KOBELT

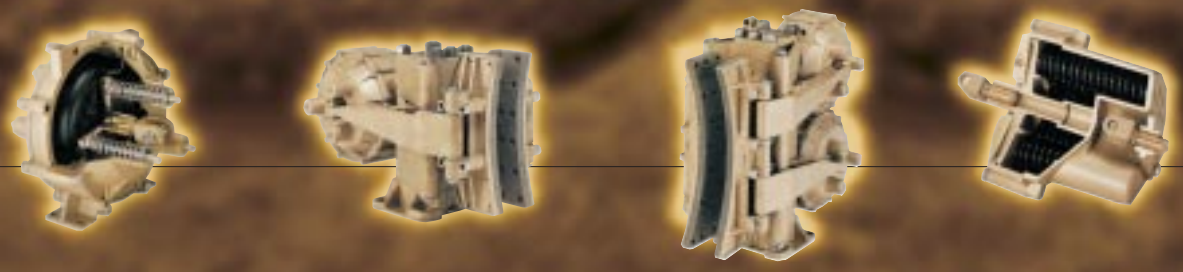
DISC BRAKES

HYDRAULIC STEERING & ACCESSORIES

ELECTRONIC CONTROLS

PNEUMATIC CONTROLS

PUSH-PULL CONTROLS



When Reliability is Everything.

Kobelt 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. We back every one of our products with a 5 year warranty, along with worldwide sales and support. Contact us today!

KOBELT *Quality Control*

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 5019-5027 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 worst 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.

Our information 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 must be of over-size and spigot ID's must have clearance. Failing to leave allowance for disc expansion and contraction may result in early disc failure.

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.

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 650^0-700^0 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	
	-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	90	102	52	61	97	108	104	113	177	186	165	186
Maximum Clamp Force (per lbs.)	5,250		9,160		9,160		18,320		16,000		25,740		25,740		32,000		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		4.1		4.1	
Actual Force each side (lbs. per actuator)	750		1,200		1,200		2,200		2,000		3,000		3,000		2,000		3,000	
Number of Levers	2		2		2		4		2		2		2		4		4	
Total Shoe Area (inches squared)	18		26		60		86		60		75		120		194		114	
Lining Thickness (inches)	5/16		3/8		1/2		1/2		1/2		5/8		5/8		5/8		5/8	
Maximum Allowance Lining Wear (inches)	.140		.200		.300		.300		.300		.420		.420		.420		.420	
H.P. Hour	1,166		1,733		6,000		8,600		6,000		10,500		16,800		27,160		15,900	
Disc Maximum Thickness (inches)	3/4		1 1/4		2		2		2		2		4		4		2	
Disc Diameter (inches)	9-20		12-30		18-60		18-60		18-60		18-60		24-72		30-72		30-72	
Disc Rubbing Face Width (inches)	2		2 1/2		4		4		4		4		7		7		4	
Pipe Fitting	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"	
Volume In^3 Maximum	9		30		30		60		55		90		90		110		180	
Pipe Fitting	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"	
Volume In^3 Maximum	9		19		19		38		48		48		48		96		96	

WHY ARE KOBELT BRAKE CALIPERS THE BEST?

Kobelt 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.

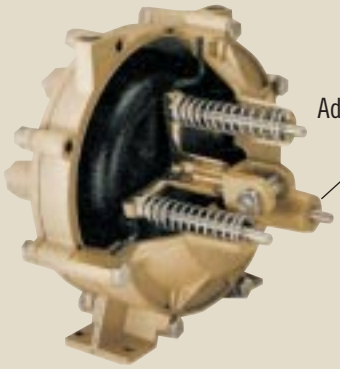
All calipers are lever operated, which keeps the actuator away from the heat of the disc. The actuators themselves are of the low pressure type, requiring maximum 100 P.S.I. (6.9 bar) for pressure applied brakes and maximum 140 P.S.I. (9.6 bar) (fully released) for spring applied calipers. Either air 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 used are asbestos-free.

Kobelt 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

Kobelt Manufacturing offers an enormous amount of 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.

