RENOLD

Hi-Tec Couplings

General Catalogue

The complete solution

RENOLD Hi-Tec Couplings

Renold Hi-Tec Couplings has been a world leader in the design and manufacture of flexible couplings for over 40 years.

- Measurement of torsional stiffness up to 220 kNm
- Full scale radial and axial stiffness measurement
- Misalignment testing of couplings up to 2 metres in diameter
- Noise attenuation testing
- Latest CAD technology
- Torsional vibration analysis
- Transient and finite element analysis

- World class manufacturing
- Total quality system
- Latest machining and tooling technology
- Static and dynamic balance capability
- Integrated cellular manufacturing
- Synchronised work flow

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Product Range

The product range comprises of rubber in compression couplings, developed over 40 years for the complete range of diesel and industrial applications. In particular, our design capability and innovation is recognised in customising couplings to meet customers specific requirements

RENOLD Hi -Tec Couplings deliver the durability, reliability and long life that customers demand.

RENOLD Hi-Tec Couplings is "the complete solution".

DCB Range

The unrivalled quality and endurance capability designed into every DCB coupling make it ideally suited for marine propulsion, power generation and reciprocating compressor applications where long life, fail safe operation and control of resonant torsional vibrations are essential. Maximum torque range 5520 kNm.

Applications

- **Marine Propulsion**
- **Reciprocating Compressors**
- **High Power Generator Sets**
- **Rail Traction**

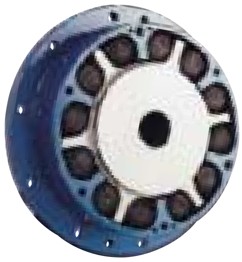
HTB Range

The HTB Coupling is a high temperature blind assembly coupling designed for mounting inside bell housings

Applications

- **Marine Propulsion**
- **Compressors**
- **Generator and Pump Sets**
- **Rail Traction**

RB Range



General purpose, cost effective range available in either shaft to shaft or flywheel to shaft configurations with a maximum torque of 41 kNm.

Applications

- **Generator and Pump Sets**
- **Metal manufacture**
- **Pulp and Paper Industry**
- **Compressors**
- **Bulk Handling**
- **General Industrial Applications**

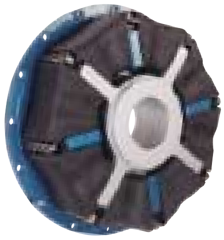
PM Range

This range of couplings is specially designed for heavy industrial applications providing exceptional protection against severe shock loads and vibration.
Maximum torque 6000 kNm.

Applications

- **Metal manufacture**
- **Pumps, Fans and Compressors**
- **Power Generation**
- **General Heavy Duty Industrial Applications**
- **Mining**
- **Cranes and Hoists**
- **Pulp and Paper Industry**

MSC Range



This innovative coupling has been designed to satisfy a vast spectrum of diesel drive and compressor applications providing low linear stiffness and control of resonant torsional vibration with intrinsically fail safe operation. Maximum torque 375 kNm.

Applications

- **Marine Propulsion**
- **Compressors**
- **High Power Generator Sets**

DCB Flexible Coupling

Fail safe coupling for use on reciprocating machinery up to 5520 kNm.

The Standard Range Comprises

- Flywheel to shaft
- Flywheel to flange
- Shaft to shaft

Applications

- Marine propulsion
- High power generator sets
- Reciprocating compressors

Features

- Intrinsically fail safe
- Control of resonant torsional vibration
- Severe shock load protection
- Maintenance free
- Misalignment capability
- Noise attenuation

Benefits

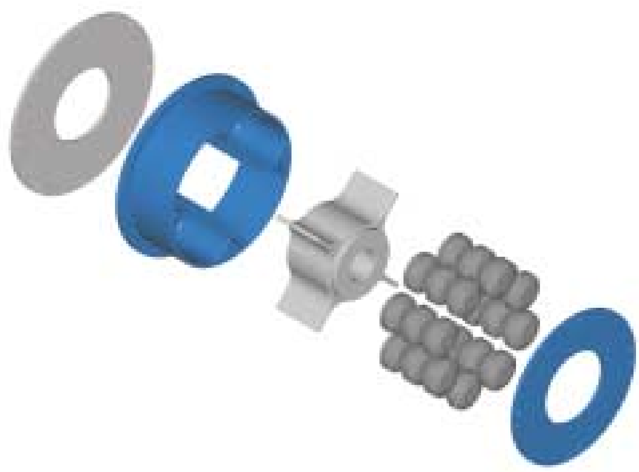
- Ensuring continuous operation of the driveline in the unlikely event of rubber damage.
- Achieving low vibratory loads in the driveline components by selection of optimum stiffness characteristics.
- Avoiding failure of the driveline under short circuit and other transient conditions.
- With no lubrication or adjustment required resulting in low running costs.
- Allows axial and radial misalignment between the driving and driven machines.
- Giving quiet running conditions in sensitive applications by the elimination of metal to metal contact.

Construction Details

8 3 5.5

- 5.5: Each rubber element would be 5.5 inch diameter.
- 3: Each cavity would house three rubber elements.
- 8: Eight rubber element cavities radially spaced around coupling diameter referred to as "Series 8" coupling.

- Available options are: Series 6, Series 8, Series 10, Series16.
- 2, 3, 4 or 5 rubber elements per cavity are available. Rubber elements up to 15" diameter are manufactured.
- The inner and outer members are manufactured in steel to BS3100 Grade A1.
- Some sizes are available in SG Iron Castings to BS2789 Grade 420/12.



DCB Typical Applications

Main propulsion. Couplings fitted between main engine and gearbox, gearbox and thrust block, and between thrust block and propulsion unit.

Bio-gas generator sets. Coupling fitted between gas engine and alternator.

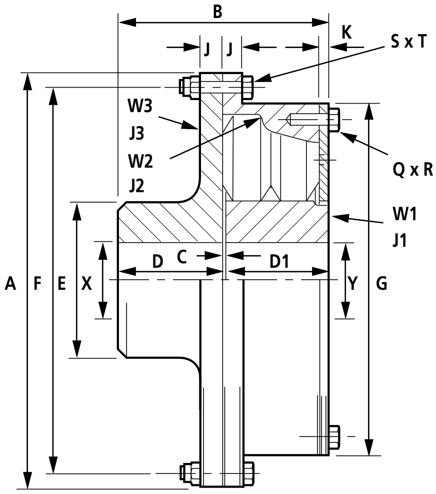
Compressor sets. Coupling fitted between electric motor and compressor units.

Rail traction. Coupling fitted between diesel engine and transmission via a universal joint shaft.

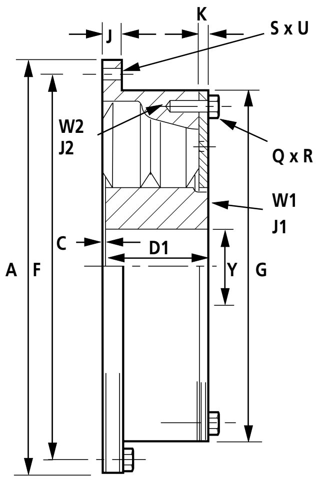
Diesel generator sets. Couplings fitted between diesel engines and alternators, to provide electrical supply for ice breaker.

DCB Series 6

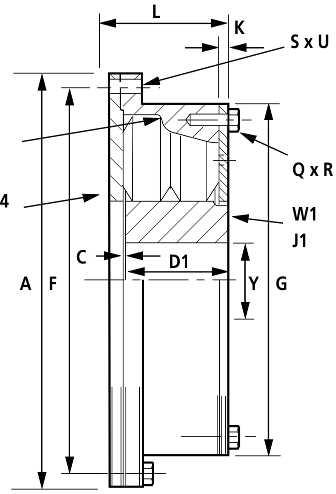
Full Coupling



Flex Half



Flex Half & Keep Plate



Dimensions, Weight, Inertia and Alignment

COUPLING SIZE		622.5	632.5	623.5	633.5	624.5	625.5	626.5	628.0	638.0
DIMENSIONS (mm)	A	280	280	370	370	455	565	675	810	810
	B	141	205	194	282	247	306	363	444	648
	C	3	3	4	4	5	6	7	8	8
	D	69	101	95	139	121	150	178	218	320
	D1	69	101	95	139	121	150	178	218	320
	E	82	82	112	112	142	180	215	260	260
	F	255	255	345	345	430	530	630	765	765
	G	225	225	315	315	400	490	580	715	715
	J	14	14	14	14	14	18	25	25	25
	K	8.5	8.5	10	10	11.5	16	20	23	23
	L	81	113	109	153	138	172	205	249	351
	Q	6	6	6	6	6	6	6	6	6
	R	M10	M10	M10	M10	M10	M16	M20	M20	M20
	S	8	12	12	18	16	8	8	12	18
	T	M10	M10	M10	M10	M10	M16	M20	M20	M20
	U	10.5	10.5	10.5	10.5	10.5	17	21	21	21
	MAX. X	50	50	70	70	90	110	130	165	165
	MAX. Y	50	50	70	70	90	110	130	165	165
MAXIMUM SPEED (rpm)	(1)	4150	4150	3150	3150	2570	2080	1730	1440	1440
WEIGHT (3) (kg)	W1	3.32	4.98	8.9	13.4	18.4	33.6	57.7	103.8	155.7
	W2	10.2	14.5	23.9	33.9	43.9	85.0	146.1	261.2	370.6
	W3	9.9	11.2	15.1	19.4	25.1	51.6	98.1	145.3	166.7
	W4	4.0	4.0	7.6	7.6	13.7	28.3	50.4	83.2	83.2
INERTIA (3) (kg m²)	J1	0.0088	0.0132	0.0480	0.0720	0.1666	0.4537	1.098	3.028	4.542
	J2	0.1068	0.1516	0.4557	0.6466	1.313	3.851	9.349	24.65	34.97
	J3	0.077	0.084	0.163	0.241	0.490	1.51	4.25	8.82	9.1
	J4	0.042	0.042	0.141	0.141	0.389	1.24	3.16	7.51	7.51
ALLOWABLE MISALIGNMENT (2)										
RADIAL (mm)		1.5	1.5	2.0	2.0	2.5	3.0	3.5	4.0	4.0
AXIAL (mm)		1.5	1.5	2.0	2.0	2.5	3.0	3.5	4.0	4.0
CONICAL (degree)		0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7

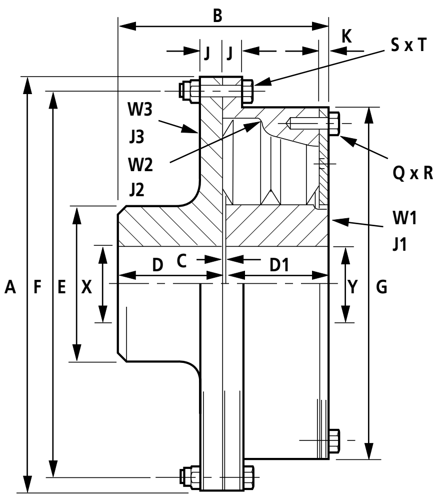
(1) For operation above 80% of the declared maximum coupling speed, it is recommended that the coupling is dynamically balanced.

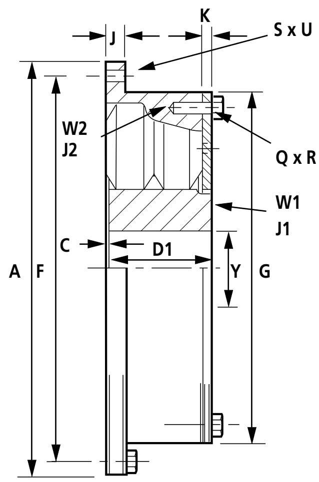
(2) Installations should be initially aligned as accurately as possible. In order to allow for deterioration in alignment over time, it is recommended that initial alignment should not exceed 25% of the above noted data. The forces on the driving and driven machinery should be calculated to ensure that these do not exceed the manufacturers allowables.

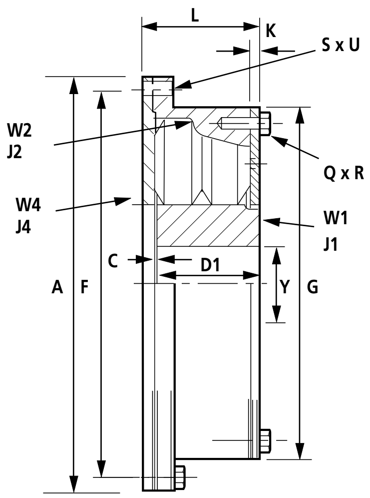
(3) Weights and inertias are based on the maximum bore size.

DCB Series 6

Full Coupling — **Flex Half** — **Flex Half & Keep Plate**







Dimensions, Weight, Inertia and Alignment

COUPLING SIZE		629.5	639.5	6211.0	6311.0	6213.0	6313.0	6215.0	6315.0
DIMENSIONS (mm)	A	995	995	1135	1135	1365	1365	1560	1560
	B	530	772	616	756	726	891	840	1030
	C	10	10	12	12	16	16	20	20
	D	260	381	302	442	355	520	410	600
	D1	260	381	302	442	355	520	410	600
	E	310	310	365	365	426	426	495	495
	F	930	930	1070	1070	1270	1270	1465	1465
	G	850	850	990	990	1165	1165	1358	1358
	J	35	35	35	35	55	55	55	55
	K	28.5	28.5	34	34	41	41	49	49
	L	299	420	355	495	412	577	479	669
	Q	6	6	6	6	6	6	6	6
	R	M30	M30	M30	M30	M42	M42	M42	M42
	S	8	12	12	18	8	12	12	18
	T	M30	M30	M30	M30	M42	M42	M42	M42
	U	31	31	31	31	43	43	43	43
	MAX. X	195	195	230	230	268	268	310	310
	MAX. Y	195	195	230	230	268	268	310	310
MAXIMUM SPEED (rpm)	(1)	1180	1180	1030	1030	860	860	750	750
WEIGHT (3) (kg)	W1	177.0	265.5	276.1	414.4	443.5	676.0	704.2	1084.2
	W2	464.1	658.6	673.7	955.4	1220.4	1765.2	1935.0	2558.8
	W3	287.5	324.0	403.1	468.6	815.1	920.0	1135.0	1293.0
	W4	159	159	292	292	424	424	660	660
INERTIA (3) (kg m^2)	J1	7.281	10.92	15.38	23.37	33.95	52.38	72.82	113.7
	J2	63.13	89.6	130	174	318	459	665	881
	J3	27.7	28.3	47.7	50.5	160	167	264	271
	J4	21.6	21.6	51.7	51.7	108	108	220	220
ALLOWABLE MISALIGNMENT (2)									
RADIAL (mm)		5.0	5.0	6.0	6.0	8.0	8.0	10.0	10.0
AXIAL (mm)		5.0	5.0	6.0	6.0	8.0	8.0	10.0	10.0
CONICAL (degree)		0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7

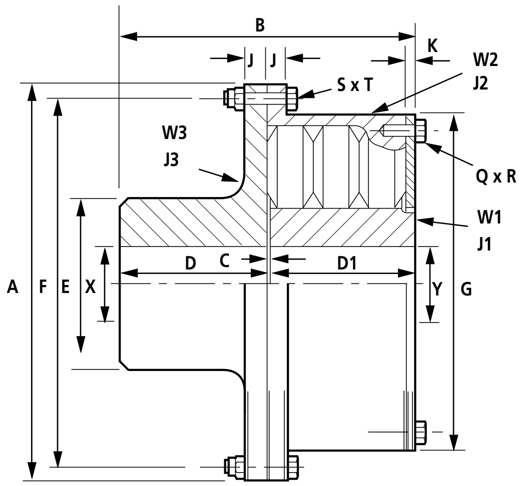
(1) For operation above 80% of the declared maximum coupling speed, it is recommended that the coupling is dynamically balanced.

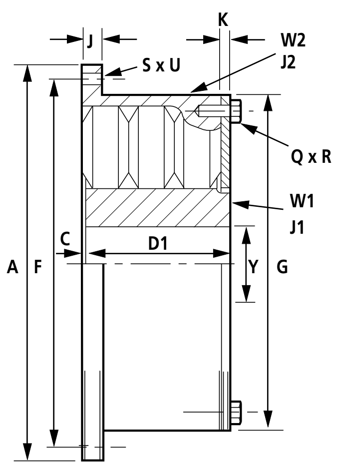
(2) Installations should be initially aligned as accurately as possible. In order to allow for deterioration in alignment over time, it is recommended that initial alignment should not exceed 25% of the above noted data. The forces on the driving and driven machinery should be calculated to ensure that these do not exceed the manufacturers allowables.

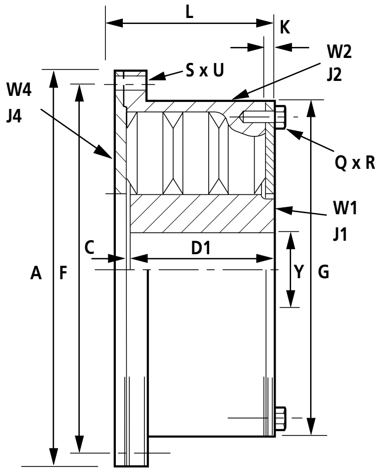
(3) Weights and inertias are based on the maximum bore size.

DCB Series 8

Full Coupling	Flex Half	Flex Half & Keep Plate







Dimensions, Weight, Inertia and Alignment

COUPLING SIZE		822.5	823.5	823.5 SAE14	833.5	833.5 SAE14	824.5	824.5 SAE18	834.5	834.5 SAE18	844.5	844.5 SAE18	825.5	825.5 SAE21	835.5
DIMENSIONS (mm)	A	325	425	466.7	425	466.7	550	571.5	550	571.5	550	571.5	660	673.1	660
	B	139	194	-	282	-	249	-	363	-	420	-	304	-	444
	C	3	4	4	4	4	5	5	5	5	5	5	6	6	6
	D	68	95	-	139	-	122	-	179	-	179	-	149	-	219
	D1	68	95	95	139	139	122	122	179	179	236	236	149	149	219
	E	130	175	-	175	-	225	-	225	-	225	-	275	-	275
	F	300	400	438	400	438	515	543	515	543	515	543	625	641.3	625
	G	270	370	370	370	370	475	475	475	475	475	475	585	585	585
	J	14	14	14	14	14	18	18	18	18	18	18	18	18	18
	K	8	10	10	10	10	12.5	12.5	12.5	12.5	12.5	12.5	15.5	15.5	15.5
	L	79	108	108	153	153	140	140	197	197	254	254	171	171	241
	Q	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	R	M10	M10	M10	M10	M10	M16	M16	M16	M16	M16	M16	M16	M16	M16
	S	8	12	8	24	8	8	6	16	6	16	6	12	12	24
	T	M10	M10	-	M10	-	M16	-	M16	-	M16	-	M16	-	M16
	U	10.5	10.5	13.5	10.5	13.5	17	17	17	17	17	17	17	17	17
	MAX. X	80	108	-	108	-	140	-	140	-	140	-	172	-	172
	MAX. Y	80	108	108	108	108	140	140	140	140	140	140	172	172	172
MAXIMUM SPEED (rpm)	(1)	3600	2760	2760	2760	2760	2130	2130	2130	2130	2130	2130	1800	1800	1800
WEIGHT (3) (kg)	W1	6.12	15.96	15.96	23.82	23.82	34.6	34.6	51.7	51.7	68.9	68.9	71.2	71.2	94.1
	W2	12.7	30.3	30.5	38.6	40.8	56.2	58.8	77.3	79.9	94.5	97.1	104.3	105.4	137.7
	W3	12.2	24.2	-	29.4	-	51.4	-	62.4	-	62.4	-	82.0	-	101.8
	W4	4.4	8.4	10.4	8.4	10.4	20.2	22.1	20.2	22.1	20.2	22.1	35.6	37.3	35.6
INERTIA (3) (kg m²)	J1	0.028	0.136	0.136	0.204	0.204	0.492	0.492	0.739	0.739	0.989	0.989	1.358	1.358	2.057
	J2	0.195	0.959	1.063	1.208	1.311	2.793	2.945	3.538	3.690	4.292	4.444	6.982	7.182	9.221
	J3	0.123	0.401	-	0.487	-	1.44	-	1.53	-	1.53	-	3.10	-	3.36
	J4	0.067	0.219	0.322	0.219	0.322	0.888	1.04	0.888	1.04	0.888	1.04	2.26	2.45	2.26
ALLOWABLE MISALIGNMENT (2)															
RADIAL (mm)		1.5	2.0	2.0	2.0	2.0	2.5	2.5	2.5	2.5	2.5	2.5	3.0	3.0	3.0
AXIAL (mm)		1.5	2.0	2.0	2.0	2.0	2.5	2.5	2.5	2.5	2.5	2.5	3.0	3.0	3.0
CONICAL (degree)		0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6

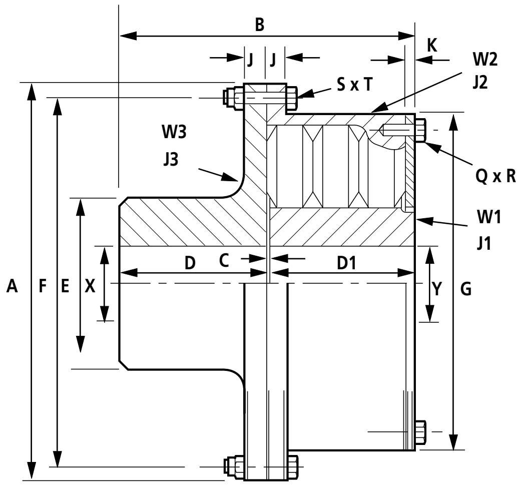
(1) For operation above 80% of the declared maximum coupling speed, it is recommended that the coupling is dynamically balanced.

(2) Installations should be initially aligned as accurately as possible. In order to allow for deterioration in alignment over time, it is recommended that initial alignment should not exceed 25% of the above noted data. The forces on the driving and driven machinery should be calculated to ensure that these do not exceed the manufacturers allowables.

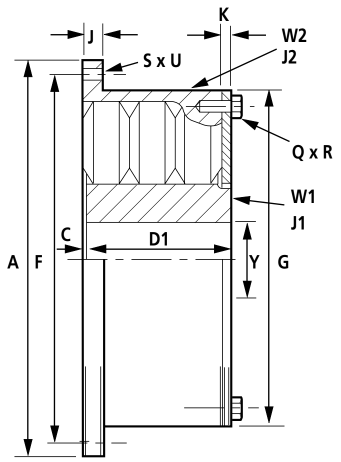
(3) Weights and inertias are based on the maximum bore size.

DCB Series 8

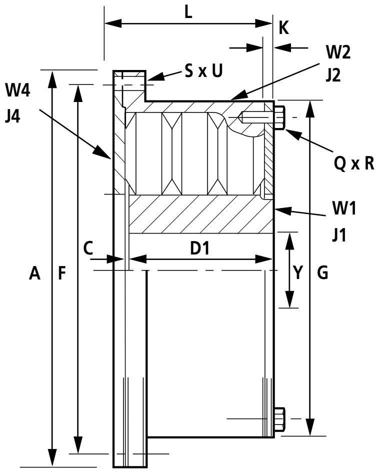
Full Coupling



Flex Half



Flex Half & Keep Plate



Dimensions, Weight, Inertia and Alignment

COUPLING SIZE		835.5 SAE21	845.5	845.5 SAE21	855.5	855.5 SAE21	826.5	836.5	846.5	827.5	837.5	847.5	857.5	828.0	838.0
DIMENSIONS (mm)	A	673.1	660	673.1	660	673.1	785	785	785	890	890	890	890	940	940
	B	-	514	-	584	-	357	523	605	414	606	701	796	440	644
	C	6	6	6	6	6	7	7	7	8	8	8	8	8	8
	D	-	219	-	219	-	175	258	258	203	299	299	299	216	318
	D1	219	289	289	359	359	175	258	340	203	299	394	489	216	318
	E	-	275	-	275	-	325	325	325	380	380	380	380	395	395
	F	641.3	625	641.3	625	641.3	740	740	740	845	845	845	845	895	895
	G	585	585	585	585	585	690	690	690	795	795	795	795	845	845
	J	18	18	18	18	18	25	25	25	25	25	25	25	25	25
	K	15.5	15.5	15.5	15.5	15.5	17.5	17.5	17.5	21	21	21	21	21	21
	L	241	311	311	381	381	200	283	365	231	327	422	517	245	347
	Q	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	R	M16	M16	M16	M16	M16	M20	M20	M20	M20	M20	M20	M20	M20	M20
	S	12	24	12	24	12	12	24	24	16	32	32	32	16	32
	T	-	M16	-	M16	-	M20	M20	M20	M20	M20	M20	M20	M20	M20
	U	17	17	17	17	17	21	21	21	21	21	21	21	21	21
	MAX. X	-	172	-	172	-	205	205	205	240	240	240	240	250	250
	MAX. Y	172	172	172	172	172	205	205	205	240	240	240	240	250	250
MAXIMUM SPEED (rpm)	(1)	1800	1800	1800	1800	1800	1490	1490	1490	1315	1315	1315	1315	1240	1240
WEIGHT (3) (kg)	W1	94.1	116.9	116.9	139.6	139.6	160.4	211.5	261.9	156.3	232.8	308.6	384.6	191.8	287.2
	W2	139.8	171.1	173.2	204.5	206.6	167.9	221.8	274.9	252.6	335.7	418.0	500.3	294.5	393.0
	W3	-	101.8	-	101.8	-	146.8	179.4	179.4	207.9	259.1	259.1	259.1	236.0	294.7
	W4	37.3	35.6	37.3	35.6	37.3	56.5	56.5	56.5	80.4	80.4	80.4	80.4	94.0	94.0
INERTIA (3) (kg m²)	J1	2.057	2.747	2.747	3.437	3.437	3.136	4.743	7.546	6.262	9.359	12.48	15.58	8.624	13.00
	J2	9.421	11.46	11.66	13.68	13.88	15.72	20.73	25.67	30.77	41.06	51.15	61.34	40.36	54.15
	J3	-	3.36	-	3.36	-	8.32	8.95	8.95	14.5	15.7	15.7	15.7	18.0	19.5
	J4	2.45	2.26	2.45	2.26	2.45	5.09	5.09	5.09	9.33	9.33	9.33	9.33	12.2	12.2
ALLOWABLE MISALIGNMENT (2)															
RADIAL (mm)		3.0	3.0	3.0	3.0	3.0	3.5	3.5	3.5	4.0	4.0	4.0	4.0	4.0	4.0
AXIAL (mm)		3.0	3.0	3.0	3.0	3.0	3.5	3.5	3.5	4.0	4.0	4.0	4.0	4.0	4.0
CONICAL (degree)		0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6

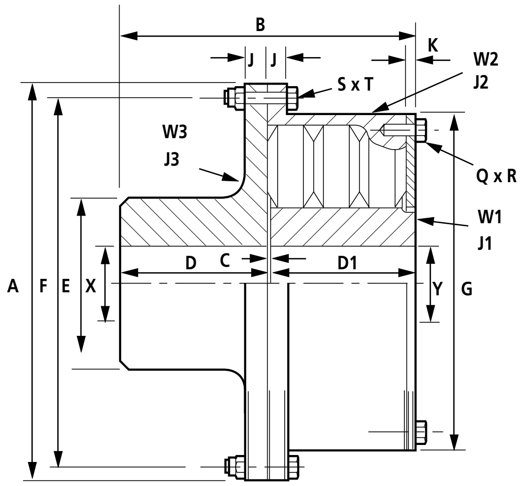
(1) For operation above 80% of the declared maximum coupling speed, it is recommended that the coupling is dynamically balanced.

