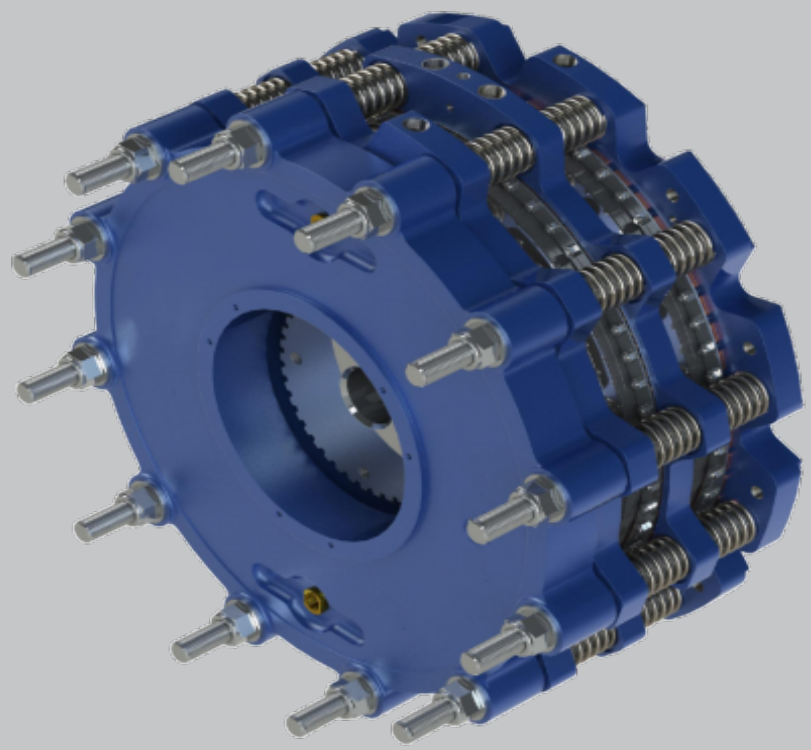
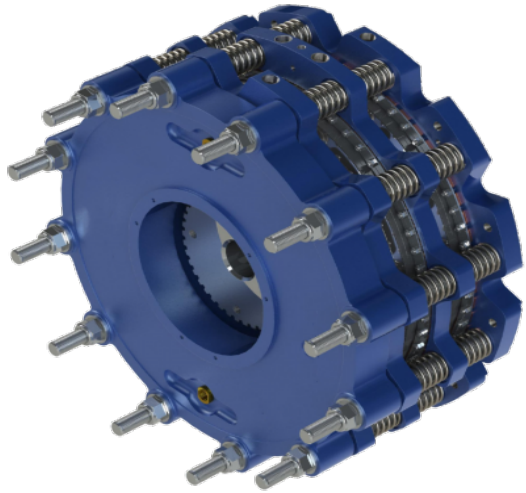
Water Cooled Brakes



Contents

Spring-Released



Water Cooled Brakes (WCB) are a high energy absorbing solution used for dynamic tensioning. The design of the internal water flow and copper alloy wear plates allow for excellent heat dissipation. WCB's are well suited for applications where a heavy-duty continuous slip tensioning is needed such as drawworks, mooring winches, dynamometers, paper converting, uncoilers and yarders.

- Available in air or hydraulic actuation
- Standard mounting hole pattern for OEM applications, rebuilds, or retrofits
- O-ring water jacket design allows for fast, easy field service
- Full Marine Corrosion Package available, see pg. 8
- Type approval certification available: DNV & ABS *(Others available on request)*

