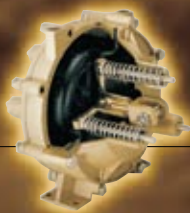


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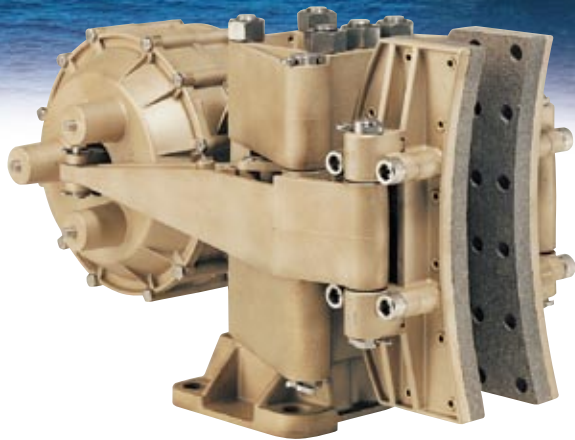
DISC BRAKES
HYDRAULIC STEERING & ACCESSORIES
ELECTRONIC CONTROLS
PNEUMATIC CONTROLS
PUSH-PULL CONTROLS

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EDITION
2008 – 2009

When Reliability is Everything.



*K*obelt has gained worldwide recognition for manufacturing extremely reliable controls and disc brake systems. And we're

put to the test every day. Kobelt Manufacturing has been producing high quality marine controls, steering components and brake systems for over 35 years. Contact us today!

KOBELT

Quality Control



KOBELT DISC BRAKES

GENERAL INFORMATION

Kobelt Manufacturing has been designing and manufacturing disc brake systems for over 30 years. We have gained an enviable reputation for cost-effective performance and reliability.

Kobelt disc brakes are used in all corners of the world. The applications we serve are limitless. Sales and service are available from distributors throughout the world.

Most of our older brake calipers were manufactured in sand cast bronze. Increased demand prompted us to apply our extensive knowledge of bronze die-casting technology to a whole new series of brakes. Caliper models 5019-5028 are made entirely of die-cast silicon bronze with stainless steel hardware. While older models are still available upon special request, the new series is much more uniform in design and is also more cost-effective.

All our calipers are available in either fluid or spring applied configurations. Several types of brake linings are also available to conform with environmental guidelines.

APPLICATIONS

- Aerospace
- Cable spooling reels
- Cable trams
- Chair lifts
- Conveyor belt systems
- Draw work disc brakes, both on land and off-shore
- Drill ship anchor handling
- Hoists
- Industrial equipment
- Logging and forestry
- Mining
- Paper industry
- Pipe laying barges
- Propellor shaft brakes, from 40 - 50,000 H.P.
- Railroad equipment
- Sugar industry
- Wind generators

DISC BRAKE SELECTION

Selecting the proper brake disc and brake caliper is important and can only be accomplished if all the information pertaining to the operation of the braking system is made available to Kobelt Manufacturing.

When completing the application form, it is best to consider the most challenging operating conditions. If a brake runs 95% of the time on the light-duty cycle, and 5% on the heavy-duty cycle, it is the 5% that must be considered when selecting a braking system.

Disc brakes are used in innumerable types of applications. A static holding brake obviously requires very little consideration. Stopping brakes are relatively simple. Tensioning and cycling brakes can become very complex. We have in-house computer programs to assist our customers in selecting the proper combination of brake disc and brake caliper.

The information that we provide is reliable within 5%, and includes a 20% safety margin. If a brake disc, however, is poorly installed (no air circulation), overheating, disc failure and premature lining wear may result.

When installing a brake disc that is running at elevated temperatures, it is of extreme importance to allow for disc expansion and contraction in operation. Bolt holes for attaching a disc should be over-sized and spigot ID's must have clearance. Failing to leave allowance for disc expansion and contraction may result in early disc failure.

Contact Kobelt Manufacturing with the details of your specific application. Let us help you select the most suitable disc brake system to stop your machinery safely and effectively.



Kobelt is ISO 9001:2000 certified.

GENERAL INFORMATION

Braking systems having to absorb continuous energy require a disc that is capable of absorbing and radiating the input energy to atmosphere. The brake caliper must also have sufficient lining area to absorb the energy without going beyond the Pressure Velocity Ratio. The PV ratio should never exceed 250,000; that is to say, pounds per square inch of lining pressure and feet per minute rubbing speed. No general rule can be given in this area since all the factors of a braking system must be considered before making a definite choice. Small brake shoes such as the 5019 and 5020 are not suited for continuous energy input unless, of course, the energy is very small. The table (below) shows the horsepower hour (H.P. hour) before brake lining replacement becomes necessary. In other words, a 5020 brake caliper can absorb 1733 H.P. hour before brake lining replacement becomes necessary. If, however, the temperature exceeds 650°-700° F, the lining will disappear at a much faster rate. Looking at brake caliper 5026, you will note that 27,160 H.P. hour of energy input into the lining is available. Again, if elevated

temperatures occur, lining wear will accelerate. It is therefore extremely important to first of all pick a disc that is capable of absorbing the energy and a brake caliper having sufficient lining to give a reasonable service life for the brake lining.

The disc thickness is also specified on the table and the minimum lining thickness before lining replacement should take place.

