

# ROTARY UNIONS

Steel Industry Applications





Since 1945, Deublin has grown from a small garage shop to the world's largest manufacturer of rotary unions. Today, Deublin's international headquarters is located in Waukegan, Illinois, with manufacturing facilities, sales offices and warehouses located in 17 countries on four continents.

Our worldwide distribution network allows end users all over the world to specify Deublin unions when purchasing equipment made in another country. We're manufacturers ourselves, so we understand the importance of fast response time to keep your manufacturing process rolling. Wherever you're located, Deublin has a stocking distributor nearby to meet your requirements—quickly.



## **UNIQUE REQUIREMENTS DEMAND CUSTOM UNIONS**

Rotary unions must accommodate a broad range of materials, viscosities, temperatures, pressures and speeds. That's why the Deublin product line offers over 500 standard unions, over 3,000 separate models.

Even this extensive line cannot meet all the specialized needs required by our customers. That's why we manufacture an ever-growing line of custom unions to meet individual manufacturers' particular requirements. In many instances, we can adapt or convert an existing union and offer a cost-effective solution to meet your exact specifications.



# ROTARY UNIONS FOR STEEL INDUSTRY

Deublin has been the world's largest manufacturer of rotary unions for the general industry for over 75 years and specialty unions for the continuous casting industry for over 55 years. Deublin has worked closely with designers and users of continuous casting equipment and as a result, has developed a number of solutions to the unique requirements of continuous casting applications.

Rotary unions are used to transmit cooling water in and out of the rolls of caster segments and, therefore, are critical components of every continuous casting machine (CCM). Rotary union performance can often make the difference between a productive operation or a casting operation with frequent downtime, maintenance, and repair.

A rotary union is composed of 3 parts — a housing that turns with the caster roll, a stationary hollow sleeve that connects the water supply and return and balanced mechanical seal that acts as a leak-proof rotating connection. The critical component is the mechanical seal.

Deublin unions have **balanced mechanical seals** with seal faces that are micro lapped to an optical flatness of better than 2 light bands. The seal faces are made of silicon carbide to provide the ultimate life in harsh and abrasive environments. While Deublin's standard unions have a one-year warranty — the 2400 Series, due to its robust design and advanced technology, is offered with a **two-year warranty**.

In today's very competitive environment, Deublin unions can help you reduce maintenance costs and enjoy the profitability of longer, high tonnage campaigns.

Deublin also offers **rebuilding and exchange programs** that can be designed to complement your section-rebuilding schedule. This assures you of always having a dependable quality union at a fraction of the cost of a new union.

## Quality Credentials

Deublin pursues its design and manufacturing missions with a passionate belief in the premise that quality is designed-in, not inspected in — a philosophy that is at the heart of its independently registered ISO 9001 compliant Quality Management System. This recognition offers assurance that our customers' end-use environment, performance requirements and reliability expectations are always captured and expressed in our product designs, as well as at every stage of development and manufacture. It means that "lessons learned" in hundreds of product applications are projected forward into continual improvement of both our product and processes. Our ISO 9001 recognition is therefore simply more evidence of Deublin's unmatched reputation for customer satisfaction and product quality.

In addition, Deublin is certified as an Authorized Economic Operator (AEO), which provides assurance that Deublin's supply chain is approved as both secure and customs-reliable. This recognition fast-tracks the flow of goods and materials worldwide — a customer service advantage for all of our supply chain partners.