5021/5027 DIE CAST BRAKE CALIPERS

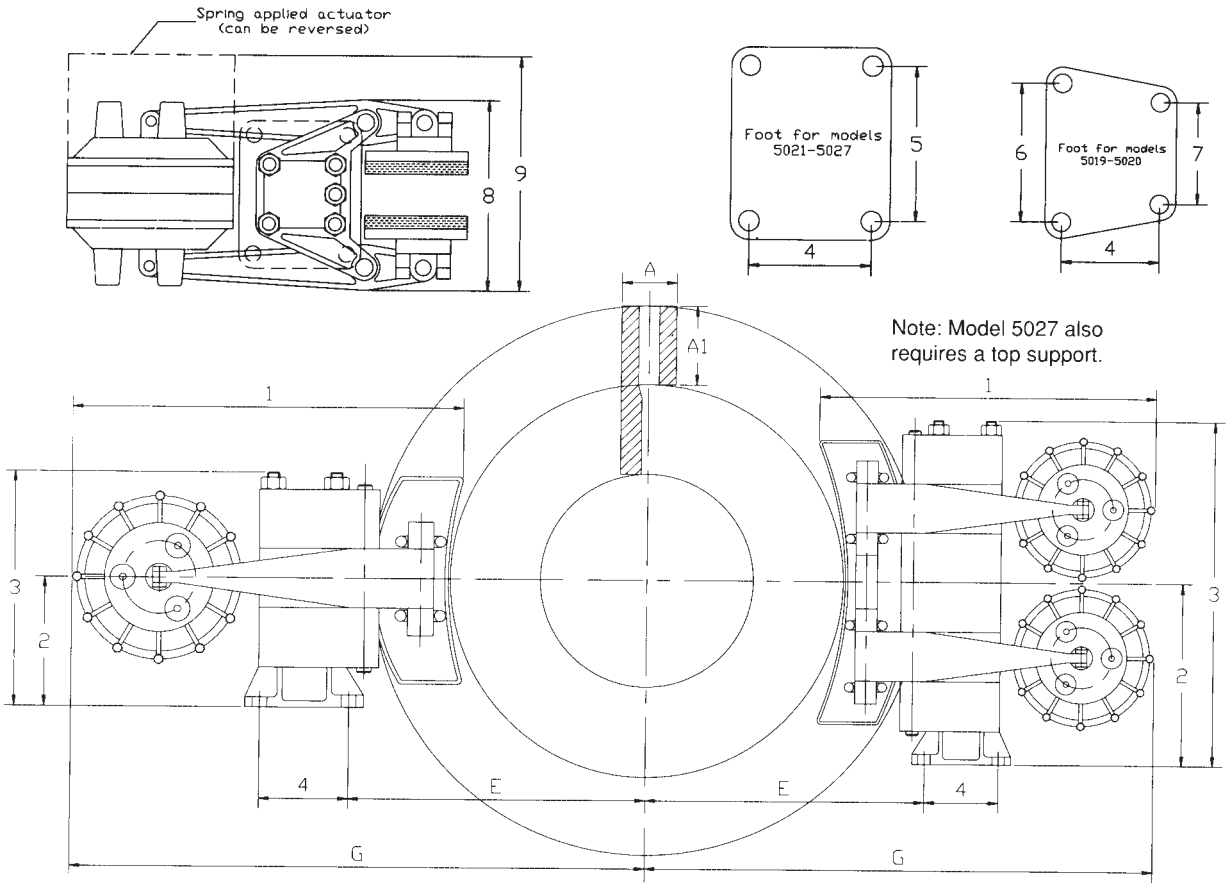
These calipers are made entirely of die cast silicone bronze with stainless steel hardware. The standard lining supplied is asbestos-free with a co-efficient of friction between .45 to .55. Patented balancing links are used to ensure even lining wear. All calipers are available with shims between the shoe and the bearing to adapt to thinner discs. Most of our actuators are of the low-pressure type. The maximum pressure for fluid applied calipers (air or hydraulic) is 100 P.S.I. (6.9 bar) and the maximum pressure for spring applied calipers is 250 P.S.I. (17 bar). Spring applied calipers, however, are fully released at 140 P.S.I. (9.7 bar) for Models 5024 and 5207.