Caliper	5019		5020		5021		5022		5023		5024		5025		5026		5027		5028	
	-A	-S	-A	-S	-A	-S	-A	-S	-A	-S	-A	-S	-A	-S	-A	-S	-A	-S	-A	-S
Weight/lbs.	15	17	36	42	53	59	92	102	52	61	97	108	104	113	177	186	165	186	330	349
Maximum Clamp Force (lbs.)	5,250		9,160		9,160		18,320		16,000		25,740		17,160		32,000		48,000		48,000	
Lever Ratio	3.5:1		3.8:1		3.8:1		3.8:1		4.12:1		4.29:1		4.29:1		4.0:1		4.0:1		4.0:1	
Actual Force each side (lbs. per actuator)	750		1,200		1,200		1,200		2,000		3,000		2,000		2,000		3,000		3,000	
Number of Levers	2		2		2		4		2		2		2		4		4		4	
Total Shoe Area (square inches)	18		26		60		86		60		75		120		194		114		420	
Lining Thickness (inches)	5/16		3/8		1/2		1/2		1/2		5/8		5/8		5/8		5/8		0.7"	
Maximum Allowance Lining Wear (inches)	.140		.200		.300		.300		.300		.420		.420		.420		.420		.500	
H.P. Hour	840		1,733		6,000		8,600		6,000		10,500		16,800		27,160		15,900		69,000	
Disc Maximum Thickness (inches)	3/4		1 1/4		2		2		2		2		4		4		2		4	
Disc Diameter (inches)	9-20		12-30		18-60		18-60		18-60		18-60		24-72		30-72		30-72		42.5-96	
Disc Rubbing Face Width (inches)	2		2 1/2		4		4		4		4		7		7		4		10	
Pipe Fitting (Fluid Applied) NPT	1 of 1/4"		2 of 1/4"		2 of 1/4"		4 of 1/4"		2 of 1/4"		2 of 1/4"		2 of 1/4"		4 of 1/4"		4 of 1/4"		4 of 1/4"	
Volume In ³ Maximum (Fluid Applied)	9		30		30		60		55		90		55		110		180		180	
Pipe Fitting (Spring Applied) NPT	1 of 1/4"		1 of 1/4"		1 of 1/4"		2 of 1/4"		1 of 3/8"		1 of 3/8"		1 of 3/8"		2 of 3/8"		2 of 3/8"		2 of 3/8"	
Volume In ³ Maximum (Spring Applied)	9		19		19		38		48		48		48		96		96		96	

KOBELT BRAKE CALIPERS

WHY ARE KOBELT BRAKE CALIPERS THE BEST?

Kobelts calipers are designed for the harshest environments. Very little maintenance is required because of the rugged construction. Our many patented features put these brakes in a class by themselves.

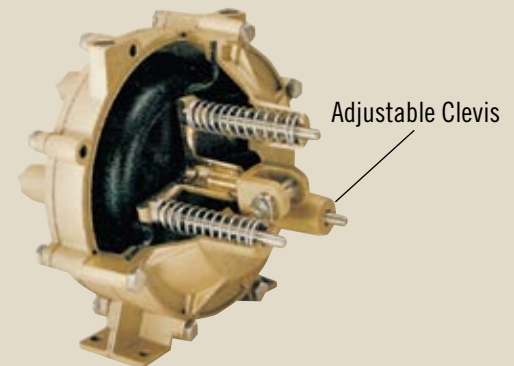
All calipers are lever operated, which keeps the actuator away from the heat of the disc. The actuators themselves are of the low pressure type, requiring maximum 100 P.S.I. (6.9 bar) for pressure applied brakes and maximum 140 P.S.I. (9.6 bar) (fully released) for spring applied calipers. Either air or hydraulic pressure can be used. For applications with high-pressure hydraulics, special actuators are available. All actuators have adjustable clevises to adjust the clearance between the disc and the shoe. This can compensate for brake lining wear as well as maintain the torque on spring applied calipers. On fluid applied brake calipers air consumption can be reduced by maintaining little clearance between the shoe and the disc.

The pressure applied to the brake is absolutely proportional to the brake torque itself. Therefore, our actuators, both fluid and spring applied, lend themselves extremely well to applications requiring precise control over the brake torque. All brake calipers, (except Model 1720) use floating brake shoes. A balancing link (patented) is utilized to keep the shoes parallel to the disc, which ensures even lining wear across the whole shoe. Spring applied calipers are furthermore equipped with an equalizing link. This linkage arrangement keeps the shoes centered in relation to the disc. This is useful, should the caliper be installed on a horizontally rotating disc, where one of the brake shoes could cause drag. All of our calipers have a large shoe area, giving long lining life. The linings are asbestos-free.

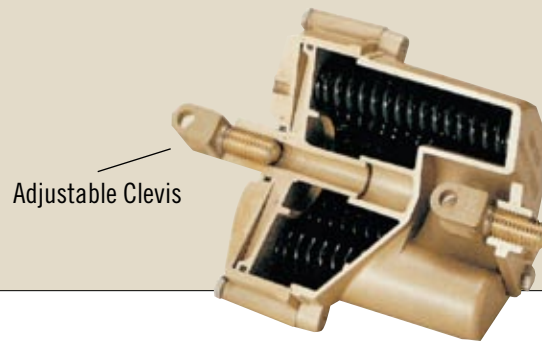
Kobelts disc brakes are manufactured under one or more of the following Patent Numbers. (Further patents pending.)

Canadian Patent Numbers	U.S. Patent Numbers
895693	3722636
922603	3815471
1069066	4013148
1072025	4060153
1158181	4108285
1176187	4121697
	4164993
	4236608
	4393962
	4572335

Typical Fluid Applied Actuator



Typical Spring Applied Actuator

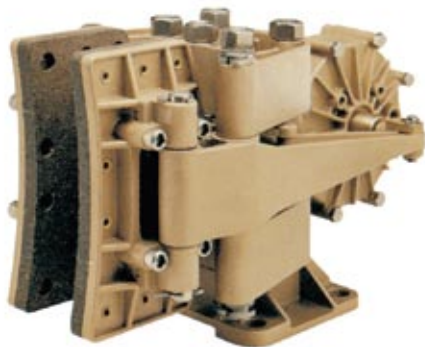


CUSTOM ACTUATORS

Kobelts Manufacturing offers many actuators that can be fitted to various brake calipers. The standard actuators are basically all low pressure devices in either spring or fluid set. We make a large variety of actuators for high pressure fluid applied applications, as well as high and medium pressure spring applied actuators. If you have any specific requirements please let us know. Most of our calipers are also available in standard or side mount version. Our Engineering Department will be pleased to come up with a solution to suit your application.

5019-5028 DIE CAST BRAKE CALIPERS

These calipers are made entirely of die cast silicone bronze with stainless steel hardware. The standard lining supplied is asbestos-free with a co-efficient of friction between .45 to .55. Patented balancing links are used to ensure even lining wear. All calipers are available with shims between the shoe and the bearing to adapt to thinner discs. Most of our actuators are of the low-pressure type. Air or hydraulic pressure can be used to either apply or release the brake. The pressure applied brakes have a maximum pressure of 100 P.S.I. To fully release a spring applied brake is 140 P.S.I. The maximum pressure for a spring applied brake is 250 P.S.I.



