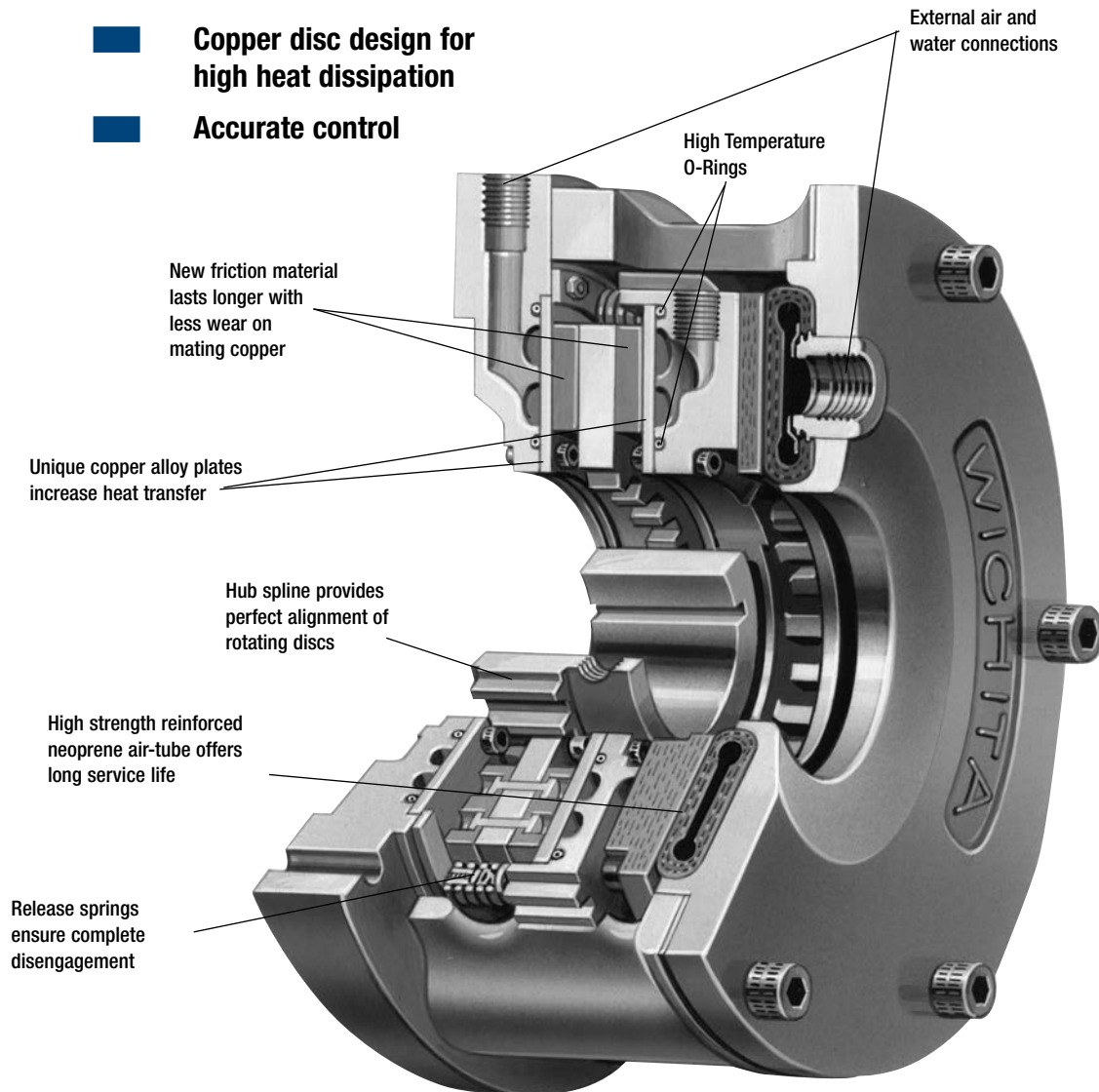


# CSM/KK Clutches and Brakes

## CSM Brakes

■ **Copper disc design for high heat dissipation**

■ **Accurate control**



The Wichita CSM (or Kopper Kool) airtube disc Clutches and Brakes are liquid cooled and consist of a series of alternating discs connecting an inner drive member to an outer drive member.

Engagement is achieved by pneumatic expansion of the airtube. This air-operated clutch contains copper discs for excellent heat dissipation and provides an accurately controlled continuous slip action for constant web tensioning. Tension levels are in direct proportion to air pressure applied.

### Design Features

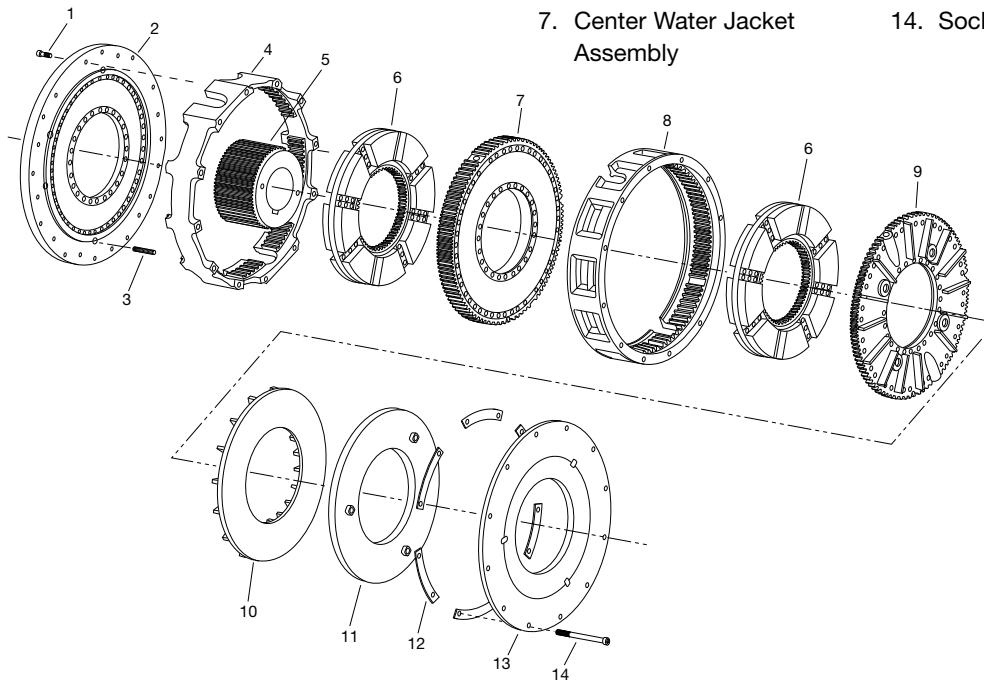
- New friction material lasts longer with less wear on mating copper.
- Copper alloy wear plates increase heat transfer.
- Hub spline provides perfect alignment of rotating discs.
- External air & water connections.
- Release springs ensure complete disengagement.
- High strength reinforced neoprene air-tube offers long service life.
- High thermal capacity.

**For additional torque and heat capacity, see the Wichita AquaMaKKs on page 82.**

## CSM Brakes

### Component Parts

- |                                    |                                   |
|------------------------------------|-----------------------------------|
| 1. Socket Head Capscrews           | 8. Ring (Airtube End)             |
| 2. Backplate Water Jacket Assembly | 9. Floating Water Jacket Assembly |
| 3. Release Springs                 | 10. Pressure Plate                |
| 4. Ring (Backplate End)            | 11. Airtube                       |
| 5. Hub                             | 12. Segmented Shims               |
| 6. Drive Plate Assembly            | 13. Airtube Holding Plate         |
| 7. Center Water Jacket Assembly    | 14. Socket Head Capscrews         |

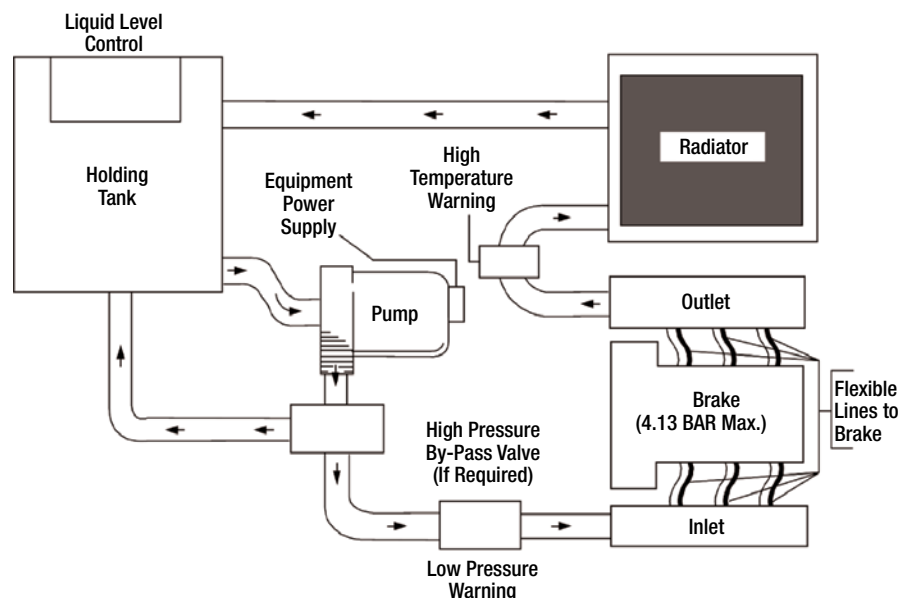


## Principle of Operation

### Closed Cooling System

As shown here in the closed loop system, flexible water lines should be brought into each jacket at the 6 o'clock position. When the CSM Unit is used as a clutch, air vent tubes must be installed internally at the factory to insure proper filling of the water jackets. The CSM Clutches also require 0.35 BAR back pressure on the outlet side of the triple passage roto-coupling to insure complete evacuation of air from these jackets during rotation.

