TYPE TSR/TLR

T SERIES CLOSE COUPLED MEMBRANE COUPLINGS

Technical Specification

A – Replaceable Stainless Steel Flexible Membranes

B – Overload and Anti-fly Protection Collars

C – Anti-Corrosion Treatment

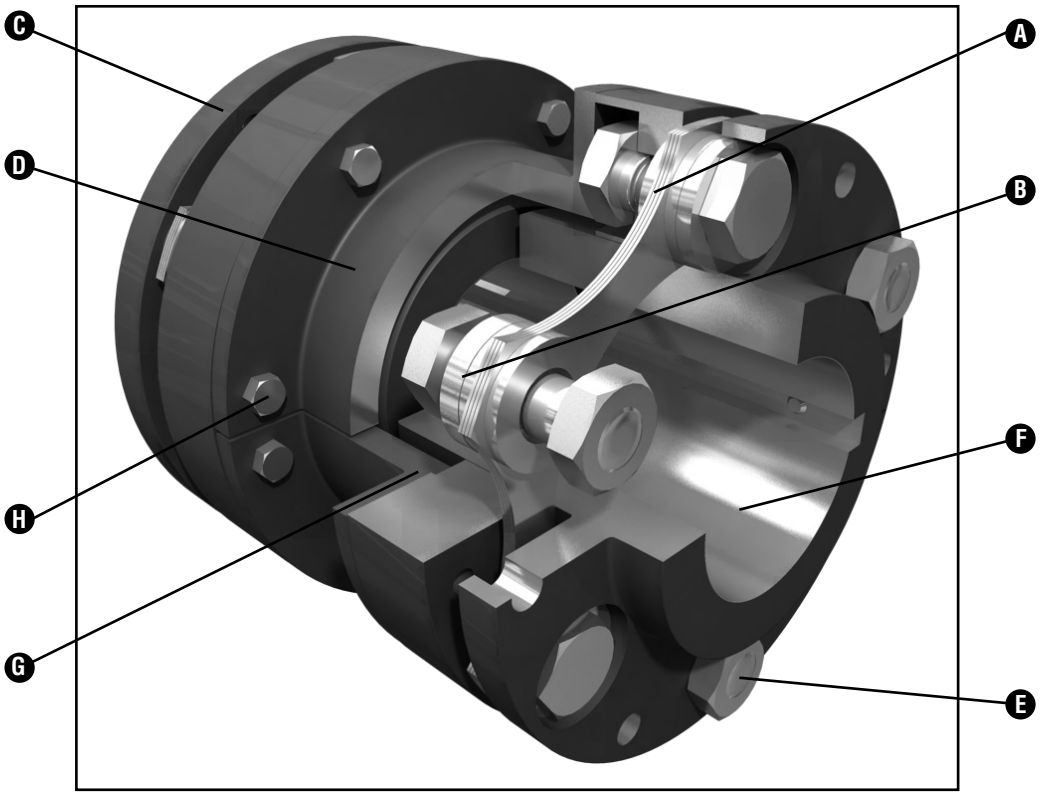
D – Axially Split

E – Fitted Bolts for Balance Integrity

F – Hubs Designed For All Short DBSE Applications

G – Spigot Fit Spacer

H – Locked Thread



Product Description

John Crane's Metastream® TSR/TLR range of membrane couplings has been specifically designed to provide a solution for close coupled machinery. The key benefit of this coupling is the ability to replace membranes without the need to move either of the connected machines.

- Easy maintenance without moving machines
- The motor can be isolated easily by removing the split spacer element
- Close coupled Distance Between Shaft Ends (DBSE), fully variable from 3 mm upwards
- Operated in either direction
- Choice of hub configuration to suit DBSE
- Designed for the life of the connecting machines
- AGMA Class 8 intrinsic balance
- Phosphate coating for corrosion protection

Design Features

- **Fit and Forget -** Designed for infinite life, and with correct machinery alignment will out last the machines that it is connected to
- **Overload Protection -** Fitted with overload collars to protect the membranes in the event of severe torsional overload
- **Low Imposed Loads -** Designed to optimize their torque capability, whilst minimizing the reaction forces due to misalignment
- **Zero Maintenance** - No relative moving parts, and hence requires no lubrication or routine maintenance
- **Ease of Assembly -** Can be replaced without moving the associated machines
- **No Backlash -** Ensure that there is zero backlash