5021

5027

Caliper Number	Disc Diameter		Maximum Torque		Dim. E		Dim. G	
	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	197	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	643	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	682	15.75	400	25.50	648
	35	889	5890	814	18.25	464	28.00	711
	40	1016	6840	945	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	486
	20	508	6080	840	10.37	263	20.12	511
	25	635	7980	1104	12.87	327	22.62	575
	30	762	9880	1364	15.37	390	25.12	638
	35	889	11780	1628	17.87	454	27.62	702
	40	1016	13680	1890	20.37	517	30.12	765
	45	1143	15580	2154	22.87	581	32.62	829
	50	1270	17480	2416	25.37	644	35.12	892
5023	18	457	4664	644	9.75	248	20.63	524
	20	508	5328	736	10.75	273	21.63	549
	25	635	7000	967	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	613
	20	508	8580	1187	11.12	283	25.12	638
	25	635	11261	1557	13.62	346	27.62	706
	30	762	13942	1928	16.12	410	30.12	765
	35	889	16624	2299	18.62	473	32.62	829
	40	1016	19305	2670	21.12	537	35.12	892
	45	1143	21986	3041	23.62	600	37.62	956
	50	1270	24668	3412	26.12	664	40.12	1019
5025	30	762	8230	1138	15.42	392	27.92	1709
	35	889	10038	1387	17.92	455	30.42	773
	40	1016	11754	1625	20.42	519	32.92	836
	48	1219	14678	2028	24.42	620	36.92	938
5026	30	762	15360	2123	15.14	385	27.14	689
	35	889	18720	2588	17.64	448	29.64	753
	40	1016	21920	3033	20.14	512	32.14	816
	48	1219	27360	3782	24.14	613	36.14	918
5027	30	762	26000	3594	16.00	406	29.50	749
	35	889	31000	4285	18.50	470	32.00	813
	40	1016	36000	4976	21.00	533	34.50	876
	45	1143	41000	5668	23.50	597	37.00	940
	50	1270	46000	6359	26.00	660	39.50	1003

CALIPER DIMENSIONS AND SPECIFICATIONS



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

Models: 5022, 5026, 5027

Caliper Number	Clamp Force*		Weight**		All Dimensions in Inches										
	lbs.	kg.	lbs.	kg.	A	A1	1	2	3	4	5	6	7	8	9
5019	5250	2381	17	7.7	0.75	2.00	9.87	3.00	5.56	2.18		3.00	1.87	4.81	6.56
5020	9120	4136	42	19	1.25	2.75	14.00	4.00	7.62	3.12		3.75	2.75	6.50	8.12
5021	9120	4136	59	26.3	2.00	4.25	14.81	4.75	7.50	3.75	5.50			7.75	8.75
5022	18240	8272	102	46	2.00	4.25	15.25	8.00	15.25	3.75	5.50			7.75	8.75
5023	16000	7256	61	23.6	2.00	4.25	16.00	4.85	9.00	3.75	5.50			9.00	12.00
5024	25740	11673	108	49	2.00	4.25	19.12	6.50	11.87	4.50	5.75			9.50	11.50
5025	25740	11673	113	47	4.00	7.00	20.63	6.50	11.87	4.75	7.50			11.00	11.50
5026	32000	14512	186	80	4.00	7.00	20.75	9.50	18.25	4.75	7.50			11.00	11.50
5027	48000	21769	186	84	2.00	4.25	20.12	9.50	18.37	4.50	5.75			9.50	11.50

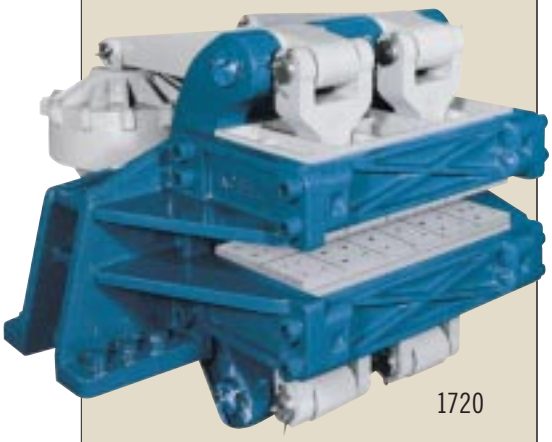
* Clamping forces for fluid and spring applied calipers are the same.

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

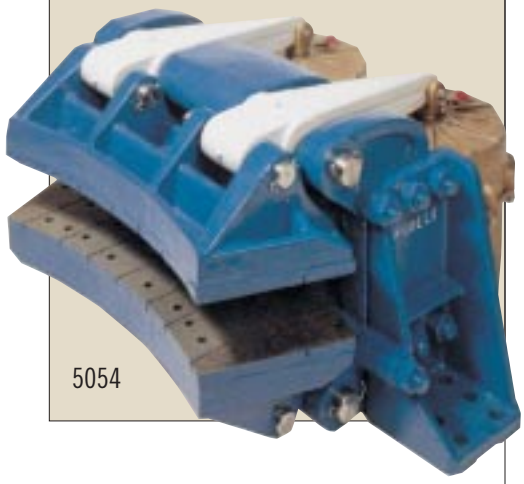
*** Models 5019 and 5027 are also available in a sidemount configuration.

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.



