ALTRA MOTION

Electric Clutches & Brakes

Inertia Dynamics®
Altra Industrial Motion

INERTIA DYNAMICS

THE INERTIA DYNAMICS ADVANTAGE

Our business growth since our founding in 1971 has been achieved by a customer-dedicated employee team. Our success and our future are based on our commitment to being a world-class manufacturer of clutches and brakes. We pride ourselves on TOTAL CUSTOMER SERVICE with a high-quality product delivered on-time for you.

We manufacture a full line of products to solve your motion control needs – power-on and spring applied friction clutches and brakes, motor brakes, controls and moment of inertia measuring equipment.

Inertia Dynamics excels at creating a custom clutch or brake solution for your OEM application. Each of our standard products in this catalog can be adapted to meet a wide variety of applications. Put us to the test – we enjoy assisting customers with challenging projects. Our engineers welcome the opportunity to provide cost-effective solutions in situations where unique, one-of-a-kind designs are needed.

Inertia Dynamics is located 20 minutes from both Hartford, Connecticut and Bradley International Airport. Our engineering, manufacturing and support staff are located in our new facility in New Hartford, Connecticut. We welcome you to tour our facility and meet our people.

At Inertia Dynamics, we provide solutions!

VISIT US ON THE WEB AT
IDICB.COM

Electromagnetic Power-On Friction Clutches & Brakes

Electromagnetic Spring Applied Brakes

A.C. Motor Brakes

Controls

General Information

Ordering Information

Limited Warranty

Products are guaranteed against defects in materials and workmanship for a period of 12 months from the date of shipment. In the event any product fails to conform with said guarantee, or in the event that any product shipped under this contract fails to conform to the specifications thereof, if there be any such specifications, liability with respect thereto shall be limited to repairing or replacing any product or part thereof F.O.B. our factory; or, at our option, we will refund the purchase price thereof, if paid.

There is no implied representation or warranty as to any product. No guarantee, warranty, promise, or representation with respect to any product, other than those stated herein, shall be binding upon us unless made in writing and signed by one of our executive officers. In the event there be such written representation, warranty, guarantee, promise, or agreement and the product fails to conform thereto, we shall not be liable for any special or consequential damages, but our liability shall be limited to repairing such product or replacing it with one that does conform thereto or, at our option, refunding the purchase price of same, if paid. Any guarantee, warranty, representation or agreement that would otherwise be binding on us shall not be effective with respect to any product that has been tampered with or is defective or unworkable due to abuse or improper installation or application.

Inertia Dynamics reserves the right to make changes to information contained in this product guide without notice.

Underwriters Laboratories Standards

All Inertia Dynamics standard clutches, brakes, and spring applied brakes are recognized by Underwriters Laboratories to both U.S. and Canadian safety requirements. Products built to meet their construction requirements are labeled with the UL symbol as shown above.

The products indicated meet UL Class B requirements.

Electromagnetic Power-On Friction Clutches & Brakes

PART NUMBERING SYSTEM FOR PRODUCTS ON PAGES 5 TO 28 OF THIS CATALOG

(For Imperial Units) **A A B B – C D E F**

DIGIT	DIGIT	MODEL NO.
0	1	SL
0	3	BSL
0	5	FL
0	7	SO
0	9	FO
1	1	FB
1	3	SLB
1	5	SOB

DIGIT	DIGIT	SIZE
0	9	08
1	0	11
1	1	15
1	2	17
1	3	19
1	4	22
1	5	26
1	6	30
1	7	42

DIGIT	VOLTS
1	90 VDC
2	24 VDC
3	12 VDC
4	120 VAC

DIGIT	BORE (INCH)
1	1/8
2	3/16
3	1/4
4	5/16
5	3/8
6	1/2
7	5/8
8	3/4
9	7/8
0	1

DIGIT	DRIVE
1	ZERO BACKLASH

DIGIT	CONNECTION
1	LEAD WIRES
2	SCREW TERMINALS

How To Order

A. Select the model number from the product guide.
B. Select the size of the clutch or brake.
C. Select the voltage.
D. Select the bore diameter.
E. For all power-on clutches and brakes, select 1.
F. For all clutches and brakes, refer to the product guide and specify 1 or 2.

