b>	L5000P-19	451665C
	3/8	3/8-19 BSP	<b>750144C</b>	R5100P-20	451255C	<b>750143C</b>	L5100P-20	451254C
		3/8-19 BSPP	<b>750259C</b>	R5100P-19	451311C	<b>750258C</b>	L5100P-19	451310C
	M16	16 x P1.5	<b>750377C</b>	R511600P-27	451363C	<b>750376C</b>	L511600P-27	451688C
	M18	18 x P1.5	<b>750379C</b>	R511800P-27	451365C	<b>750378C</b>	L511800P-27	451690C
	1/2	1/2-14 BSP	<b>750149C</b>	R5200P-20	451262C	<b>750148C</b>	L5200P-20	451261C
		1/2-14 BSPP	<b>750261C</b>	R5200P-19	451313C	<b>750260C</b>	L5200P-19	451312C
	M22	22 x P1.5	<b>750381C</b>	R522200P-27	451367C	<b>750380C</b>	L522200P-27	451692C
	M25	25 x P1.5	<b>750383C</b>	R522500P-27	451369C	<b>750382C</b>	L522500P-27	451694C
	M26	26 x P1.5	<b>750385C</b>	R522600P-27	451371C	<b>750384C</b>	L522600P-27	451696C
	3/4	3/4-14 BSP	<b>750154C</b>	R5300P-20	451269C	<b>750153C</b>	L5300P-20	451268C
		3/4-14 BSPP	<b>750244C</b>	R5300P-19	451315C	<b>750243C</b>	L5300P-19	451314C
	M30	30 x P1.5	<b>750387C</b>	R533000P-27	451373C	<b>750386C</b>	L533000P-27	451698C
	1	1-11 BSP	<b>750159C</b>	R5400P-20	451276C	<b>750158C</b>	L5400P-20	451275C
		1-11 BSPP	<b>750246C</b>	R5400P-19	451317C	<b>750245C</b>	L5400P-19	451316C
	M35	35 x P1.5	<b>750389C</b>	R543500P-27	451375C	<b>750388C</b>	L543500P-27	451700C
	M42	42 x P1.5	<b>750391C</b>	R544200P-27	451377C	<b>750390C</b>	L544200P-27	451702C
	1-1/4	1-1/4-11 BSP	<b>750164C</b>	R5500P-20	451283C	<b>750163C</b>	L5500P-20	451282C
		1-1/4-11 BSPP	<b>750263C</b>	R5500P-19	451319C	<b>750262C</b>	L5500P-19	451318C
	M48	48 x P1.5	<b>750393C</b>	R554800P-27	451379C	<b>750392C</b>	L554800P-27	451704C
	1-1/2	1-1/2-11 BSP	<b>750169C</b>	R5600P-20	451290C	<b>750168C</b>	L5600P-20	451289C
		1-1/2-11 BSPP	<b>750265C</b>	R5600P-19	451321C	<b>750264C</b>	L5600P-19	451318C
	M50	50 x P1.5	<b>750395C</b>	R565000P-27	451381C	<b>750394C</b>	L565000P-27	451706C
	2	2-11 BSP	<b>750174C</b>	R5700P-20	451297C	<b>750173C</b>	L5700P-20	451296C
		2-11 BSPP	<b>750267C</b>	R5700P-19	451323C	<b>750266C</b>	L5700P-19	451322C



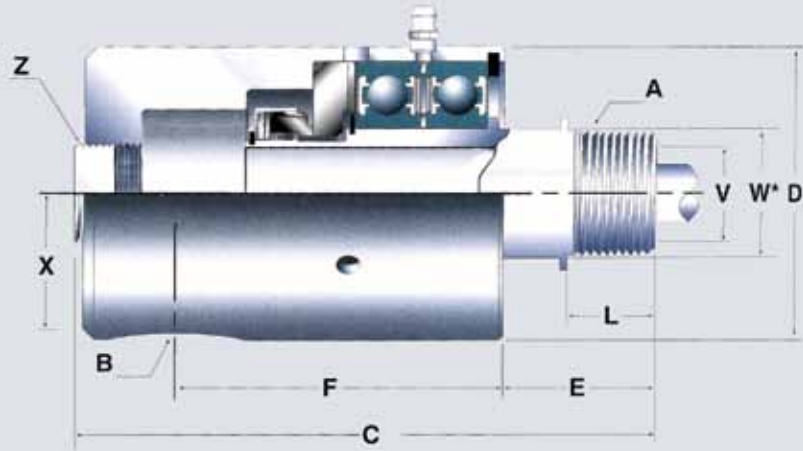
Models Added

5000 ASM SERIES ROTARY UNIONS • NPT THREADS • MONO FLOW (Consult Factory for Metric Threads)								
PART NUMBERS	Nominal Pipe Size	Shaft Thread (A)	Right Hand			Left Hand		
			Part Number	Description	Repair Cartridge	Part Number	Description	Repair Cartridge
				3/8	3/8 NPT	<b>750505C</b>	R5100PA	451460C
	1/2	1/2 NPT	<b>750513C</b>	R5200PA	451468C	<b>750512C</b>	L5200PA	451467C
	3/4	3/4 NPT	<b>750522C</b>	R5300PA	451477C	<b>750521C</b>	L5300PA	451476C
	1	1 NPT	<b>750531C</b>	R5400PA	451486C	<b>750530C</b>	L5400PA	451485C
	1-1/4	1-1/4 NPT	<b>750540C</b>	R5500PA	451495C	<b>750539C</b>	L5500PA	451494C
	1-1/2	1-1/2 NPT	<b>750549C</b>	R5600PA	451504C	<b>750548C</b>	L5600PA	451503C
	2	2 NPT	<b>750558C</b>	R5700PA	451513C	<b>750557C</b>	L5700PA	451512C



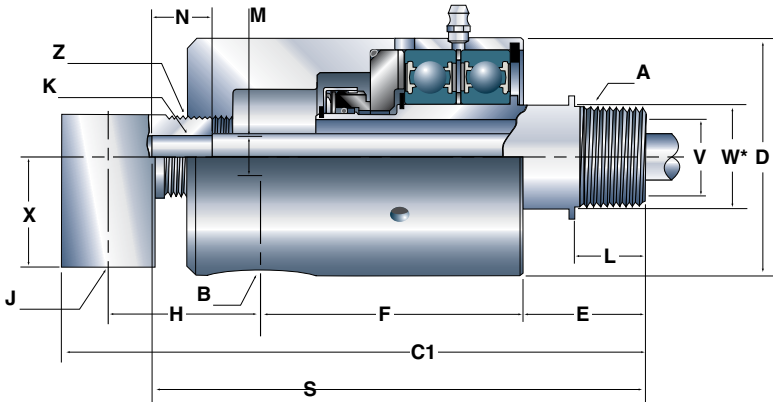
5000 SERIES ROTARY UNIONS • NPT, UNS, UN THREADS • MONO FLOW (in.)														
Nominal Pipe Size	Shaft Thread A (Right or Left)	B (NPT)	C	C1	D	E	F	H	J (NPT)	L	V	W (Flats)	X	Z (NPT)
1/4	1/4 NPT	3/8	4	5-1/4	1-9/16	1-1/4	2-9/32	1-3/8	3/8	9/16	1/4	5/8	1-1/16	3/8
3/8	3/8 NPT	3/8	4	5-1/4	1-9/16	1-1/4	2-9/32	1-3/8	3/8	5/8	3/8	5/8	1-1/16	3/8
	5/8-18 UNF													
1/2	1/2 NPT	1/2	4-3/4	5-15/16	2-1/16	1-9/32	2-23/32	1-7/16	3/8	3/4	1/2	7/8	1-1/16	3/8
	3/4-16 UNF													
	Quick Release													
3/4	3/4 NPT	3/4	5-1/4	6-1/2	2-5/16	1-13/32	3	1-9/16	1/2	3/4	11/16	1-1/4	1-1/16	1/2
	1-14 UNS													
	Quick Release													
1	1 NPT	1	6-3/16	7-1/2	3-1/8	1-5/8	3-7/16	1-13/16	1/2	15/16	1	1-3/8	1-15/32	3/4
	1-1/2-12 UNF													
	Quick Release													
1-1/4	1-1/4 NPT	1-1/4	7-1/2	9-1/16	3-1/2	2-9/64	4-1/32	2-5/32	3/4	1-1/16	1-1/4	1-5/8	1-1/32	1
	1-3/4-12 UN MT													
	Quick Release													
1-1/2	1-1/2 NPT	1-1/2	8-3/8	9-15/16	4	2-13/32	4-17/32	2-1/4	3/4	1-1/16	1-1/2	1-15/16	1-5/32	1-1/4
	2-12 UN													
	Quick Release													
2	2 NPT	2	9-1/2	11	4-3/8	2-21/32	5-1/16	2-1/2	3/4	1-1/8	1-7/8	2-1/2	1-5/32	1-1/4
	2-1/2-12 UN													
	Quick Release													

DIMENSIONS



5000 SERIES ROTARY UNIONS • METRIC THREADS • MONO FLOW (in.)																
DIMENSIONS	Nominal Pipe Size	Shaft Thread A (Right or Left)	B (NPT)	C	C1	D	E	F	H	J (NPT)	L	V	W (Flats)	X	Z (NPT)	
	1/4	1/4-19 BSP	3/8-18	101.6	133.4	39.7	31.8	57.9	34.9	3/8-18	13.9	6.4	16.0	27.0	3/8-18	
		1/4-19 BSPP														
	3/8	3/8-19 BSP	3/8-18	101.6	133.4	39.7	31.8	57.9	34.9	3/8-18	15.9	9.5	16.0	27.0	3/8-18	
		3/8-19 BSPP														
	M16	16 x P1.5	3/8-18	101.6	133.4	39.7	31.8	57.9	34.9	3/8-18	15.9	9.5	16.0	27.0	3/8-18	
	M18	18 x P1.5														
	1/2	1/2-14 BSP	1/2-14	120.7	150.8	52.4	32.5	69.1	36.5	3/8-18	19.1	12.7	22.2	27.0	3/8-18	
		1/2-14 BSPP														
		M22														22 x P1.5
		M25														25 x P1.5
	3/4	3/4-14 BSP	3/4-14	133.4	165.1	58.7	35.7	76.2	39.7	1/2-14	19.1	17.5	31.8	27.0	1/2-14	
		3/4-14 BSPP														
	M30	30 x P1.5	1-11 1/2	157.2	190.5	79.4	41.3	87.3	46.0	1/2-14	23.8	25.4	34.9	37.3	3/4-14	
	1	1-11 BSPP														
M35	35 x P1.5	1-1/4 -11 1/2	190.5	230.2	88.9	54.4	102.4	54.8	3/4-14	27.0	31.8	41.3	26.2	1-11 1/2		
M42	42 x P1.5															
1-1/4	1-1/4-11 BSP	1-1/4 -11 1/2	190.5	230.2	88.9	54.4	102.4	54.8	3/4-14	27.0	31.8	41.3	26.2	1-11 1/2		
	1-1/4														1-1/4-11 BSPP	
M48	48 x P1.5	1/2-11 1	212.7	252.4	101.6	61.1	115.1	57.2	3/4-14	27.0	38.1	49.2	29.4	1-1/4 -11 1/2		
1-1/2	1-1/2-11 BSP															
M50	1-1/2-11 BSPP	1/2-11 1	212.7	252.4	101.6	61.1	115.1	57.2	3/4-14	27.0	38.1	49.2	29.4	1-1/4 -11 1/2		
	M50														50 x P1.5	
2	2-11 BSP	2-11 1/2	241.3	279.4	111.1	67.5	128.6	63.5	3/4-14	28.6	47.6	63.5	29.4	1-1/4 -11 1/2		
	2														2-11 BSPP	

# 5000 SERIES



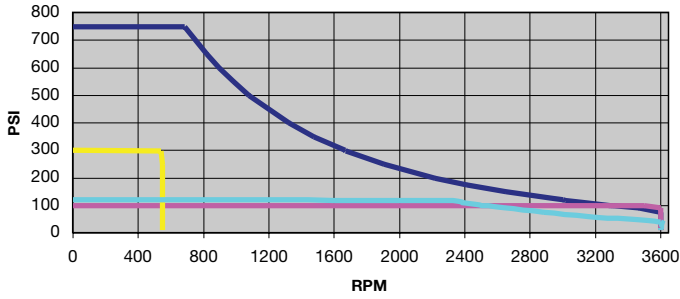
5000 SERIES ELBOWS FOR DUAL FLOW (in.)

Nominal Pipe Size	Elbows for Stationary Siphon Systems				Elbows for Rotating Siphon Systems				
	Part Number	Siphon K	Siphon Pipe	Siphon Tube	Part Number	Siphon (K)	S	M	N
		Pipe Thread							
3/8	465409C	1/4	-	4-1/4	-	-	-	-	-
1/2	465408C	1/8 NPT	4-15/16	-	451245C	3/8	4-9/16	.370-.371	1-1/4
	465410C	3/8	-	4-15/16	-	-	-	-	-
BSP	465416C	1/8-28 BSP	125 mm	-	-	-	-	-	-
3/4	465401C	1/8 NPT	5-3/8	-	-	-	-	-	-
	465402C	1/4 NPT	5-15/32	-	-	-	-	-	-
	465403C	7/16	-	5-5/32	-	-	-	-	-
	465404C	1/2	-	5-5/32	451243C	1/2	5-5/32	.495-.496	1-1/4
BSP	465417C	1/8-28 BSP	136 mm	-	-	-	-	-	-
	465418C	1/4-19 BSP	139 mm	-	-	-	-	-	-
1	465411C	1/4 NPT	6-5/16	-	-	-	-	-	-
	465412C	3/8 NPT	6-3/16	-	451246C	5/8	6-1/8	.619-.612	1-1/4
	465413C	5/8	-	6-1/4	-	-	-	-	-
BSP	465419C	3/8-19 BSP	157 mm	-	-	-	-	-	-
1-1/4	465414C	1/2 NPT	7-13/32	-	-	-	-	-	-
	465415C	3/4	-	7-9/16	451247C	3/4	7-7/16	.743-.745	1-1/2
BSP	465420C	1/2-14 BSP	188 mm	-	-	-	-	-	-
1-1/2	465405C	1/2 NPT	8-9/32	-	-	-	-	-	-
	465406C	3/4 NPT	8-1/4	-	451244C	1	8-9/16	.998-1.000	1-3/4
	465407C	1	-	8-1/2	-	-	-	-	-
BSP	465421C	3/4-14 BSP	210 mm	-	-	-	-	-	-
2	465405C	1/2 NPT	9-11/32	-	-	-	-	-	-
	465406C	3/4 NPT	9-9/32	-	451244C	1	9-19/32	.998-1.000	1-3/4
	465407C	1	-	9-17/32	-	-	-	-	-
BSP	465421C	3/4-14 BSP	235 mm	-	-	-	-	-	-

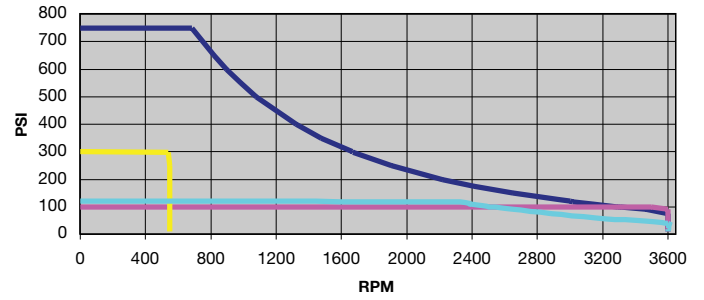
ELBOWS FOR DUAL FLOW

# Performance Charts

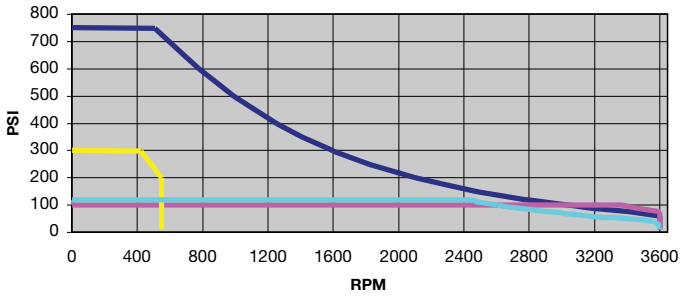
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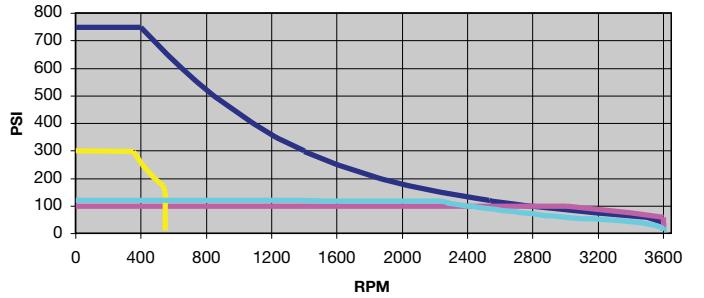
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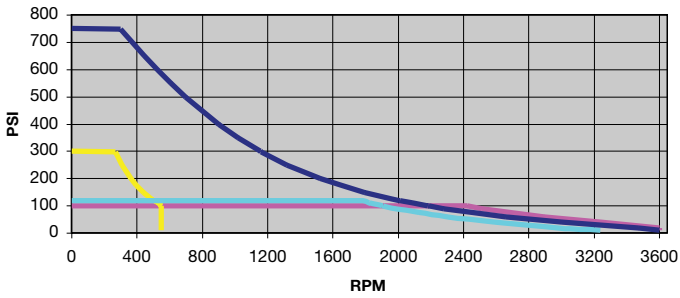
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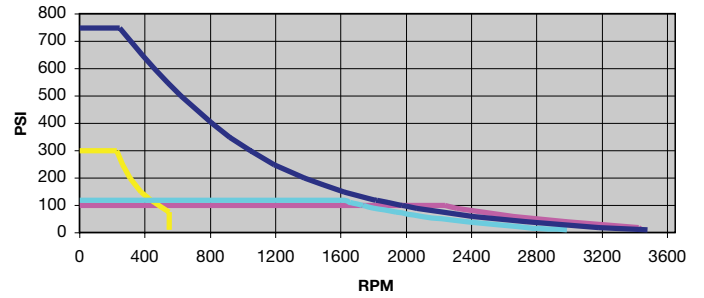
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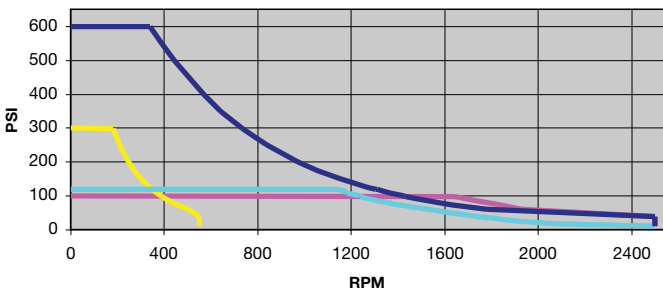
1"



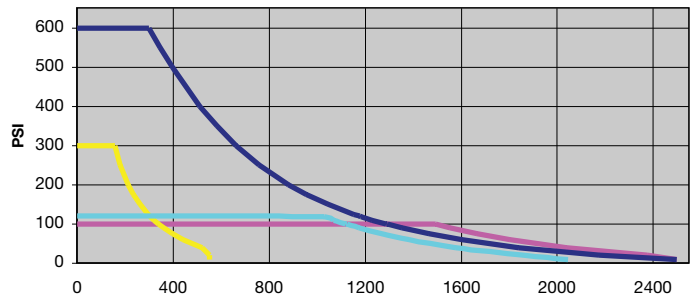
1 1/4"



1 1/2"



2"



Steam

Water

Hot Oil

Air

# 9000 SERIES

GENERAL PURPOSE



**MODELS  
ADDED**

## Operating Parameters

### MEDIA

Steam, Hot Oil, Water

### PRESSURE\*

250 psi (Water), 175 psi (Steam),  
100 psi (Hot Oil)

### TEMPERATURE\*

600° F (Hot Oil), 378° F (Steam)

### SPEED\*

700 RPM

### THREADS

- 1/4" to 3" NPT
- BSP Threads Available
- Flanged

### MATERIAL

- Cast Iron Housing with Stainless Steel or Plated Sleeve
- Steel Shaft

### CONFIGURATION OPTIONS

Mono Flow & Dual Flow Configurations Available

\* See Performance Charts For Details

## Features & Benefits

### Advanced Sealing System

The Bellows Sealing System provides superior sealing performance throughout the wear life of the Rotary Union.

### Superior Alignment

Dual bearings available in all sizes over 1 1/4" to provide superior alignment.

### Resists Debris Build-Up

Compared to seals utilizing springs, the 9000 series bellows sealing system is more resistant to debris in contaminated media, which reduces clogging.

### Easy Mounting

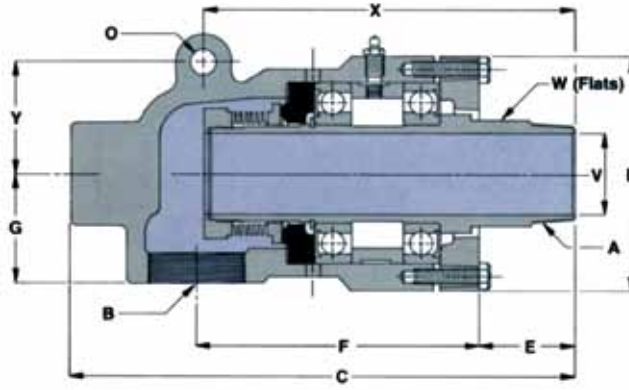
The flange attaches directly to the machine journal, providing inherently concentric mounting, minimizing overhang, and partially relieving bearing load to increase service life.



9000 SERIES ROTARY UNIONS • MONO FLOW							
Nominal Pipe Size	Shaft Thread (A)	Right Hand Thread			Left Hand Thread		
		Part Number	Description	Repair Cartridge	Part Number	Description	Repair Cartridge
1/4	1/4 NPT	730432C	R030P	441647C	730431C	L030P	441646C
	9/16-18 MT	730434C	R024P	441649C	730433C	L024P	441648C
	5/8-18 MT	730436C	R024P	441651C	730435C	L024P	441650C
3/8	3/8 NPT	730444C	R100P	441659C	730443C	L100P	441658C
	5/8-18 MT	730446C	R124P	441661C	730445C	L124P	441660C
1/2	1/2 NPT	730396C	R200P	441630C	730395C	L200P	441629C
	3/4-16 MT	730402C	R224P	441634C	730401C	L224P	441633C
	7/8-14 MT	730410C	R224P	441636C	730409C	L224P	441635C
	3/4-14 MT	730639C	R224P	441632C	730638C	L224P	441631C
	7/8-16 MT	730641C	R224P	441709C	730640C	L224P	441708C
3/4	3/4 NPT	730332C	R300P	441597C	730331C	L300P	441596C
	1-14 MT	730338C	R324P	441599C	730337C	L324P	441598C
1	1 NPT	730303C	R400P	441579C	730302C	L400P	441578C
	1-1/4-12 MT	730309C	R424P	441581C	730308C	L424P	441580C
1-1/4	1-1/4 NPT	440320C	R9500P	471460C	440319C	L9500P	471459C
	1-5/8-8 MT	440326C	R9524P-3	471462C	440325C	L9524P-3	471461C
	1-5/8-12 MT	440324C	R9524P-2	471464C	440323C	L9524P-2	471463C
1-1/2	1-1/2 NPT	440144C	R9600P	471364C	440143C	L9600P	471363C
	2-8 MT	440148C	R9624P-3	471368C	440147C	L9624P-3	471367C
	2-12 MT	440152C	R9624P-2	471374C	440151C	L9624P-2	471373C
2	2 NPT	440465C	R9700P	471554C	440464C	L9700P	471553C
2-1/2	2-1/2 NPT	440535C	R9800P	471556C	440534C	L9800P	471555C
3	3 NPT	440493C	R9900P	471558C	440492C	L9900P	471557C
	3-1/2-8 MT	440499C	R9924P-3	471644C	440498C	L9924P-3	471643C

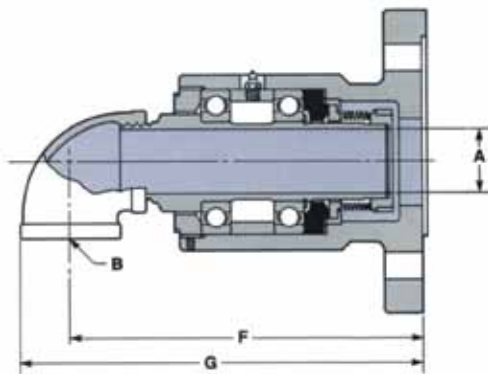
9000 SERIES ROTARY UNIONS • DUAL FLOW							
Nominal Pipe Size	Shaft Thread (A)	Right Hand Thread			Left Hand Thread		
		Part Number	Description	Repair Cartridge	Part Number	Description	Repair Cartridge
1/2	1/2 NPT	730398C	R200S	441630C	730397C	L200S	441629C
	3/4-16 MT	730404C	R224S	441634C	730403C	L224S	441633C
	7/8-14 MT	730412C	R224S	441636C	730411C	L224S	441635C
3/4	3/4 NPT	730334C	R300S	441597C	730333C	L300S	441596C
	1-14 MT	730340C	R324S	441599C	730339C	L324S	441598C
1	1 NPT	730305C	R400S	441579C	730304C	L400S	441578C
	1-1/4-12 MT	730311C	R424S	441581C	730310C	L424S	441580C
1-1/4	1-1/4 NPT	440322C	R9500S	471460C	440321C	L9500S	471459C
	1-5/8-8 MT	440330C	R9524S-3	471462C	440329C	L9524S-3	471461C
	1-5/8-12 MT	440328C	R9524S-2	471464C	440327C	L9524S-2	471463C
1-1/2	1-1/2 NPT	440146C	R9600S	471364C	440145C	L9600S	471363C
	2-8 MT	440150C	R9624S-3	471368C	440149C	L9624S-3	471367C
	2-12 MT	440154C	R9624S-2	471374C	440153C	L9624S-2	471373C
2	2 NPT	440467C	R9700S	471554C	440466C	L9700S	471553C
2-1/2	2-1/2 NPT	440575C	R9800S	471556C	440574C	L9800S	471555C
3	3 NPT	440495C	R9900S	471558C	440494C	L9900S	471557C

9000 SERIES ROTARY UNIONS • DUAL FLOW ROTATING SIPHON							
Nominal Pipe Size	Shaft Thread (A)	Right Hand Thread			Left Hand Thread		
		Part Number	Description	Repair Cartridge	Part Number	Description	Repair Cartridge
1/2	1/2 NPT	730400C	R225-4	441630C	730399C	L225-4	441629C
	3/4-14	730406C	XR225-4	441632C	730405C	XL225-4	441631C
	3/4-16	730408C	XR225-4	441634C	730407C	XL225-4	441633C
	7/8-14	730414C	XR225-4	441636C	730413C	XL225-4	441635C
	7/8-16	730644C	XR225-4	441709C	730643C	XL225-4	441708C
3/4	3/4-14	730336C	R325-2	441597C	730335C	L325-2	441596C
	1-14	730342C	XR325-2	441599C	730341C	XL325-2	441598C
1	1 NPT	730307C	R425-10	441579C	730306C	L425-10	441578C
	1-1/2-12	730315C	XR425-10	441583C	730314C	XL425-10	441582C
	1-1/4-12	730313C	XR425-10	441581C	730312C	XL425-10	441580C
1-1/4	1-1/4 NPT	440334C	R9525-20	471460C	440333C	L9525-20	471459C
	1-5/8-12 MT	440336C	XR9525-20	471464C	440335C	XL9525-20	471463C
1-1/2	1-1/2 NPT	440251C	R9625-30	471364C	440250C	L9625-30	471363C
	2-12 MT	440438C	XR9625-30	471374C	440437C	XL9625-30	471373C
	2-8 MT	440449C	XR9625-30	471368C	440448C	XL9625-30	471367C
2	2 NPT	440475C	R9725-30	471554C	440474C	L9725-30	471553C
2-1/2	2-1/2 NPT	440585C	R9825-40	471556C	440584C	L9825-40	471555C
3	3 NPT	440587C	R9925-50	471558C	440586C	L9925-50	471557C



9000 SERIES ROTARY UNIONS • MONO FLOW (in.)												
Nominal Pipe Size	Thread (A)	Inlet B (NPT)	C	D	E	F	G	V	W	O	Y	X
1/4	1/4 NPT	1/4	4-3/8	1-3/4	1-1/8	2-9/16	1-1/16	1/4	5/8	-	-	-
	9/16-18 MT											
	5/8-18 MT											
3/8	3/8 NPT	3/8	4-3/8	1-3/4	1-1/8	2-9/16	1-1/16	3/8	11/16	-	-	-
	5/8-18 MT											
1/2	1/2 NPT	1/2	5	2-3/8	1-1/2	2-3/4	1-1/4	1/2	15/16	-	-	-
	3/4-16 MT											
	7/8-14 MT											
	3/4-14 MT											
3/4	3/4 NPT	3/4	5-1/2	2-1/2	1-5/8	3	1-7/16	3/4	1-3/4	-	-	-
	1-14 MT											
1	1 NPT	1	6-1/8	3	1-3/4	3-3/8	1-3/4	1	1-11/32	-	-	-
	1-1/4-12 MT											
1-1/4	1-1/4 NPT	1-1/4	9-1/16	3-3/4	2-1/16	4-13/16	2-3/16	1-1/4	1-11/16	5/8	2	6-7/8
	1-5/8-8 MT		8-15/16		1-15/16							6-3/4
	1-5/8-12 MT											
1-1/2	1-1/2 NPT	1-1/2	9-11/16	4/18	2-3/16	5-1/4	2-3/16	1-1/2	1-15/16	5/8	2-1/4	7-3/4
	2-8 MT		10-1/4		2-3/4							7-15/16
	2-12 MT											
2	2 NPT	2	11-3/4	5-7/8	2-7/16	6-7/8	2-5/8	2	2-9/16	5/8	2-3/4	8-9/16
2-1/2	2-1/2 NPT	2-1/2	13-7/8	6-1/2	3-1/2	7-3/16	3-3/8	2-1/2	3	-	-	-
3	3 NPT	3	15-3/8	7-1/8	3-1/2	8-5/16	3-7/8	3	3-5/8	-	-	-
	3-1/2-8 MT		15-3/4		3-7/8							-