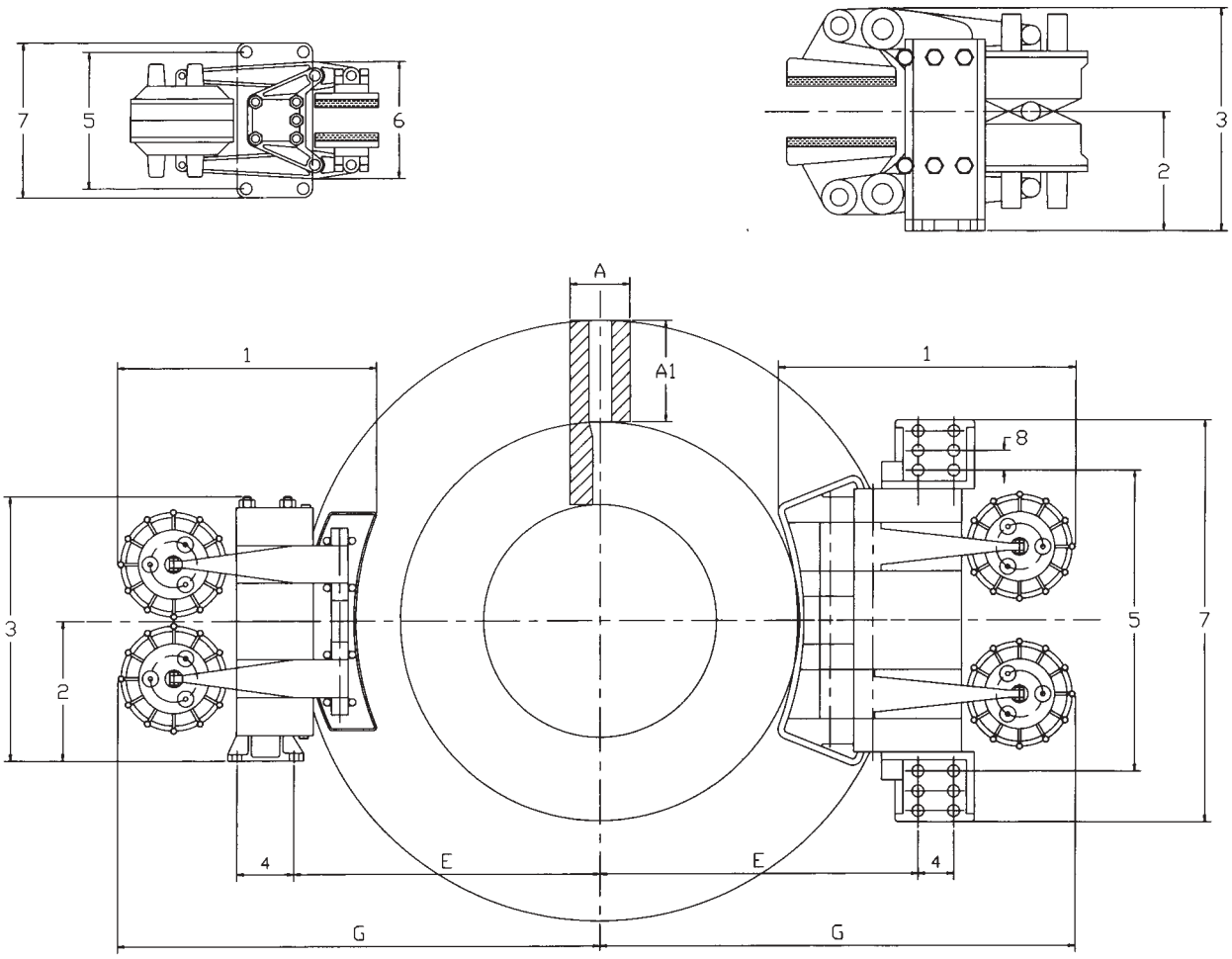
1720



5054

Caliper Number	Disc Diameter		Maximum Torque		Dim. E		Dim. G	
	in.	mm.	ft.-lbs.	kg.-m.	in.	mm.	in.	mm.
5036	30	762	15750	2178	14.87	378	27.62	702
	35	889	19500	2696	17.37	441	30.12	765
	40	1016	23250	3214	19.87	505	32.62	829
	48	1219	29250	4044	23.87	606	36.62	930
5040	42.5	1080	31000	4286	20.50	521	37.00	940
	48.5	1232	37500	5185	23.50	597	40.00	1016
	54.5	1384	44000	6083	26.50	673	43.00	1092
	60.5	1537	50500	6982	29.50	749	46.00	1168
	72	1829	61650	8523	35.25	895	51.75	1314
	84	2134	74000	10231	41.25	1048	57.75	1467
	96	2438	86500	11959	47.25	1200	63.75	1619
5054	48.5	1232	98500	13618	25.75	654	42.75	1086
	54.5	1384	114700	15858	28.75	730	45.75	1162
	60.5	1537	130900	18098	31.75	806	48.75	1238
	72	1829	162000	22397	37.50	953	54.50	1384
	84	2134	194400	26877	43.50	1105	60.50	1537
	96	2438	226800	31356	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	55301	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: 5036, 5040