(2) Installations should be initially aligned as accurately as possible. In order to allow for deterioration in alignment over time, it is recommended that initial alignment should not exceed 25% of the above noted data. The forces on the driving and driven machinery should be calculated to ensure that these do not exceed the manufacturers allowables.

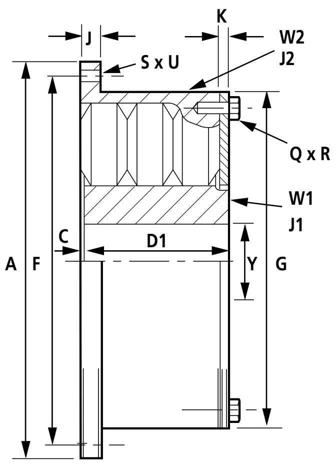
(3) Weights and inertias are based on the maximum bore size.

DCB Series 8

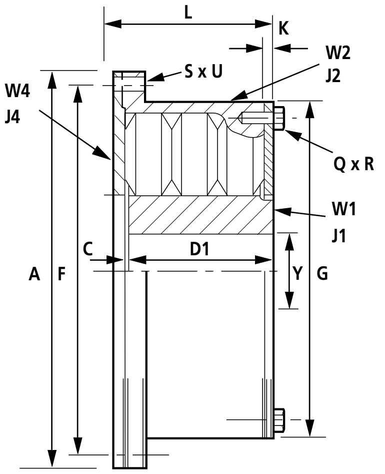
Full Coupling



Flex Half



Flex Half & Keep Plate



Dimensions, Weight, Inertia and Alignment

COUPLING SIZE		848.0	858.0	829.5	839.5	849.5	859.5	8211.0	8311.0	8411.0	8213.0	8313.0	8413.0	8215.0	8315.0	8415.0
DIMENSIONS (mm)	A	940	940	1160	1160	1160	1160	1330	1330	1330	1610	1610	1610	1830	1830	1830
	B	746	848	528	770	891	1012	612	892	1032	724	1054	1219	834	1215	1406
	C	8	8	10	10	10	10	12	12	12	14	14	14	17	17	17
	D	318	318	259	380	380	380	300	440	440	355	520	520	408	599	599
	D1	420	521	259	380	501	622	300	440	580	355	520	685	408	599	790
	E	395	395	475	475	475	475	560	560	560	660	660	660	762	762	762
	F	895	895	1095	1095	1095	1095	1265	1265	1265	1515	1515	1515	1730	1730	1730
	G	845	845	1015	1015	1015	1015	1185	1185	1185	1410	1410	1410	1625	1625	1625
	J	25	25	35	35	35	35	35	35	35	55	55	55	55	55	55
	K	21	21	28	28	28	28	33	33	33	39	39	39	45	45	45
	L	449	550	297	418	539	666	345	485	625	408	573	738	470	661	851
	Q	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	R	M20	M20	M30	M30	M30	M30	M30	M30	M30	M42	M42	M42	M42	M42	M42
	S	32	32	12	24	24	24	16	32	32	12	24	24	16	32	32
	T	M20	M20	M30	M30	M30	M30	M30	M30	M30	M42	M42	M42	M42	M42	M42
	U	21	21	31	31	31	31	31	31	31	43	43	43	43	43	43
	MAX. X	250	250	300	300	300	300	350	350	350	414	414	414	475	475	475
	MAX. Y	250	250	300	300	300	300	350	350	350	414	414	414	475	475	475
MAXIMUM SPEED (rpm)	(1)	1240	1240	1010	1010	1010	1010	880	880	880	730	730	730	640	640	640
WEIGHT (3) (kg)	W1	382.6	477.6	333.3	498.5	663.7	838.0	522.2	795.5	1056	873	1304	1736	1345	2013	2681
	W2	491.6	589.3	555.0	729.7	904.0	1078.3	865.7	1148	1431	1558	2041	2530	2306	3054	3803
	W3	294.7	294.7	457	558	558	558	665	830	830	1305	1574	1574	1826	2244	2244
	W4	94	94	192	192	192	192	294	294	294	516	516	516	766	766	766
INERTIA (3) (kg m²)	J1	17.39	21.78	21.48	32.37	43.26	54.15	45.66	70.63	94.00	107	161	215	218	330	442
	J2	67.84	81.42	112	147	182	217	234	311	388	609	799	989	1180	1567	1954
	J3	19.5	19.5	56.0	59.8	59.8	59.8	101	110	110	320	339	339	541	591	591
	J4	12.2	12.2	37.8	37.8	37.8	37.8	76.5	76.5	76.5	195	195	195	375	375	375
ALLOWABLE MISALIGNMENT (2)																
RADIAL (mm)		4.0	4.0	5.0	5.0	5.0	5.0	6.0	6.0	6.0	7.0	7.0	7.0	8.0	8.0	8.0
AXIAL (mm)		4.0	4.0	5.0	5.0	5.0	5.0	6.0	6.0	6.0	7.0	7.0	7.0	8.0	8.0	8.0
CONICAL (degree)		0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6

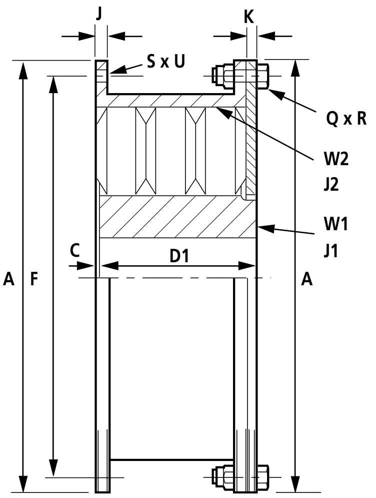
(1) For operation above 80% of the declared maximum coupling speed, it is recommended that the coupling is dynamically balanced.

(2) Installations should be initially aligned as accurately as possible. In order to allow for deterioration in alignment over time, it is recommended that initial alignment should not exceed 25% of the above noted data. The forces on the driving and driven machinery should be calculated to ensure that these do not exceed the manufacturers allowables.

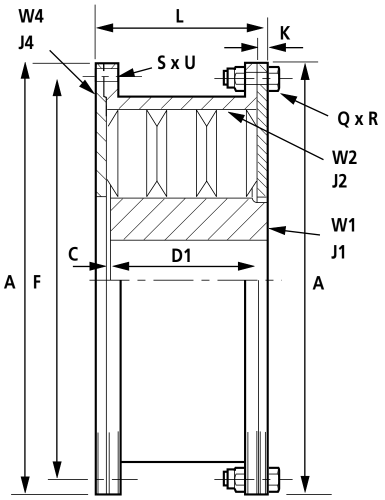
(3) Weights and inertias are based on the maximum bore size.

DCB Series 10

Flex Half



Flex Half & Keep Plate



Dimensions, Weight, Inertia and Alignment

COUPLING SIZE		10211.0	10311.0	10411.0	10213.0	10313.0	10413.0	10215.0	10315.0	10415.0
DIMENSIONS (mm)	A	1510	1510	1510	1770	1770	1770	2020	2020	2020
	C	15	15	15	15	15	15	20	20	20
	D1	295	435	575	350	515	680	399	589	780
	F	1420	1420	1420	1691	1691	1691	1930	1930	1930
	J	38	38	38	50	50	50	50	50	50
	K	31	31	31	35	35	35	38	38	38
	L	310	450	590	365	530	695	419	609	800
	Q	16	16	16	16	16	16	16	16	16
	R	M30	M30	M30	M36	M36	M36	M36	M36	M36
	S	16	16	16	16	16	16	16	16	16
	U	37	37	37	43	43	43	43	43	43
MAXIMUM SPEED (rpm) (1)		770	770	770	650	650	650	570	570	570
WEIGHT (3) (kg)	W1	857	1285	1710	1340	2010	2680	1868	2800	3735
	W2	1191	1526	1860	1888	2386	2884	2585	3327	4199
	W4	317	317	317	566	566	566	732	732	732
INERTIA (3) (kg m²)	J1	86	125	166	220	326	435	465	698	931
	J2	471	600	730	1016	1276	1529	1822	2332	2936
	J4	115	115	115	272	272	272	461	461	461
ALLOWABLE MISALIGNMENT (2)										
RADIAL (mm)		7	7	7	7	7	7	7	7	7
AXIAL (mm)		7	7	7	7	7	7	7	7	7
CONICAL (degree)		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5

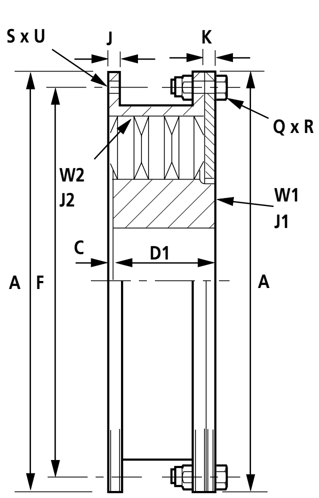
(1) For operation above 80% of the declared maximum coupling speed, it is recommended that the coupling is dynamically balanced.

(2) Installations should be initially aligned as accurately as possible. In order to allow for deterioration in alignment over time, it is recommended that initial alignment should not exceed 25% of the above noted data. The forces on the driving and driven machinery should be calculated to ensure that these do not exceed the manufacturers allowables.

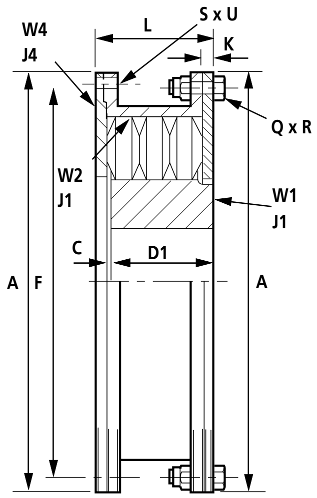
(3) Weights and inertias are based on the maximum bore size.

DCB Series 16

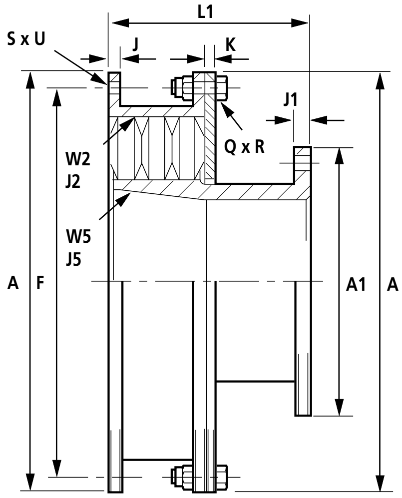
Full Coupling



Flex Half & Keep Plate



Flex Half & Flanged Inner Member



Dimensions, Weight, Inertia and Alignment

COUPLING SIZE		16313.0	16413.0	16513.0	16315.0	16415.0	16515.0
DIMENSIONS (mm)	A	2486	2486	2486	2921	2921	2921
	A1	1400	1400	1400	1700	1700	1700
	C	15	15	15	20	20	20
	D1	520	685	850	601	792	982
	F	2370	2370	2370	2800	2800	2800
	J	50	50	50	70	70	70
	J1	75	75	75	95	95	95
	K	40	40	40	50	50	50
	L	535	700	865	621	812	1002
	L1	805	970	1135	985	1176	1367
	Q	24	24	24	24	24	24
	R	M30	M30	M30	M36	M36	M36
	S	24	24	24	24	24	24
	U	43	43	43	50	50	50
MAXIMUM SPEED (rpm) (1)		490	490	490	390	390	390
WEIGHT (3) (kg)	W1	1770	2370	2970	3158	4077	5247
	W2	3547	4307	5069	6309	7545	8782
	W4	903	903	903	1810	1810	1810
	W5	2913	3623	4319	5761	7147	8534
INERTIA (3) (kg m^2)	J1	3692	4920	5820	5693	7591	9488
	J2	4169	5049	5931	10033	11936	13838
	J4	994	994	994	2534	2534	2534
	J5	1731	2226	2713	4255	5418	6580
ALLOWABLE MISALIGNMENT (2)							
RADIAL (mm)		8	8	8	8	8	8
AXIAL (mm)		8	8	8	8	8	8
CONICAL (degree)		0.5	0.5	0.5	0.5	0.5	0.5

(1) For operation above 80% of the declared maximum coupling speed, it is recommended that the coupling is dynamically balanced.

(2) Installations should be initially aligned as accurately as possible. In order to allow for deterioration in alignment over time, it is recommended that initial alignment should not exceed 25% of the above noted data. The forces on the driving and driven machinery should be calculated to ensure that these do not exceed the manufacturers allowables.

(3) Weights and inertias are based on the maximum bore size.

DCB Technical Data

1.1 Torque Capacity - Diesel Engine Drives

The DCB Coupling is selected on the "Nominal Torque, T_{KN}" without service factors.

The full torque capacity of the coupling for transient vibration whilst passing through major criticals on run up is published as the Maximum Torque T_{Kmax} ($T_{Kmax} = 3 \times T_{KN}$.)

There is additional torque capacity built within the coupling for short circuit torques.

The published "Vibratory Torque, T_{KW}", relates to the amplitude of the permissible continous torque fluctuation. The vibratory torque values shown in the Technical Data are at a frequency of 10Hz. The measure of acceptability of the coupling for vibrating drives is published as "Allowable Dissipated Heat at Ambient Temperature 30°C".

1.2 Transient Torques

Prediction of transient torques in marine drives can be complex. Normal installations are well provided for by selecting couplings based on the "Nominal Torque T_{KN}." Transients, such as start up and clutch manoeuvre, are usually within the "Maximum Torque, T_{Kmax}" for the coupling.

Care needs to be taken in the design of couplings with shaft brakes, to ensure coupling torques are not increased by severe deceleration.

Sudden torque applications of propulsion devices, such as thrusters or waterjets, need to be considered when designing the coupling connection.

2.0 Stiffness Properties

The Renold Hi-Tec Coupling remains fully flexible under all torque conditions. The DCB series is a non-bonded type operating with the Rubber-in-Compression principle.

2.1 Axial Stiffness

When subject to axial misalignment, the coupling will have an axial resistance which gradually reduces due to the effect of vibratory torque.

The axial stiffness of the coupling is torque dependent. The variation is as shown in the Technical Data on pages 16 to 22.

2.2 Radial Stiffness

The radial stiffness of the coupling is torque dependent, and is as shown in the Technical Data on pages 16 to 22.

2.3 Torsional Stiffness

The torsional stiffness of the coupling is dependent upon applied torque and temperature as shown in the Technical Data on pages 16 to 22.

2.4 Prediction of the System Torsional Vibration Characteristics.

An adequate prediction of the system's torsional vibration characteristics, can be made by the following method.

2.4.1 Use the torsional stiffness, as published in the catalogue, which is based upon data measured at 30˚C ambient temperature.

2.4.2 Repeat the calculation made in 2.4.1 but using the maximum temperature correction factor S_{t100}, and dynamic magnifier correction factor, M_{100}, for the selected rubber. Use tables on page 15 to adjust values for both torsional stiffness and dynamic magnifier. ie, $C_{T100} = C_{Tdyn} \times S_{t100}$

2.4.3 Review calculations 2.4.1 and 2.4.2 and if the speed range is clear of criticals which do not exceed the allowable heat dissipation value as published in the catalogue then the coupling is considered suitable for the application, with respect to the torsional vibration characteristics. If there is a critical in the speed range, then the actual temperature of the coupling should be calculated at this speed.

DCB Technical Data

Rubber Grade	$Temp_{max}$ °C	S_t
NM 45	100	$St_{100} = 0.71$
SM 50	100	$St_{100} = 0.65$
SM 60	100	$St_{100} = 0.61$
SM 70	100	$St_{100} = 0.44$
SM 80	100	$St_{100} = 0.37$
SM 60 is considered "standard"		

Rubber Grade	Dynamic Magnifier at 30°C (M_{30})	Dynamic Magnifier at 100°C (M_{100})
NM 45	15	21.1
SM 50	10	15.4
SM 60	8	13.1
SM 70	6	13.6
SM 80	4	10.8
SM 60 is considered "standard"		

2.5 Prediction of the Actual Coupling Temperature and Torsional Stiffness

2.5.1 Use the torsional stiffness as published in the catalogue. This is based upon data measured at 30˚C and the dynamic magnifier at 30˚C. (M_{30})

2.5.2 Compare the synthesis value of the calculated heat load in the coupling (P_K) at the speed of interest, to the "Allowable Heat Dissipation" (P_{KW}).

The coupling temperature rise

$$°C = Temp_{coup} = \left(\frac{P_K}{P_{KW}}\right) \times 70$$

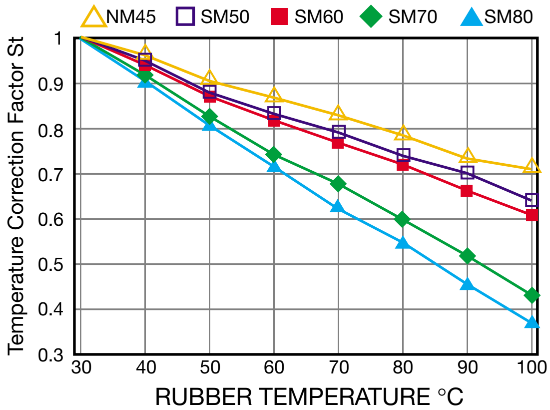
The coupling temperature = ϑ

$$\vartheta = Temp_{coup} + \text{Ambient Temp.}$$

2.5.3 Calculate the temperature correction factor, S_t, from 2.6 (if the coupling temperature > 100°C, then use S_{t100}). Calculate the dynamic Magnifier as per 2.7. Repeat the calculation with the new value of coupling stiffness and dynamic magnifier.

2.5.4 Calculate the coupling temperature as per 2.5. Repeat calculation until the coupling temperature agrees with the correction factors for torsional stiffness and dynamic magnifier used in the calculation.

2.6 Temperature Correction Factor



2.7 Dynamic Magnifier Correction Factor

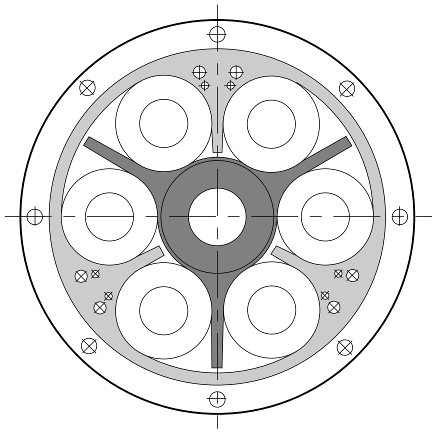
The Dynamic Magnifier of the rubber is subject to temperature variation in the same way as the torsional stiffness.

$$M_T = \frac{M_{30}}{S_t} \qquad \psi_T = \psi_{30} \times S_t$$

Rubber Grade	Dynamic Magnifier (M_{30})	Relative Damping ψ_{30}
NM 45	15	0.42
SM 50	10	0.63
SM 60	8	0.78
SM 70	6	1.05
SM 80	4	1.57
SM 60 is considered "standard"		

DCB Series 6 Technical Data

End View - Series 6



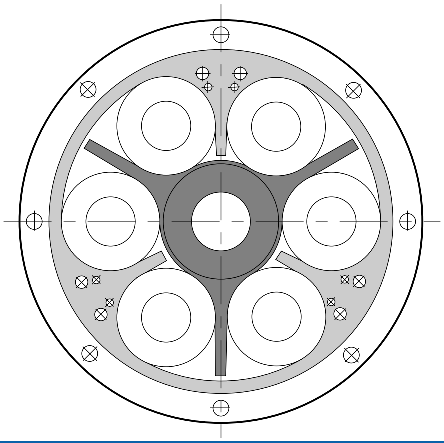
COUPLING SIZE		622.5	632.5	623.5	633.5	624.5	625.5	626.5	628.0	638.0
NOMINAL TORQUE T_{KN} (kNm)		0.51	0.76	1.39	2.08	2.90	5.30	8.77	16.50	24.80
MAXIMUM TORQUE T_{Kmax} (kNm)		1.52	2.28	4.14	6.21	8.67	15.90	26.40	49.50	74.20
VIBRATORY TORQUE T_{KW} (kNm)		0.19	0.29	0.52	0.78	1.08	1.99	3.32	6.22	9.33
ALLOWABLE DISSIPATED HEAT AT AMB. TEMP. 30°C. (W) P_{KW}	NM 45	69	103	97	146	125	153	181	223	335
	SM 50	77	115	108	162	139	170	201	248	372
	SM 60	87	130	122	183	158	193	228	281	422
	SM 70	98	147	137	206	176	215	254	314	471
	SM 80	108	162	152	228	195	238	282	347	521
MAXIMUM SPEED (rpm) (1)		4150	4150	3150	3150	2570	2080	1730	1440	1440
DYNAMIC TORSIONAL STIFFNESS C_{Tdyn} (MNm/rad)										
@ 0.25 T_{KN}	NM 45	0.003	0.004	0.007	0.010	0.015	0.022	0.037	0.078	0.111
	SM 50	0.003	0.005	0.008	0.012	0.018	0.027	0.045	0.084	0.132
	SM 60	0.004	0.006	0.010	0.015	0.021	0.035	0.057	0.106	0.171
	SM 70	0.005	0.008	0014	0.021	0.030	0.056	0.093	0.174	0.262
	SM 80	0.009	0.014	0.024	0.036	0.050	0.075	0.123	0.229	0.365
@ 0.5 T_{KN}	NM 45	0.004	0.006	0.011	0.016	0.023	0.036	0.059	0.110	0.176
	SM 50	0.005	0.008	0.014	0.021	0.030	0.048	0.079	0.147	0.215
	SM 60	0.006	0.009	0.016	0.024	0.034	0.053	0.087	0.162	0.248
	SM 70	0.007	0.011	0.019	0.029	0.040	0.063	0.104	0.194	0.308
	SM 80	0.013	0.020	0.036	0.054	0.076	0.097	0.160	0.299	0.475
@ 0.75 T_{KN}	NM 45	0.006	0.008	0.015	0.023	0.033	0.056	0.093	0.174	0.274
	SM 50	0.007	0.011	0.020	0.030	0.043	0.069	0.114	0.212	0.318
	SM 60	0.008	0.012	0.023	0.035	0.048	0.077	0.127	0.237	0.358
	SM 70	0.010	0.015	0.026	0.039	0.055	0.087	0.144	0.269	0.415
	SM 80	0.018	0.027	0.051	0.077	0.108	0.135	0.222	0.414	0.658
@ 1.0 T_{KN}	NM 45	0.008	0.012	0.022	0.033	0.046	0.085	0.140	0.261	0.407
	SM 50	0.010	0.015	0.027	0.041	0.059	0.096	0.159	0.296	0.448
	SM 60	0.011	0.016	0.030	0.045	0.064	0.102	0.169	0.315	0.478
	SM 70	0.012	0.018	0.034	0.051	0.072	0.116	0.191	0.357	0.541
	SM 80	0.024	0.036	0.066	0.099	0.140	0.184	0.305	0.568	0.883
RADIAL STIFFNESS NO LOAD (N/mm)	NM 45	730	1095	1020	1530	1312	1600	1896	2334	3500
	SM 50	833	1250	1162	1743	1500	1830	2166	2666	4000
	SM 60	1250	1875	1748	2622	2250	2750	3250	4000	6000
	SM 70	1666	2500	2332	3498	3000	3666	4333	5332	8000
	SM 80	1958	2937	2740	4110	3525	4310	5091	6266	9400
RADIAL STIFFNESS @ T_{KN} (N/mm)	NM 45	1262	1890	1762	2643	2272	2775	3280	4035	6050
	SM 50	1250	1875	1750	2625	2250	2750	3250	4000	6000
	SM 60	1666	2500	2332	3498	3000	3666	4333	5332	8000
	SM 70	2084	3126	2916	4374	3750	4582	5416	6666	10000
	SM 80	2916	4374	4080	6120	5250	6416	7582	9333	14000
AXIAL STIFFNESS (N/mm)	NM 45	285	428	400	600	515	630	744	916	1374
	SM 50	336	504	470	705	605	756	890	1100	1650
	SM 60	540	810	758	1137	975	1192	1409	1733	2600
	SM 70	746	1120	1044	1566	1740	2126	2512	3092	4638
	SM 80	1688	2532	2362	3543	3030	3700	4372	5380	8070
MAXIMUM AXIAL (2) LOAD AT POINT OF SLIP @ T_{KN} (N)	NM 45	390	590	540	810	680	830	980	1200	1800
	SM 50	470	710	660	990	940	1150	1360	1680	2520
	SM 60	650	980	920	1380	1200	1460	1720	2120	3180
	SM 70	840	1260	1180	1770	1500	1830	2160	2660	3990

(1) For operation above 80% of the declared maximum coupling speed, it is recommended that the coupling is dynamically balanced.

(2) The Renold Hi-Tec Coupling will "slip" axially when the maximum axial force is reached.

