

## Uniflex Coupling Design

### Flexible Spring Type Coupling with Exclusive Triple Wound Spring Design

The Uniflex Coupling is an all steel, single piece coupling that solves a variety of application concerns including: high misalignment, space limitations, high temperature, and exceptionally low backlash/windup. The unique flexing center of the Uniflex consists of three opposingly wound square wire springs for forward or reverse operation. Two steel hubs are then brazed to the steel spring pack to create a durable one-piece flexible coupling. Benefits of this coupling include:

- This designed flexibility compensates for high degrees of shaft misalignment (up to 4.5° angular, up to .045" parallel).
- The one piece Uniflex is simple to install — nothing to replace, no wearing parts, and no lubrication needed.
- The compact design provides a coupling that is smaller and lighter than most couplings of comparable torque ratings. It is also well suited for applications with inaccessible mounting locations.
- All metal design means that the Uniflex can be used in applications where severe environmental concerns are a factor. Standard couplings withstand temperatures to +250° F (due to soldering); special designs to +600° F (stainless steel w/electron beam weld).
- The Uniflex is unaffected by oil, grease, dirt and most industrial chemicals.



UNIFLEX TRIPLE SPRING COUPLING

The Uniflex is designed for applications up to 30,000 RPM such as textile equipment, conveyors, machine tools, centrifugal pumps, blowers, winding machines, and steering mechanisms. In addition, most sizes can be supplied in stainless steel for applications requiring frequent washdowns (food processing), additional chemical resistance (salt water handling), non-magnetic properties (military), or sterile/vacuum usage (pharmaceutical).

## Uniflex Coupling Types

Four styles of Uniflex couplings are available: shaft-to-shaft, drop out, flange-to-flange and flange-to-shaft.

### U Type

This is a durable one-piece flexible coupling for general purpose shaft-to-shaft applications. It is the basis for all Uniflex coupling types.

### RRU Type

This design offers "quick disconnect" for drop out requirements. It can also accommodate a slightly larger shaft diameter than the standard U type.

### UF Type

This flange-to-flange type is designed to connect flange mounted equipment to another flange while compensating for misalignment. It is also the center drop out section of the RRU type.

### UFH Type

A flange-to-shaft configuration, this couples flange mounted equipment to a shaft with all the benefits of Uniflex versatility. The stock flange plate is the same as used on the UF type.



U TYPE



RRU TYPE



UF TYPE



UFH TYPE

## Uniflex Coupling Selection

Once it is determined that the unique features of Uniflex meet your application, selection of the proper coupling depends on three factors: torque transmission, bore requirements, and RPM. When selecting a Uniflex coupling, the torque capability shown as maximum must not be exceeded. Nominal torque adjusted by an application service factor, start up torque, braking torque and any cyclic shock or peak torques inherent in the application must be considered.

Determine the correct Uniflex coupling size by working out the following calculations:

**Step 1:** Determine the Uniflex type or configuration from page SP-14.

**Step 2:** Calculate the nominal torque as T or nominal HP/100RPM

$$T = \frac{(HP * 63,025)}{RPM} \quad HP/100RPM = \frac{HP * 100}{RPM}$$

$$T = \frac{(KW * 9,550)}{RPM}$$

\* Usually HP (KW) & RPM of prime mover, if the coupling is to be attached to the prime mover or if no speed or torque devices are between the driver and driven equipment.

**Step 3:** Determine the application service factor from page JW-6.

Multiply the nominal torque by the application service factor to determine the total required torque.

**Step 4:** Select the size.

**Step 5:** Check to be sure the peak torque or maximum torque from starting, braking or cyclic peaks does not exceed the coupling maximum capability. For applications involving frequent starts and stops, refer to Lovejoy Engineering. **NOTE:** Diesel and gasoline engine drives usually require special considerations. Refer to Lovejoy Engineering.

**Step 6:** a. Check the coupling maximum bore capability versus the shaft to be used. If necessary, pick a larger size coupling to get the needed bore capacity.

b. Check the maximum speed.

c. Check any limiting dimensions.

## Selection Example

A rolling device operates at 6,000 RPM and requires 15 HP. The driving shaft is 1.250" diameter and the roll shaft is 1.125" diameter. Select the proper U type shaft-to-shaft coupling. Occasional emergency stops impose 675 in-lbs of torque, otherwise the operation has no cyclic loading. Start up torque is 1/3 of emergency stopping torque. Rolls of various types typically have a 1.5 - 2.0 application service factor.