DIMENSIONS

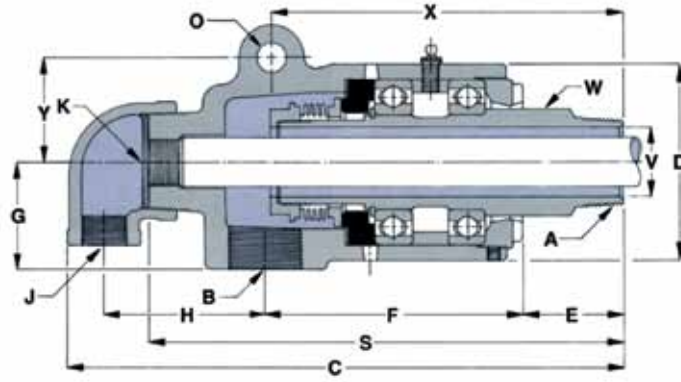


MONO FLOW (in.) • FLANGED					
DIMENSIONS	Nominal Pipe Size	Shaft ID (A)	Part Number	Description	Repair Cartridge
	1-1/4	1-1/4	Consult Factory	570P-1-U	Consult Factory
	1-1/2	1-1/2	Consult Factory	670P-1-U	
	2	2	Consult Factory	770P-1-U	
	2-1/2	2-3/8	Consult Factory	870P-1-U	
	3	2-7/8	Consult Factory	970P-1-U	
	4	4	Consult Factory	1070-P-U	
	5	5	Consult Factory	1170-P-U	



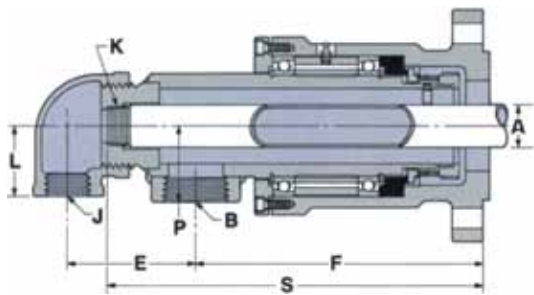
Models Added

MONO FLOW (in.) • FLANGED				
DIMENSIONS	Nominal Pipe Size	Inlet (B)	F	G
	1-1/4	1-1/4" NPT	8-7/16	9-1/2
	1-1/2	1-1/2" NPT	8-13/16	10-1/8
	2	2" NPT	10-5/8	12-1/16
	2-1/2	2-1/2" NPT	12	13-13/16
	3	3" NPT	14-1/16	16-1/4
	4	4" Flange	438 mm	Consult Factory
	5	5" Flange	545 mm	



9000 SERIES ROTARY UNIONS • DUAL FLOW • STATIONARY SIPHON (in.)

Nominal Pipe Size	Shaft Thread (A)	Inlet (B)	Outlet (J)	Siphon K (NPSM)	C	D	E	F	G	H	S	V	W	O	Y	X
1/2	1/2 NPT	1/2	1/2	1/8	7-1/4	2-3/8	1-1/2	2-3/4	1-1/4	2-1/8	6	1/2	15/16	-	-	-
	3/4-16 MT															
	7/8-14 MT															
3/4	3/4 NPT	3/4	1/2	1/4	7-3/4	2-1/2	1-5/8	3	1-7/16	2-3/8	6-3/8	3/4	1-1/8	-	-	-
	1-14 MT															
1	1 NPT	1	1/2	3/8	8-1/2	3	1-3/4	3-3/8	1-3/4	2-5/8	7-1/8	1	1-3/8	-	-	-
	1-1/4-12 MT															
1-1/4	1-1/4 NPT	1-1/4	1/2	1/2"	10-5/8	3-3/4	2-1/8	4-13/16	2	-	8-7/8	1-1/4	1-11/16	5/8	2	6-3/4
	1-5/8-8 MT				10-7/8		2				8-3/4					
	1-5/8-12 MT				11-3/8		2-3/16				9-9/16					
1-1/2	1-1/2 NPT	1-1/2	3/4	3/4"	11-15/16	4-1/8	2-3/4	5-1/4	2-3/16	-	10-1/8	1-1/2	1-15/16	5/8	2-1/4	7-3/8
	2-8 MT				2-3/4		10-1/8				7-15/16					
	2-12 MT				11-3/8		2-3/16				9-9/16					
2	2 NPT	2	1	3/4"	13-7/8	5-7/8	2-7/16	6-1/2	2-5/8	-	11-1/2	2	2-9/16	5/8	2-3/4	8-9/16
2-1/2	2-1/2 NPT	2	1	1"	16-7/8	6-1/2	3-1/2	7-1/4	3-3/8	-	14	2-1/2	3	-	-	-
3	3 NPT	2-1/2	1-1/4	1-1/4"	18-3/4	7-1/8	3-1/2	8-5/16	3-7/8	-	15-5/8	3	3-5/8	-	-	-



Dual FLOW (in.) • FLANGED • STATIONARY SIPHON PIPE

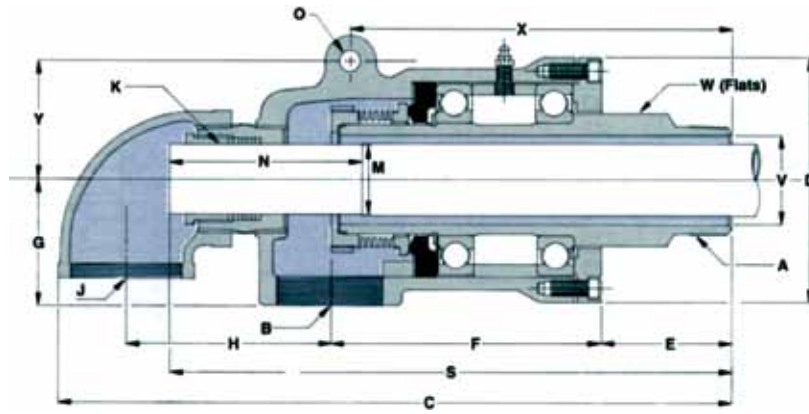
Nominal Pipe Size	Shaft ID (A)	Part Number	Description	Repair Cartridge
1-1/4	1-1/4	Consult Factory	570S-1-U	Consult Factory
1-1/2	1-1/2	Consult Factory	670S-1-U	
2	2	Consult Factory	770S-1-U	
2-1/2	2-3/8	Consult Factory	870S-1-U	
3	2-7/8	Consult Factory	970S-1-U	
4	4	Consult Factory	1070-S-U	
5	5	Consult Factory	1170-S-U	

Models Added

Dual FLOW (in.) • FLANGED • STATIONARY SIPHON PIPE

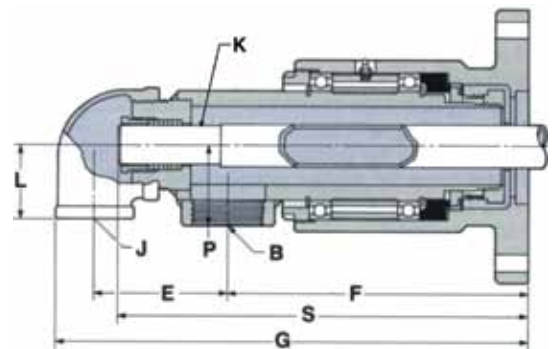
Nominal Pipe Size	Inlet B (NPT)	Outlet J (NPT)	Siphon Tap K (NPSM)	E	F	S	L	P
1-1/4	1	1/2	1/2	2-3/4	7-1/16	8-7/8	1-5/8	1-5/8
1-1/2	1-1/4	3/4	3/4	3-3/8	7-11/16	9-15/16	1-13/16	1-13/16
2	1-1/2	1	3/4	3-13/16	9-1/16	11-1/2	2-1/16	2-1/16
2-1/2	2	1-1/4	1	4-3/4	10-5/16	13-9/16	2-5/8	2-5/8
3	2-1/2	1-1/4	1-1/4	5-1/4	11-7/8	15-1/2	2-7/8	3-1/16
4	Consult Factory			--	--	--	--	--
5	Consult Factory			--	--	--	--	--

# 9000 SERIES



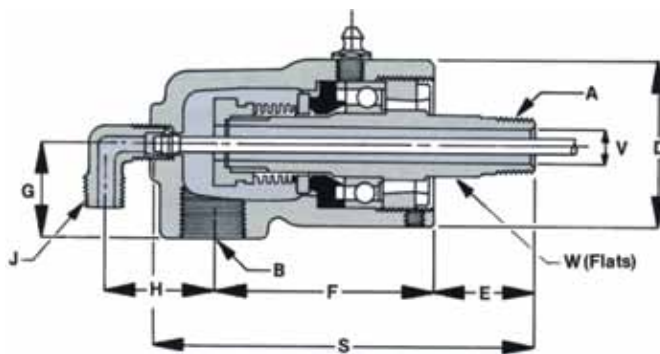
9000 SERIES ROTARY UNIONS • DUAL FLOW ROTATING SIPHON (in.)																			
Nominal Pipe Size	Shaft Thread (A)	Inlet (B)	Outlet (J)	Siphon (K)	C	D	E	F	G	H	M	N	O	S	V	W	X	Y	
1/2"	1/2 NPT	1/2	1/2	1/4 Tube	7-1/4	2-3/8	1-1/2	2-3/4	1-1/4	2-1/8	0.249 to 0.252	1-5/8	-	6-1/4	1/2	15/16	-	-	
	3/4-14 MT																		
	7/8-14 MT																		
	7/8-16 MT																		
3/4"	3/4 NPT	3/4	1/2	1/4 Pipe	7-3/4	2-1/2	1-5/8	3	1-7/16	2-3/4	0.522 to 0.528	1-3/4	-	6-13/16	3/4	1-1/8	-	-	
	1-14 MT																		
1"	1 NPT	1	1/2	3/8 Pipe	8-1/2	3	1-3/4	3-3/8	1-3/4	2-5/8	0.657 to 0.663	2	-	7-11/16	1	1-3/8	-	-	
	1-1/4-12 MT																		
1-1/4	1-1/4 NPT	1-1/4	1/2	1/2 Pipe	10-5/8	3-3/4	2-1/8	4-13/16	2	3	0.803 to .808	3	5/8	9-7/16	1-1/4	1-11/16	6-7/8	2	
	1-5/8-12 MT				10-1/2									2			9-5/16		6-3/4
1-1/2	1-1/2 NPT	1-1/2	3/4	3/4 Pipe	11-3/8	4-1/8	2-3/16	5-1/4	2-3/16	3-1/4	0.991 to 0.997	3-1/4	5/8	10-1/8	1-1/2	1-15/16	7-3/8	2-1/4	
	2-12 MT				11-15/16									2-3/4			10-3/4		7-15/16
	2-8 MT																		
2	2 NPT	2	1	3/4 Pipe	13-7/8	5-7/8	2-7/16	6-1/2	2-5/8	4-1/16	0.991 to 0.997	3-1/4	5/8	12-1/8	2	2-9/16	8-9/16	2-3/4	
2-1/2	2-1/2 NPT	2	1-1/4	1 Pipe	16-7/8	6-1/2	3-1/2	7-1/4	3-3/8	5	1.241 to 1.247	3-3/4	-	14-11/16	2-1/2	3	-	-	
3	3 NPT	2-1/2	1-1/4	1-1/4 Pipe	18-3/4	7-1/8	3-1/2	8-5/16	3-7/8	5-1/2	1.615 to 1.621	4-1/4	-	16-3/8	3	3-5/8	-	-	

Dual FLOW (in.) • FLANGED • ROTATING SIPHON PIPE				
Nominal Pipe Size	Shaft ID	Part Number	Description	Repair Cartridge
1-1/4	1-1/4	Consult Factory	587-20-U	Consult Factory
1-1/2	1-1/2	Consult Factory	687-30-U	
2	2	Consult Factory	787-30-U	
2-1/2	2-3/8	Consult Factory	887-40-U	
3	2-7/8	Consult Factory	987-50-U	
4	4	Consult Factory	--	
5	5	Consult Factory	--	



Models Added

Dual FLOW (in.) • FLANGED • ROTATING SIPHON PIPE									
Nominal Pipe Size	Inlet B (NPT)	Outlet J (NPT)	Siphon Dia.	E	F	G	L	P	S
1-1/4	1	1/2	Siphon not provided. Contact Factory for information.	2-3/4	7-1/16	10-5/16	1-5/8	1-5/8	9-1/2
1-1/2	1-1/4	3/4		3-3/8	7-11/16	11-13/16	1-13/16	1-7/8	10-3/4
2	1-1/2	1		3-13/16	9-1/16	14	2-1/16	2-5/16	12-1/4
2-1/2	2	1-1/4		4-3/4	10-5/16	16-5/16	2-5/8	2-5/8	14-1/4
3	2-1/2	1-1/4		5-1/4	11-7/8	18-3/4	2-7/8	3-1/16	16-1/4
4	Consult Factory			--	--	--	--	--	--
5	Consult Factory			--	--	--	--	--	--



Dual FLOW (in.) • COMPRESSION FITTING SIPHON									
DIMENSIONS	Nominal Pipe Size	Shaft Thread (A)	Thread Rotation	Right Hand			Left Hand		
				Part Number	Description	Repair Cartridge	Part Number	Description	Repair Cartridge
1/4	1/4 NPT	RH	730779C	R019-2	441647	730778	L019-2	441646	
			730781C	R019-3	441647	730780	L019-3	441646	
3/8	3/8 NPT	RH	730787C	R119-2	441659	730786	L119-2	441658	
			730783C	R119-3	441659	730782	L119-3	441658	
1/2	1/2 NPT	RH	730800C	R219-6	441630	730799	L219-6	441629	
3/4	3/4 NPT	RH	730804C	R319-8	441597	730803	L319-8	441596	
1	1 NPT	RH	730429C	R419-10	441579	730428	L419-10	441578	

 Models Added

Dual FLOW (in.) • COMPRESSION FITTING SIPHON													
DIMENSIONS	Nominal Pipe Size	Thread A (NPT)	Inlet B (NPT)	Outlet J	Siphon Tube Size	D	E	F	G	V	W	S	H
	1/4	1/4	1/4	1/8 MALE	1/8	1-3/4	1-1/8	2-9/16	1-1/16	1/4	5/8	4-7/16	1-1/4
3/16					1-3/4	1-1/8	2-9/16	1-1/16	3/8	11/16	4-7/16	1-1/4	
3/8	3/8	3/8	1/8 MALE	1/8	1-3/4	1-1/8	2-9/16	1-1/16	3/8	11/16	4-7/16	1-1/4	
				3/16	1-3/4	1-1/8	2-9/16	1-1/16	1/2	15/16	6-3/8	2-1/8	
1/2	1/2	1/2	1/2 NPT	3/8	2-3/8	1-1/2	2-3/4	1-1/4	1/2	15/16	6-3/8	2-1/8	
3/4	3/4	1/2	1/2 NPT	1/2	2-1/2	1-5/8	3	1-7/16	3/4	1-1/8	6-7/8	2-5/16	
1	1	1	3/4 NPT	5/8	3	1-3/4	3-3/8	1-3/4	1	1-3/8	7-3/4	2-9/16	

## 9000 Series repair parts



Shaft



Ball Bearing



Bearing Retainer



Seal Ring



Bellows Assembly

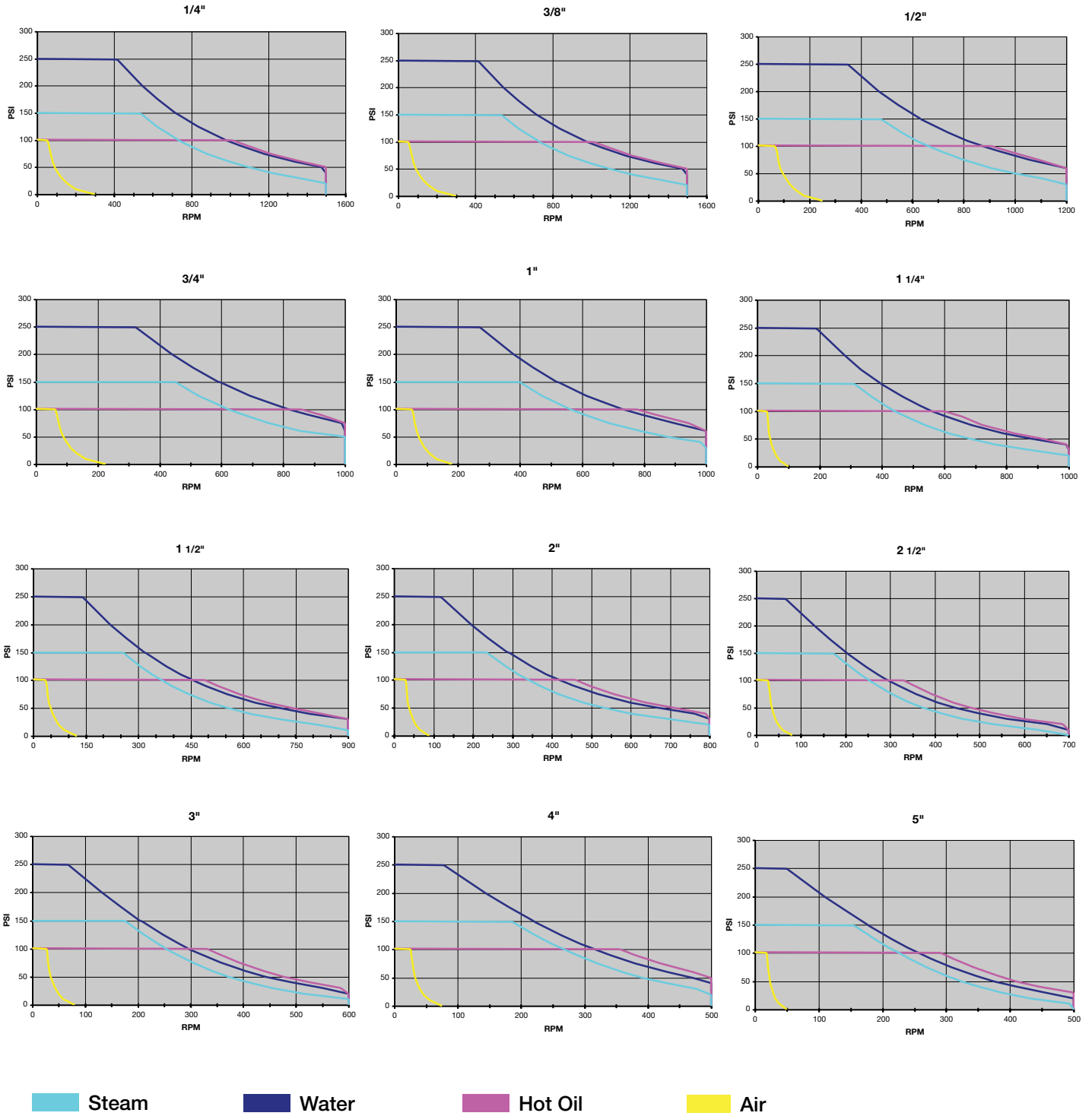


Bellows Gasket

### 9000 SERIES ROTARY UNIONS • REPAIR PARTS

Nominal Pipe Size	Thread Rotation	Shaft		Ball Bearing	Bearing Retainer	Seal Ring	Bellows Gasket	Bellows Assembly	Housing Gasket
		Shaft Thread (A)	Part Number						
1/4	LH	1/4 NPT	463474C	482020C	847022C	463472C	482033C	481010C	482026C
	RH		463475C						
	LH	9/16-18 MT	463476C						
	RH		463477C						
	LH	5/8-18 MT	463478C						
	RH		463479C						
3/8	LH	3/8 NPT	463484C	482020C	847022C	463472C	482033C	481010C	482026C
	RH		463485C						
	LH	5/8-18 MT	463486C						
	RH		463487C						
1/2	LH	1/2 NPT	463428C	482076C	854744C	463426C	482090C	481018C	482083C
	RH		463429C						
	LH	3/4-16 MT	463436C						
	RH		463437C						
	LH	7/8-14 MT	463430C						
	RH		463431C						
	LH	3/4-14 MT	463434C						
	RH		463435C						
3/4	LH	3/4 NPT	463291C	482134C	844654C	463287C	482148C	481035C	482141C
	RH		463292C						
	LH	1-14 MT	463293C						
	RH		463294C						
	LH	1 NPT	463265C	482188C	844341C	463264C	482201C	481048C	482195C
	RH		463266C						
	LH	1-1/4-12 MT	463277C						
	RH		463278C						
1-1/4	LH	1-1/4 NPT	485070C	482241C	854753C	482246C	482255C	481062C	482248C
	RH		485071C						
	LH	1-5/8-8 MT	485086C						
	RH		485087C						
	LH	1-5/8-12 MT	485084C						
	RH		485085C						
1-1/2	LH	1-1/2 NPT	483951C	482303C	863095C	482308C	482316C	481073C	482310C
	RH		483952C						
	LH	2-8 MT	483953C						
	RH		483954C						
	LH	2-12 MT	483955C						
	RH		483956C						
2	LH	2 NPT	485181C	482362C	854757C	482786C	482788C	481247C	482787C
	RH		485182C						
2-1/2	LH	2-1/2 NPT	485256C	482809C	854762C	482811C	482813C	481268C	482812C
	RH		485257C						
3	LH	3 NPT	485155C	482839C	854766C	482841C	482843C	481289C	482842C
	RH		485156C						
	LH	3-1/2-8 MT	485199C						
	RH		485200C						
	LH	3-1/2-12 MT	485189C						
	RH		485198C						

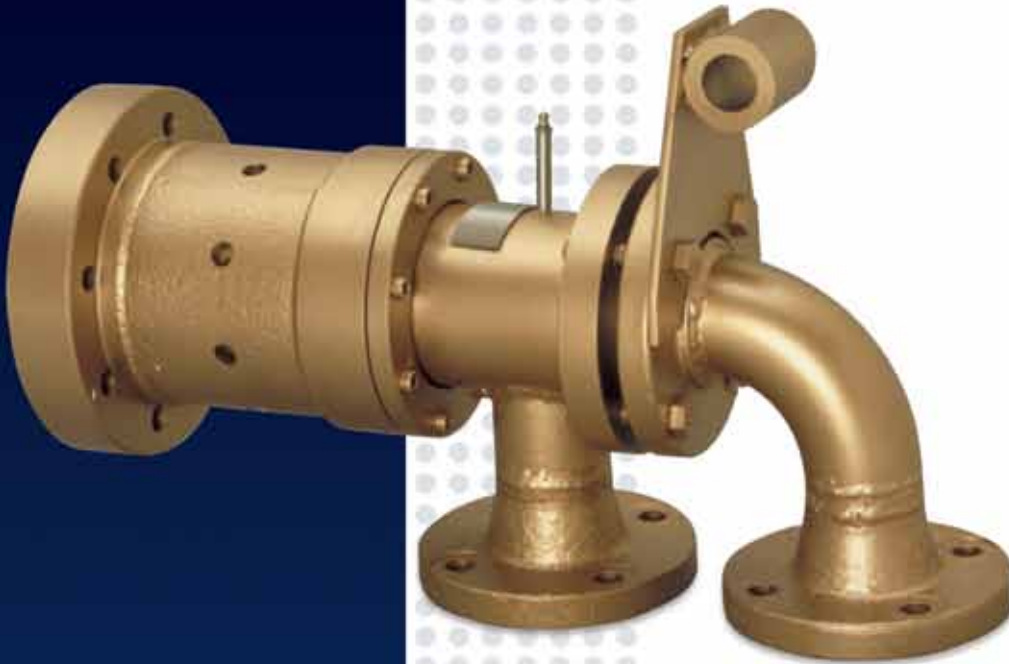
# Performance Charts



# 2000 SERIES

WATER, HOT OIL & AIR

SHOCK & VIBRATION RESISTANT



## Operating Parameters

### MEDIA

Water, Hot Oil, Air

### PRESSURE\*

150 psi (Water), 100 psi (Air & Hot Oil)

### TEMPERATURE\*

375° F (Water), 550° F (Hot Oil)\*\*

### SPEED\*

500 RPM

### CONNECTIONS

2" to 4" ASA Flange

### MATERIAL

Cast Iron Housing, Steel Shaft

### CONFIGURATION OPTIONS

Mono Flow & Dual Flow Configurations Available

\* See Performance Charts For Details

\*\* Consult factory for applications exceeding 375°

## Features & Benefits

### Heavy Duty Design

Designed with two ball bearings spaced to withstand radial and thrust loads.

### No Leakage In Tough Applications

Compression springs in the 2000 Series provide even loading across the seal surfaces to maintain zero leakage even in low pressure applications.

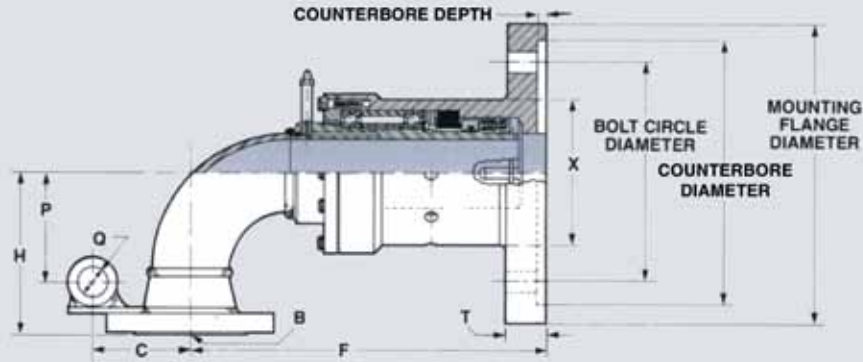
### Easy Maintenance

Designed with an integral flange that allows repairs without removing the housing from the machine.

### Easy Mounting

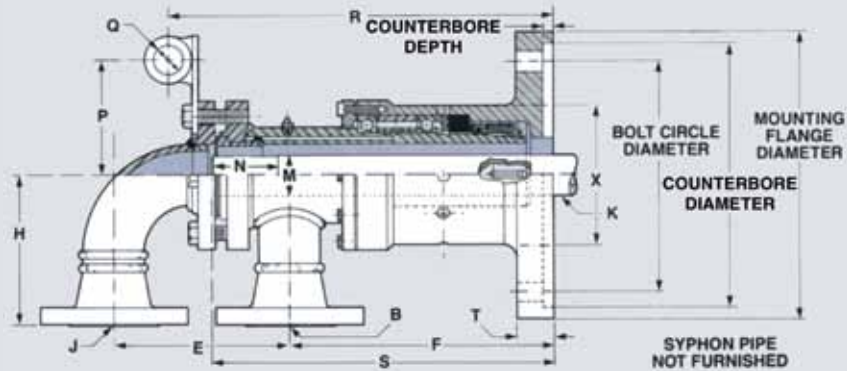
The flange attaches directly to the machine journal, providing inherently concentric mounting, minimizing overhang, and partially relieving bearing load to increase service life.





2000 SERIES ROTARY UNIONS • MONO FLOW (in.)

Nominal Pipe Size	Part Number	Repair Cartridge	B (3)	F	T	Mounting Flange Diameter	Bolt Circle Diameter	Flange Type	Counterbore		Bolt Hole Size	Number of Bolt Holes (4)	H	P	Diameter (X)	Diameter (Q)	C
									Diameter	Depth							
2	730747C	441781C	2	12-3/4	1-7/16	10	7-1/8	2	9.002 to 9.004	3/16	11/16	4	5-1/2	N/A	5-1/4	-	-
3	730841C	441845C	3	16-1/8	1-3/4	9-1/2	7-9/16	2	10.824 to 10.820		11/16	8	7-1/4	N/A	6-5/16	-	-
4	730842C	441846C	4	20-1/4	1-3/4	11-1/2	8-15/16	2	10.824 to 10.820		13/16	6	9-1/8	6-3/4	7-3/4	1/8	5-3/4



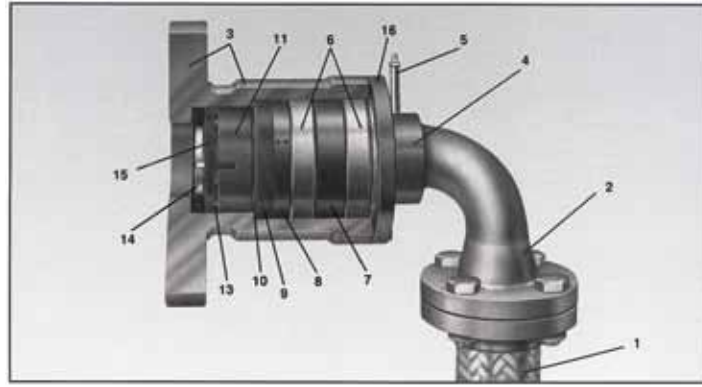
2000 SERIES ROTARY UNIONS • DUAL FLOW • WITH REVOLVING SYPHON (in.)

Nominal Pipe Size	Part Number	Repair Cartridge	B(3)	F	T	Mounting Flange Diameter	Bolt Circle Diameter	Flange Type	Counterbore		Bolt Hole Size	Number of Bolt Holes	H	P	Diameter (X)	Diameter (Q)	K(1)	M(2)	N	J(3)	S	E	R
									Diameter	Depth													
2	730843C	441847C	1-1/2	10	1-7/16	10	7-1/8	2	9.002 to 9.004	3/16	11/16	4	4-5/8	-	-	-	3/4	.991 to .997	4-1/4	1-1/2	13-3/8	6-5/8	N/A
3	730737C	441786C	2-1/2	12-1/2	1-3/4	9-1/2	7-9/16		9.002 to 9.004		11/16	8	7-1/8	5-1/2	6-1/4	1-3/8	1-1/2	1.865 to 1.871		2-1/2	16-1/4	8-3/8	18-1/4
4	730852C	441860C	2-1/2	15-3/8	1-3/4	11-1/2	8-15/16		10.820 to 10.824		13/16	6	7-1/8	6-1/8	7-3/4	1-3/8	2-1/2	2.801 to 2.807		2-1/2	19-3/8	8-7/8	21

- (1) Standard syphon pipe diameter.
- (2) Machined dimension to allow revolving syphon pipe to run concentrically with journal diameter to within .005" T.I.R.
- (3) 150 lb. ASA Flange.
- (4) Equally spaced.

**Notes:**

- 1. For heat transfer oil applications, consult factory
- 2. Other flange dimensions available. See previous page.
- 3. For dimensions on 5" - 6", consult factory



The unique design of this 2000 series flanged type joint permits them to be used to introduce heating and cooling agents into rolls or cylinders in various types of machinery. Models are available to handle water, oil and other fluids in applications requiring sealing pressure to 150 psi, speeds to 500 rpm, and temperature to 550°F when specified.