## MANUFACTURING PROCESS

Foundry/Casting



Hot Rolled

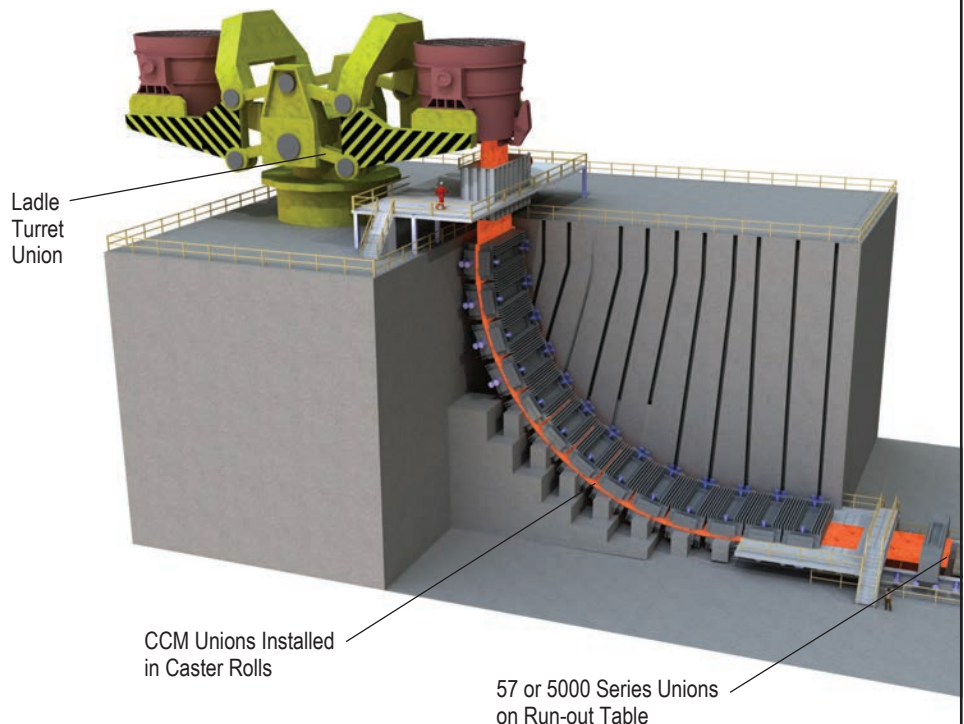


Cold Rolled

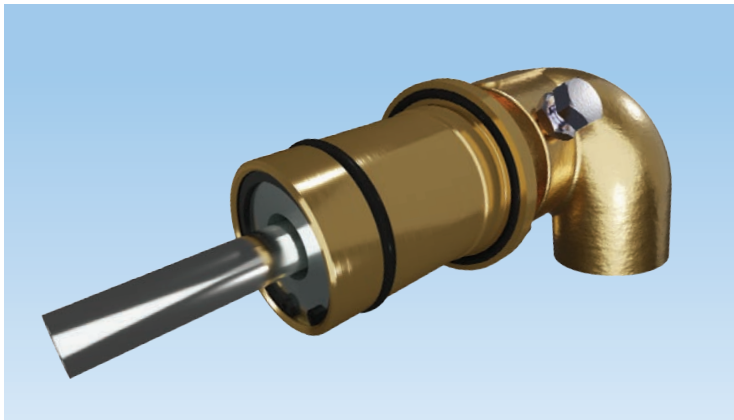


Finishing

## STEEL CONTINUOUS CASTING MACHINE



# ROTARY UNIONS FOR CONTINUOUS CASTING



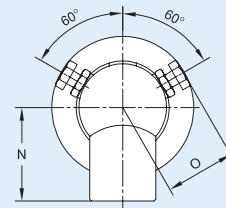
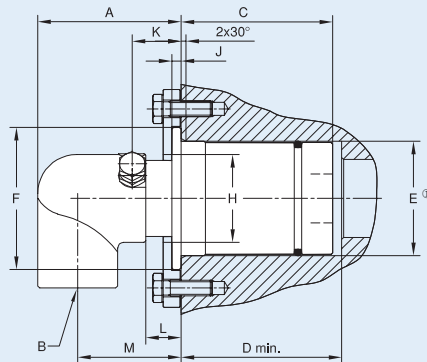
## DEUBLIN

### 2400 Series Rotary Union

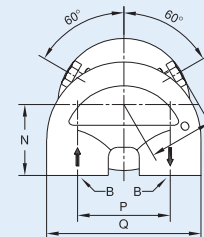
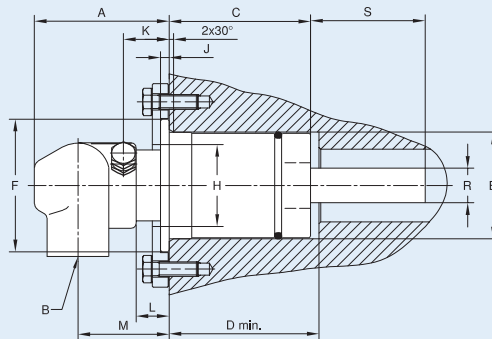
- monoflow and duoflow design
- in-the-shaft mounted
- self-supported
- flanged housing or mounted with retaining plate
- balanced mechanical seal
- seal combination:  
Silicon Carbide/Silicon Carbide
- brass housing and elbow
- stainless steel rotor and supply pipe
- engineered sleeve bearing
- full-media flow
- easily field repairable

OPERATING DATA	2400 SERIES	
Max. Pressure	150 PSI	10 bar
Max. Speed	100 RPM	100/min
Max. Temperature	250°F	120°C

### Monoflow Rotary Union



### Duoflow Rotary Union



	B Port	Ordering Number	A	C	D*	E Ø*	F Ø	H Ø	J	K	L	M	N	O	P	Q	R Ø	S	Shpg. Wt.
Monoflow	3/4" NPT	2420-001-125	2 2/64"	2 3/8"	2 7/16"	1.825 1.815	2 5/16"	1 15/16"	3/16"	1 1/32"	3/4"	1 2 1/2"	1 13/16"	1 7/16"	-	-	-	-	1 1/2#
	G 3/4" (BSP)	2420-001-139	59	60	62	46.35 46.10	59	49	5	26	19	42	46	36	-	-	-	-	.7 Kg
	1" NPT	2425-001-281	2 15/16"	3 1/16"	3 1/4"	2.323 2.313	2 7/8"	1 1/16"	3/16"	1 1/32"	3/4"	2 1/8"	1 13/16"	1 9/16"	-	-	-	-	3 1/2#
	G 1" (BSP)	2425-001-172	75	78	83	59.00 58.75	73	36	5	26	19	54	46	39	-	-	-	-	1.6 Kg
Duoflow	3/4" NPT	2420-001-135-180	2 15/16"	2 3/8"	2 7/16"	1.825 1.815	2 5/16"	1 15/16"	3/16"	1 1/32"	3/4"	2"	1 17/32"	1 7/16"	2"	3 1 1/2"	511 510	1 15/16"	2#
	G 3/4" (BSP)	2420-001-141-180	75	60	62	46.35 46.10	59	49	5	26	19	51	39	36	51	85	13.00 12.95	49	.9 Kg
	3/4" NPT	2425-001-283-180	2 15/16"	3 1/16"	3 1/4"	2.323 2.313	2 7/8"	1 1/16"	3/16"	1 1/32"	3/4"	2"	1 17/32"	1 9/16"	2"	3 1 1/2"	748 746	2 1/2"	4#
	G 3/4" (BSP)	2425-001-177-180	75	78	83	59.00 58.75	73	36	5	26	19	51	39	39	51	85	19.00 18.94	63.5	1.8 Kg
	1" NPT	2440-001-301-254	3 7/8"	3 1/16"	3 1 1/16"	2.805 2.795	3 3/8"	2"	3/16"	1 1/32"	3/4"	2 1 1/16"	1 1 1/16"	1 13/16"	2 1 1/2"	4 7/8"	1.130 1.125	1 7/8"	9#
G 1" (BSP)	2440-001-306-254	98	87	94	71.25 71.00	86	51	5	26	19	68	43	46	64	105	28.70 28.58	48	4 Kg	