DCB Series 6 Technical Data

End View - Series 6



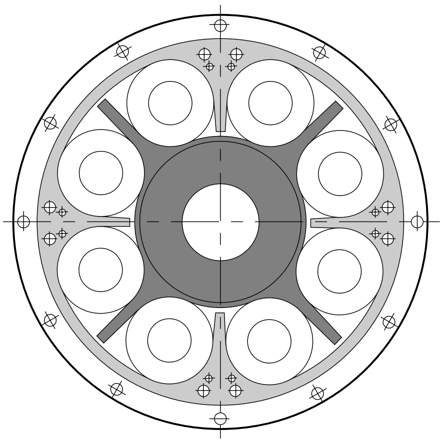
COUPLING SIZE		629.5	639.5	6211.0	6311.0	6213.0	6313.0	6215.0	6315.0
NOMINAL TORQUE T_{KN} (kNm)		27.5	41.3	43.1	64.7	71.4	107.0	110.0	166.0
MAXIMUM TORQUE T_{Kmax} (kNm)		82.6	124.0	130.0	194.0	214.0	321.0	331.0	497.0
VIBRATORY TORQUE T_{KW} (kNm)		10.4	15.6	16.2	24.3	26.7	40.0	41.3	62.0
ALLOWABLE	NM 45	265	398	306	459	362	543	418	627
DISSIPATED	SM 50	294	441	340	510	402	603	464	696
HEAT AT AMB.	SM 60	333	500	386	579	456	684	526	789
TEMP. 30°C. (W) P_{KW}	SM 70	372	558	431	646	510	765	588	882
	SM 80	412	618	477	716	563	845	650	975
MAXIMUM SPEED (rpm) (1)		1180	1180	1030	1030	860	860	750	750
DYNAMIC TORSIONAL STIFFNESS C_{Tdyn} (MNm/rad)									
	NM 45	0.116	0.186	0.179	0.288	0.296	0.475	0.454	0.730
	SM 50	0.141	0.221	0.219	0.344	0.361	0.567	0.555	0.871
@ 0.25 T_{KN}	SM 60	0.178	0.286	0.276	0.444	0.456	0.732	0.701	1.125
	SM 70	0.291	0.440	0.452	0.683	0.745	1.127	1.145	1.731
	SM 80	0.384	0.611	0.597	0.950	0.985	1.565	1.513	2.403
	NM 45	0.183	0.295	0.285	0.458	0.470	0.756	0.722	1.162
	SM 50	0.247	0.360	0.383	0.559	0.632	0.923	0.971	1.419
@ 0.5 T_{KN}	SM 60	0.271	0.415	0.420	0.645	0.694	1.065	1.066	1.636
	SM 70	0.326	0.515	0.506	0.800	0.835	1.320	1.283	2.027
	SM 80	0.500	0.796	0.776	1.236	1.281	2.039	1.968	3.133
	NM 45	0.291	0.458	0.451	0.712	0.745	1.175	1.144	1.804
	SM 50	0.355	0.533	0.550	0.827	0.908	1.365	1.395	2.097
@ 0.75 T_{KN}	SM 60	0.397	0.599	0.616	0.930	1.017	1.535	1.563	2.359
	SM 70	0.450	0.696	0.699	1.080	1.154	1.782	1.742	2.738
	SM 80	0.694	1.102	1.077	1.711	1.778	2.824	2.731	4.338
	NM 45	0.437	0.682	0.678	1.058	1.120	1.747	1.720	2.683
	SM 50	0.496	0.750	0.769	1.164	1.270	1.922	1.950	2.952
@ 1.0 T_{KN}	SM 60	0.527	0.801	0.818	1.244	1.350	2.054	2.074	3.155
	SM 70	0.597	0.906	0.928	1.406	1.531	2.321	2.352	3.566
	SM 80	0.951	1.479	1.476	2.297	2.436	3.791	3.742	5.825
	NM 45	2770	4155	3210	4815	3800	5700	4400	6600
RADIAL STIFFNESS	SM 50	3165	4748	3666	5500	4330	6495	5000	7500
NO LOAD (N/mm)	SM 60	4750	7125	5500	8250	6500	9750	7500	11250
	SM 70	6330	9495	7330	11000	8650	12975	10000	15000
	SM 80	7440	11160	8620	12930	10180	15270	11750	17625
	NM 45	4792	7190	5550	8325	6558	9837	7575	11363
RADIAL STIFFNESS	SM 50	4750	7125	5500	8250	6500	9750	7500	11250
@ T_{KN} (N/mm)	SM 60	6330	9500	7330	11000	8660	12990	10000	15000
	SM 70	7915	11870	9165	13750	10830	16256	12500	18750
	SM 80	11080	16620	12830	19245	15165	22750	17500	26250
	NM 45	1088	1632	1260	1890	1489	2234	1718	2577
AXIAL STIFFNESS	SM 50	1306	1959	1512	2268	1787	2680	2062	3090
(N/mm)	SM 60	2059	3088	2384	3576	2818	4228	3250	4875
	SM 70	3672	5508	4252	6378	5025	7538	5798	8700
	SM 80	6390	9585	7400	11100	8745	13116	10090	15135
	NM 45	1430	2140	1660	2500	1960	2940	2260	3400
MAXIMUM AXIAL (2)	SM 50	1990	3000	2300	3450	2720	4080	3140	4700
LOAD AT POINT	SM 60	2520	3780	2920	4380	3450	5180	4000	6000
OF SLIP @ T_{KN} (N)	SM 70	3160	4740	3660	5500	4320	6480	5000	7500

(1) For operation above 80% of the declared maximum coupling speed, it is recommended that the coupling is dynamically balanced.

(2) The Renold Hi-Tec Coupling will "slip" axially when the maximum axial force is reached.

DCB Series 8 Technical Data

End View - Series 8



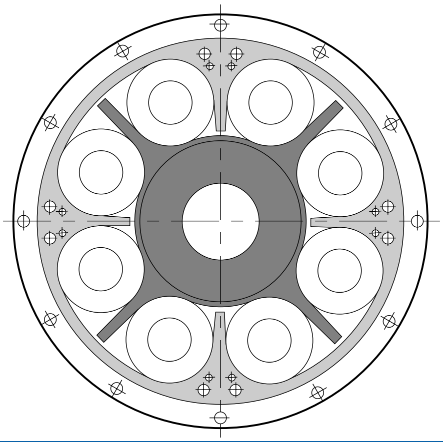
COUPLING SIZE		822.5	823.5	833.5	824.5	834.5	844.5	825.5	835.5	845.5	855.5	826.5
NOMINAL TORQUE T_{KN} (kNm)		0.83	2.25	3.37	4.84	7.26	9.68	8.98	13.47	17.96	22.45	14.67
MAXIMUM TORQUE T_{Kmax} (kNm)		2.52	6.74	10.1	14.52	21.78	29.04	26.94	40.42	53.89	67.36	44.01
VIBRATORY TORQUE T_{KW} (kNm)		0.31	0.84	1.26	1.81	2.73	3.63	3.37	5.05	6.74	8.42	5.50
ALLOWABLE	NM 45	93	130	195	166	250	332	204	306	409	510	241
DISSIPATED	SM 50	103	144	216	185	278	370	227	340	454	566	268
HEAT AT AMB.	SM 60	117	163	245	210	315	420	257	385	514	642	304
TEMP. 30°C. (W) P_{KW}	SM 70	131	182	274	234	352	468	287	430	574	716	340
	SM 80	144	202	303	260	390	520	317	475	634	792	375
MAXIMUM SPEED (rpm) (1)		3600	2760	2760	2130	2130	2130	1800	1800	1800	1800	1490
DYNAMIC TORSIONAL STIFFNESS C_{Tdyn} (MNm/rad)												
	NM 45	0.006	0.016	0.024	0.039	0.057	0.070	0.060	0.090	0.120	0.144	0.105
	SM 50	0.007	0.020	0.030	0.047	0.064	0.083	0.076	0.113	0.147	0.188	0.127
@ 0.25 T_{KN}	SM 60	0.010	0.026	0.040	0.059	0.088	0.110	0.100	0.154	0.206	0.251	0.170
	SM 70	0.016	0.042	0.064	0.089	0.135	0.177	0.170	0.251	0.338	0.407	0.274
	SM 80	0.025	0.068	0.101	0.151	0.248	0.318	0.230	0.359	0.529	0.615	0.437
	NM 45	0.009	0.025	0.037	0.057	0.081	0.102	0.093	0.143	0.190	0.230	0.159
	SM 50	0.012	0.033	0.049	0.078	0.105	0.136	0.130	0.184	0.249	0.297	0.211
@ 0.5 T_{KN}	SM 60	0.015	0.040	0.060	0.095	0.137	0.171	0.150	0.224	0.296	0.360	0.257
	SM 70	0.019	0.052	0.078	0.119	0.183	0.228	0.190	0.294	0.390	0.489	0.337
	SM 80	0.031	0.083	0.124	0.229	0.338	0.409	0.298	0.468	0.637	0.784	0.535
	NM 45	0.014	0.037	0.055	0.082	0.119	0.149	0.145	0.222	0.287	0.354	0.239
	SM 50	0.018	0.048	0.071	0.113	0.155	0.199	0.185	0.272	0.365	0.441	0.308
@ 0.75 T_{KN}	SM 60	0.021	0.057	0.085	0.132	0.193	0.240	0.218	0.323	0.419	0.518	0.366
	SM 70	0.026	0.070	0.106	0.163	0.248	0.307	0.261	0.397	0.518	0.646	0.455
	SM 80	0.042	0.112	0.169	0.326	0.460	0.549	0.412	0.648	0.848	1.072	0.727
	NM 45	0.020	0.054	0.081	0.115	0.167	0.216	0.216	0.331	0.431	0.534	0.349
	SM 50	0.025	0.066	0.099	0.154	0.216	0.278	0.257	0.383	0.502	0.610	0.427
@ 1.0 T_{KN}	SM 60	0.028	0.076	0.114	0.177	0.260	0.325	0.288	0.432	0.561	0.692	0.489
	SM 70	0.034	0.092	0.138	0.212	0.322	0.403	0.345	0.517	0.681	0.840	0.594
	SM 80	0.056	0.152	0.228	0.423	0.606	0.726	0.563	0.870	1.135	1.478	0.981
	NM 45	972	1360	2040	1750	2625	3500	2140	3210	4280	5350	2528
RADIAL STIFFNESS	SM 50	1111	1550	2325	2000	3000	4000	2444	3666	4888	6110	2888
NO LOAD (N/mm)	SM 60	1666	2330	3495	3000	4500	6000	3666	5500	7332	9165	4333
	SM 70	2222	3110	4665	4000	6000	8000	4888	7332	9776	12220	5778
	SM 80	2610	3655	5482	4700	7050	9400	5744	8616	11488	14360	6788
	NM 45	1683	2350	3525	3030	4545	6060	3700	5550	7400	9250	4376
RADIAL STIFFNESS	SM 50	1666	2333	3500	3000	4500	6000	3666	5500	7332	9165	4333
@ T_{KN} (N/mm)	SM 60	2222	3110	4665	4000	6000	8000	4888	7332	9776	12220	5778
	SM 70	2778	3888	5832	5000	7500	10000	6110	9165	12220	15275	7222
	SM 80	3888	5440	8160	7000	10500	14000	8555	12832	17110	21388	10110
	NM 45	380	534	800	687	1030	1374	840	1260	1680	2100	992
AXIAL STIFFNESS	SM 50	448	628	942	807	1210	1614	986	1480	1972	2465	1166
(N/mm)	SM 60	721	1010	1515	1300	1950	2600	1588	2382	3176	3970	1878
	SM 70	995	1392	2086	2320	3480	4640	2835	4253	5670	7088	3350
	SM 80	2250	3150	4725	4040	6060	8080	4937	7410	9874	12342	5835
	NM 45	520	720	1080	910	1380	1820	1110	1660	2220	2780	1310
MAXIMUM AXIAL (2)	SM 50	630	880	1320	1250	1880	2500	1530	2290	3060	3820	1800
LOAD AT POINT	SM 60	870	1220	1830	1600	2400	3200	2000	3000	4000	5000	2360
OF SLIP @ T_{KN} (N)	SM 70	1120	1570	2360	2000	3000	4000	2440	3660	4880	6100	2900
	SM 80	1890	2650	3980	2800	4200	5600	3420	5120	6840	8550	4040

(1) For operation above 80% of the declared maximum coupling speed, it is recommended that the coupling is dynamically balanced.

(2) The Renold Hi-Tec Coupling will "slip" axially when the maximum axial force is reached.

DCB Series 8 Technical Data

End View - Series 8



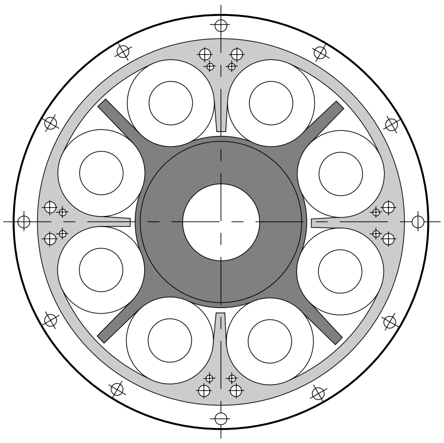
COUPLING SIZE		836.5	846.5	827.5	837.5	847.5	857.5	828.0	838.0	848.0	858.0	829.5
NOMINAL TORQUE T_{KN} (kNm)		22.01	29.34	22.37	33.55	44.73	55.92	27.03	40.55	54.06	67.58	45.78
MAXIMUM TORQUE T_{Kmax} (kNm)		66.02	88.03	67.10	100.65	134.20	167.75	81.10	121.64	162.19	202.74	137.34
VIBRATORY TORQUE T_{KW} (kNm)		8.25	11.00	8.39	12.561	16.77	20.97	10.41	15.21	20.27	25.34	17.33
ALLOWABLE	NM 45	363	482	278	418	556	696	297	446	594	743	353
DISSIPATED	SM 50	402	536	309	464	618	773	330	495	660	825	392
HEAT AT AMB.	SM 60	456	608	351	526	702	877	374	561	748	935	444
TEMP. 30°C. (W) P_{KW}	SM 70	510	680	392	588	784	980	418	627	836	1045	497
	SM 80	563	750	433	650	866	1083	462	693	924	1155	550
MAXIMUM SPEED (rpm) (1)		1490	1490	1315	1315	1315	1315	1240	1240	1240	1240	1010
DYNAMIC TORSIONAL STIFFNESS C_{Tdyn} (MNm/rad)												
@ 0.25 T_{KN}	NM 45	0.157	0.209	0.160	0.240	0.320	0.400	0.195	0.293	0.391	0.488	0.328
	SM 50	0.191	0.255	0.195	0.292	0.390	0.487	0.238	0.357	0.476	0.594	0.399
	SM 60	0.256	0.341	0.261	0.391	0.521	0.651	0.318	0.477	0.636	0.795	0.534
	SM 70	0.410	0.547	0.419	0.628	0.837	1.046	0.511	0.767	1.022	1.278	0.857
	SM 80	0.655	0.874	0.668	1.003	1.337	1.671	0.816	1.224	1.632	2.040	1.369
@ 0.5 T_{KN}	NM 45	0.238	0.317	0.243	0.364	0.485	0.607	0.296	0.445	0.593	0.741	0.497
	SM 50	0.316	0.422	0.323	0.484	0.645	0.807	0.394	0.591	0.788	0.985	0.661
	SM 60	0.385	0.514	0.393	0.589	0.786	0.982	0.480	0.720	0.959	1.199	0.805
	SM 70	0.505	0.673	0.515	0.773	1.030	1.288	0.629	0.943	1.258	1.572	1.055
	SM 80	0.802	1.069	0.818	1.227	1.636	2.045	0.999	1.498	1.997	2.497	1.675
@ 0.75 T_{KN}	NM 45	0.358	0.477	0.365	0.547	0.730	0.912	0.445	0.668	0.891	1.114	0.747
	SM 50	0.461	0.615	0.470	0.706	0.941	1.176	0.574	0.862	1.149	1.436	0.963
	SM 60	0.549	0.731	0.559	0.839	1.119	1.398	0.683	1.024	1.366	1.707	1.145
	SM 70	0.682	0.909	0.695	1.043	1.391	1.739	0.849	1.274	1.698	2.123	1.424
	SM 80	1.091	1.454	1.112	1.668	2.224	2.780	1.358	2.037	2.716	3.395	2.277
@ 1.0 T_{KN}	NM 45	0.523	0.698	0.534	0.801	1.068	1.335	0.652	0.978	1.304	1.629	1.093
	SM 50	0.640	0.854	0.653	0.980	1.306	1.633	0.797	1.196	1.595	1.993	1.337
	SM 60	0.734	0.979	0.749	1.123	1.497	1.872	0.914	1.371	1.828	2.285	1.533
	SM 70	0.891	1.188	0.909	1.363	1.818	2.272	1.110	1.665	2.220	2.775	1.861
	SM 80	1.471	1.962	1.500	2.251	3.001	3.751	1.832	2.748	3.664	4.580	3.072
RADIAL STIFFNESS NO LOAD (N/mm)	NM 45	3792	5056	2988	4482	5976	7470	3112	4668	6224	7780	3696
	SM 50	4332	5776	3413	5120	6826	8533	3555	5332	7110	8888	4220
	SM 60	6500	8666	5120	7680	10240	12800	5332	8000	10660	13325	6332
	SM 70	8667	11556	6828	10242	13656	17070	7110	10665	14220	17775	8442
	SM 80	10180	13576	8022	12030	16044	20050	8355	12530	16710	20888	9920
RADIAL STIFFNESS @ T_{KN} (N/mm)	NM 45	6564	8752	5170	7755	10340	12925	5381	8070	10760	13450	6390
	SM 50	6500	8666	5120	7680	10240	12800	5332	8000	10660	13325	6332
	SM 60	8666	11556	6828	10242	13656	17070	7110	10665	14220	17775	8442
	SM 70	10830	14444	8535	12800	17070	21338	8888	13330	17776	22220	10554
	SM 80	15165	20220	11948	17922	23896	29870	12444	18666	24888	31110	14776
AXIAL STIFFNESS (N/mm)	NM 45	1488	1984	1145	1718	2290	2862	1221	1832	2442	3052	1450
	SM 50	1750	2332	1345	2018	2690	3362	1434	2152	2868	3586	1700
	SM 60	2817	3756	2167	3250	4334	5418	2310	3466	4620	5778	2744
	SM 70	5026	6700	3866	5800	7730	9666	4124	6186	8248	10311	4898
	SM 80	8752	11670	6733	10100	13466	16832	7182	10773	14364	17955	8528
MAXIMUM AXIAL (2) LOAD AT POINT OF SLIP @ T_{KN} (N)	NM 45	1970	2620	1520	2280	3040	3800	1620	2430	3240	4050	1920
	SM 50	2700	3600	2080	3130	4160	5200	2220	3330	4440	5550	2640
	SM 60	3550	4720	2720	4100	5440	6800	2840	4260	5680	7100	3380
	SM 70	4350	5890	3330	5000	6660	8330	3550	5330	7100	8880	4220
	SM 80	6050	8080	4660	6980	9320	11650	4980	7470	9960	12450	5900

(1) For operation above 80% of the declared maximum coupling speed, it is recommended that the coupling is dynamically balanced.

(2) The Renold Hi-Tec Coupling will "slip" axially when the maximum axial force is reached.

DCB Series 8 Technical Data

End View - Series 8



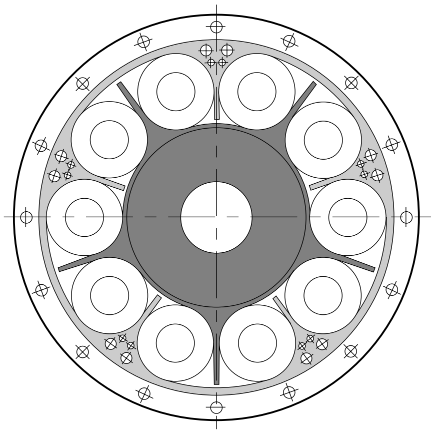
COUPLING SIZE		839.5	849.5	859.5	8211.0	8311.0	8411.0	8213.0	8313.0	8413.0	8215.0	8315.0	8415.0
NOMINAL TORQUE T_{KN} (kNm)		68.67	91.56	114.50	71.94	107.91	143.88	118.59	177.56	237.18	185.30	277.95	370.60
MAXIMUM TORQUE T_{Kmax} (kNm)		206.01	274.68	343.50	215.82	323.73	431.64	355.78	533.66	711.55	555.90	833.85	1111.80
VIBRATORY TORQUE T_{KW} (kNm)		25.75	34.34	37.90	26.98	40.47	53.96	44.47	66.71	88.94	69.49	104.23	138.98
ALLOWABLE	NM 45	529	706	883	409	613	818	483	724	966	557	836	1114
DISSIPATED	SM 50	588	784	980	454	681	908	537	805	1074	619	928	1238
HEAT AT AMB.	SM 60	666	888	1110	515	772	1030	608	912	1216	701	1052	1402
TEMP. 30°C. (W) P_{KW}	SM 70	745	994	1243	575	862	1150	679	1019	1358	784	1176	1568
	SM 80	823	1100	1375	635	953	1270	751	1126	1502	867	1300	1734
MAXIMUM SPEED (rpm) (1)		1010	1010	1010	880	880	880	730	730	730	640	640	640
DYNAMIC TORSIONAL STIFFNESS C_{Tdyn} (MNm/rad)													
	NM 45	0.491	0.655	0.819	0.512	0.768	1.024	0.846	1.268	1.691	1.299	1.948	2.597
	SM 50	0.598	0.798	0.997	0.623	0.935	1.247	1.029	1.544	2.059	1.581	2.371	3.162
@ 0.25 T_{KN}	SM 60	0.800	1.067	1.334	0.834	1.251	1.668	1.377	2.066	2.754	2.115	3.173	4.231
	SM 70	1.286	1.714	2.143	1.340	2.010	2.680	2.212	3.318	4.424	3.397	5.096	6.795
	SM 80	2.053	2.737	3.421	2.140	3.209	4.279	3.532	5.298	7.064	5.425	8.138	10.851
	NM 45	0.745	0.994	1.242	0.777	1.165	1.554	1.283	1.924	2.565	1.970	2.955	3.940
	SM 50	0.991	1.322	1.652	1.033	1.550	2.066	1.705	2.558	3.411	2.620	3.929	5.239
@ 0.5 T_{KN}	SM 60	1.207	1.609	2.011	1.258	1.887	2.516	2.076	3.115	4.153	3.189	4.784	6.379
	SM 70	1.582	2.109	2.637	1.649	2.473	3.298	2.722	4.083	5.444	4.181	6.272	8.362
	SM 80	2.512	3.349	4.187	2.618	3.927	5.237	4.322	6.484	8.645	6.639	9.959	13.279
	NM 45	1.121	1.494	1.868	1.168	1.752	2.336	1.928	2.892	3.856	2.962	4.443	5.924
	SM 50	1.445	1.927	2.409	1.506	2.259	3.012	2.486	3.730	4.973	3.819	5.729	7.639
@ 0.75 T_{KN}	SM 60	1.718	2.291	2.863	1.791	2.686	3.581	2.956	4.434	5.912	4.541	6.811	9.081
	SM 70	2.136	2.848	3.560	2.226	3.339	4.453	3.675	5.513	7.350	5.645	8.468	11.290
	SM 80	3.416	4.554	5.693	3.560	5.340	7.120	5.877	8.816	11.755	9.028	13.541	18.055
	NM 45	1.640	2.186	2.733	1.709	2.563	3.418	2.821	4.232	5.642	4.333	6.500	8.667
	SM 50	2.006	2.675	3.343	2.091	3.136	4.181	3.451	5.177	6.903	5.301	7.952	10.603
@ 1.0 T_{KN}	SM 60	2.299	3.066	3.832	2.397	3.595	4.793	3.956	5.935	7.913	6.077	9.116	12.154
	SM 70	2.792	3.723	4.653	2.910	4.365	5.820	4.804	7.206	9.608	7.379	11.068	14.758
	SM 80	4.608	6.145	7.681	4.803	7.205	9.606	7.929	11.894	15.859	12.180	18.270	24.359
	NM 45	5544	7392	9240	4280	6420	8560	5058	7587	10116	5836	8754	11672
RADIAL STIFFNESS	SM 50	6330	8440	10550	4888	7332	9776	5777	8666	11552	6665	10000	13330
NO LOAD (N/mm)	SM 60	9500	12664	15828	7332	11000	14664	8665	13000	17330	10000	15000	20000
	SM 70	12660	16884	21108	9776	14664	19550	11534	17300	23068	13330	20000	26660
	SM 80	14880	19840	24800	11488	17232	22976	13576	20634	27150	15660	23500	31330
	NM 45	9585	12780	15975	7400	11100	14800	8745	13118	17490	10100	15150	20200
RADIAL STIFFNESS	SM 50	9500	12664	15828	7332	11000	14664	8665	13000	17330	10000	15000	20000
@ T_{KN} (N/mm)	SM 60	12660	16884	21108	9776	14664	19550	11550	17325	23100	13330	20000	26660
	SM 70	15830	21100	26370	12220	18330	24440	14440	21660	28880	16660	24990	33320
	SM 80	22160	29550	36940	17110	25665	34220	20220	30330	40440	23330	35000	46660
	NM 45	2175	2900	3625	1679	2518	3358	1984	2976	3968	2290	3435	4580
AXIAL STIFFNESS	SM 50	2550	3400	4250	1972	2960	3944	2332	3498	4334	2690	4035	5380
(N/mm)	SM 60	4116	5488	6860	3177	4766	6354	3755	5632	7510	4333	6500	8666
	SM 70	7347	9796	12245	5670	8505	11340	6702	10050	13400	7733	11600	15466
	SM 80	12792	17056	21320	9875	14810	19750	11670	17500	23340	13466	20200	26932
	NM 45	2880	3840	4800	2220	3330	4440	2630	3950	5260	3030	4540	6060
MAXIMUM AXIAL (2)	SM 50	3960	5280	6600	3060	4580	6120	3600	5400	7200	4160	6250	8320
LOAD AT POINT	SM 60	5070	6760	8450	3910	5860	7820	4620	6930	9240	5330	8000	10660
OF SLIP @ T_{KN} (N)	SM 70	6330	8440	10550	4880	7320	9760	5770	8660	11540	6660	9990	13320
	SM 80	8850	11800	14750	6840	10260	13680	8090	12130	16180	9330	14000	18660

(1) For operation above 80% of the declared maximum coupling speed, it is recommended that the coupling is dynamically balanced.

(2) The Renold Hi-Tec Coupling will "slip" axially when the maximum axial force is reached.

