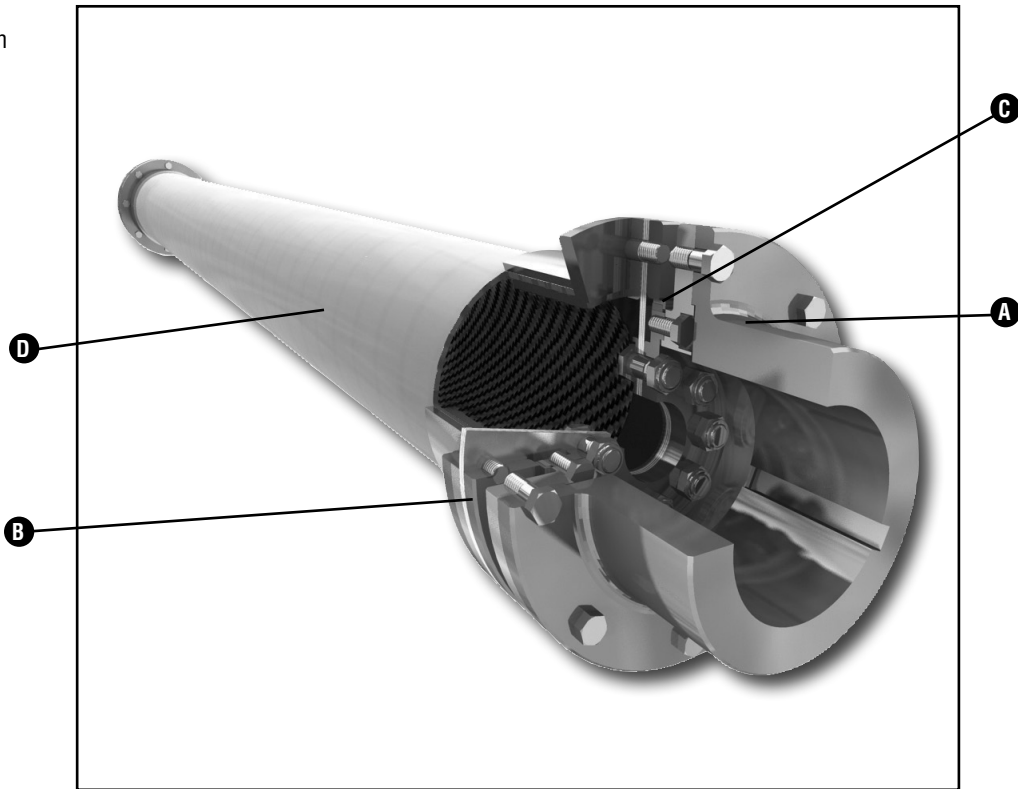


- A** – All Stainless Steel Construction
- B** – Cartridge Membrane Assembly
- C** – Non-Metallic Anti-Fly Bush
- D** – Composite Fiber Spacer



Product Description

John Crane's Metastream® ZMH coupling is a non-lubricated, non-wearing, flexible coupling which has been designed to connect remote machines in the humid atmosphere of cooling towers.

The design is based on the M Series coupling and incorporates a radial spoke, stainless steel, flexible membrane design. This design gives the most reliable and safe solution available, and has the added advantage of allowing the machines to disconnect in the event of membrane failure. In the hostile environment of a forced draft cooling tower, the fan drive shaft is a vital element.

- Easy to fit
- Corrosion resistant to cooling tower environments at temperatures up to 300°F / 150°C
- Unitized membrane unit protects the composite fibre spacer assembly in the event of failure
- Up to 80 percent lighter than comparable metal construction designs
- Shaft separation up to 20 feet / 6.7 meters in a single span with no need for intermediate bearing
- Tube designs virtually eliminate thermal expansion and sag

Design Features

- **Fit and Forget** - Designed for infinite life, giving users the confidence to run unsparred machinery for longer periods
- **Low Imposed Loads** - Minimizes the imposed loads on critical machinery components such as bearings and seals, allowing running periods between planned shutdowns to be increased
- **Failsafe** - Inbuilt close-clearance non-metallic bearing retains the spacer, avoiding damage to adjacent components such as the fan blades
- **Reduced Life Cycle Costs** - Requires no lubrication, has no wearing parts and can be fitted without special tools
- **Ease of Installation** - Simply fitted and accurately centered in the hub recesses after shaft alignment