### 1 Flexible Hose

Eliminates complex piping, allows adjustment of rolls without repiping. Allows rotary joint to “float” so as to avoid unnecessary strain on sealing surfaces. A flexible hose either rubber or metal - must always be used with rotary joints.

### 2 Flanged Inlet

Elbow of steel is a 150lb. ASA flange type.

### 3 Flanged Rotating Housing

Prevents leakage under pressure and protects the internal parts for a long service life. The flanged housing attaches directly to the machine journal, providing inherently concentric mounting, minimizes overhang. The housing may rotate in either direction without causing back out problems.

### 4 Stationary shaft

Is constructed of steel. It serves as a conduit for the fluid transfer from the flanged inlet into the revolving flanged housing.

### 5 Lubrication Fitting

Located on the stationary shaft allows lubrication of the ball bearings while the rotary joint is in operation.

### 6 Two Single Row, Widely Spaced Ball Bearings

For radial and thrust loads.

### 7 Grease Ring Assembly

Made of steel, ground and spaced for ball bearing load sharing for increased life.

### 8 Drain Ring

Made of steel. It allows minute start-up leakage from entering the ball bearings.

### 9 Seal Ring

Forms the primary rotating seal with the face ring. The seal ring is constructed of carbon graphite to provide a low friction, wear resistant surface.

### 10 Gasket

Provides an effective seal between the housing and the fluid chamber.

### 11 The Face Ring

Constructed of hardened and tempered stainless steel mates with the seal ring to form the primary seal.

### 12 O-Ring Elastomer (not shown)

Made of ethylene propylene for hot water applications. For higher temperature applications, a perfluoroelastomer is used.

### 13 Compression Springs

Apply an initial pressure between the face ring and seal ring to provide sealing for low pressure applications.

### 14 Drive Collar

Keys the face ring and the shaft together to prevent rotation.

### 15 Retainer Rings

Secure the internal components to the shaft.

### 16 Flange Secures

Secures the internal components within the flanged housing. This allows quick rotary joint repair and less machine downtime.

## Order Checklist

Supply the following information when ordering

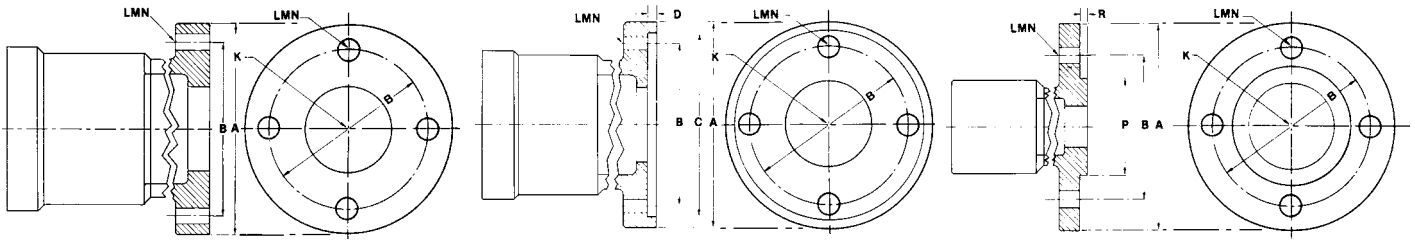
1. Desired bolt circle
2. Bolt hole size
3. Number of bolt holes and spacing
4. Desired flange thickness
5. Flange O.D.
6. Pilot diameter and type
7. Pilot (length or depth)

## 2000 & 9000 SERIES • BOLT & FLANGE DIMENSIONS

Shaft I.D.	Minimum Bolt Circle		Maximum Flange Diameter (A)	Maximum Flange Thickness
	Bolt Circle (B)	Cap Screw Diameter		
2	7-1/8	5/8	10-7/8	1-7/16
3	7-9/16	5/8	13-1/2	1-3/4
4	8-15/16	3/4	14-7/8	2-1/16
5	11-9/16	1	16-1/4	2-3/4

\*All dimensions in inches  
See page 35 for diagram

## 2000 & 9000 Series Flange Mountings



### Flanged Housing Type 1

- A. Overall diameter
- B. Bolt circle diameter
- K. Rotary Union joint shaft thread size and direction
- L. Size of bolt holes
- M. Type and size of bolts
- N. Number of bolt holes required

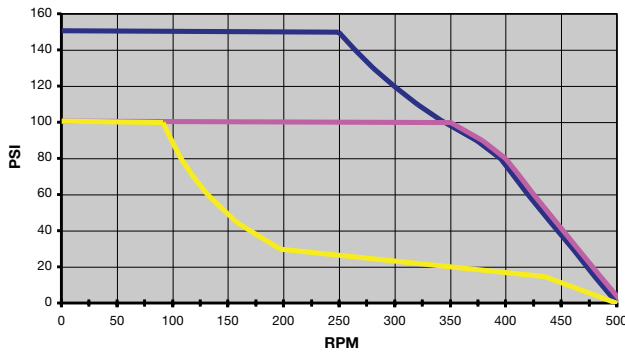
### Flanged Housing w/ Counterbore Type 2

- A. Overall diameter
- B. Bolt circle diameter
- C. O.D. of journal for sizing counterbore diameter
- D. Counterbore depth
- K. Rotary Union joint shaft thread size and direction
- L. Size of bolt holes
- M. Type and size of bolts
- N. Number of bolt holes required

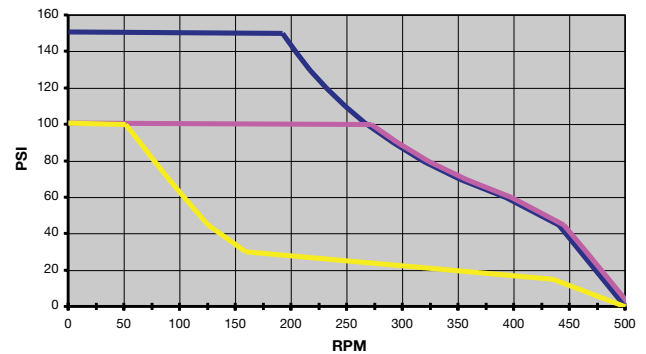
### Flanged Housing w/ Pilot Type 3

- A. Overall diameter
- B. Bolt circle diameter
- K. Rotary Union joint shaft thread size and direction
- L. Size of bolt holes
- M. Type and size of bolts
- N. Number of bolt holes required
- P. I.D. of journal for sizing pilot diameter
- R. Pilot length

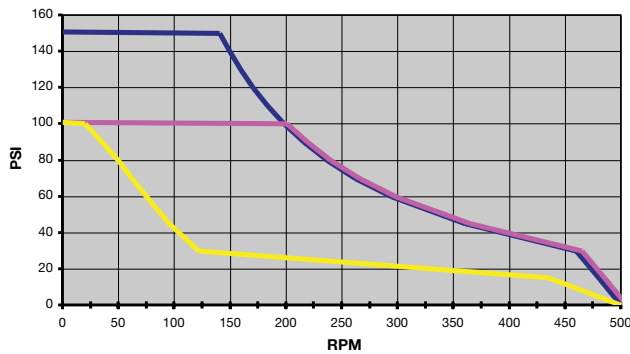
2"



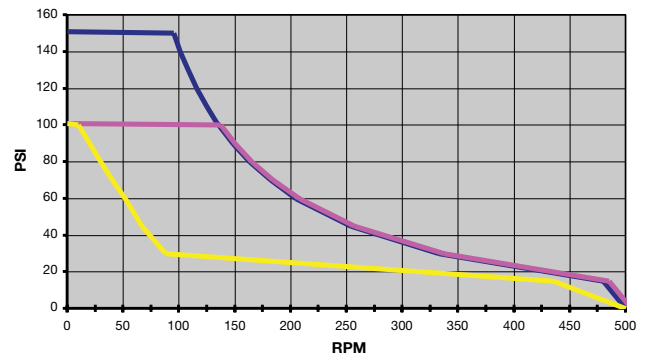
3"



4"



5"



Water

Hot Oil

Air

# 8000 SERIES

STEAM & HOT OIL



## Operating Parameters

### MEDIA

Steam, Hot Oil

### PRESSURE\*

175 psi (Steam), 100 psi (Hot Oil)

### TEMPERATURE\*

450° F (Steam), 600° F (Hot Oil)

### SPEED\*

600 RPM

### THREADS

- 1/2" to 4" NPT
- BSP or ISO228 Available
- Quick Release

### MATERIAL

- Cast Iron Housing with Stainless Steel Sleeve
- Steel Shaft with Hardened Nickel Plating

### CONFIGURATION OPTIONS

Mono Flow & Dual Flow Configurations Available

*\* See Performance Charts For Details*

## Features & Benefits

### Ideal For Steam Applications

Designed for operation in a variety of steam applications.

### Safety

An anti-torque lug prevents rotation of the housing while in operation.

### No Lubrication Needed

The special carbon graphite bearing is lubricated by the process fluid and requires no additional lubrication.

### Hot Oil Applications

8000HO offers the same design features as the standard 8000 Series but with a special high temperature seal ring for hot oil applications.

### Stainless Steel Insert

The stainless steel housing insert in the 8000T Series makes this joint a favorite in the textile industry

8000 SERIES ROTARY UNIONS • MONO FLOW														
PART NUMBERS	Nominal Pipe Size (A)	Inlet (B)	Left Hand Thread				Right Hand Thread				Quick Release			
			Standard Spring	Description	Heavy Duty Spring	Description	Standard Spring	Description	Heavy Duty Spring	Description	Standard Spring	Description	Heavy Duty Spring	Description
	1/2	1/2	430483C	L8200P	730215C	L8200P-HD	430484C	R8200P	730216C	R8200P-HD	430533C	Q8200P	730214C	Q8200P-HD
	3/4	3/4	430485C	L8300P	730223C	L8300P-HD	430486C	R8300P	730224C	R8300P-HD	430534C	Q8300P	730225C	Q8300P-HD
	1	1	730856C	L8400-T	-	-	730857C	R8400-T	-	-	430535C	Q8400P	730232C	Q8400P-HD
	1-1/4	1-1/4	430489C	L8500P	730244C	L8500P-HD	430490C	R8500P	730245C	R8500P-HD	430536C	Q8500P	730246C	Q8500P-HD
	1-1/2	1-1/2	730496C	L8600P	730506C	L8600P-HD	730497C	R8600P	730507C	R8600P-HD	730498C	Q8600P	730508C	Q8600P-HD
	2	2	460617C	L8700P	730269C	L8700P-HD	460618C	R8700P	730270C	R8700P-HD	460616C	Q8700P	730271C	Q8700P-HD
	2-1/2	2	430495C	L8800P	730278C	L8800P-HD	430496C	R8800P	730279C	R8800P-HD	430539C	Q8800P	730280C	Q8800P-HD
	3	2-1/2	430497C	L8900P	730290C	L8900P-HD	430498C	R8900P	730291C	R8900P-HD	430540C	Q8900P	730292C	Q8900P-HD
	4	4	430501C	L81100P	730322C	L81100P-HD	430502C	R81100P	730323C	R81100P-HD	430542C	Q81100P	730324C	Q81100P-HD

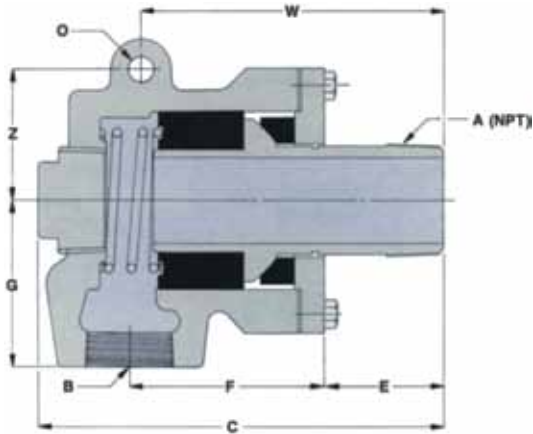
8000 SERIES ROTARY UNIONS • DUAL FLOW														
PART NUMBERS	Nominal Pipe Size (A)	Inlet (B)	Right Hand Thread				Left Hand Thread				Quick Release			
			Standard Spring	Description	Heavy Duty Spring	Description	Standard Spring	Description	Heavy Duty Spring	Description	Standard Spring	Description	Heavy Duty Spring	Description
	1/2	1/2	430504C	R8200S	730219C	R8200S-HD	430503C	L8200S	730218C	L8200S-HD	430543C	Q8200S	730217C	Q8200S-HD
	3/4	3/4	430506C	R8300S	730227C	R8300S-HD	430505C	L8300S	730226C	L8300S-HD	430544C	Q8300S	730228C	Q8300S-HD
	1	1	730859C	R8400S-T	-	-	730858C	L8400S-T	-	-	430545C	Q8400S	730238C	Q8400S-HD
			730861C	XR8400S-T	-	-	730860C	XL8400S-T	-	-	430546C	XQ8400S	730235C	XQ8400S-HD
	1-1/4	1-1/4	430512C	R8500S	730248C	R8500S-HD	430511C	L8500S	730247C	L8500S-HD	430547C	Q8500S	730249C	Q8500S-HD
	1-1/2	1-1/2	730500C	R8600S	730523C	R8600S-HD	730499C	L8600S	730522C	L8600S-HD	730501C	Q8600S	730524C	Q8600S-HD
	2	2	460648C	R8700S	730273C	R8700S-HD	460647C	L8700S	730272C	L8700S-HD	460595C	Q8700S	730274C	Q8700S-HD
	2-1/2	2	430520C	R8800S	730285C	R8800S-HD	430517C	L8800S	730284C	L8800S-HD	430550C	Q8800S	730286C	Q8800S-HD
			430521C	R8800S	730282C	R8800S-HD	430518C	L8800S	730281C	L8800S-HD	430551C	Q8800S	730283C	Q8800S-HD
			430522C	R8800S	730288C	R8800S-HD	430519C	L8800S	730287C	L8800S-HD	430552C	Q8800S	730289C	Q8800S-HD
	3	2-1/2	430526C	R8900S	730296C	R8900S-HD	430523C	L8900S	730293C	L8900S-HD	430553C	Q8900S	730299C	Q8900S-HD
			430527C	R8900S	730297C	R8900S-HD	430524C	L8900S	730294C	L8900S-HD	430554C	Q8900S	730300C	Q8900S-HD
			430528C	R8900S	730298C	R8900S-HD	430525C	L8900S	730295C	L8900S-HD	430555C	Q8900S	730301C	Q8900S-HD
	4	4	430532C	R81100S	730326C	R81100S-HD	430531C	L81100S	730325C	L81100S-HD	430557C	Q81100S	730327C	Q81100S-HD

8000HO SERIES ROTARY UNIONS • MONO FLOW • HOT OIL							
PART NUMBERS	Nominal Pipe Size (A)	Right Hand Thread		Left Hand Thread		Quick Release	
		Part Number	Description	Part Number	Description	Part Number	Description
	1/2	740226C	R8200P-HO	740225C	L8200P-HO	740227C	Q8200P-HO
	3/4	740211C	R8300P-HO	740210C	L8300P-HO	740212C	Q8300P-HO
	1	740242C	R8400P-HO	740241C	L8400P-HO	740243C	Q8400P-HO
	1-1/4	740349C	R8500P-HO	740348C	L8500P-HO	740350C	Q8500P-HO
	1-1/2	740279C	R8600P-HO	740278C	L8600P-HO	740280C	Q8600P-HO
	2	740275C	R8700P-HO	740274C	L8700P-HO	740276C	Q8700P-HO
	2-1/2	740425C	R8800P-HO	750026C	L8800P-HO	780995C	Q8800P-HO
	3	740190C	R8900P-HO	740189C	L8900P-HO	740459C	Q8900P-HO

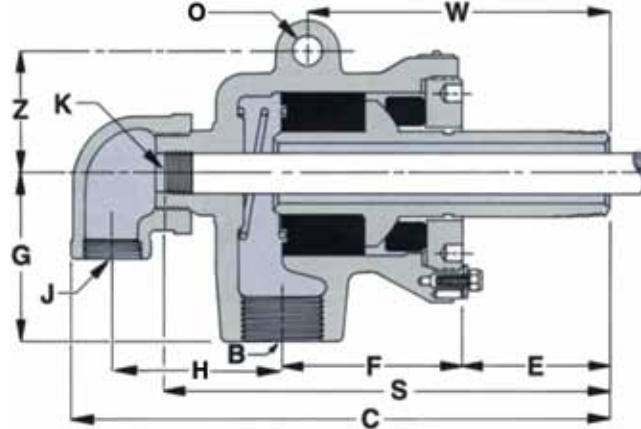
8000HO SERIES ROTARY UNIONS • DUAL FLOW • HOT OIL							
PART NUMBERS	Nominal Pipe Size (A)	Right Hand Thread		Left Hand Thread		Quick Release	
		Part Number	Description	Part Number	Description	Part Number	Description
	1/2	740222C	R8200S-HO	740221C	L8200S-HO	-	Q8200S-HO
	3/4	740324C	R8300S-HO	740323C	L8300S-HO	740325C	Q8300S-HO
	1	740321C	R8400S-HO	740320C	L8400S-HO	740322C	Q8400S-HO
	1-1/4	740388C	R8500S-HO	740387C	L8500S-HO	740389C	Q8500S-HO
	1-1/2	740282C	R8600S-HO	740281C	L8600S-HO	740283C	Q8600S-HO
	2	740272C	R8700S-HO	740271C	L8700S-HO	740273C	Q8700S-HO
		740314C	R8800S-HO	740313C	L8800S-HO	740315C	Q8800S-HO
	2-1/2	740267C	R8800S-HO	740266C	L8800S-HO	740268C	Q8800S-HO
		740286C	R8900S-HO	740285C	L8900S-HO	740287C	Q8900S-HO

# 8000 SERIES

## Mono Flow



## Dual Flow

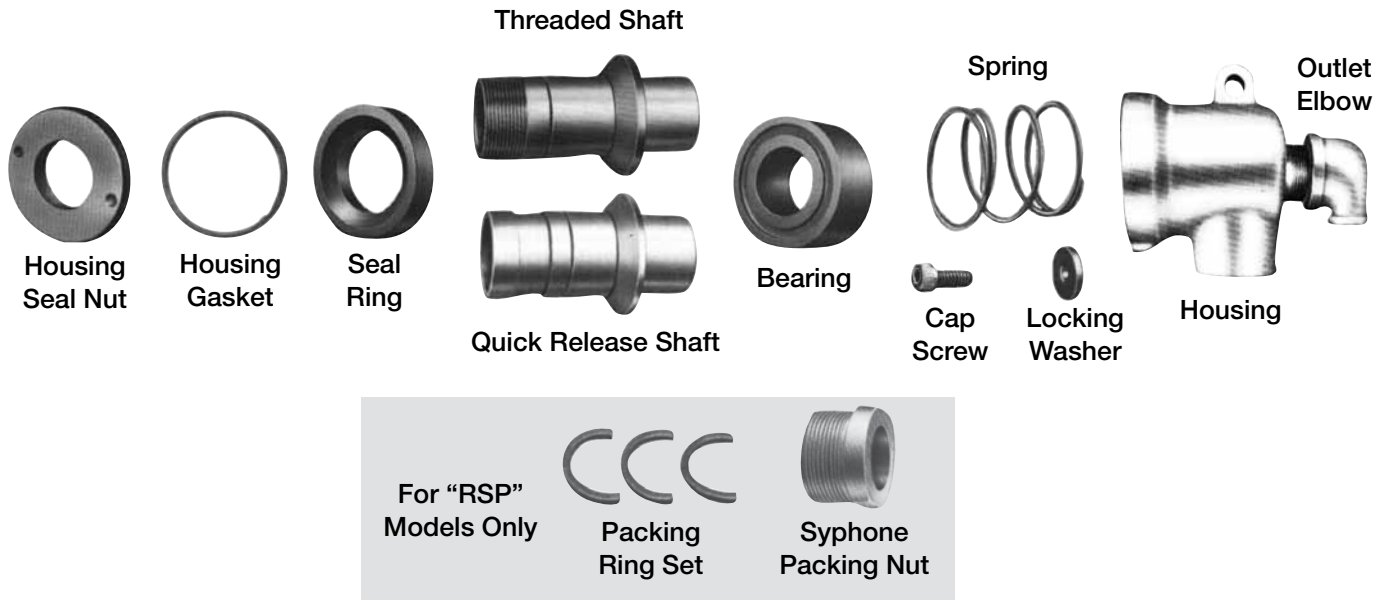


8000 SERIES ROTARY UNIONS • STEAM & HOT OIL • MONO FLOW (in.)

DIMENSIONS	Nominal Pipe Size (A)	Inlet B (NPT)	F	E	G	Overall Length (C)	W	Z	O
	1/2	1/2	2-1/2	2-1/8	2	6-1/4	4-7/16	1-5/8	15/32
		Quick Release							
	3/4	3/4	2-1/2	2-3/16	2-3/8	6-3/8	4-11/16	1-13/16	15/32
		Quick Release							
	1	1	2-3/4	2-5/16	2-5/8	7-1/8	4-7/8	1-7/8	15/32
		Quick Release							
	1-1/4	1-1/4	3-3/16	2-1/2	3	8-1/8	5-5/8	2-1/8	5/8
		Quick Release							
	1-1/2	1-1/2	3-3/4	2-1/2	3-1/2	8-13/16	6	2-7/8	5/8
Quick Release									
2	2	4	2-9/16	4	9-1/2	6-9/16	3-1/8	5/8	
	Quick Release								
2-1/2	2	5-3/16	3-3/16	4-7/16	10-7/8	8	3-9/16	11/16	
	Quick Release								
3	2-1/2	5-3/4	3-5/8	4-9/16	12-3/16	8-1/2	3-31/32	7/8	
	Quick Release								
4	4	8-1/8	5-7/16	6-5/16	16-7/8	13-1/2	5-1/8	1-3/32	
	Quick Release								

8000 SERIES ROTARY UNIONS • STEAM & HOT OIL • DUAL FLOW (in.)

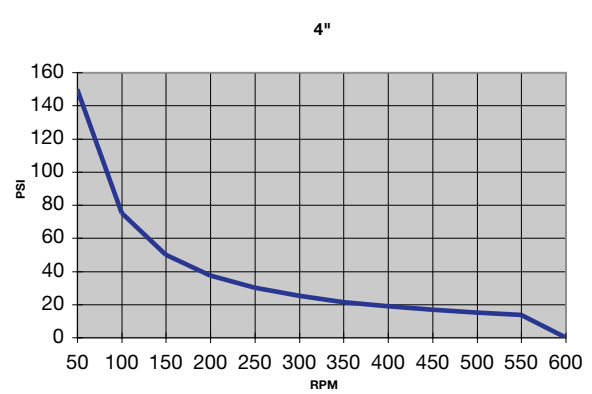
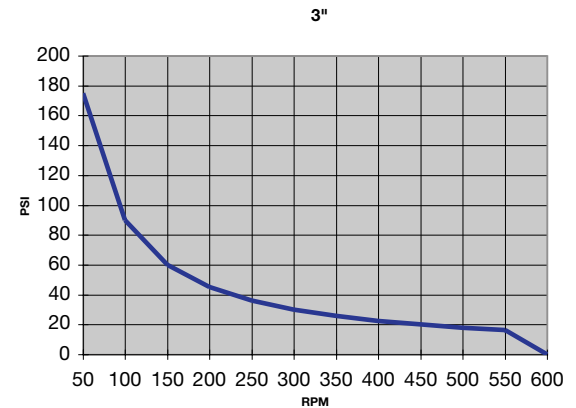
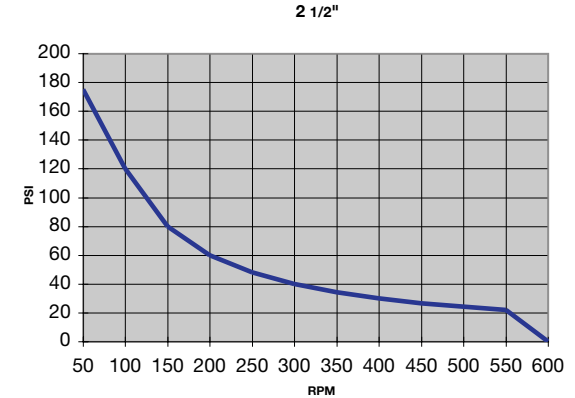
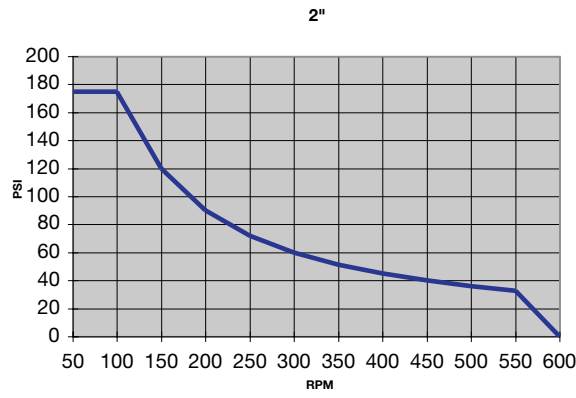
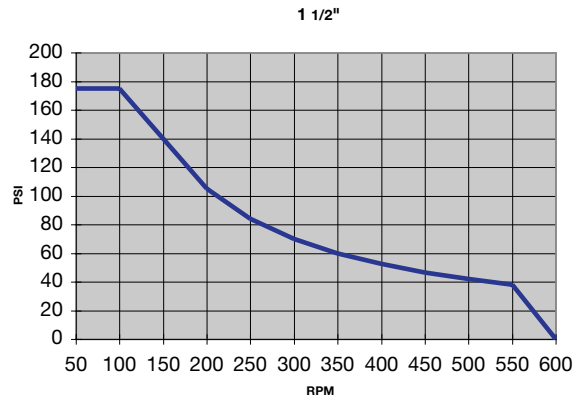
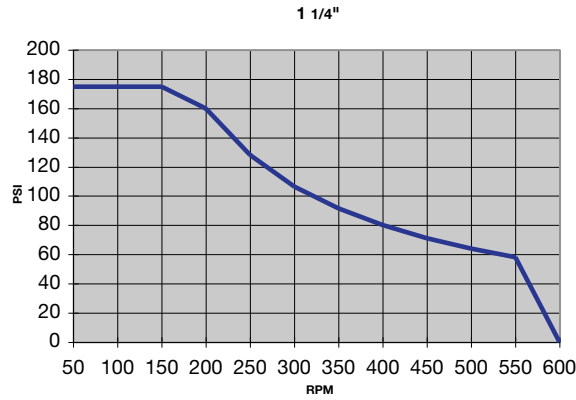
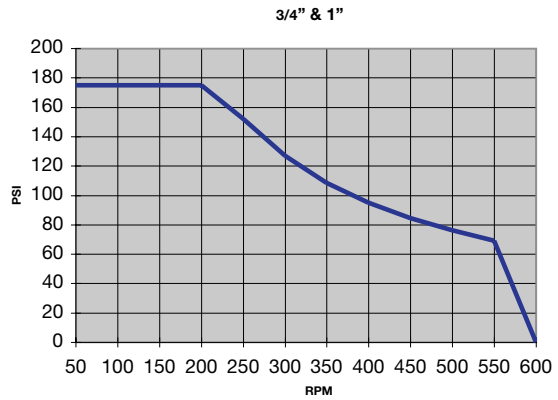
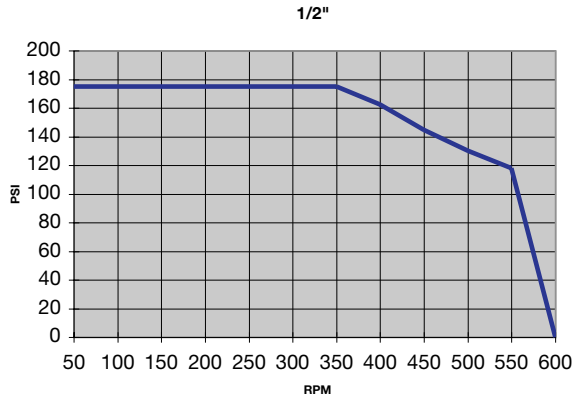
DIMENSIONS	Nominal Pipe Size (A)	Inlet B (NPT)	Outlet J (NPT)	Siphon Tap K (NPSM)	C	F	E	G	S	W	Z	O	H
	1/2	1/2	1/2	1/8	7-1/2	2-1/2	2-1/8	2	6-1/16	4-7/16	1-5/8	15/32	2-1/4
	3/4	3/4	1/2	1/4	7-11/16	2-1/2	2-3/16	2-3/8	6-1/4	4-11/16	1-13/16	15/32	2-5/16
	1	1	1/2	3/8	8-3/4	2-3/4	2-5/16	2-5/8	6-15/16	4-7/8	1-7/8	15/32	2-5/8
			1/2	1/4									
	1-1/4	1-1/4	1/2	1/2	9-1/4	3-3/16	2-1/2	3	7-7/8	5-5/8	2-1/8	5/8	3-1/8
	1-1/2	1-1/2	3/4	3/4	10-3/8	3-3/4	2-1/2	3-1/2	8-5/8	6	2-7/8	5/8	3-9/16
	2	2	1	3/4	11-11/16	4	2-9/16	4	9-1/2	6-9/16	3-1/8	5/8	4
	2-1/2	2	1-1/4	3/4	14-1/8	5-3/16	3-3/16	4-7/16	11-1/4	8	3-9/16	11/16	5-1/16
				1									
1-1/4													
3	2-1/2	1-1/4	1	17	5-3/4	3-5/8	4-9/16	12-1/2	8-1/2	3-31/32	7/8	5-9/16	
		1-1/4	1-1/4										
		1-1/2	1-1/2										
4	4	2-1/2	2	24-1/4	8-1/8	5-7/16	6-5/16	18-1/8	13-1/2	5-1/8	1-3/32	7-3/4	



8000 SERIES ROTARY UNIONS • 1/2" to 1 1/4" REPAIR PARTS • STEAM ONLY										
REPAIR PARTS	Nominal Pipe Size	Mono Flow Housing	Dual Flow Housing	Rotating Siphon Housing Part Number	LH Shaft (NPT)	RH Shaft (NPT)	Quick Release Shaft	Graphite Bearing	8000 Series Spring	8000 Series Hot Oil Heavy Duty Spring
	1/2	487240C	487242C	Contact factory	471050C	471051C	471818C	484247C	484246C	487912C
	3/4	487248C	487252C	Contact factory	481759C	481760C	471894C	484005C	484039C	487909C
	1	487153C	487148C	441147C	441878C	441879C	471094C	484007C	484026C	487872C
	1-1/4	487214C	487217C	Contact factory	481753C	481754C	471095C	484009C	484033C	487911C
REPAIR PARTS	Nominal Pipe Size	Graphite Seal Ring	Housing Gasket	Housing Seal Nut	Lock Washer	Socket Head Cap Screw	Rotating Siphon Models Only			
							Outlet Elbow	Siphon Packing Nut	Siphon Packing Ring Set	
	1/2	484245C	484361C	487239C	484037C	854295C	487234C	482039C	482745C	
	3/4	484004C	484038C	487304C	484037C	854295C	487235C	482038C	481473C	
	1	484006C	484025C	487159C	484023C	854295C	487160C	482040C	481475C	
1-1/4	484008C	484032C	487213C	484031C	854295C	487212C	482041C	471476C		