5021



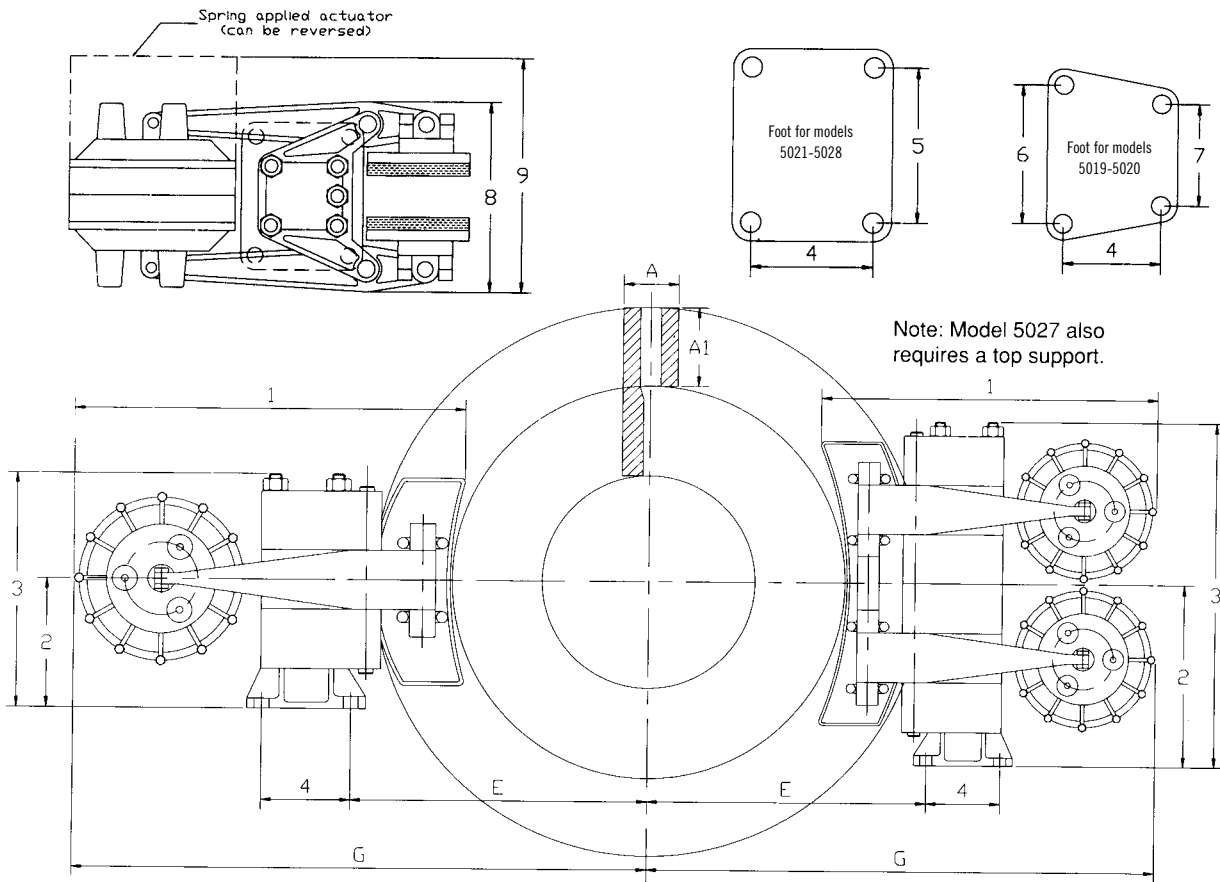
5027

Figures below refer to one brake per disc – more brakes per disc are available.

Caliper Number	Disc Diameter		Maximum Torque		Dim. E		Dim. G (approx)	
	in.	mm.	ft.-lbs.	kg.-m.	in.	mm.	in.	mm.
5019	9	229	764	106	5.56	141	12.06	306
	12	305	1092	151	7.06	179	13.56	344
	15	381	1420	196	8.56	217	15.06	383
	18	457	1748	242	10.06	256	16.56	421
	20	508	1969	272	11.06	281	17.56	446
5020	12	305	1805	250	7.25	184	17.25	438
	15	381	2375	328	8.75	222	18.75	476
	18	457	2945	407	10.25	260	20.25	514
	21	533	3515	486	11.75	298	21.75	552
	24	610	4085	565	13.25	337	23.25	591
	27	686	4655	644	14.75	375	24.75	629
	30	762	5225	722	16.25	413	26.25	667
5021	18	457	2660	368	9.75	248	19.50	495
	20	508	3040	420	10.75	273	20.50	521
	25	635	3990	552	13.25	337	23.00	584
	30	762	4940	683	15.75	400	25.50	648
	35	889	5890	814	18.25	464	28.00	711
	40	1016	6840	946	20.75	527	30.50	775
	45	1143	7790	1077	23.25	591	33.00	838
	50	1270	8740	1208	25.75	654	35.50	902
	5022*	18	457	5320	736	9.37	238	19.12
20		508	6080	841	10.37	263	20.12	511
25		635	7980	1103	12.87	327	22.62	575
30		762	9880	1366	15.37	390	25.12	638
35		889	11780	1629	17.87	454	27.62	702
40		1016	13680	1891	20.37	517	30.12	765
45		1143	15580	2154	22.87	581	32.62	829
50		1270	17480	2417	25.37	644	35.12	892
5023		18	457	4664	645	9.75	248	20.63
	20	508	5328	737	10.75	273	21.63	549
	25	635	7000	968	13.25	337	24.13	613
	30	762	8664	1198	15.75	400	26.63	676
	35	889	10336	1429	18.25	464	29.13	740
	40	1016	12000	1659	20.75	527	31.63	803
	45	1143	13664	1889	23.25	591	34.13	867
	50	1270	15336	2120	25.75	654	36.63	930
	5024	18	457	7507	1038	10.12	257	24.12
20		508	8580	1186	11.12	282	25.12	638
25		635	11261	1557	13.62	346	27.62	702
30		762	13942	1928	16.12	409	30.12	765
35		889	16624	2298	18.52	470	32.62	829
40		1016	19305	2669	21.12	536	35.12	892
45		1143	21986	3040	23.62	600	37.62	956
50		1270	24668	3410	26.12	663	40.12	1019
5025		30	762	8230	1138	15.42	392	27.92
	35	889	10038	1388	17.92	455	30.42	773
	40	1016	11754	1625	20.42	519	32.92	836
	48	1219	14678	2029	24.42	620	36.92	938
5026*	30	762	15360	2124	15.14	385	27.14	689
	35	889	18720	2588	17.64	448	29.64	753
	40	1016	21920	3031	20.14	512	32.14	816
	48	1219	27360	3783	24.14	613	36.14	918
5027*	30	762	26000	3595	16.00	406	29.50	749
	35	889	31000	4286	18.50	470	32.00	813
	40	1016	36000	4977	21.00	533	34.50	876
	45	1143	41000	5668	23.50	597	37.00	940
	50	1270	46000	6360	26.00	660	39.50	1003
5028*	42.5	1080	30500	4217	21.0	533	34.6	879
	48.5	1232	36500	5046	24.0	610	37.6	955
	54.5	1384	42500	7233	27.0	686	40.6	1031
	60.5	1537	48500	6705	30.0	762	43.6	1107
	72.0	1829	60000	8295	36.0	914	49.6	1260
	84.0	2134	72000	9955	42.0	1067	55.6	1412
	96.0	2438	84000	11614	48.0	1219	61.6	1565