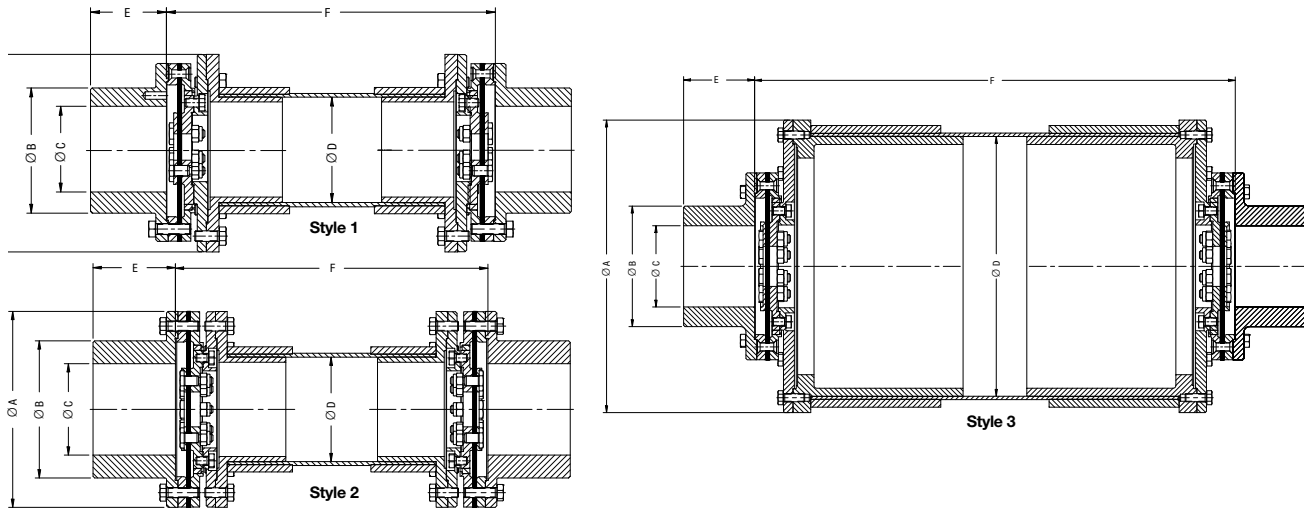
TYPE ZMH

M SERIES COOLING TOWER MEMBRANE COUPLING

ZMH Technical Data (Metric)

Coupling Designation	Style	(1) Rating	A	B	C	D	E	F	
		kw/ 1000RPM	mm	mm	mm	mm	mm	mm 1800 RPM	mm 1500 RPM
ZMH1-0030	2	27	191	100	70	102	51	3400	3730
ZMH2-0030	2	27	219	100	70	152	51	4060	4445
ZMH1-0060	2	54	191	121	83	102	68	3400	3730
ZMH2-0060	2	54	219	121	83	152	68	4060	4445
ZMH3-0060	2	54	294	121	83	203	68	4825	5280
ZMH1-0100	1	71	191	133	89	102	81	3400	3730
ZMH2-0100	2	89	219	133	89	152	81	4060	4445
ZMH3-0100	2	89	294	133	89	203	81	4825	5280
ZMH4-0100	2	89	343	133	89	254	81	5330	5840
ZMH2-0200	1	164	219	143	95	152	83	4060	4445
ZMH3-0200	2	179	294	143	95	203	83	4825	5280
ZMH4-0200	3	179	343	143	95	254	83	5330	5840
ZMH5-0200	3	179	343	143	95	305	83	5765	6325
ZMH6-0200	3	179	376	143	95	356	83	6095	6680
ZMH3-0450	2	246	294	170	114	203	92	4825	5280
ZMH4-0450	3	313	343	170	114	254	92	5330	5840
ZMH5-0450	3	313	343	170	114	305	92	5765	6325
ZMH6-0450	3	313	376	170	114	356	92	6095	6680

ZMH Typical Arrangement



ZMH Technical Data (Imperial)