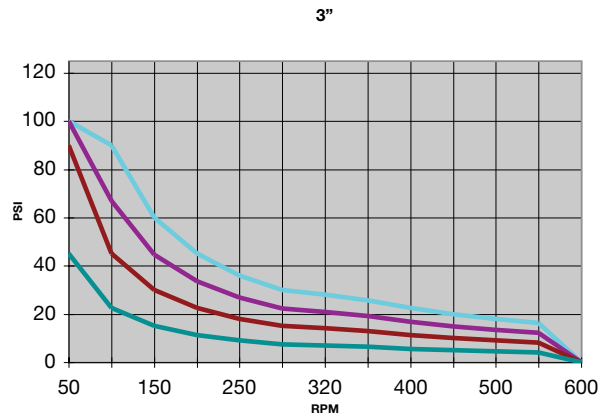
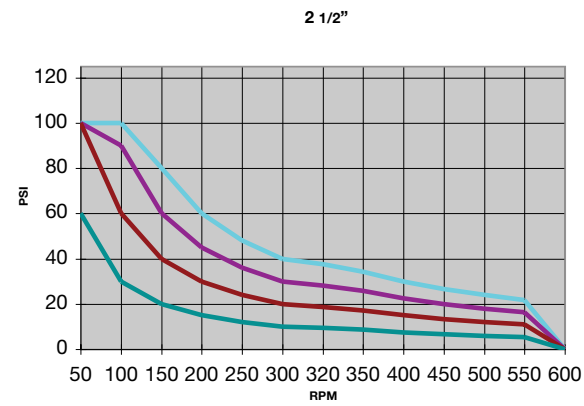
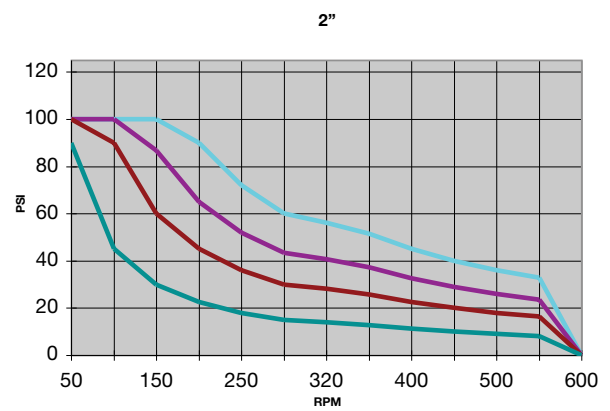
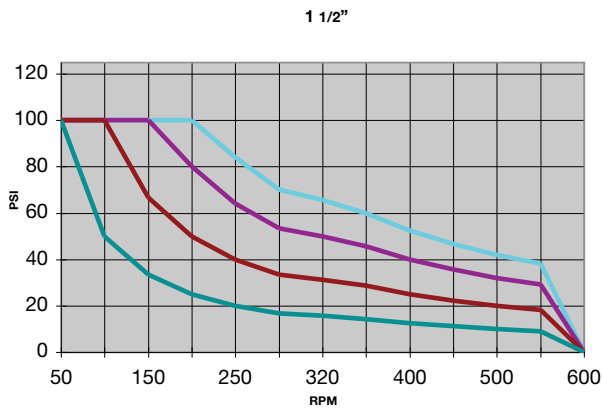
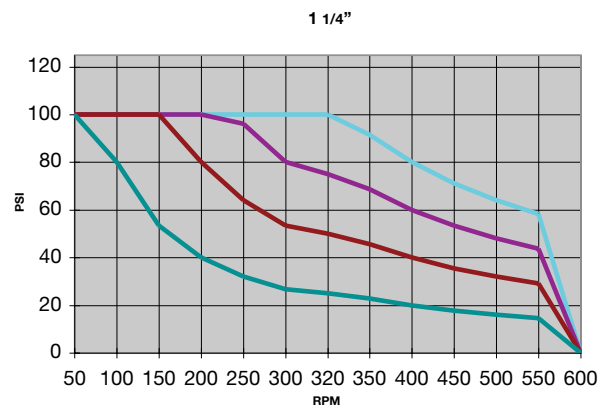
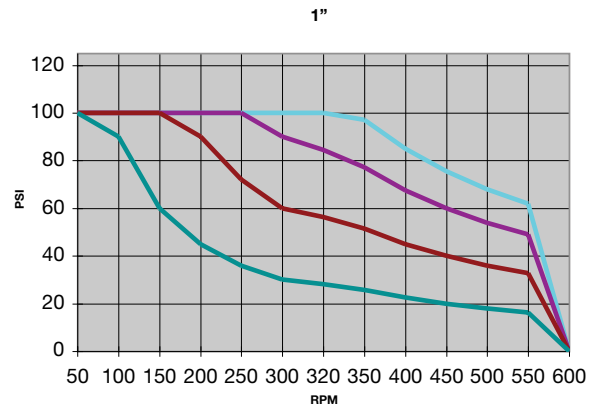
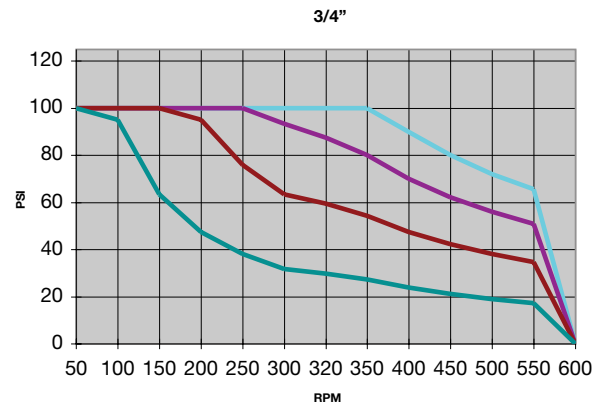
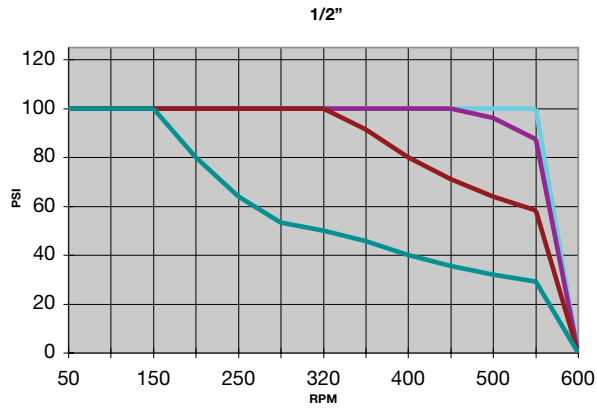
8000 SERIES ROTARY UNIONS • 1 1/2" to 4" REPAIR PARTS • STEAM ONLY										
REPAIR PARTS	Nominal Pipe Size	Mono Flow Housing	Dual Flow Housing	Rotating Siphon Housing Part Number	LH Shaft (NPT)	RH Shaft (NPT)	Quick Release Shaft	Graphite Bearing	8000 Series Spring	8000 Series Hot Oil Heavy Duty Spring
	1-1/2	Contact Factory	Contact Factory	N/A	481756C	481757C	471096C	484011C	484034C	487910C
	2	Contact Factory	Contact Factory		471055C	471056C	471097C	484301C	484300C	487903C
	2-1/2	Contact Factory	Contact Factory		471777C	471776C	471775C	485416C	485415C	463306C
	3	Contact Factory	Contact Factory		471796C	471795C	471797C	485467C	485466C	487305C
	4	Contact Factory	Contact Factory		471838C	471837C	471836C	485594C	485595C	463025C
REPAIR PARTS	Nominal Pipe Size	Graphite Seal Ring	Housing Gasket	Housing Flange	Housing Cap Screw	Housing Plug for Mono Flow Models	Outlet Elbow for Dual Flow Models Only	Siphon Packing Nut for RSP Models	Siphon Packing Ring for RSP Models	
	1-1/2	484010C	463514C	463513C	855366C	N/A	487171C	482042C	481477C	
	2	484249C	487927C	487926C	855236C	N/A	487155C	482042C	481477C	
	2-1/2	485420C	485421C	487208C	485545C	Contact Factory	487209C	N/A	N/A	
	3	485470C	485471C	487236C	485545C	Contact Factory	487303C	N/A	N/A	
	4	485596C	485593C	487238C	485605C	Contact Factory	487329C	N/A	N/A	

## Performance Charts





# Performance Charts



■ 600°     
 ■ 550°     
 ■ 500°     
 ■ 450°

# 9000G SERIES

WATER, STEAM & HOT OIL

HIGH TEMPERATURE



**MODELS  
ADDED**

## Operating Parameters

### MEDIA

Steam, Hot Oil, Water

### PRESSURE\*

250 psi (Water), 175 psi (Steam),  
100 psi (Hot Oil)

### TEMPERATURE\*

600° F (Hot Oil), 378° F (Steam)

### SPEED\*

700 RPM

### THREADS

- 1/4" to 3" NPT
- BSP Threads Available
- Flanged

### MATERIAL

- Cast Iron Housing with Stainless Steel or Plated Sleeve
- Steel Shaft

### CONFIGURATION OPTIONS

Mono Flow & Dual Flow Configurations Available

\* See Performance Charts For Details

## Features & Benefits

### Superior Sealing Performance

Bellows Sealing System provides superior sealing performance throughout the wear life of the Rotary Union.

### Designed For Dirty Media Applications

Debris in contaminated media will not be captured in the Bellows Sealing System, which reduces clogging.

### Maintenance Free

The 9000G is maintenance free because there is no rolling element bearing, therefore no lubrication is required.

### High Temperature Applications

Offers the same design as the standard 9000 Series, but utilizes carbon graphite bearings for high temperature applications.

### Ideal For High Temperatures

The thrust collar allows for thermal expansion, making this an ideal union for high temperature, general purpose applications.

### Flanged Mounted Units Available

Consult Factory.

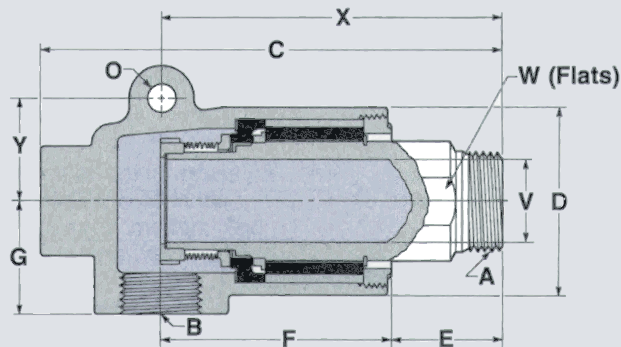
9000G SERIES HIGH TEMPERATURE ROTARY UNIONS • MONO FLOW

PART NUMBERS	Nominal Pipe Size	Shaft Thread (A)	Right Hand Thread			Left Hand Thread		
			Part Number	Description	Repair Cartridge	Part Number	Description	Repair Cartridge
			1/4	1/4	<b>480630C</b>	R050P	481323C	<b>480629C</b>
3/8	3/8	<b>480632C</b>	R150P	481325C	<b>480631C</b>	L150P	481324C	
1/2	1/2	<b>480198C</b>	R250P	481204C	<b>480197C</b>	L250P	481203C	
3/4	3/4	<b>480247C</b>	R350P	481208C	<b>480246C</b>	L350P	481207C	
1	1	<b>430111C</b>	R450P-8	471882C	<b>430110C</b>	L450P-8	471881C	
1-1/4	1-1/4	<b>440581C</b>	R9550P	471665C	<b>440580C</b>	L9550P	471664C	
1-1/2	1-1/2	<b>440165C</b>	R9650P	471575C	<b>440164C</b>	L9650P	471576C	
2	2	<b>440469C</b>	R9750P	471716C	<b>440468C</b>	L9750P	471715C	
2-1/2	2-1/2	<b>440577C</b>	R9850P	471718C	<b>440576C</b>	L9850P	471717C	
3	3	<b>440505C</b>	R9950P	471720C	<b>440504C</b>	L9950P	471719C	

9000G SERIES HIGH TEMPERATURE ROTARY UNIONS • DUAL FLOW

PART NUMBERS	Nominal Pipe Size	Shaft Thread (A)	Right Hand Thread			Left Hand Thread		
			Part Number	Description	Repair Cartridge	Part Number	Description	Repair Cartridge
			1/2	1/2	<b>480204C</b>	R250S	481204C	<b>480203C</b>
3/4	3/4	<b>480253C</b>	R350S	481208C	<b>480252C</b>	L350S	481207C	
1	1	<b>430113C</b>	R450S-8	471882C	<b>430112C</b>	L450S-8	471881C	
1-1/4	1-1/4	<b>440583C</b>	R9550S	471665C	<b>440582C</b>	L9550S	471664C	
1-1/2	1-1/2	<b>440167C</b>	R9650S	471575C	<b>440166C</b>	L9650S	471576C	
2	2	<b>440471C</b>	R9750S	471716C	<b>440470C</b>	L9750S	471715C	
2-1/2	2-1/2	<b>440579C</b>	R9850S	471718C	<b>440578C</b>	L9850S	471717C	
3	3	<b>440507C</b>	R9950S	471720C	<b>440506C</b>	L9950S	471719C	

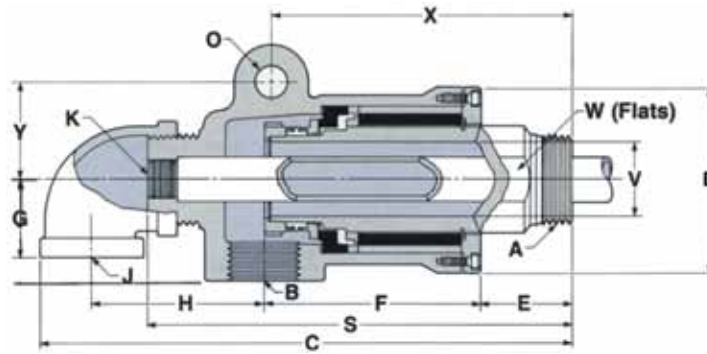
Mono Flow



9000G SERIES HIGH TEMPERATURE ROTARY UNIONS • MONO FLOW (in.)

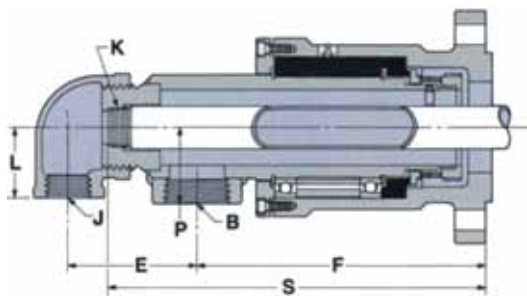
DIMENSIONS	Nominal Pipe Size	Shaft Thread (A)	Right Hand Thread			Left Hand Thread			Inlet Thread (B)	C	D	E	F	G	O	V	W	X	Y
			Part Number	Description	Repair Cartridge	Part Number	Description	Repair Cartridge											
			1/4	1/4	<b>480630C</b>	R050P	481323C	<b>480629C</b>											
3/8	3/8	<b>480632C</b>	R150P	481325C	<b>480631C</b>	L150P	481324C	3/8	4-3/8	1-3/4	1-1/8	2-9/16	1-1/16	—	3/8	11/16	—	—	
1/2	1/2	<b>480198C</b>	R250P	481204C	<b>480197C</b>	L250P	481203C	1/2	5	2-3/8	1-1/2	2-3/4	1-1/4	—	1/2	15/16	—	—	
3/4	3/4	<b>480247C</b>	R350P	481208C	<b>480246C</b>	L350P	481207C	3/4	5-1/2	2-1/2	1-5/8	3	1-7/16	—	3/4	1-3/32	—	—	
1	1	<b>430111C</b>	R450P-8	471882C	<b>430110C</b>	L450P-8	471881C	1	6-1/8	3	1-3/4	3-3/8	1-3/4	—	1	1-11/32	—	—	
1-1/4	1-1/4	<b>440581C</b>	R9550P	471665C	<b>440580C</b>	L9550P	471664C	1-1/4	9-1/16	3-3/4	2-1/16	4-13/16	2-3/16	5/8	1-1/4	1-11/16	6-7/8	2	
1-1/2	1-1/2	<b>440165C</b>	R9650P	471575C	<b>440164C</b>	L9650P	471576C	1-1/2	9-11/16	4-1/8	2-3/16	5-1/4	2-3/16	5/8	1-1/2	1-15/16	7-3/8	2-1/4	
2	2	<b>440469C</b>	R9750P	471716C	<b>440468C</b>	L9750P	471715C	2	11-3/4	5-7/8	2-7/16	6-7/16	2-5/8	5/8	2	2-9/16	8-9/16	2-3/4	
2-1/2	2-1/2	<b>440577C</b>	R9850P	471718C	<b>440576C</b>	L9850P	471717C	2-1/2	15-3/8	7-1/8	3-1/2	7-3/16	3-3/8	—	2-1/2	3	—	—	
3	3	<b>440505C</b>	R9950P	471720C	<b>440504C</b>	L9950P	471719C	3	15-3/4	7-1/8	3-7/8	8-5/16	3-7/8	—	3	3-5/8	—	—	

## Dual Flow

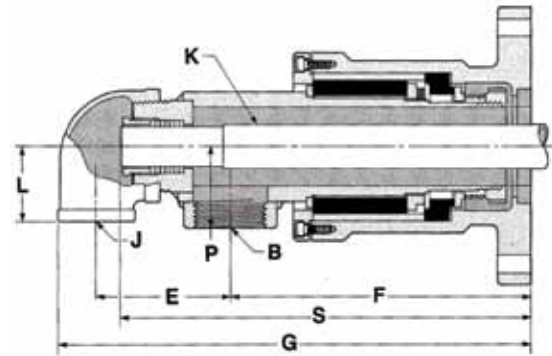


9000G SERIES HIGH TEMPERATURE ROTARY UNIONS • DUAL FLOW (in.)																	
DIMENSIONS	Nominal Pipe Size	Shaft Thread (A)	Inlet (B)	Outlet (J)	Siphon K (NPSM)	C	D	E	F	G	H	O	S	V	W	X	Y
	1/2	1/2	1/2	1/2	1/8	7-1/4	2-3/8	1-1/2	2-3/4	1-1/4	2-1/8	—	6	1/2	15/16	—	—
	3/4	3/4	3/4	1/2	1/4	7-3/4	2-1/2	1-5/8	3	1-7/16	2-3/8	—	6-3/8	3/4	1-3/32	—	—
	1	1	1	1/2	3/8	8-1/2	3	1-3/4	3-3/8	1-3/4	2-5/8	—	7-1/8	1	1-11/32	—	—
	1-1/4	1-1/4	1-1/4	1/2	1/2	10-5/8	3-3/4	2-1/8	4-13/16	2	3	5/8	8-7/8	1-1/4	1-11/16	6-7/8	2
	1-1/2	1-1/2	1-1/2	3/4	3/4	11-3/8	4-1/8	2-3/16	5-1/4	2-3/16	3-1/4	5/8	9-9/16	1-1/2	1-15/16	7-3/8	2-1/4
	2	2	2	1	3/4	13-7/8	5	2-7/16	6-1/2	2-5/8	4-1/16	5/8	11-1/2	2	2-9/16	8-9/16	2-3/4
	2-1/2	2-1/2	2	1-1/4	1	16-7/8	6-1/2	3-1/2	7-1/4	3-3/8	5	—	14	2-1/2	3	—	—
	3	3	2-1/2	1-1/4	1-1/4	18-3/4	7-1/8	3-1/2	8-5/16	3-7/8	5-1/2	—	15-5/8	3	3-5/8	—	—

## Dual Flow Flange



## RSP Flange



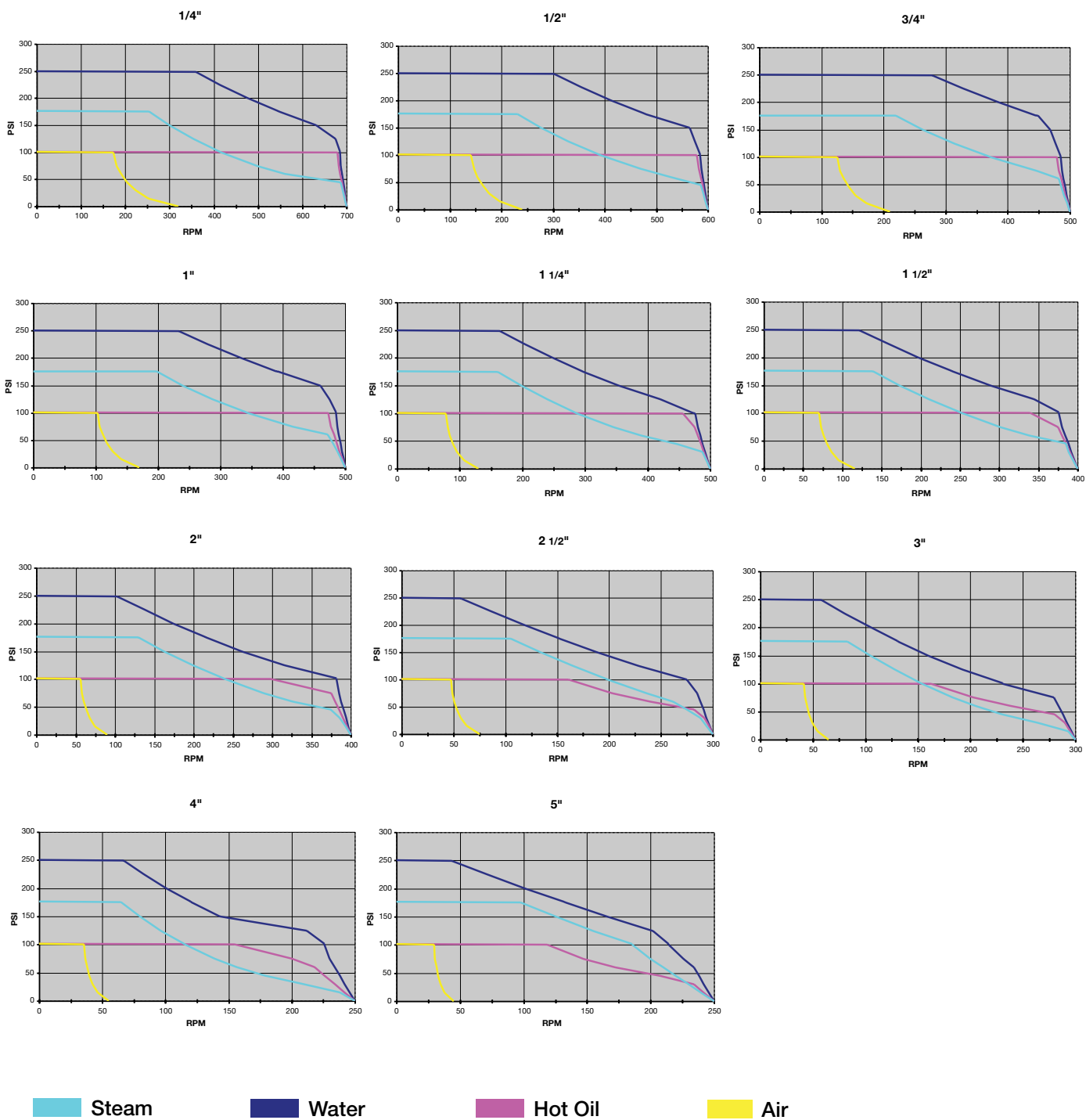
9000G SERIES HIGH TEMPERATURE ROTARY UNIONS • DUAL FLOW (in.) • FLANGE													
DIMENSIONS	Shaft ID (A)	Part Number	Description	Repair Cartridge	Shaft ID (A)	Inlet B (NPT)	Outlet J (NPT)	Syphon Tap K (NPSM)	E	F	S	L	P
	1-1/4	Consult Factory	580S-2-U	Consult Factory	1-1/4	1	1/2	1/2	2-3/4	7-1/16	8-7/8	1-5/8	1-5/8
	1-1/2		680S-2-U		1-1/2	1-1/4	3/4	3/4	3-3/8	7-11/16	9-15/16	1-13/16	1-7/8
	2		780S-2-U		2	1-1/2	1	3/4	3-13/16	9-1/16	11-1/2	2-1/16	2-5/16
	2-1/2		880S-2-U		2-1/2	2	1-1/4	1	4-3/4	10-5/16	13-9/16	2-5/8	2-5/8
	3		980S-2-U		3	2-1/2	1-1/4	1-1/4	5-1/4	11-7/8	15-1/2	2-7/8	3-1/16
	4	1080S-1-U	4	Consult Factory	Consult Factory	Consult Factory	--	--	--	--	--	--	
	5	1180S-1-U	5	Consult Factory	Consult Factory	Consult Factory	--	--	--	--	--	--	

Models Added

9000G SERIES HIGH TEMPERATURE ROTARY UNIONS • ROTATING SIPHON PIPE (in.) • FLANGE															
DIMENSIONS	Shaft ID	Part Number	Description	Repair Cartridge	Shaft ID	Inlet B (NPT)	Outlet J (NPT)	Siphon Size K (NPSM)	Maximum Siphon Size	E	F	G	L	P	S
	1-1/4	Consult Factory	588-20-U	Consult Factory	1-1/4	1	1/2	1/2	1/2	2-3/4	7-1/16	10-7/16	1-5/8	1-5/8	9-1/2
	1-1/2		688-30-U		1-1/2	1-1/4	3/4	3/4	3/4	3-3/8	7-11/16	11-13/16	1-13/16	1-7/8	10-3/4
	2		788-30-U		2	1-1/2	1	3/4	1	3-13/16	9-1/16	13-3/4	2-1/16	2-5/16	12-1/4
	2-1/2		888-40-U		2-1/2	2	1-1/4	1	1-1/2	4-3/4	10-5/16	16-1/2	2-5/8	2-5/8	14-1/4
	3		988-50-U		3	2-1/2	1-1/4	1-1/4	2	5-1/4	11-7/8	18-3/16	2-7/8	3-1/16	16-1/4
	4	Consult Factory	4	Consult Factory	Consult Factory	Consult Factory	2-1/2	--	--	--	--	--	--		
	5	Consult Factory	5	Consult Factory	Consult Factory	Consult Factory	3	--	--	--	--	--	--		

Models Added

# Performance Charts



# HPMC • HSMC SERIES

MULTI-PORT ROTARY UNIONS



## Operating Parameters

### MEDIA

Water, Air, Hydraulic Fluid

### PRESSURE\*

170 psi (HSMC), 5,880 psi (HPMC)

### TEMPERATURE\*

248° F (HSMC & HPMC)

### SPEED\*

3,000 RPM (HSMC), 180 RPM (HPMC)

### THREADS

3/8" to 3/4" NPT or BSP

### MATERIAL

Nickel Plated Steel

### STANDARD NUMBER OF PORTS

2 to 8

\* See Performance Charts  
For Details

## Features & Benefits

### High Pressure Or High Speed Applications

Duff-Norton multi-port Rotary Unions are available in both high pressure (HPMC Series) and high speed (HSMC Series) configurations.

### Pressures Up To 5,880 psi

HPMC Series Rotary Unions are designed for higher pressure, available with up to eight ports as standard and are suitable for use in low speed applications for pressures up to 5,880 psi.

### Available Up To 8 Ports

HSMC Series Rotary Unions are available with up to four ports as standard. HPMC Series Rotary Unions offer up to eight ports as standard.

### Speeds Up To 3,000 RPM

HSMC Series is perfect for low pressure applications, up to 170 psi with rotational speeds up to 3,000 RPM.

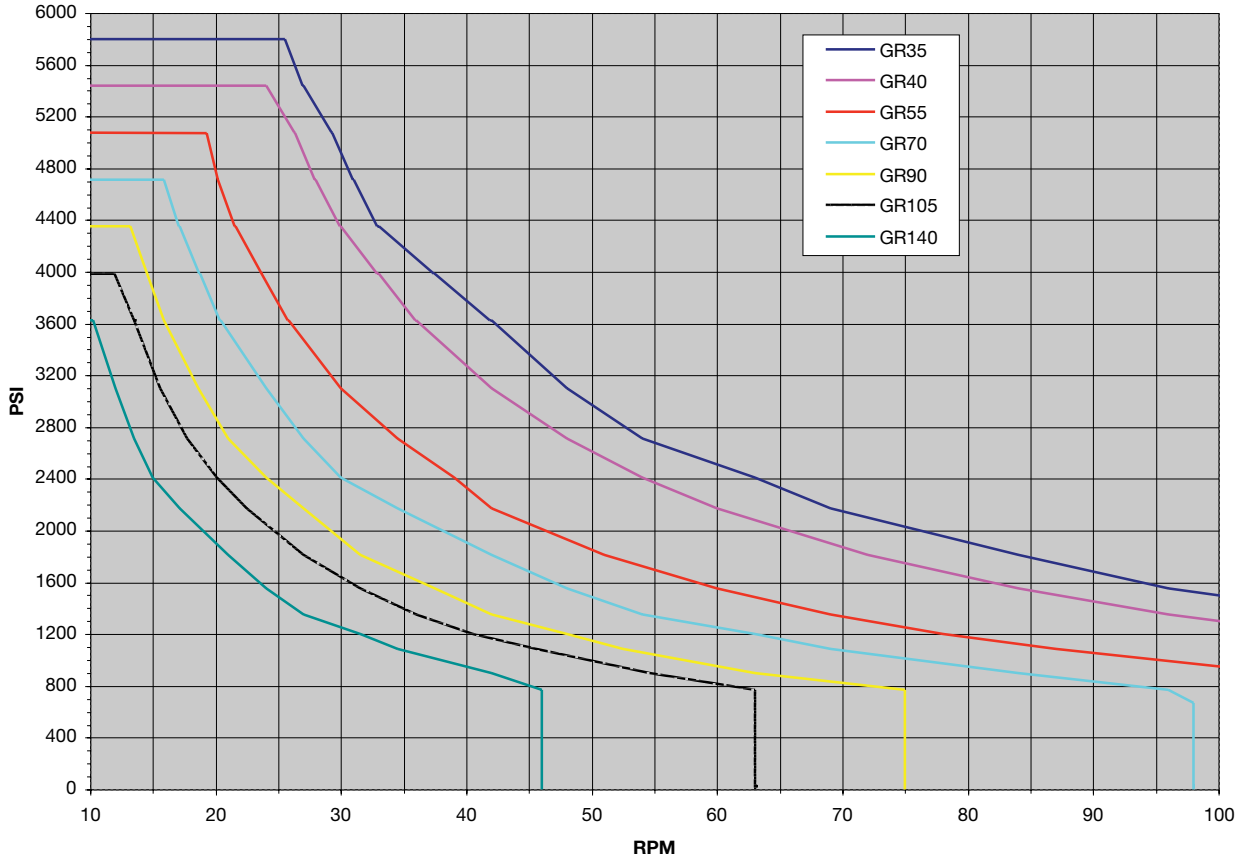
### No Cross Contamination

Feel free to run dissimilar fluids through Duff-Norton Multi-Port Rotary Unions as each port is always individually sealed eliminating cross contamination between circuits.