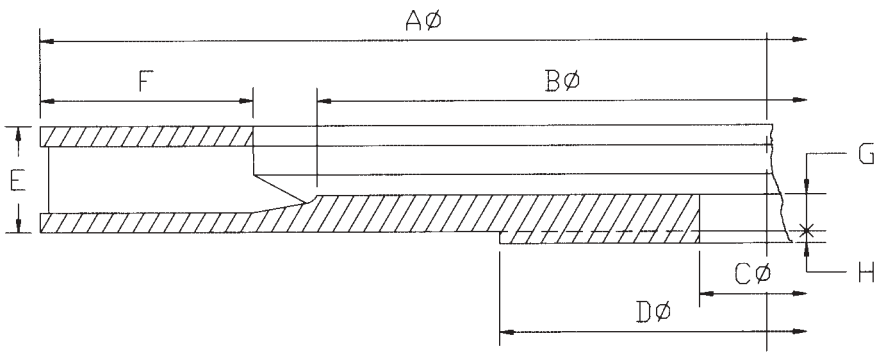
Models: 5054, 1720

Caliper Number	Clamp Force*		Weight		All Dimensions in Inches									
	lbs.	kg.	lbs.	kg.	A	A1	1	2	3	4	5	6	7	8
5036	36000	16327	295	134	4.00	7.0	22.0	9.94	18.18	5.50	8.37	12.75	10.00	
5040	49300	22358	570	259	4.00	10.5	29.5	12.75	25.25	7.50	9.25	13.87	11.75	
5054	129600	58776	1600	726	4.00	10.5	31.0	9.37	18.75	3.25	29.62		40.00	2.00
1720	226000	102494	2475	1122	2.50	11.0	37.0	9.25	30.00	9.50	30.00		43.00	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.

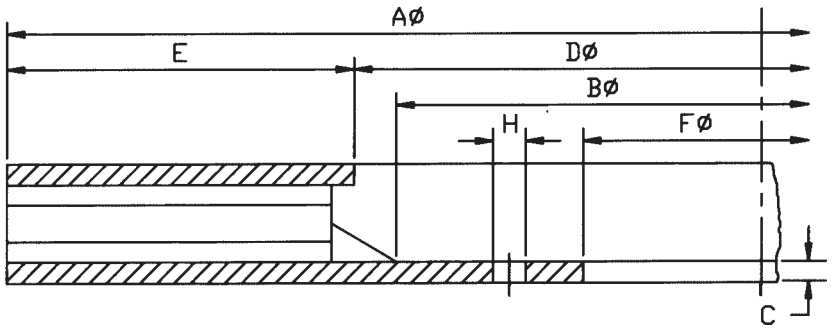


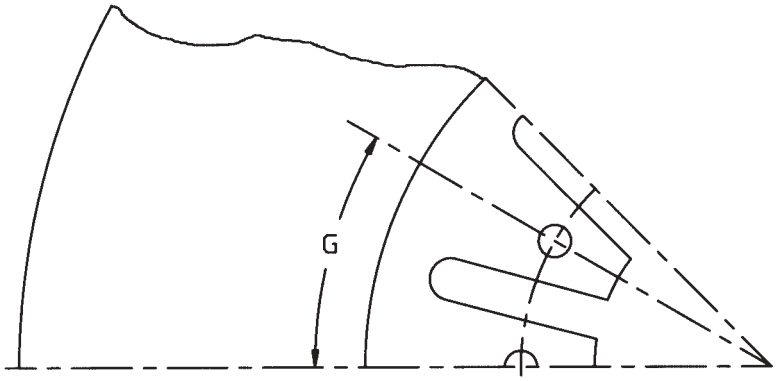
		A Diameter		B Max. Diameter		C Min. Diameter		D Max. Diameter		Max.	Weight*		Act. Rad	
		inch	mm	inch	mm	inch	mm	inch	mm	RPM	lbs.	kg.	ft.	m
3/4" x 2" Series														
for Caliper 5019														
		9	229	5	127	2	51	3.75	95	6150	8	4	0.29	0.09
Dim. E=0.750 in	19mm	12	305	8	203	2	51	5	127	4550	15	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		12	305	4.5	114	2.0	51	3.75	95	4600	19	9	0.39	0.12
for Caliper 5020		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		18	457	7	178	3.25	83	7.75	197	3070	74	34	0.58	0.18
for Calipers 5021, 5022,		20	508	9	229	4	102	9.75	248	2750	86	39	0.67	0.20
5024, 5027		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.