Example (Imperial)

SL11 clutch, 24 volts, 1/4 bore
Part No. 0110-2311

Example (Metric)

FB11 brake, 24 volt D.C., 6mm bore
Part No. M1110-2211

(For Metric Units) **M A A B B – C D E F**

DIGIT	DIGIT	MODEL NO.
0	1	SL
0	5	FL
0	7	SO
0	9	FO
1	1	FB

DIGIT	DIGIT	SIZE
0	9	08
1	0	11
1	1	15
1	2	17
1	3	19
1	4	22
1	5	26
1	6	30
1	7	42

DIGIT	VOLTS
1	90 VDC
2	24 VDC
3	12 VDC
4	120 VAC

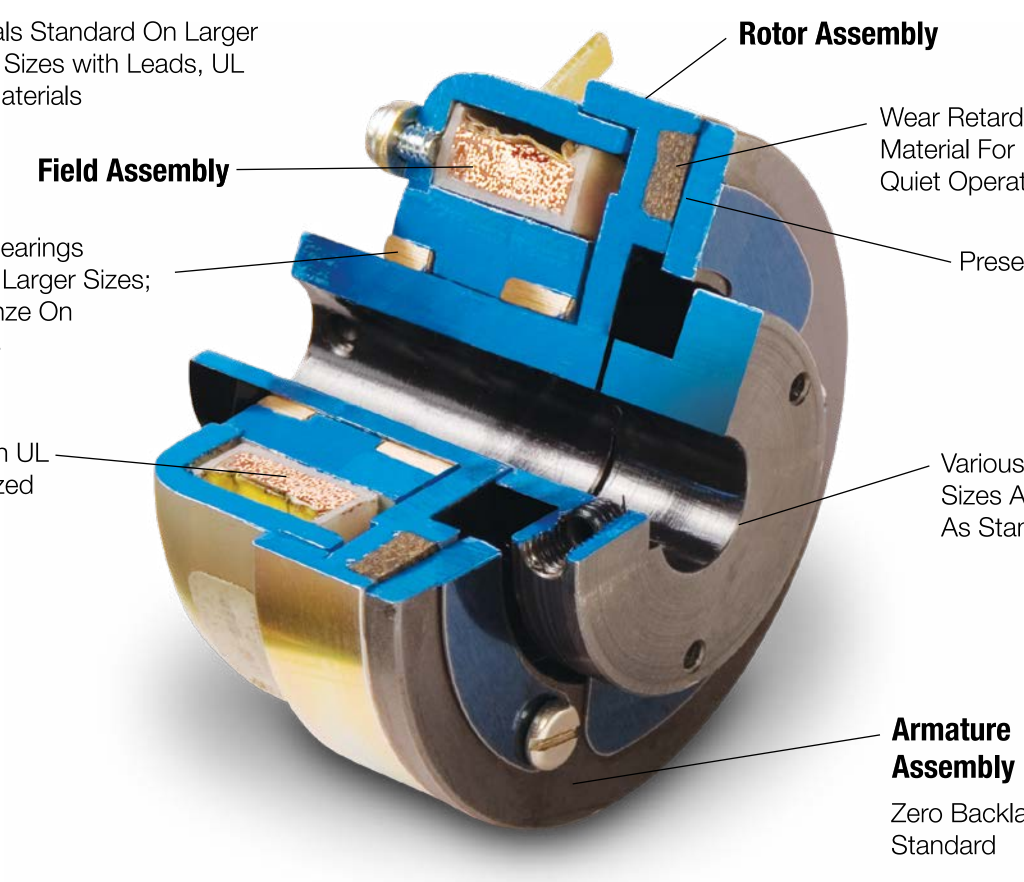
DIGIT	BORE (MM)
1	5
2	6
3	8
4	10
5	
6	15
7	17
8	20
9	25

DIGIT	DRIVE
1	ZERO BACKLASH

DIGIT	CONNECTION
1	LEAD WIRES
2	SCREW TERMINALS

Electromagnetic Power-On Friction Clutches & Brakes

Power-On Clutches & Brakes Description



Model SO26 Clutch Coupling shown

Typical Applications of Clutches & Brakes

- Packaging Machinery
- Medical Equipment
- Conveyors
- Postal Sorters/Readers
- Document Feeders
- Textile Equipment
- Mobile Power Equipment
- Copiers/Printers

Generating the Clutch or Brake Torque

Inertia Dynamics clutches and brakes are designed to start and stop inertial loads when the voltage is turned on. When DC voltage is applied to the coil, the magnetic force caused by the magnetic flux pulls the armature across the air gap against the force of the zero-backlash spring attached to the armature. The mating of the armature and rotor face produce torque.

When DC voltage is interrupted, the magnetic field collapses, and the zero-backlash spring retracts the armature from the rotor face. There is no residual torque produced.

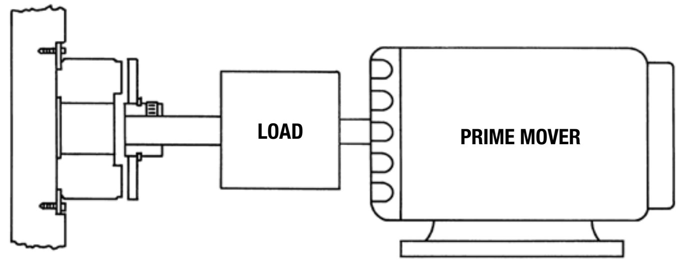
Special Features of the IDI Clutches and Brakes

- Precision oiltite sleeve and ball bearings for long life.
- Zero-backlash armature assembly providing a spring release for reliable and precise disengagement.
- Stationary field coil assembly means no slip rings or brushes.
- All parts effectively protected against corrosion. Asbestos-free friction material.
- Non-standard coil voltages available upon request.
- Metric bore sizes available.
- Conforms to ROHS standards.