Specifications

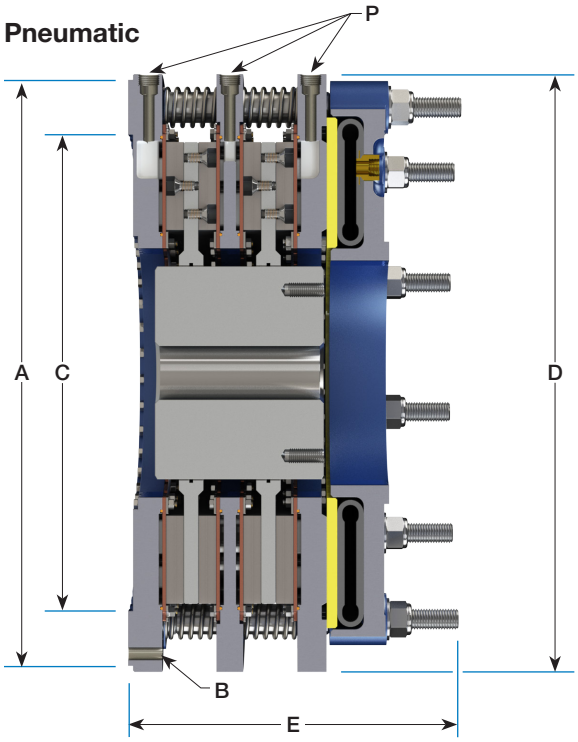
Model	Torque Rating[1]		Heat Dissipation[2] Capacity	Freshwater[2] Flow (minimum)	Maximum Speed		Total Weight	Hub & Drive Plate Weight	Hub & Drive Plate Inertia
	Medium Coefficient[3]	High Coefficient[3]			Free-Wheel	Slip			
	lbf·in (N·m)	lbf·in (N·m)	hp (kW)	gpm (L/min)	r/min		lb (kg)	lb (kg)	lb·ft² (kg·m²)
118	47,200 (5330)	72900 (8240)	144 (107)	14.4 (54.5)	1910	1270	400 (180)	88 (40)	21 (0.88)
218	94,300 (10700)	146,000 (16500)	290 (216)	29.0 (110)	1910	1270	590 (270)	180 (80)	42 (1.8)
318	142,000 (16000)	219,000 (24700)	430 (321)	43.0 (163)	1910	1270	800 (360)	280 (130)	66 (2.8)
418	189,000 (21300)	292,000 (32900)	580 (433)	58.0 (220)	1910	1270	990 (450)	350 (160)	84 (3.5)
124	126,000 (14200)	194,000 (21900)	325 (242)	32.5 (123)	1450	970	840 (380)	200 (89)	79 (3.3)
224	251,000 (28400)	388,000 (43900)	650 (485)	65.0 (246)	1450	970	1,300 (590)	430 (200)	160 (6.8)
324	377,000 (42600)	583,000 (65800)	970 (723)	97.0 (367)	1450	970	1,700 (780)	650 (300)	260 (11)
424	503,000 (56800)	777,000 (87800)	1,300 (969)	130 (492)	1450	970	2,100 (960)	860 (390)	370 (15)
136	373,000 (42100)	576,000 (65100)	780 (582)	78.0 (295)	950	640	2,500 (1200)	500 (230)	410 (17)
236	746,000 (84200)	1,150,000 (130000)	1,560 (1160)	156 (591)	950	640	3,700 (1700)	940 (430)	820 (34)
336	1,120,000 (126000)	1,730,000 (195000)	2,340 (1750)	234 (886)	950	640	4,900 (2200)	1,300 (600)	1,200 (51)
436	1,490,000 (168000)	2,300,000 (260000)	3,120 (2330)	312 (1180)	950	640	6,400 (2900)	1,900 (840)	1,700 (73)

[1] Pneumatic Rated Actuator Pressure: 100 psi (7 bar) All sizes Pneumatic Max Actuator Pressure: 130 psi (9 bar) All sizes
Hydraulic Rated Actuator Pressure: 18" = 330 psi (23 bar), 24" = 380 psi (26 bar), 36" = 410 psi (28 bar)
Hydraulic Max Actuator Pressure: 18" = 430 psi (30 bar), 24" = 490 psi (34 bar), 36" = 530 psi (37 bar)
Torque is directly proportional to the actuator pressure applied.

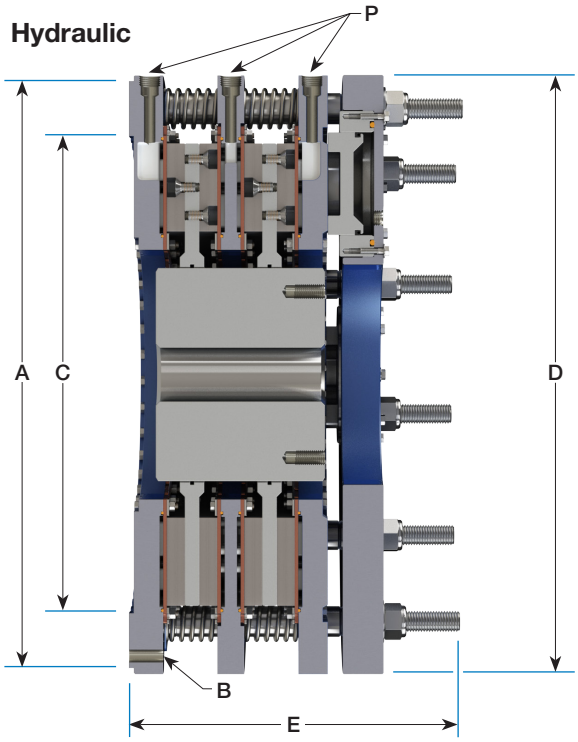
[2] Flow and heat dissipation ratings are for parallel water flow through the jackets. Rated heat dissipation requires a freshwater flowrate of 1 gpm for every 10 hp (one liter per minute for every 2 kW) and are based upon a 50°F (28°C) temperature rise between the inlet and outlet. The outlet water temperature should not exceed 170°F (77°C). Maximum static inlet water pressure is 45 psi (3.1 bar) for the 18"/24"and 40 psi (2.8 bar) for the 36". Maximum dynamic inlet / outlet water pressure is 60 psi (4.1 bar) / 20 psi (1.4 bar) for all sizes. Ethylene Glycol is the recommended coolant additive. At 50% concentration in water, the required flowrate is 1.5 times the freshwater flowrate, due to the reduced specific heat of the solution. Seawater may be used as a coolant, with the same flow characteristics as with freshwater, and purging with freshwater after each use.

[3] Low Coefficient and Extra-High Coefficent Friction Material offerings are available.