\*Denotes Shaft Dimension

# BEARINGLESS UNIONS FOR CONTINUOUS CASTING

## Deublin Bearingless Technology

Conventional unions are dependent on bearings for support and smooth low torque rotation. However, bearings inherently have limitations, one of which is premature failure as a result of side loading from piping connections. Deublin has adapted this bearingless technology to CCM applications with proven in-the-field success. Call our Engineering Department for complete details and specifications.

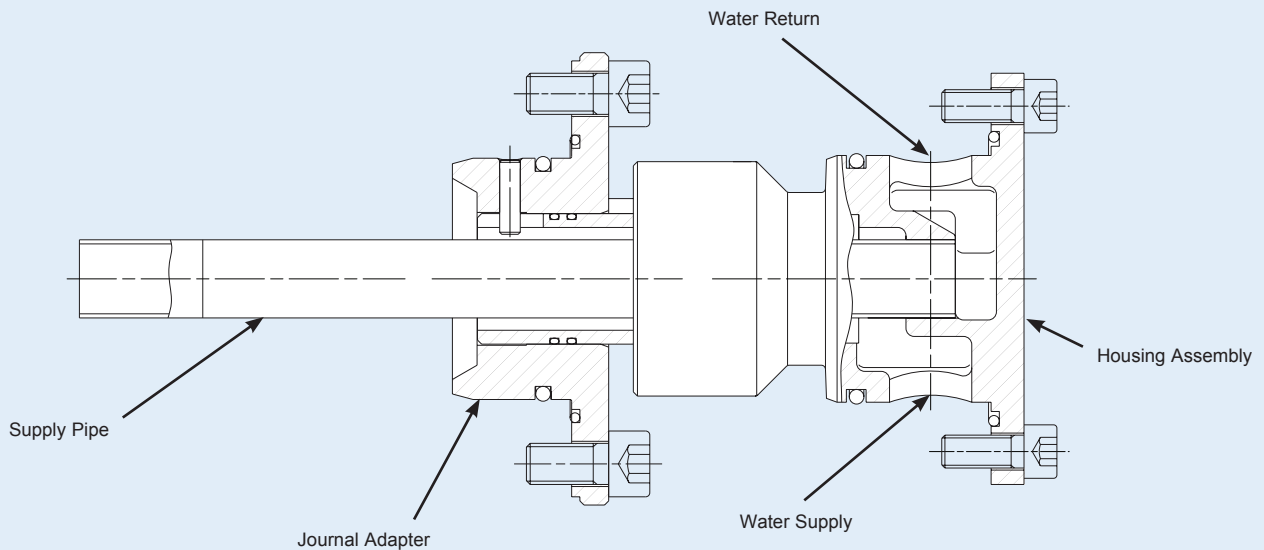


## DEUBLIN Bearingless CCM Union

- monoflow and duoflow design
- in-the-shaft mounted
- flanged housing or mounted with retaining plate
- balanced mechanical seal
- seal combination:  
Silicon Carbide/Silicon Carbide
- brass housing and elbow
- stainless steel rotor and supply pipe
- full-media flow
- easily field repairable
- no internal bearing

OPERATING DATA	BEARINGLESS CCM UNION	
Max. Pressure	150 PSI	10 bar
Max. Speed	100 RPM	100/min
Max. Temperature	250°F	120°C