* Brakes 5022, 5026, 5027 and 5028 have alloy steel tie rods.

CALIPER DIMENSIONS AND SPECIFICATIONS



Models: 5019, 5020, 5021, 5023, 5024, 5025

Models: 5022, 5026, 5027, 5028

Caliper Number	Clamp Force*		All Dimensions in Inches										
	lbs.	kg.	A	A1	1	2	3	4	5	6	7	8	9
5019	5250	2381	0.75	2.00	9.87	3.00	5.56	2.18	n/a	3.00	1.87	4.81	6.56
5020	9160	4155	1.25	2.75	14.00	4.00	7.62	3.12	n/a	3.75	2.75	6.50	8.12
5021	9160	4155	2.00	4.25	14.81	4.75	7.50	3.75	5.50	n/a	n/a	7.75	8.75
5022	18320	8310	2.00	4.25	15.25	8.00	15.25	3.75	5.50	n/a	n/a	7.75	8.75
5023	16000	7256	2.00	4.25	16.00	4.85	9.00	3.75	5.50	n/a	n/a	9.00	12.00
5024	25740	11673	2.00	4.25	19.12	6.50	11.87	4.50	5.75	n/a	n/a	9.50	11.50
5025	17160	7784	4.00	7.00	20.63	6.50	11.87	4.75	7.50	n/a	n/a	11.00	12.70
5026	32000	14512	4.00	7.00	20.75	9.50	18.25	4.75	7.50	n/a	n/a	11.00	12.70
5027	48000	21769	2.00	4.25	20.12	9.50	18.37	4.50	5.75	n/a	n/a	9.50	11.50
5028	48000	21769	4.00	10.00	25.63	12.75	24.23	5.20	7.00	n/a	n/a	11.94	13.35

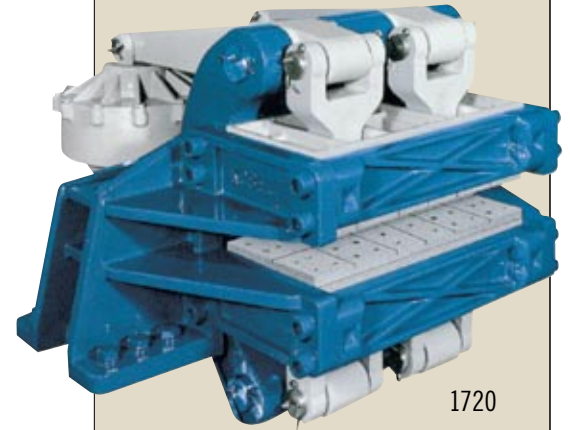
All models are also available in a sidemount configuration.

* Clamping forces for fluid and spring applied calipers are the same.

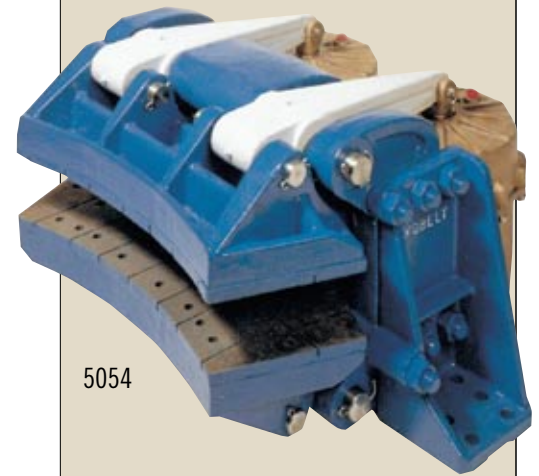
** Weights are for spring applied calipers, fluid applied calipers weigh approx. 12% less.

1720/5054 SAND CAST HIGH ENERGY INPUT BRAKE CALIPERS

These calipers were designed for extremely high energy input applications. They have a large shoe area which gives them long brake lining life. The brake lining supplied with these calipers has a coefficient of friction between .45 to .55. These calipers are available pressure or spring applied. Air or hydraulic pressure can be used to either apply or release the brake. The maximum pressure for pressure applied models is 100 P.S.I. (6.9 bar) and 250 P.S.I. (17 bar) for spring applied brakes. The torque ratings are the same for either version.