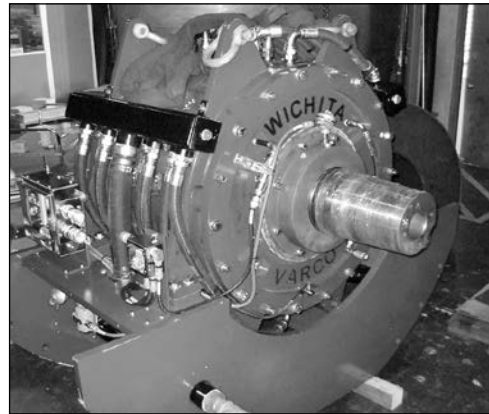
Referring to the closed loop cooling system, the equipment should be protected with low water pressure and high temperature warning devices. For availability information, contact factory.



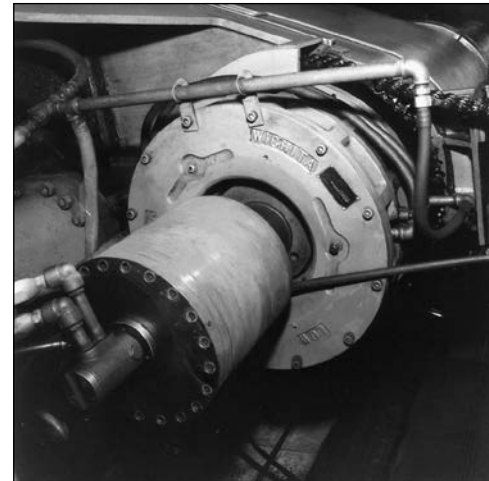
## Design advantages

- New friction material is longer lasting with less wear on mating copper. Consistent torque response results directly with air pressure applied. Mechanically retained friction pads can be changed in field.
- Copper has a greater heat transfer capacity than most other metals.
- All factors affecting torque are fully controlled. Patented water flows through tangential cooling grooves to ensure effective mixing of cooling water for best heat conductivity. Water volume of the jackets insures high water velocity, which reduces sedimentation and chemical formation. Maximum inlet pressure is 4.13BAR/60 PSI.
- Close grain alloy iron jackets for coolant assure high resistance to corrosion.
- Releasing springs insure complete disengagement.
- By using a triple roto-coupling, the brake can be used as a constant slipping clutch.
- Composite pressure plate assures even distribution of pressure from actuator to braking surfaces, providing maximum contact area on friction surfaces.
- All coolant and air connections are external and easily accessible. Double outlets in center water jackets for multiple plate units 24" and larger.
- Air passages through brake greatly assist in keeping brake cool.
- Actuating member is a reinforced neoprene airtube which has low resistance to movement, resulting in immediate reaction with small pressure changes. Non-corrosion neoprene is unaffected by actuating medium.

## Typical Applications



Wichita CSM Brakes provide precise weight on bit control on drawworks for drilling rigs.



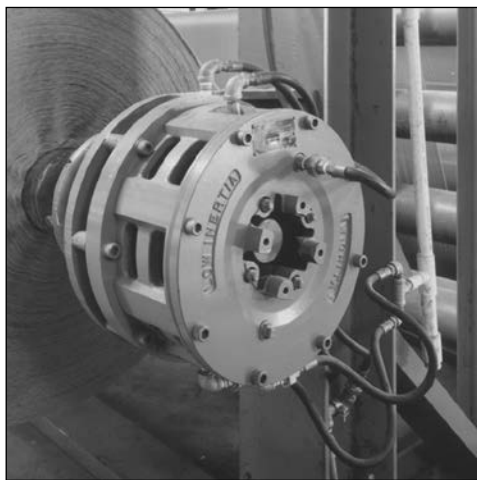
CSM Brakes dissipate high heat loads in steel uncoiler applications.



CSM brakes increase control on marine winches.



## Selecting a CSM Brake for an unwind application



To properly select a tension brake for an unwind application the following information is needed:

Max. Roll Diameter . . . . . 2135 mm.  
 Max. Web Width . . . . . 3050 mm.  
 Max. Web Speed . . . . . 450 M/min.  
 Max. Tension . . . . . 2.63 N/mm.  
 Air Pressure Available . . . . . 7 BAR.  
 Min. Roll Diameter . . . . . 305 mm.  
 Min. Web Width . . . . . 2135 mm.  
 Min. Web Speed . . . . . 225 mm/min  
 Min. Tension . . . . . 10 PLI

## Calculations

For the calculations below, consult CSM Brake Specifications Chart on the next two pages.

The brake selected for this application is a CSM 218, with 5.5 inch bore.

$$\begin{aligned} \text{Max. Tension} &= \text{Max. N/mm} \times \text{Max. Web Width} \\ &= 2.63 \times 3050 = 8022 \text{ N.} \end{aligned}$$

$$\begin{aligned} \text{Max. Torque} &= \frac{\text{Max. Tension} \times \text{Max. Roll Dia (M)}}{2} \\ &= 8022 \times 2.135/2 = 8563 \text{ Nm} \end{aligned}$$

$$\begin{aligned} \text{Max. RPM} &= \frac{\text{Max. Web Speed}}{\text{Min. Roll Dia.} \times \pi} \\ &= 450 / (3.142 \times .305) = 470 \text{ RPM} \end{aligned}$$

$$\begin{aligned} \text{Heat HP} &= \text{Max. Tension} \times \text{Max. Web Speed}/60,000 \\ &= \frac{8022 \times 450}{60,000} = 60.2 \text{ kW} \end{aligned}$$

$$\begin{aligned} \text{Min. Tension} &= \text{Min. tension} \times \text{Min. Web Width (mm)} \\ &= 1.75 \times 2135 = 3736 \text{ N.} \end{aligned}$$

$$\begin{aligned} \text{Min. Torque} &= \frac{\text{Min. Tension} \times \text{Min. Roll Dia.}}{2} \\ &= 3736 \times .305 = 570 \text{ Nm.} \end{aligned}$$

$$\begin{aligned} \text{Min. RPM} &= \frac{\text{Min. Web Speed}}{\text{Max. Roll Dia.} \times \pi} \\ &= 225 / (3.142 \times 2.135) = 34 \text{ RPM} \end{aligned}$$

## How to select

1. Select a brake with equal to or greater thermal capacity. The CSM214 has 115 kW x 0.7 = 78.4 kW. The requirement is 60.2 kW.
2. Check torque capacity vs. required. The CSM214 has 4745 Nm @ 5.5 bar. The requirement is 8563 Nm. Therefore, a CSM214 Brake will not produce enough torque for this application. A CSM218 Brake would be the best choice.
3. Check maximum bore. The requirement is 5.00 inches. The CSM218 maximum bore is 5.5 inches
4. Check maximum RPM. The requirement is 470 RPM. The maximum RPM for the CSM218 is 1300 RPM.

$$\begin{aligned} \text{Max. Air Pressure Required} &= \frac{\text{Max. Torque} \times 7 \text{ BAR}}{\text{Catalog Torque Rating}} \\ &= \frac{8563 \times 7}{10620} = 5.64 \text{ BAR} \end{aligned}$$

$$\begin{aligned} \text{Min. Air Pressure Required} &= \frac{\text{Min. Torque} \times 7 \text{ BAR}}{\text{Catalog Torque Rating}} \\ &= \frac{570 \times 7}{10620} = 0.38 \text{ BAR} \end{aligned}$$