Pneumatic



Hydraulic

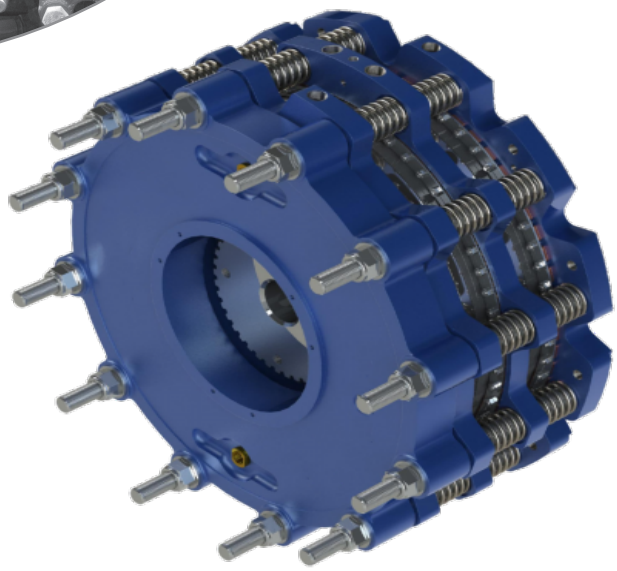


Dimensions

Model	A[2] +0.000/-0.003 (+0.00/-0.08)	B			C +0.003/-0.000 (+0.08/-0.00)	P	D	E	Bore Range[3]	
		Hole Circle	Diameter	Qty[1]					Minimum	Maximum
	in (mm)	in (mm)	in (mm)		in (mm)	NPT	in (mm)	in (mm)	in (mm)	in (mm)
118	23.250 (590.55)	22.00 (558.8)	21/32 (16.7)	10	18.250 (463.55)	1/2	23 5/8 (600.1)	9 3/4 (247.3)	2.25 (57.2)	5.34 (135.7)
218								13 1/8 (331.8)	2.25 (57.2)	5.34 (135.7)
318								17 3/8 (441.3)	2.25 (57.2)	5.34 (135.7)
418								21 5/8 (548.6)	2.25 (57.2)	5.34 (135.7)
124	29.998 (761.95)	28.75 (730.3)	21/32 (16.7)	10	24.375 (619.13)	3/4	30 5/8 (777.9)	11 1/4 (284.2)	2.75 (69.9)	7.00 (177.8)
224								17 1/8 (435.0)	2.75 (69.9)	7.00 (177.8)
324								24 1/8 (612.8)	2.75 (69.9)	7.00 (177.8)
424								30 3/4 (779.5)	2.75 (69.9)	7.00 (177.8)
136	44.498 (1130.25)	42.00 (1066.8)	1 1/16 (27.0)	14	18.375 (466.73)	1 1/4	44 7/8 (1139.8)	17 1/4 (439.0)	4.00 (101.6)	10.13 (257.2)
236								20 3/4 (527.9)	5.00 (127.0)	10.13 (257.2)
336								27 1/2 (699.4)	7.00 (177.8)	10.13 (257.2)
436								35 (889.9)	7.50 (190.5)	10.13 (257.2)

[1] 18" and 24" brakes have (10) mounting holes based on a (12) hole pattern. 36" brakes have (14) mounting holes based on a (16) hole pattern. (2) holes omitted for coolant inlets/outlets
[2] 36" brakes: +0.000/-0.005 (+0.00/-0.13)
[3] Maximum bores shown are with a standard square key.

Spring-Applied



Water Cooled Spring Applied Brakes are a high energy absorbing solution used as a dynamic tensioning, static holding, or emergency stop brake. These brakes are spring-applied and released through pneumatic or hydraulic pressure. The WCB Spring Applied Brake is ideal for applications that require dissipation of large thermal loads such as marine winches, drilling rig drawworks, and logging equipment.

- Available in air or hydraulic release
- Standard mounting hole pattern for OEM applications, rebuilds, or retrofits
- O-ring water jacket design allows for fast, easy field service
- Full Marine Corrosion Package available, see pg. 8
- Type approval certification available: DNV & ABS *(Others available on request)*
- Dual actuation available