Determine the nominal torque or HP/100RPM:

**Step 1:**

$$T = \frac{15 \times 63,025}{6,000} = 158 \text{ in-lbs}$$

$$HP/100 \text{ RPM} = \frac{15 \times 100}{6,000} = 0.25 \text{ HP/100 RPM}$$

**Step 2:** Determine the Total Rated Torque:

$$Tr = 158 \times 2.0 = 316 \text{ in-lbs}$$

Maximum stopping torque = 675 in-lbs

Start up torque = 225 in-lbs

The U-125 coupling meets all the above requirements with the key item as the maximum stopping torque.

**Step 3:** The U-125 has a maximum bore capability of 1.250", which covers the application driver shaft of the same size. The roll shaft is 1.125", which is less than maximum.

**Note:** Uniflex maximum bore sizes includes a standard keyway allowance.

## Uniflex Coupling Technical Data

### Selection Chart

Size	Wind Up At Max. Torque <sup>1</sup>	Misalignment Capability								
		Maximum Angular Offset	Maximum Parallel Offset		Maximum Recommended End Play		Maximum Torque		HP 100RPM	Maximum Speed RPM
			in	mm	in	mm	in-lbs	Nm		
18 Reg.	1.80°	3.0°	0.008	0.20	0.010	0.25	18	2.0	0.03	30,000
25 Reg.	1.80°	4.5°	0.011	0.28	0.020	0.51	34	3.8	0.05	30,000
37 Reg.	1.78°	4.5°	0.014	0.36	0.020	0.51	39	4.4	0.06	30,000
50 Reg.	1.82°	4.5°	0.021	0.53	0.035	0.89	82	9.3	0.13	30,000
62 Reg.	0.85°	3.0°	0.019	0.48	0.035	0.89	126	14.2	0.20	20,000
75 Reg.	1.82°	4.5°	0.028	0.71	0.040	1.02	175	19.8	0.28	20,000
87 Reg.	1.68°	4.5°	0.035	0.89	0.040	1.02	346	39.1	0.55	10,000
100 Reg.	1.03°	3.0°	0.030	0.76	0.040	1.02	565	63.8	0.90	6,000
125 Reg.	1.85°	4.5°	0.044	1.12	0.040	1.02	755	85.3	1.21	6,000
137 Reg.	1.85°	3.0°	0.035	0.89	0.040	1.02	1,260	142.4	2.02	6,000
150 Reg.	0.85°	3.0°	0.041	1.04	0.040	1.02	1,890	213.5	3.02	3,000
25 Short	1.07°	3.0°	0.007	0.18	0.015	0.38	34	3.8	0.05	30,000
37 Short	1.09°	3.0°	0.009	0.23	0.015	0.38	39	4.4	0.06	30,000
50 Short	1.05°	3.0°	0.014	0.36	0.010	0.25	82	9.3	0.13	30,000
62 Short	0.85°	3.0°	0.019	0.48	0.020	0.51	126	14.2	0.20	20,000
75 Short	1.12°	3.0°	0.019	0.48	0.020	0.51	175	19.8	0.28	20,000
87 Short	1.17°	3.0°	0.024	0.61	0.020	0.51	346	39.1	0.55	10,000
100 Short	1.03°	3.0°	0.030	0.76	0.020	0.51	565	63.8	0.90	6,000
125 Short	1.22°	3.0°	0.030	0.76	0.020	0.51	755	85.3	1.21	6,000
137 Short	1.35°	3.0°	0.035	0.89	0.020	0.51	1,260	142.4	2.02	6,000
150 Short	0.85°	3.0°	0.041	1.04	0.020	0.51	1,890	213.5	3.02	3,000

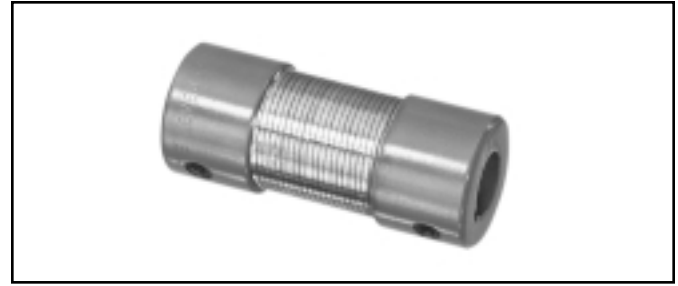
- Notes:**
1. Total backlash is approximately  $\frac{1}{3}$  of windup at maximum torque—consult Lovejoy Engineering for more information.
  2. See Lovejoy list pricebook for UPC numbers.