# CSM/KK Clutches and Brakes

## CSM Brakes

### Specifications

Model Size ATD-	Dynamic Torque Capacity*		Heat Capacity		Max Bore
			Series	Parallel	
	Nm		Water Hosing HP/kW	Water Hosing HP/kW	Rect. Key mm
	5.5 BAR	7 BAR			
CSM 106	151	192	10 / 7.5	15 / 11	44
CSM 206	302	384	20 / 15	30 / 22	
CSM 108	479	610	21 / 16	32 / 24	
CSM 208	959	1220	42 / 31	64 / 48	57
CSM 308	1438	1830	63 / 47	96 / 72	
CSM 111	1065	1356	35 / 26	53 / 40	
CSM 211	2131	2712	70 / 52	105 / 78	76
CSM 311	3196	4067	105 / 78	158 / 118	
CSM 114	1864	2373	50 / 37	75 / 56	
CSM 214	3728	4745	100 / 75	150 / 112	111
CSM 314	5593	7118	150 / 112	225 / 168	
CSM 116	2841	3615	65 / 48	98 / 73	
CSM 216	5681	7231	130 / 97	195 / 145	121
CSM 118	4172	5310	80 / 60	120 / 89	
CSM 218	8344	10620	160 / 119	240 / 179	
CSM 318	12517	15930	240 / 179	360 / 268	140
CSM 121	5504	7005	100 / 75	150 / 112	
CSM 221	11008	14010	200 / 149	300 / 224	
CSM 321	16511	21015	300 / 224	450 / 336	165
CSM 124H	11185	14236	190 / 142	285 / 213	
CSM 224H	22370	28471	380 / 283	570 / 425	
CSM 324H	33556	42707	570 / 425	855 / 638	194
CSM 127	13316	16947	175 / 130	263 / 196	
CSM 227	26631	33894	350 / 261	526 / 392	
CSM 130	17754	22596	230 / 172	345 / 257	203
CSM 230	35508	45193	460 / 343	690 / 515	
CSM 330	53263	67789	690 / 515	1035 / 772	
CSM 136H	36154	45193	500 / 373	750 / 559	229
CSM 236H	72308	90385	1000 / 746	1500 / 1119	
CSM 336H	108462	135578	1500 / 1119	2250 / 1678	
CSM 436H <sup>1</sup>	141227	180771	2000 / 1491	3000 / 2237	229
CSM 346 <sup>2</sup>	233468	297142	2200 / 1641	3300 / 2461	

\* Static torque will vary with temperature. Maximum air pressure is 100 PSI / 7 BAR. Minimum recommended air pressure is 3 PSI / 0.2 BAR.

Note: Maximum water jacket inlet pressure is 60 PSI / 4.13 BAR.

Brakes with as great as 50% higher torque capacity is available upon request.

<sup>1</sup> Current design is with the Marine Corrosion package. A Non-Marine unit is available upon request.

<sup>2</sup> Current design is for intermittent duty applications. Such as, anchor, mooring, take-up and traction type winch applications.



# Water Cooled/High Heat Capacity

Model Size ATD-	Max. Speed RPM	Parallel Water Flow % Ethylene Glycol			Total Brake Wt. kg	Hub & Drive Plate	
		LPM				Wt. kg	J=mr <sup>2</sup> kgm <sup>2</sup>
		0%	30%	50%			
CSM 106	3,800	6	7.4	8.5	20.4	2.5	0.01
CSM 206		11	14.8	17	32.2	5.3	0.01
CSM 108		12	1.6	19	30.8	5.0	0.03
CSM 208	2,860	24	32	38	52.6	11.1	0.05
CSM 308		36	48	57	74.4	17.2	0.08
CSM 111		20	26	30	66.2	10.9	0.08
CSM 211	2,100	40	52	60	104.3	24.5	0.17
CSM 311		60	78	78	142.4	38.1	0.25
CSM 114		28	37	45	100.2	18	0.21
CSM 214	1,600	57	74	90	156.5	36	0.44
CSM 314		84	111	135	213.2	54	0.67
CSM 116		37	48	56	135	34	0.51
CSM 216	1,400	74	96	111	295	65	1.07
CSM 118		45	60	72	188	39.9	0.76
CSM 218		90	120	144	256	79.8	1.52
CSM 318	1,300	135	180	216	324	119.7	2.28
CSM 121		57	74	90	272	63	1.43
CSM 221		114	148	170	395	103	2.70
CSM 321	1,100	170	221	255	488	137	4.09
CSM 124H		106	144	170	424	109	4.64
CSM 224H		212	288	340	680	186	8.85
CSM 324H	960	318	432	510	937	263	13.07
CSM 127		102	133	153	445	103	3.87
CSM 227		204	266	307	599	193	7.55
CSM 130	850	132	170	204	514	119	5.86
CSM 230		264	340	408	839	240	11.59
CSM 330		396	510	612	1163	361	17.28
CSM 136H	760	284	369	454	1157	243	17.28
CSM 236H		568	738	908	1865	420	33.31
CSM 336H		852	1107	1362	2538	764	68.3
CSM 436H		1136	1476	1703	3072	997	87.6
CSM 346	480	1249	1624	1874	4899	1379	210

## CSM Brakes

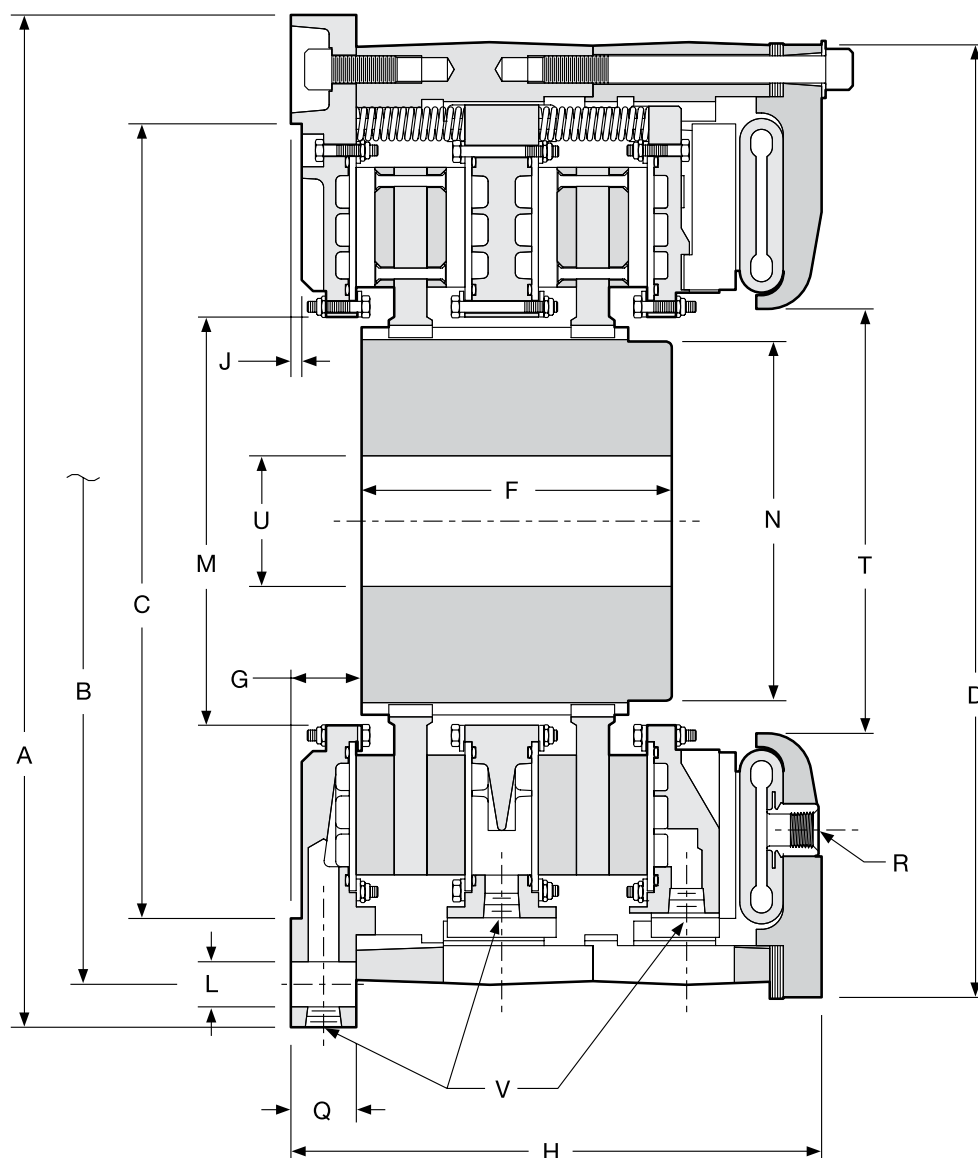
### Specifications (Continued)

Model Size ATD-	Pressure Drop Parallel Flow w/ % Ethylene Glycol PSI / BAR			Pressure Drop Series Flow w/ % Ethylene Glycol PSI / BAR			Maximum Lining Wear		Water Volume dm³
	0%	30%	50%	0%	30%	50%	cm	dm³	
CSM 108				4 / 0.14	9 / 0.62	9 / 0.62			0.13
CSM 208	0.9 / 0.06	1.6 / 0.11	2.3 / 0.16	11 / 0.76	25 / 1.72	32 / 2.21	1.0	0.2	0.26
CSM 308				15 / 1.03	34 / 2.34	41 / 2.83			0.4
CSM 114				4 / 0.14	8 / 0.55	12 / 0.83			0.33
CSM 214	1.2 / 0.08	1.6 / 0.11	1.8 / 0.12	24 / 1.66	40 / 2.76	52 / 3.59	1.3	1.0	0.65
CSM 314				28 / 1.93	48 / 3.31	—			1
CSM 118				7 / 0.48	13 / 0.9	20 / 1.38			0.8
CSM 218	1.7 / 0.12	2.4 / 0.17	2.8 / 0.19	52 / 3.59	—	—	1.5	1.2	1.5
CSM 318				—	—	—			2.35
CSM 124H				7 / 0.48	11 / 0.76	14 / 0.97			1.8
CSM 224H	1.9 / 0.13	2.4 / 0.17	3.1 / 0.21	23 / 1.59	35 / 2.41	48 / 3.31	2.0	3.3	3.6
CSM 324H				30 / 2.07	46 / 3.17	—			1.8
CSM 130				9 / 0.62	14 / 0.97	21 / 1.45			3.1
CSM 230	2.1 / 0.14	2.4 / 0.17	3.1 / 0.21	31 / 2.14	48 / 3.31	—	2.0	3.9	6.2
CSM 330				40 / 2.76	—	—			9.3
CSM 136H				14 / 0.97	24 / 1.66	—			4.7
CSM 236H	4.0 / 0.28	5.3 / 0.37	7.2 / 0.50	60 / 4.14	—	—	2.0	8.2	9.3
CSM 336H				—	—	—			14

F

# CSM/KK Clutches and Brakes

## CSM Brake



For mounting hole pattern, see following pages.