Specifications

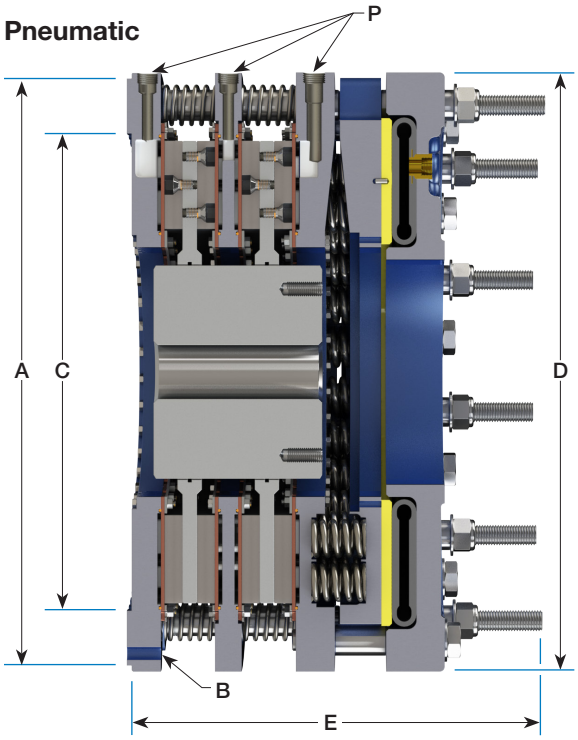
Model	Torque Rating[1]		Heat Dissipation[2] Capacity	Freshwater[2] Flow (minimum)	Maximum Speed		Total Weight	Hub & Drive Plate Weight	Hub & Drive Plate Inertia
	Medium Coefficient[3]	High Coefficient[3]			Free-Wheel	Slip			
	lbf·in (N·m)	lbf·in (N·m)	hp (kW)	gpm (L/min)	r/min	r/min	lb (kg)	lb (kg)	lb·ft² (kg·m²)
118	46,600 (5260)	71,900 (8130)	144 (107)	14.4 (54.5)	1,910	1,270	600 (270)	88 (40)	21 (0.88)
218	86,600 (9790)	134,000 (15100)	290 (216)	29.0 (110)	1,910	1,270	790 (360)	180 (80)	42 (1.8)
318	120,000 (13600)	186,000 (21000)	430 (321)	43.0 (163)	1,910	1,270	1,000 (450)	280 (130)	66 (2.8)
418	148,000 (16700)	229,000 (25800)	580 (433)	58.0 (220)	1,910	1,270	1,200 (540)	350 (160)	84 (3.5)
124	127,000 (14300)	196,000 (22100)	325 (242)	32.5 (123)	1,450	970	1,300 (590)	200 (89)	79 (3.3)
224	238,000 (26900)	368,000 (41600)	650 (485)	65.0 (246)	1,450	970	1,700 (790)	430 (200)	160 (6.8)
324	334,000 (37800)	516,000 (58300)	970 (723)	97.0 (367)	1,450	970	2,200 (980)	650 (300)	260 (11)
424	415,000 (46900)	642,000 (72600)	1,300 (969)	130 (492)	1,450	970	2,600 (1200)	860 (390)	370 (15)
136	391,000 (44100)	604,000 (68200)	780 (582)	78.0 (295)	950	640	2,500 (1200)	500 (230)	410 (17)
236	755,000 (85200)	1,170,000 (132000)	1,560 (1160)	156 (591)	950	640	3700 (1700)	940 (430)	820 (34)
336	1,090,000 (123000)	1,690,000 (191000)	2,340 (1750)	234 (886)	950	640	4,900 (2200)	1,300 (600)	1,200 (51)
436	1,400,000 (158000)	2,170,000 (245000)	3,120 (2330)	312 (1180)	950	640	6,400 (2900)	1,900 (840)	1,700 (73)

[1] Pneumatic Rated Actuator Release Pressure: 115 psi (7.9 bar) Approximately, All sizes Pneumatic Max Actuator Release Pressure: 130 psi (9 bar) All sizes
Hydraulic Rated Actuator Release Pressure: 18" = 330 psi (23 bar), 24" = 380 psi (26 bar), 36" = 410 psi (28 bar)
Hydraulic Max Actuator Release Pressure: 18" = 430 psi (30 bar), 24" = 490 psi (34 bar), 36" = 530 psi (37 bar)
Torque is inversely proportional to the actuator pressure applied.

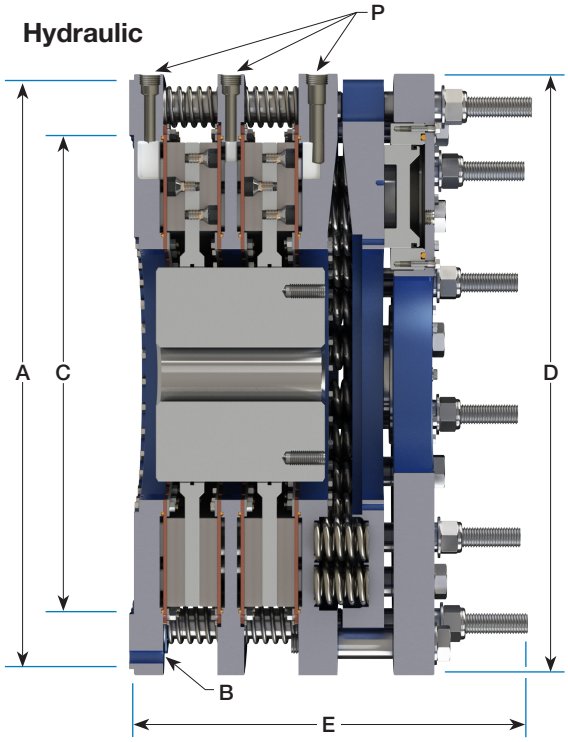
[2] Flow and heat dissipation ratings are for parallel water flow through the jackets. Rated heat dissipation requires a freshwater flowrate of 1 gpm for every 10 hp (one liter per minute for every 2 kW) and are based upon a 50°F (28°C) temperature rise between the inlet and outlet. The outlet water temperature should not exceed 170°F (77°C). Maximum static inlet water pressure is 45 psi (3.1 bar) for the 18"/24"and 40 psi (2.8 bar) for the 36". Maximum dynamic inlet / outlet water pressure is 60 psi (4.1 bar) / 20 psi (1.4 bar) for all sizes. Ethylene Glycol is the recommended coolant additive. At 50% concentration in water, the required flowrate is 1.5 times the freshwater flowrate, due to the reduced specific heat of the solution. Seawater may be used as a coolant, with the same flow characteristics as with freshwater, and purging with freshwater after each use.