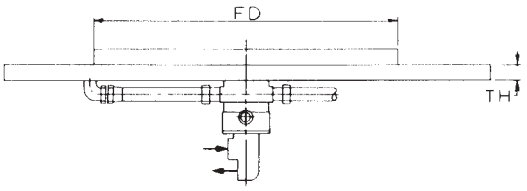
4" SERIES BRAKE DISCS

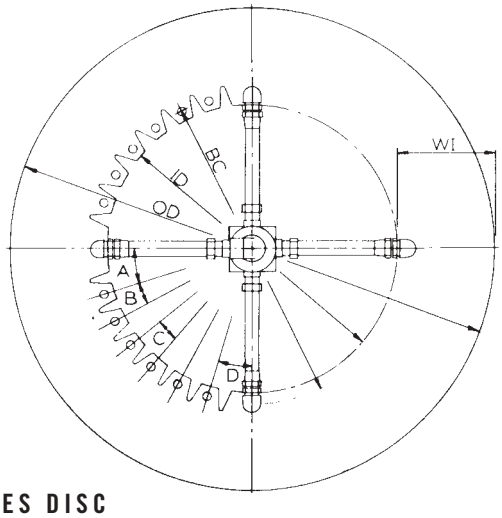
Caliper Number	5025, 5026, 5036					5040, 5054						
Thickness	4.00					4.00						
A	25.0	30.0	35.0	40.0	48.0	42.5	48.5	54.5	60.5	72.0	84.0	96.0
B	9.0	14.0	18.0	23.0	31.0	18.5	23.5	29.5	35.5	46.0	58.0	70
C			1.0			1.0	1.0	1.12	1.12	1.12	1.12	1.12
D	11.0	16.0	21.0	26.0	34.0	21.5	27.5	33.5	39.5	50.0	62.0	74.0
E Face			7.0						10.5			
F (Min.)	4.5	9.5	14.5	19.5	27.5	15.0	21.0	21.0	27.0	38.0	50.0	62.0
F (Max.)	6.0	11.0	16.0	21.0	29.0	17.5	23.5	25.0	31.0	42.0	54.0	66.0
G	20°	20°	20°	20°	20°	30°	30°	18°	18°	15°	15°	15°
H			11/16			11/16	11/16	1-3/32	1-3/32	1-3/8	1-3/8	1-3/8
WR^2 (lb. $ft.^2$)	185	365	635	1010	1990	1160	2010	3010	4220	9170	16600	26900
Acting Rad (ft.)	0.75	0.96	1.17	1.37	1.71	1.33	1.58	1.83	2.08	2.54	3.04	3.54
Weight (lb.)	300	380	460	530	690	620	790	890	980	1450	1860	2240
Max. Cont. HP	50	65	80	100	120	140	170	195	220	280	340	400
Cont. HP 100 RPM	20	25	35	45	60	55	70	90	150	240	340	400
Max. RPM	2200	1800	1500	1300	1100	1300	1100	1000	900	700	600	500
HP.-Sec. (Cont. Input)	26000	33000	40000	47000	60000	54000	69000	78000	86000	128000	163000	200000

Note: WR^2 and Weight may vary slightly from values given in the table.

INTERNALLY WATERCOOLED DISCS FOR MAXIMUM ENERGY DISSIPATION

Kobelt Internally watercooled Brake Discs are designed for maximum energy dissipation. They will absorb a continuous energy input at high torque and low rpm. This is accomplished by the use of a rotary seal which provides a constant flow of coolant to the rotating disc.





2" SERIES DISC

MOUNTING DETAILS

		Angle Between Mounting Holes (Deg.)					
Disc Size	Bolt Circle	A	B	C	D	Bold Diam.	No. of Bolts
2 x 36	13.5	22.5	45		22.5	1.00	8
2 x 48	25.5	25	20	20	25	1.00	12
2 x 60	37.5	19	15	22	19	1.00	16

WATER COOLED DISC DIMENSIONS

Outer Dia. OD (in.)	Inner Dia. ID (in.)	Thickness Th (in.)	Face Width WI (in.)	Flange Max. Dia. FD (in.)	Acting Radius AR (in.)	Weight (lb.)	WR^2 ($lb.\ ft.^2$)	Maximum Speed (rpm)	Maximum Power* IN (hp)	Required Flow** (gal. min.)	Caliper Number ***
36	11.5	2.0	12.25	16.0	13.0	330	400	500	500	40	5025
48	23.5	2.0	12.25	28.0	19.0	500	1,200	40	750	65	5026
60	35.5	2.0	12.25	40.5	25.0	670	2,800	350	1000	85	