# Water Cooled/High Heat Capacity

Dimensions: mm

Model Size ATD-	A Pilot	B Hole Circle	C <sup>(1)</sup> Pilot	D	F	G	H	J
CSM 106					50.8		133.4	
CSM 206	220	203.2	190	223.8	117.6	19.1	193.8	3.3
CSM 108					50.8		144.3	
CSM 208					108	28.7	214.1	6.4
CSM 308	310	282.58	220	288.5	177.8		282.4	
CSM 111					73.2		160.5	
CSM 211					155.7	19.1	242.8	6.4
CSM 311	400	374.65	295	374.7	231.6		325.4	
CSM 114					82.6	26.9	177.8	
CSM 214					149.4	42.9	268.5	6.4
CSM 314	470	444.5	370	444.5	231.9	42.9	358.9	
CSM 116					101.6		192.0	
CSM 216	540	508	410	508	177.8	31.8	292.1	6.4
CSM 118					921.2	26.9	203.2	
CSM 218					181.1	41.4	309.6	6.4
CSM 318	590	558.8	470	555.8	273.1	41.4	416.1	
CSM 121					139.7	31.8	212.9	
CSM 221					201.7	38.1	401.6	6.4
CSM 321	685	647.7	540	632	316	31.8	436.6	
CSM 124H					127		248.7	
CSM 224H					219.2	35.1	372.9	6.4
CSM 324H	760	730.25	620	787.4	346.2		496.8	

<sup>(1)</sup> Dimension "C" is given as a nominal figure. The applicable tolerance is ISO H7. (Consult factory for drawing before final layout.)

Dimensions: mm

Model Size ATD-	L No. - Size	M	N	Q	R No. - Size	T	U Min. Max.	V <sup>(2)</sup> - Inlets No. - Size
CSM 106								2 - 1/4 NPT
CSM 206	4 x Ø9	74.7	61.7	9.7	2 - 1/2 NPT	50.8	15.2 44.5	3 - 1/4 NPT
CSM 108								2 - 3/8 NPT
CSM 208								3 - 3/8 NPT
CSM 308	4 x Ø14	111.3	88.9	35.1	2 - 1/2 NPT	95.3	25.4 57.2	4 - 3/8 NPT
CSM 111								2 - 1/2 NPT
CSM 211								3 - 1/2 NPT
CSM 311	4 x Ø18	136.7	117.6	28.7	2 - 1/2 NPT	133.4	25.4 76.2	4 - 1/2 NPT
CSM 114								2 - 1/2 NPT
CSM 214								3 - 1/2 NPT
CSM 314	6 x Ø18	187.5	165.1	38.1	2 - 1/2 NPT	177.8	35.1 111.3	4 - 1/2 NPT
CSM 116								2 - 1/2 NPT
CSM 216	10 x Ø18	218.9	190.5	38.1	2 - 1/2 NPT	212.9	35.1 120.7	3 - 1/2 NPT
CSM 118								2 - 1/2 NPT
CSM 218								3 - 1/2 NPT
CSM 318	10 x Ø18	238.3	209.6	38.1	3 - 1/2 NPT	247.7	50.8 139.7	4 - 1/2 NPT
CSM 121								2 - 3/4 NPT
CSM 221								3 - 3/4 NPT
CSM 321	10 x Ø18	289.1	266.7	44.5	3 - 1/2 NPT	289.1	50.8 165.1	4 - 3/4 NPT
CSM 124H								2 - 1 NPT
CSM 224H								4 - 1 NPT
CSM 324H	10 x Ø18	322.3	292.1	23.9	3 - 1/2 NPT	384.0	50.8 193.8	6 - 1 NPT

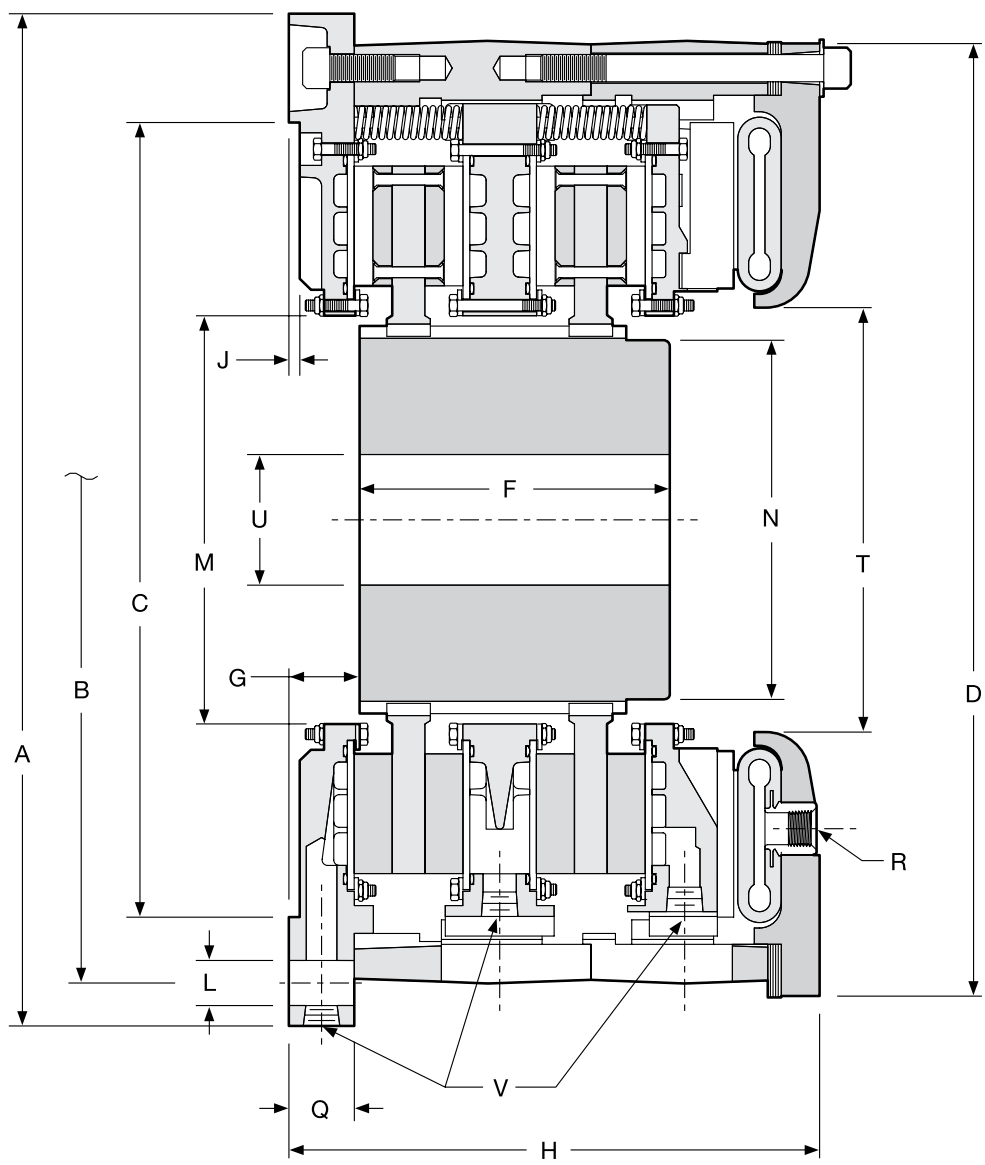
<sup>(2)</sup> Number of inlets and outlets are equivalent.  
(Consult factory for drawing before final layout.)

F



# CSM/KK Clutches and Brakes

## CSM Brake



For mounting hole pattern, see following pages.

# Water Cooled/High Heat Capacity

Dimensions: mm

Model Size ATD-	A Pilot	B Hole Circle	C <sup>(1)</sup> Pilot	D	F	G	H	J
CSM 127					127		228.6	
CSM 227	832	800.10	700	384.3	219.2	35.1	349.3	6.4
CSM 130					117.6		239.8	
CSM 230	940	901.7	775	882.7	235	35.1	362	6.4
CSM 330					352.6		482.6	
CSM 136H					143	28.7	320.8	
CSM 236H	1105	1066.8	925	1130.3	279.4	36.3	89.2	6.4
CSM 336H <sup>(2)</sup>					422.4	36.3	654.3	
CSM 436H <sup>(2)</sup>	1130	1079.5	925	1130.3	628.7	36.3	819.4	6.4
CSM 346 <sup>(2)</sup>	1492	1441.45	1220	1441.45	527.1	69.9	739.9	6.4

<sup>(1)</sup> Dimension "C" is given as a nominal figure. The applicable tolerance is ISO H7. (Consult factory for drawing before final layout.)