## Bearingless Duoflow Union



# **ROTARY UNIONS FOR CONTINUOUS CASTING**

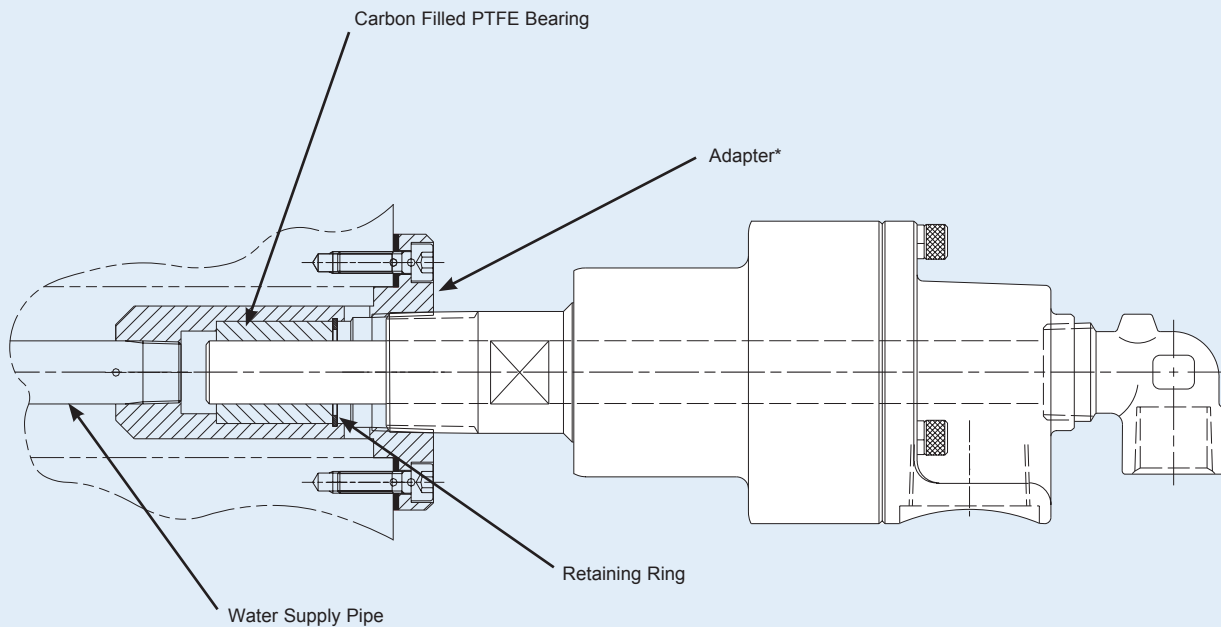


## **DEUBLIN** **5000 Series Rotary Union**

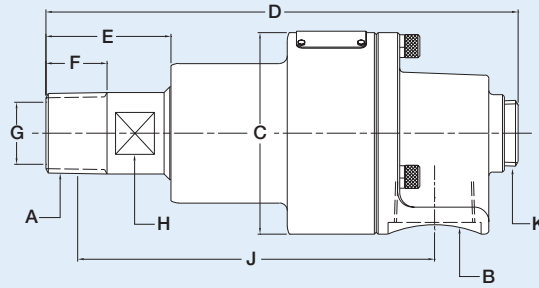
- monoflow and duoflow design
- externally mounted
- self-supported
- radial housing connection
- balanced mechanical seal
- seal combination - standard:  
Carbon Graphite/Silicon Carbide
- keyed rotor seal
- cast iron body/brass end-cap
- stainless steel rotor (3/4"-1 1/2")
- engineered sleeve bearing
- easily field repairable
- special options:  
threaded vent holes

OPERATING DATA	5000 SERIES	
Max. Pressure	150 PSI	10 bar
Max. Speed	100 RPM	100/min
Max. Temperature	250°F	120°C

### Duoflow Rotary Union



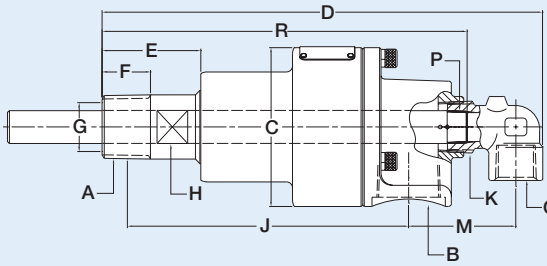
**\* Adapter for Outboard  
 Mounted Unions**  
 (Supplied by Customer)



### Monoflow

	B Port	Ordering Number	A Rotor Thread*	CØ	D	E	F	G Rotor Hole	H	J	K NPT	M	O NPT	P	Q Turn Ø	R	S	Shpg. Wt.	
Monoflow	3/4" NPT	5075-001-101	3/4" (NPT) RH	2 5/8"	5 1/2"	1 1/2"	7/8"	1 1/16"	1 1/4"	4 1/2"	-	-	-	-	-	-	-	3 1/2#	
		5075-001-102	3/4" (NPT) LH	67	150	38	19	17	32	105	-	-	-	-	-	-	-	-	1,6 Kg
		5075-001-117	G 3/2" (BSP) RH	3 1/4"	7 3/8"	1 3/4"	3/4"	1"	1 1/8"	5 1/2"	3/4"	-	-	-	-	-	-	-	6#
		5075-001-118	G 3/2" (BSP) LH	82	187	44	21,5	25,4	28	128	3/4"	-	-	-	-	-	-	-	2,8 Kg
	1" NPT	5100-060-160	1" (NPT) RH	4 1/4"	9 5/8"	2 1/8"	1 1/8"	1 1/2"	1 3/4"	7 1/8"	1 1/4"	-	-	-	-	-	-	-	12#
		5100-060-161	1" (NPT) LH	108	238	62	29	38	44	174	1 1/4"	-	-	-	-	-	-	-	5,6 Kg
		5100-060-171	G 1" (BSP) RH	3 1/4"	7 3/8"	1 3/4"	3/4"	1"	1 1/8"	5 1/2"	3/4"	-	-	-	-	-	-	-	6#
		5100-060-172	G 1" (BSP) LH	82	187	44	21,5	25,4	28	128	3/4"	-	-	-	-	-	-	-	2,8 Kg
	1 1/2" NPT	5150-001-117	1 1/2" (NPT) RH	4 1/4"	9 5/8"	2 1/8"	1 1/8"	1 1/2"	1 3/4"	7 1/8"	1 1/4"	2 15/16"	3/4"	3/4" N.P.T.	-	9 13/16"	-	-	12#
		5150-001-118	1 1/2" (NPT) LH	108	238	62	29	38	44	174	1 1/4"	75	3/4"	G 3/4" (BSP)	-	241	-	5,6 Kg	
		5150-001-156	G 1 1/2" (BSP) RH	3 1/4"	7 3/8"	1 3/4"	3/4"	1"	1 1/8"	5 1/2"	3/4"	-	-	-	-	-	-	-	6#
		5150-001-157	G 1 1/2" (BSP) LH	82	187	44	21,5	25,4	28	128	3/4"	-	-	-	-	-	-	-	2,8 Kg