TYPE TSR/TLR

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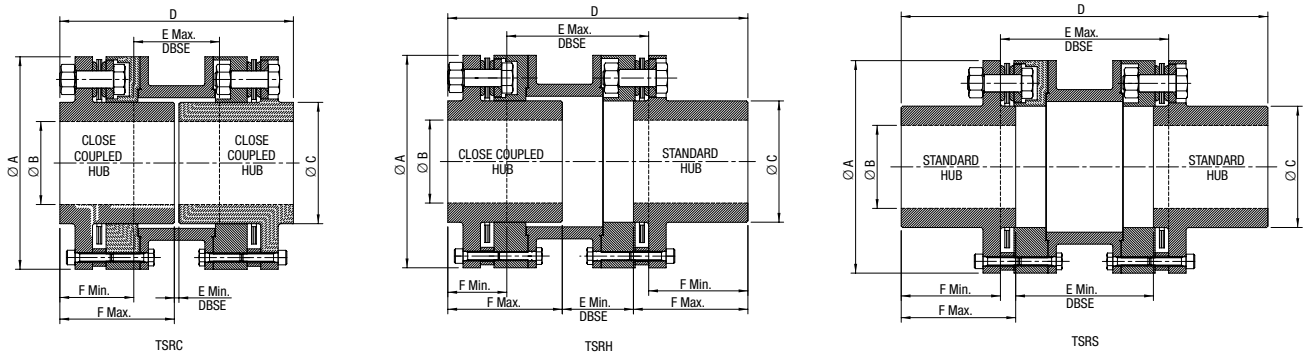
Technical Specification

TSR Technical Data (Metric)

Coupling Size	Rating kW/1000 rpm	Max. Continuous Torque Nm	Peak Overload Torque Nm	Max. Speed rpm	Complete Coupling Weight Kg	Complete Coupling Moment Of Inertia Kg.m²
0033	33	315	630	6,400	3.7	0.004
0075	75	715	1,430	5,800	6.5	0.014
0135	135	1,290	2,600	5,000	11.3	0.033
0230	230	2,200	4,400	4,200	18.4	0.079
0350	350	3,350	6,700	3,800	27.7	0.152
0500	500	4,780	9,600	3,600	38.8	0.279
0740	740	7,070	14,000	3,400	53.9	0.477
0930	930	8,880	17,600	3,200	72.1	0.758
1400	1,400	13,370	26,750	3,000	96.7	1.237

TSR Typical Arrangement



TSR Dimensional Data (mm)

Coupling Size	A	(1) Max Bore B	C	TSRC DBSE D	TSRC DBSE E Min	TSRC DBSE E Max	TSRC DBSE F Min	TSRH DBSE D	TSRH DBSE E Min	TSRH DBSE E Max	TSRH DBSE F Min	TSRS DBSE D	TSRS DBSE E Min	TSRS DBSE E Max	TSRS DBSE F Min	F Max
0033	98	35	51	113	3	36	38.5	146	36.1	69	29	179	69.1	83	48	55
0075	125	50	68	129	3	39	45	165	39.1	75	35.5	201	75.1	92	54.5	63
0135	148	60	84	155	5	47	54	197	47.1	89	43.5	239	89.1	110	64.5	75
0230	178	75	103	175	5	53	61	223	53.1	101	48.5	271	101.1	124	73.5	85
0350	202	85	119	201	5	60	70.5	256	60.1	115	56.5	311	115.1	142	84.5	98
0500	228	100	135	225	7	67	79	285	67.1	127	64.5	345	127.1	158	93.5	109
0740	255	110	151	247	7	74	86.5	314	74.1	141	69.5	381	141.1	174	103.5	120
0930	279	120	167	275	7	82	96.5	350	82.1	157	77.5	425	157.1	194	115.5	134
1400	309	130	182	295	7	88	103.5	376	88.1	169	82.5	457	169.1	208	124.5	144

Notes:

1 Maximum bored hubs are based on standard DIN/BS rectangular key and for hubs that are not reduced in length.

- Dimensions should not be used for construction. Certified dimensions furnished upon request.
- Unless otherwise specified, parallel bores will be machined to an H7 tolerance, with Js9 key-ways to DIN 6885, ISO R773 or BS 46 Pt1 (inch).