DCB Series 10 Technical Data

End View - Series 10



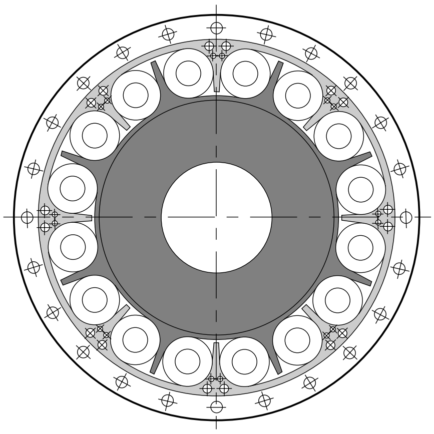
COUPLING SIZE		10211.0	10311.0	10411.0	10213.0	10313.0	10413.0	10215.0	10315.0	10415.0
NOMINAL TORQUE T_{KN} (kNm)		106	160	213	177	266	354	278	417	556
MAXIMUM TORQUE T_{Kmax} (kNm)		319	479	639	513	797	1062	834	1250	1670
VIBRATORY TORQUE T_{KW} (kNm)		39.9	59.8	79.8	66.4	99.6	133.0	104.0	156.0	209.0
ALLOWABLE	NM 45	510	765	1020	604	906	1208	696	1044	1392
DISSIPATED	SM 50	568	852	1136	671	1008	1344	774	1161	1548
HEAT AT AMB.	SM 60	643	965	1286	760	1140	1520	877	1315	1754
TEMP. 30°C. (W) P_{KW}	SM 70	719	1078	1438	850	1275	1700	980	1470	1960
	SM 80	795	1192	1590	939	1409	1880	1083	1625	2166
MAXIMUM SPEED (rpm) (1)		770	770	770	650	650	650	570	570	570
DYNAMIC TORSIONAL STIFFNESS C_{Tdyn} (MNm/rad)										
	NM 45	0.760	1.141	1.521	1.280	1.921	2.561	2.083	3.125	4.167
	SM 50	0.926	1.389	1.851	1.559	2.338	3.117	2.536	3.804	5.072
@ 0.25 T_{KN}	SM 60	1.239	1.858	2.477	2.086	3.128	4.171	3.393	5.090	6.787
	SM 70	1.989	2.984	3.979	3.350	5.024	6.699	5.450	8.175	10.900
	SM 80	3.177	4.765	6.354	5.349	8.023	10.698	8.703	13.055	17.407
	NM 45	1.154	1.730	2.307	1.942	2.914	3.885	3.161	4.741	6.321
	SM 50	1.534	2.301	3.068	2.583	3.874	5.165	4.202	6.303	8.404
@ 0.5 T_{KN}	SM 60	1.868	2.801	3.735	3.144	4.717	6.289	5.116	7.675	10.233
	SM 70	2.448	3.672	4.896	4.122	6.183	8.244	6.707	10.061	13.415
	SM 80	3.888	5.831	7.775	6.546	9.818	13.091	10.651	15.976	21.301
	NM 45	1.734	2.601	3.468	2.920	4.380	5.840	4.751	7.127	9.502
	SM 50	2.236	3.354	4.473	3.765	5.648	7.531	6.127	9.190	12.254
@ 0.75 T_{KN}	SM 60	2.659	3.988	5.317	4.477	6.715	8.953	7.284	10.926	14.568
	SM 70	3.305	4.958	6.611	5.565	8.348	11.131	9.056	13.584	18.112
	SM 80	5.286	7.929	10.572	8.900	13.350	17.800	14.482	21.723	28.964
	NM 45	2.537	3.806	5.075	4.272	6.408	8.544	6.952	10.427	13.903
	SM 50	3.104	4.656	6.208	5.226	7.840	10.453	8.504	12.756	17.009
@ 1.0 T_{KN}	SM 60	3.558	5.338	7.117	5.991	8.987	11.983	9.749	14.623	19.498
	SM 70	4.321	6.481	8.641	7.275	10.912	14.509	11.837	17.755	23.674
	SM 80	7.132	10.697	14.263	12.008	18.011	24.015	19.538	29.307	39.077
	NM 45	5350	8025	10700	6322	9483	12644	7295	10942	14590
RADIAL STIFFNESS	SM 50	6100	9150	12200	7220	10830	14440	8331	12500	16660
NO LOAD (N/mm)	SM 60	9165	13747	18330	10830	16245	21660	12500	18750	25000
	SM 70	12220	18330	24440	14418	21627	28836	16662	25000	33324
	SM 80	14360	21540	28720	16970	25455	33940	19580	29370	39160
	NM 45	9250	13875	18500	10930	16395	21860	12625	19838	25250
RADIAL STIFFNESS	SM 50	9165	13748	18330	10830	16245	21660	12500	18750	25000
@ T_{KN} (N/mm)	SM 60	12220	18330	24440	14440	21660	28880	16660	24990	33320
	SM 70	15275	22910	30550	18050	27075	36100	20825	31238	41650
	SM 80	21380	32070	42760	25275	37912	50550	29163	43744	58326
	NM 45	2100	3148	4200	2480	3720	4960	2862	4294	5724
AXIAL STIFFNESS	SM 50	2465	3700	4930	2914	4372	5418	3362	5044	6724
(N/mm)	SM 60	3970	5958	7942	4694	7040	11724	5416	8125	10832
	SM 70	7088	10632	14175	8378	12560	16750	9666	14500	19332
	SM 80	12345	18510	24688	14588	21875	29175	16833	2520	33666
	NM 45	2780	4160	5550	3300	4940	6580	3790	5670	7580
MAXIMUM AXIAL (2)	SM 50	3820	5720	7650	4500	6750	9000	5200	7820	10400
LOAD AT POINT	SM 60	4880	7320	9800	5780	8660	11550	6660	10000	13320
OF SLIP @ T_{KN} (N)	SM 70	6100	9150	12200	7220	10820	14440	8320	12500	16640
	SM 80	8550	12820	17100	10120	15160	20220	11660	17500	23320

(1) For operation above 80% of the declared maximum coupling speed, it is recommended that the coupling is dynamically balanced.

(2) The Renold Hi-Tec Coupling will "slip" axially when the maximum axial force is reached.

DCB Series 16 Technical Data

End View - Series 16



COUPLING SIZE		16313.0	16413.0	16513.0	16315.0	16415.0	16515.0
NOMINAL TORQUE T_{KN} (kNm)		723	963	1200	1100	1470	1840
MAXIMUM TORQUE T_{Kmax} (kNm)		2170	2890	3610	3320	4520	5520
VIBRATORY TORQUE T_{KW} (kNm)		271	361	451	415	552	690
ALLOWABLE DISSIPATED HEAT AT AMB. TEMP. 30°C. (W) P_{KW}	SM 50	1610	2147	2683	1857	2476	3095
	SM 60	1824	2432	3040	2105	2807	3508
	SM 70	2038	2717	3397	2352	3136	3920
MAXIMUM SPEED (rpm) (1)		490	490	490	390	390	390
DYNAMIC TORSIONAL STIFFNESS C_{Tdyn} (MNm/rad)							
@ 0.25 T_{KN}	SM 50	6.056	8.075	10.094	9.278	12.371	15.464
	SM 60	8.104	10.805	13.506	12.415	16.553	20.691
	SM 70	13.015	17.354	21.692	19.939	26.586	33.232
@ 0.5 T_{KN}	SM 50	10.035	13.380	16.725	15.374	20.498	25.623
	SM 60	12.218	16.291	20.364	18.718	24.957	31.197
	SM 70	16.018	21.357	26.696	24.539	32.718	40.898
@ 0.75 T_{KN}	SM 50	14.631	19.508	24.385	22.414	29.886	37.357
	SM 60	17.395	23.193	28.992	26.649	35.531	44.414
	SM 70	21.626	28.835	36.043	33.130	44.174	55.217
@ 1.0 T_{KN}	SM 50	20.309	27.078	33.848	31.112	41.483	51.854
	SM 60	23.281	31.041	38.801	35.665	47.554	59.442
	SM 70	28.267	37.690	47.112	43.305	57.739	72.174
RADIAL STIFFNESS NO LOAD (N/mm)	SM 50	17330	23100	28875	20000	26660	33325
	SM 60	26000	34660	43325	30000	40000	50000
	SM 70	34600	46133	57666	40000	53330	66660
RADIAL STIFFNESS @ T_{KN} (N/mm)	SM 50	26000	34666	43333	30000	40000	50000
	SM 60	34650	46200	57750	40000	53330	66660
	SM 70	43320	57760	72200	49980	66640	83300
AXIAL STIFFNESS (N/mm)	SM 50	6996	9328	11660	8070	10080	13450
	SM 60	11264	15000	18750	13000	17333	21666
	SM 70	20100	26800	33500	23200	30933	38666
MAXIMUM AXIAL (2) LOAD AT POINT OF SLIP @ T_{KN} (N)	SM 50	10800	14400	18000	12500	16660	20830
	SM 60	13860	18480	23100	16000	21330	26660
	SM 70	17320	23100	28880	20000	26660	33330

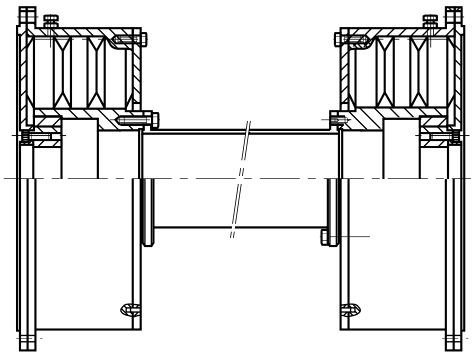
(1) For operation above 80% of the declared maximum coupling speed, it is recommended that the coupling is dynamically balanced.

(2) The Renold Hi-Tec Coupling will "slip" axially when the maximum axial force is reached.

DCB Design Variations

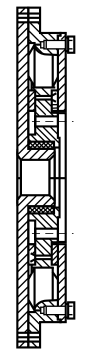
The DCB coupling can be adapted to meet customer requirements, as can be seen from the design variations shown below. For a more comprehesive list contact Renold Hi-Tec.

Cardan Shaft Coupling



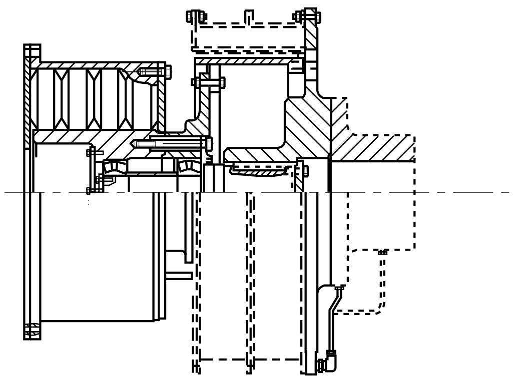
Cardan shaft coupling to give high misalignment capability, low axial and angular stiffness and high noise attenuation.

Universal Joint Shaft Coupling



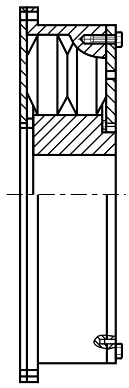
Coupling for use with a universal joint shaft. The coupling has radial and axial bearings to accept the sinusoidal loads from the universal joint shaft.

Clutch Coupling



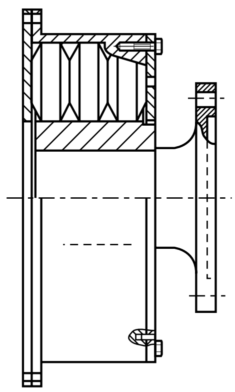
Clutch coupling to allow the drive to be engaged and disengaged.

Limited End Float Coupling



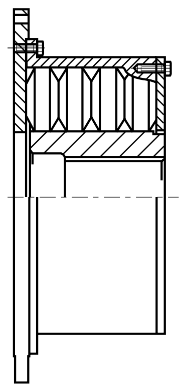
Limited end float coupling for use on applications where axial restraint is required, such as alternators with sleeve bearings.

Stub Shaft Coupling



Stub shaft coupling for flywheel to flange application or when increased distance between the driving and driven machines is required.

Adaptor Plate Coupling



Adaptor plate coupling for adapting the standard DCB coupling to meet customer requirements.

HTB Flexible Coupling

High temperature blind assembly, coupling designed for bell housing applications.

Applications

- Marine propulsion
- Generator sets
- Pump sets
- Compressors
- Rail traction

Features

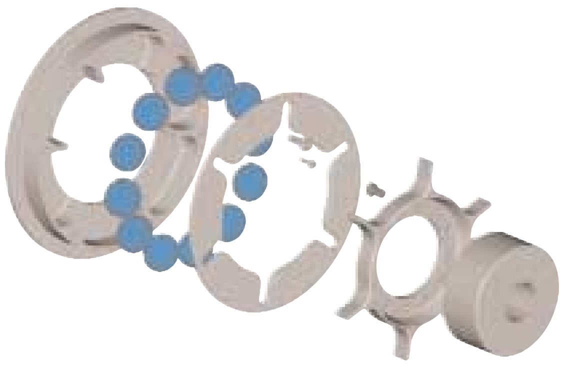
- Unique blind assembly
- High temperature capability (up to 200°C)
- Severe shock load protection
- Intrinsically fail safe
- Maintenance free
- Noise attenuation

Benefits

- Allows easy assembly for applications in bell housings.
- Allows operation in bell housings where ambient temperatures can be high.
- Avoiding failure of the driveline under short circuit and other transient conditions.
- Ensuring continuous operation of the driveline in the unlikely event of rubber damage.
- No lubrication or adjustment required resulting in low running costs.
- Giving quiet running conditions in sensitive applications by the elimination of metal to metal contact.

Construction details

- Spheroidal Graphite to BS 2789 Grade 420/12.
- High temperature elastomer with a 200°C temperature capability.
- Keep plate integral with outer member.
- Hub manufactured to meet application requirements.



HTB Typical Applications


Main propulsion. Coupling fitted between diesel engine and gearbox.

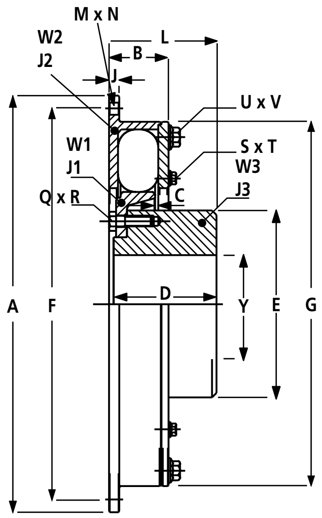

Main propulsion. Coupling fitted between engine and gearbox.


Diesel generator sets. Couplings fitted between diesel engine and alternator.

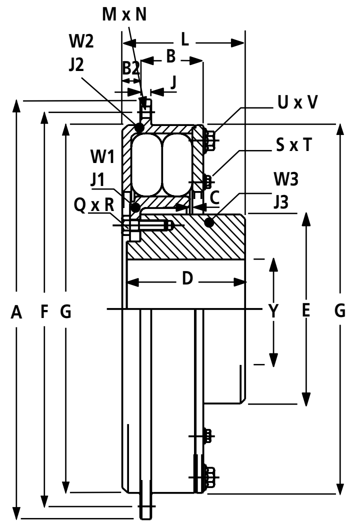

Rail traction. Couplings fitted between diesel engines and transmission gear.

HTB Standard SAE Flywheel to Shaft

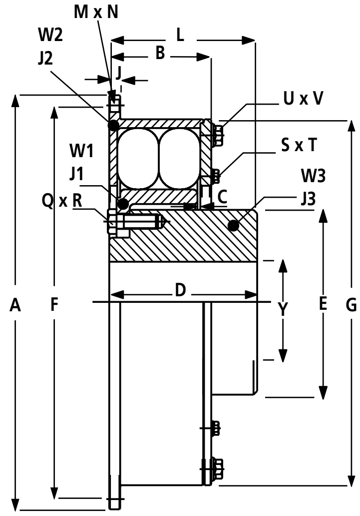
HTB1200 - HTB10000



HTB4500



HTB12000 - HTB40000



Dimensions, Weight, Inertia and Alignment

COUPLING SIZE		1200		3000		4500		6000		10000	12000		20000	40000
		SAE11.5	SAE14	SAE14	SAE18	SAE14	SAE18	SAE18	SAE21	SAE21	SAE18	SAE21	SAE21	
DIMENSIONS (mm)	A	352.4	466.7	466.7	571.5	466.7	571.5	571.5	673.1	673.1	571.5	673.1	673.1	860.0
	B	50.0	50.0	67.0	67.0	69.5	69.5	84.0	84.0	103.0	141.0	141.0	173.0	215.0
	B_2	-	-	-	-	20.0	20.0	-	-	-	-	-	-	-
	C	3.0	3.0	3.0	3.0	3.0	3.0	4.0	4.0	4.0	4.0	4.0	4.0	7.0
	D (STANDARD)	100.0	100.0	112.0	112.0	128.0	128.0	139.0	139.0	166.0	194.0	194.0	236.0	276
	D (DIN 6281)	100.0	85.8	105.0	105.0	105.0	105.0	-	-	-	-	-	-	-
	E	156.0	156.0	210.0	210.0	210.0	210.0	256.0	256.0	308.0	256.0	256.0	308.0	416.0
	F	333.4	438.2	438.2	542.9	438.2	542.9	542.9	641.4	641.4	542.9	641.4	641.4	820.0
	G	304.0	304.0	409.0	409.0	409.0	409.0	505.0	505.0	600.0	505.0	505.0	600.0	778.0
	J	10.0	10.0	12.0	12.0	12.0	12.0	16.0	16.0	20.0	16.0	16.0	20.0	22.0
	L (STANDARD)	106.6	106.6	120.0	120.0	136.0	136.0	150.0	150.0	180.0	205.0	205.0	250.0	300.0
	M	8	8	8	6	8	6	6	12	12	6	12	12	32
	N	10.5	13.5	13.5	17.0	13.5	17.0	17.0	17.0	17.0	17.0	17.0	17.0	21.0
	L (DIN 6281)	106.6	92.4	92.4	-	92.4	-	-	-	-	-	-	-	-
	Q	12	12	12	12	16	16	12	12	12	12	12	12	16
	R	M12	M12	M16	M16	M16	M16	M20	M20	M24	M20	M20	M24	M24
	S	6	6	6	6	6	6	6	6	6	6	6	6	-
	T	M6	M6	M8	M8	M8	M8	M10	M10	M10	M10	M10	M10	-
	U	6	6	6	6	6	6	6	6	6	6	6	6	6
	V	M12	M12	M14	M14	M14	M14	M16	M16	M20	M16	M16	M20	M24
	Y (MAX)	85.0	85.0	115.0	115.0	115.0	115.0	150	150	170	150	150	170	220.0
	Y (MIN)	40.0	40.0	50.0	50.0	50.0	50.0	60.0	60.0	60.0	60.0	60.0	60.0	110.0
	Z	16.0	16.0	20.0	20.0	0.0	0.0	29.0	29.0	36.0	29.0	29.0	36.0	-
RUBBER ELEMENTS	PER CAVITY	1	1	1	1	2	2	1	1	1	2	2	2	2
	PER COUPLING	12	12	12	12	24	24	12	12	12	24	24	24	24
MAXIMUM SPEED (rpm) (1)		3730	2820	2820	2300	2820	2300	2300	1950	1950	2300	1950	1950	1500
WEIGHT (kg)	W1	3.0	3.0	7.0	7.0	10.6	10.6	16.0	16.0	24.4	41.7	41.7	56.0	98.3
	W2	10.0	15.2	22.1	29.2	26.4	34.5	43.2	55.1	77.9	58.6	70.5	112.1	199.7
	W3 (STANDARD)	12.1	12.2	22.9	22.9	22.9	22.9	42.0	42.0	46.7	65.1	65.1	114.5	262.6
	W3 (DIN 6281)	12.2	10.3	20.5	-	20.5	-	-	-	-	-	-	-	-
	TOTAL (W1 & W2)	13.0	18.2	29.2	36.2	37.0	45.1	59.2	71.1	102.3	100.3		168.1	298.0
INERTIA (kg m²)	J1	0.03	0.03	0.09	0.09	0.15	0.15	0.26	0.26	0.64	0.98	0.98	1.92	5.97
	J2	0.19	0.42	0.75	0.93	0.88	0.92	2.26	3.35	5.39	2.79	3.95	6.63	23.68
	J3 (STANDARD)	0.04	0.04	0.14	0.14	0.17	0.17	0.37	0.37	1.00	0.58	0.58	1.47	5.96
	J3 (DIN 6281)	0.03	0.04	0.12	-	0.12	-	-	-	-	-	-	-	-
ALLOWABLE MISALIGNMENT														
RADIAL (mm)	ALIGN	0.25	0.25	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40
	MAX	1.00	1.00	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
AXIAL (mm)	ALIGN	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	MAX	2.00	2.00	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50
CONICAL (degree)		0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50

HTB Technical Data

1.1 Torque Capacity - Diesel Engine Drives

The HTB Coupling is selected on the "Nominal Torque, T_{KN}" without service factors.

The full torque capacity of the coupling for transient vibration whilst passing through major criticals on run up is published as the Maximum Torque T_{Kmax}.
($T_{Kmax} = 3 \times T_{KN}$).

There is additional torque capacity built within the coupling for short circuit torques.

The published "Vibratory Torque T_{KW}", relates to the amplitude of the permissible continous torque fluctuation. The vibratory torque values shown in the technical data are at the frequency of 10Hz. The measure of acceptability of the coupling for vibrating drives is published as "Allowable Dissipated Heat at Ambient Temperature 30°C.

1.2 Transient Torques

Prediction of transient torques in marine drives can be complex. Normal installations are well provided for by selecting couplings based on the "Nominal Torque T_{Kn}". Transients, such as start up and clutch manoeuvre, are usually within the "Maximum Torque T_{Kmax}" for the coupling.

Care needs to be taken in the design of couplings with shaft brakes, to ensure coupling torques are not increased by severe deceleration.

Sudden torque applications of propulsion devices such as thrusters or waterjets, need to be considered when designing the coupling connection.

2.0 Stiffness Properties

The Renold Hi-Tec Coupling remains fully flexible under all torque conditions. The HTB series is a non-bonded type operating with the Rubber-in-Compression principle.

2.1 Axial Stiffness

When subject to axial misalignment, the coupling will have an axial resistance which gradually reduces due to the effect of vibratory torque.

The axial stiffness of the coupling is torque dependent, the variation is as shown in the technical data on page 29.

2.2 Radial Stiffness

The radial stiffness of the coupling is torque dependent, and is as shown in the technical data on page 29.

2.3 Torsional Stiffness

The torsional stiffness of the coupling is dependent upon applied torque and temperature as shown in the technical data on page 29.

2.4 Prediction of the System Torsional Vibration Characteristics

An adequate prediction of the systems torsional vibration characteristics, can be made by the following method:

2.4.1 Use the torsional stiffness, as published in the catalogue which is based upon data measured at 30˚C ambient temperature.

2.4.2 Repeat the calculation made as 2.4.1, but using the maximum temperature correction factor S_{t200}, and dynamic magnifier correction factor, M_{200}, for the selected rubber. Use tables on page 28 to adjust values for both torsional stiffness and dynamic magnifier. ie. $C_{T200} = C_{Tdyn} \times S_{t200}$

2.4.3 Review calculations 2.4.1 and 2.4.2 and if the speed range is clear of criticals which do not exceed the allowable heat dissipation value as published in the catalogue, then the coupling is considered suitable for the application with respect to the torsional vibration characteristics. If there is a critical in the speed range, then the actual temperature of the coupling should be calculated at this speed.

Rubber Grade	$Temp_{max}$ °C	S_t
Si 70	200	S_{t200} = 0.48
Si 70 is considered "standard"		

Rubber Grade	Dynamic Magnifier at 30°C (M_{30})	Dynamic Magnifier at 200°C (M_{200})
Si 70	7.5	15.63
Si 70 is considered "standard"		

2.5 Prediction of the Actual Coupling Temperature and Torsional Stiffness

2.5.1 Use the torsional stiffness as published in the catalogue. This is based upon data measured at 30˚C and the dynamic magnifier at 30˚C. (M_{30})

2.5.2 Compare the synthesis value of the calculated heat load in the coupling (P_K) at the speed of interest, to the "Allowable Heat Dissipation" (P_{KW}).

The coupling temperature rise

$$°C = Temp_{coup} = \left(\frac{P_K}{P_{KW}}\right) \times 170$$

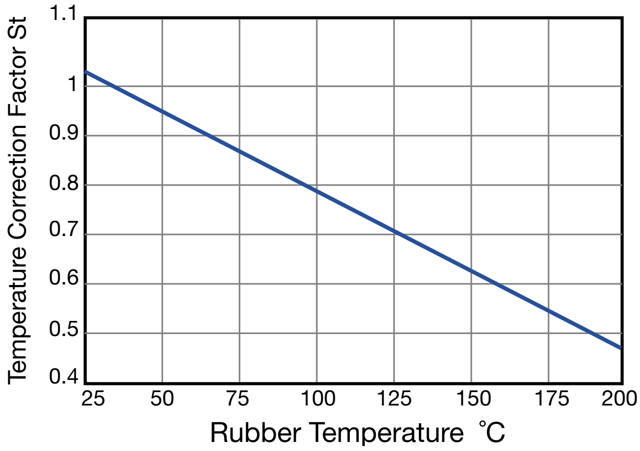
The coupling temperature = ϑ

$$\vartheta = Temp_{coup} + \text{Ambient Temp.}$$

2.5.3 Calculate the temperature correction factor, S_t, from 2.6 (if the coupling temperature > 200°C, then use S_{t200}). Calculate the dynamic Magnifier as per 2.7. Repeat the calculation with the new value of coupling stiffness and dynamic magnifier

2.5.4 Calculate the coupling temperature as per 2.5. Repeat calculation until the coupling temperature agrees with the correction factors for torsional stiffness and dynamic magnifier used in the calculation.

2.6 Temperature Correction Factor



2.7 Dynamic Magnifier Correction Factor

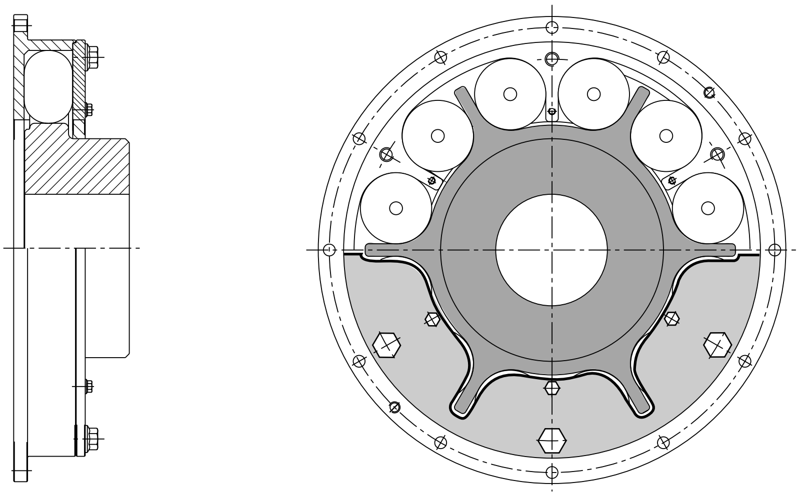
The Dynamic Magnifier of the rubber is subject to temperature variation in the same way as the torsional stiffness.

$$M_T = \frac{M_{30}}{S_t} \qquad \psi_T = \psi_{30} \times S_t$$

Rubber Grade	Dynamic Magnifier (M_{30})	Relative Damping ψ_{30}
Si 70	7.5	0.83
Si 70 is considered "standard"		

HTB Technical Data

End view

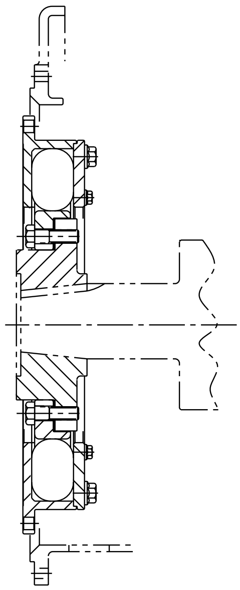


COUPLING SIZE	1200		3000		4500		6000		10000	12000		20000	40000
	SAE11.5	SAE14	SAE14	SAE18	SAE14	SAE18	SAE18	SAE21	SAE21	SAE18	SEA21	SAE21	
Nominal Torque T_{kN} (kNm)	1.2	1.2	3.0	3.0	4.5	4.5	6.0	6.0	10.0	12.0	12.0	20.0	40.0
Maximum Torque T_{kmax} (kNm)	3.6	3.6	9.0	9.0	13.5	13.5	18.0	18.0	30.0	36.0	36.0	60.0	120.0
Vibratory Torque T_{kw} (kNm)	0.4	0.4	1.0	1.0	1.5	1.5	2.0	2.0	3.3	4.0	4.0	6.6	13.33
Dynamic Torsional Stiffness C_{Tdyn} (MNm/rad)													
10% Nominal Torque	0.003	0.003	0.008	0.008	0.012	0.012	0.015	0.015	0.027	0.030	0.030	0.054	0.117
25% Nominal Torque	0.008	0.008	0.021	0.021	0.032	0.032	0.040	0.040	0.072	0.080	0.080	0.143	0.310
50% Nominal Torque	0.022	0.022	0.056	0.056	0.086	0.083	0.105	0.105	0.188	0.210	0.210	0.376	0.819
75% Nominal Torque	0.043	0.043	0.109	0.109	0.162	0.162	0.205	0.205	0.367	0.410	0.410	0.734	1.597
100% Nominal Torque	0.074	0.074	0.178	0.178	0.265	0.265	0.335	0.335	0.600	0.670	0.670	1.200	2.609
Allowable Heat Loading @ 30°C (W) P_{KW}	430	430	600	600	760	760	735	735	900	1150	1150	1425	1800
Dynamic Magnifier (M)	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
Maximum Speed (RPM)	3730	2820	2820	2300	2820	2300	2300	1950	1950	2300	1950	1950	1500
Radial Stiffness													
No Load (N/mm)	520	520	710	710	1050	1050	900	900	1040	1800	1800	2080	2430
@ TkN (N/mm)	1655	1655	2275	2275	3360	3360	2875	2875	3325	5740	5740	6640	7750
Axial Stiffness													
No Load (N/mm)	195	195	275	275	515	515	345	345	415	980	980	1150	2650
@ TKN (N/mm)	840	840	1180	1180	2210	2210	1490	1490	1790	4230	4230	4770	8560

HTB Design Variations

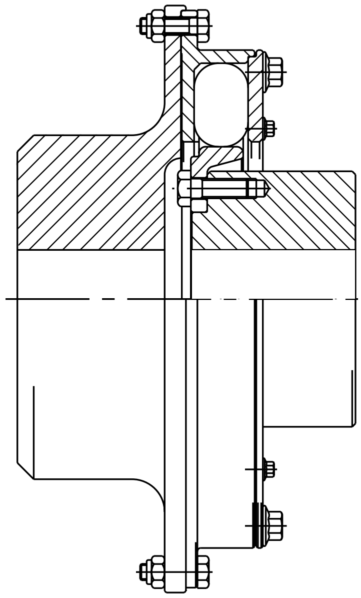
The HTB coupling can be adapted to meet customer requirements as, can be seen from some of the design variations below. For a more comprehensive list contact Renold Hi-Tec.