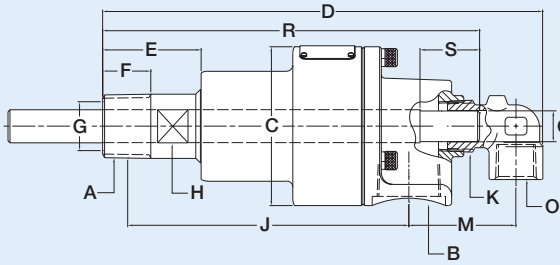
\*Female Thread also available



### Duoflow-Fixed Supply Pipe

	B Port	Ordering Number	A Rotor Thread*	CØ	D	E	F	G Rotor Hole	H	J	K NPT	M	O NPT	P	Q Turn Ø	R	S	Shpg. Wt.
Duoflow-Fixed Supply Pipe	1" NPT	5100-060-160-083	1" (NPT) RH	3 1/4"	8 3/8"	1 3/4"	3/4"	1"	1 1/8"	5 1/2"	3/4"	2 3/16"	1/2"	3/8" N.P.T.	-	7 5/8"	-	6#
		5100-060-161-083	1" (NPT) LH	82	225	44	21,5	25,4	28	128	3/4"	55	1/2"	G 3/2" (BSP)	-	183	-	2,8 Kg
		5100-060-171-255	G 1" (BSP) RH	4 1/4"	11 1/8"	2 1/8"	1 1/8"	1 1/2"	1 3/4"	7 1/8"	1 1/4"	2 15/16"	3/4"	3/4" N.P.T.	-	9 13/16"	-	12#
		5100-060-172-255	G 1" (BSP) LH	108	287	62	29	38	44	174	1 1/4"	75	3/4"	G 3/4" (BSP)	-	241	-	5,6 Kg
	1 1/2" NPT	5150-001-117-013	1 1/2" (NPT) RH	4 1/4"	11 1/8"	2 1/8"	1 1/8"	1 1/2"	1 3/4"	7 1/8"	1 1/4"	2 15/16"	3/4"	3/4" N.P.T.	-	9 13/16"	-	12#
		5150-001-118-013	1 1/2" (NPT) LH	108	287	62	29	38	44	174	1 1/4"	75	3/4"	G 3/4" (BSP)	-	241	-	5,6 Kg
		5150-001-156-221	G 1 1/2" (BSP) RH	3 1/4"	7 3/8"	1 3/4"	3/4"	1"	1 1/8"	5 1/2"	3/4"	-	-	-	-	-	-	6#
		5150-001-157-221	G 1 1/2" (BSP) LH	82	187	44	21,5	25,4	28	128	3/4"	-	-	-	-	-	-	2,8 Kg