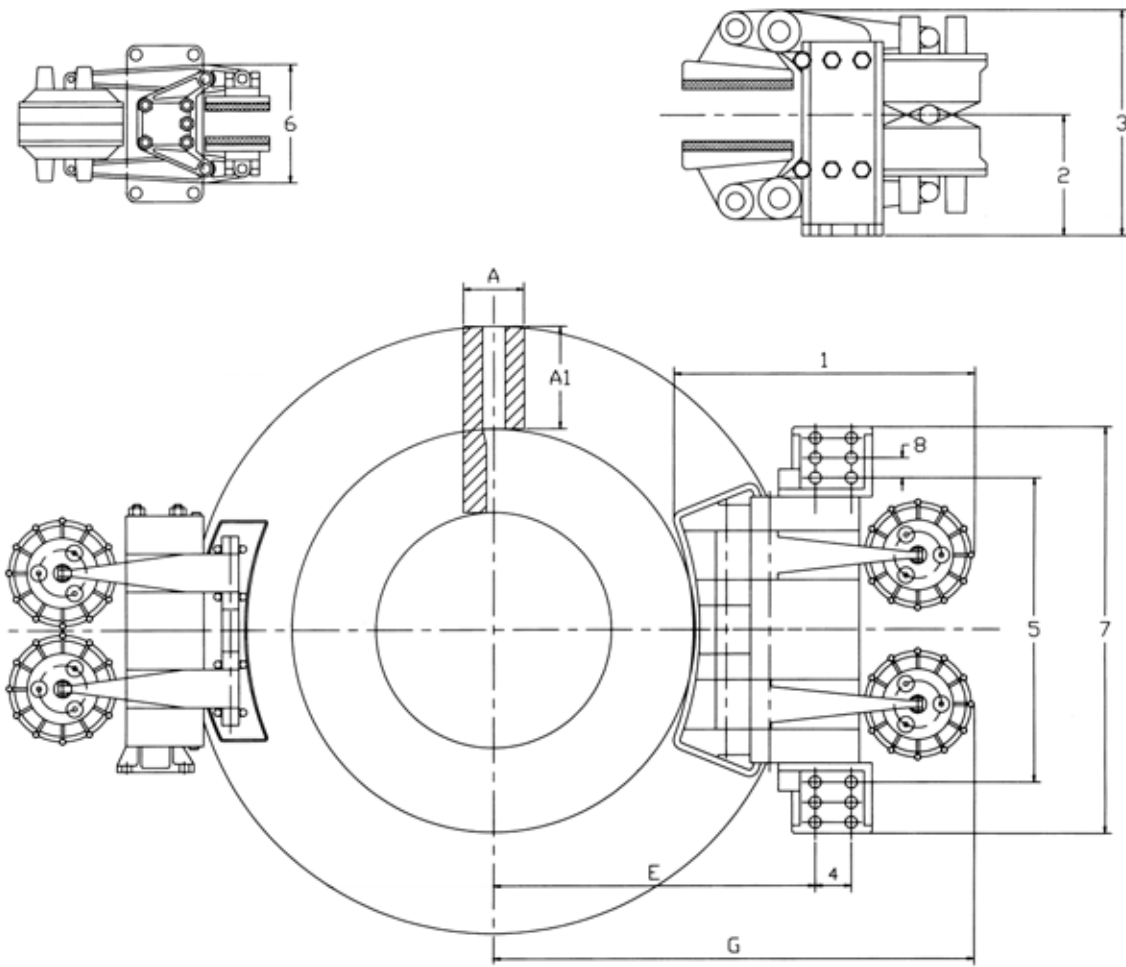
1720



5054

Caliper Number	Disc Diameter		Maximum Torque		Dim. E		Dim. G	
	in.	mm.	ft.-lbs.	kg.-m.	in.	mm.	in.	mm.
5054	48.5	1232	102400	14157	25.75	654	42.75	1086
	54.5	1384	118600	16397	28.75	730	45.75	1162
	60.5	1537	134800	18637	31.75	806	48.75	1238
	72	1829	164600	22757	37.50	953	54.50	1384
	84	2134	197000	27236	43.50	1105	60.50	1537
	96	2438	229400	31716	49.50	1257	66.50	1689
1720	60	1524	231000	31937	29.81	757	50.62	1286
	72	1829	287000	39679	36.00	914	56.81	1443
	84	2134	344000	47560	42.18	1071	63.00	1600
	96	2438	400000	55302	48.18	1224	69.00	1753
	108	2743	456000	63044	54.18	1376	75.00	1905
	120	3048	513000	70925	60.18	1529	81.00	2057

CALIPER DIMENSIONS AND SPECIFICATIONS



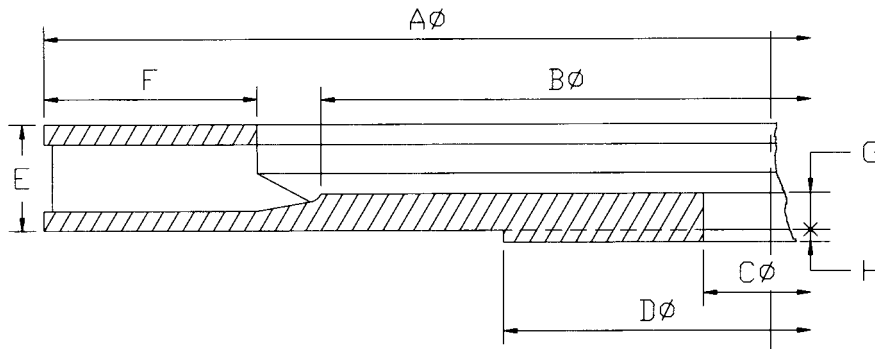
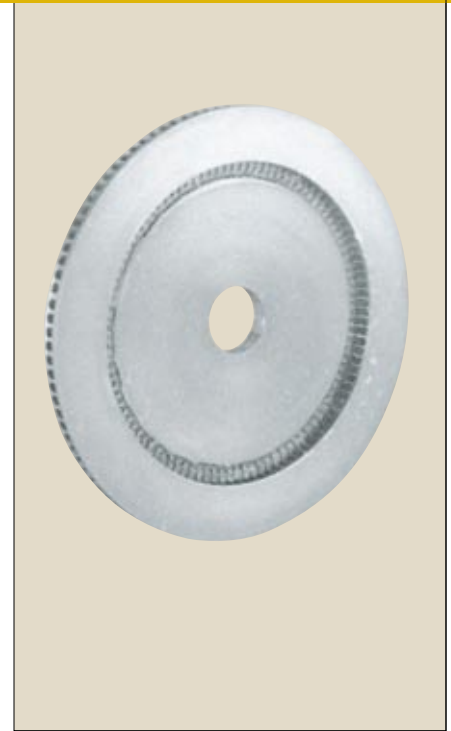
Models: 5040, 5054, 1720

Caliper Number	Clamp Force*		Weight		All Dimensions in Inches									
	lbs.	kg.	lbs.	kg.	A	A1	1	2	3	4	5	6	7	8
5040	49300	22362	570	259	4.00	10.5	29.0	12.75	24.25	7.50	9.25	13.75	11.30	N/A
5054	129600	58776	1600	726	4.00	10.5	31.0	9.37	18.75	3.25	29.62	18.25	40.00	2.00
1720	226000	102494	2475	1122	2.50	11.0	37.0	9.25	24.00	9.50	30.00	29.50	44.25	2.50

*Clamping forces for fluid and spring applied calipers are the same.