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## Uniflex Coupling Data

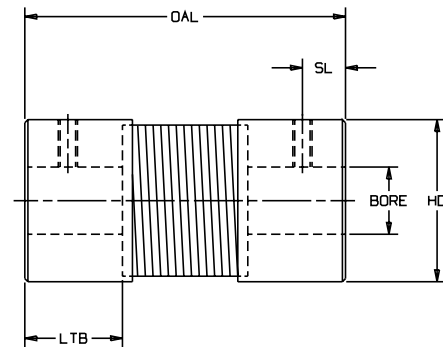
### U Type — Shaft-to-Shaft

The U type is the basis for all Uniflex couplings. It is a shaft-to-shaft flexible coupling with a simple one piece design, making it ideal for indexing, robotic or positioning applications. The U type consists of a triple-wound flexible steel spring brazed to a steel hub at each end. This all steel design ensures optimum equipment protection in severe environments and/or high temperature applications.



U TYPE

Regular and short versions are available for most sizes to accommodate different overall length requirements. Special hub or bore modifications are also possible. These units can be supplied with either pin holes or with keyways and set screws. Lovejoy does not recommend the reboring of uniflex couplings by customers due to potential damage to the brazed joint.



### U Type Dimensional Data

Size	HD in	Min. Bore		Max. Bore		LTB		OAL <sup>1</sup>		Pin Location (SL)		Pin Size in	Set Screw Qty Per Hub	Set Screw Size	Weight	
		in	mm	in	mm	Reg in	Short in	Reg in	Short in	Reg in	Short in				lbs.	kg.
U-18	0.61	0.12	3	0.25	6	0.31	.....	1.00	.....	0.16	.....	3/32	1	6-32	0.09	0.04
U-25	0.73	0.12	3	0.31	8	0.38	0.32	1.50	1.00	0.16	0.16	3/32	1	6-32	0.10	0.05
U-37	0.86	0.25	6	0.38	9.5	0.52	0.52	2.06	1.65	0.25	0.25	3/32	1	10-24	0.27	0.12
U-50	1.04	0.31	8	0.50	12.5	0.64	0.50	2.50	1.82	0.31	0.31	1/8	1	1/4-20	0.36	0.16
U-62	1.42	0.31	8	0.62	16	0.84	0.62	2.72	2.28	0.38	0.38	1/8	1	1/4-20	0.78	0.35
U-75	1.42	0.38	10	0.75	19	0.84	0.84	3.31	2.72	0.41	0.41	1/8	1	1/4-20	0.82	0.37
U-87	1.73	0.44	11	0.88	22	0.84	0.84	3.50	2.91	0.44	0.44	3/16	1	1/4-20	1.40	0.63
U-100	2.11	0.44	11	1.00	25	1.29	1.00	4.12	3.56	0.56	0.56	5/16	1	1/4-20	2.60	1.18
U-125	2.17	0.62	16	1.25	31	1.28	1.10	4.88	3.75	0.62	0.62	5/16	1	3/8-16	2.74	1.24
U-137	2.54	0.62	16	1.38	35	1.58	1.01	5.25	4.12	0.69	0.69	3/8	1	3/8-16	4.00	1.81
U-150	2.98	0.75	19	1.50	38	1.88	1.72	6.28	5.00	0.81	0.81	3/8	1	3/8-16	8.00	3.63

Note: 1. OAL Tolerance  $\pm 1/8$  inch.