\*Female Thread also available

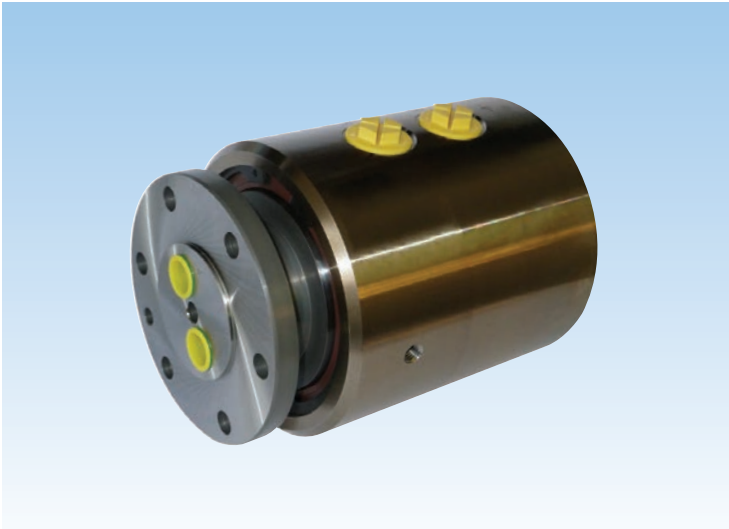


### Duoflow-Rotary Supply Pipe

	B Port	Ordering Number	A Rotor Thread*	CØ	D	E	F	G Rotor Hole	H	J	K NPT	M	O NPT	P	Q Turn Ø	R	S	Shpg. Wt.
Duoflow-Rotary Supply Pipe	1" NPT	5100-060-160-163	1" (NPT) RH	3 1/4"	8 3/8"	1 3/4"	3/4"	1"	1 1/8"	5 1/2"	3/4"	2 3/16"	1/2"	-	.621" .619"	7 5/8"	1 1/4"	6#
		5100-060-161-163	1" (NPT) LH	82	225	44	21,5	25,4	28	128	3/4"	55	1/2"	-	15,95 15,90	196	31	2,8 Kg
		5100-060-171-347	G 1" (BSP) RH	4 1/4"	11 1/8"	2 1/8"	1 1/8"	1 1/2"	1 3/4"	7 1/8"	1 1/4"	2 15/16"	3/4"	-	1.000" .998"	9 15/16"	1 3/4"	12#
		5100-060-172-347	G 1" (BSP) LH	108	287	62	29	38	44	174	1 1/4"	75	3/4"	-	25,91 25,81	263	44	5,6 Kg
	1 1/2" NPT	5150-001-117-144	1 1/2" (NPT) RH	4 1/4"	11 1/8"	2 1/8"	1 1/8"	1 1/2"	1 3/4"	7 1/8"	1 1/4"	2 15/16"	3/4"	-	1.000" .998"	9 15/16"	1 3/4"	12#
		5150-001-118-144	1 1/2" (NPT) LH	108	287	62	29	38	44	174	1 1/4"	75	3/4"	-	25,91 25,81	263	44	5,6 Kg
		5150-001-156-468	G 1 1/2" (BSP) RH	3 1/4"	7 3/8"	1 3/4"	3/4"	1"	1 1/8"	5 1/2"	3/4"	-	-	-	-	-	-	6#
		5150-001-157-468	G 1 1/2" (BSP) LH	82	187	44	21,5	25,4	28	128	3/4"	-	-	-	-	-	-	2,8 Kg

\*Female Thread also available

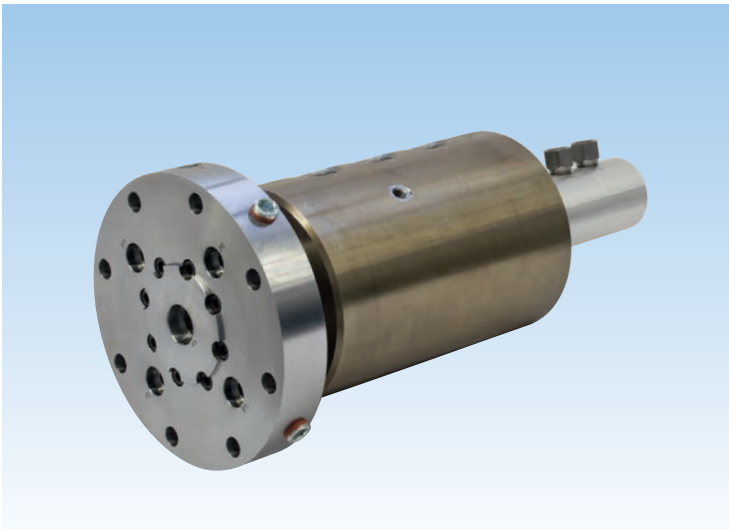
**Typical Examples**



**2-Passage Rotary Union with Hydrostatic Seal**

- for clamping-unclamping applications on steel-strip winders

OPERATING DATA	7100-535	
Max. Pressure	5,075 PSI	350 bar
Max. Speed	100 RPM	100/min
Max. Temperature	205°F	95°C



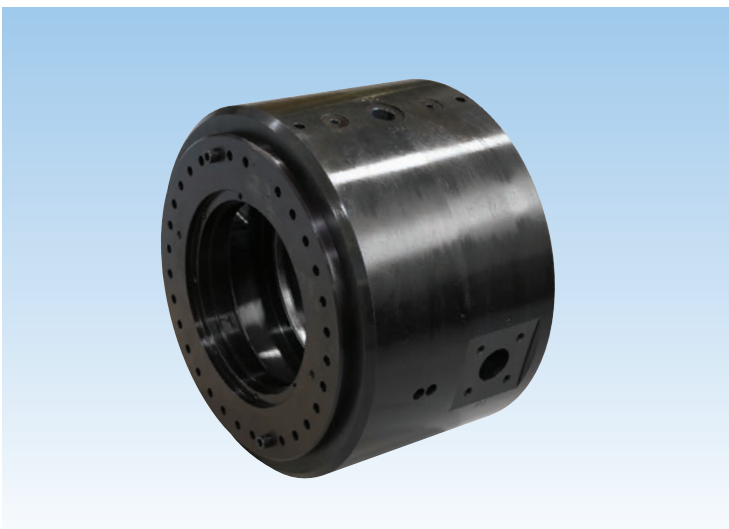
**3-Passage Rotary Union with Hydrostatic Seal**

- for spraying-clamping-unclamping applications on steel-strip winders

**In combination with SP0077 (2-Passage)**

- grease is supplied to the winding mandrel to lubricate the moving elements of the winder

OPERATING DATA	7100-1010		SP0077	
Media	Hydraulic		Grease	
Max. Pressure	1,450 PSI	100 bar	5,800 PSI	400 bar
Max. Speed	450 RPM	450/min	600 RPM	600/min
Max. Temperature	160 °F	70 °C	160 °F	70 °C



**2-Passage Rotary Union with Mechanical Seal – for Around-the-Shaft Application**

- for clamping-unclamping applications on steel-strip winders

**In combination with SP0077 (2-Passage)**

- grease is supplied to the winding mandrel to lubricate the moving elements of the winder

OPERATING DATA	SP0283		SP0077	
Media	Hydraulic		Grease	
Max. Pressure	2,610 PSI	180 bar	5,800 PSI	400 bar
Max. Speed	800 RPM	800/min	600 RPM	600/min
Max. Temperature	160 °F	70 °C	160 °F	70 °C

**Other Models Available**



## UNIONS FOR LADLE TURRETS



### Ladle Turret Union

- Ladle turrets require complex, heavy-duty multi-passage unions that support the hydraulic lifting of the ladle for each pour of molten metal. Deublin Ladle Turret Unions accommodate multiple media including hydraulic oil, argon, air and water.
- Typical number of ports: up to 26.