Coupling to Suit Existing Hub



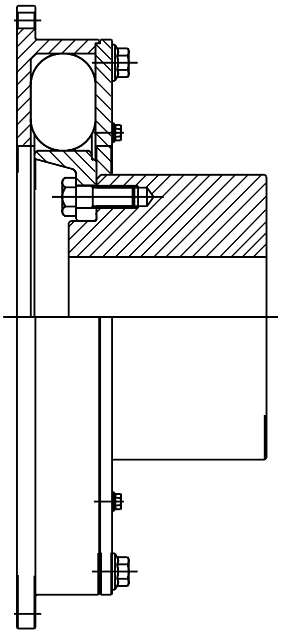
Existing hub fitment. Coupling inner member designed to suit existing hub design.

Shaft to Shaft Coupling



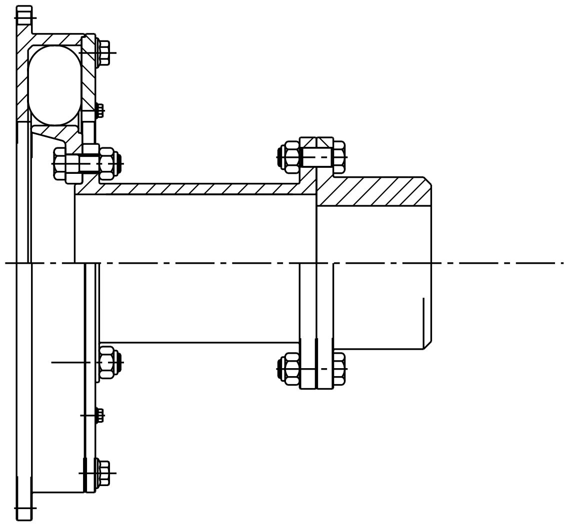
Shaft to Shaft Coupling. Designed for use on electric motor drives and power take off applications.

Reversed Inner Member Coupling



Coupling with reversed inner member to increase distance between flywheel face and shaft end.

Spacer Coupling



Spacer coupling. Used to increase the distance between shaft ends and allow easy access to driven and driving machine.

RB Flexible Coupling

General purpose, cost effective range, which is manufactured in SG iron for torques up to 41kNm.

The Standard Range Comprises

- Shaft to shaft
- Shaft to shaft with increased shaft engagement
- Flywheel to shaft
- Flywheel to shaft with increased shaft engagement

Applications

- Generator sets
- Pump sets
- Compressors
- Wind turbines
- Metal manufacture
- Bulk handling
- Pulp and paper industry
- General purpose industrial applications

Features

- Intrinsically fail safe
- Control of resonant torsional vibration
- Maintenance free
- Severe shock load protection
- Misalignment capability
- Zero backlash
- Low cost

Benefits

- Ensuring continuous operation of the driveline in the unlikely event of rubber damage.
- Achieving low vibratory loads in the driveline components by selection of optimum stiffness characteristics.
- With no lubrication or adjustment required resulting in low running costs.
- Avoiding failure of the driveline under short circuit and other transient conditions.
- Allows axial and radial misalignment between the driving and driven machines.
- Eliminating torque amplifications through pre-compression of the rubber elements.
- The RB Coupling gives the lowest lifetime cost.

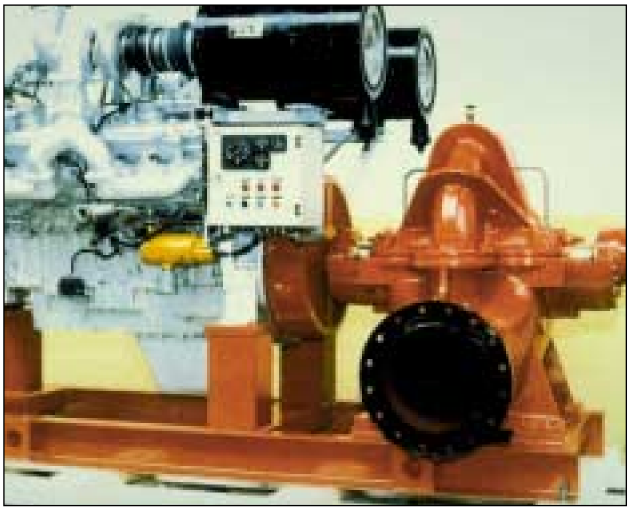
Construction Details

- Spheroidal graphite to BS 2789 Grade 420/12.
- Separate rubber elements with a choice of grade and hardness with SM70 shore hardness being the standard.
- Rubber elements which are totally enclosed and loaded in compression

RB Typical Applications

Mobile diesel generator sets. Coupling fitted between diesel engine and alternator.

CHP plants.Couplings fitted between diesel engines and alternators.



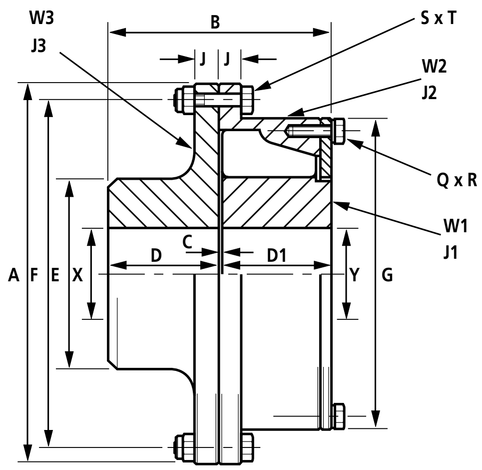
Pump sets. Coupling fitted between diesel engine and centrifugal pump.

Steel mills. Couplings fitted on 35 tonne overhead crane, and on table roller drives.

Steel mills. Couplings fitted to table roller drives on rolling mills and furnace discharge tables.

RB Shaft to Shaft

Rigid half / Flex half



Features

- Can accommodate a wide range of shaft diameters
- Easy disconnection of the outer member and driving flange
- Coupling available with limited end float

Benefits

- Allows the optimum coupling to be selected
- Allows the driving and driven machines to be disconnected
- Provides axial location for armatures with axial float

Dimensions, Weight, Inertia and Alignment

COUPLING SIZE		0.12	0.2	0.24	0.37	0.73	1.15	2.15	3.86	5.5
DIMENSIONS (mm)	A	200.0	222.2	238.1	260.3	308.0	358.8	466.7	508.0	577.8
	B	104.8	111.2	123.8	136.5	174.6	193.7	233.4	260.4	285.8
	C	3.2	3.2	3.2	3.2	3.2	3.2	4.8	6.4	6.4
	D	50.8	54.0	60.3	66.7	85.7	95.2	114.3	127.0	139.7
	D1	50.8	54.0	60.3	66.7	85.7	95.2	114.3	127.0	139.7
	E	79.4	95.2	101.6	120.6	152.4	184.1	222.2	279.4	330.2
	F	177.8	200.0	212.7	235.0	279.4	323.8	438.15	469.9	536.6
	G	156.5	178	186.5	210	251	295	362	435	501.5
	J	12.7	14.3	15.9	17.5	19.0	19.0	19.0	22.2	25.4
	Q	5	6	6	6	6	6	6	7	8
	R	M8	M8	M8	M10	M10	M12	M12	M12	M12
	S	6	6	6	8	8	10	16	12	12
	T	M8	M8	M10	M10	M12	M12	M12	M16	M16
	U	9.2	9.2	11.2	11.2	13.2	13.2	13.2	17.25	17.25
	MAX. X	50	60	65	80	95	115	140	170	210
	MAX. Y	55	70	75	85	95	115	140	170	210
	MIN. X & Y	30	35	40	40	55	55	70	80	90
RUBBER ELEMENTS	PER CAVITY	1	1	1	1	1	1	1	1	1
	PER COUPLING	10	12	12	12	12	12	12	14	16
MAXIMUM SPEED (rpm)	(1)	5250	4725	4410	4035	3410	2925	2250	2070	1820
WEIGHT (3) (kg)	W1	2.82	4.04	5.29	7.49	12.82	23.39	35.88	62.81	102.09
	W2	4.00	5.05	6.38	8.14	13.29	18.41	33.98	43.87	59.00
	W3	4.06	5.82	7.42	10.44	18.03	27.37	47.43	75.39	113.32
INERTIA (3) (kg m^2)	J1	0.0044	0.0084	0.0131	0.0233	0.0563	0.1399	0.3227	0.8489	1.9633
	J2	0.0232	0.0375	0.0546	0.0887	0.20	0.3674	1.1035	1.9161	3.4391
	J3	0.0153	0.027	0.0396	0.0644	0.1475	0.2862	0.7998	1.512	2.9796
ALLOWABLE MISALIGNMENT (2)										
RADIAL (mm)		0.75	0.75	0.75	0.75	1.0	1.5	1.5	1.5	1.5
AXIAL (mm)		1.5	1.5	1.5	1.5	1.5	1.5	2.0	3.0	3.0
CONICAL (degree)		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5

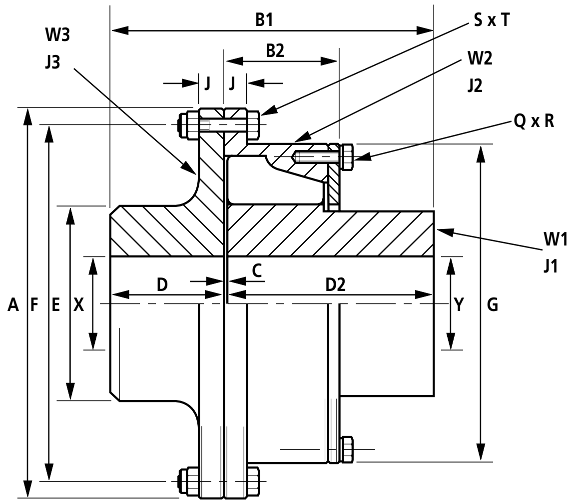
(1) For operation above 80% of the declared maximum coupling speed, it is recommended that the coupling is dynamically balanced.

(2) Installations should be initially aligned as accurately as possible. In order to allow for deterioration in alignment over time, it is recommended that initial alignment should not exceed 25% of the above noted data. The forces on the driving and driven machinery should be calculated to ensure that these do not exceed the manufacturers allowables.

(3) Weights and inertias are based on the minimum bore size.

RB Shaft to Shaft with Increased Shaft Engagement

Rigid half / Flex half



Features

- Long Boss Inner Member

Benefits

- Allows small diameter long length shafts to be used
- Reduces key stress
- Allows increased distances between shaft ends
- Full shaft engagement avoids the need for spacer collars

Dimensions, Weight, Inertia and Alignment

COUPLING SIZE		0.12	0.2	0.24	0.37	0.73	1.15	2.15	3.86	5.5
DIMENSIONS (mm)	A	200.0	222.2	238.1	260.3	308.0	358.8	466.7	508.0	577.8
	B1	139.0	152.2	173.5	189.9	233.9	268.4	309.1	343.4	386.1
	B2	54.0	57.2	63.5	69.8	88.9	98.4	119.0	133.4	146.0
	C	3.2	3.2	3.2	3.2	3.2	3.2	4.8	6.4	6.4
	D	50.8	54.0	60.3	66.7	85.7	95.2	114.3	127.0	139.7
	D2	85	95	110	120	145	170	190	210	240
	E	79.4	95.2	101.6	120.6	152.4	184.1	222.2	279.4	330.2
	F	177.8	200.0	212.7	235.0	279.4	323.8	438.15	469.9	536.6
	G	156.5	178	186.5	210	251	295	362	435	501.5
	J	12.7	14.3	15.9	17.5	19.0	19.0	19.0	22.2	25.4
	Q	5	6	6	6	6	6	6	7	8
	R	M8	M8	M8	M10	M10	M12	M12	M12	M12
	S	6	6	6	8	8	10	16	12	12
	T	M8	M8	M10	M10	M12	M12	M12	M16	M16
	U	9.2	9.2	11.2	11.2	13.2	13.2	13.2	17.25	17.25
	MAX. X	50	60	65	80	95	115	140	170	210
	MAX. Y	55	70	75	85	95	115	140	170	210
	MIN. X & Y	30	35	40	40	55	55	70	80	90
RUBBER ELEMENTS	PER CAVITY	1	1	1	1	1	1	1	1	1
	PER COUPLING	10	12	12	12	12	12	12	14	16
MAXIMUM SPEED (rpm)	(1)	5250	4725	4410	4035	3410	2925	2250	2070	1820
WEIGHT (3) (kg)	W1	4.21	6.42	8.67	11.85	19.43	35.28	53.81	95.50	162.79
	W2	4.0	5.05	6.38	8.14	13.29	18.41	33.98	43.87	59.0
	W3	4.06	5.82	7.42	10.44	18.03	27.37	47.43	75.39	113.32
INERTIA (3) (kg m²)	J1	0.0059	0.0121	0.0193	0.0326	0.0770	0.1896	0.4347	1.1833	2.8953
	J2	0.0232	0.0375	0.0546	0.0887	0.2000	0.3674	1.1035	1.9161	3.4391
	J3	0.0153	0.0270	0.0396	0.0644	0.1475	0.2862	0.7998	1.5120	2.9796
ALLOWABLE MISALIGNMENT (2)										
RADIAL (mm)		0.75	0.75	0.75	0.75	1.0	1.5	1.5	1.5	1.5
AXIAL (mm)		1.5	1.5	1.5	1.5	1.5	1.5	2.0	3.0	3.0
CONICAL (degree)		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5

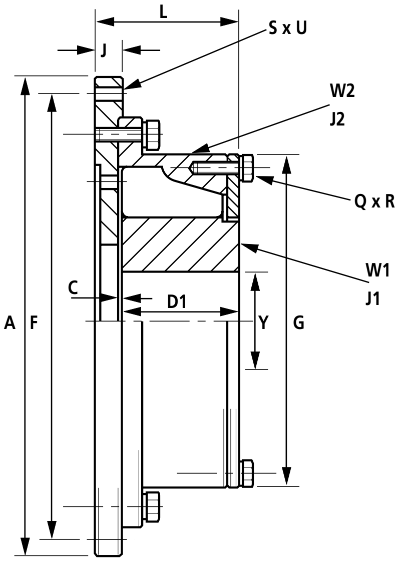
(1) For operation above 80% of the declared maximum coupling speed, it is recommended that the coupling is dynamically balanced.

(2) Installations should be initially aligned as accurately as possible. In order to allow for deterioration in alignment over time, it is recommended that initial alignment should not exceed 25% of the above noted data. The forces on the driving and driven machinery should be calculated to ensure that these do not exceed the manufacturers allowables.

(3) Weights and inertias are based on the minimum bore size.

RB Standard SAE Flywheel to Shaft

0.24 to 1.15



Features

- Wide range of adaptor plates
- Choice of rubber compound and hardness
- Short axial length

Benefits

- Allows the coupling to be adapted to suit most engine flywheels
- Allows control of the torsional vibration system
- Allows the coupling to fit in bell housed applications

Dimensions, Weight, Inertia and Alignment

COUPLING SIZE		0.24		0.37		0.73		1.15	
		SAE 10	SAE 11.5	SAE 11.5	SAE 14	SAE 11.5	SAE 14	SAE 14	SAE 18
DIMENSIONS (mm)	A	314.3	352.4	352.4	466.7	352.4	466.7	466.7	571.5
	C	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2
	D1	60.3	60.3	66.7	66.7	85.7	85.7	95.2	95.2
	F	295.27	333.38	333.38	438.15	333.38	438.15	438.15	542.92
	G	186.5	186.5	210	210	251	251	295	295
	J	20	20	20	20	20	20	20	28
	L	79.5	79.5	85.8	85.8	104.9	104.9	114.4	122.4
	Q	6	6	6	6	6	6	6	6
	R	M8	M8	M10	M10	M10	M10	M12	M12
	S	8	8	8	8	8	8	8	6
	U	10.5	10.5	10.5	13.5	10.5	13.5	13.5	16.7
	MAX. Y	75	75	85	85	95	95	115	115
	MIN. Y	40	40	40	40	55	55	55	55
RUBBER ELEMENTS	PER CAVITY	1	1	1	1	1	1	1	1
	PER COUPLING	12	12	12	12	12	12	12	12
MAXIMUM SPEED (rpm)	(1)	3710	3305	3305	2500	3310	2500	2500	2040
WEIGHT (3) (kg)	W1	5.29	5.29	7.49	7.49	12.82	12.82	23.39	23.39
	W2	15.71	17.1	19.96	28.76	24.01	35.31	39.03	61.0
INERTIA (3) (kg m^2)	J1	0.0131	0.0131	0.0233	0.0233	0.0563	0.0563	0.1399	0.1399
	J2	0.1922	0.2546	0.3087	0.7487	0.4000	0.8900	1.0274	2.3974
ALLOWABLE MISALIGNMENT (2)									
RADIAL (mm)		0.75	0.75	0.75	0.75	1.0	1.0	1.5	1.5
AXIAL (mm)		1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
CONICAL (degree)		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5

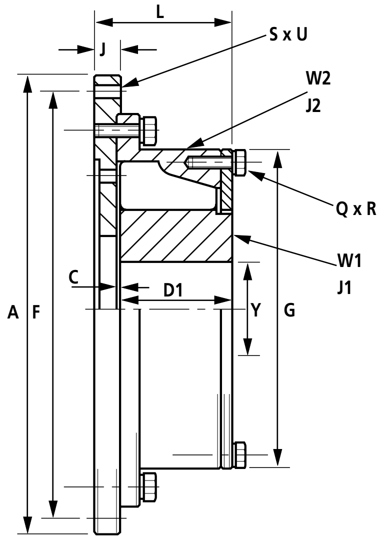
(1) For operation above 80% of the declared maximum coupling speed, it is recommended that the coupling is dynamically balanced.

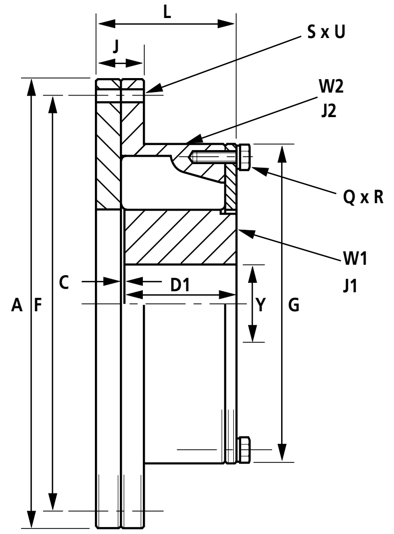
(2) Installations should be initially aligned as accurately as possible. In order to allow for deterioration in alignment over time, it is recommended that initial alignment should not exceed 25% of the above noted data. The forces on the driving and driven machinery should be calculated to ensure that these do not exceed the manufacturers allowables.

(3) Weights and inertias are based on the minimum bore size.

RB Standard SAE Flywheel to Shaft

2.15 - 5.5 **Keep Plate (2.15 SAE 14 and 5.5 SAE 18)**





Dimensions, Weight, Inertia and Alignment

COUPLING SIZE		2.15			3.86			5.5		
		SAE 14	SAE 18	SAE 21	SAE 18	SAE 21	SAE 24	SAE 18	SAE 21	SAE 24
DIMENSIONS (mm)	A	466.7	571.5	673.1	571.5	673.1	733.4	571.5	673.1	733.4
	C	4.8	4.8	4.8	6.4	6.4	6.4	6.4	6.4	6.4
	D1	114.3	114.3	114.3	127.0	127.0	127.0	139.7	139.7	139.7
	F	438.15	542.92	641.35	542.92	641.35	692.15	542.92	641.35	692.15
	G	362.0	362.0	362.0	435.0	435.0	435.0	501.5	501.5	501.5
	J	35.0	28.0	28.0	28.0	31.0	31.0	41.4	28.0	31.0
	L	135.05	143.0	143.0	157.35	160.35	160.35	162.05	170.0	173.05
	Q	6	6	6	7	7	7	8	8	8
	R	M12	M12	M12	M12	M12	M12	M12	M12	M12
	S	8	6	12	6	12	12	6	12	12
	U	13.2	16.7	16.7	16.7	16.7	22	16.7	16.7	22
	MAX. Y	140	140	140	170	170	170	210	210	210
	MIN. Y	70	70	70	80	80	80	90	90	90
RUBBER ELEMENTS	PER CAVITY	1	1	1	1	1	1	1	1	1
	PER COUPLING	12	12	12	14	14	14	16	16	16
MAXIMUM SPEED (rpm)	(1)	2500	2040	1800	2040	1800	1590	2040	1800	1590
WEIGHT (3) (kg)	W1	35.88	35.88	35.88	62.81	62.81	62.81	102.09	102.09	102.09
	W2	50.42	79.17	92.19	86.46	110.35	120.33	79.14	117.21	135.46
INERTIA (3) (kg m²)	J1	0.3227	0.3227	0.3227	0.8489	0.8489	0.8489	1.9633	1.9633	1.9633
	J2	1.6535	3.2935	4.9935	3.9461	6.4661	8.1461	4.5684	7.3291	9.6691
ALLOWABLE MISALIGNMENT (2)										
RADIAL (mm)		1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
AXIAL (mm)		2.0	2.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0
CONICAL (degree)		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5

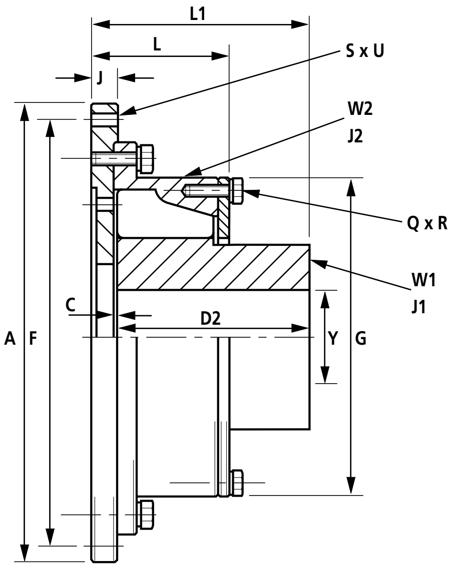
(1) For operation above 80% of the declared maximum coupling speed, it is recommended that the coupling is dynamically balanced.

(2) Installations should be initially aligned as accurately as possible. In order to allow for deterioration in alignment over time, it is recommended that initial alignment should not exceed 25% of the above noted data. The forces on the driving and driven machinery should be calculated to ensure that these do not exceed the manufacturers allowables.

(3) Weights and inertias are based on the minimum bore size.

RB Standard SAE Flywheel to Shaft with Increased Shaft Engagement

0.24 - 1.15



Features

- Long Boss Inner Members

Benefits

- Allows small diameter long length shafts to be used
- Reduces key stress
- Allows increased distance between shaft end and flywheel
- Full shaft engagement avoids the need for spacer collars

Dimensions, Weight, Inertia and Alignment

COUPLING SIZE		0.24		0.37		0.73		1.15	
		SAE 10	SAE 11.5	SAE 11.5	SAE 14	SAE 11.5	SAE 14	SAE 14	SAE 18
DIMENSIONS (mm)	A	314.3	352.4	352.4	466.7	352.4	466.7	466.7	571.5
	C	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2
	D2	110	110	120	120	145	145	170	170
	F	295.27	333.38	333.38	438.15	333.38	438.15	438.15	542.92
	G	186.5	186.5	210	210	251	251	295	295
	J	20	20	20	20	20	20	20	28
	L	79.5	79.5	85.8	85.8	104.9	104.9	114.4	122.4
	L1	129.2	129.2	139.1	139.1	164.2	164.2	189.2	197.2
	Q	6	6	6	6	6	6	6	6
	R	M8	M8	M10	M10	M10	M10	M12	M12
	S	8	8	8	8	8	8	8	6
	U	10.5	10.5	10.5	13.5	10.5	13.5	13.5	16.7
	MAX. Y	75	75	85	85	95	95	115	115
	MIN. Y	40	40	40	40	55	55	55	55
RUBBER ELEMENTS	PER CAVITY	1	1	1	1	1	1	1	1
	PER COUPLING	12	12	12	12	12	12	12	12
MAXIMUM SPEED (rpm)	(1)	3710	3305	3305	2500	3305	2500	2500	2040
WEIGHT (3) (kg)	W1	8.67	8.67	11.85	11.85	19.43	19.43	35.28	35.28
	W2	15.71	17.10	19.96	28.76	24.01	35.31	39.03	61.00
INERTIA (3) (kg m^2)	J1	0.0193	0.0193	0.0326	0.0326	0.0770	0.0770	0.1896	0.1896
	J2	0.1922	0.2546	0.3087	0.7487	0.4000	0.8900	1.0274	2.3974
ALLOWABLE MISALIGNMENT (2)									
RADIAL (mm)		0.75	0.75	0.75	0.75	1.0	1.0	1.5	1.5
AXIAL (mm)		1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
CONICAL (degree)		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5

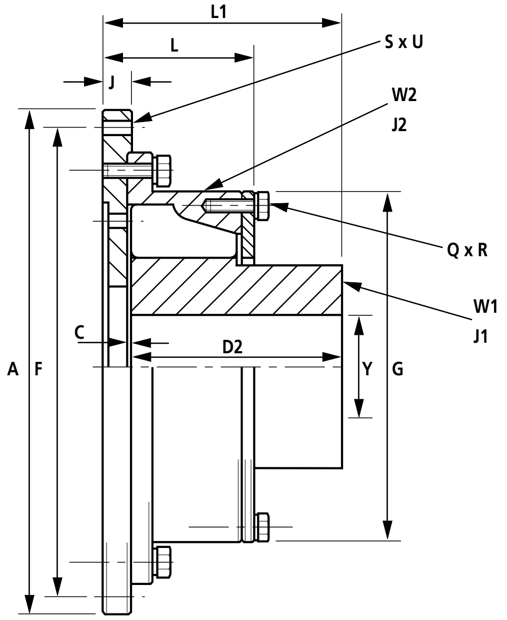
(1) For operation above 80% of the declared maximum coupling speed, it is recommended that the coupling is dynamically balanced.