2 1/2" SERIES DISC

MOUNTING DETAILS

		Angle Between Mounting Holes (Deg.)					
Disc Size	Bolt Circle	A	B	C	D	Bold Dia.	No. of Bolts
2 1/2 x 60	31.0	22	18	10	22	1.25	16
2 1/2 x 72	43.0	19	15	22	19	1.25	16
2 1/2 x 82	53.0	15	12	12	15	1.25	24
2 1/2 x 96	67.0	12.5	10	5	12.5	1.25	32

WATER COOLED DISC DIMENSIONS

Outer Dia. OD (in.)	Inner Dia. ID (in.)	Thickness Th (in.)	Face Width WI (in.)	Flange Max. Dia. FD (in.)	Acting Radius AR (in.)	Weight (lb.)	WR^2 ($lb.\ ft.^2$)	Maximum Speed (rpm)	Maximum Power* IN (hp)	Required Flow** (gal. min.)	Caliper Number ***
60	28.0	2.5	16.0	33.5	23.1	970	3,600	350	1200	100	1710
72	40.0	2.5	16.0	46.5	29.5	1250	7,200	300	1500	130	1720
82	50.0	2.5	16.0	56.5	34.6	1500	12,000	250	1800	150	5040
96	64.0	2.5	16.0	71.0	41.6	1800	20,000	225	2200	185	5054

* The disc requires high water pressure during high power input to prevent boiling. At maximum power the minimum required water pressure into the disc is 100 psi.

** The amount of energy absorbed is a function of water flow rate and not a function of rpm.

*** Calipers 5025 and 5026 are not yet available. Consult Kobelt for availability on other calipers.

ROTARY SEALS

No. 45	120 Gallons per Minute
No. 46	200 Gallons per Minute

All dimensions in inches.

PNEUMATIC CONTROLS

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

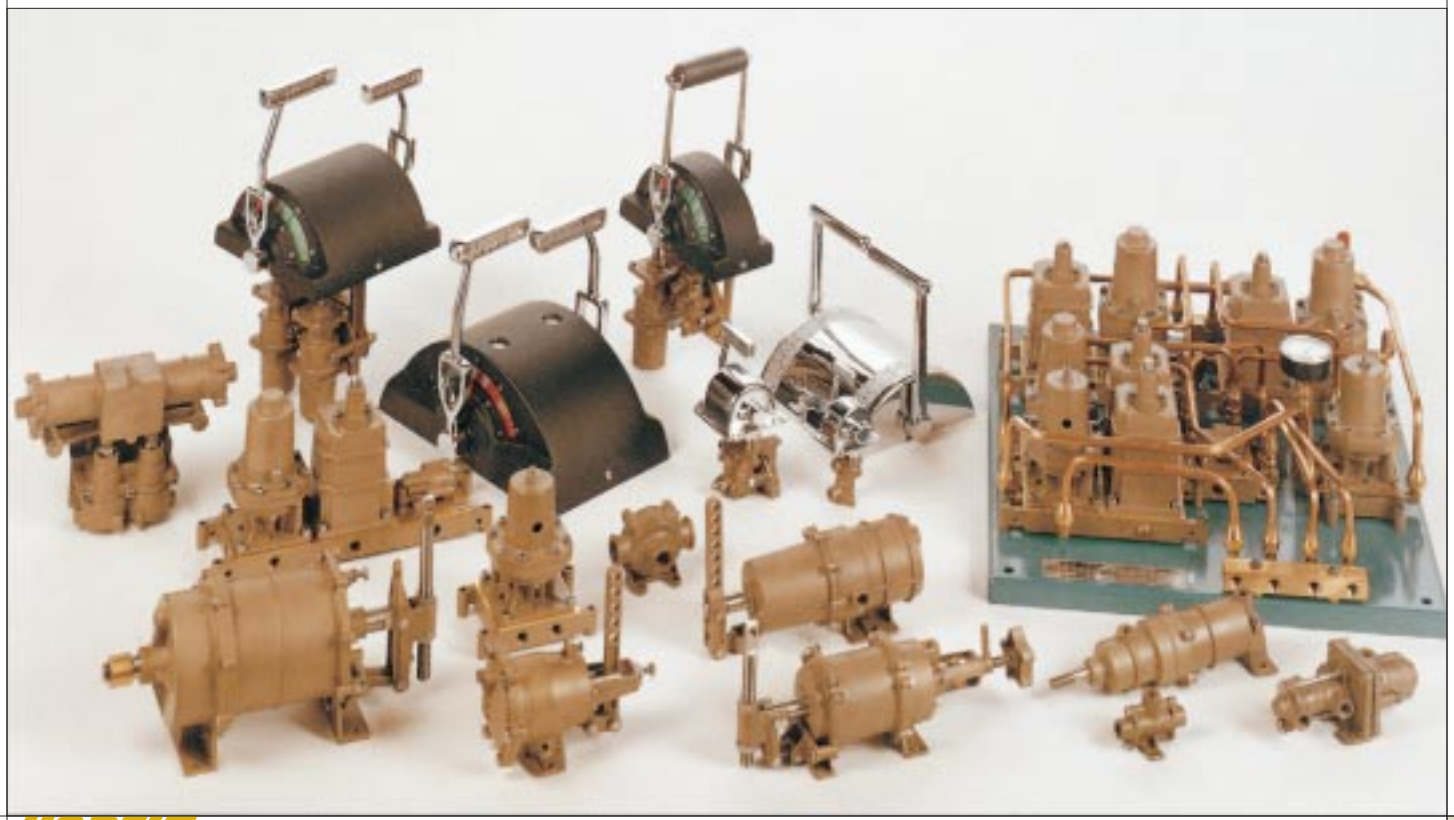
This control system features a limitless number of control stations. Additional control stations do not affect the performance of the control system. This means that, regardless of the distance or the force required, the control heads move effortlessly.