OPERATING DATA	LADLE TURRET							
	Hydraulic Oil		Argon		Air		Water	
Max. Pressure	3,625 PSI	250 bar	150 PSI	10 bar	150 PSI	10 bar	300 PSI	20 bar
Max. Speed	20 RPM	20/min	20 RPM	20/min	20 RPM	20/min	20 RPM	20/min
Max. Temperature	250°F	120°C	250°F	120°C	250°F	120°C	250°F	120°C

## PLANE & SELF-ALIGNING SWIVEL JOINTS



### Plane Swivel Joints

- Handles 360° single & multi-plane swivel movement with positive sealing
- Available in 1" through 6" sizes in threaded, welded or flanged styles
- Available in three seal materials that are compatible with many types of media
- Spring energized seals offer leak-tight sealing at all pressures, including vacuum
- Seal can be replaced without removing bearings



### Self-Aligning Swivel Joints

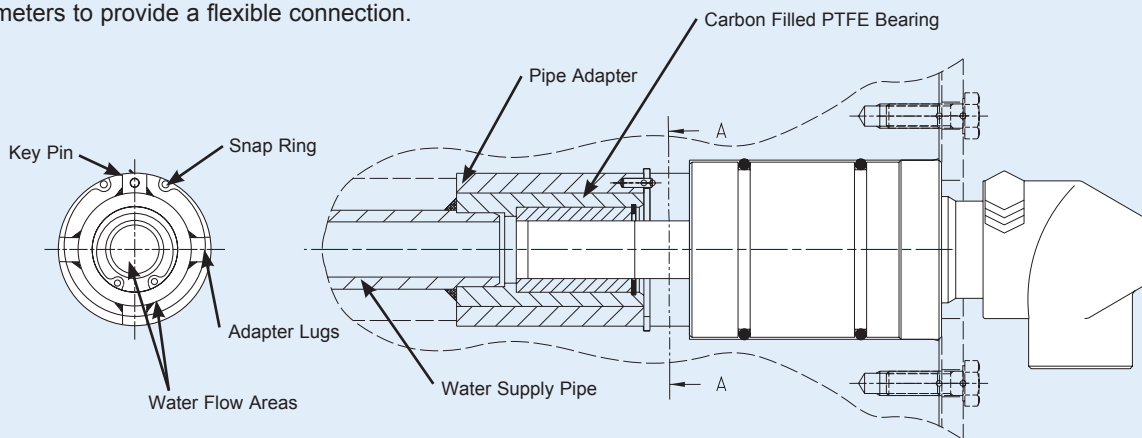
- Handles 360° rotary and 10° angular misalignment motion with positive sealing
- Conveys hot and cold water, alternating steam and water and heat transfer fluids
- Eliminates the hazards of leaking pipe connections or catastrophic hose failures
- Outperforms and outlasts flexible hose with lower pressure drop

# INSTALLATION INSTRUCTIONS

## PROPER MOUNTING ENSURES LONGER UNION LIFE

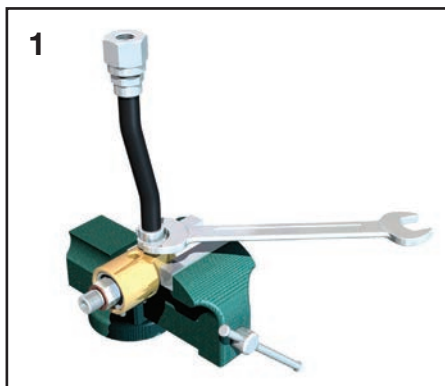
Flexible hoses must be used to connect the rotary union to its supply and return lines. A flexible hose ensures less side load and wear on the bearing surfaces of the union. Rigid piping should not be used. The hose should connect directly to the union, if possible, by way of a live swivel that will eliminate any torsional stress from the pressurized hose. The table shows minimum recommended lengths for the different hose diameters to provide a flexible connection.