<sup>(2)</sup> For dimensions of the 36H, 46, and 48 models please consult factory for drawing before final layout.

Dimensions: mm

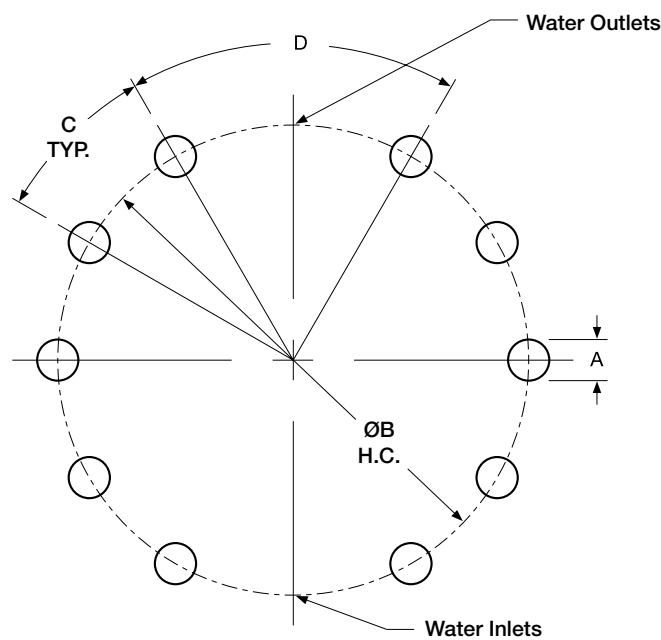
Model Size ATD-	L No. - Size	M	N	Q	R No. - Size	T	U Min.	Max.	V <sup>(3)</sup> - Inlets No. - Size
CSM 127	14 x Ø18				3 - 1/2 NPT				2 - 3/4 NPT
CSM 227		358.9	317.5	44.5		358.9	63.5	203.2	3 - 3/4 NPT
CSM 130									2 - 1 NPT
CSM 230	16 x Ø22	400.1	362	50.8	4 - 1/2 NPT	441.5	63.5	228.6	4 - 1 NPT
CSM 330									6 - 1 NPT
CSM 136H <sup>(2)</sup>									2 - 1.25 NPT
CSM 236H <sup>(2)</sup>	16 x Ø22	419.1	355.6	30.2	4 - 1/2 NPT	441.5	152.4	228.6	4 - 1.25 NPT
CSM 336H <sup>(2)</sup>									6 - 1.25 NPT
CSM 436H <sup>(2)</sup>	16 x Ø22	419.1	355.6	31.8	4 - 1/2 NPT	441.5	152.4	228.6	8 - 1.25 NPT
CSM 346 <sup>(2)</sup>	22 x Ø22	736.6	609.6	79.5	4 - 1/2 NPT	768.4	203.2	406.4	6 - 1.25 NPT

<sup>(3)</sup> Number of inlets and outlets are equivalent.

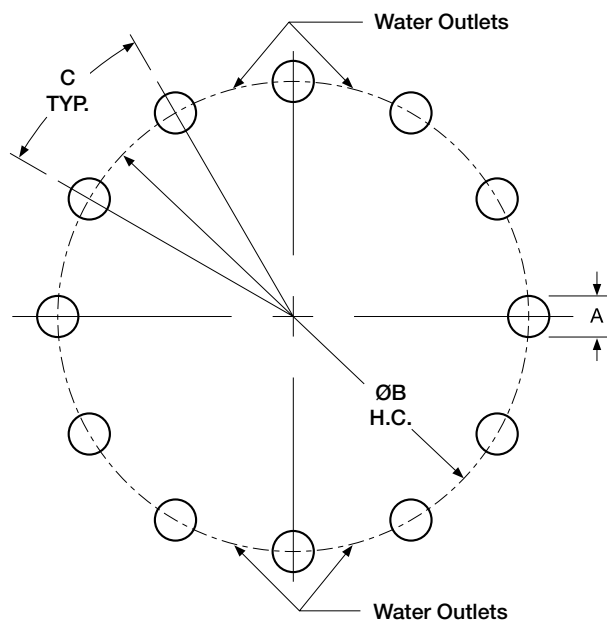
(Consult factory for drawing before final layout.)

# CSM/KK Clutches and Brakes

## CSM Brakes - Mounting Hole Pattern



CSM Brakes



Sizes 19 & 25

# Water Cooled/High Heat Capacity

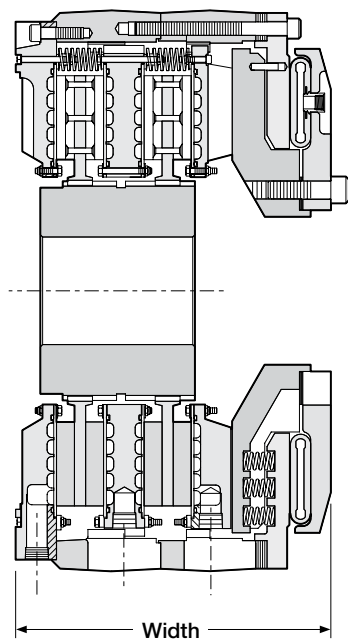
Dimensions: mm

Model CSM	No. of Mounting Holes	A Size	B Hole Circle	No. of Holes, Hole Pattern is Based	C	D
6	4	8.6	203.20	4	45°	90°
8	4	13.5	282.58	6	60°	120°
11	4	16.7	374.65	6	60°	120°
14	6	16.7	444.50	8	45°	90°
16	10	16.7	508.00	12	30°	60°
18	10	16.7	558.80	12	30°	60°
19	12	17.5	558.80	12	30°	—
21	10	16.7	647.70	12	30°	60°
24H	10	16.7	730.25	12	30°	60°
25	12	16.7	730.25	12	30°	—
27	14	16.7	800.10	16	22.5°	45°
30	16	19.8	901.70	18	20°	40°
36H	16	20.6	1066.80	18	20°	40°
436H	16	26.9	1079.50	18	20°	40°
46	22	26.2	1441.45	24	15°	30°

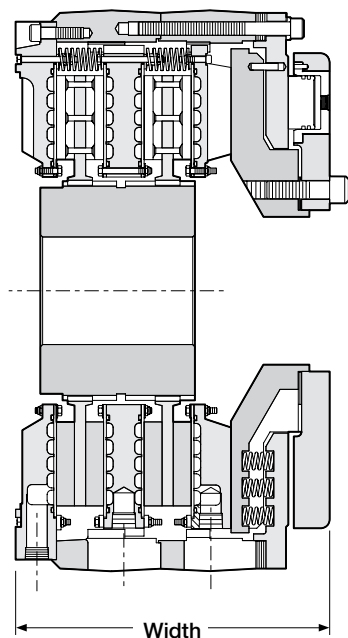
# CSM/KK Clutches and Brakes

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## CSM Brakes - Spring-Set Brakes



**CSM SS Brake**



**CSM SS-HYD Brake**

See previous pages for dimensional information.

# Water Cooled/High Heat Capacity

Dimensions: mm

Model Size ATD-	Dynamic Torque Capacity*		Width mm
	Nm	Release Pressure BAR	
CSM SSB 218	5434	6.2	381
CSM SSB 224H <sup>(3)</sup>	11840	5.2	446.8
CSM SSB-HYD 124H	9942	88.3	320.8
CSM SSB-HYD 224H	18077	88.3	445
CSM SSB 330H <sup>(1)</sup>	84612	6.9	576.3
CSM SSB 236H <sup>(2,4)</sup>	73370	8.3	559.6
CSM SSB 336H <sup>(1,2,4)</sup>	133070	6.9	726.4
CSM SSB 336H <sup>(2,4)</sup>	106270	8.3	726.4

\* Static torque will vary with temperature.

Note: Maximum water jacket inlet pressure is 4.13 BAR.

Brakes with as great as 50% higher torque capacity is available upon request.

<sup>(1)</sup> Current design is with enhanced linings. A unit with regular linings is available upon request.

<sup>(2)</sup> Current design is with the Marine Corrosion package. A Non-Marine unit is available upon request.

<sup>(3)</sup> Current design is without hub. A unit with hub is available upon request.