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.)

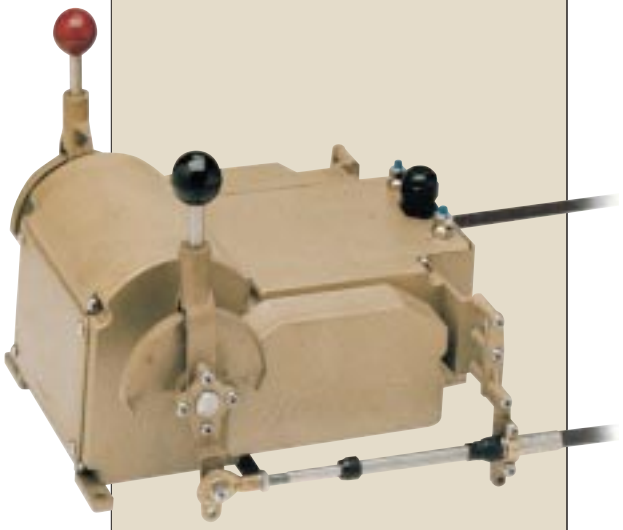
Canadian Patent Numbers	**U.S. Patent Numbers**
828507	3455186
922594	3724970
923767	3766835
928607	3783742
932600	3795110
936055	3820438
939202	3826490
947619	3838630
964138	3900090
964555	



ELECTRONIC CONTROLS AND COMPONENTS

ELECTRONIC CONTROL COMPONENTS

- Motorola microprocessor with a LAN input for head units.
- Up to twelve switched inputs for the synchronizer and alarms.
- Eight point potentiometer input for the actuator feedback.
- Six actuator outputs.
- Two brake relays.
- Alarm relay.
- RS232 communication port to ensure communication and calibration of all components of the control system.



6524 Electronic Actuator

6525 Model Microprocessor

QUALITY MATERIALS

The finest electronic components are assembled to provide the utmost reliability on the electronic side, to ensure many years of corrosion-free operation. All Kobelt control components are made of bronze and stainless steel. Look closely and you'll see we even use bronze to house such things as microprocessors and PC boards. It may take a little more effort to build, but it assures us that we're supplying you with nothing but the very best.

BUILT TO ORDER

With an enormous variety of components available from stock, Kobelt Manufacturing can provide an integrated system from the simplest application to ocean going vessels where we can incorporate all of the shipboard functions into a common command centre for the control of your main engines, steering gear, bow thrusters and stern thrusters, as well as any other shipboard components that need to be remotely controlled.

FUNCTIONS

- Electronic or mechanical throttle outputs
- Electric or mechanical clutch output
- Constant and variable timing
- Throttle boost
- Overriding throttle
- Shaft brake timing
- Station outlock
- Trolling valve
- Omega slip clutch
- PTO control
- Clutch delay
- CP propeller control
- Engine load control
- Engine synchronizer
- Engine alarms
- Control monitoring
- Electronic shaft

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 electronic controls to our craftsmanship with bronze and stainless steel, our products span the oceans of the world to further our reputation as an international leader in maritime technology.

All Kobelt equipment comes with a 5-year warranty that is the best in the industry. Strict quality control manufacturing and sturdy corrosion-resistant materials ensure trouble-free service above and beyond this generous warranty period.

CE

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