Performance Charts

HPMC Series



GR seals are used in these High Pressure Multi-Circuit Models

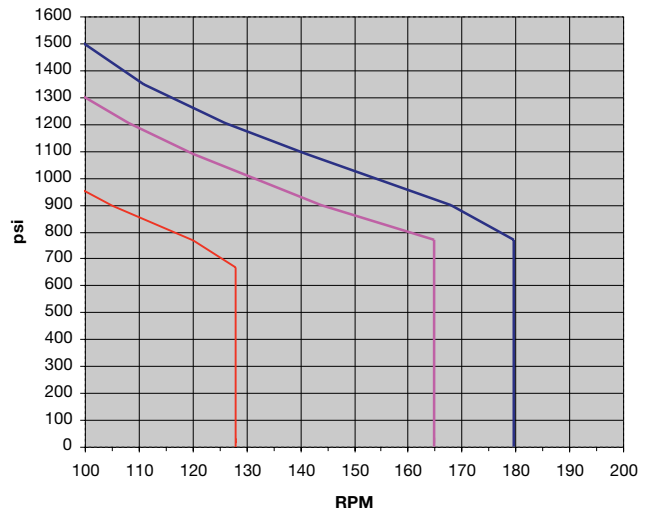
GR35	GR40	GR55	GR70	GR90	GR105	GR140
MC206R2K	MC706R2K	MC608R2K	MC810R2K	MC612R2K	MC525R2K	MC531R2K
MC306R2K	MC806R2K	MC708R2K	MC512R2K	MC712R2K	MC231R2K	
MC406R2K	MC208R2K	MC808R2K	MC218R2K	MC812R2K	MC331R2K	
MC506R2K	MC308R2K	MC510R2K	MC318R2K	MC518R2K	MC431R2K	
MC606R2K	MC408R2K	MC610R2K	MC418R2K	MC618R2K		
	MC508R2K	MC710R2K		MC225R2K		
	MC210R2K	MC212R2K		MC325R2K		
	MC310R2K	MC312R2K		MC425R2K		
	MC410R2K	MC412R2K				

Performance charts are for oil, grease or similar lubricating media. For media such as water or air, reduce the maximum recommended speed as follows:

- For Water: Multiply speed by 0.67
- For Air: Multiply speed by 0.33

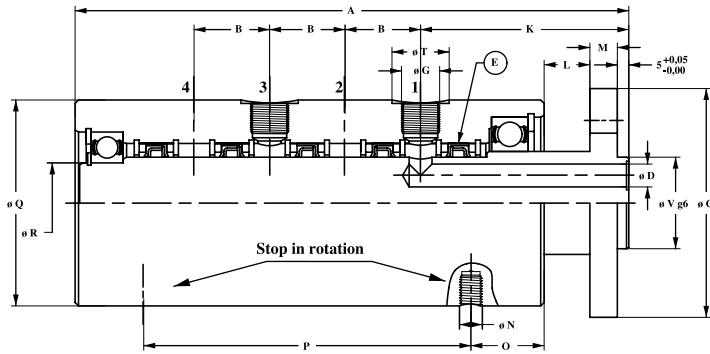
Where maximum recommended speeds are found on the horizontal axis.

HPMC Series Over 100 RPM

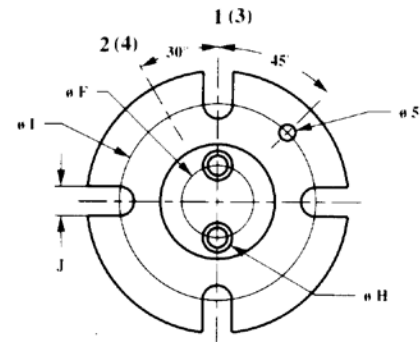




### HSMC Series



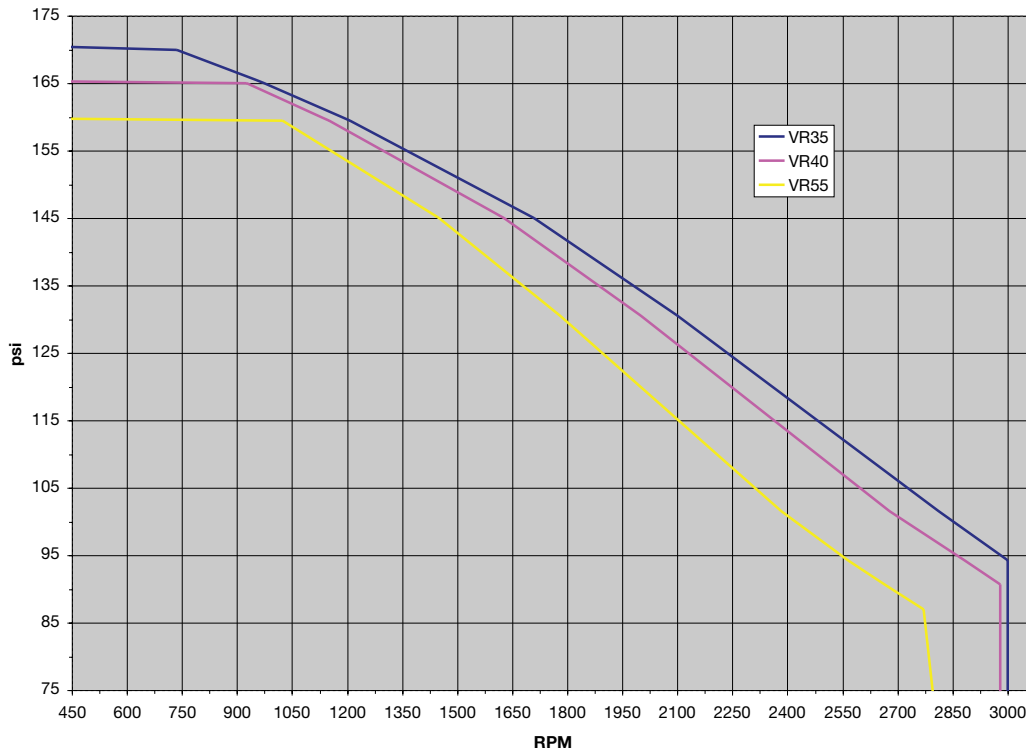
### HSMC End



HSMC MULTI-PORT ROTARY UNIONS (in.)

Number of Ports	Part Number	Description	A	B	C	D	V	F	G (NPT)	H	Ref. O-ring	I	J	K	L	M	N	O	P	Q	R	T
2	750889C	RMC206RVRKNPT	5.89	1.04	3.15	0.24	35	0.87	1/8"	0.35	06X01.5	2.36	0.35	3.05	0.59	0.39	M8	1.26	2.26	3.15	1.18	0.71
3	750809C	RMC306RVRKNPT	6.93	1.04	3.15	0.24	35	0.87	1/8"	0.35	06X01.5	2.36	0.35	3.05	0.59	0.39	M8	1.26	3.31	3.15	1.18	0.71
4	750810C	RMC406RVRKNPT	7.97	1.04	3.15	0.24	35	0.87	1/8"	0.35	06X01.5	2.36	0.35	3.05	0.59	0.39	M8	1.26	4.35	3.15	1.18	0.71
2	750811C	RMC208RVRKNPT	6.77	1.22	3.94	0.31	40	0.94	1/4"	0.47	R6A	2.83	0.43	3.54	0.79	0.47	M10	1.26	2.87	3.54	1.38	0.87
3	750812C	RMC308RVRKNPT	7.99	1.22	3.94	0.31	40	0.94	1/4"	0.47	R6A	2.83	0.43	3.54	0.79	0.47	M10	1.26	4.09	3.54	1.38	0.87
4	750813C	RMC408RVRKNPT	9.21	1.22	3.94	0.31	40	0.94	1/4"	0.47	R6A	2.83	0.43	3.54	0.79	0.47	M10	1.26	5.31	3.54	1.38	0.87
2	750814C	RMC210RVRKNPT	6.93	1.30	3.94	0.39	40	0.94	3/8"	0.49	010X01.3	2.83	0.43	3.58	0.79	0.47	M10	1.26	3.03	3.54	1.38	0.98
3	750815C	RMC310RVRKNPT	8.23	1.30	3.94	0.39	40	0.94	3/8"	0.49	010X01.3	2.83	0.43	3.58	0.79	0.47	M10	1.26	4.33	3.54	1.38	0.98
4	750816C	RMC410RVRKNPT	9.53	1.30	3.94	0.39	40	0.94	3/8"	0.49	010X01.3	2.83	0.43	3.58	0.79	0.47	M10	1.26	5.63	3.54	1.38	0.98

### Performance Charts



VR seals are used in these High Speed Multi-Circuit Models		
GR35	GR40	GR55
MC206R VR	MC208R VR	MC212R VR
MC306R VR	MC308R VR	MC312R VR
MC406R VR	MC408R VR	MC412R VR
	MC210R VR	
	MC310R VR	
	MC410R VR	

Performance chart is for lubricated air, dry air, liquid and oils.

Maximum recommended speeds are found on the horizontal axis.

# 1600 SERIES

## TWO PORT ROTARY UNION



### Operating Parameters

#### MEDIA

Water, Air, Hydraulic Fluid

#### PRESSURE\*

2,900 psi

#### TEMPERATURE\*

250° F

#### SPEED\*

1,500 RPM

#### THREADS

- 1/4" to 1" NPT
- BSP & BSPP Available

#### MATERIAL

Nickel Plated Steel

Also available in all stainless steel with a hardened ceramic shaft for higher speed and longer life.

#### STANDARD NUMBER OF PORTS

Two Port Design

\* See Performance Charts For Details

## Features & Benefits

### Two Port Design

Features two ports for use in a wide variety of applications.

### Corrosion Resistant

Nickel plated steel for corrosion resistance. Also available in all stainless steel and with a hardened ceramic shaft for higher speeds and longer life.

### Medium Speed & Medium Pressure Capable

Offers the ability to use medium speed and pressure simultaneously.

### No Cross Contamination

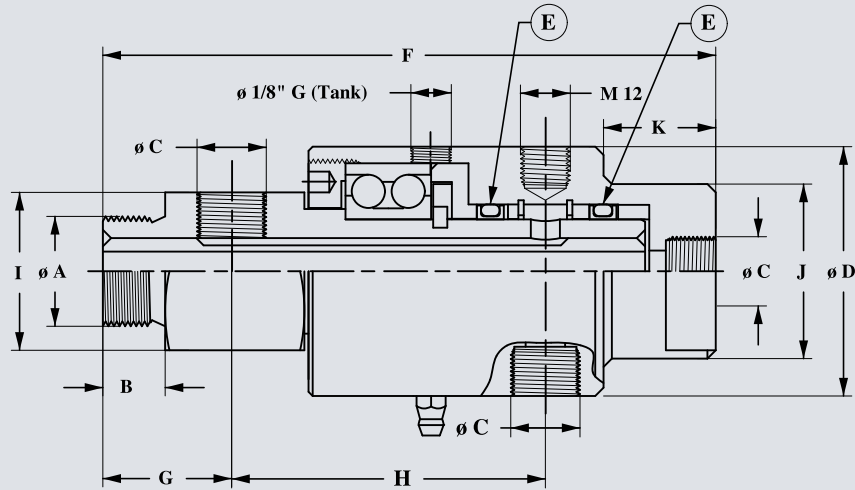
The 1600 Series can be used with two dissimilar fluids. All circuits are individually sealed eliminating cross contamination.

1600 SERIES TWO PORT ROTARY UNIONS

PART NUMBERS	Nominal Pipe Size	Nickel Plated Steel				Hardened Shaft			
		Left Hand Thread		Right Hand Thread		Left Hand Thread		Right Hand Thread	
		Part Number	Description	Part Number	Description	Part Number	Description	Part Number	Description
	2 x 1/4	760607C	L16191/4KNPT	760612C	R16191/4KNPT	760617C	L16191/4KCNPT	760622C	R16191/4KCNPT
	2 x 3/8	760608C	L16833/8KNPT	760613C	R16833/8KNPT	760618C	L16833/8KCNPT	760623C	R16833/8KCNPT
	2 x 1/2	760609C	L16441/2KNPT	760614C	R16441/2KNPT	760619C	L16441/2KCNPT	760624C	R16441/2KCNPT
	2 x 3/4	760610C	L16443/4KNPT	760615C	R16443/4KNPT	760620C	L16443/4KCNPT	760625C	R16443/4KCNPT
	2 x 1	760611C	L17601KNPT	760616C	R17601KNPT	760621C	L17601KCNPT	760626C	R17601KCNPT

\* 2 seals per joint

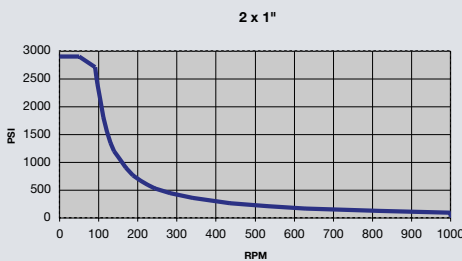
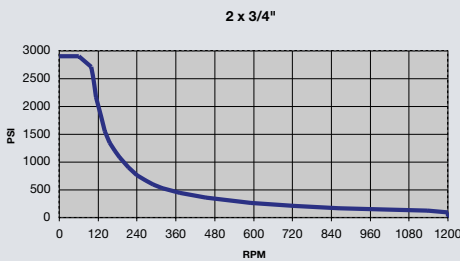
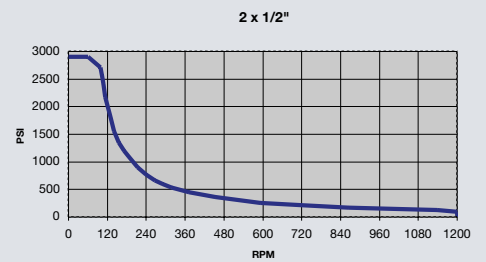
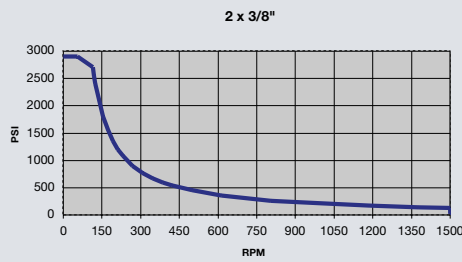
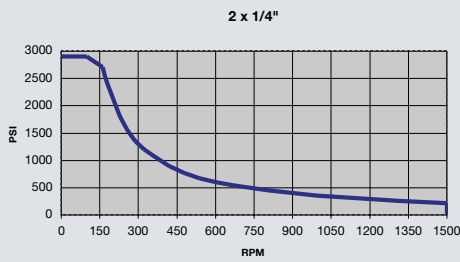
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1600 SERIES TWO PORT ROTARY UNIONS (in.)													
DIMENSIONS	Nominal Pipe Size	Shaft Thread (A)	B	Inlet Thread C	D	E*	F	G	H	I	J	Flats on (J) Diameter	K
	2 x 1/4	1/2	.50	1/4	1.96	466790C	4.05	.94	1.88	1.06	1.18	.94	.47
	2 x 3/8	3/4	.59	3/8	2.36	466794C	5.62	1.22	2.83	1.49	1.65	1.49	.47
	2 x 1/2	1	.78	1/2	3.14	466796C	7.87	1.57	3.81	2.12	1.96	1.77	.59
	2 x 3/4	1	.78	3/4	3.14	466796C	7.12	1.57	3.81	2.12	1.96	1.77	.59
2 x 1	1-1/2	.78	1	3.54	466799C	9.72	2.04	5	3.54	2.36	1.96	.70	

\* 2 seals per joint

## Performance Charts



Performance charts are for oil, grease or similar lubricating media. For media such as water or air, reduce the maximum recommended speed as follows:

**For Water: Multiply speed by 0.67**  
**For Air: Multiply speed by 0.33**

Where maximum recommended speeds are found on the horizontal axis.

Standard Material

# 1650 SERIES

## TWO PORT ROTARY UNION



### Operating Parameters

#### MEDIA

Water, Air, Hydraulic Fluid

#### PRESSURE\*

2,900 psi

#### TEMPERATURE\*

250° F

#### SPEED\*

1,500 RPM

#### THREADS

- 1/4" to 1" NPT
- BSP & BSPP Available

#### MATERIAL

Nickel Plated Steel

Also available in all stainless steel with a hardened ceramic shaft for higher speed and longer life.

#### STANDARD NUMBER OF PORTS

Two Port Design

\* See Performance Charts For Details

## Features & Benefits

### Two Port Design

Features two ports for use in a wide variety of applications.

### Corrosion Resistant

Nickel plated steel for corrosion resistance. Also available in all stainless steel and with a hardened ceramic shaft for higher speeds and longer life.

### Medium Speed & Medium Pressure Capable

Offers the ability to use medium speed and pressure simultaneously.

### No Cross Contamination

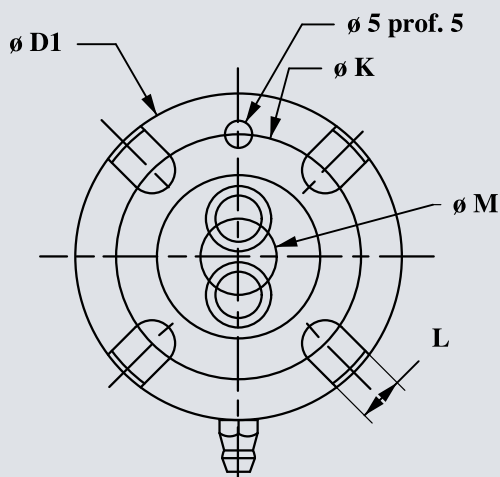
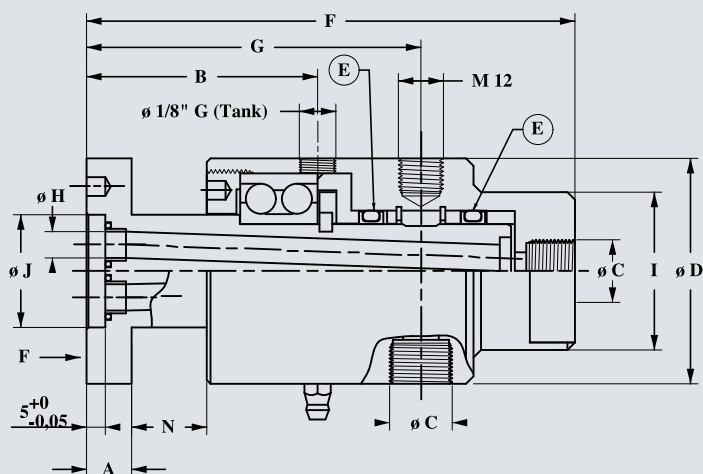
Can be used with two dissimilar fluids. All circuits are individually sealed to eliminate cross contamination.

1650 SERIES TWO PORT ROTARY UNIONS

PART NUMBERS	Nominal Pipe Size	Nickel Plated Steel				Stainless Steel			
		Nickel Plated Steel Shaft		Hardened Shaft		Nickel Plated Steel Shaft		Hardened Shaft	
		Part Number	Description	Part Number	Description	Part Number	Description	Part Number	Description
	2 x 1/4	760559C	F1619BKNPT	760592C	F1619BKCNP	760597C	F1619BINPT	760602C	F1619BICNPT
	2 x 3/8	760560C	F1683BKNPT	760593C	F1683BKCNP	760598C	F1683BINPT	760603C	F1683BICNPT
	2 x 1/2	760561C	F1644BK1/2NPT	760594C	F1644BKC1/2NPT	760599C	F1644BI1/2NPT	760604C	F1644BIC1/2NPT
	2 x 3/4	760562C	F1644BK3/4NPT	760595C	F1644BKC3/4NPT	760600C	F1644BI3/4NPT	760605C	F1644BIC3/4NPT
	2 x 1	760563C	F1760BKNPT	760596C	F1760BKCNP	760601C	F1760BINPT	760606C	F1760BICNPT

\* 2 seals per joint

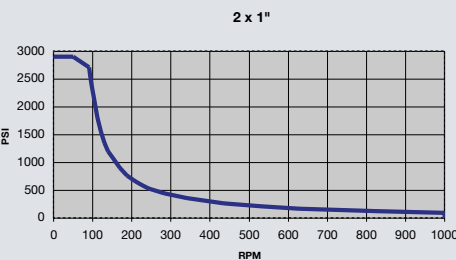
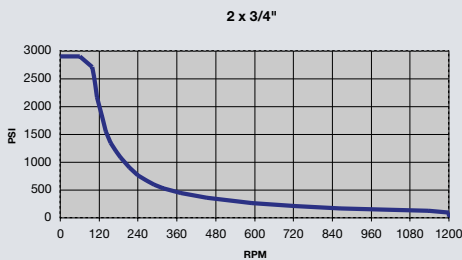
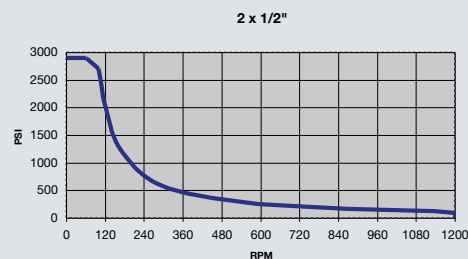
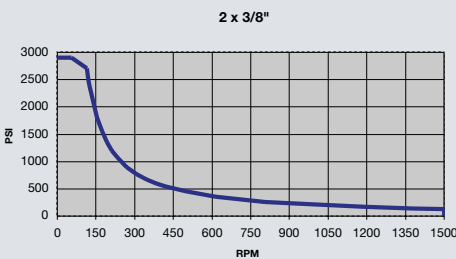
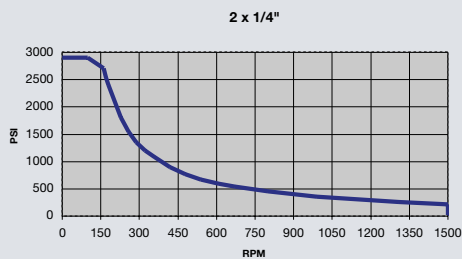
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1650 SERIES TWO PORT ROTARY UNIONS (in.)															
DIMENSIONS	Nominal Pipe Size	A	B	NPT C	D	E*	F	G	H	I	Flats on (I) Diameter	J	K	L	M
		1/4	.47	1.73	1/4	1.96	GR15	3.85	2.55	.11	1.18	.94	.78	1.37	.33
	3/8	.47	2.42	3/8	2.36	GR25	5.11	3.5	.27	1.65	1.49	1.18	1.77	.33	.55
	1/2	.47	2.63	1/2	3.14	GR35	6.49	3.85	.47	1.96	1.77	1.77	2.55	.33	.82
	3/4	.47	2.63	3/4	3.14	GR35	5.70	3.85	.47	1.96	1.77	1.77	2.55	.33	.82
	1	.59	3.79	1	3.54	GR50	8.26	5.51	.70	2.36	1.96	2.36	3.14	.43	1.14

\* 2 seals per joint

## Performance Charts



Performance charts are for oil, grease or similar lubricating media. For media such as water or air, reduce the maximum recommended speed as follows:

**For Water: Multiply speed by 0.67**  
**For Air: Multiply speed by 0.33**

Where maximum recommended speeds are found on the horizontal axis.

Standard Material

# 500 SERIES

AROUND THE SHAFT



## Operating Parameters

### MEDIA

Water, Air, Hydraulic Fluid

### PRESSURE\*

5,800 psi

### TEMPERATURE\*

248° F

### SPEED\*

3,000 RPM

### THREADS

1/4" to 1/2" NPT or BSPP

### MATERIAL

Nickel Treated Carbon Steel Construction

\* See Performance Charts  
For Details

## Features & Benefits

### Shaft Mounted Design

Used in conjunction with the customer's shaft and retaining sleeve.

### Two Configurations

High speed, low pressure applications, or high pressure, low speed applications.

### Flexible Installation

Can be installed anywhere on the shaft, singly or in series, due to in-line design.

### High Pressure, Low Speed

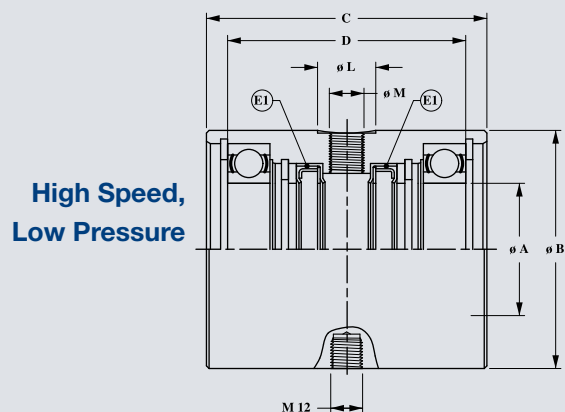
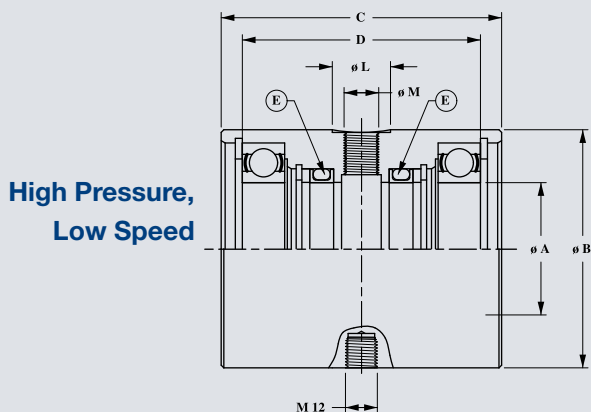
High pressure, low speed models can be used at pressures to 5,800 psi and speeds less than 100 RPM.

### High Speed, Low Pressure

High speed, low pressure models can be used at speeds to 3,000 RPM, and pressures to 175 psi.