MEDIUM AND HEAVY DUTY BRAKE DISCS

These brake discs were designed to go with our die cast brake calipers. They are suitable for both fluid applied and spring applied brakes. All discs are ventilated and can be used for medium to heavy-duty applications. Normally they are cast in ductile iron, however, other materials are available to suit customer requirements.

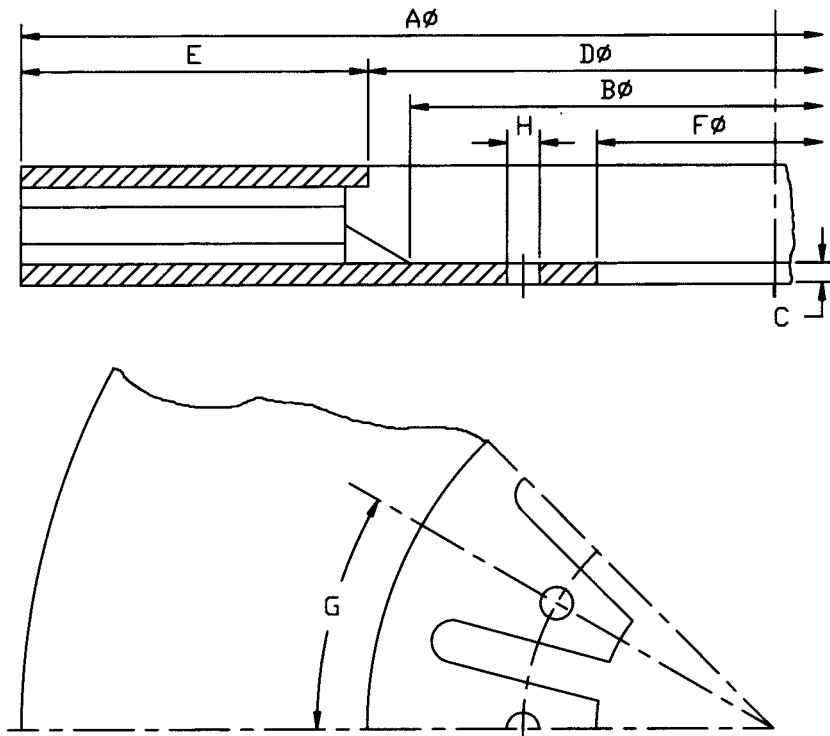


3/4" x 2" Series for Caliper 5019	A Diameter		B Max. Diameter		C Min. Diameter		D Max. Diameter		Max. RPM	Weight*		Act. Rad		
	inch	mm	inch	mm	inch	mm	inch	mm		lbs.	kg.	ft.	m	
	9	229	5	127	2	51	3.75	95	6150	8	4	0.29	0.09	
Dim. E=0.750 in 19mm	12	305	8	203	2	51	5	127	4550	15	7	0.42	0.13	
Dim. F=2.000 in 51mm	15	381	11	279	2	51	6	152	3600	21	10	0.54	0.17	
Dim. G=0.375 in 10mm	18	457	14	356	2	51	7	178	3000	29	13	0.67	0.20	
Dim. H=0.125 in 3mm	20	508	16	406	2	51	8	203	2680	36	16	0.75	0.23	
1-1/4" x 2-1/2" Series for Caliper 5020	12	305	4.5	114	2.0	51	3.75	95	4600	19	9	0.39	0.12	
	15	381	7.5	191	2.5	64	5	127	3650	27	12	0.52	0.15	
	18	457	10.5	267	3.0	76	6	152	3000	37	17	0.65	0.19	
	Dim. E=1.250 in 32mm	21	533	13.5	343	3.5	89	9	229	2550	50	23	0.77	0.23
	Dim. F=2.750 in 70mm	24	610	16.75	425	4.0	102	8	203	2250	64	29	0.89	0.27
	Dim. G=0.625 in 16mm	27	686	19.5	495	4.0	102	12	305	1980	79	36	1.02	0.31
Dim. H=0.250 in 6mm	30	762	22.75	578	4.5	114	10	254	1780	99	45	1.14	0.34	
2" x 4" Series for Calipers 5021, 5022, 5023 5024, 5027	18	457	7	178	3.25	83	7.75	197	3070	74	34	0.58	0.18	
	20	508	9	229	4	102	9.75	248	2750	86	39	0.67	0.20	
	25	635	14	356	3.5	89	9.75	248	2200	118	54	0.88	0.27	
	30	762	19	483	4.5	114	13	330	1800	165	75	1.08	0.33	
	Dim. E=2.00 in 51mm	35	889	24	610	5.5	140	13.75	349	1550	212	96	1.29	0.39
	Dim. F=4.25 in 108mm	40	1016	29	737	6	152	15	381	1350	263	119	1.50	0.46
	Dim. G=0.75 in 19mm	45	1143	34	864	8.25	210	15.75	400	1200	302	137	1.71	0.52
	Dim. H=0.25 in 6mm	50	1270	39	991	10.25	260	19.5	495	1070	358	162	1.92	0.58

*Weights may vary due to machining

BRAKE DISC DETAILS FOR HIGH ENERGY INPUT

These brake discs were developed for medium to high energy input. The patented fin design offers the ultimate in heat transfer and air flow. This disc will accomplish tasks not possible with ordinary ventilated discs.