HOSE DIAMETER	HOSE LENGTH	
	INCHES	mm
1/2"	12	305
3/4"	14	355
1"	16	405
1 1/4"	18	460
1 1/2"	20	510

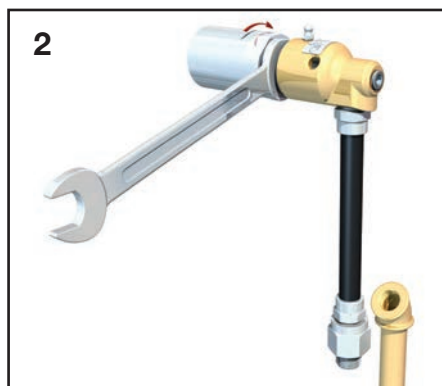


**Adapter for "In-The-Shaft" Mounted Unions**

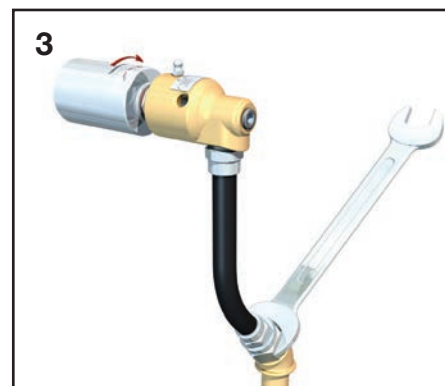
## Flexible Hose Installation Instructions for Deublin Rotary Unions\*



1 Mount housing in a bench vise and install hose.



2 Install rotary union into machine.



3 Connect flexible hose to supply line.

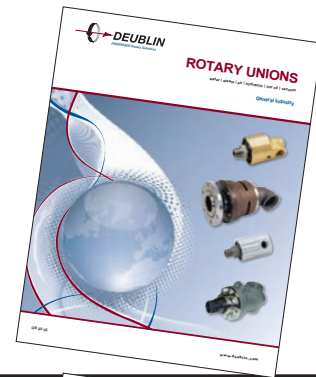
\*Consult Deublin website for installation instructions for CCM Unions.

### WARNING

DEUBLIN unions should not be used to convey flammable media (flash point  $\leq 140^{\circ}\text{F}$  or  $60^{\circ}\text{C}$ ) as leakage may result in explosions or fires. DEUBLIN unions should be used in accordance with standard safety guidelines for the media, and in a well-ventilated area. The use of our product on hazardous or corrosive media is strictly forbidden.

## Deublin Rotary Unions General Catalog

From the world leader in rotary unions, the Deublin general engineering catalog provides application information and specifications for over 500 standard unions and 3000 models used with a broad range of materials, viscosities, temperatures, pressures and speeds. Deublin unions accommodate water, steam, hot oil, coolant and air for thousands of manufacturing, equipment and process applications. Custom unions are also available to address specific requirements.



## Deublin Rotary Unions for Machine Tool

Whether CNC machining centers or automotive transfer lines, Deublin offers the broadest range of rotary union solutions for continuous through-the-spindle coolant applications. State-of-the-art features include silicon carbide seals, and dry running capability with or without pressure.



## Deublin Steam Joints and Siphon Systems for the Paper Industry

Deublin has a complete line of steam inducing and condensate removal products designed specifically for the paper industry. These products are contained in a dedicated catalog. This line features the revolutionary FS Series Steam Joint with the Deltasint Stationary Siphon System designed and proven for today's high-speed paper machine's dryer sections.



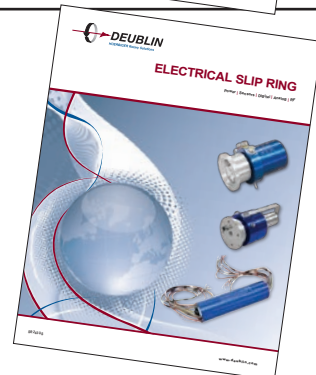
## Deublin Wind Energy Brochure

Deublin manufactures a complete line of high pressure hydraulic unions for wind energy applications. Available in configurations ranging from monoflow to four passage designs, with central passages for cable connection to electrical slip rings. Durability features such as water resistant construction and hardened stainless steel rotors provide unparalleled lifecycle reliability over millions of cycles.



## Deublin Electrical Slip Ring Brochure

Deublin is a leader in the manufacturing of electrical slip rings, and complete slip ring/rotary union combinations for use in a variety of applications including wind turbines, robotics, centrifuges, milling, plastic molding, semiconductor and more. Custom slip rings can be designed to address such challenges as RF shielding, mixed signal handling, high frequency impedance matching, reduced temperature generation, and miniaturization.



Since its founding in 1945 as a small, family-owned business, Deublin consistently has adhered to a policy of designing and building the best products of their kind in the world. The result of this policy has been continuous growth through the years, and for this we are grateful to our many loyal customers.

Today, Deublin is the world's largest manufacturer of Rotary Unions, with state-of-the-art factories, technical sales and services, and local stocking in 13 countries on four continents, as well as a worldwide distribution network operating in more than 60 countries. Our global organization and extensive catalog of field-tested products ensure a precise match between each customer's requirements and an engineered solution. Deublin has been part of the HOERBIGER Group since 2019 and forms the core of the Rotary Solution division.

We cordially invite you to visit our modern manufacturing facilities in Waukegan, Illinois, USA; Mainz, Germany; Monteveglio, Italy; Dalian, China; and Diadema, Brazil.



Our Global Headquarters in Waukegan, Illinois, U.S.A.



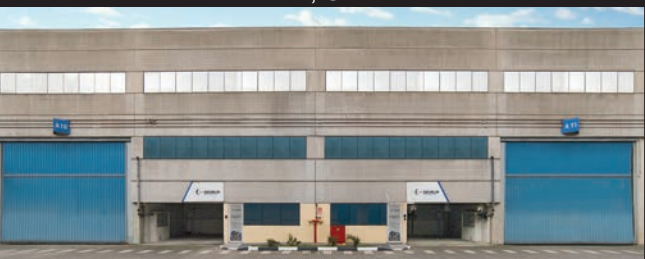
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