500 SERIES ROTARY UNIONS									
Customer Shaft Size	Nickel Plated Steel				Stainless Steel				
	High Pressure, Low Speed		High Speed, Low Pressure		High Pressure, Low Speed		High Speed, Low Pressure		
	Part Number	Description	Part Number	Description	Part Number	Description	Part Number	Description	
PART NUMBERS	20mm	750905C	BAT20RK	750935C	BAT20RKVR	750920C	BAT20RI	750950C	BAT20RIVR
	30mm	750906C	BAT30RK	750936C	BAT30RKVR	750921C	BAT30RI	750951C	BAT30RIVR
	40mm	750907C	BAT40RK	750937C	BAT40RKVR	750922C	BAT40RI	750952C	BAT40RIVR
	45mm	750908C	BAT45RK	750938C	BAT45RKVR	750923C	BAT45RI	750953C	BAT45RIVR
	50mm	750909C	BAT50RK	750939C	BAT50RKVR	750924C	BAT50RI	750954C	BAT50RIVR
	55mm	750910C	BAT55RK	750940C	BAT55RKVR	750925C	BAT55RI	750955C	BAT55RIVR
	60mm	750911C	BAT60RK	750941C	BAT60RKVR	750926C	BAT60RI	750956C	BAT60RIVR
	65mm	750912C	BAT65RK	750942C	BAT65RKVR	750927C	BAT65RI	750957C	BAT65RIVR
	70mm	750913C	BAT70RK	750943C	BAT70RKVR	750928C	BAT70RI	750958C	BAT70RIVR
	75mm	750914C	BAT75RK	750944C	BAT75RKVR	750929C	BAT75RI	750959C	BAT75RIVR
	80mm	750915C	BAT80RK	750945C	BAT80RKVR	750930C	BAT80RI	750960C	BAT80RIVR
	85mm	750916C	BAT85RK	750946C	BAT85RKVR	750931C	BAT85RI	750961C	BAT85RIVR
	90mm	750917C	BAT90RK	750947C	BAT90RKVR	750932C	BAT90RI	750962C	BAT90RIVR
	95mm	750918C	BAT95RK	750948C	BAT95RKVR	750933C	BAT95RI	750963C	BAT95RIVR
100mm	750919C	BAT100RK	750949C	BAT100RKVR	750934C	BAT100RI	750964C	BAT100RIVR	

\* 2 seals per joint

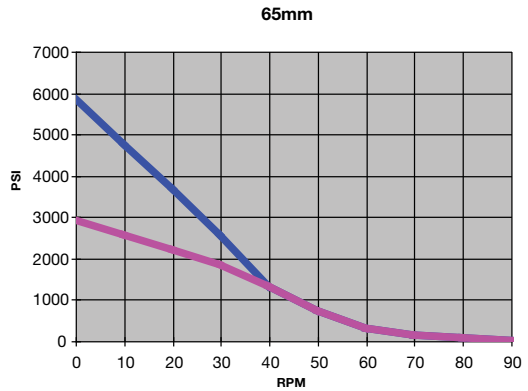
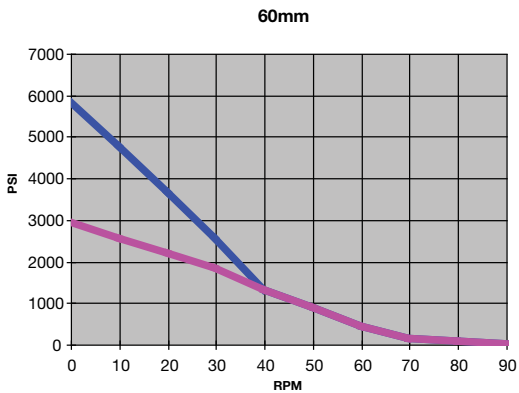
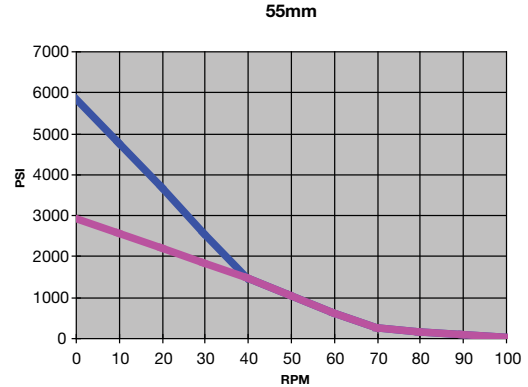
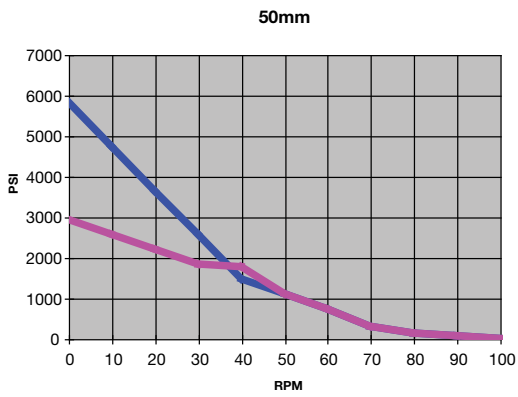
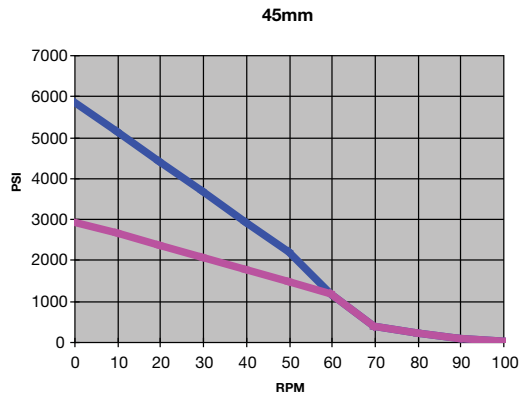
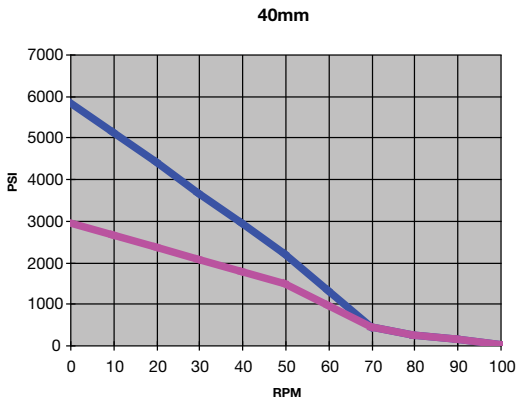
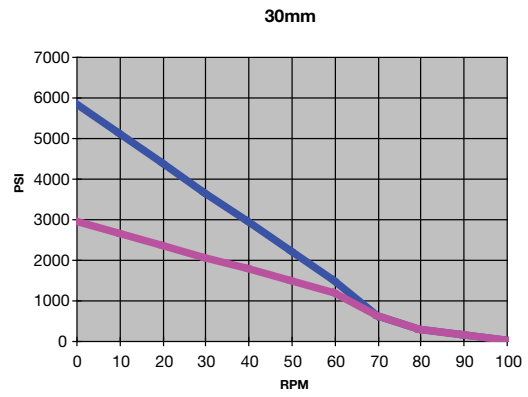
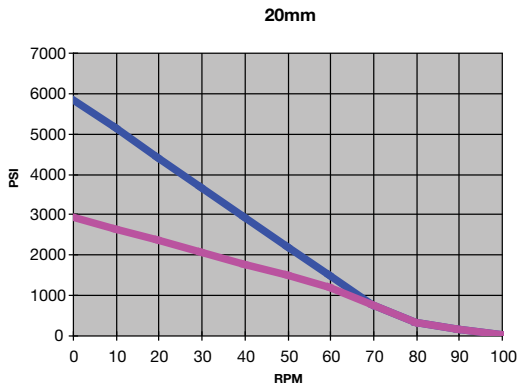


500 SERIES ROTARY UNION (in.)									
Customer Shaft Size	A	B	C	D	E*	E1*	L	M	
DIMENSIONS	20mm	0.75	2.16	3.50	3.03	GR20	OAB20	.86	.25
	30mm	1.18	2.55	3.58	3.03	GR30	OAB30	.86	.25
	40mm	1.57	2.95	3.93	3.38	GR40	OAB40	.86	.25
	45mm	1.77	3.34	4.09	3.54	GR45	OAB45	.86	.25
	50mm	1.96	3.54	4.17	3.54	GR50	OAB50	.86	.25
	55mm	2.16	3.93	4.68	4.05	GR55	OAB55	1.25	.50
	60mm	2.36	4.13	4.76	4.13	GR60	OAB60	1.25	.50
	65mm	2.55	4.33	4.84	4.21	GR65	OAB65	1.25	.50
	70mm	2.75	4.72	5.00	4.21	GR70	OAB70	1.25	.50
	75mm	2.95	4.92	5.27	4.48	GR75	OAB75	1.25	.50
	80mm	3.14	5.31	5.43	4.64	GR80	OAB80	1.25	.50
	85mm	3.34	5.51	5.51	4.72	GR85	OAB85	1.25	.50
	90mm	3.54	5.90	5.59	4.80	GR90	OAB90	1.25	.50
	95mm	3.74	6.10	5.78	5.00	GR95	OAB95	1.25	.50
100mm	3.93	6.29	6.02	5.07	GR100	OAB100	1.25	.50	

\* 2 seals per joint

## Performance Charts

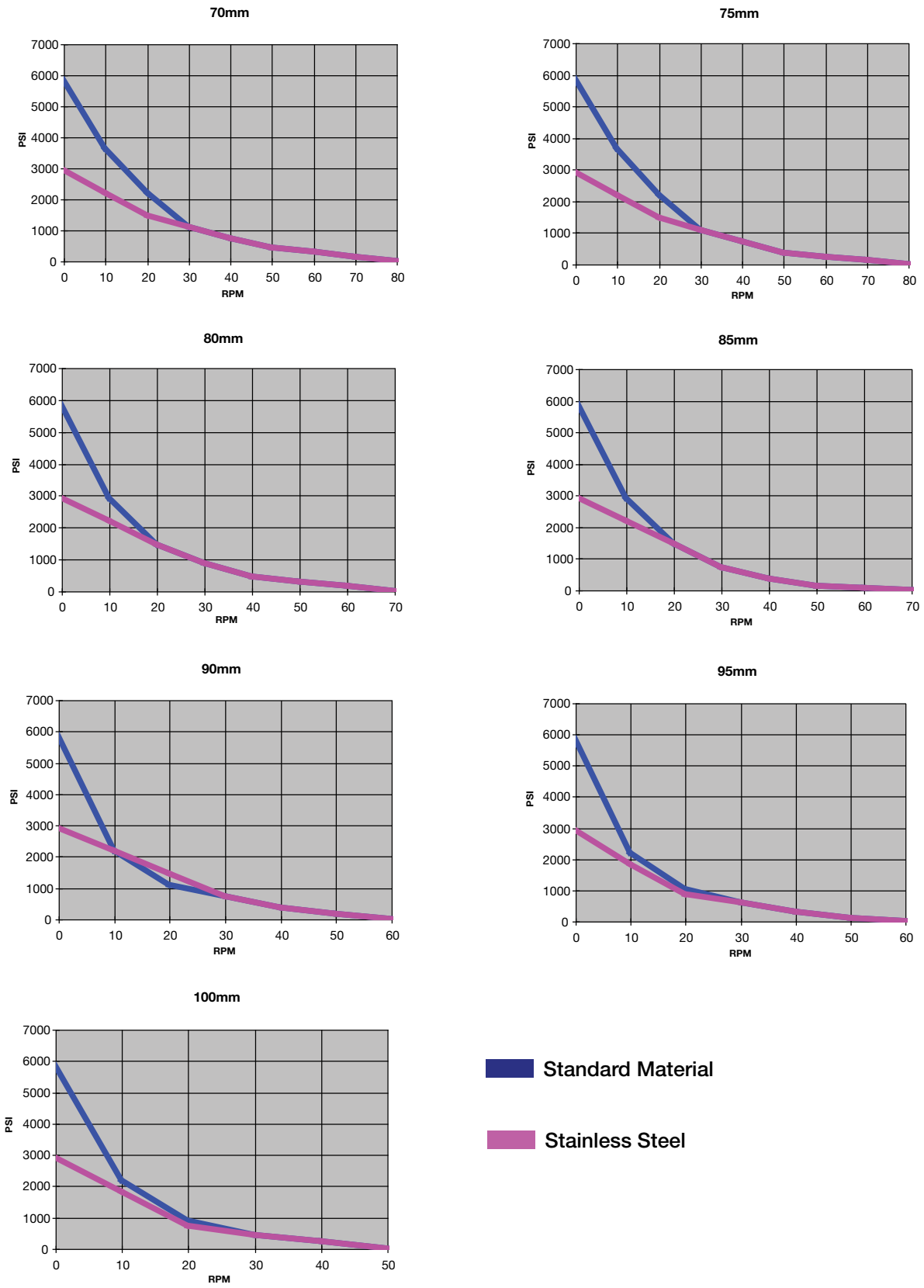
### 500 Series - High Pressure





# Performance Charts

## 500 Series - High Pressure

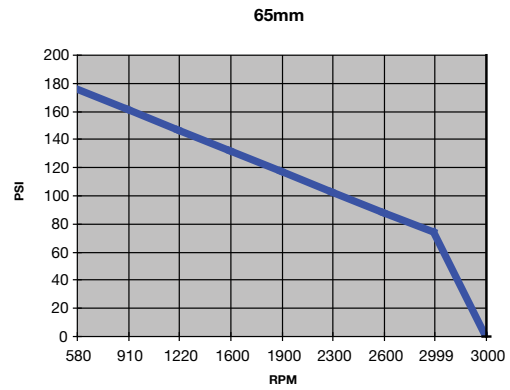
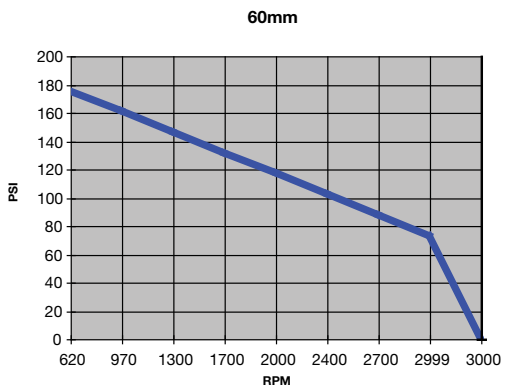
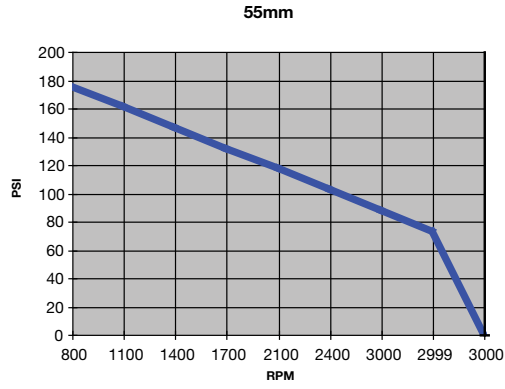
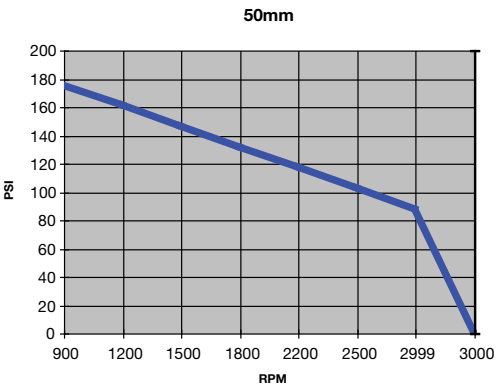
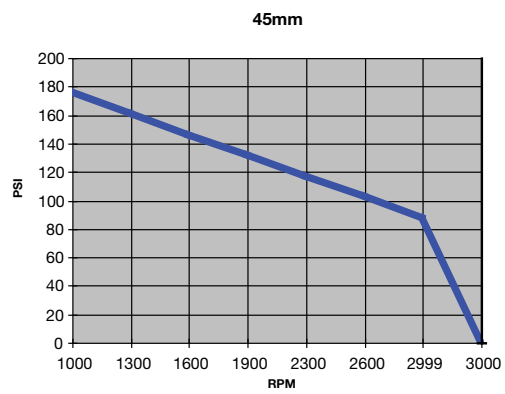
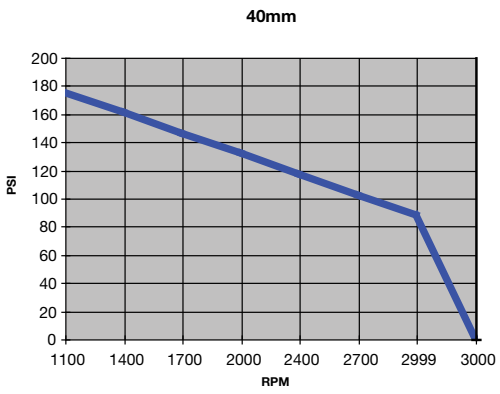
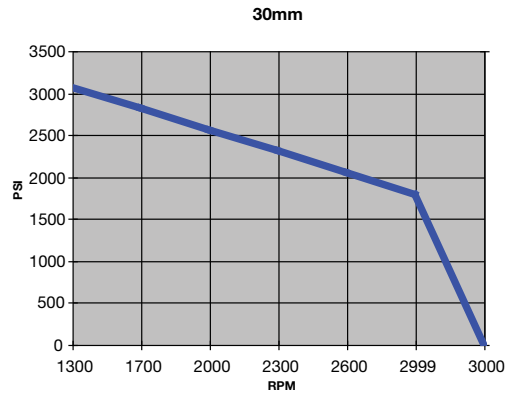
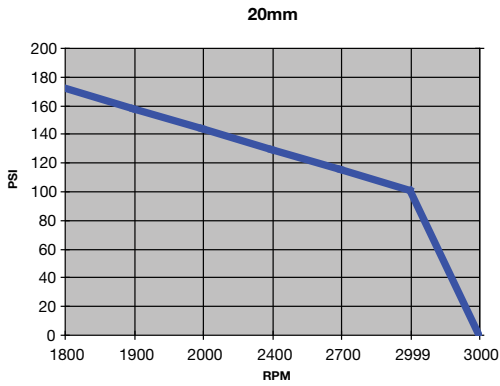


Standard Material

Stainless Steel

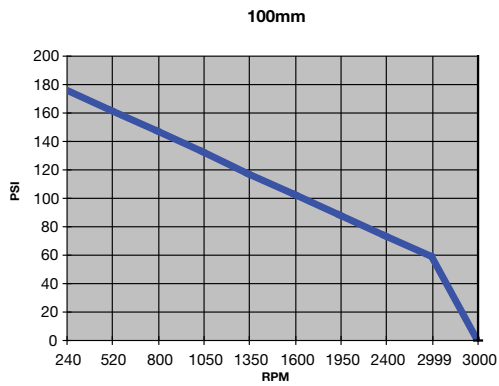
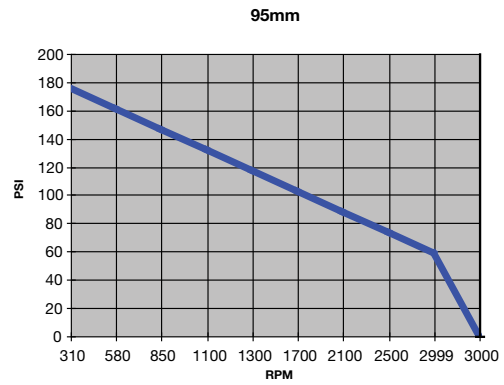
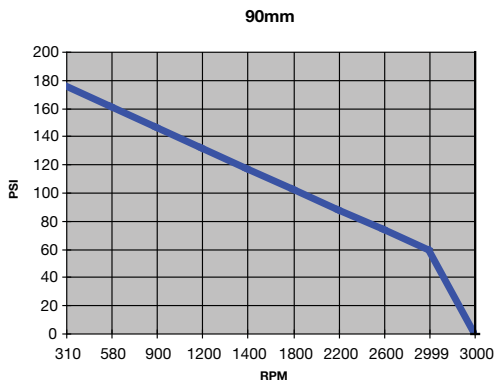
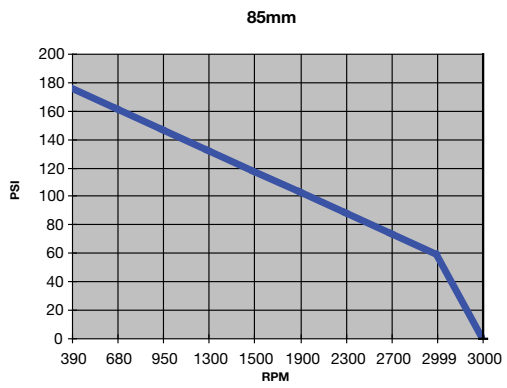
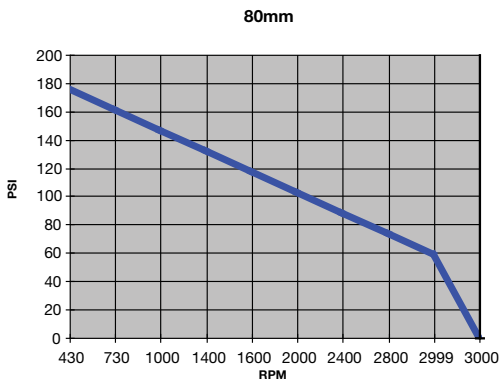
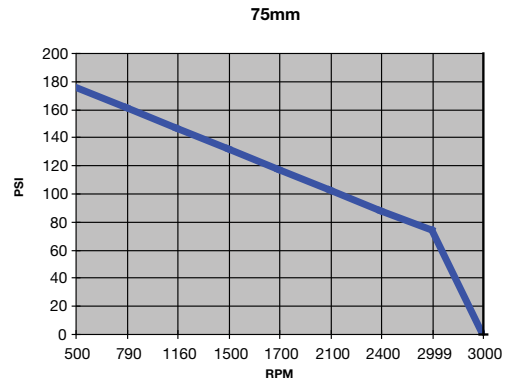
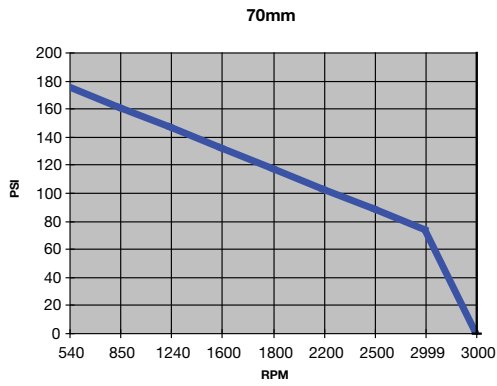
## Performance Charts

### 500 Series - High Pressure



# Performance Charts

## 500 Series - High Pressure



# 1100 SERIES

SLOW ROTATION SWIVEL



## Operating Parameters

### MEDIA

Water, Air, Hydraulic Fluid

### PRESSURE\*

725 psi

### TEMPERATURE\*

392° F

### SPEED\*

60 RPM

### MATERIAL

Nickel Plated Steel

Also Available In All Stainless Steel

### THREADS

- 1/4" to 3" NPT
- BSP Available

\* See Performance Charts  
For Details

## Features & Benefits

### Bi-Directional Swivel

1100 Series swivels are for applications where complete rotation is not necessary.

### Designed For Slow Rotation

Designed for swiveling or slow rotation applications.

### Superior Sealing Performance

The 1100 series has the GR seal for superior sealing performance.

### Multiple Configurations

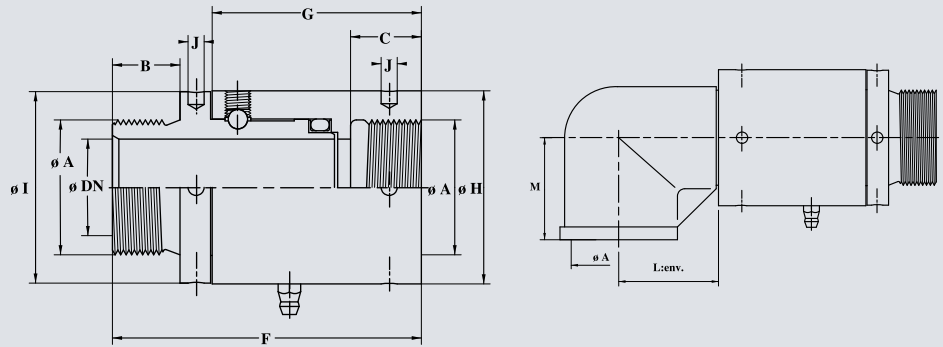
Available with axial (straight through) flow, or radial flow with the addition of a 90° stainless steel elbow.

### Corrosion Resistant

Features nickel plated carbon steel construction. Stainless steel models are also available.

1100 SERIES SWIVELS										
PART NUMBERS	Nominal Pipe Size	Shaft Thread (A)	Axial Flow				with Stainless Steel Elbow			
			Nickel Plated Steel		Stainless Steel		Nickel Plated Steel		Stainless Steel	
			Part Number	Description	Part Number	Description	Part Number	Description	Part Number	Description
	1/4	1/4	<b>750839C</b>	R1013KNPT	<b>760628C</b>	R1013INPT	<b>760934</b>	R1013KENPT	<b>760944</b>	R1013IENPT
	3/8	3/8	<b>750840C</b>	R1017KNPT	<b>750850C</b>	R1017INPT	<b>760935</b>	R1017KENPT	<b>760945</b>	R1017IENPT
	1/2	1/2	<b>750841C</b>	R1021KNPT	<b>750851C</b>	R1021INPT	<b>760936</b>	R1021KENPT	<b>760946</b>	R1021IENPT
	3/4	3/4	<b>750842C</b>	R1027KNPT	<b>750852C</b>	R1027INPT	<b>760937</b>	R1027KENPT	<b>760947</b>	R1027IENPT
	1	1	<b>750843C</b>	R1034KNPT	<b>750853C</b>	R1034INPT	<b>760938</b>	R1034KENPT	<b>760948</b>	R1034IENPT
	1-1/4	1-1/4	<b>750844C</b>	R1042KNPT	<b>750854C</b>	R1042INPT	<b>760939</b>	R1042KENPT	<b>760949</b>	R1042IENPT
	1-1/2	1-1/2	<b>750845C</b>	R1049KNPT	<b>750855C</b>	R1049INPT	<b>760940</b>	R1049KENPT	<b>760950</b>	R1049IENPT
	2	2	<b>750846C</b>	R1060KNPT	<b>750856C</b>	R1060INPT	<b>760941</b>	R1060KENPT	<b>760951</b>	R1060IENPT
	2-1/2	2-1/2	<b>750847C</b>	R1076KNPT	<b>750857C</b>	R1076INPT	<b>760942</b>	R1076KENPT	<b>760952</b>	R1076IENPT
	3	3	<b>750848C</b>	R1090KNPT	<b>750858C</b>	R1090INPT	<b>760943</b>	R1090KENPT	<b>760953</b>	R1090IENPT

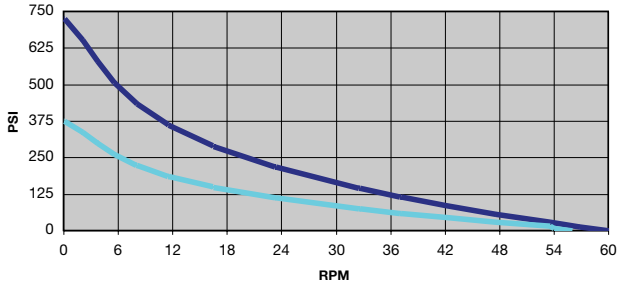
MAXIMUM OPERATING PRESSURE (psi)		
Nominal Pipe Size	Nickel Plated Steel	Stainless Steel
1/4	725	290
3/8	725	290
1/2	725	290
3/4	725	290
1	435	218
1-1/4	435	218
1-1/2	435	218
2	290	145
2-1/2	290	145
3	290	145



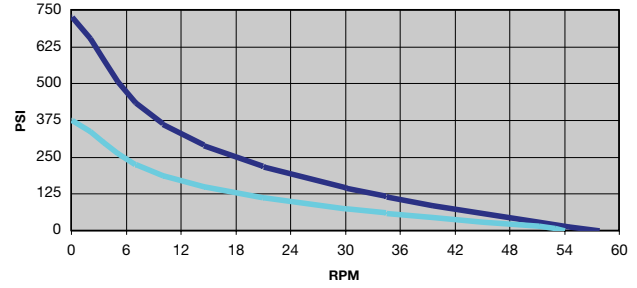
1100 SERIES SWIVEL (in.)												
DIMENSIONS	Nominal Pipe Size	Shaft Thread (A)	B	C	DN	Overall Length (F)	G	Overall Diameter (H)	I	J	L	M
	1/4	1/4	.39	.43	.27	1.87	1.22	.98	.74	.19	.78	.78
	3/8	3/8	.43	.47	.39	2.06	1.37	1.25	1.02	.19	1.10	.94
	1/2	1/2	.55	.59	.43	2.30	1.49	1.25	1.02	.19	1.18	1.10
	3/4	3/4	.62	.66	.70	2.97	2	1.77	1.49	.23	1.25	1.25
	1	1	.74	.78	.98	3.42	2.36	2.04	2.04	.23	1.53	1.49
	1-1/4	1-1/4	.82	.86	1.18	3.77	2.55	2.36	2.36	.23	1.73	1.77
	1-1/2	1-1/2	.82	.86	1.49	3.85	2.63	2.55	2.55	.23	2.00	1.96
	2	2	.98	1.02	1.88	4.48	3.07	3.14	3.14	.27	2.36	2.28
	2-1/2	2-1/2	1.10	.90	2.36	4.46	2.95	3.74	3.74	.27	2.95	2.75
	3	3	1.18	1.02	2.95	4.78	3.18	4.17	4.17	.27	3.42	3.07

## Performance Charts

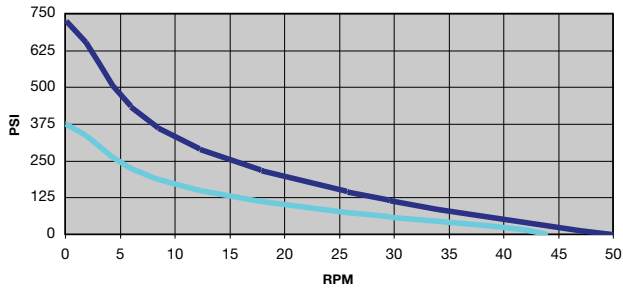
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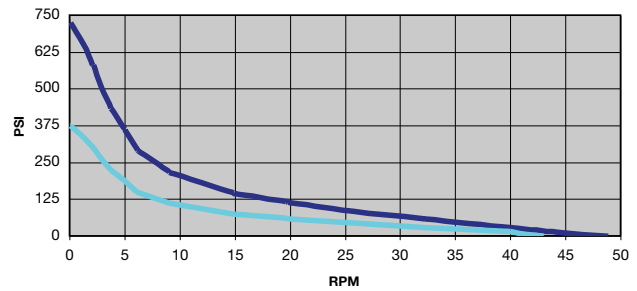
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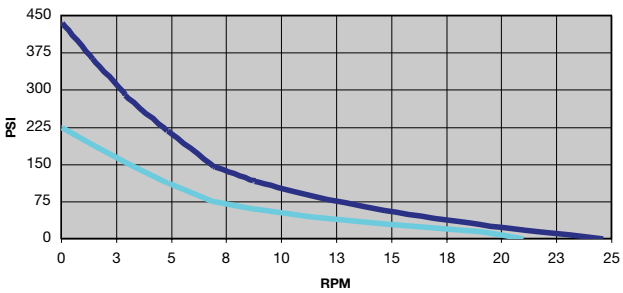
1/2"



3/4"



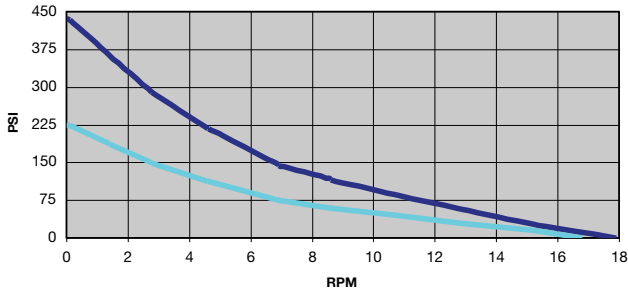
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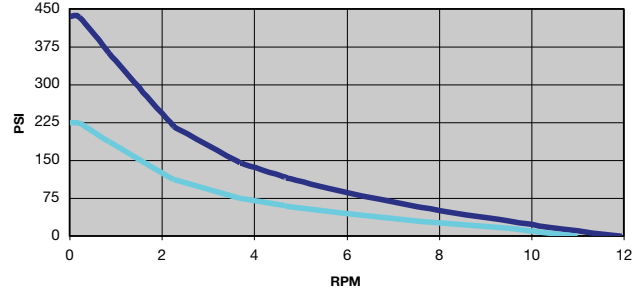
Standard Material  
 Stainless Steel

# Performance Charts

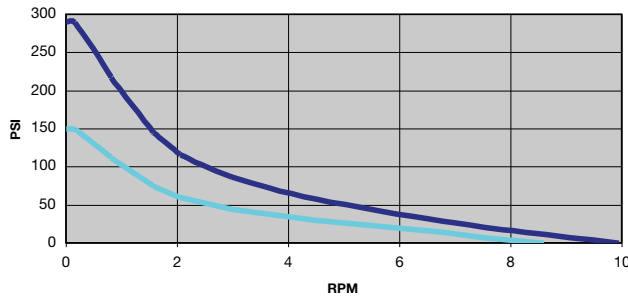
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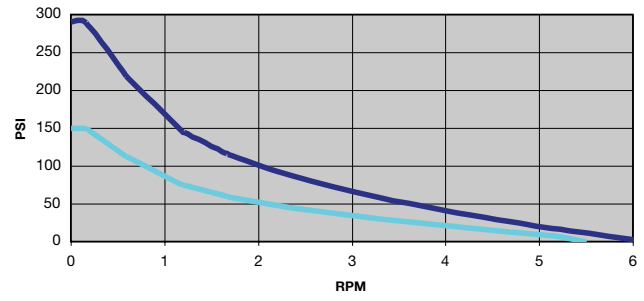
1 1/2"



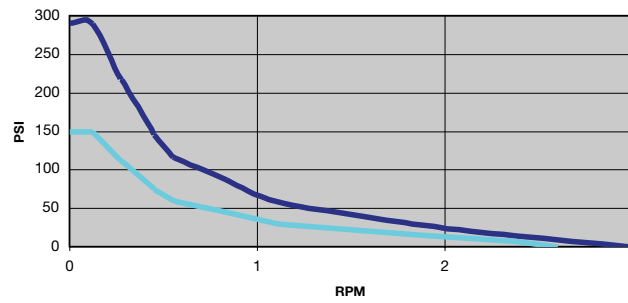
2"



2 1/2"



3"



Standard Material  
 Stainless Steel

# 1102 SERIES

SLOW ROTATION SWIVEL



## Operating Parameters

### MEDIA

Water, Air, Hydraulic Fluid

### PRESSURE\*

1,160 psi

### TEMPERATURE\*

392° F

### SPEED\*

90 RPM

### THREADS

- 1/4" to 6" NPT
- BSP Available

### MATERIAL

Nickel Plated Steel

Also Available In All Stainless Steel

\* See Performance Charts  
For Details

## Features & Benefits

### Bi-Directional Swivel

1102 Series swivels are for applications where complete rotation is not necessary.

### Slow Rotation Applications

Designed for swiveling or slow rotation applications.