(2) Installations should be initially aligned as accurately as possible. In order to allow for deterioration in alignment over time, it is recommended that initial alignment should not exceed 25% of the above noted data. The forces on the driving and driven machinery should be calculated to ensure that these do not exceed the manufacturers allowables.

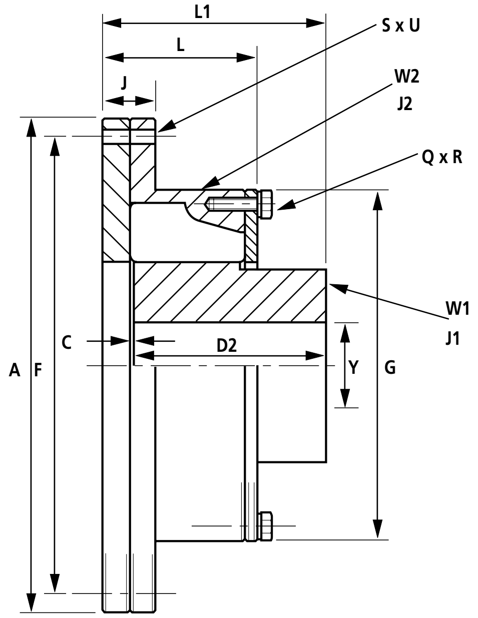
(3) Weights and inertias are based on the minimum bore size.

RB Standard SAE Flywheel to Shaft with Increased Shaft Engagement

2.15 - 5.5



Keep Plate (2.15 SAE 14 and 5.5 SAE 18)



Dimensions, Weight, Inertia and Alignment

COUPLING SIZE		2.15			3.86			5.5		
		SAE 14	SAE 18	SAE 21	SAE 18	SAE 21	SAE 24	SAE 18	SAE 21	SAE 24
DIMENSIONS (mm)	A	466.7	571.5	673.1	571.5	673.1	733.4	571.5	673.1	733.4
	C	4.8	4.8	4.8	6.4	6.4	6.4	6.4	6.4	6.4
	D2	190	190	190	210	210	210	240	240	240
	F	438.15	542.92	641.35	542.92	641.35	692.15	542.92	641.35	692.15
	G	362.0	362.0	362.0	435.0	435.0	435.0	501.5	501.5	501.5
	J	35.0	28.0	28.0	28.0	31.0	31.0	41.4	28.0	31.0
	L	135.0	143.0	143.0	157.4	160.4	160.4	162.05	170.0	173.0
	L1	210.7	219.7	219.7	240.4	243.4	243.4	262.4	271.3	273.3
	Q	6	6	6	7	7	7	8	8	8
	R	M12	M12	M12	M12	M12	M12	M12	M12	M12
	S	8	6	12	6	12	12	6	12	12
	U	13.5	16.7	16.7	16.7	16.7	22	16.7	16.7	22
	MAX. Y	140	140	140	170	170	170	210	210	210
	MIN. Y	70	70	70	80	80	80	90	90	90
RUBBER ELEMENTS	PER CAVITY	1	1	1	1	1	1	1	1	1
	PER COUPLING	12	12	12	14	14	14	16	16	16
MAXIMUM SPEED (rpm)	(1)	2500	2040	1800	2040	1800	1590	2040	1800	1590
WEIGHT (3) (kg)	W1	53.81	53.81	53.81	95.50	95.50	95.50	162.79	162.79	162.79
	W2	50.42	79.17	92.19	86.46	110.35	120.33	79.14	117.21	135.46
INERTIA (3) (kg m^2)	J1	0.4347	0.4347	0.4347	1.1833	1.1833	1.1833	2.8953	2.8953	2.8953
	J2	1.6535	3.2935	4.9935	3.9461	6.4661	8.1461	4.5684	7.3291	9.6691
ALLOWABLE MISALIGNMENT (2)										
RADIAL (mm)		1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
AXIAL (mm)		2.0	2.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0
CONICAL (degree)		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5

(1) For operation above 80% of the declared maximum coupling speed, it is recommended that the coupling is dynamically balanced.

(2) Installations should be initially aligned as accurately as possible. In order to allow for deterioration in alignment over time, it is recommended that initial alignment should not exceed 25% of the above noted data. The forces on the driving and driven machinery should be calculated to ensure that these do not exceed the manufacturers allowables.

(3) Weights and inertias are based on the minimum bore size.

RB Technical Data

1.1 Torque Capacity - Diesel Engine Drives

The RB Coupling is selected on the "Nominal Torque T_{KN}" without service factors for Diesel Drive applications.

The full torque capacity of the coupling for transient vibration whilst passing through major criticals on run up, is published as the maximum torque.
($T_{Kmax} = 3 \times T_{KN}$).

There is additional torque capacity built within the coupling for short circuit and shock torques, which is 3 x T_{Kmax}.

The published "Vibratory Torque T_{KW}", relates to the amplitude of the permissible torque fluctuation. The vibratory torque values shown in the technical data are at the frequency of 10Hz. The measure used for acceptability of the coupling under vibratory torque, is published as "Allowable dissipated heat at ambient temperature 30˚C".

1.2 Industrial Drives

For industrial Electrical Motor Applications refer to the "Selection Procedures", and base the selection on T_{Kmax} with the appropriate service factors.

The service factors used in the "Selection Procedures" are based upon 40 years' experience of drives and their shock frequency/amplitude. The stated T_{Kmax} quoted should not be exceeded by design, without reference to Renold Hi-Tec Couplings.

Care should be taken in the design of couplings with shaft brakes, to ensure that coupling torques are not increased by severe deceleration.

2.0 Stiffness Properties

The Renold Hi-Tec Coupling remains fully flexible under all torque conditions. The RB series is a non-bonded type operating with the Rubber-in-Compression principle.

2.1 Axial Stiffness

When subject to axial misalignment, the coupling will have an axial resistance which gradually reduces due to the effect of vibratory torque.

Given sufficient axial force, as shown in the technical data, the coupling will slip to its new position immediately.

2.2 Radial Stiffness

The radial stiffness of the coupling is torque dependent, and is as shown in the technical data.

2.3 Torsional Stiffness

The torsional stiffness of the coupling is dependent upon applied torque (see technical data) and temperature.

2.4 Prediction of the System Torsional Vibration Characteristics

An adequate prediction of the system's torsional vibration characteristics, can be made by the following method:

2.4.1 Use the torsional stiffness as shown in the technical data, which is based upon data measured at a 30˚C ambient temperature (C_{Tdyn}).

2.4.2 Repeat the calculation made as 2.4.1, but using the maximum temperature correction factor S_{t100}, and dynamic magnifier correction factor, M_{100}, for the selected rubber. Use tables on page 40 to adjust values for both torsional stiffness and dynamic magnifier. ie. $C_{T100} = C_{Tdyn} \times S_{t100}$

2.4.3 Review calculations 2.4.1 and 2.4.2 and if the speed range is clear of criticals which do not exceed the allowable heat dissipation value as published in the catalogue, then the coupling is considered suitable for the application with respect to the torsional vibration characteristics. If there is a critical in the speed range, then actual temperature of the coupling will need to be calculated at this speed.

RB Technical Data

Rubber Grade	$Temp_{max}$ °C	S_t
SM 60	100	$St_{100} = 0.75$
SM 70	100	$St_{100} = 0.63$
SM 80	100	$St_{100} = 0.58$
SM 70 is considered "standard"		

Rubber Grade	Dynamic Magnifier at 30°C (M_{30})	Dynamic Magnifier at 100°C (M_{100})
SM 60	8	10.7
SM 70	6	9.5
SM 80	4	6.9
SM 70 is considered "standard"		

2.5 Prediction of the actual coupling temperature and torsional stiffness

2.5.1 Use the torsional stiffness as published in the catalogue, this is based upon data measured at 30˚C and the dynamic magnifier at 30˚C. (M_{30})

2.5.2 Compare the synthesis value of the calculated heat load in the coupling (P_K) at the speed of interest, to the "Allowable Heat Dissipation" (P_{KW}).

The coupling temperature rise

$$°C = Temp_{coup} = \left(\frac{P_K}{P_{KW}}\right) \times 70$$

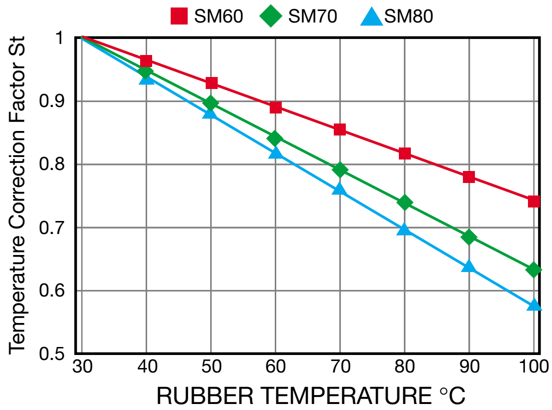
The coupling temperature = ϑ

$$\vartheta = Temp_{coup} + \text{Ambient Temp.}$$

2.5.3 Calculate the temperature correction factor, S_t, from 2.6 (if the coupling temperature > 100°C, then use S_{t100}). Calculate the dynamic Magnifier as per 2.7. Repeat the calculation with the new value of coupling stiffness and dynamic magnifier.

2.5.4 Calculate the coupling temperature as per 2.5. Repeat calculation until the coupling temperature agrees with the correction factors for torsional stiffness and dynamic magnifier used in the calculation.

2.6 Temperature Correction Factor



2.7 Dynamic Magnifier Correction Factor

The Dynamic Magnifier of the rubber is subject to temperature variation in the same way as the torsional stiffness.

$$M_T = \frac{M_{30}}{S_t} \qquad \psi_T = \psi_{30} \times S_t$$

Rubber Grade	Dynamic Magnifier (M_{30})	Relative Damping ψ_{30}
SM 60	8	0.78
SM 70	6	1.05
SM 80	4	1.57
SM 70 is considered "standard"		

RB Technical Data

COUPLING SIZE		0.12	0.2	0.24	0.37	0.73	1.15	2.15	3.86	5.5
NOMINAL TORQUE T_{KN} (kNm)		0.314	0.483	0.57	0.879	1.73	2.731	5.115	9.159	13.05
MAXIMUM TORQUE T_{Kmax}(kNm)		0.925	1.425	1.72	2.635	5.35	8.1	15.303	27.4	41.0
VIBRATORY TORQUE T_{KW} (kNm)		0.122	0.188	0.222	0.342	0.672	1.062	1.989	3.561	5.075
ALLOWABLE DISSIPATED	SM60	90	112	125	140	185	204	246	336	426
HEAT AT AMBIENT TEMP	SM70	98	123	138	155	204	224	270	369	465
30ºC P_{KW} (W) P_{KW}	SM80	100	138	154	173	228	250	302	410	520
DYNAMIC TORSIONAL STIFFNESS C_{Tdyn} (MNm/rad)										
@0.25 T_{KN}	SM60	0.007	0.009	0.010	0.016	0.032	0.049	0.093	0.142	0.186
	SM70	0.011	0.014	0.017	0.026	0.052	0.079	0.150	0.230	0.300
	SM80	0.016	0.021	0.025	0.039	0.079	0.119	0.225	0.346	0.453
@0.5 T_{KN}	SM60	0.016	0.021	0.025	0.038	0.078	0.118	0.223	0.343	0.449
	SM70	0.022	0.028	0.034	0.052	0.105	0.159	0.300	0.460	0.602
	SM80	0.026	0.033	0.040	0.062	0.125	0.189	0.358	0.549	0.719
@0.75 T_{KN}	SM60	0.035	0.045	0.054	0.082	0.167	0.253	0.479	0.735	0.962
	SM70	0.043	0.055	0.066	0.101	0.205	0.310	0.586	0.900	1.178
	SM80	0.049	0.063	0.076	0.117	0.238	0.360	0.680	1.043	1.366
@1.0T_{KN}	SM60	0.057	0.073	0.088	0.134	0.273	0.413	0.780	1.197	1.567
	SM70	0.066	0.085	0.103	0.157	0.319	0.483	0.912	1.400	1.833
	SM80	0.078	0.100	0.121	0.185	0.377	0.570	1.077	1.653	2.164
RADIAL STIFFNESS NO LOAD (N/mm)	SM60	1020	1260	1435	1594	2116	2310	2870	3740	4728
	SM70	1255	1550	1765	1962	2586	2845	3530	4600	5810
	SM80	1728	2135	2430	2700	3654	3915	4860	6330	8008
RADIAL STIFFNESS @T_{KN} (N/mm)	SM60	2046	2536	2880	3207	4250	4650	5780	7520	9510
	SM70	2134	2638	3000	3435	4396	4835	6000	7820	9890
	SM80	2310	2855	3250	3610	4885	5235	6500	8465	10700
AXIAL STIFFNESS NO LOAD (N/mm)	SM60	1030	1250	1400	1600	2095	2310	2850	3700	4700
	SM70	1100	1350	1510	1710	2200	2500	3100	4100	5200
	SM80	2940	3690	4060	4620	6060	6700	8220	10760	13580
MAX AXIAL FORCE (1) @T_{KN} (N)	SM60	1080	1350	1500	1700	2200	2460	3000	3900	5000
	SM70	1150	1440	1600	1800	2360	2600	3200	4100	5300
	SM80	1300	1600	1760	2000	2600	2900	3500	4600	5800

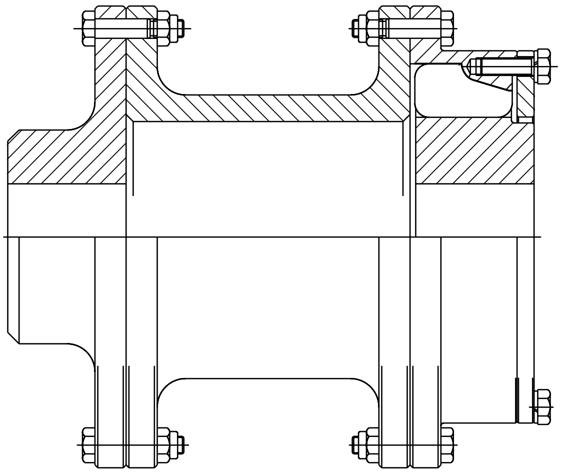
NB. SM70 is supplied as standard rubber grade with options of rubber grades SM60 or SM80, if these are considered a better solution to a dynamic application problem. It should be noted that for operation above 80% of the declared maximum coupling speed, the coupling should be dynamically balanced.

(1) The Renold Hi-Tec Coupling will "slip" axially when the maximum axial force is reached.

RB Design Variations

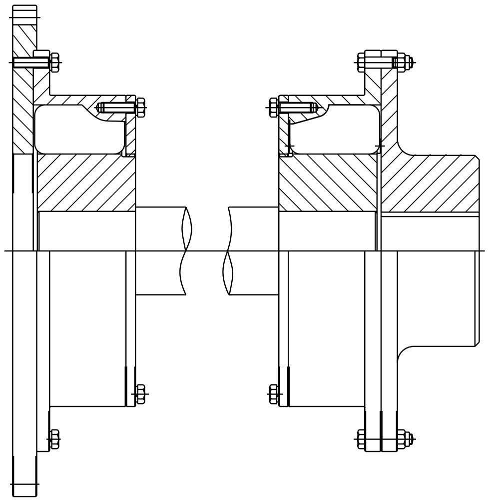
The RB Coupling can be adapted to meet customer requirements, as can be seen from some of the design variations shown below. For a more comprehensive list, contact Renold Hi-Tec.

Spacer Coupling



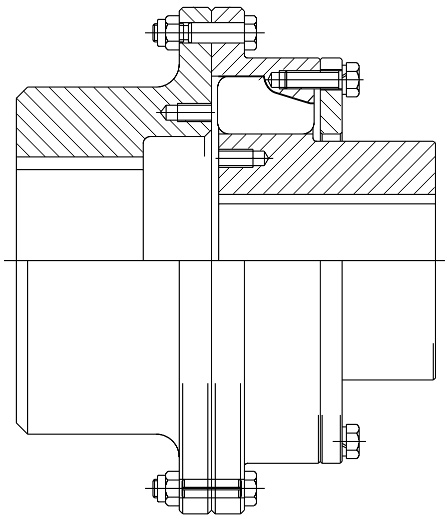
Spacer Coupling. Used to increase distance between shaft ends and allow easy access to driven and driving machines.

Cardan Shaft Coupling



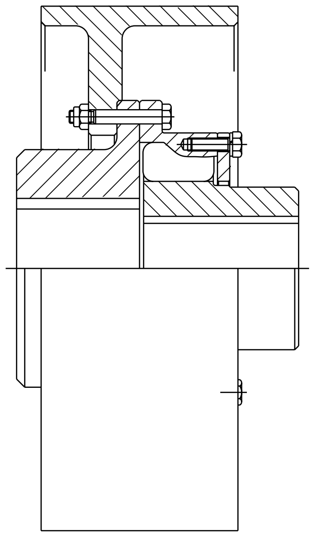
Cardan Shaft Coupling. Used to increase the distance between shaft ends and give a higher misalignment capability.

Coupling with Long Boss Inner Member



Coupling with long boss inner member and large boss driving flange for use on vertical applications.

Brake Drum Coupling



Coupling with brake drum for use on cranes, fans and conveyor drives, (brake disk couplings are available).

PM Features and Benefits

Heavy duty steel coupling for torques up to 6000KNm.

The Standard range comprises

- Shaft to shaft
- Flange to shaft
- Mill motor coupling
- Brake drum coupling

Applications

- Metal manufacture
- Mining and mineral processing
- Pumps
- Fans
- Compressors
- Cranes and hoists
- Pulp and paper industry
- General heavy duty industrial applications

Features

- Severe shock load protection
- Intrinsically fail safe
- Maintenance free
- Vibration control
- Zero backlash
- Misalignment capability
- Low cost

Benefits

- Giving protection and avoiding failure of the driveline under high transient torques.
- Ensuring continuous operation of the driveline in the unlikely event of rubber failure or damage.
- With no lubrication or adjustment required resulting in low running costs.
- Achieving low vibratory loads in the driveline components by selection of optimum stiffness characteristics.
- Eliminating torque amplifications through pre-compression of the rubber elements.
- Allows axial and radial misalignment between the driving and driven machines.
- The PM Coupling gives the lowest lifetime cost.

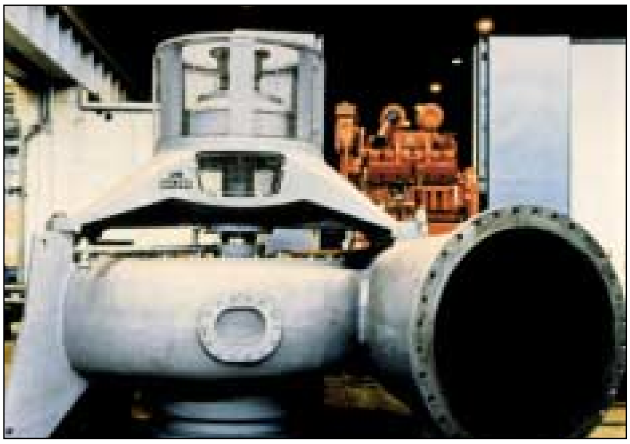
Construction details

- The PM Coupling range is manufactured in steel. Driving flanges up to and including PM60 are steel forgings to BS970 grade 070 M55. Driving flanges PM90 to PM7000 and all inner and outer members up to PM7000 are steel casting to BS 3100 grade A4.
- Separate rubber elements with a choice of grade and hardness, styrene butadiene with 60 shore hardness (SM60) being the standard.
- Rubber elements loaded in compression.
- Rubber elements are totally enclosed.

PM Typical Applications

Steel mills. Medium section mill drive.

Compressor drives. Coupling mounted between electric motor and compressor input shaft.



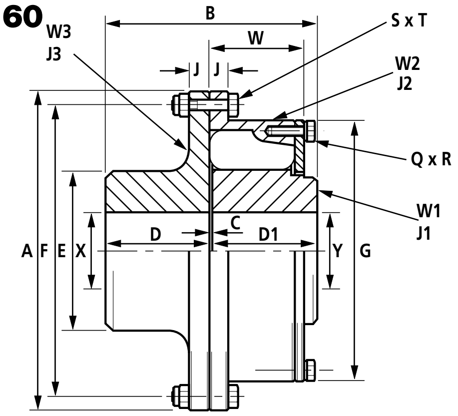
Pump sets. Couplings fitted between electric motors and pumps.

Grinding mills. Couplings fitted between electric motors, gearbox and mill.

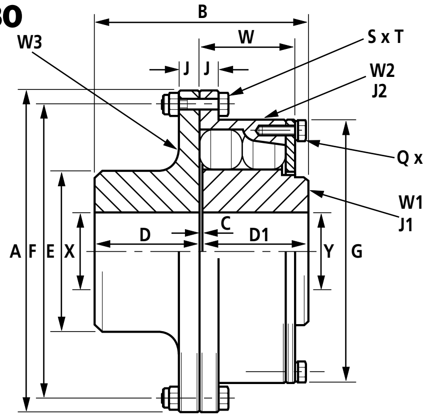
Conveyor drives. Couplings fitted on belt conveyor drives.

PM Shaft to Shaft PM 0.4 to PM 130

0.4 - 60



90 - 130



Dimensions, Weight, Inertia and Alignment

COUPLING SIZE		0.4	0.7	1.3	3	6	8	12	18	27	40	60	90	130
	A	161.9	187.3	215.9	260.3	260	302	338	392	440	490	568	638	728
	B	103	110	130	143	175	193	221.5	254	290.5	329	377.5	432.5	487
	C	1	2	2	3	3	3	3.5	4	4.5	5	5.5	6.5	7
	D	51	54	64	70	86	95	109	125	143	162	186	213	240
	D1	51	54	64	70	86	95	109	125	143	162	186	213	240
	E	76	92	108	122	135	148	168	195	220	252	288	330	373
	F	146	171.4	196.8	235	240	276	312	360	407	458	528	598	680
	G	133	157	181	221	222	245	280	320	367	418	479	548	620
DIMENSIONS	J	9.5	11	12	14.5	11	13.5	14	16	18.5	21	24	26.5	31
(mm)	Q	5	5	6	6	8	8	8	8	8	8	8	8	8
	R	M8	M8	M8	M8	M8	M10	M12	M16	M16	M16	M20	M20	M24
	S	8	8	8	8	12	12	12	12	12	16	12	16	16
	T	M8	M8	M8	M8	M8	M12	M12	M16	M16	M16	M20	M20	M24
	W	36	39	46	60	81	89	102	118	134	152.7	175	200	226
	MAX. X & Y (4)	41	51	64	73	85	95	109	125	143	162	186	213	240
	MIN. X (5)	27	27	35	37	50	62	68	80	90	105	120	140	160
	MIN. Y	27	27	37	40	50	55	65	70	85	105	110	140	160
RUBBER	Per Cavity	1	1	1	1	1	1	1	1	1	1	1	2	2
ELEMENTS	Per Coupling	10	10	12	12	16	16	16	16	16	16	16	32	32
MAXIMUM SPEED (rpm) (1)		7200	6300	5400	4500	4480	3860	3450	2975	2650	2380	2050	1830	1600
	W1	1.9	2.8	4.5	6.9	8.9	11.62	17.74	27.0	40.18	59.5	89.45	132.0	191.11
WEIGHT (3)	W2	2.0	2.9	4.6	6.0	6.55	10.92	15.86	24.59	35.34	50.47	77.80	111.96	165.24
(kg)	W3	2.8	4.3	6.6	10.0	10.84	15.14	21.24	33.03	47.80	69.32	104.63	151.78	222.39
	TOTAL	6.7	10.0	15.7	22.9	26.3	37.7	54.8	84.6	123.3	179.3	271.9	395.7	578.7
INERTIA (3)	J1	0.002	0.004	0.008	0.018	0.026	0.050	0.101	0.203	0.392	0.756	1.491	2.872	5.330
(kg m^2)	J2	0.006	0.014	0.019	0.049	0.072	0.149	0.273	0.560	1.041	1.898	3.867	7.188	13.680
	J3	0.005	0.013	0.025	0.05	0.058	0.116	0.194	0.406	0.748	1.345	2.719	4.955	9.565
ALLOWABLE MISALIGNMENT (2)														
RADIAL (mm)		0.8	0.8	0.8	1.2	1.5	1.6	1.6	1.6	1.9	2.1	2.4	2.8	3.3
AXIAL (mm)		0.8	1.2	1.2	1.2	1.25	1.5	1.75	2.0	2.25	2.5	2.75	3.25	3.5
CONICAL (degree)		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5

(1) For operation above 80% of the declared maximum coupling speed, it is recommended that the coupling is dynamically balanced.

(2) Installations should be initially aligned as accurately as possible. In order to allow for deterioration in alignment over time, it is recommended that initial alignment should not exceed 25% of the above noted data. The forces on the driving and driven machinery should be calculated to ensure that these do not exceed the manufacturers allowables.

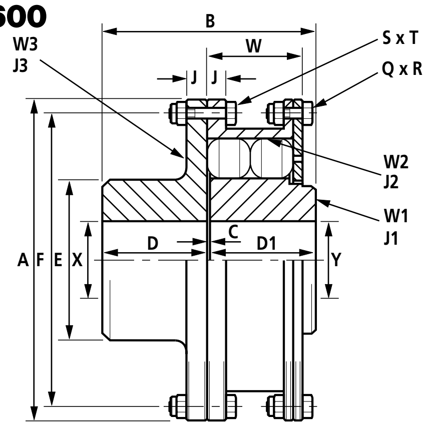
(3) Weights and inertias are calculated with mean bore for couplings up to and including PM600, and with maximum bore for PM900 and above.

(4) Oversize shafts can be accommodated in large boss driving flanges, manufactured to customer's requirements.

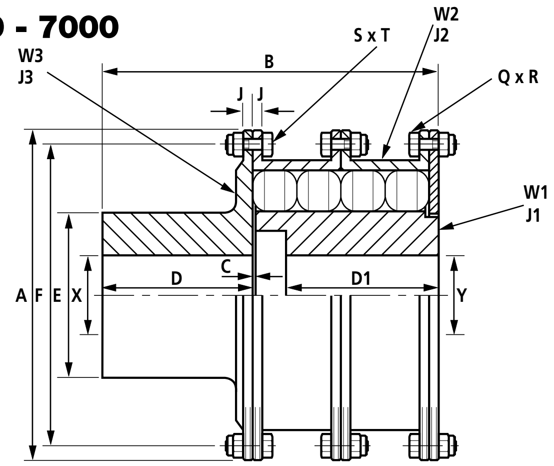
(5) PM0.4 - PM3 driving flanges are available with solid bores on request.