4" SERIES BRAKE DISCS

Caliper Number	5025, 5026				5028, 5040, 5054							
	4.00				4.00							
A	30.0	35.0	40.0	48.0	42.5	48.5	54.5	60.5	72.0	84.0	96.0	
B	14.0	18.0	23.0	31.0	18.5	23.5	29.5	35.5	46.0	58.0	70	
C	1.0	1.0	1.0	1.0	1.0	1.0	1.12	1.12	1.12	1.12	1.12	
D	16.0	21.0	26.0	34.0	21.5	27.5	33.5	39.5	50.0	62.0	74.0	
E Face	7.0	7.0	7.0	7.0	10.5	10.5	10.5	10.5	10.5	10.5	10.5	
F (Min.)	8.0	14.0	19.5	19.6	15.0	18.0	23.1	27.0	38.0	50.0	62.0	
F (Max.)	11.0	16.0	21.0	29.0	17.5	23.5	25.0	31.0	42.0	54.0	66.0	
G	30°	30°	20°	20°	30°	30°	20°	18°	15°	15°	15°	
H (to customers' requirements)	11/16	11/16	11/16	11/16	11/16	11/16	1-3/32	1-3/32	1-3/8	1-3/8	1-3/8	
WR ² (lb. ft. ²)	365	635	1010	1990	1160	2010	3010	4220	9170	16600	26900	
Acting Rad (ft.)	0.96	1.17	1.37	1.71	1.33	1.58	1.83	2.08	2.54	3.04	3.54	
Weight (lb.)	380	460	530	690	620	790	890	980	1450	1860	2240	
Max. Cont. HP	65	80	100	120	140	170	195	220	280	340	400	
Cont. HP 100 RPM	25	35	45	60	55	70	90	150	240	340	400	
Max. RPM	1800	1500	1300	1100	1300	1100	1000	900	700	600	500	
HP.-Sec. (Cont. Input)	33000	40000	47000	60000	54000	69000	78000	86000	128000	163000	200000	

Note: WR² and Weight may vary slightly from values given in the table.

AIR SUPPLY AND TREATMENT OF DRAW WORKS DISC BRAKES

It is of extreme importance that air compressors and storage tanks provide sufficient air during the operation of the brakes and clutches. There must not be any shortage of supply air. It is also equally important that all the air lines between the tanks, control valves and brake actuators are of a generous size. An operator will lose confidence in the rig if the brake response from the control handle is not instant. Actuators and control valves equipped with 'U' cups and 'O' rings require lubrication in order to provide years of trouble-free service. 'O' rings and 'U' cups will become sticky and show wear if not lubricated properly. Diaphragm type actuators do not require lubrication, however, it is recommended that the control valve have a lubricant in order to make it respond accurately.

The main supply line to the control and brake system should be equipped with a filter and regulator. The filter's responsibility is to remove moisture and dirt in the system, and the regulator will provide a constant air pressure to the control system. It is, therefore, important that the compressor pressure be set higher than the air pressure regulator. The oil that is required for the lubricator should be of a hydraulic type with a viscosity of 10 – 32. Heavy oils are not a good solution for lubricators. If the draw works is operating in a cold environment, it is recommended to have an air dryer in the system to remove all moisture. In some cases, in extremely cold locations, it may be necessary to add a lubricator large enough to handle all the air flow. This lubricator should be equipped with a metal bowl and can be filled with methyl hydrate (wood alcohol). The wood alcohol must be used sparingly since it is not friendly to most synthetic rubber.

BRAKE POTS

Kobelt Manufacturing provides three different types of actuators for the disc brake. The most common would be an air only applied actuator which is of a dual diaphragm type and does not require lubricating. These diaphragms provide an optimum accurate and controlled response.

Kobelt Manufacturing also produces a spring applied actuator which is of a piston type, and is equipped with multi spring packs which can be adjusted to suit customer

requirements. This actuator, however, requires lubricating in order to prolong the seal life and its accuracy. It is not as responsive as a diaphragm type.

The third actuator that Kobelt provides is of a truck type called Maxi Brake. This actuator is not manufactured by Kobelt and is of a dual diaphragm type whereby one diaphragm looks after the spring applied portion and the other diaphragm looks after the air applied portion. This combination comes in extremely handy when spring and air applied systems are both required. In order to release the spring brake, air must be accumulated in the spring chamber to compress the spring and release the brake. Now, the air applied portion will provide infinite control over the brake. The more air pressure that is accumulated in this chamber, the more torque the brake will produce. It is, however, very important not to apply the spring portion and air portion at the same time. This could cause an overload on the basic mechanical brake structure.

The Maxi Pot brake actuators are also equipped with a manual release screw whereby the spring portion can be manually released. It is critical that the air be applied to the spring portion so that the threads do not become over stressed when using the manual release screw, because in some actuators the thread screw is not designed to release the actuators without the assistance of air.

PLEASE NOTE:

If a customer fails to inform Kobelt Manufacturing of any specific characteristics of the machinery on which our brake assemblies are installed, which could be detrimental to the performance of our brakes, Kobelt Manufacturing will not assume any responsibility. This applies especially to machinery having harmonics, vibrations and crucial rpms since this may adversely affect the performance of our brake disc and caliper.

Upon ordering, please specify all operational details to ensure that you purchase the correct braking system for your individual application. Our representatives are happy to assist you with any questions that you may have, and will guide you towards the right selection for your needs.

PNEUMATIC CONTROLS

Kobelt pneumatic controls are the finest in the industry. We manufacture all components for any type of pneumatic control system.

This control system features a limitless number of control stations. Additional control stations do not affect the performance of the control system. This means that, regardless of the distance or the force required, the control heads move effortlessly.

The pneumatic control system is one of the most flexible systems we offer. Since the system does not depend on the force you apply (everything is done by air signals) we can automate and synchronize as much, or as little, of your propulsion equipment as desired. The control options are almost limitless. We offer propulsion timing packages with, and without, shaft brakes. A timing system will protect your propulsion equipment. It ensures that the gear box is engaged before you accelerate your engine. The system will allow you to go from full ahead to full astern without damaging your gear box or stalling your engine.

You will find that the pneumatic system is best suited for vessels anywhere between 50 to 600 feet (15 to 180m). For the ultimate in styling, flexibility and for fingertip control, contact your nearest Kobelt distributor about Kobelt pneumatic controls.