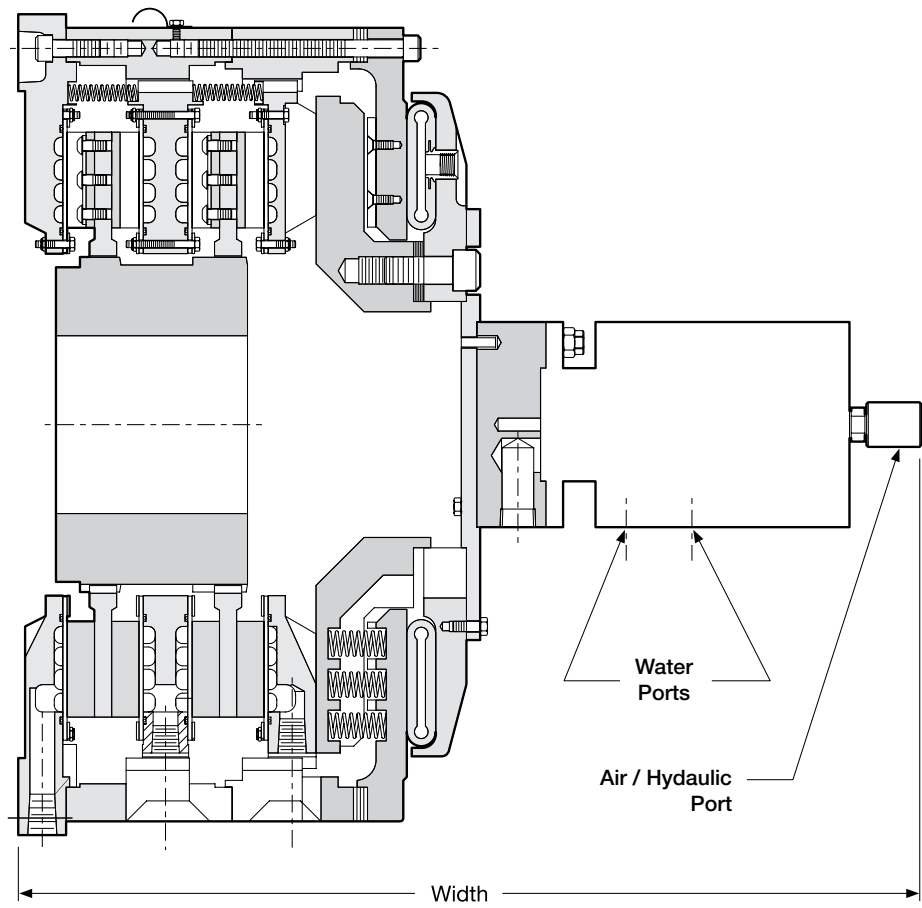
<sup>(4)</sup> Mounting same as 436H CSM except with 1079.5 mm hole circle.

Feature Differences: The CSM SS brake uses air to release the brake, where as the CSM SS-HYD brake uses hydraulic pressure to release the brake.



# CSM/KK Clutches and Brakes

## CSM Custom Units - CSM SS Clutch



See previous pages for dimensional information.

# Water Cooled/High Heat Capacity

Dimensions: mm

Model Size ATD-	Dynamic Torque Capacity* with Release Pressure		Heat Capacity HP(kW)	Roto - Coupling NPT	Max. Speed		Width mm
	Nm	BAR			R/C RPM	Unit RPM	
CSM SSC 224 <sup>(2)</sup>	8389	5.2	260 <sup>(6)</sup>	1-1/4"	40	475	838.2
CSM SSC 324 <sup>(2)</sup>	12507	5.2	300 <sup>(6)</sup>	1-1/4"	40	475	954.5
CSM SSC 224H <sup>(1,2)</sup>	17764	5.2	425 <sup>(6)</sup>	1-1/2"	250	475	987.3
CSM SSC 324H <sup>(1,2)</sup>	31488	6.6	300 <sup>(6)</sup>	1-1/4"	40	475	991.4
CSM SSC 236H <sup>(2,3)</sup>	61247	6.9	975 <sup>(6)</sup>	2"	250	300	819.2
CSM SSC-HYD 236H <sup>(2,3)</sup>	61247	100.0	975 <sup>(6)</sup>	2"	250	300	819.2

\* Dynamic torque will vary with temperature.

**Note:** Maximum water jacket inlet pressure is 4.13 BAR.

Brakes with as great as 50% higher torque capacity is available upon request.

<sup>(1)</sup> Current design is with enhanced linings. A unit with regular linings is available upon request.

<sup>(2)</sup> Current design is with the Marine Corrosion package. A Non-Marine unit is available upon request.

<sup>(3)</sup> Mounting same as 436H CSM except with 1079.5 mm hole circle.

<sup>(4)</sup> Series hosing

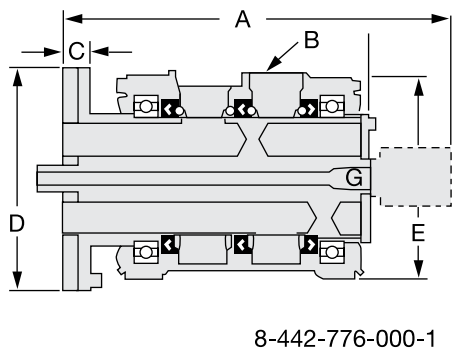
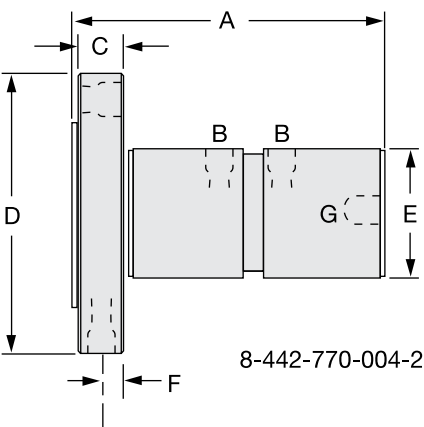
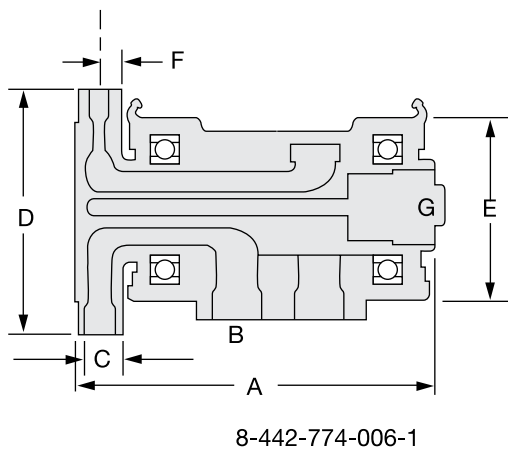
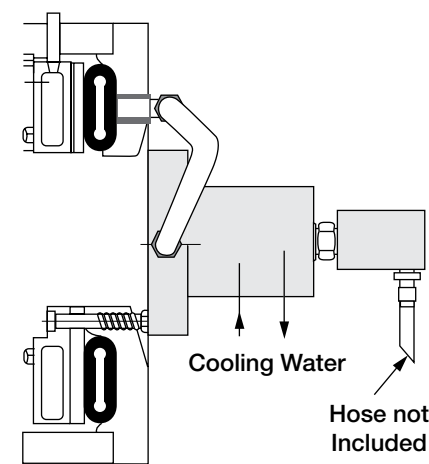
<sup>(5)</sup> Parallel hosing

<sup>(6)</sup> Partial-parallel hosing

Feature Differences: The CSM SS clutch uses air to release the clutch where as; the CSM SS-HYD clutch uses hydraulic pressure to release the clutch.

# CSM/KK Clutches and Brakes

## 3-Way Roto-Coupling (for water-cooled Clutches)

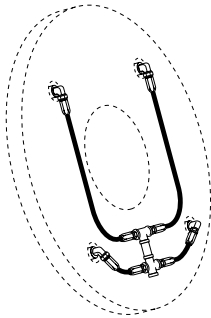
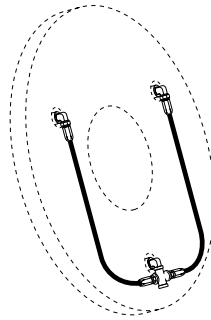
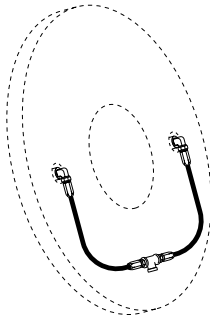
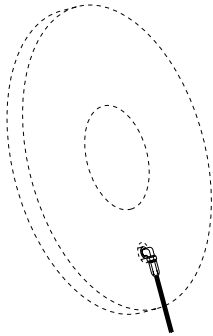


Dimensions: inches

	A	B	C	D	E	F	Thread Size G
MODEL A	7.250	3/8"-18 NPT	1.00	6.50	3.000	.50	5/8"-18
MODEL B	11.000	1-1/4"-11-1/2 NPT	1.375	7.25	5.375	.687	1/4" NPT
MODEL C	18.875	2"-11-1/2 NPT	1.250	10.00	9.000	—	1"-14

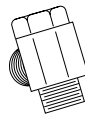


## CSM Brake Air Hose Kits



Air hose kits contain all necessary parts (fittings, hoses and extensions) to completely plumb the brake air system.

Optional Quick Release Valves can replace elbows on most units (see page 20 & 21).