### Stainless Steel U Series Dimensional Data

Size	HD	Max. Bore		LTB		OAL <sup>1</sup>		Pin Location (SL)		Pin Size in	Set Screw Qty Per Hub	Set Screw Size	Weight	
		in	mm	Reg in	Short in	Reg in	Short in	Reg in	Short in				lbs.	kg.
U-18	0.60	0.25	6	0.31	.....	0.95	.....	0.16	.....	3/32	1	6-32	0.09	0.04
U-25	0.62	0.31	8	.....	0.41	.....	0.97	.....	0.16	3/32	1	6-32	0.10	0.05
U-37	0.75	0.31	8	.....	0.68	.....	1.68	.....	0.25	3/32	1	10-24	0.27	0.12
U-50	0.94	0.38	9.5	.....	0.58	.....	1.80	.....	0.31	1/8	1	1/4-20	0.36	0.16
U-62	1.25	0.50	12.5	0.96	0.77	2.65	2.27	0.38	0.38	1/8	1	1/4-20	0.78	0.35
U-75	1.25	0.50	12.5	.....	0.96	.....	2.65	.....	0.41	1/8	1	1/4-20	0.82	0.37
U-87	1.69	0.75	19	.....	0.99	.....	2.94	.....	0.44	3/16	1	1/4-20	1.40	0.63
U-100	1.94	1.00	25	1.41	1.13	4.09	3.55	0.56	0.56	5/16	1	1/4-20	2.60	1.18
U-125	1.97	1.00	25	.....	1.25	.....	3.99	.....	0.62	5/16	1	3/8-16	2.74	1.24

Note: 1. OAL Tolerance  $\pm 1/8$  inch.

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## Uniflex Coupling Data

### RRU Type — Dropout Style

The RRU type Uniflex coupling is designed for fast, easy installation and removal without disrupting the connected shafts. This is ideal when servicing impellers, bearings and seals.

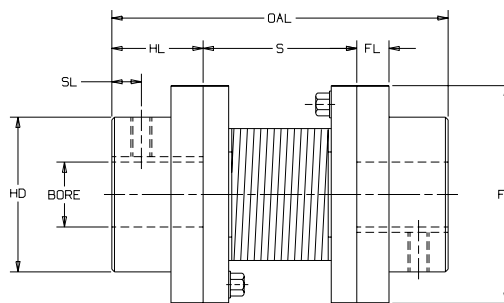
The design consists of two steel hubs fastened with cap screws to a Uniflex double flange coupling (UF type). The RRU is easily disassembled by simply removing the cap screws and sliding out the UF center spring section.

### UF Type — Flange-to-Flange

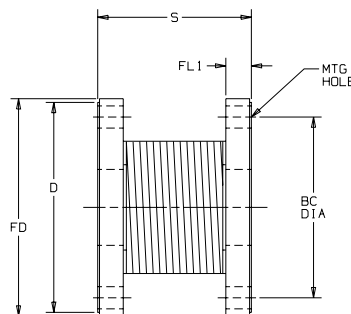
This coupling is actually the center dropout section of the RRU type, but it can be purchased separately for direct flange-to-flange mounting of the driving unit to the driven. The UF type coupling compensates for high misalignment to protect connected equipment, yet it is also well-suited for applications which require negligible backlash or windup and reliability under high temperature conditions. Stock flange sizes are shown in the Dimensional Data table below, but other sizes can be provided to meet special mounting requirements.



RRU TYPE



UF TYPE



### RRU and UF Types Dimensional Data

Size	HD in	Min. Bore		Max. Bore		HL in	FL in	FL1 in	OAL <sup>1</sup> in	D in	FD in	Pin Loc. SL in	Pin Size in	S <sup>2</sup> in	BC in	Mtg. Screw <sup>3</sup>		Set Screw	
		in.	mm	in.	mm											Qty.	Size	Qty.	Size
RRU-50	2.00	0.38	10	1.00	25	1.00	.....	0.25	3.52	1.88	2.00	0.50	1/8	1.56	1.50	3	1/4-20	1	1/4-20
RRU-75	2.50	0.38	10	1.25	32	1.25	.....	0.38	4.27	2.38	2.50	0.62	1/8	1.81	2.00	3	1/4-20	1	1/4-20
RRU-87	2.87	0.44	11	1.38	35	1.38	.....	0.38	4.84	2.75	2.88	0.69	3/16	2.12	2.25	3	1/4-20	1	1/4-20
RRU-100	2.31	0.44	11	1.38	35	1.38	0.50	0.38	4.90	3.12	3.25	0.44	5/16	2.18	2.68	3	5/16-18	1	1/4-20
RRU-125	2.75	0.62	16	1.62	41	1.62	0.50	0.50	5.84	3.56	3.68	0.56	5/16	2.62	3.12	3	5/16-18	1	3/8-16
RRU-137	3.25	0.62	16	1.88	48	1.88	0.50	0.50	6.53	4.25	4.38	0.69	3/8	2.81	3.75	3	3/8-16	1	3/8-16
RRU-150	3.75	0.75	19	2.12	54	2.12	0.62	0.50	7.66	5.00	5.38	0.82	3/8	3.44	4.38	4	3/8-16	1	3/8-16