[3] Low Coefficient and Extra-High Coefficent Friction Material offerings are available.

Pneumatic



Hydraulic

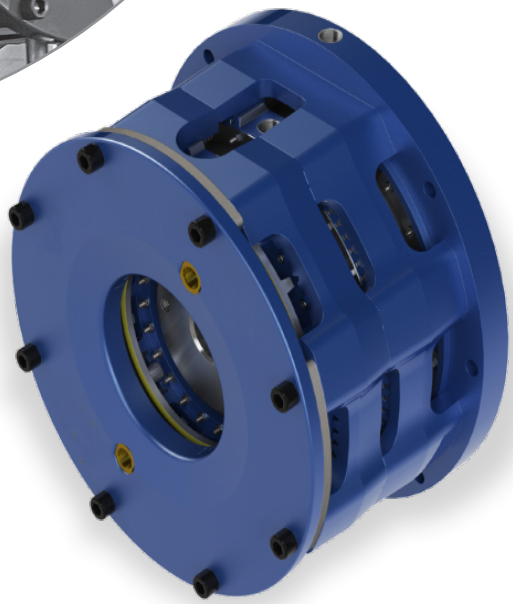


Dimensions

Model	A[2] +0.000/-0.003 (+0.00/-0.08)	B			C +0.003/-0.000 (+0.08/-0.00)	P	D	E	Bore Range[3]	
		Hole Circle	Diameter	Qty[1]					Minimum	Maximum
	in (mm)	in (mm)	in (mm)		in (mm)	NPT	in (mm)	in (mm)	in (mm)	in (mm)
118	23.250 (590.55)	22.00 (558.8)	21/32 (16.7)	10	18.250 (463.55)	1/2	23 5/8 (600.1)	10 3/4 (273.1)	2.25 (57.2)	5.34 (135.7)
218								14 1/8 (358.8)	2.25 (57.2)	5.34 (135.7)
318								18 3/8 (466.7)	2.25 (57.2)	5.34 (135.7)
418								22 5/8 (574.7)	2.25 (57.2)	5.34 (135.7)
124	29.998 (761.95)	28.75 (730.3)	21/32 (16.7)	10	24.375 (619.13)	3/4	30 5/8 (777.9)	15 1/4 (387.4)	2.75 (69.9)	7.00 (177.8)
224								21 1/8 (536.6)	2.75 (69.9)	7.00 (177.8)
324								28 1/8 (714.4)	2.75 (69.9)	7.00 (177.8)
424								34 3/4 (882.7)	2.75 (69.9)	7.00 (177.8)
136	44.498 (1130.25)	42.00 (1066.8)	1 1/16 (27.0)	14	18.375 (466.73)	1 1/4	44 7/8 (1139.8)	21 7/8 (555.6)	4.00 (101.6)	10.13 (257.2)
236								25 3/8 (644.5)	5.00 (127.0)	10.13 (257.2)
336								32 1/8 (816.0)	7.00 (177.8)	10.13 (257.2)
436								39 5/8 (1006.5)	7.50 (190.5)	10.13 (257.2)

[1] 18" and 24" brakes have (10) mounting holes based on a (12) hole pattern. 36" brakes have (14) mounting holes based on a (16) hole pattern. (2) holes omitted for coolant inlets/outlets
[2] 36" brakes: +0.000/-0.005 (+0.00/-0.13)
[3] Maximum bores shown are with a standard square key.

Copper Water Cooled



Power Copper Water Cooled (CWC) brakes are designed for maximum heat transfer in a small package. The CWC is perfect for tension control equipment, coil processing, paper converting, unwinding stands, and large inertia stops.

- O-ring water jacket design allows for fast, easy field service
- Standard mounting hole pattern for OEM applications, rebuilds, or retrofits
- No outboard support required
- Legacy service parts available for additional sizes