PM Shaft to Shaft PM 180 to PM 7000

180 - 600



850 - 7000



Dimensions, Weight, Inertia and Alignment

COUPLING SIZE		180	270	400	600	850	1200	2000	3500	4700	7000
DIMENSIONS (mm)	A	798	925	1065	1195	1143	1320.8	1574.8	2006.6	2006.6	2006.6
	B	544	623	710.5	812	831	869	1035	1245	1447	1877
	C	8	9	10.5	12	6.35	6.35	6.35	12.7	12.7	12.7
	D	268	307	350	400	406	425	508	507	711	875
	D1	268	307	350	400	406	425	508	507	711	875
	E	415	475	542	620	648	762	965	1016	1220	1370
	F	750	865	992	1122	1066.8	1239.9	1473.2	1892.3	1892.3	1892.3
	J	33.5	36	43	52	44.5	50.8	63.5	76	76	76
	Q	12	12	12	12	20	20	20	24	24	24
	R	M24	M30	M36	M36	M30	M30	M36	M36	M36	M36
	S	20	20	20	24	20	20	20	24	24	24
	T	M24	M30	M36	M36	M36	M36	M45	M48	M48	M48
	W	252	288.5	328	376	425.5	444.5	514.4	520.7	643.5	1003.3
	MAX. X & Y (4)	268	307	350	400	400	457	559	612	711	813
	MIN. X	167	192	232	285	343	381	457	533	609	686
	MIN. Y	170	195	235	285	343	381	457	533	609	686
RUBBER ELEMENTS	Per Cavity	2	2	2	2	2	3	3	3	4	6
	Per Coupling	32	32	32	32	48	78	84	96	128	192
MAXIMUM SPEED (rpm) (1)		1460	1260	1090	975	1000	870	725	580	580	580
WEIGHT (3) (kg)	W1	262.3	389.0	562.4	813.3	1059.9	1633.3	2594.6	5263.3	6450.8	8644.4
	W2	266.78	414.0	633.4	909.1	710.3	965.1	1670.9	2732.2	3921.2	4895.6
	W3	297.4	437.3	651.2	946.7	929.8	1388.8	2631.4	4185.5	7196.1	7742.9
TOTAL		826.5	1240.3	1847	2669.1	2700.0	3987.2	6896.9	12181.0	17568.1	21282.9
INERTIA (3) ($kg\ m^2$)	J1	9.14	17.88	34.03	65.54	103.97	221.36	493.67	1653.41	2145.76	3063.85
	J2	28.80	59.30	119.5	220.2	163.89	306.74	743.28	2075.48	3056.46	3755.94
	J3	15.35	29.89	60.66	115.7	105.01	212.24	587.70	1466.3	2637.60	2927.67
ALLOWABLE MISALIGNMENT (2)											
RADIAL (mm)		3.5	3.9	4.6	5.2	2.8	3.3	3.3	3.3	3.3	3.3
AXIAL (mm)		4.0	4.5	5.25	6.0	3.2	3.2	4.8	6.3	6.3	6.3
CONICAL (degree)		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5

(1) For operation above 80% of the declared maximum coupling speed, it is recommended that the coupling is dynamically balanced.

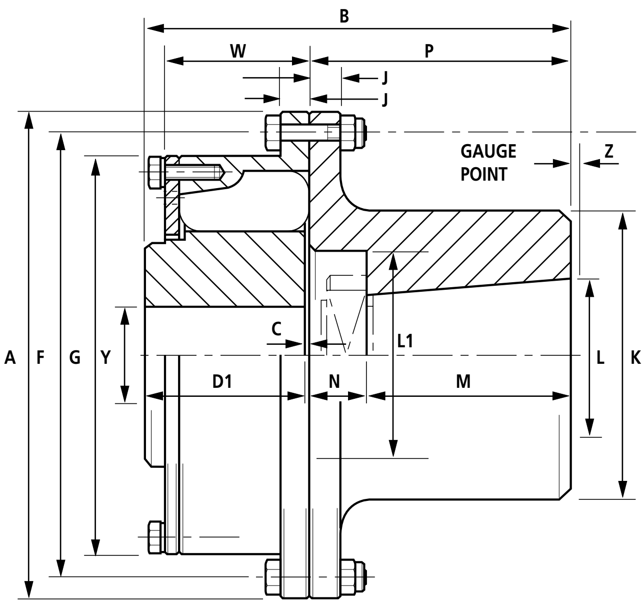
(2) Installations should be initially aligned as accurately as possible. In order to allow for deterioration in alignment over time, it is recommended that initial alignment should not exceed 25% of the above noted data. The forces on the driving and driven machinery should be calculated to ensure that these do not exceed the manufacturers allowables.

(3) Weights and inertias are calculated with mean bore for couplings up to and including PM600, and with maximum bore for PM900 and above.

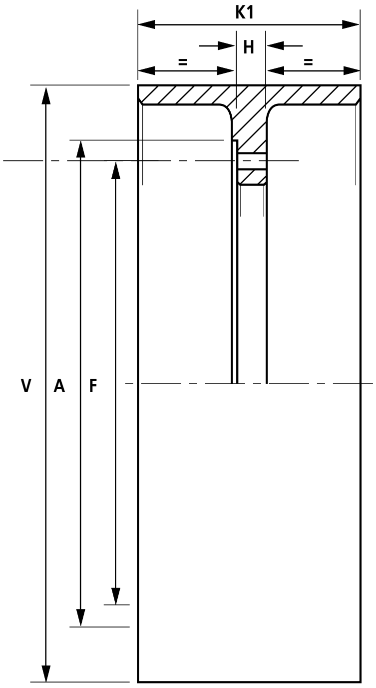
(4) Oversize shafts can be accommodated in large boss driving flanges, manufactured to customer's requirements.

PM Mill Motor Couplings

Mill motor coupling



Brakedrum



Brakedrums may be used in conjunction with the whole range of PM couplings and may be bolted on either the driving flange or flexible half side of the coupling, the recess - øA - locating on the outside diameter of the coupling.

Recommended brake drums for each size of coupling are shown in the table, but øV is adjustable to suit "Non-standard" applications.

Type PM-SDW dimensions table (Ingot motor)

COUPLING SIZE		0.7		1.3	3	6		12		18	
MOTOR FRAME SIZE		180M	180L	225L	250L	280M	280L	355L	400L	400LX	450L
hp		12.7	16	26	43	63	82	123	170	228	300
rpm		956	958	730	732	734	735	590	590	591	592
DIMENSIONS (mm)	A	187.3	187.3	215.9	260.3	260	260	338	338	392	392
	B	168	168	178	215	231	231	284.5	324.5	341	341
	C	2	2	2	3	3	3	3.5	3.5	4	4
	D1	54	54	64	70	86	86	109	109	125	125
	F	171.4	171.4	196.8	235	240	240	312	312	360	360
	G	157	157	181	221	222	222	280	280	320	320
	H	15.3	20.3	18.7	18.9	23.5	23.5	23.5	25.5	26	26
	J	11	11	12	14.5	11	11	14	14	16	16
	K	100	100	125	140	155	185	205	205	205	215
	K1	90	110	110	140	180	180	180	225	225	225
	L	42	42	55	60	75	75	95	100	100	110
	L1	70	70	90	105	120	120	135	155	155	170
	M	84	84	84	107	107	107	132	167	167	167
	N	28	28	28	35	35	35	40	45	45	45
	P	112	112	112	142	142	142	172	212	212	212
	V	250	315	315	400	500	500	500	630	630	630
	W	36	46	46	60	81	81	102	102	118	118
	MIN.Y	27	27	38	49	50	50	72	72	80	80
	MAX.Y	51	51	64	73	85	85	109	109	125	125
	Z	3	3	3	3	3	3	3	5	5	5

The motor ratings are taken for Periodic Duty Classes S4 and S5, 150 starts per hour with a cyclic duration factor at 40%. For motors operating outside these ratings, consult Renold Hi-Tec Couplings

PM Mill Motor Couplings

Type PM-MM dimensions table (AISE motor)

Series 6 mill motors

COUPLING SIZE		0.4	0.7		1.3	3	6	12		18	27			40
MOTOR FRAME SIZE		602	603	604	606	608	610	612	614	616	618	620	622	624
hp		7	10	15	25	35	50	75	100	150	200	275	375	500
rpm		800	725	650	575	525	500	475	460	450	410	390	360	340
DIMENSIONS (mm)	A	161.9	187.3	187.3	215.9	260.3	260	338	338	392	440	440	440	490
	B	153	172	172	196	219	237	281.5	281.5	318	336.5	336.5	392.5	466
	C	1	2	2	2	3	3	3.5	3.5	4	4.5	4.5	4.5	5
	D1	51	54	54	64	70	86	109	109	125	143	143	143	162
	F	146	171.4	171.4	196.8	235	240	312	312	360	407	407	407	458
	G	133	157	157	181	221	222	280	280	320	367	367	367	418
	H	13.5	15.3	15.3	18.7	18.9	18.5	18.5	18.5	21	21	21	21	21
	J	9.5	11	11	12	14.5	11	14	14	16	18.5	18.5	18.5	21
	K	102	121	121	133	171	178	190	216	241	254	305	305	305
	K1	83	95	95	146	146	171	222	222	286	286	286	286	286
	L	44.45	50.80	50.80	63.50	76.20	82.55	92.07	107.95	117.47	127.00	149.22	158.75	177.80
	L1	76.2	88.9	88.9	101.6	123.8	127	158.7	158.7	181	203.2	228.6	228.6	228.6
	M	70	83	83	95	111	111	124	124	137	149	168	178	232
	N	31	33	33	35	35	37	45	45	52	40	51	67	67
	P	101	116	116	130	146	148	169	169	189	189	219	245	299
	V	203	254	254	330	330	406	483	483	584	584	584	584	584
	W	36	39	39	46	60	81	102	102	118	134	134	152.7	152.7
	MIN.Y	22	27	27	38	49	50	72	72	80	92	92	92	105
	MAX.Y	41	51	51	64	73	85	109	109	125	143	143	143	162
	Z	3	3	3	3	3	3	3	3	5	5	5	5	5

Series 8 mill motors

COUPLING SIZE		0.4		0.7	1.3	3		6	12		18	27
MOTOR FRAME SIZE		802	802	803	804	806	808	810	812	814	816	818
hp		7.5	10	15	20	30	50	70	100	150	200	250
rpm		800	800	725	650	575	525	500	475	460	450	410
DIMENSIONS (mm)	A	161.9	161.9	187.3	215.9	260.3	260.3	260	338	338	392	440
	B	153	153	172	182	203	219	237	281.5	281.5	318	336.5
	C	1	1	2	2	3	3	3	3.5	3.5	4	4.5
	D1	51	51	54	64	70	70	86	109	109	125	143
	F	146	146	171.4	196.8	235	235	240	312	312	360	407
	G	133	133	157	181	221	221	222	280	280	320	367
	H	13.5	15.3	15.3	18.7	18.9	18.5	18.5	18.5	18.5	21	21
	J	9.5	9.5	11	12	14.5	14.5	11	14	14	16	18.5
	K	102	102	121	121	133	171	178	190	216	241	254
	K1	83	95	95	146	146	171	171	222	222	286	286
	L	44.45	44.45	50.80	50.80	63.50	76.20	82.55	92.07	107.95	117.47	127.00
	L1	76.2	76.2	88.9	88.9	101.6	123.8	127	158.7	158.7	181	203.2
	M	70	70	83	83	95	111	111	124	124	137	149
	N	31	31	33	33	35	35	37	45	45	52	40
	P	101	101	116	116	130	146	148	169	169	189	189
	V	203	254	254	330	330	406	406	483	483	584	584
	W	36	36	39	46	60	60	81	102	102	118	134
	MIN.Y	22	22	27	38	49	49	50	72	72	80	92
	MAX.Y	41	41	51	64	73	73	85	109	109	125	143
	Z	3	3	3	3	3	3	3	3	3	5	5

PM Technical Data

1.1 Prediction of the System Torsional Vibration Characteristics.

An adequate prediction of the system torsional vibration characteristics can be made by the following method.

1.1.1 Use the torsional stiffness as shown in the technical data, which is based upon data measured at a 30˚C ambient temperature (C_{Tdyn}).

1.1.2 Repeat the calculation made as 1.1.1 but using the maximum temperature correction factor St_{100}, and dynamic magnifier correction factor, M100, for the corrected rubber. Use tables below to adjust values for both torsional stiffness and dynamic magnifier.
ie, $C_{Tdyn} = C_{Tdyn} \times S_{t100}$

Rubber Grade	$Temp_{max}$ °C	S_t
SM 60	100	$S_{t100} = 0.60$
SM 70	100	$S_{t100} = 0.44$
SM 80	100	$S_{t100} = 0.37$
SM 60 is considered "standard"		

Rubber Grade	Dynamic Magnifier at 30°C (M_{30})	Dynamic Magnifier at 100°C (M_{100})
SM 60	8	13.1
SM 70	6	13.6
SM 80	4	10.8
SM 60 is considered "standard"		

1.1.3 Review calculations 1.1.1 and 1.1.2 and if the speed range is clear of criticals which do not exceed the allowable heat dissipation value as published in the catalogue, then the coupling is considered suitable for the application with respect to the torsional vibration characteristics. If there is a critical in the speed range then actual temperature of the coupling will need to be calculated.

1.2 Prediction of the Actual Coupling Temperature and Torsional Stiffness

1.2.1 Use the torsional stiffness as published in the catalogue, this is based upon data measured at 30˚C and the dynamic magnifier at 30˚C (M_{30}).

2.2.2 Compare the synthesis value of the calculated heat load in the coupling (P_K) at the speed of interest to the "Allowable Heat Dissipation" (P_{KW}).

The coupling temperature rise

$$°C = Temp_{coup} = \left(\frac{P_K}{P_{KW}}\right) \times 70$$

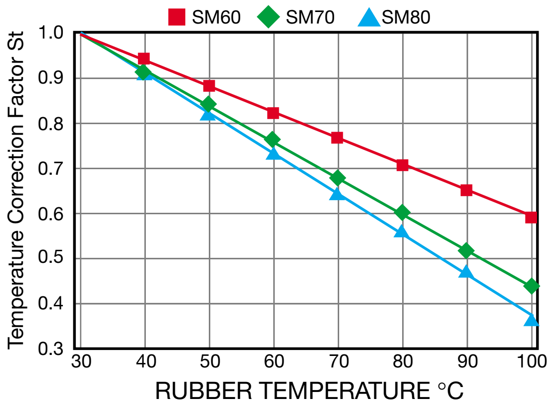
The coupling temperature = ϑ

$$\vartheta = Temp_{coup} + \text{Ambient Temp.}$$

1.2.3 Calculate the temperature correction factor St from 1.3 (if the coupling temperature > 100°C, then use S_{t100}). Calculate the dynamic Magnifier as per 1.4. Repeat the calculation with the new value of coupling stiffness and dynamic magnifier.

1.2.4 Calculate the coupling temperature as per 1.2. Repeat calculation until the coupling temperature agrees with the correction factors for torsional stiffness and dynamic magnifier used in the calculation.

1.3 Temperature Correction Factor



1.4 Dynamic Magnifier Correction Factor

The Dynamic Magnifier of the rubber is subject to temperature variation in the same way as the torsional stiffness.

$$M_T = \frac{M_{30}}{S_t} \qquad \psi_T = \psi_{30} \times S_t$$

Rubber Grade	Dynamic Magnifier (M_{30})	Relative Damping φ_{30}
SM 60	8	0.78
SM 70	6	1.05
SM 80	4	1.57
SM 60 is considered "standard"		

PM Technical Data - Standard Blocks

PM 0.4 - PM 130

COUPLING SIZE		0.4	0.7	1.3	3	6	8	12	18	27	40	60	90	130
kW / rpm		0.045	0.07	0.14	0.32	0.63	0.84	1.25	1.89	2.83	4.19	6.28	9.43	13.62
MAXIMUM TORQUE T_{Kmax} (kNm)		0.43	0.67	1.3	3.0	6.0	8.0	12.0	18.0	27.0	40.0	60.0	90.0	130.0
VIBRATORY TORQUE T_{KW} (kNm) (2)		0.054	0.084	0.163	0.375	0.75	1.0	1.5	2.25	3.375	5.0	7.5	11.25	16.25
ALLOWABLE DISSIPATED HEAT AT AMB. TEMP. 30°C P_{KW} (W)		266	322	365	458	564	562	670	798	870	1018	1159	1209	1369
MAXIMUM SPEED (rpm)		7200	6300	5400	4500	4480	3860	3450	2975	2650	2380	2050	1830	1600
DYNAMIC TORSIONAL (3) STIFFNESS C_{Tdyn} (MNm/rad)														
@ 0.25 T_{KN}	SM 60	0.003	0.005	0.012	0.029	0.073	0.097	0.146	0.218	0.328	0.485	0.728	1.092	1.577
	SM 70	0.005	0.008	0.018	0.043	0.104	0.138	0.207	0.311	0.466	0.691	1.036	1.554	2.245
	SM 80	0.009	0.013	0.030	0.072	0.134	0.179	0.269	0.403	0.605	0.896	1.344	2.016	2.912
@ 0.50 T_{KN}	SM 60	0.005	0.008	0.019	0.046	0.104	0.138	0.207	0.311	0.466	0.691	1.036	1.554	2.245
	SM 70	0.007	0.010	0.025	0.058	0.139	0.185	0.277	0.416	0.624	0.924	1.386	2.079	3.003
	SM 80	0.010	0.015	0.036	0.086	0.181	0.241	0.361	0.542	0.813	1.204	1.806	2.709	3.913
@ 0.75 T_{KN}	SM 60	0.008	0.012	0.029	0.069	0.154	0.205	0.308	0.462	0.693	1.027	1.540	2.310	3.337
	SM 70	0.009	0.014	0.033	0.078	0.199	0.265	0.398	0.596	0.895	1.325	1.988	2.982	4.307
	SM 80	0.012	0.018	0.043	0.102	0.265	0.353	0.529	0.794	1.191	1.764	2.646	3.969	5.733
@ 1.0 T_{KN}	SM 60	0.011	0.018	0.043	0.102	0.224	0.299	0.448	0.672	1.008	1.493	2.240	3.360	4.853
	SM 70	0.012	0.018	0.044	0.105	0.277	0.370	0.554	0.832	1.247	1.848	2.772	4.158	6.006
	SM 80	0.014	0.021	0.051	0.122	0.382	0.510	0.764	1.147	1.720	2.548	3.822	5.733	8.281
RADIAL STIFFNESS (N/mm) @ NO LOAD	SM 60	685	723	1240	2050	6276	6966	7980	9140	10460	11069	12680	14500	16400
	SM 70	1070	1130	1950	3240	8400	9320	10680	12230	14000	15960	18280	20916	23646
	SM 80	1740	1820	3210	5190	11400	12650	14500	16600	19000	21660	24810	28200	32100
RADIAL STIFFNESS (N/mm) @ 50% T_{Kmax}	SM 60	1430	1510	2600	4300	13180	14630	16780	19200	21970	25050	28700	32820	37110
	SM 70	1760	1860	3200	5240	13800	15320	17550	20100	23000	26220	30040	34360	38850
	SM 80	2510	2650	4480	7450	16500	18320	20980	24000	27500	31350	35910	41100	46450
AXIAL STIFFNESS (N/mm) @ NO LOAD	SM 60	458	502	714	970	1060	1176	1347	1543	1766	2010	2306	2638	2980
	SM 70	753	828	1180	1610	2748	3050	3495	4000	4580	5220	5980	6840	7740
	SM 80	1040	1160	1670	2230	4120	4573	5240	6000	6867	7828	8968	10260	11600
AXIAL STIFFNESS (N/mm) @ 50% T_{Kmax}	SM 60	920	1050	1540	2020	2300	2500	2920	3310	3830	4360	4980	5720	6460
	SM 70	1100	1360	1920	2610	2750	3050	3500	4000	4580	5220	5980	6840	7740
	SM 80	1250	1450	2060	2750	4120	4570	5240	6000	6870	7830	8970	10260	11600
MAX. AXIAL FORCE (N) @ 50% T_{Kmax} (1)	SM 60	66	72	102	128	1501	1668	1913	2178	2502	2845	3267	3728	4218
	SM 70	78	80	112	140	1648	1825	2099	2374	2747	3139	3581	4101	4640
	SM 80	85	106	148	185	2237	2482	2845	3257	3728	4265	4866	5572	6298

(1 The couplings will 'slip' axially when the maximum axial force is reached.

(2) At 10Hz only, allowable vibratory torque at higher or lower frequencies $fe = T_{KW}\sqrt{\frac{10Hz}{fe}}$

(3) These values should be corrected for rubber temperature as shown in the design information section.

$$T_{KN} = \frac{T_{KMAX}}{3}$$

PM Technical Data - Standard Blocks

PM 180 - PM 7000

COUPLING SIZE		180	270	400	600	850	1200	2000	3500	4700	7000
kW / rpm		18.86	28.29	41.91	62.86	89.01	125.67	209.45	366.53	492.20	733.06
MAXIMUM TORQUE T_{Kmax} (kNm)		180.0	270.0	400.0	600.0	850.0	1200	2000	3500	4700	7000
VIBRATORY TORQUE T_{KW} (kNm) (2)		22.5	33.75	50.00	75.00	106.2	150.0	250.0	437.5	587.5	875.0
ALLOWABLE DISSIPATED HEAT AT AMB. TEMP. 30°C P_{KW} (W)		1526	1735	1985	2168						
MAXIMUM SPEED (rpm)		1460	1260	1090	975	1000	870	725	580	580	580
DYNAMIC TORSIONAL (3) STIFFNESS C_{Tdyn} (MNm/rad)											
@ 0.25 T_{KN}	SM 60	2.184	3.276	4.853	7.280	14.600	22.500	40.800	74.900	102.000	148.000
	SM 70	3.108	4.662	6.838	10.360	22.000	34.000	61.700	114.000	154.000	225.000
	SM 80	4.032	6.048	8.960	13.440	36.600	56.500	102.000	195.000	257.000	376.000
@ 0.50 T_{KN}	SM 60	3.108	4.661	6.838	10.360	23.100	35.500	64.000	117.000	161.000	232.000
	SM 70	4.158	6.237	9.240	13.860	29.900	46.100	83.300	153.000	209.000	304.000
	SM 80	5.418	8.127	12.040	18.060	43.800	67.600	123.000	226.000	307.000	443.000
@ 0.75 T_{KN}	SM 60	4.620	6.720	10.269	15.400	36.000	55.300	99.100	178.000	249.000	358.000
	SM 70	5.964	8.946	13.251	19.880	40.600	62.400	115.000	205.000	232.000	409.000
	SM 80	7.938	11.907	17.64	26.480	52.500	80.900	147.000	268.000	367.000	534.000
@ 1.0 T_{KN}	SM 60	6.720	10.080	14.931	22.400	54.000	82.900	149.000	265.000	372.000	533.000
	SM 70	8.316	12.474	18.480	27.720	54.700	84.100	151.000	272.000	379.000	546.000
	SM 80	11.466	17.199	25.480	38.220	63.000	97.100	175.000	320.000	439.000	638.000
RADIAL STIFFNESS (N/mm) @ NO LOAD	SM 60	18270	20920	23820	27300	37800	41900	54900	57500	76500	115000
	SM 70	26350	30170	34340	39370	60300	66200	87300	91100	122000	182000
	SM 80	35750	40945	46600	53400	95800	105000	140000	145800	195000	291000
RADIAL STIFFNESS (N/mm) @ 50% T_{Kmax}	SM 60	41350	47350	53890	61780	85540	94820	124240	130120	173345	260245
	SM 70	43290	49560	56420	64680	99073	108766	143434	149677	200446	299026
	SM 80	51760	59260	67460	77330	38714	152040	202720	211118	282360	421368
AXIAL STIFFNESS (N/mm) @ NO LOAD	SM 60	3324	3800	4332	4966	18200	20800	27700	28400	37800	56700
	SM 70	8620	9870	11230	12880	30300	34300	45600	47000	62700	94000
	SM 80	12924	14800	16844	19310	35000	39800	49300	75000	100000	150000
AXIAL STIFFNESS (N/mm) @ 50% T_{Kmax}	SM 60	7200	8240	9380	10760	39440	45074	60026	61543	81913	122869
	SM 70	8620	9870	11230	12880	30300	34300	45600	47000	62700	94000
	SM80	12920	14800	16840	19310	35000	39800	49300	75000	100000	150000
MAX. AXIAL FORCE (N) @ 50% T_{Kmax} (1)	SM 60	4709	5396	6131	7034	-	-	-	-	-	-
	SM 70	5160	5915	6730	7720	-	-	-	-	-	-
	SM 80	7014	8025	9143	10477	-	-	-	-	-	-
					-	-	-	-	-	-	

(1) The couplings will 'slip' axially when the maximum axial force is reached.

(2) At 10Hz only, allowable vibratory torque at higher or lower frequencies fe = $T_{KW} \sqrt{\frac{10Hz}{fe}}$

(3) These values should be corrected for rubber temperature as shown in the design information section.

$$T_{KN} = \frac{T_{KMAX}}{3}$$

PM Technical Data - Special Round Blocks

PM 12 - PM 600

COUPLING SIZE		12	18	27	40	60	90	130	180	270	400	600
kW / rpm		1.25	1.89	2.83	4.19	6.28	9.43	13.62	18.86	28.29	41.91	62.86
NOMINAL TORQUE T_{KN} (kNm)		3.2	4.8	7.2	10.67	15.99	24.0	34.67	48.0	72.0	106.67	159.99
MAXIMUM TORQUE T_{Kmax} (kNm)		12.0	18.0	27.0	40.0	60.0	90.0	130.0	180.0	270.0	400.0	600.0
VIBRATORY TORQUE T_{KW} (kNm) (2)		1.0	1.5	2.25	3.334	5.0	7.5	10.833	15.0	22.5	29.0	42.75
ALLOWABLE DISSIPATED HEAT AT AMB. TEMP. 30°C P_{KW} (W)		130	150	180	220	260	300	340	375	440	490	565
MAXIMUM SPEED (rpm)		3450	2975	2650	2380	2050	1830	1600	1460	1260	1090	975
DYNAMIC TORSIONAL (3) STIFFNESS C_{Tdyn} (MNm/rad)												
@ 0.25 T_{KN}	SM 60	0.053	0.08	0.12	0.18	0.27	0.613	0.885	1.226	1.839	2.724	4.087
	SM 70	0.072	0.109	0.163	0.241	0.362	0.895	1.293	1.79	2.685	3.978	5.967
	SM 80	0.1	0.149	0.224	0.322	0.498	0.747	1.079	1.493	2.24	3.319	4.98
@ 0.50 T_{KN}	SM 60	0.088	0.132	0.198	0.293	0.44	0.791	1.143	1.582	2.373	3.516	5.273
	SM 70	0.104	0.155	0.233	0.345	0.52	1.05	1.517	2.1	3.15	4.667	7
	SM 80	0.159	0.239	0.358	0.53	0.796	1.193	1.724	2.387	3.58	5.304	7.956
@ 0.75 T_{KN}	SM 60	0.168	0.251	0.377	0.559	0.84	1.154	1.667	2.308	3.462	5.129	7.693
	SM 70	0.162	0.243	0.364	0.539	0.809	1.317	1.902	2.634	3.951	5.853	8.78
	SM 80	0.214	0.321	0.481	0.713	1.069	1.603	2.316	3.207	4.81	7.126	10.689
@ 1.0 T_{KN}	SM 60	0.285	0.427	0.641	0.948	1.424	1.91	2.759	3.82	5.73	8.489	12.733
	SM 70	0.256	0.385	0.577	0.855	1.282	1.85	2.672	3.7	5.55	8.222	12.333
	SM 80	0.328	0.491	0.737	1.092	1.638	2.457	3.549	4.913	7.37	10.919	16.378
RADIAL STIFFNESS (N/mm) @ NO LOAD	SM 60	2619	3000	3433	3914	4497	5132	5798	6464	7398	8438	9657
	SM 70	3742	4286	4905	5592	6425	7333	8284	9236	10570	12050	13798
	SM 80	6138	7030	8044	9170	10538	12025	13586	15147	17335	19770	22628
RADIAL STIFFNESS (N/mm) @ T_{KN}	SM 60	9510	10900	12470	14215	16300	18640	21000	23480	26870	30650	35070
	SM 70	9056	10374	11870	13530	15550	17745	20048	22350	25580	29176	33390
	SM 80	9132	10460	11968	13644	15678	17892	20214	22535	25790	29410	33666
AXIAL STIFFNESS (N/mm) @ NO LOAD	SM 60	1122	1285	1470	1675	1925	2198	2482	2768	3168	3613	4135
	SM 70	1495	1710	1960	2234	2568	2930	3310	3690	4220	4818	5514
	SM 80	2545	2915	3335	3800	4368	4986	5632	6278	7187	8197	9380
AXIAL STIFFNESS (N/mm) @ T_{KN}	SM 60	2918	3340	3825	4360	5010	5718	6460	7200	8242	9400	10750
	SM 70	3067	3510	4020	4580	5266	6000	6790	7570	8660	9880	11300
	SM80	3218	3686	4218	4808	5526	6306	7124	7942	9090	10368	11865
MAX. AXIAL FORCE (N) @ T_{KN} (1)		2943	3335	3728	4415	5003	5690	6475	7161	8240	9418	10791

(1) The couplings will 'slip' axially when the maximum axial force is reached.