## The newest addition to Wichita Clutch's family of water cooled airtube clutches and brakes

For increased torque and heat capacity, Wichita has introduced the AquaMaKKs™ range clutches and brakes, which are pneumatically or hydraulically controlled and water cooled. They consist of a series of alternating friction discs and water jackets. Torque is transmitted by applying axial force from the pneumatic, hydraulic, or spring set actuator. Copper wear plates are used for superior heat dissipation. AquaMaKKs provides accurate torque control for constant tensioning and are perfectly suited for applications in oil and gas, metal processing and forming, forestry, and marine deck machinery. See the following page for AquaMaKKs™ applications:

### Design Benefits

- Simplicity of design with fewer parts simplifies installation and maintenance, saving both time and money.
- The standard AquaMaKKs design incorporates premium materials and finishes suitable for marine deck environments. No optional salt water corrosion protection is required.
- Shim design makes it easy to maintain and adjust for wear.
- Unique patent pending water jacket design ensures high heat absorption and torque stability, allowing for greater heat dissipation over similar sized competitive units.
- Unique mounting pattern enables direct replacement to Wichita or competitors' units, requiring no design changes for the customer.
- AquaMaKKs is a perfect solution for field retrofits, rebuilds or new OEM applications.

# AquaMaKKs Clutches and Brakes

## AquaMaKKs Water Cooled Clutches and Brakes

Air, hydraulic, or spring set actuated and water cooled design, featuring copper wear plates optimized for heavy-duty continuous slip tension applications



### Oil and Gas

The AquaMaKKs family is ideally suited for superior water cooled tension control for drawworks applications.

It also can be the perfect solution for integration into electronic drilling systems as well as traditional style drawworks control systems.

#### Features that make AquaMaKKs ideal for oil and gas applications:

- Compatible with major electronic drilling systems
- Airtube design has less hysteresis than piston type actuators, making it ideal for automatic drilling systems
- Engineered packaged solutions including shafts, water kits, covers, and deck mounts
- The unit can be easily removed for service if required and/or quickly swapped out for maximum rig availability and rapid serviceability, reducing expensive downtime

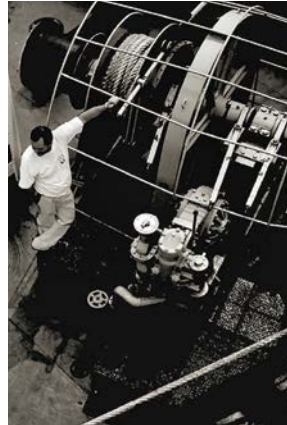


### Metal Processing & Metal Forming

AquaMaKKs clutches and brakes can be used to control tension on coilers in metal processing plants and to control tension in unwind stands and slitters in metal forming facilities.

#### Features that make AquaMaKKs ideal for metal processing and metal forming applications:

- Compatible with PLC control systems
- Higher thermal capacity than comparable models
- Easy to maintain minimizing downtime
- Open design concept for easy wear inspection
- Safety covers provided for increased operator and plant safety



### Marine Deck Machinery

Positioning and Mooring Winches require high heat dissipation and accurate tension control. That's why AquaMaKKs is ideal for these applications.

#### Features that make AquaMaKKs ideal for marine deck applications:

- The standard AquaMaKKs design incorporates premium materials and finishes suitable for marine deck environments.
- No optional salt water corrosion protection is required.
- Compatible with electronic and analog control systems for tension winches
- Long lasting friction material for improved wear life
- Optional designs available for suitability in low temperature environments
- Accessories and packaged engineered solutions available such as deck mounts, manifold kits, water connection kits, covers, and sensor mounting provisions



### Forestry

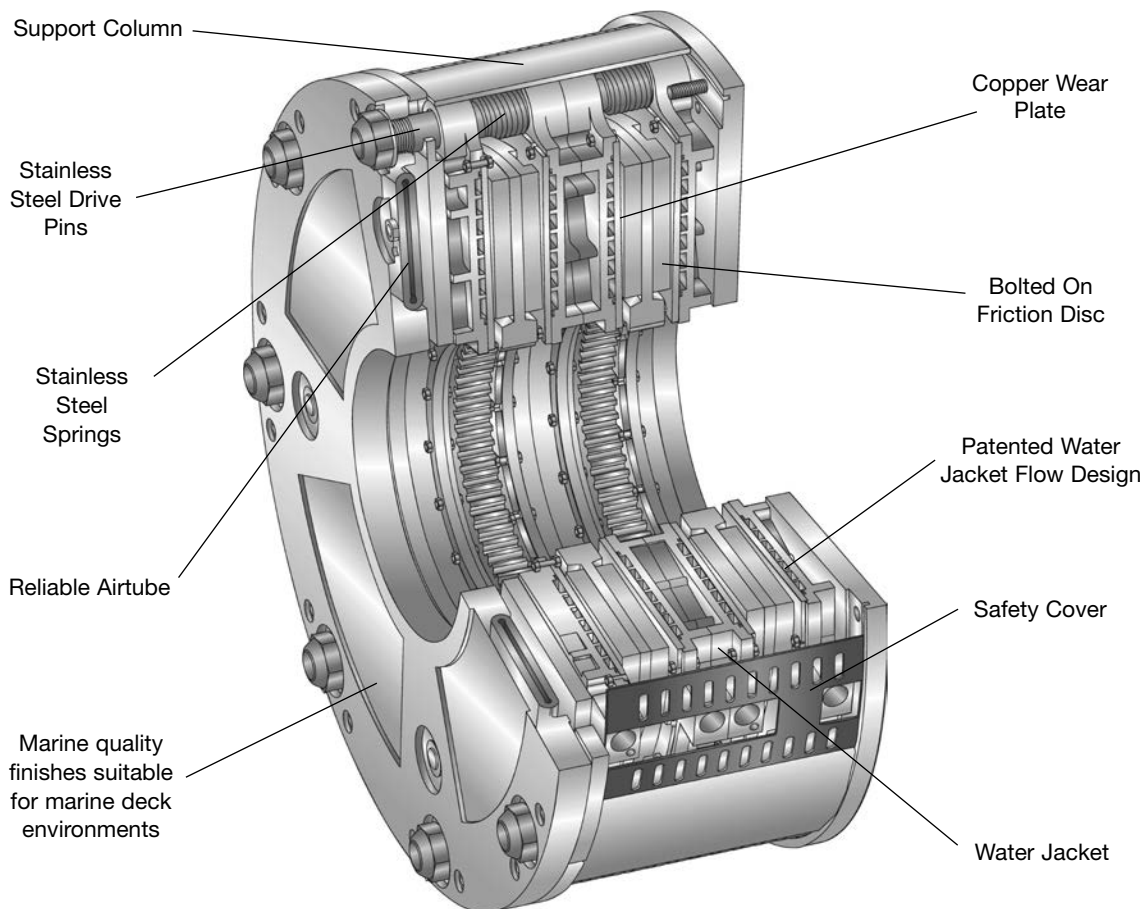
AquaMaKKs water cooled brakes provide precise tension control on winch drives for mobile forestry equipment, such as yarders.

#### Features that make AquaMaKKs ideal for forestry applications:

- Compatible with tension control systems on yarders
- Open case design enables easy wear inspection and serviceability
- Higher thermal capacity than comparable models
- Lighter weight version available for mobile equipment



# AquaMaKKs Clutches and Brakes



## Features

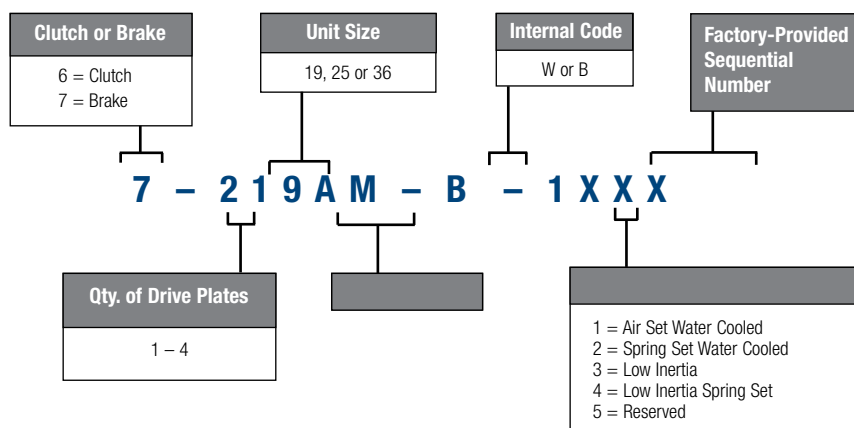
- Durable air tube design with high strength reinforced neoprene air-tubes, offering longer service life.
- Water channels for balanced water flow for the highest thermal capacity.
- Long-lasting friction material with minimal wear on mating copper.
- Copper alloy wear plates enable higher heat transfer than any other metals.
- Hub spline provides perfect alignment of rotating discs.
- External air & water connections.
- Release springs ensure complete disengagement.
- Adjustment for wear is easily accomplished by removing shims without any unit disassembly.
- Unique torque pin column arrangement provides structural integrity of case.
- Open case design with covers for safe, simple, visual inspection and easy maintenance.
- The standard AquaMaKKs design incorporates premium materials and finishes suitable for marine deck environments. No optional salt water corrosion protection is required.

## Options

- Standard and HICO friction materials available.
- Optional HICO friction material provides up to 50% higher torque.
- Provisions for electronic wear monitoring.
- Customer specific back-plate mounting configurations.
- Custom engineered solutions available for adding accessories such as deck mount assemblies, water kits, shaft assemblies, etc.
- Materials available for operation in low temperature environments.
- Hydraulic piston actuation available.
- Spring Set version with either air or hydraulic release available.