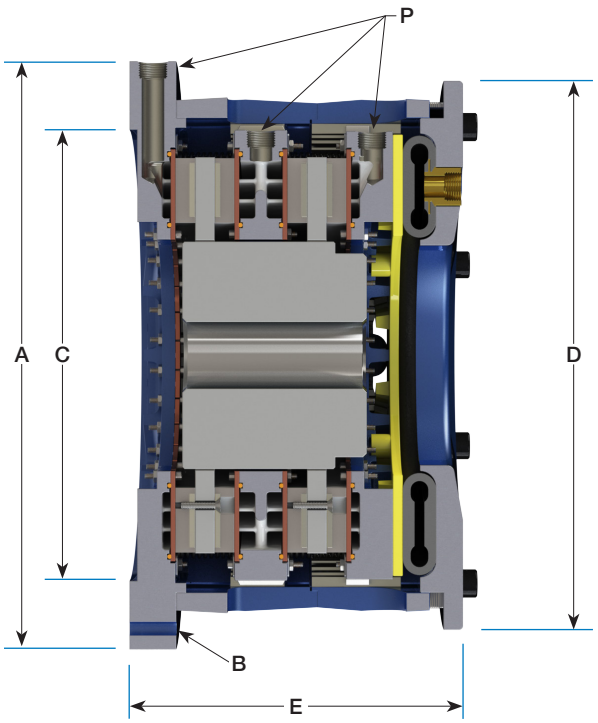
Specifications

Model	Pneumatic Torque Rating @ 100 psi (7 bar)[1]		Heat Dissipation Capacity[2]		Freshwater[2] Flow (minimum)	Maximum Speed		Total Weight	Hub & Drive Plate Weight	Hub & Drive Plate Inertia
	Medium Coefficient[3]	High Coefficient[3]	Parallel Piping	Series Piping		Free-Wheel	Slip			
	lbf·in (N·m)	lbf·in (N·m)	hp (kW)	hp (kW)	gpm (L/min)	r/min	r/min	lb (kg)	lb (kg)	lb·ft² (kg·m²)
114	16,100 (1820)	24,900 (2820)	75.0 (56.0)	50.0 (37.0)	7.50 (45.0)	2740	1820	240 (110)	35 (16)	6.2 (0.26)
214	32,200 (3640)	49,800 (5630)	150 (112)	100 (75.0)	15.0 (57.0)	2740	1820	380 (170)	68 (31)	12 (0.52)
314	48,400 (5460)	74,700 (8450)	225 (168)	150 (112)	23.0 (84.0)	2740	1820	510 (230)	163 (74)	52 (2.2)
118	36,700 (4150)	56,700 (6410)	120 (89.0)	80.0 (60.0)	12.0 (45.0)	2120	1410	350 (160)	100 (46)	18 (0.75)
218	73,400 (8290)	113,000 (12800)	240 (179)	160 (119)	24.0 (90.0)	2120	1410	620 (280)	200 (91)	35 (1.5)
318	110,000 (12400)	170,000 (19200)	360 (268)	240 (179)	36.0 (135)	2120	1410	880 (400)	310 (140)	54 (2.3)
124	79,200 (8940)	122,000 (13800)	285 (213)	190 (142)	29.0 (106)	1610	1070	870 (400)	310 (140)	370 (16)
224	158,000 (17900)	245,000 (27600)	570 (425)	380 (283)	58.0 (212)	1610	1070	1,200 (550)	760 (350)	760 (32)
324	237,000 (26800)	367,000 (41500)	855 (638)	570 (425)	87.0 (318)	1610	1070	1,600 (700)	1,100 (500)	1,100 (47)

[1] Pneumatic Max Actuator Pressure: 130 psi (9 bar) All sizes
Torque is directly proportional to the actuator pressure applied.

[2] Rated heat dissipation requires a freshwater flowrate of 1 gpm for every 10 hp (one liter per minute for every 2 kW) and are based upon a 50°F (28°C) temperature rise between the inlet and outlet. The outlet water temperature should not exceed 170°F (77°C). Maximum inlet water pressure is 60 psi (4.1 bar). Ethylene Glycol is the recommended coolant additive. At 50% concentration in water, the required flowrate is 1.5 times the freshwater flowrate, due to the reduced specific heat of the solution.

[3] Low Coefficient and Extra-High Coefficent Friction Material offerings are available.