Coupling Designation	Style	(1) Rating	A	B	C	D	E	F	
		HP/100 rpm	Inch	Inch	Inch	Inch	Inch	Inch 1800 RPM	Inch 1500 RPM
ZMH1-0030	2	3.6	7.5	3.94	2.75	4	2	134	147
ZMH2-0030	2	3.6	8.63	3.94	2.75	6	2	160	175
ZMH1-0060	2	7.2	7.5	4.75	3.25	4	2.69	134	147
ZMH2-0060	2	7.2	8.63	4.75	3.25	6	2.69	160	175
ZMH3-0060	2	7.2	11.56	4.75	3.25	8	2.69	190	208
ZMH1-0100	1	9.5	7.5	5.25	3.5	4	3.19	134	147
ZMH2-0100	2	12	8.63	5.25	3.5	6	3.19	160	175
ZMH3-0100	2	12	11.56	5.25	3.5	8	3.19	190	208
ZMH4-0100	2	12	13.5	5.25	3.5	10	3.19	210	230
ZMH2-0200	1	22	8.63	5.63	3.75	6	3.28	160	175
ZMH3-0200	2	24	11.56	5.63	3.75	8	3.28	190	208
ZMH4-0200	3	24	13.5	5.63	3.75	10	3.28	210	230
ZMH5-0200	3	24	13.5	5.63	3.75	12	3.28	227	249
ZMH6-0200	3	24	14.79	5.63	3.75	14	3.28	240	263
ZMH3-0450	2	33	11.56	6.69	4.5	8	3.63	190	208
ZMH4-0450	3	42	13.5	6.69	4.5	10	3.63	210	230
ZMH5-0450	3	42	13.5	6.69	4.5	12	3.63	227	249
ZMH6-0450	3	42	14.79	6.69	4.5	14	3.63	240	263

Notes:

1 These ratings include an appropriate Service Factor for fan applications.

Selection Procedure

1. Calculate the coupling rating R from:

$$R = \frac{HP \times 100}{N}$$

Where:

HP = rated power for driven equipment (HP)
N = speed

2. Select coupling with the same or higher rating.
3. Check hub bore capacity is suitable, if not, select a higher rated coupling.
4. Check DBSE vs. speed is suitable.

1. Calculate the coupling rating R from:

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

Where:

kW = rated power for driven equipment (kW)
N = speed

2. Select coupling with the same or higher rating.
3. Check hub bore capacity is suitable, if not, select a higher rated coupling.
4. Check DBSE vs. speed is suitable.

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.

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.

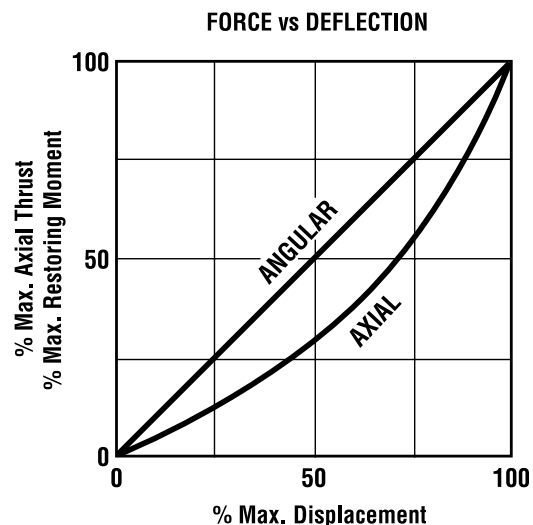
ZMH - Metric Misalignment Capabilities					
Coupling Size	Max. Axial ± mm	Equivalent Thrust kN	(2) Max. Angular Degrees	Restoring Moment at Max. Angle Nm	(3) Max. Parallel mm
0030	1.98	0.7	0.5	16	17.3
0060	2.18	1	0.5	26	17.3
0100	2.18	1.3	0.5	30	17.3
0200	2.18	1.7	0.5	37	17.2
0450	2.59	2.5	0.5	86	17.2

ZMH - Imperial Misalignment Capabilities					
Coupling Size	Max. Axial ± in	Equivalent Thrust lbf	(2) Max. Angular Degrees	Restoring Moment at Max. Angle in. lb	(3) Max. Parallel in
0030	0.08	157	0.5	142	0.681
0060	0.09	225	0.5	230	0.681
0100	0.086	292	0.5	266	0.681
0200	0.086	382	0.5	327	0.679
0450	0.102	562	0.5	761	0.678

Notes

2 Per Membrane Bank

3 Values based on angular deflection of 1/2° per end and a DBSE of 79° / 2000mm.



Balance Condition

- John Crane will balance the spacer assembly as standard.
- Hubs and membrane units may also be balanced if specified.



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