### High Pressure

The 1102 will operate at pressures up to 1,160 psi.

### Superior Sealing Performance

The 1102 series has the GR Seal for superior sealing performance.

### Multiple Configurations

Available with axial (straight through) flow, or radial flow with the addition of a 90° stainless steel elbow.

### Corrosion Resistant

Features nickel plated carbon steel construction. Stainless steel models are also available.

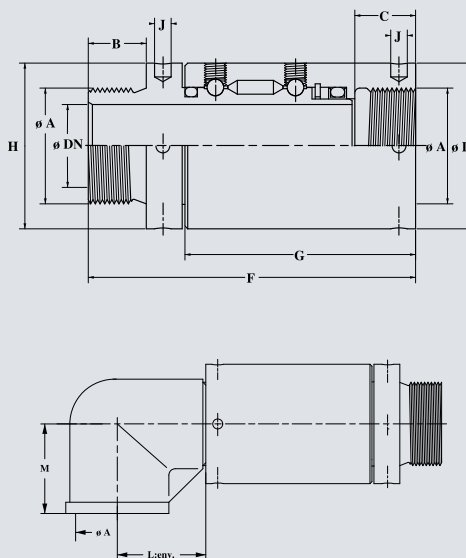
### Stability At Higher Speeds & Pressures

The 1102 Series offers two ball races which allow for increased pressure and speed.



1102 SERIES SWIVELS										
PART NUMBERS	Nominal Pipe Size	Shaft Thread (A)	Axial Flow				with Stainless Steel Elbow			
			Nickel Plated Steel		Stainless Steel		Nickel Plated Steel		Stainless Steel	
			Part Number	Description	Part Number	Description	Part Number	Description	Part Number	Description
	1/4	1/4	750859C	R1013K2NPT	750872C	R1013I2NPT	760980C	R1013K2ENPT	760993C	R1013I2ENPT
	3/8	3/8	750860C	R1017K2NPT	750873C	R1017I2NPT	760981C	R1017K2ENPT	760994C	R1017I2ENPT
	1/2	1/2	750861C	R1021K2NPT	750874C	R1021I2NPT	760982C	R1021K2ENPT	760995C	R1021I2ENPT
	3/4	3/4	750862C	R1027K2NPT	750875C	R1027I2NPT	760983C	R1027K2ENPT	760996C	R1027I2ENPT
	1	1	750863C	R1034K2NPT	750876C	R1034I2NPT	760984C	R1034K2ENPT	760997C	R1034I2ENPT
	1-1/4	1-1/4	750864C	R1042K2NPT	750877C	R1042I2NPT	760985C	R1042K2ENPT	760998C	R1042I2ENPT
	1-1/2	1-1/2	750865C	R1049K2NPT	750878C	R1049I2NPT	760986C	R1049K2ENPT	760999C	R1049I2ENPT
	2	2	750866C	R1060K2NPT	750879C	R1060I2NPT	760987C	R1060K2ENPT	770000C	R1060I2ENPT
	2-1/2	2-1/2	750867C	R1076K2NPT	750880C	R1076I2NPT	760988C	R1076K2ENPT	770001C	R1076I2ENPT
	3	3	750868C	R1090K2NPT	750881C	R1090I2NPT	760989C	R1090K2ENPT	770002C	R1090I2ENPT
	4	4	750869C	R10114K2NPT	750882C	R10114I2NPT	-	-	-	-
	5	5	750870C	R10140K2NPT	750883C	R10140I2NPT	-	-	-	-
	6	6	750871C	R10165K2NPT	750884C	R10165I2NPT	-	-	-	-

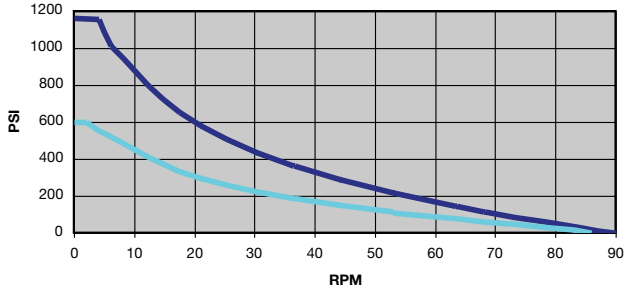
MAXIMUM OPERATING PRESSURE (psi)		
Nominal Pipe Size	Nickel Plated Steel	Stainless Steel
1/4	1160	435
3/8	1160	435
1/2	1160	435
3/4	870	360
1	870	360
1-1/4	580	290
1-1/2	580	290
2	435	215
2-1/2	435	215
3	435	215
4	290	145
5	290	145
6	215	115



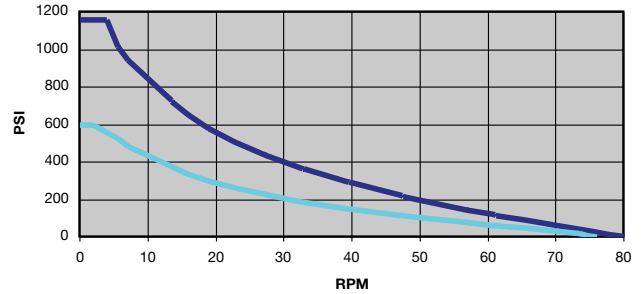
1102 SERIES SWIVEL (in.)												
DIMENSIONS	Nominal Pipe Size	Shaft Thread (A)	B	C	DN	F	G	H	I	J	L	M
	1/4	1/4	.39	.43	.27	2.48	1.77	.74 (flats)	.98	.19	.78	.78
	3/8	3/8	.43	.47	.39	2.83	2.00	1.02 (flats)	1.25	.19	1.10	.94
	1/2	1/2	.55	.59	.43	3.07	2.12	1.02 (flats)	1.25	.19	1.18	1.10
	3/4	3/4	.62	.66	.70	3.77	2.65	1.49 (flats)	1.77	.23	1.25	1.25
	1	1	.74	.78	.98	4.21	2.97	2.04	2.04	.23	1.53	1.49
	1-1/4	1-1/4	.82	.86	1.18	4.64	3.28	2.36	2.36	.23	1.73	1.77
	1-1/2	1-1/2	.82	.86	1.49	5.15	3.79	2.55	2.55	.23	51	1.96
	2	2	.98	1.02	1.88	5.90	4.38	3.14	3.14	.27	2.36	2.28
	2-1/2	2-1/2	1.10	1.18	2.36	6.73	5.03	3.74	3.74	.27	2.95	2.75
	3	3	1.18	1.25	2.95	7.28	5.51	4.17	4.17	.27	3.42	3.07
	4	4	1.37	1.57	3.93	8.00	6.18	5.43	5.43	.27	-	-
	5	5	1.37	1.57	4.72	8.00	6.18	6.69	6.69	.27	-	-
	6	6	1.37	1.57	5.90	8.00	6.18	7.87	7.87	.27	-	-

## Performance Charts

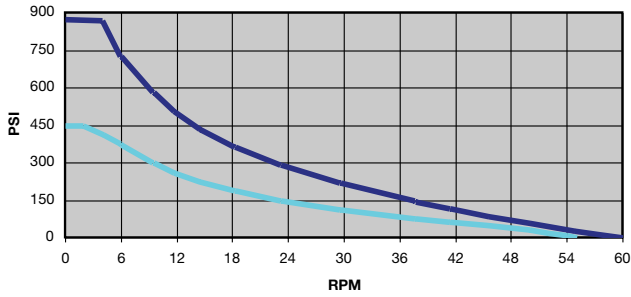
1/4" & 3/8"



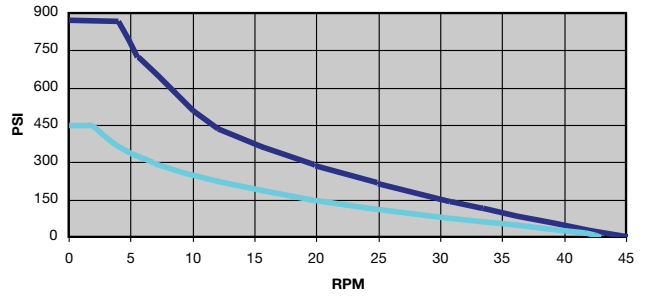
1/2"



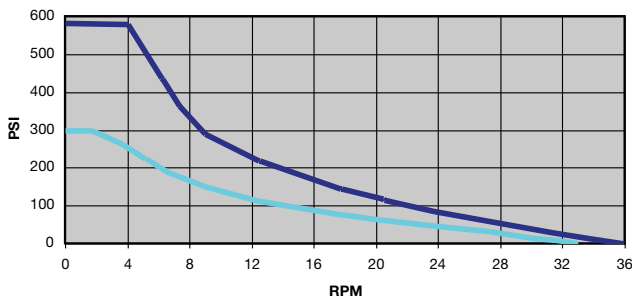
3/4"



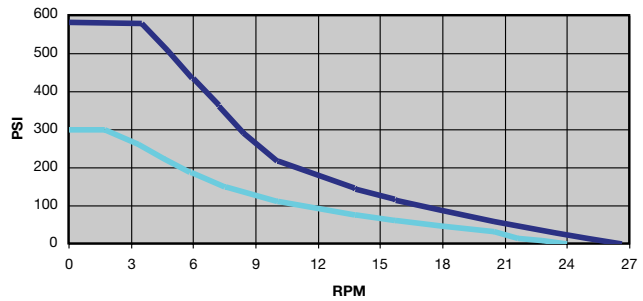
1"



1 1/4"



1 1/2"

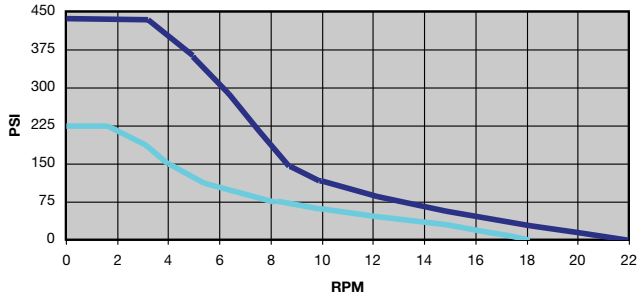


Standard Material

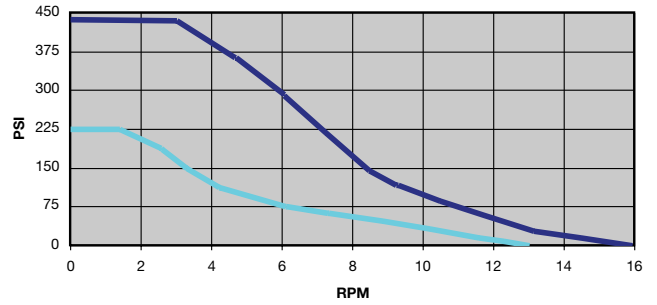
Stainless Steel

# Performance Charts

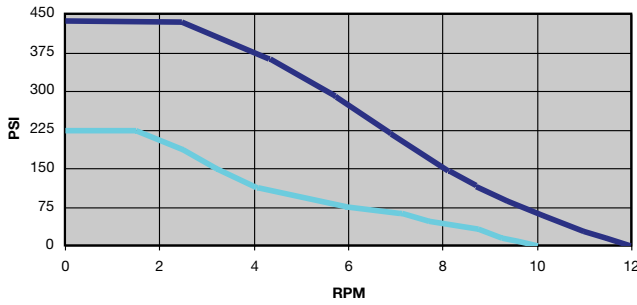
2"



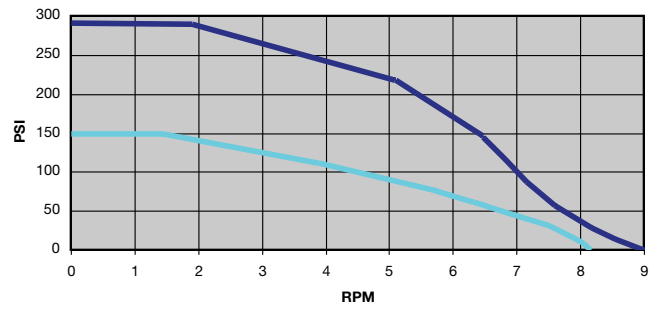
2 1/2"



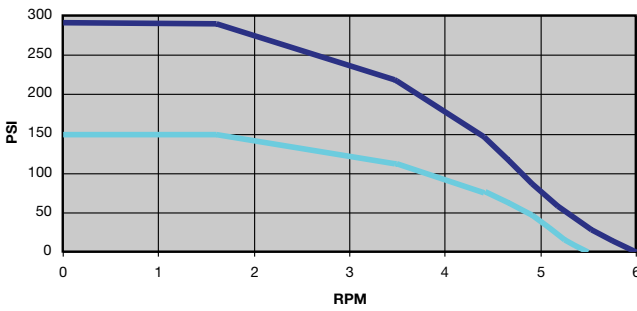
3"



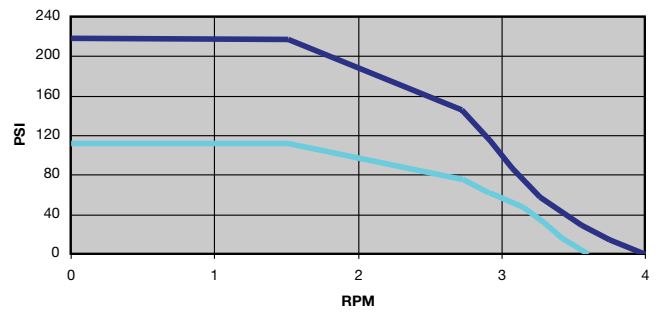
4"



5"



6"



Standard Material

Stainless Steel

# 1200 SERIES

SMALL ENVELOPE SWIVEL



## Operating Parameters

### MEDIA

Water, Air, Hydraulic Fluid

### PRESSURE

5,075 PSI

### TEMPERATURE

392° F

### SPEED

Swivel

### MATERIAL

Nickel Plated Steel

### THREADS

- 1/4" to 2" NPT
- Other Threads Available

## Features & Benefits

### Small Profile

Perfect for small envelope dimensions.

### Bi-Directional Swivel

Slow or swiveling rotation.

### Hydraulic Applications

Suitable for hydraulic service.

### No Lubrication

PTFE seals require no lubrication.

### Easy Installation

Precision made wrench flats on center shaft for easy installation. Custom designs available.

### Corrosion Resistant

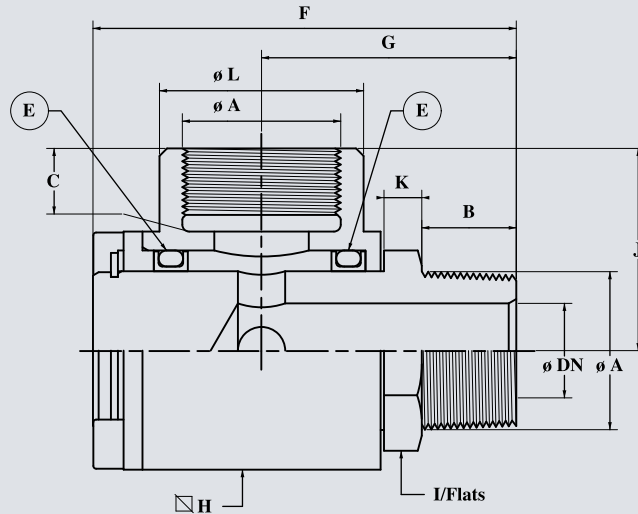
The 1200 Series is nickel plated as standard. Also available in stainless steel.

### Thread Connections

NPT standard. SAE, JIC, DIN or ISO threads are available upon request.

1200 SERIES SWIVELS									
PART NUMBERS	Nominal Pipe Size	Nickel Plated Steel				Stainless Steel			
		Right Hand Thread		Left Hand Thread		Right Hand Thread		Left Hand Thread	
		Part Number	Description	Part Number	Description	Part Number	Description	Part Number	Description
	1/4	750981C	R1213SR2KNPT	760645C	L1213SR2KNPT	750988C	R1213SR2INPT	760653C	L1213SR2INPT
	3/8	750982C	R1217SR2KNPT	760646C	L1217SR2KNPT	750989C	R1217SR2INPT	760654C	L1217SR2INPT
	1/2	750983C	R1221SR2KNPT	760647C	L1221SR2KNPT	750990C	R1221SR2INPT	760655C	L1221SR2INPT
	3/4	750984C	R1227SR2KNPT	760648C	L1227SR2KNPT	750991C	R1227SR2INPT	760656C	L1227SR2INPT
	1	750985C	R1234SR2KNPT	760649C	L1234SR2KNPT	750992C	R1234SR2INPT	760657C	L1234SR2INPT
	1-1/4	750986C	R1242SR2KNPT	760650C	L1242SR2KNPT	750993C	R1242SR2INPT	760658C	L1242SR2INPT
	1-1/2	750987C	R1249SR2KNPT	760651C	L1249SR2KNPT	750994C	R1249SR2INPT	760659C	L1249SR2INPT

MAXIMUM OPERATING PRESSURE (psi)		
Nominal Pipe Size	Nickel Plated Steel	Stainless Steel
1/4	5,075	2,530
3/8	5,075	2,530
1/2	4,350	2,175
3/4	4,350	2,175
1	3,625	1,810
1-1/4	3,625	1,810
1-1/2	2,900	1,450
2	2,900	1,450



1200 SERIES SWIVEL (in.)													
DIMENSIONS	Nominal Pipe Size	Shaft Thread (A)	B	C	DN	E*	F	G	H	I (flats)	J	K	L
		1/4	1/4	.55	.47	.27	GR817SR	2.24	1.33	1.10	.82	1.02	.23
	3/8	3/8	.59	.55	.39	GR821SR	2.5	1.53	1.25	.90	1.18	.29	1.18
	1/2	1/2	.70	.59	.51	GR827SR	3.07	1.81	1.57	1.18	1.37	.31	1.49
	3/4	3/4	.86	.78	.70	GR834SR	3.60	2.18	1.96	1.65	1.77	.33	1.77
	1	1	.98	.86	.94	GR849SR	4.40	2.63	2.48	1.81	2.10	.39	2.15
	1-1/4	1-1/4	1.18	1.22	1.18	GR849SR	5.39	3.12	3.11	2.12	2.63	.37	2.75
	1-1/2	1-1/2	1.18	1.18	1.49	GR860SR	6.25	3.62	3.77	2.75	3.03	.47	3.74

\* 2 seals per joint

# 1300 SERIES

FLANGED SWIVEL



## Operating Parameters

<b>MEDIA</b>	<b>PRESSURE*</b>
Water, Air	290 psi
<b>TEMPERATURE*</b>	<b>SPEED*</b>
392° F	Swivel
<b>MATERIAL</b>	<b>CONNECTION TYPE</b>
Nickel Plated Steel	2" to 12" Flange

\* See Performance Charts  
For Details

## Features & Benefits

### Swivel Applications

Used in applications where slow rotation or swiveling motion is needed.

### GR Seal Technology

Design features include a ball bearing for rotation, and a GR seal for superior sealing performance.

### Flanged Swivel Design

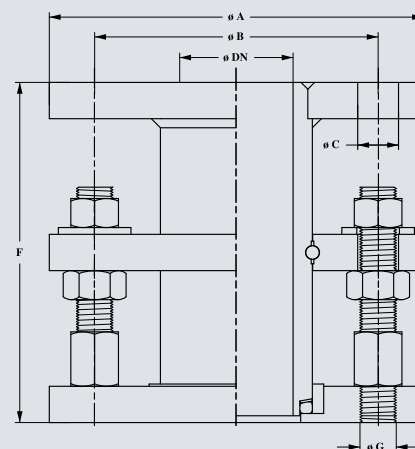
Allows for stability in high flow applications.

### High Temperature Applications

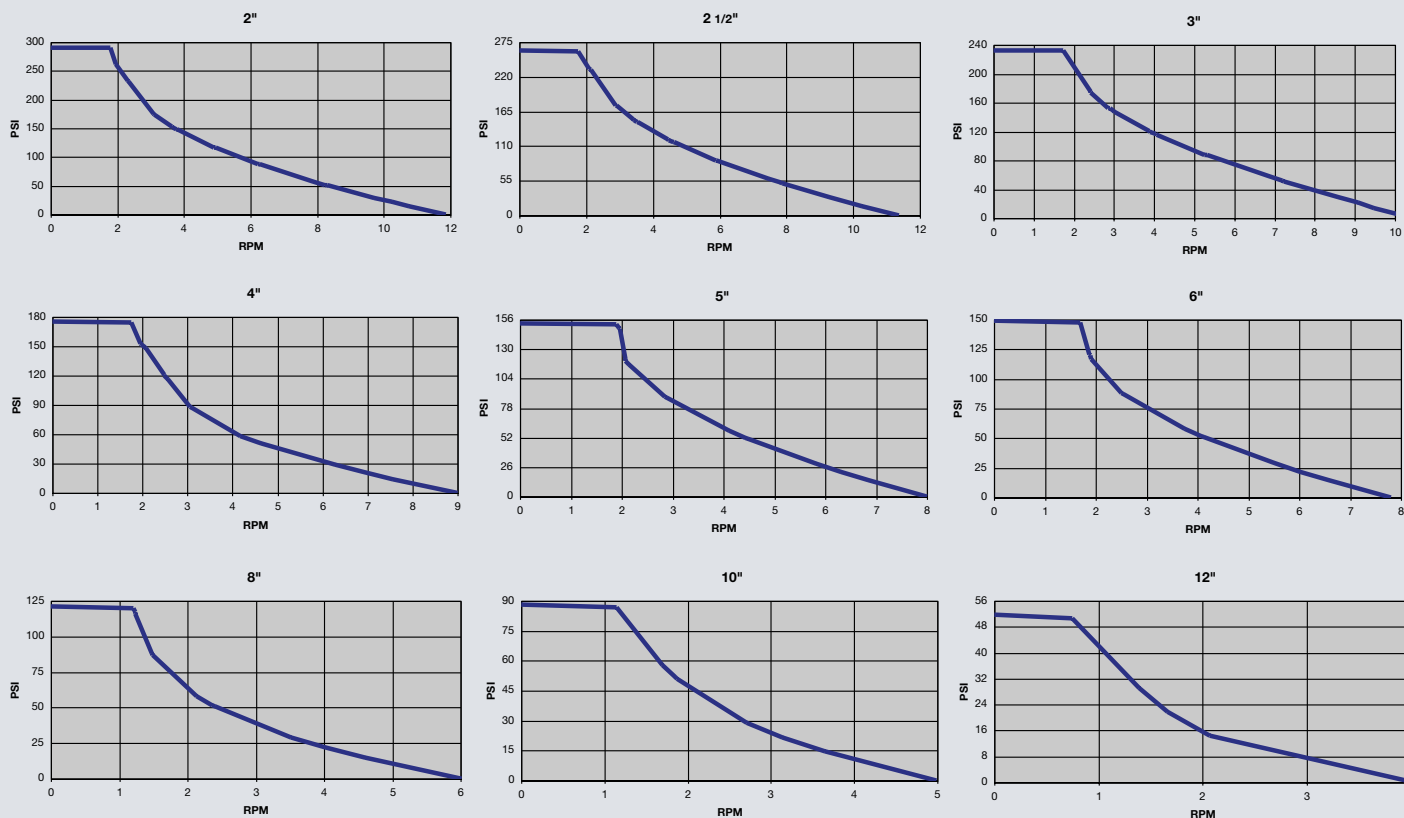
Can be used in applications with temperatures up to 392° F.

1300 SERIES FLANGED SWIVELS					
PART NUMBERS	Nominal Pipe Size	Nickel Plated Steel		Stainless Steel	
		Part Number	Description	Part Number	Description
	2	760572C	BR50K	790101C	BR50I
	2-1/2	760573C	BR66K	790102C	BR66I
	3	760574C	BR80K	790103C	BR80I
	4	760575C	BR100K	760343C	BR100I
	5	760576C	BR125K	790104C	BR125I
	6	760577C	BR150K	760344C	BR150I
	8	760579C	BR200K	760345C	BR200I
	10	760580C	BR250K	780644C	BR250I
	12	760581C	BR300K	790105C	BR300I

1300 SERIES FLANGED SWIVEL (in.)								
DIMENSIONS	Nominal Pipe Size	Number of Holes	Overall Diameter (A)	B	Slot C	DN	Overall Length (F)	Thread (G)
	2	4	6.49	4.92	.70	2	5.90	4 x .70
	2-1/2	4	7.28	5.70	.70	2-1/2	5.90	4 x .70
	3	8	7.87	6.29	.70	3	5.90	4 x .70 4 x M16
	4	8	8.66	7.08	.70	4	5.90	8 x .70
	5	8	9.84	8.26	.70	5	5.90	8 x .70
	6	8	11.22	9.44	.86	6	5.90	8 x .86
	8	8	13.38	11.60	.86	8	7.87	8 x .86
	10	12	15.55	13.77	.86	10	7.87	12 x .86
	12	12	17.50	15.70	.86	12	7.87	12 x .86



## Performance Charts



# 1700 SERIES

HIGH PRESSURE SWIVEL



## Operating Parameters

### MEDIA

Water, Air, Hydraulic Fluid

### PRESSURE\*

5,075 psi

### TEMPERATURE\*

248° F

### SPEED\*

80 RPM

### MATERIAL

Nickel Plated Steel

### THREADS

- 1/4" to 3" NPT
- BSP & BSPP Available

\* See Performance Charts For Details

## Features & Benefits

### High Pressure Applications

High pressure swivel for use in hydraulic and pneumatic applications.

### Corrosion Resistant

Standard models feature nickel treated carbon steel construction, but are also available in all stainless steel.

### GR Seal Technology

Equipped with a GR seal, which is suitable for most fluids.

### Thrust Bearings

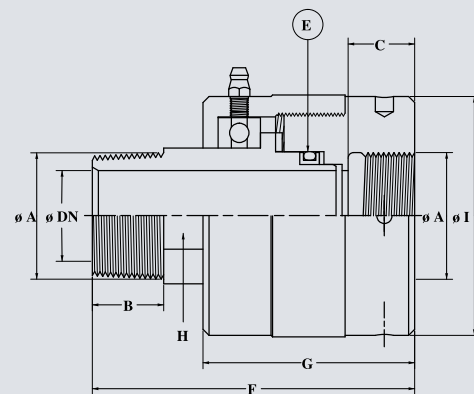
A single acting thrust bearing permits slow rotation at high pressures.