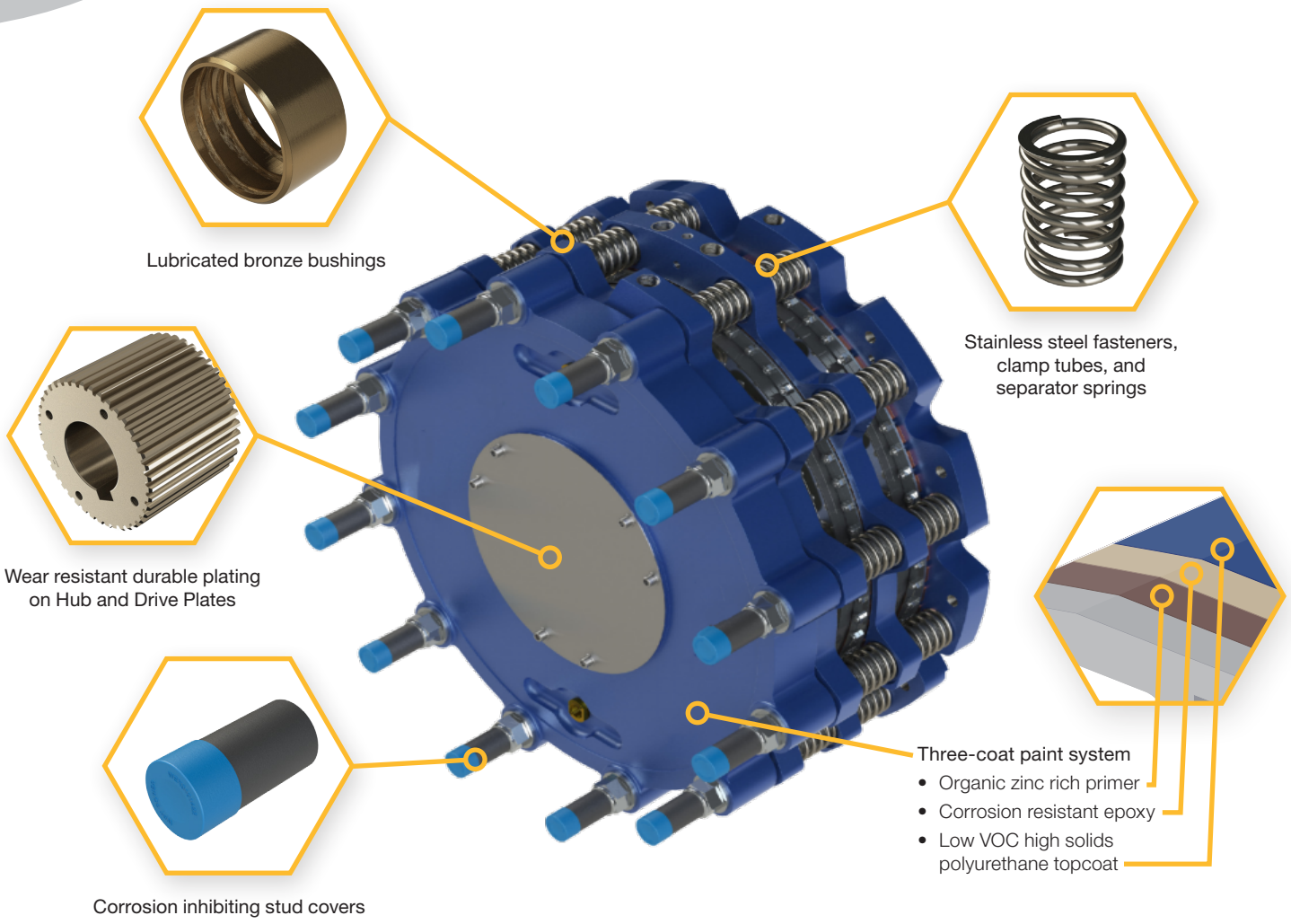
Dimensions

Model	A +0.000/-0.003 (+0.00/-0.08)	B			C +0.003/-0.000 (+0.08/-0.00)	P	D	E	Bore Range[2]	
		Hole Circle	Diameter	Qty[1]					Minimum	Maximum
	in (mm)	in (mm)	in (mm)		in (mm)	NPT	in (mm)	in (mm)	in (mm)	in (mm)
114	18.750 (476.25)	17.50 (444.5)	21/32 (16.7)	6	14.375 (365.13)	1/2	17 1/2 (444.5)	7 (177.8)	2.13 (54.0)	4.50 (114.3)
214								10 5/8 (269.9)	2.13 (54.0)	4.50 (114.3)
314								14 1/4 (362.0)	2.13 (54.0)	4.50 (114.3)
118	23.250 (590.54)	22.00 (558.8)	21/32 (16.7)	10	18.250 (463.55)	1/2	22 (558.8)	8 (201.5)	2.25 (57.2)	5.78 (146.8)
218								12 1/8 (308.0)	2.25 (57.2)	5.78 (146.8)
318								16 3/8 (414.3)	2.25 (57.2)	5.78 (146.8)
124	30.000 (762.00)	28.75 (730.3)	21/32 (16.7)	10	24.375 (619.13)	3/4	29 (736.6)	9 (228.2)	2.13 (54.0)	8.00 (203.2)
224								13 5/8 (347.3)	2.13 (54.0)	8.00 (203.2)
324								18 3/8 (466.3)	2.13 (54.0)	8.00 (203.2)

[1] 14" brakes have (6) mounting holes based on a (8) hole pattern. 18" and 24" brakes have (10) mounting holes based on a (12) hole pattern. (2) holes omitted for coolant inlets/outlets
[2] Maximum bores shown are with a standard square key.

Full Marine Corrosion Package

The Full Marine Corrosion Protection package delivers the defense needed for equipment running above deck or below deck in the harshest of saltwater environments.