TYPE TSR/TLR

T SERIES CLOSE COUPLED MEMBRANE COUPLINGS

Technical Specification

Selection Procedure (Metric)

1. Select appropriate service factor (SF).
2. Calculate the coupling rating R from:

$$R = \frac{kW \times 1000 \times SF}{N}$$

Where:
kW = rated power for driven equipment (kW)
N = speed (rev./min)

3. Select a coupling with the same or higher rating.
4. Check DBSE.
5. Check the hub bore capacity is suitable, if not select a lager size coupling.
6. Check peak torque capability is suitable for application.
7. Check speed capability.
8. Specify DBSE as appropriate.

Example:

150 kW electric motor connected to a centrifugal pump at 2960 rpm with a 10 mm DBSE.
SF = 1.0

$$R = \frac{150 \times 1000 \times 1.0}{2960}$$

R = 50.7 kW per 1000 rpm

Selection: TSRC – 0075
DBSE is between 3 and 39 mm
Maximum parallel shaft bore is 50 mm
Peak torque capability – 1430 Nm
Maximum speed capability is 5,800 rpm
Designation – **TSRC – 0075 – 0077 – 0000**
Actual SF = 1.48

Service Factor (SF)

Suggested service factors for electric motor, steam turbine, and gas turbine drivers are given below.

Torque Variation	Typical Application	Service Factor
Constant Torque	Centrifugal Pump Centrifugal Compressor Axial Compressor Centrifugal Blower	1.0*
Slight Torque Fluctuation	Screw Compressor Gear, Lobe and Vane Pumps Forced Draft Fan Medium Duty Mixer Lobe Blower	1.5
Substantial Torque Fluctuations	Reciprocating Pumps Heavy Duty Mixers Induced Draft Fans	2.0

*Use a minimum service factor of 1.25 on electric motor drives through a gearbox.

The examples given are for typical machines and are empirically based guidelines. Knowledge of actual torque characteristics may indicate a different service factor. Consult John Crane for advice.

KSelect is an internet based selection program for the TSR/TLR This selection program provides all necessary technical data including inertias and torsional stiffness.

Visit www.johncrane.com

Available Options

- Spark-resistant couplings for hazardous zone operation
- Special materials for low temperature applications and/or higher corrosion resistance
- Consult John Crane for any other special requirements. Couplings can be adapted to suit virtually all power transmission coupling needs.

TYPE TSR/TLR

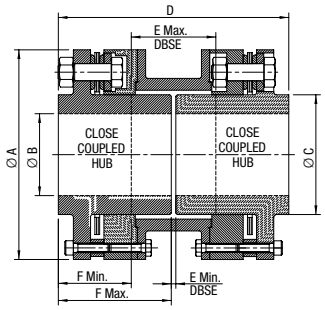
T SERIES CLOSE COUPLED MEMBRANE COUPLINGS

Technical Specification

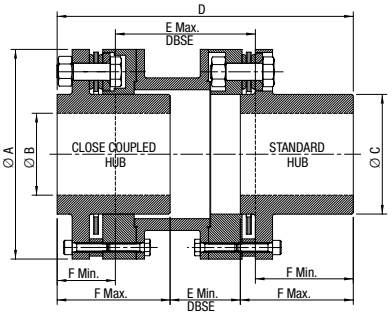
TLR Technical Data (Metric)

Coupling Size	Rating kW/1000 rpm	Max. Continuous Torque Nm	Peak Overload Torque Nm	Max. Speed rpm	Complete Coupling	
					Weight Kg	Moment Of Inertia Kg.m²
0210	210	2,000	4,000	5,000	13	0.039
0350	350	3,300	6,700	4,200	22	0.093
0530	530	5,100	10,100	3,800	33.5	0.179
0750	750	7,200	14,300	3,600	46.5	0.324
1000	1,000	9,600	19,100	3,400	64.5	0.567
1400	1,400	13,400	26,700	3,200	85	0.903
1850	1,850	17,700	35,300	3,000	112	1.46
2400	2,400	22,900	45,800	2,800	139	2.17
3000	3,000	28,700	57,300	2,600	178	3.29
4200	4,200	40,100	80,200	2,450	246	5.84
6000	6,000	57,300	114,600	2,150	336	10.3
9009	9,000	86,000	171,900	1,900	479	19
9012	12,000	114,600	229,200	1,650	653	35.4
9015	15,000	143,300	286,500	1,550	816	50.2
9022	22,000	210,100	420,200	1,350	1,334	112
9033	33,000	315,200	630,300	1,200	1,775	181