# AquaMaKKs Clutches and Brakes

## Order Numbering System

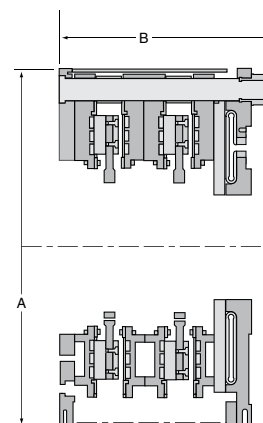


## Dimensions and Specifications

### Dimensions

inches mm

Model Size ATD-	Assembly Number	(A) Diameter		(B) Width	
		in.	(mm)	in.	mm
KKB119AM	7-119AM-B-1000	28.28	718	12.35	317
KKB219AM	7-219AM-B-1000	28.28	718	18.00	457
KKB319AM	7-319AM-B-1000	28.28	718	23.65	601
KKB225AM	7-225AM-B-1000	34.12	867	20.16	512
KKB325AM	7-325AM-B-1000	34.12	867	26.85	682
KKB136AM	7-136AM-B-1000	45.50	1155	11.70	297
KKB236AM	7-236AM-B-1000	45.50	1155	18.80	478
KKB336AM	7-336AM-B-1000	45.50	1155	25.90	658
KKB436AM	7-436AM-B-1000	45.50	1155	33.06	840



### Specifications

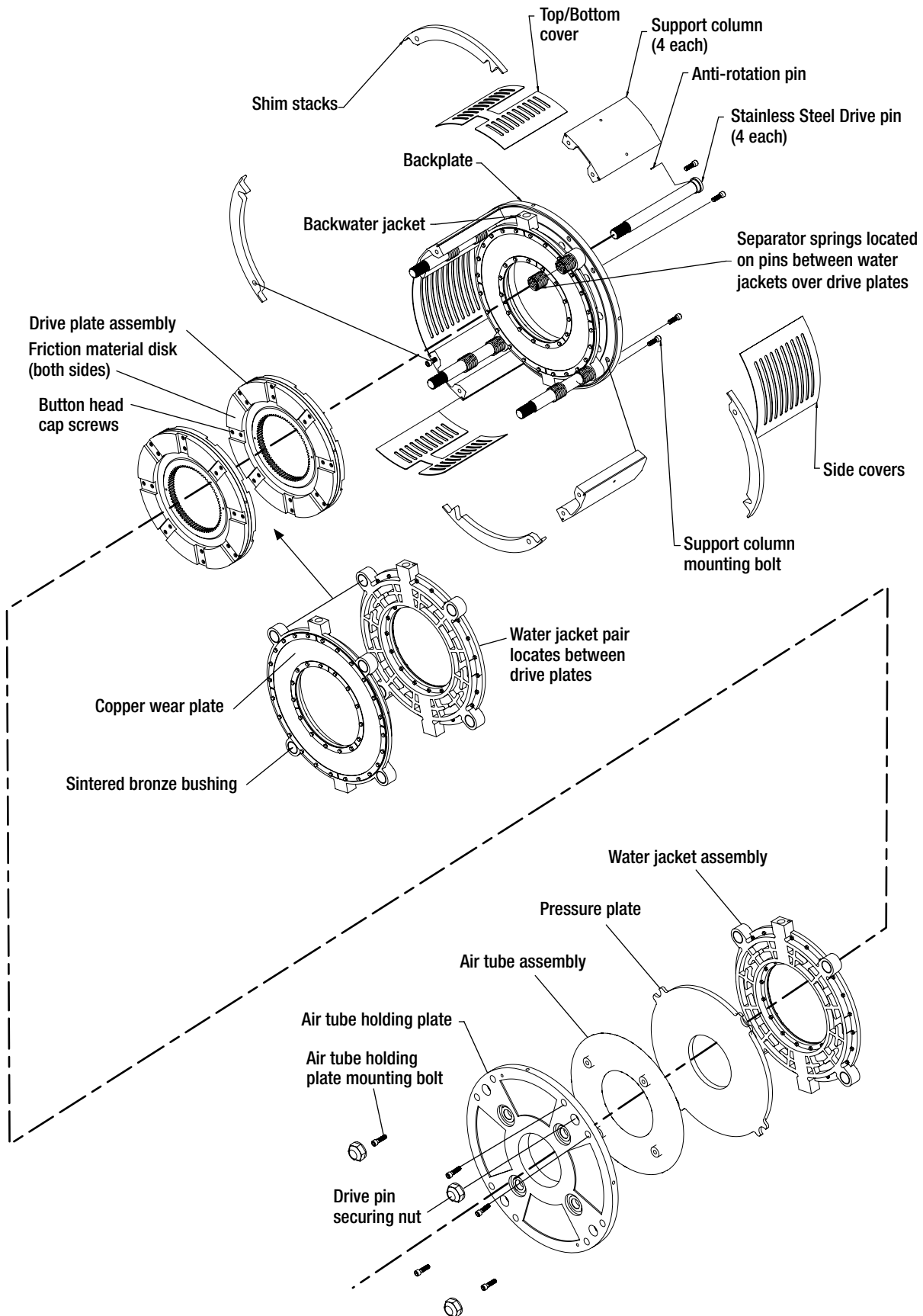
Model Size ATD-	Assembly Number	Dynamic Torque Capacity with Standard Linings (optional linings available)				Heat Capacity		
		lb.in.		Nm		Water Hosing HP/kW	Parallel	Max Bore
		80 PSI	100 PSI	5.5 BAR	7 BAR		Water Hosing HP/kW	Water Hosing HP/kW
KKB119AM	7-119AM-B-1000	66,500	83,100	7,500	9,380	93/69	185/138	5.50/140
KKB219AM	7-219AM-B-1000	133,000	166,300	15,000	18,700	185/135	370/276	5.50/140
KKB319AM	7-319AM-B-1000	199,500	249,000	22,500	28,100	278/207	555/414	5.50/140
KKB225AM	7-225AM-B-1000	264,000	330,000	29,800	37,200	350/261	700/522	8.13/207
KKB325AM	7-325AM-B-1000	396,000	495,000	44,700	55,900	600/447	1200/895	8.13/207
KKB136AM	7-136AM-B-1000	322,000	402,000	36,300	45,400	425/317	850/633	8.13/207
KKB236AM	7-236AM-B-1000	644,000	805,000	72,700	90,900	875/652	1750/1304	9.00/229
KKB336AM	7-336AM-B-1000	966,000	1,208,000	109,100	136,400	1275/950	2550/1900	9.00/229
KKB436AM	7-436AM-B-1000	1,288,000	1,611,000	145,600	182,000	1700/1260	3400/2535	9.00/229

### Mounting Hole Pattern

Model	øA		øB		øC		Hole Circle		PLT THK	
	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
19	28.28	718	11.00	279	.656	17	25.50	648	1.38	35
25	34.12	867	16.70	424	.656	17	31.00	787	1.38	35
36	45.50	1156	16.75	425	1.06	27	42.72	1085	1.38	35

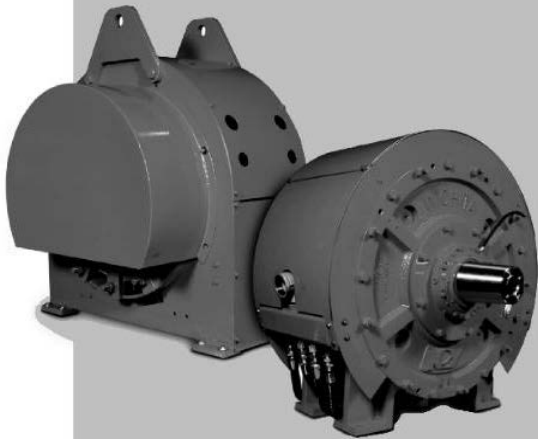
# AquaMaKKs Clutches and Brakes

## Exploded View



## Custom Engineered Solutions with Wichita

With Wichita Clutch, you get more than just a water cooled brake, you can get a turnkey solution. Whether you need a brake painted a preferred color, water connection kits, covers, shaft assemblies, or deck mount assemblies, Wichita will provide a custom engineered solution to meet your specific needs. Call Wichita today for more information.



**For assistance, please call, +44 (0) 1234 350 311**

**For after hours emergency service, call +44 (0) 1234 324 324**

# Notes

# Premier Industrial Company Leading Brands

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Our comprehensive product offerings include various types of clutches and brakes, overrunning clutches, engineered bearing assemblies, gearing and gear motors along with linear motion products, belted drives, couplings, limit switches, precision motors, drives & controls, and miniature motors. With thousands of product solutions available, Altra provides true single source convenience while meeting specific customer requirements. Many major OEMs and end users prefer Altra products as their No. 1 choice for performance and reliability.

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Kollmorgen



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Svendborg Brakes  
Twiflex  
Wichita Clutch



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## Wichita Clutch Facilities

### North America

#### USA

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Wichita Falls, TX 76302 - USA  
940-723-3400

*Pneumatic Clutches  
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### Europe

#### United Kingdom

Amphill Road  
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+44 (0) 1234 350311

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#### Wichita Clutch

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