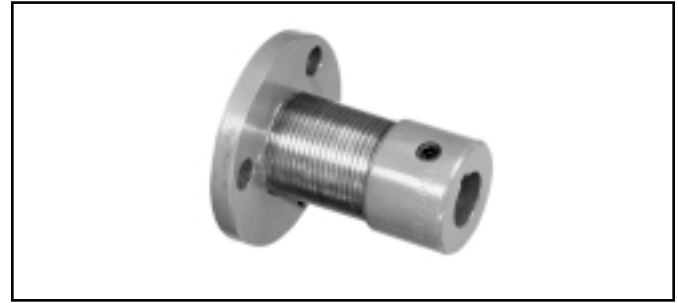
- Notes:**
- OAL Tolerance  $\pm .19$  inch.
  - UF Center Drop out Length Tolerance  $\pm .12$  inch.
  - Screws not supplied for UF.
  - When ordering specify prefix RRU or UF; dimensions remain the same for either.
  - See page SP-16 for Performance Data.

## Uniflex Coupling Data

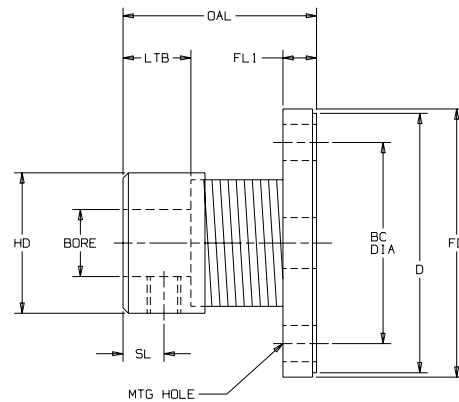
### UFH Type — Flange-to-Shaft

The one-piece UFH type coupling is similar to the U type, except that one hub is replaced by a flange plate. Stock flange sizes are shown in the Dimensional Data table below but other sizes can be made to order. As with the other Uniflex styles, this coupling compensates for high degrees of angular and parallel misalignment with very little backlash or windup and is reliable in harsh or severe environments.

Regular and short versions are available for each size to accommodate different overall length requirements. For increased versatility, the hub can be modified with a tapered, spline, hex or square bore. The standard hub is furnished with either a pre-drilled pin hole or with a keyway and set screw. Specify when ordering.



UFH TYPE



### UFH Series Dimensional Data

Size	HD in	Min. Bore		Max. Bore		LTB		OAL <sup>1</sup>			FD in	Pin Loc. Pin Size			BC in	Mtg. Screw <sup>2</sup>		Set Screw	
		in	mm	in	mm	Reg in	Short in	FL1 in	Reg in	Short in		D in	SL in	Pin Size in		Qty.	Size	Qty.	Size
UFH-50	1.04	0.31	8	0.50	13	0.64	0.50	0.25	2.03	1.50	2.00	1.88	0.31	1/8	1.50	3	1/4-20	1	1/4-20
UFH-75	1.42	0.38	10	0.75	19	0.84	0.84	0.38	2.58	2.00	2.50	2.38	0.41	1/8	2.00	3	1/4-20	1	1/4-20
UFH-87	1.73	0.44	11	0.88	22	0.84	0.84	0.38	2.82	2.24	2.88	2.75	0.44	3/16	2.25	3	1/4-20	1	1/4-20
UFH-100	2.11	0.44	11	1.00	25	1.29	1.00	0.38	3.17	2.88	3.25	3.12	0.56	5/16	2.68	3	5/16-18	1	1/4-20
UFH-125	2.17	0.62	16	1.25	32	1.28	1.10	0.50	3.75	2.82	3.68	3.56	0.62	5/16	3.12	3	5/16-18	1	3/8-16
UFH-137	2.54	0.62	16	1.38	35	1.58	1.02	0.50	4.03	3.46	4.38	4.25	0.69	3/8	3.75	3	3/8-16	1	3/8-16
UFH-150	2.98	0.75	19	1.50	.....	1.88	1.72	0.63	4.86	3.75	5.38	5.00	0.81	3/8	4.38	4	3/8-16	1	3/8-16

- Notes:**
- OAL Tolerance  $\pm .12$  inch.
  - Screws not supplied.
  - See page SP-16 for Performance Data.

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