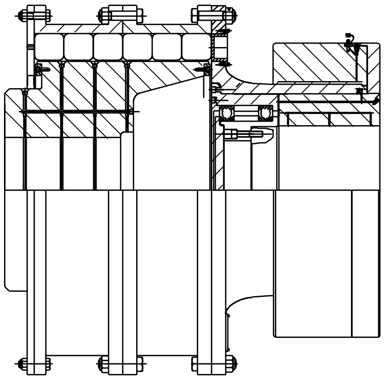
(2) At 10Hz only, allowable vibratory torque at higher or lower frequencies fe = $T_{KW}\sqrt{\frac{10Hz}{fe}}$

(3) These values should be corrected for rubber temperature as shown in the design information section.

PM Design Variations

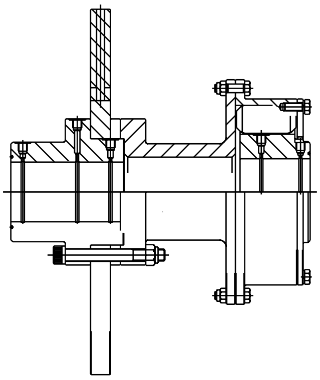
The PM Coupling can be adapted to meet customer needs as can be seen from some of the design variations shown below. For a more comprehensive list contact Renold Hi-Tec.

Torque Limiting Coupling



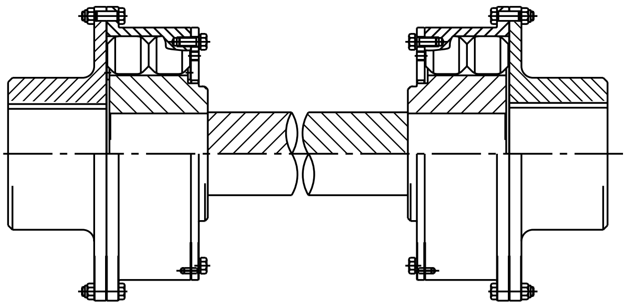
Combination with a torque limiting device to prevent damage to driving and driven machine under shock load.

Brake Disk Coupling



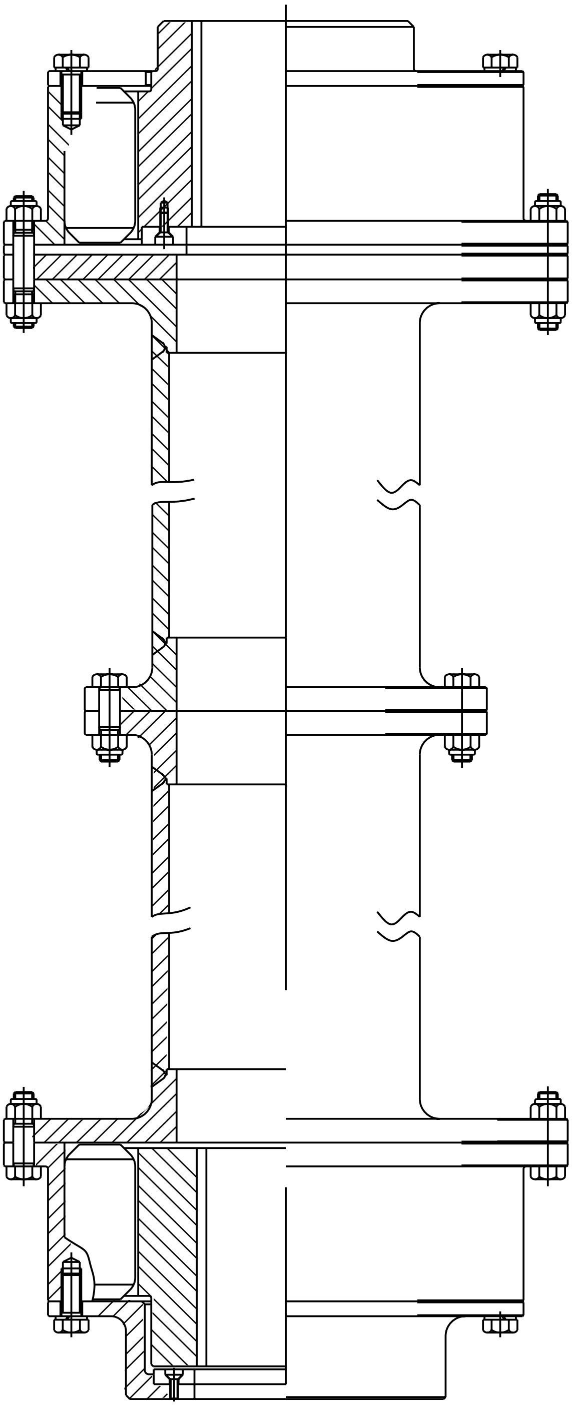
Combination with a brake disc, for use on cranes, fans and conveyor drives. (Brake drum couplings also available).

Cardan Shaft Coupling



Cardan Shaft Coupling. Used to increase the distance between shaft ends and give a higher misalignment capability.

Vertical Spacer Coupling



Spacer Couplings. Used to increase the distance between shaft ends and allow access to driven and driving machine.

Selection Procedure

- From the continuous Power (P) and operating Speed (n) calculate the Application Torque T_{NORM} from the formula:

$$T_{NORM} = 9549 \times (P/n) \text{ Nm}$$

- Select Prime Mover Service Factor (Fp) from the table below.
- Select Driven Equipment Service Factor (Fm) from page 55.
- The minimum Service Factor has been set at 1.5.
- Calculate T_{MAX} from the formula:

$$T_{MAX} = T_{NORM} (Fp + Fm)$$

- Select Coupling such that $T_{MAX} < T_{Kmax}$
- Check **n** < Coupling Maximum Speed (from coupling technical data).
- Check Coupling Bore Capacity such that dmin < d < dmax.
- Consult the factory for alternatives, if catalogue limits are exceeded.

N.B. If you are within 80% of maximum speed, dynamic balancing is required.

T_{NORM} = Application Torque (Nm)
T_{MAX} = Peak Application Torque (Nm)
T_{KN} = Nominal Coupling Rating according to DIN 740 (kNm)
(with service factor = 3 according to Renold Hi-Tec Couplings standard)
T_{Kmax} = Maximum Coupling Rating according to DIN 740 (kNm)
P = Continuous Power to be transmitted by coupling (kW)
n = Speed of coupling application (rpm)
Fp = Prime Mover Service Factor
Fm = Driven Equipment Service Factor
dmax = Coupling maximum bore (mm)
dmin = Coupling minimum bore (mm)

WARNING

It is the responsibility of the system designer to ensure that the application of the coupling does not endanger the other constituent components in the system. Service factors given are an initial selection guide.

Prime mover service factors

Prime Mover Factors		Fp
Diesel Engine	1 Cylinder	*
	2 Cylinder	*
	3 Cylinder	2.5
	4 Cylinder	2.0
	5 Cylinder	1.8
	6 Cylinder	1.7
More than	6 Cylinder	1.5
Vee Engine		1.5
Petrol Engine		1.5
Turbine		0
Electric Motor		0
Induction Motor		0
Synchronous Motor		1.5
Variable Speed*		
Synchronous Converter (LCI)	- 6 pulse	1.0
	- 12 pulse	0.5
PWM/Quasi Square		0.5
Cyclo Converter		0.5
Cascade Recovery (Kramer, Scherbius)		1.5

*The application of these drive types is highly specialised and it is recommended that Renold Hi-Tec Couplings is consulted for further advice.

The final selection should be made by Renold Hi-Tec Couplings.

Driven Equipment Service Factors

Application	Typical Driven Equipment Factor(Fm)
Agitators	
Pure liquids	1.5
Liquids and solids	2.0
Liquids-variable density	2.0
Blowers	
Centrifugal	1.5
Lobe (Rootes type)	2.5
Vane	2.0
Brewing and Distilling	
Bottling machinery	1.5
Lauter Tub	1.75
Briquetter Machines	3.0
Can filling machines	1.5
Cane knives	3.0
Car dumpers	3.0
Car pullers - Intermittent Duty	2.5
Clay working machinery	2.5
Compressors	
Axial Screw	1.5
Centrifugal	1.5
Lobe	2.5
Reciprocating - multi-cylinder	3.0
Rotary	2.0
Conveyors - uniformly loaded or fed	
Apron	2.0
Assembly	1.5
Belt	1.5
Bucket	2.0
Chain	2.0
Flight	2.0
Oven	2.5
Screw	2.0
Conveyors - heavy duty not uniformly fed	
Apron	2.0
Assembly	2.0
Belt	2.0
Bucket	2.5
Chain	2.5
Flight	2.5
Oven	2.5
Reciprocating	3.0
Screw	3.0
Shaker	4.0
Crane & hoists	
All motions	3.0
Crushers	
Ore	3.0
Stone	3.5
Sugar (1)	3.5
Dredgers	
Cable reels	2.5
Conveyors	2.0
Cutter head drives	3.5
Jig drives	3.5
Manoeuvering winches	3.0
Pumps	3.0
Screen drive	3.0
Stackers	3.0
Utility winches	2.0
Dynamometer	1.5
Elevators	
Bucket	3.0
Centrifugal discharge	2.0
Escalators	1.5
Freight	2.0
Gravity discharge	2.0
Fans	
Centrifugal	1.5
Cooling towers	2.0
Forced draft	2.0
Induced draft (without damper control)	2.0
Feeders	
Apron	2.0
Belt	2.0
Disc	2.0
Reciprocating	3.0
Screw	2.0

Application	Typical Driven Equipment Factor(Fm)
Generators	
Alternating	1.5
Not welding	1.5
Welding	2.2
Hammer mills	4.0
Lumber industry	
Barkers - drum type	3.0
Edger feed	2.5
Live rolls	2.5
Log haul-incline	2.5
Log haul-well type	2.5
Off bearing rolls	2.5
Planer feed chains	2.0
Planer floor chains	2.0
Planer tilting hoist	2.0
Sawing machine	2.0
Slab conveyor	2.0
Sorting table	2.0
Trimmer feed	2.0
Metal Manufacture	
Bar reeling machine	2.5
Crusher-ore	4.0
Feed rolls	*
Forging machine	2.0
Rolling machine	*
Roller table	*
Shears	3.0
Tube mill (pilger)	*
Wire Mill	2.0
Metal mills	
Drawn bench - carriage	2.5
Drawn bench - main drive	2.5
Forming machines	2.5
Slitters	2.0
Table conveyors - non-reversing	*
- reversing	*
Wire drawing and flattening machine	2.0
Wire winding machine	2.0
Metal rolling mills	
Blooming mills	*
Coilers - hot mill & cold mill	2.5
Cold mills	*
Cooling mills	*
Door openers	2.0
Draw benches	2.5
Edger drives	2.5
Feed rolls, reversing mills	*
Furnace pushers	2.5
Hot mills	*
Ingot cars	2.0
Manipulators	3.0
Merchant mills	*
Piercers	3.0
Pushers rams	2.5
Reel drives	2.0
Reel drums	2.0
Bar mills	*
Roughing mill delivery table	*
Runout table	*
Saws - hot, cold	2.0
Screwdown drives	2.5
Skelp mills	*
Slitters	2.0
Slabbing mills	*
Soaking pit cover drives	2.5
Straighteners	3.0
Table transfer & runabout	2.5
Thrust block	3.0
Traction drive	2.0
Tube conveyor rolls	2.0
Unscramblers	2.5
Wire drawing	2.0
Mills, rotary type	
Ball	2.5
Cement kilns	2.5
Dryers and coolers	2.5
Kilns	2.5
Hammer	3.5
Pebble	2.5
Pug	3.0
Rod	2.5
Tumbling barrels	2.5
Mining	
Conveyor - armoured face	3.0

Application	Typical Driven Equipment Factor(Fm)
- belt	1.5
- bucket	1.5
- chain	1.75
- screw	1.5
Dintheader	3.0
Fan - ventilation	2.0
Haulages	2.0
Lump breakers	1.5
Pulveriser	2.0
Pump - rotary	2.0
- ram	3.0
- reciprocating	3.0
- centrifugal	1.5
Roadheader	2.0
Shearer - Longwall	2.0
Winder Colliery	2.5
Mixers	
Concrete mixers	2.0
Drum type	2.0
Oil industry	
Chillers	2.0
Oil well pumping	3.0
Paraffin filter press	2.0
Rotary kilns	2.5
Paper mills	
Barker-auxiliaries hydraulic	3.0
Barker-mechanical	3.5
Barking drum (Spur Gear only)	3.5
Beater and pulper	3.5
Bleacher	2.0
Calenders	2.0
Chippers	2.5
Coaters	2.0
Converting machine (not cutters, platers)	2.0
Couch	2.0
Cutters, platers	3.0
Cylinders	2.0
Dryers	2.0
Felt stretcher	2.0
Felt whipper	2.0
Jordans	2.25
Line shaft	2.0
Log haul	2.5
Presses	2.5
Pulp grinder	3.5
Reel	2.0
Stock chests	2.0
Suction roll	2.0
Washers and thickeners	2.0
Winders	2.0
Printing presses	2.0
Propellors	
Marine - fixed pitch	2.0
- controllable pitch	2.0
Pullers	
Barge haul	2.5
Pumps	
Centrifugal	1.5
Reciprocating - double acting	3.0
single acting - 1 or 2 cylinders	3.0
3 or more cylinders	3.0
Rotary - gear, lobe, vane	2.0
Rubber industry	
Mixed - banbury	3.0
Rubber calender	2.0
Rubber mill (2 or more)	2.5
Sheeter	2.5
Tyre building machines	2.5
Tyre and tube press openers	2.0
Tubers and strainer	2.5
Screens	
Air washing	1.5
Grizzly	2.5
Rotary, stone or gravel	2.0
Travelling water intake	1.5
Vibrating	2.5
Sewage disposal equipment	2.0
Textile industry	2.0
Windless	2.5

* Use 1.75 with motor cut-out power rating

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Selection Examples

Example 1

- Selection of 6 Cylinder Diesel Engine 750 kW at 900 rpm driving a Centrifugal Pump.

The coupling is flywheel mounted
Pump shaft diameter = dm

P	=	750 kW	n	=	900 rpm
dm	=	95 mm	temp	=	30ºC
Fp	=	1.7	Fm	=	1.5

T_{NORM} = (P/n) x 9549 Nm
= (750/900) x 9549 Nm
= 7.958 kNm

T_{MAX} = T_{NORM} (Fp + Fm)
= 7.958 (1.7 + 1.5)
= 25.466 kNm

- The application is considered light industrial and RB type coupling should be selected. Examination of RB catalogue shows RB 3.86 as:

T_{Kmax} = 27.4 kNm T_{KN} = 9.159 kNm

which satisfies the condition

- $T_{MAX} < T_{Kmax}$ (25.466 < 27.4) kNm
- $T_{NORM} < T_{KN}$ (7.859 < 9.159) kNm
- n < Coupling Maximum Speed (900 < 2500) rpm
- dmin < dm < dmax (80 < 95 < 170) mm

Example 2

- Selection of Induction Motor 800 kW at 1498 rpm driving a Rotary Pump.

Motor shaft = dp   Pump shaft = dm

P	=	800 kW	n	=	1498 rpm
dp	=	95 mm	dm	=	85 mm
temp	=	30ºC	Fp	=	0
Fm	=	2			

T_{NORM} = (P/n) x 9549 Nm
= (800/1498) x 9549 Nm
= 5.1 kNm

T_{MAX} = T_{NORM} (Fp + Fm)
= 5.1 (0 + 2) kNm
= 10.2 kNm

- The application requires a steel coupling (by customer specification) and PM type coupling should be selected. Examination of PM catalogue shows PM12 as:

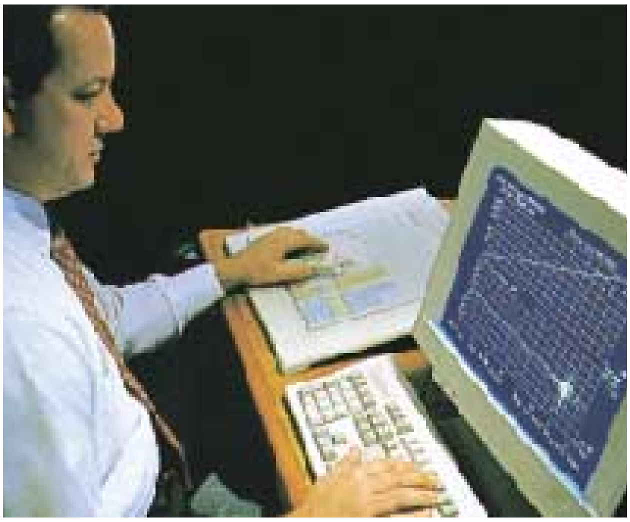
T_{Kmax} = 12 kNm

which satisfies the condition

- $T_{MAX} < T_{Kmax}$ (10.2 < 12.0) kNm
- n < Coupling Maximum Speed (1498 < 3450) rpm
- dmin < dp < dmax (72 < 95 < 109) mm
- dmin < dm < dmax (72 < 85 < 109) mm

Calculation Service

- For over 40 years we have been the world leader in torsional vibration analysis for all types of machinery, we have developed sophisticated in-house computer programmes specifically for this purpose.



- A consultancy service is also available to customers in the selection of the correct product for their specific application.
- Renold Hi-Tec Couplings is well known in the diesel engine industry for its analysis techniques.
- In the heavy industrial sector, Renold Hi-Tec Engineers have made many torsional vibration analyses. For example, steady state transient and Torque Amplification Factors (TAF) on electric motor drivelines in cement mills, rolling mills, compressor drive trains, synchronous motor start ups and variable frequency (LCI, Kramer/Scherbius/PWM) applications.
- On page 57, two examples of torsional vibration analysis that are produced by Renold Hi-Tec Engineers are shown.

Transient Analysis

Calculated Examples

Illustrated below are two different types of transient torsional vibrations analysis that can be produced by Renold Hi-Tec Engineers.
This ensures optimum solutions are reached by the correct selection, of torsional stiffness and damping characteristics of the coupling.
Whilst the synchronous resonance and synchronous convertor (LCI) examples are shown, other applications which Renold Hi-Tec Couplings have experience of include, Torque Amplification, Electrical Speed Control Devices, PWM, Scherbius/Kramer, Short-Circuit and any re-connection of electrical circuits on the mechanical systems.

Example 1

Since June 1962 we have engineered flexible couplings for Synchronous Motor applications to reduce by damping, the damaging vibratory torques imposed into the system when accelerating through the first resonant frequency.

Table A

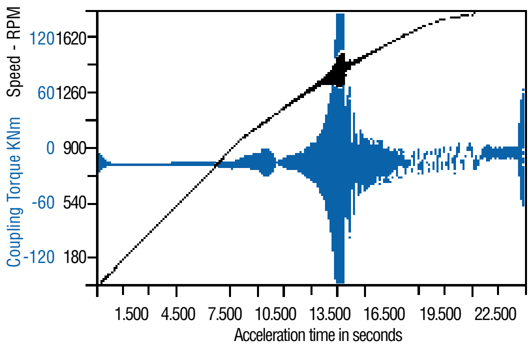


Table A shows vibrating torque experienced in the motor shaft when the system is connected rigidly (or by a gear or membrane coupling) to the driven system.

Table B

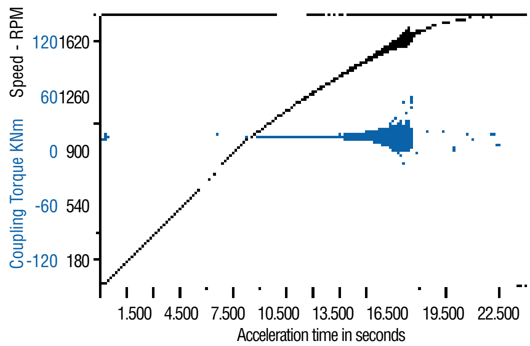


Table B shows the same system connected by a DCB coupling. A PM type coupling is also used in such applications.

Example 2

From 1981 we have been engineering flexible couplings for Synchronous Convertor (LCI) drives to control the forced mode conditions through the first natural frequency by judicial selection of torsional stiffness and damping.

Table C

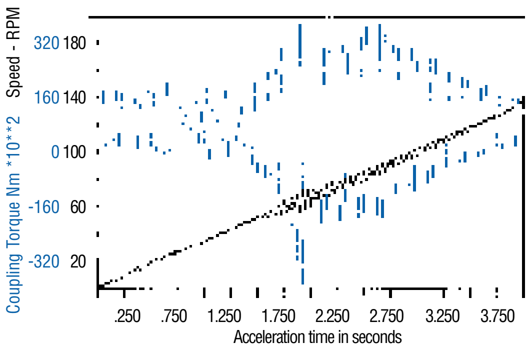


Table C shows a typical motor/fan system connected rigidly (or through a gear or membrane coupling) when damaging torques would have been experienced in the motor shaft.

Table D

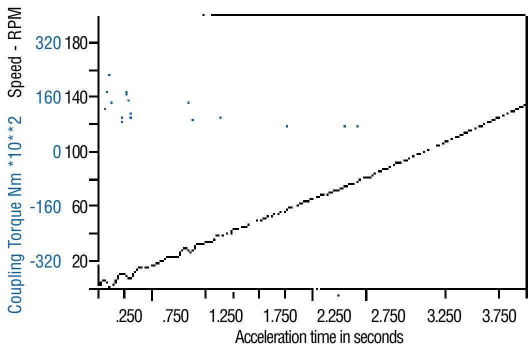


Table D shows the equivalent Renold Hi-Tec Couplings engineered solution using a PM coupling.

Rubber Information

The rubber blocks and elements used in Renold Hi-Tec Couplings are key elements in the coupling design. Strict quality control is applied in the manufacture, and frequent testing is part of the production process.

Rubber-in-Compression

These designs use non-bonded components, which allows for many synthetic elastomers to be employed.
These elastomers offer considerable advantages over others for specific applications, giving Renold Hi-Tec Couplings a distinctive lead in application engineering in specialised areas.

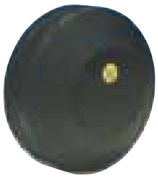
Rubber Compound

	Natural	Styrene-Butadiene	Neoprene	Nitrile	Stryene-Butadiene
Identification label	Red (F, NM)	Green (SM)	Yellow (CM)	White (AM)	Blue* (S)
Resistance to Compression Set	Good	Good	Fair	Good	Fair
Resistance to Flexing	Excellent	Good	Good	Good	Good
Resistance to Cutting	Excellent	Good	Good	Good	Fair
Resistance to Abrasion	Excellent	Good	Good	Good	Good
Resistance to Oxidation	Fair	Fair	Very Good	Good	Fair
Resistance to Oil & Gasoline	Poor	Poor	Good	Good	Poor
Resistance to Acids	Good	Good	Fair	Fair	Good
Resistance to Water Swelling	Good	Good	Good	Good	Good
Service Temp. Maximum; Continuous	80°C	100°C	100°C	100°C	100°C
Service Temperature Minimum	-50°C	-40°C	-30°C	-40°C	-40°C

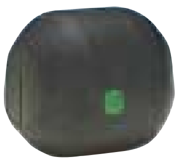
* High Damping

Rubber Block Types

DCB

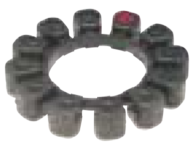


PM

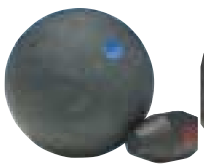


RB

SM/SB



SPECIAL



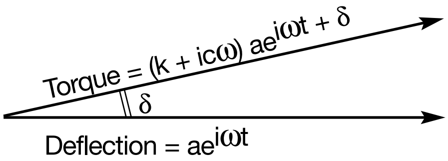
WB

NM	SM	CM	AM	S
Renold 45				
	Renold 50	Renold 50 NCB A1976/7 Renold A833/7		Renold 50
Renold 60	Renold 60	Renold 60		Renold 60
Renold 70	Renold 70	Renold 70	Renold 70	Renold 70
Renold 80	Renold 80			
			Renold 90	

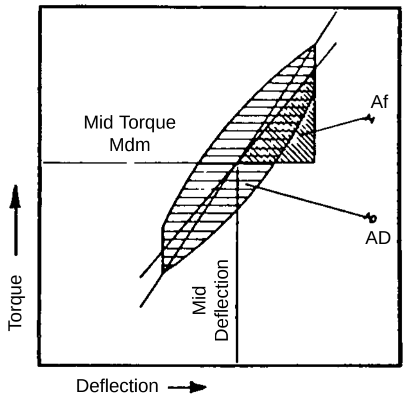
Damping Characteristics

Coupling damping varies directly with torsional stiffness and inversely with frequency for a given rubber grade. This relationship is conventionally described by the dynamic magnifier M, varying with hardness for the various rubber types.

$$M = \frac{K}{C\omega}$$



$$\tan\delta = \frac{C\omega}{K} = \frac{I}{M}$$



$$\psi = \frac{AD}{Af} = \frac{2\pi}{M}$$

This property may also be expressed as the Damping Energy Ratio or Relative Damping, ψ, which is the ratio of the damping energy, AD, produced mechanically by the coupling during a vibration cycle and converted into heat energy, to the flexible strain energy Af with respect to the mean position.

Where
- C = Specific Damping (Nms/rad)
- K = Torsional Stiffness (Nm/rad)
- ω = Frequency (Rad/s)
- M = Dynamic Magnifier
- δ = Phase Angle Rad
- ψ = Damping Energy Ratio

The rubber compound dynamic magnifier values are shown in the table below.

Rubber grade	M
NM 45	15
SM 50	10
SM60	8
SM70	6
SM 80	4

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(b) Guidance on safe and proper use, provided that full disclosure is made of the precise details of the intended, or existing, application.

All relevant information must be passed on to the persons engaged in, likely to be affected by and those responsible for the use of the product.

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