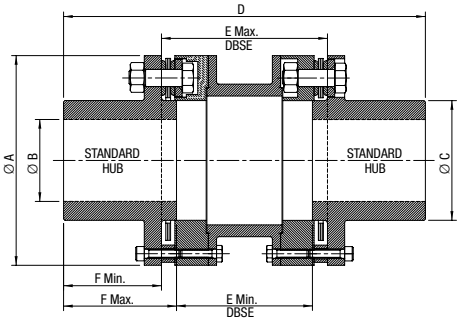
TLR Typical Arrangement



TLRC



TLRH



TLRS

TLR Dimensional Data (mm)

Coupling Size	A	(1) Max Bore B	C	TLRC DBSE				TLRH DBSE				TLRS DBSE				
				D	E Min	E Max	F Min	D	E Min	E Max	F Min	D	E Min	E Max	F Min	F Max
0210	148	60	84	165	5	42	61.5	202	42.1	79	58.5	239	79.1	110	64.5	80
0350	178	75	103	189	5	46	71.5	230	46.1	87	69.5	271	87.1	124	73.5	92
0530	202	85	119	211	5	55	78	261	55.1	105	71.5	311	105	142	84.5	103
0750	228	100	135	241	7	59	91	293	59.1	111	88.5	345	111	158	93.5	117
1000	255	110	151	261	7	67	97	321	67.1	127	90.5	381	127	174	104	127
1400	279	120	167	285	7	77	104	355	77.1	147	92.5	425	147	194	116	139
1850	309	130	182	307	7	82	112.5	382	82.1	157	101	457	157	208	125	150
2400	333	145	200	325	7	94	115.5	412	94.1	181	95	499	181	227	136	159
3000	362	155	213	363	9	99	132	453	99.1	189	117	543	189	248	148	177
4200	408	175	243	389	9	107	141	487	107	205	122	585	205	265	160	190
6000	456	190	267	431	9	124	153.5	546	124	239	126	661	239	299	181	211
9009	518	220	311	467	9	132	167.5	590	132	255	139	713	255	320	197	229
9012	600	235	336	509	11	141	184	639	141.1	271	156	769	271.1	345	212	249
9015	642	260	366	549	11	154	197.5	692	154.1	297	165	835	297.1	375	230	269
9022	750	315	446	635	11	173	231	797	173.1	335	196	959	335.1	427	266	312
9033	823	340	492	701	11	187	257	877	187.1	363	221.5	1,053	363.1	468	292.5	345

Notes:

1 Maximum bored hubs are based on standard DIN/BS rectangular key and for hubs that are not reduced in length.

- Dimensions should not be used for construction. Certified dimensions furnished upon request.
- Unless otherwise specified, parallel bores will be machined to an H7 tolerance, with Js9 key-ways to DIN 6885, ISO R773 or BS 46 Pt1 (inch)

TYPE TSR/TLR

T SERIES CLOSE COUPLED MEMBRANE COUPLINGS

Technical Specification

Coupling Alignment

Correct installation and alignment of couplings is essential for reliable machinery performance.

The angular and axial restoring forces in the table below are given at maximum deflections. The chart can be used to determine forces across the full deflection range. The nonlinear characteristics can detune a system to prevent high amplitude axial vibration.