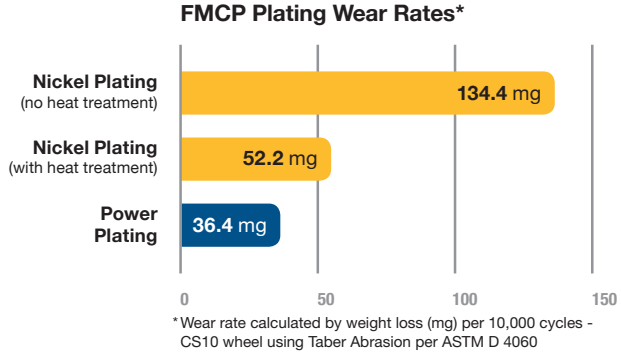
Lubricated bronze bushings

Stainless steel fasteners, clamp tubes, and separator springs

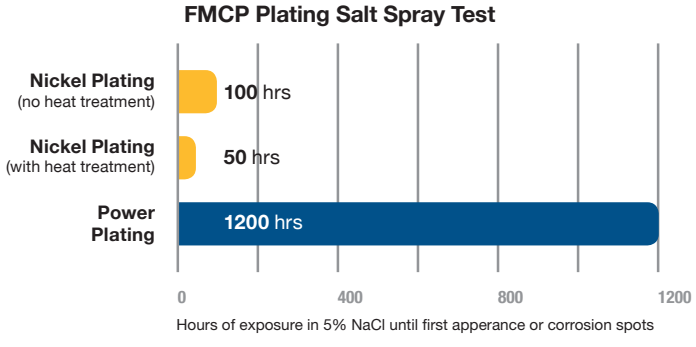
Wear resistant durable plating on Hub and Drive Plates

Three-coat paint system
- Organic zinc rich primer
- Corrosion resistant epoxy
- Low VOC high solids polyurethane topcoat

Corrosion inhibiting stud covers

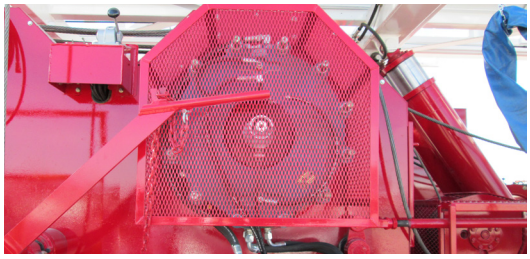


*Wear rate calculated by weight loss (mg) per 10,000 cycles - CS10 wheel using Taber Abrasion per ASTM D 4060



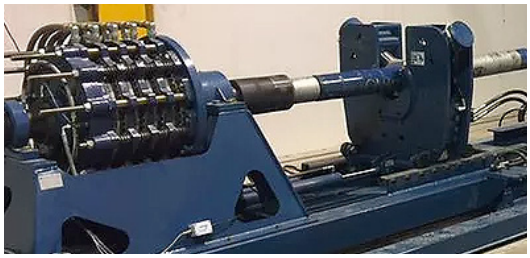
Hours of exposure in 5% NaCl until first apperance or corrosion spots

Water Cooled Brake Applications



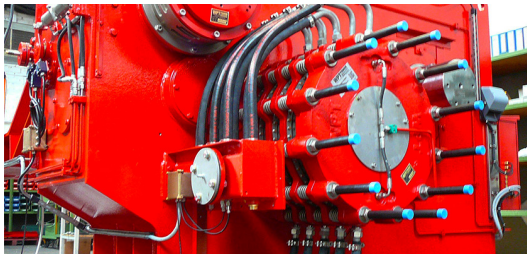
Drawworks

It's ability to dissipate large thermal loads and precision control in dynamic and static braking conditions, make Water Cooled Brake ideal for drilling or well service operations



Dynamometers

In dyno applications, torque control and energy dissipation are key factors. The Water Cooled Brake airtube and hydraulic multi-piston radial actuators provide a wide torque range and precision control. The high-flow water jackets and copper linings transfer the energy quickly and efficiently.

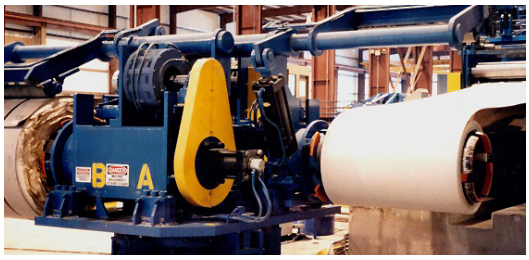


Marine Winches

The constant, demanding heave-in and payout mooring operations at sea require a brake with high thermal capacity. The use of copper wear plates in Water Cooled Brake design allows for maximum heat dissipation during operational cycles. The proprietary Full Marine Corrosion Package protects the brake in the harshest marine environments.

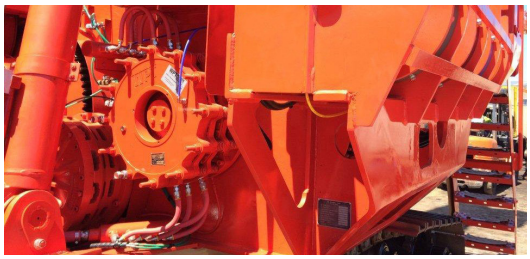
Paper Converting

Accurate torque and tension control, as well as constant water flow to maintain friction temperature, provide consistent performance and increased service life. These qualities make Water Cooled Brakes well suited for winding applications inside paper mills.



Coil Processing

Water Cooled Brakes provide accurate tension control and excellent heat dissipation for uncoilers, unwind stands, and slitters in metal processing plants.



Yarders

Water Cooled Brakes are designed for continuous slip service, well suited for the log yarder application. Winch drum cables must either be slowed or stopped/ held, creating large thermal loads that must be dissipated. Log yarders depend on the consistent performance of brakes.