1700 SERIES HIGH PRESSURE SWIVEL				
	Nominal Pipe Size (DN)	Shaft Thread (A)	Part Number	Description
PART NUMBERS	1/4"	1/4"	750788C	R1813SRKNPT
	3/8"	3/8"	750789C	R1817SRKNPT
	1/2"	1/2"	750790C	R1821SRKNPT
	3/4"	3/4"	750791C	R1827SRKNPT
	1"	1"	750792C	R1834SRKNPT
	1-1/8"	1-1/4"	750793C	R1842SRKNPT
	1-1/2"	1-1/2"	750794C	R1849SRKNPT
	1-3/4"	2"	750795C	R1860SRKNPT
	2-1/4"	2-1/2"	750796C	R1876SRKNPT
	2-3/4"	3"	750797C	R1890SRKNPT

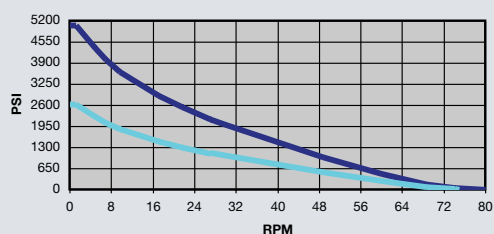
MAXIMUM OPERATING PRESSURE (psi)		
Nominal Pipe Size (DN)	Shaft Thread (A)	Maximum Pressure (psi)
1/4"	1/4"	5,075
3/8"	3/8"	5,075
1/2"	1/2"	4,350
3/4"	3/4"	4,350
1"	1"	3,625
1-1/8"	1-1/4"	3,625
1-1/2"	1-1/2"	2,900
1-3/4"	2"	2,900
2-1/4"	2-1/2"	2,175
2-3/4"	3"	2,175



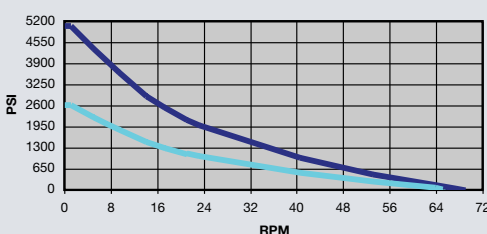
1700 SERIES HIGH PRESSURE SWIVEL (in.)								
DIMENSIONS	Nominal Pipe Size (DN)	Shaft Thread (A)	B	C	Overall Length (F)	G	Flats (H)	Overall Diameter (I)
	1/4	1/4	1/2	7/16	2-5/8	1-3/4	1/2	1-3/8
	3/8	3/8	1/2	1/2	2-3/4	1-15/16	1/2	1-1/2
	1/2	1/2	5/8	9/16	3-1/8	2-3/16	3/4	2-1/16
	3/4	3/4	3/4	5/8	3-1/2	2-1/2	1	2-1/4
	1	1	7/8	3/4	3-3/4	2-9/16	1-1/4	2-1/2
	1-1/8	1-1/4	1	3/4	4-3/16	2-3/4	1-1/2	3
	1-1/2	1-1/2	1	3/4	4-9/16	3-1/8	1-3/4	3-3/8
	1-3/4	2	1-1/8	1	5.12	3-1/4	2-1/4	4
	2-1/4	2-1/2	1-1/8	1	5-5/8	3-3/4	2-3/4	5-1/8
2-3/4	3	1-1/4	1-1/8	7-1/8	4-13/16	3-3/8	6-1/8	



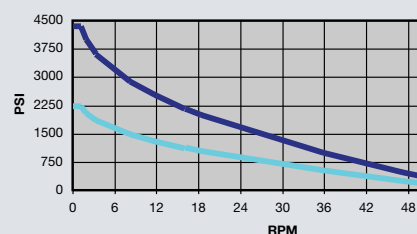
## Performance Charts



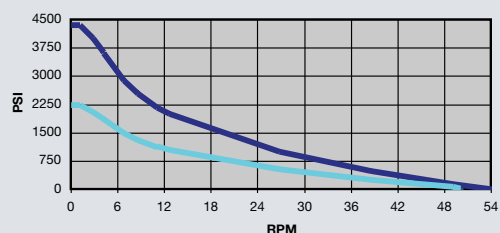
3/4"



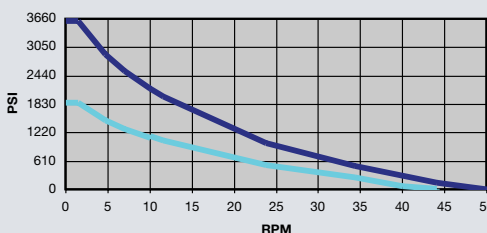
1"



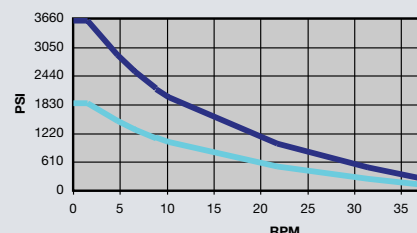
1 1/4"



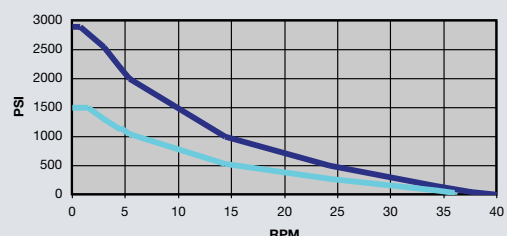
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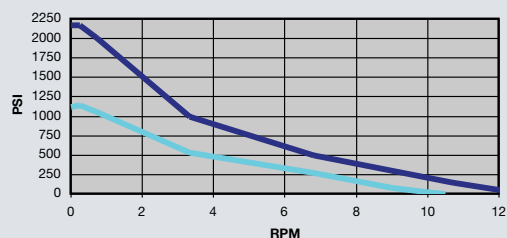
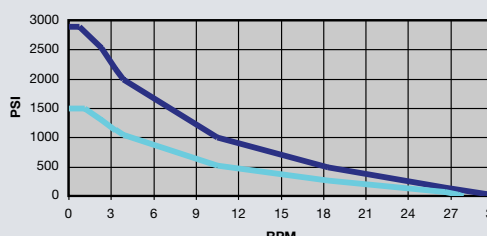
2"



2 1/2"



3"



Standard Material

Stainless Steel

# 1900 SERIES

HIGH PRESSURE SWIVEL



## Operating Parameters

<b>MEDIA</b>	<b>PRESSURE*</b>
Water, Air, Hydraulic Fluid	10,150 psi
<b>TEMPERATURE*</b>	<b>SPEED*</b>
248° F	100 RPM
<b>MATERIAL</b>	<b>THREADS</b>
Nickel Plated Steel	1/4" to 3" NPT

\* See Performance Charts For Details

## Features & Benefits

### Hydraulic Applications

High pressure swivel for use in hydraulic and pneumatic applications.

### High Pressure

Designed for use in very high pressure applications up to 10,150 psi.

### Corrosion Resistant

Standard models feature nickel plated carbon steel construction. Also available in all stainless steel.

### GR Seal Technology

Equipped with a GR seal for superior sealing performance.

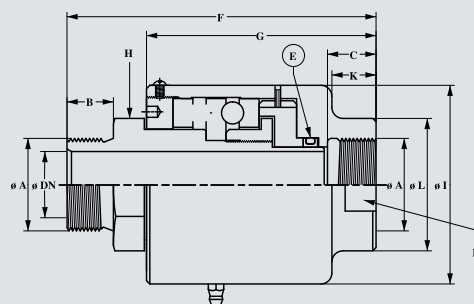
### Stability At High Pressures

Equipped with a double acting thrust bearing and a bronze bushing. The bearing permits higher pressure, while the bushing increases the guide of the shaft to allow faster rotating speeds.

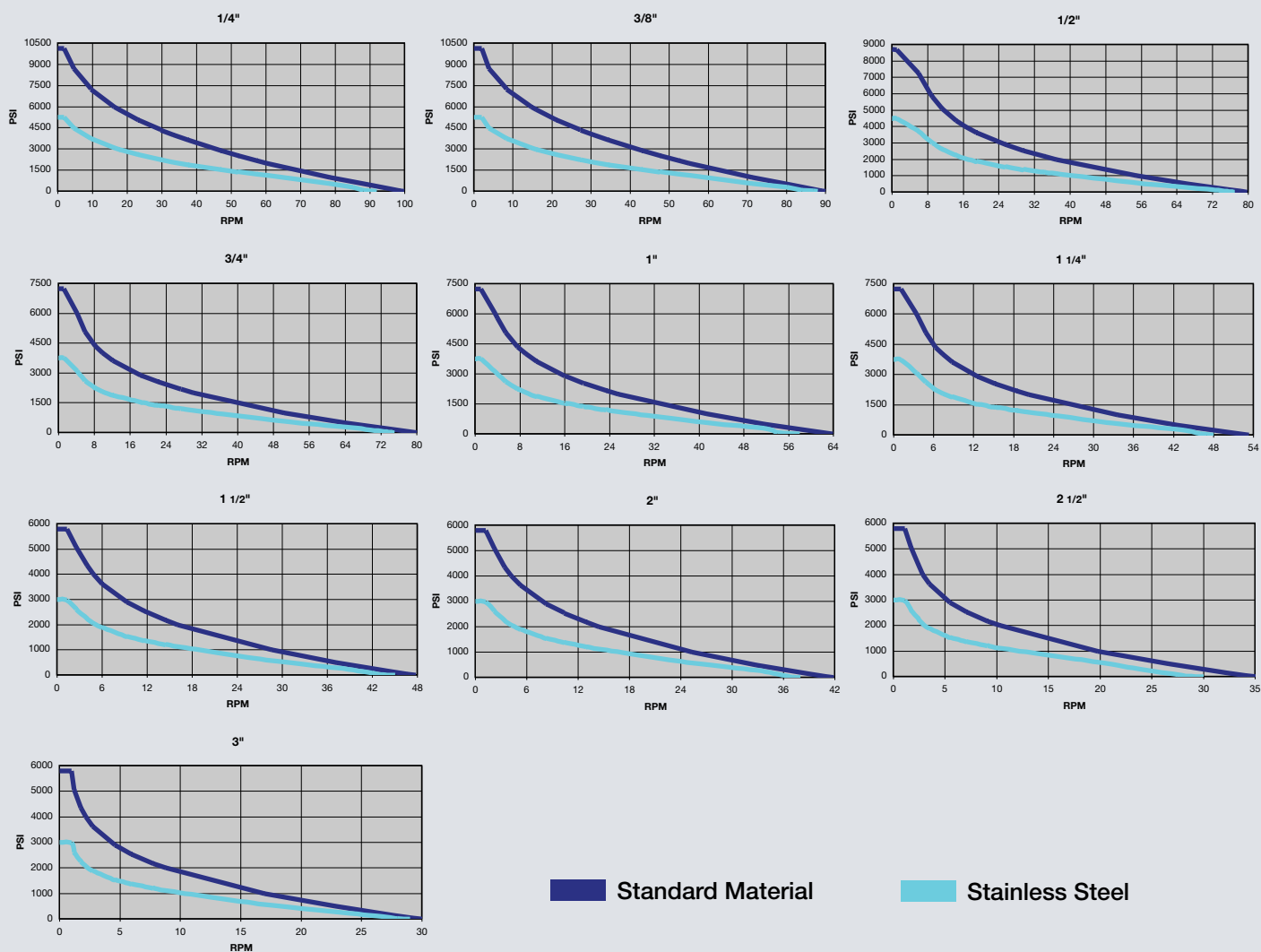
1900 SERIES SWIVEL			
	Shaft Thread (A)	Part Number	Description
PART NUMBERS	1/4	750798C	R1813SRDENPT
	3/8	750799C	R1817SRDENPT
	1/2	750800C	R1821SRDENPT
	3/4	750801C	R1827SRDENPT
	1	750802C	R1834SRDENPT
	1-1/4	750803C	R1842SRDENPT
	1-1/2	750804C	R1849SRDENPT
	2	750806C	R1860SRDENPT
	2-1/2	750807C	R1876SRDENPT
	3	750805C	R1890SRDENPT

MAX. OPERATING PRESSURE (psi)	
Shaft Thread (A)	Maximum Pressure (psi)
1/4	10,150
3/8	10,150
1/2	8,700
3/4	7,250
1	7,250
1-1/4	7,250
1-1/2	5,800
2	5,800
2-1/2	5,800
3	5,800

1900 SERIES SWIVEL (in.)										
DIMENSIONS	Shaft Thread (A)	B	C	DN	Overall Length (F)	G	Flats (H)	Overall Diameter (I)	K	L
	1/4	3/8	7/16	1/4	3-5/8	2-15/16	13/16	1-15/16	5/8	15/16
	3/8	7/16	9/16	3/8	4	3-1/8	1-1/4	2-1/8	1/2	1-7/16
	1/2	9/16	5/8	1/2	4-1/8	3-1/8	1-1/4	2-1/8	5/8	1-3/8
	3/4	5/8	9/16	3/4	4-3/4	3-1/2	1-5/16	2-1/2	3/4	1-1/2
	1	3/4	3/4	13/16	5-1/4	4	2	3-5/16	3/4	2-1/8
	1-1/4	13/16	13/16	1-1/8	5-1/2	4-1/8	2-1/8	3-1/2	3/4	2-3/8
	1-1/2	13/16	13/16	1-7/16	6	4-5/8	2-3/8	4-1/16	1	2-5/8
	2	1	1	1-5/8	6-7/16	4-7/8	2-5/8	4-1/2	1	2-15/16
	2-1/2	1-1/16	1-1/8	2	7-1/2	5-3/4	4	6	1-1/8	4-1/4
3	1-1/8	1-1/4	2-1/2	8-1/4	6-7/16	4-3/4	6-13/16	1-1/8	5-1/8	



## Performance Charts

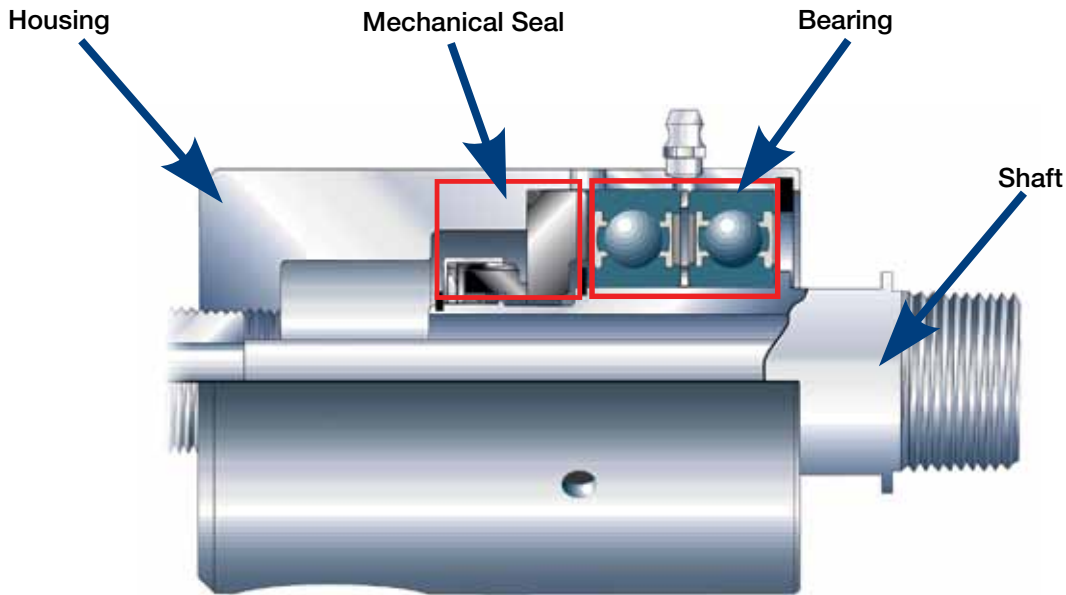


Standard Material

Stainless Steel

## Rotary Union Design

While rotating joints come in many shapes, sizes, and configurations, they always have the same four basic components: housing, a shaft, a bearing (or bearings) and a seal.



### Mechanical Seal

The heart of the rotary union or rotary joint is the seal. The seal prevents the medium (water, oil, air, etc) from leaking outside the rotary union while the rotary union is in operation. Duff-Norton uses four basic types of mechanical seals in its rotary unions: 1) pusher-type end face mechanical seal, 2) non-pusher type end face mechanical seal, 3) lip seals and 4) o-ring seal. Rotary unions may have more than one seal.

### Bearing

The second most important part of the rotary union is the bearing. A rotary union may have only one bearing or multiple bearings. Roller bearings, such as ball bearings and tapered roller bearings, or non-roller bearings, like graphite bearings and bronze bushings, may be used in the rotary union. The bearings are always used to allow a part of the joint, either the shaft or the housing, to rotate.

### Shaft

The shaft is the component that carries the medium through the rotary union into the drum or roll. In many cases, the shaft will turn with the drum or roll. In some cases, like in larger flanged rotary unions, the shaft may be stationary while the housing rotates. The bearings and seal are typically assembled around the shaft.

### Housing

The housing is the component that holds all of the other elements of the rotary union together. The housing has an inlet port, which is a threaded port to which the hose supplying the medium will be attached (See the next page for recommended hose installation). The rotary union may also have an outlet port, if the same joint is being used both to supply fluid to a roll and to remove fluid from the roll. In smaller rotary unions, the housing is stationary. In larger rotary unions, the housing maybe bolted to the drum or roll using a flange. In these cases, the housing rotates at the same speed as the drum.

# Rotary Union Technical Data

SINGLE FLOW - P		
Size	Free Flow Area (Sq. In.)	Cv
1/4"	0.050	2.06
3/8"	0.111	2.95
1/2"	0.196	5.25
3/4"	0.442	11.8
1"	0.785	21
1 1/4"	1.227	33
1 1/2"	1.767	47
2"	3.14	84
2 1/2"	4.43	113
3"	6.49	173
4"	12.57	335
5"	19.60	523

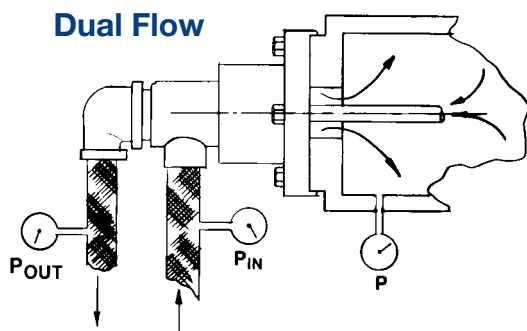
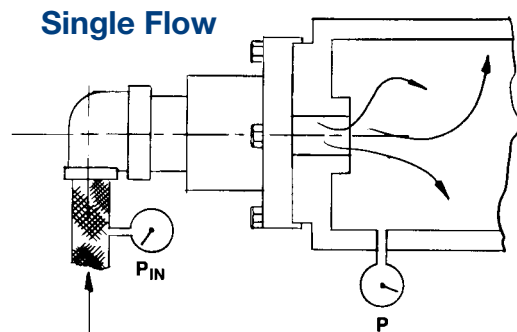
$$GRM = C_v \sqrt{\Delta P}$$

Where:

GPM = Flow rate in gallons per minute of water

$C_v$  = Flow factor in gallons of water flow per minute with a 1 psi pressure drop

$\Delta P$  = Pressure drop, psi



DUAL FLOW - S, CS, FS, RSP & FRSP						
Size (in.)	Siphon Size	Shaft Area	Cv In	Siphon Area	Cv Out	Cv In and Out
1/4"	1/8 Tube	0.065	1.6	0.004	0.11	0.1
	3/16 Tube	0.049	1.2	0.012	0.35	0.34
	1/4 Tube	0.028	0.7	0.025	0.73	0.5
3/8"	1/8 Tube	0.099	2.5	0.004	0.11	0.11
	3/16 Tube	0.083	2.1	0.012	0.35	0.34
	1/4 Tube	0.062	1.6	0.025	0.73	0.67
1/2"	1/4 Tube	0.147	3.8	0.025	0.73	0.72
	1/8 Pipe	0.068	1.7	0.057	1.6	1.16
3/4"	1/8 Pipe	0.312	8.1	0.057	1.6	1.57
	1/4 Pipe	0.212	5.5	0.104	3	2.64
	3/8 Pipe	0.083	2.1	0.191	5.6	1.97
1"	1/8 Pipe	0.656	17	0.057	1.6	1.59
	1/4 Pipe	0.556	14	0.104	3	2.94
	3/8 Pipe	0.427	11	0.191	5.6	5
	1/2 Pipe	0.231	6	0.304	8.9	5
1 1/4"	1/8 Pipe	1.098	28	0.057	1.6	1.6
	1/4 Pipe	0.998	26	0.104	3	2.97
	3/8 Pipe	0.869	22	0.191	5.6	5.43
	1/2 Pipe	0.673	17	0.304	8.9	7.88
1 1/2"	3/4 Pipe	0.361	9.4	0.533	15	8
	1/4 Pipe	1.538	40	0.104	2	2
	3/8 Pipe	1.409	36	0.191	5.6	5.53
	1/2 Pipe	1.213	31	0.304	9	8.6
2"	3/4 Pipe	0.901	23	0.533	15	12.5
	1 Pipe	0.409	10	0.864	23	9.2
	3/8 Pipe	2.784	72	1.495	5.6	5.7
	1/2 Pipe	2.588	67	0.304	9	8.95
	3/4 Pipe	2.276	59	0.533	15	14.7
2 1/2"	1 Pipe	1.784	46	0.864	23	20.8
	1-1/4 Pipe	0.978	25	1.495	44	21.8
	1/2 Pipe	3.876	100	2.036	8.9	8.9
	3/4 Pipe	3.564	92	3.355	15	14.8
	1 Pipe	3.072	80	0.304	23	22.2
2 1/2"	1-1/4 Pipe	2.266	59	0.533	44	35.2
	1-1/2 Pipe	1.595	41	0.864	60	33.9
	2 Pipe	0.478	12	1.495	98	11.8
	1/2 Pipe	5.937	154	2.036	8.9	8.9
3"	3/4 Pipe	5.625	146	3.355	15	14.9
	1 Pipe	5.133	133	4.788	23	23
	1-1/4 Pipe	4.327	112	1.495	44	40.7
	1-1/2 Pipe	4.106	107	2.036	59	52
	2 Pipe	2.061	53	3.355	98	46.7
3"	2-1/2 Pipe	0.576	15	4.788	140	14
4"	1-1/4 Pipe	10.402	270	1.495	44	43.4
	1-1/2 Pipe	9.731	254	2.036	59	58
	2 Pipe	8.136	212	3.355	98	89
	2-1/2 Pipe	6.074	158	4.788	140	105
5"	3 Pipe	2.945	76	7.393	216	71.7
	1-1/4 Pipe	17.471	450	1.495	44	43.7
	1-1/2 Pipe	16.8	430	2.036	60	59.8
	2 Pipe	15.205	390	3.355	98	95.1
	2-1/2 Pipe	13.143	340	4.788	140	129
3 Pipe	10.014	260	7.393	216	166	

## Recommended Hose Installation

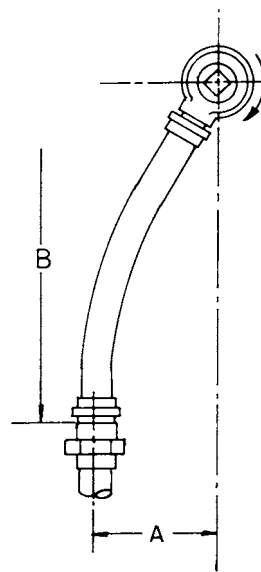
Flexible hose must be used to connect each rotary union to its supply or drain piping. Use braided metal hose for all applications involving hot fluids, such as hot water, hot oil or steam. Use two-ply rubber hose for cooling water, refrigerants, air and vacuum service.

Allow for an offset between the rotary union joint and the rigid pipe as shown in Exhibit C. It is important to allow a slight curve in the hose to allow the hose to “float”. This will prevent a side load from being placed on the rotary union. A side load will greatly reduce the life of the rotary union.

Rotary Union Thread Size (in.)	Hose Size and Length (in.)	Dimensions (in.)	
		A	B
1/2"	1/2 x 10	2 5/8	1
3/4"	3/4 x 10	2 1/2	11 7/8
1"	1 x 14	3 1/4	14 1/4
1 1/4"	1 1/4 x 16	3 1/2	16 1/4
1 1/2"	1 1/2 x 18	3 3/4	18 1/2
2"	2 x 21	4 3/8	21 3/4
	2 1/2 x 24	4 1/4	24 3/4
2 1/2"	2 x 21	4 3/8	21 3/4
	2 1/2 x 24	4 1/4	24 3/4
3"	3 x 26	4 1/2	28 5/8
	3 x 26	8	28 3/8
4"	4 x 26	8	2

### NOTE

Duff-Norton has made every effort to ensure that the information contained in the publication is accurate and reliable. Determining the suitability of our products for specific applications is the user's responsibility.



### Exhibit C

Example of the correct way to install flexible hose on a Rotary Union.

## Warranty

Subject to the conditions stated herein, Duff-Norton will repair or replace, without charge, any parts proven to Duff-Norton's satisfaction to be defective in materials or workmanship. Claims must be made within one year, except Series 9000 and 8000, 90 days REM.

Duff-Norton will not repair or replace any parts that become unusable and show clear evidence of improper maintenance, eccentric loading, overloading, excessive heat, chemical or abrasive wear, tampering or abuse. Equipment and accessories not manufactured by Duff-Norton are warranted only to the extent the manufacturer warrants them, and only if the claimed defect arose during normal use, application and service. Equipment that has been altered or modified by anyone without Duff-Norton's authorization is not warranted by Duff-Norton. Except as stated herein, Duff-Norton makes no other warranties, express or implied including warranties of merchantability and fitness for a particular purpose.

# TERMS AND CONDITIONS

All sales by Seller are made pursuant to the following terms. No other or additional terms or conditions are or will be accepted.

## ACCEPTANCE OF ORDERS -

All orders, whether placed directly or through an agent, and all subsequent amendments thereto, are subject to a final approval and acceptance by Seller's main office.

## LIMITATION OF WARRANTIES, REMEDIES AND DAMAGES -

THE WARRANTY STATED BELOW IS GIVEN IN PLACE OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OTHERWISE. NO PROMISE OR AFFIRMATION OF FACT MADE BY ANY AGENT OR REPRESENTATIVE OF SELLER SHALL CONSTITUTE A WARRANTY BY SELLER OR GIVE RISE TO ANY LIABILITY OR OBLIGATION.

Seller warrants that on the date of its delivery to carrier the goods are free from defects in workmanship and materials.

SELLER'S SOLE OBLIGATION IN THE EVENT OF BREACH OF WARRANTY OR CONTRACT OR FOR NEGLIGENCE OR OTHERWISE WITH RESPECT TO GOODS SOLD SHALL BE EXCLUSIVELY LIMITED TO REPAIR OR REPLACEMENT, F.O.B. SELLER'S POINT OF SHIPMENT, OF ANY PARTS WHICH SELLER DETERMINES TO HAVE BEEN DEFECTIVE or if Seller determines that such repair or replacement is not feasible, to a refund of the purchase price upon return of the goods to Seller.

Any action against Seller for breach of warranty, negligence or otherwise must be commenced within one year after such cause of action accrues.

NO CLAIM AGAINST SELLER FOR ANY DEFECT IN THE GOODS SHALL BE VALID OR ENFORCEABLE UNLESS BUYER'S WRITTEN NOTICE THEREOF IS RECEIVED BY SELLER WITHIN ONE YEAR FROM THE DATE OF SHIPMENT.

Seller shall not be liable for any damage, injury or loss arising out of the use of the goods if, prior to such damage, injury or loss, such goods are (1) damaged or misused following Seller's delivery to carrier; (2) not maintained, inspected, or used in compliance with applicable law and Seller's written instructions and recommendations; or (3) installed, repaired, altered or modified without compliance with such law, instructions or recommendations.

UNDER NO CIRCUMSTANCES SHALL SELLER BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES AS THOSE TERMS ARE DEFINED IN SECTION 2-715 OF THE UNIFORM COMMERCIAL CODE.

## TERMS OF PAYMENT -

Unless otherwise stated herein, payment of each invoice is required within thirty (30) days after date of shipment. Any balance unpaid after the required payment date shall be subject to a service charge of 1% per month from such date.

## PRICE ADJUSTMENTS -

Amendments made by the Buyer to orders already placed shall, without formal notice to the Buyer, be subject to extra charges. If the estimated shipping date for the goods is more than sixty (60) days after date of order, the price of the goods are subject to increase by Seller.

## TAXES -

Any sales, use, excise, and other taxes applicable to this transaction and the goods and/or services furnished by Seller are not included in the price and shall be paid by Buyer when due. If Seller pays any such taxes, Buyer shall reimburse Seller upon demand.

## INDEMNIFICATION AND SAFE OPERATION -

Buyer shall comply with and require its employees to comply with directions set forth in instructions and manuals furnished by Seller and shall use and require its employees to follow such instructions and manuals and to use reasonable care in the use and maintenance of the goods. Buyer shall not remove or permit anyone to remove any warning or instruction signs on the goods. In the event of personal injury or damage to property or business arising from the use of the goods, Buyer shall, within forty-eight (48) hours thereafter, give Seller written notice of such injury or damage. Buyer shall cooperate with Seller in investigating any such injury or damage and in the defense of any claims arising therefrom.

If Buyer fails to comply with this section or if any injury or damage is caused, in whole or in part, by Buyer's failure to comply with applicable federal or state safety requirements, Buyer shall indemnify and hold Seller harmless against any claims, loss or expense for injury or damage arising from the use of the goods.

## GOVERNING LAW -

This agreement shall be governed by and construed under the laws of the State of New York.

## DELIVERY AND DELAYS -

Unless otherwise specified herein, deliveries shall be F.O.B. Seller's point of shipment and risk of loss shall pass to Buyer upon Seller's delivery to carrier. All shipping dates are approximate and Seller shall not be liable for loss or damage because of delays occasioned by labor disputes, damage to facilities, or failure of suppliers or subcontractors to meet scheduled deliveries or any other cause beyond Seller's reasonable control or making its performance commercially impracticable.

Notwithstanding other provisions hereof, if shipment is delayed at Buyer's request, the goods shall be deemed to be stored at Buyer's risk and expense and Seller may thereupon bill Buyer for the full price and storage costs. Buyer shall pay such bill within 30 days after mailing thereof.

## BUYER'S INSPECTION UPON RECEIPT OF SHIPMENT -

Buyer shall inspect the goods as soon as received. If any loss or damage is discovered, Buyer must notify both the carrier and Seller at once. Seller will cooperate with Buyer in filing claims with the carrier.

## CHANGES AND CANCELLATION -

Seller reserves the right to change or cancel any order whenever circumstances require allocation of production or delivery or Seller deems change or cancellation to be necessary to comply with applicable laws, ordinances, regulations, directives or administrative actions. Seller reserves the right to make changes in materials or design which it determines appropriate for the goods.

## SECURITY INTEREST AND REPOSSESSION -

Until full payment has been made therefor, Seller shall have a security interest in goods shipped to Buyer and the goods shall remain personal property. Upon request Buyer shall execute and deliver to Seller security agreements and financing statements further evidencing Seller's security interest. Buyer authorizes Seller to file a financing statement or statements relating to the goods, without Buyer's signature thereon, as Seller may deem appropriate and appoints Seller as Buyer's attorney-in-fact for the limited purpose of executing (without requiring Seller to do so) financing statements in Buyer's name and performing other acts which Seller deems appropriate to perfect and continue its security interest and to protect and preserve the goods.

In the event Buyer defaults in making any payment due Seller, Seller in addition to any other rights or remedies provided by law, shall have the right, with or without legal process, to enter the place where said goods are located and to repossess the goods in accordance with the Uniform Commercial Code.

## ASSURANCES -

Shipment by Seller shall at all times be subject to the prior approval of its credit personnel and Seller may, at any time, decline to make shipment except upon receipt of prior payment or upon other terms and conditions or security satisfactory to such personnel.

## PATENTS -

Except as to goods manufactured according to design supplied by Buyer, Seller will defend and hold Buyer free and harmless in a suit or proceeding brought against Buyer insofar as it is based on a claim that use of the goods by Buyer constitutes an infringement of any existing U.S. Patents, provided, however, that Buyer gives Seller prompt written notice of such suit or proceeding; permits Seller, through its counsel, to defend and/or settle the same; and gives Seller all necessary information, assistance and authority to enable Seller so to do. If Buyer's use of the goods is held to constitute infringement and further use is enjoined, Seller shall, at its option, either (i) procure for Buyer the right to continue using the goods; or (ii) replace the goods with non-infringing goods; or (iii) modify the goods to non-infringing goods. The foregoing states Seller's entire liability for patent infringement and shall not be construed to render Seller liable for damages based on product output.

## MISCELLANEOUS -

This instrument constitutes the entire agreement between Seller and Buyer, superseding all previous understandings and writings regarding this transaction. Any amendment or modification of this Agreement shall be void unless in writing and signed by Seller.

No delay or omission by Seller in exercising any right or remedy hereunder shall be a waiver thereof or of any other right or remedy, and no single or partial exercise thereof shall preclude any other or further exercise thereof or the exercise of any other right or remedy. All rights and remedies of Seller are cumulative.

Sales made pursuant to this Agreement shall be governed by the Uniform Commercial Code as the same may from time to time be construed and in effect in the state wherein Seller has its main office.

## ARBITRATION -

All disputes that may arise between the parties regarding the interpretation of the contract and the legal effect of the contract shall, to the exclusion of any court of law, be arbitrated and determined in accordance with the latest Commercial Arbitration Rules of the American Arbitration Association. The arbitration proceeding shall be held in the city in that state where the principal office of the Seller is located. The parties recognize and consent to the above mentioned arbitration association's jurisdiction over each and every one of them.

## USTS rev. 2/98

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