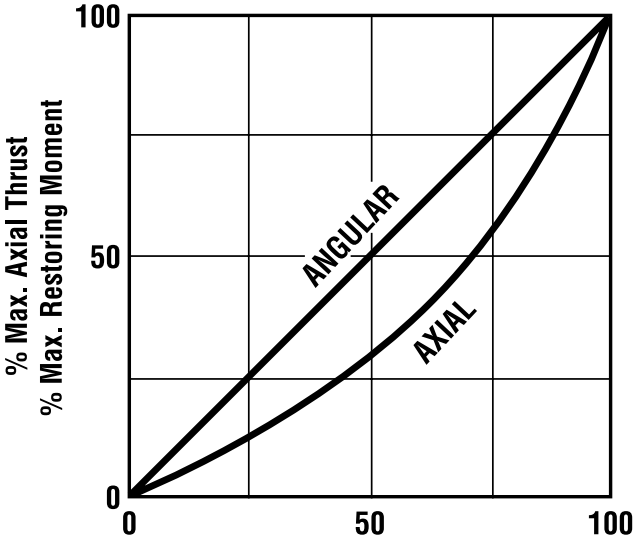
TSR - Metric Misalignment Capabilities					
Coupling Size	Max. Axial ± mm	Equivalent Thrust kN	Max. Angular Degrees	Restoring Moment at Max. Angle Nm	Max. Parallel mm
0033	1.25	0.41	0.5	5	0.7
0075	1.75	0.7	0.5	8.5	0.7
0135	2	0.89	0.5	15	0.9
0230	2.5	1.37	0.5	23.5	1
0350	3	1.97	0.5	34.5	1.2
0500	3.25	2.32	0.5	49	1.3
0740	3.75	3.12	0.5	71	1.4
0930	4	3.56	0.5	93	1.6
1400	4.5	4.55	0.5	124	1.7

TLR - Metric Misalignment Capabilities					
Coupling Size	Max. Axial ± mm	Equivalent Thrust kN	Max. Angular Degrees	Restoring Moment at Max. Angle Nm	Max. Parallel mm
0210	1.4	0.78	0.33	15	0.6
0350	1.7	1.43	0.33	28	0.7
0530	1.9	1.82	0.33	43	0.8
0750	2.2	2.6	0.33	64	0.8
1000	2.4	3.25	0.33	93	0.9
1400	2.7	3.9	0.33	124	1
1850	3	4.62	0.33	161	1.1
2400	3.2	5.4	0.33	208	1.2
3000	3.5	6.18	0.33	264	1.3
4200	3.9	7.41	0.33	371	1.4
6000	4.4	8.78	0.33	502	1.6
9009	5	11	0.33	729	1.7
9012	5.5	12.7	0.33	901	1.8
9015	6	14.6	0.33	1105	2
9022	7.1	19	0.33	1845	2.2
9033	7.9	22.1	0.33	2467	2.4

These values are maximums for each type of misalignment. It is recommended that the coupling is initially aligned to 10 percent of these values to allow for inevitable movements during the life of the machines.

John Crane supplies a variety of shaft alignment equipment and offers alignment training courses. Lase-A-Lign™ EX Shaft Alignment System is one of the toughest and most robust measurement and alignment systems available. For alignment work in potentially explosive environments, equipment needs to be explosion-protected. Lase-A-Lign EX Shaft Alignment System complies with the latest ATEX standards for work in such environments.

FORCE vs DEFLECTION



Notes
(2) Meets NEMA end float specifications without modification.
(3) Values based on angular deflection of 1/2° per end.
(4) Values based on angular deflection of 1/3° per end.

Balance Condition

This coupling is designed with a high inherent balance, due to the precision of the manufacturing process. It is important that all parts are carefully stored and fitted to maintain this integrity.

The inherent balance of the TSR/TLR range meets AGMA standard 9000-C90 class 8. The maximum operating speeds listed in the table on page 2 are on the basis of this AGMA class 8 characteristic, to provide a general guide to maximum permissible speed. If higher speeds are required contact John Crane for an alternative coupling selection or special balance if required.

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Technical Specification

TYPE TSR/TLR

T SERIES CLOSE COUPLED MEMBRANE COUPLINGS

Technical Specification

North America
United States of America
Tel: 1-847-967-2400
Fax: 1-847-967-3915

Europe
United Kingdom
Tel: 44-1753-224000
Fax: 44-1753-224224

Latin America
Brazil
Tel: 55-11-3371-2500
Fax: 55-11-3371-2599

Middle East & Africa
United Arab Emirates
Tel: 971-481-27800
Fax: 971-488-62830

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