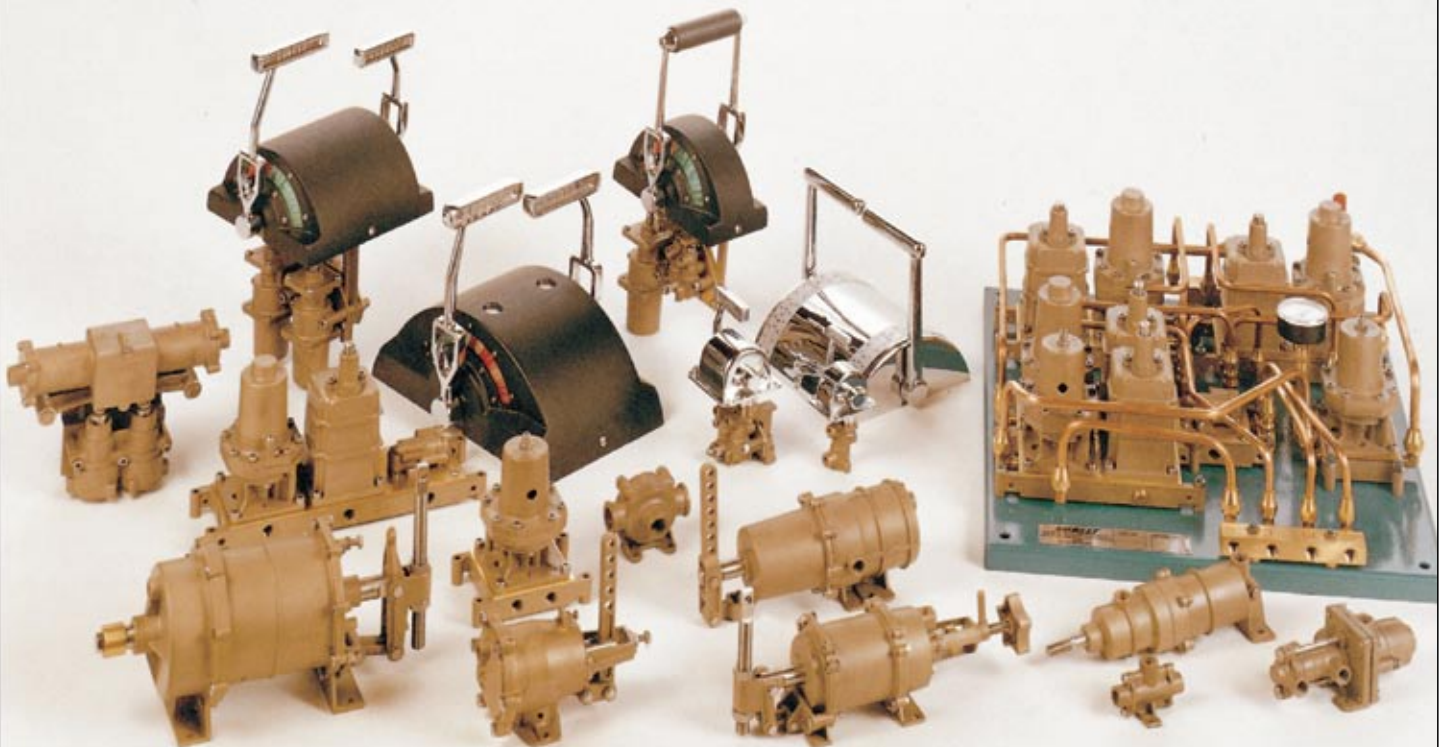
Kobelt's pneumatic controls are manufactured under one or more of the following Patent numbers. (Further patents pending.)

Canadian Patent Numbers

828507
922594
923767
928607
932600
936055
939202
947619
964138
964555

U.S. Patent Numbers

3455186
3724970
3766835
3783742
3795110
3820438
3826490
3838630
3900090



WE ALSO MAKE...

PUSH-PULL CONTROLS

Kobelc provides a complete line of mechanical controls, all in die-cast bronze and stainless steel including push/pull controls for single- and multi-station applications. We generally do not recommend the installation of more than two stations with push-pull cables, and this system is dependent largely upon the quality of the cable and the layout of the installation. The mechanical push-pull control is a very simple and easily installed system designed for smaller boats. The equipment controlled by a system of this type must be relatively easy to operate. As a mechanically connected system, push/pull controls use cables to connect control heads to the clutch and throttle. If the total length of cable is less than 50 feet, with minimal bends (15 meters), a push/pull system can work well for you.



HYDRAULIC STEERING

Kobelc specializes in hydraulic and electro-hydraulic steering systems, including the following integrated systems – manual hydraulic, electric power, power assisted and electronic steering.

The manual hydraulic system works entirely “by hand”, is simple and easy to install, and produces a smooth, simple method for steering. Electric power steering is driven by an electric power pack activated by a jog lever which forces hydraulic oil to the cylinder. The full hydraulic power assisted system operates with a power-assisted cylinder, is very compact and low maintenance, with very few and easy steering wheel turns to hard over. Powered completely by an electronic control system, the electronic system is perfect for large vessels with multiple control stations, offering unlimited options with faster reaction time for steering gear.

In addition to these, hybrid or combined systems are also available. All systems are flexible, cost-efficient and easily integrated into other steering configurations.



ELECTRONIC CONTROLS

Kobelc offers electronic control systems and individual components to suit all applications. Whether you require a simple or complex system, single or multiple stations, we offer a wide range of control heads, bases, microprocessors, actuators and accessories. We are also able to offer customized solutions to fit your vessel’s specific needs. All Kobelc control components are made of bronze and stainless steel to ensure many years of corrosion-free operation. Clean 12 or 24 volt power is required along with sufficient amperage and voltage. A single cable connects the control heads and the CPU.

We offer three major systems to meet your needs. The simplest, best value is the Mighty Mariner. For more complex systems we offer the 6525 system. If you have a 360° system (right-angle drive or Z-drive) contact us for details about the 6535 system.



**FOR MORE INFORMATION ON THESE, OR ANY OTHER KOBELC PRODUCT OR SYSTEM,
PLEASE CONTACT YOUR NEAREST KOBELC DEALER, OR VISIT US AT WWW.KOBELC.COM**



Kobelt Manufacturing, Surrey, British Columbia, Canada

Ever since our humble beginnings in 1962, Kobelt Manufacturing Limited has been committed to manufacturing the finest marine controls in the world. We stress the importance of quality, precision, competitive pricing and prompt delivery. Our team of dedicated production staff is uncompromising in ensuring that we meet the needs of all our valued customers. Our growing reputation in world markets is proof of our commitment to highest possible standards. From our very first line of pneumatic controls we've believed in the simple things—rugged construction, quality materials and prompt delivery to our customers. Today, the technology has changed, but our commitment remains the same. From our innovations in design and performance to our craftsmanship with bronze and stainless steel, our products span the world to further our reputation as an international leader in industrial and maritime technology.

Due to the nature of braking systems, our brake products come with a 1-year limited warranty, with the exception of brake lining for which there is no warranty. The warranty period for products from another manufacturer, components or in whole, will not exceed the terms or conditions under which their warranty was originally extended to Kobelt.

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