Selection Process

STEP 1

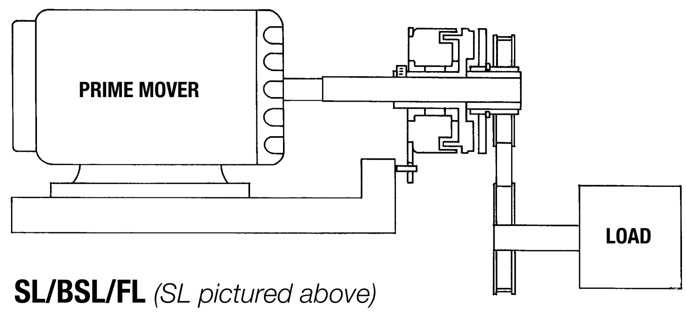
These graphics provide a visual guide to unit mounting in a typical application.



FB

FB

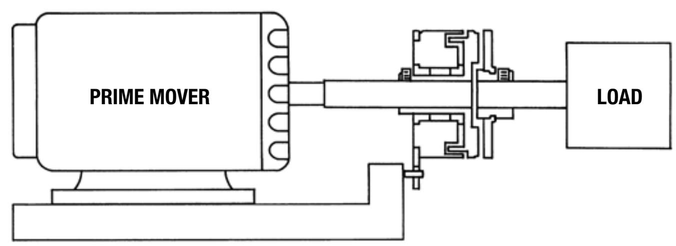
The brake will be mounted on a driven shaft with the magnet secured to the machine frame. When engaged, the brake will bring the rotating load to a stop and hold until power is removed.



SL/BSL/FL *(SL pictured above)*

SL/BSL/FL

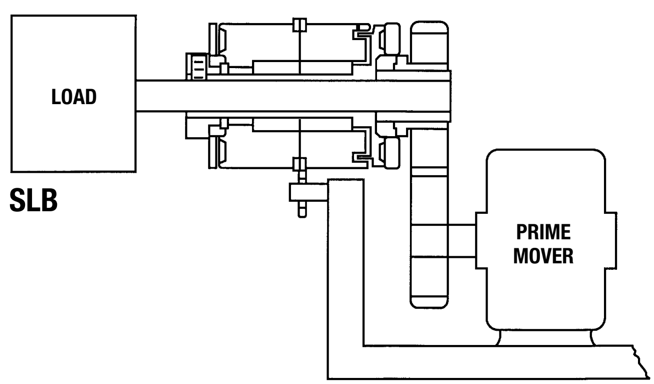
The SL, BSL and FL clutches are designed for parallel shaft mounting and will connect to the load via a chain or belt drive. The clutch can be mounted to either a driving or driven shaft.



SO/FO *(SO pictured above)*

SO/FO

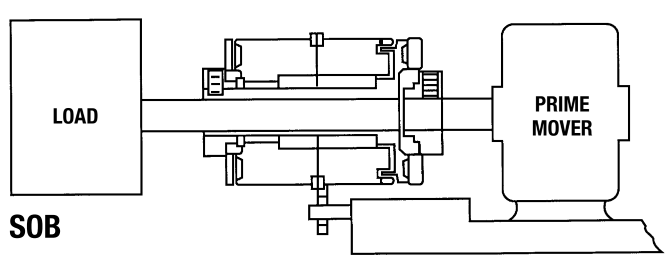
The SO/FO clutches are designed for use with two in-line shafts. Half of the clutch will mount to the driving shaft and the other half to the driven shaft. When engaged the unit will couple the two shafts together.



SLB

SLB

This clutch/brake combination will be mounted on a driven shaft with the brake located closest to the load. SLB units are designed for parallel shaft mounting and will have input from a chain or belt drive. When the clutch is engaged, it will drive the load, when the brake is engaged, the load will be stopped and held, and the clutch input will rotate.



SOB

SOB

This clutch/brake combination will be used with two in-line shafts with the brake on the driven shaft. When clutch is engaged, the clutch will couple the two shafts together. With brake engaged, the driven shaft and load will be stopped and held while the input half of the clutch will rotate freely on the driving shaft.

Selection Process

STEP 2

Determine the shaft speed at the clutch or brake location. Whenever possible locate the clutch or brake at the highest speed shaft available to perform the desired task. A higher speed will provide a lower torque requirement and therefore a smaller clutch or brake.

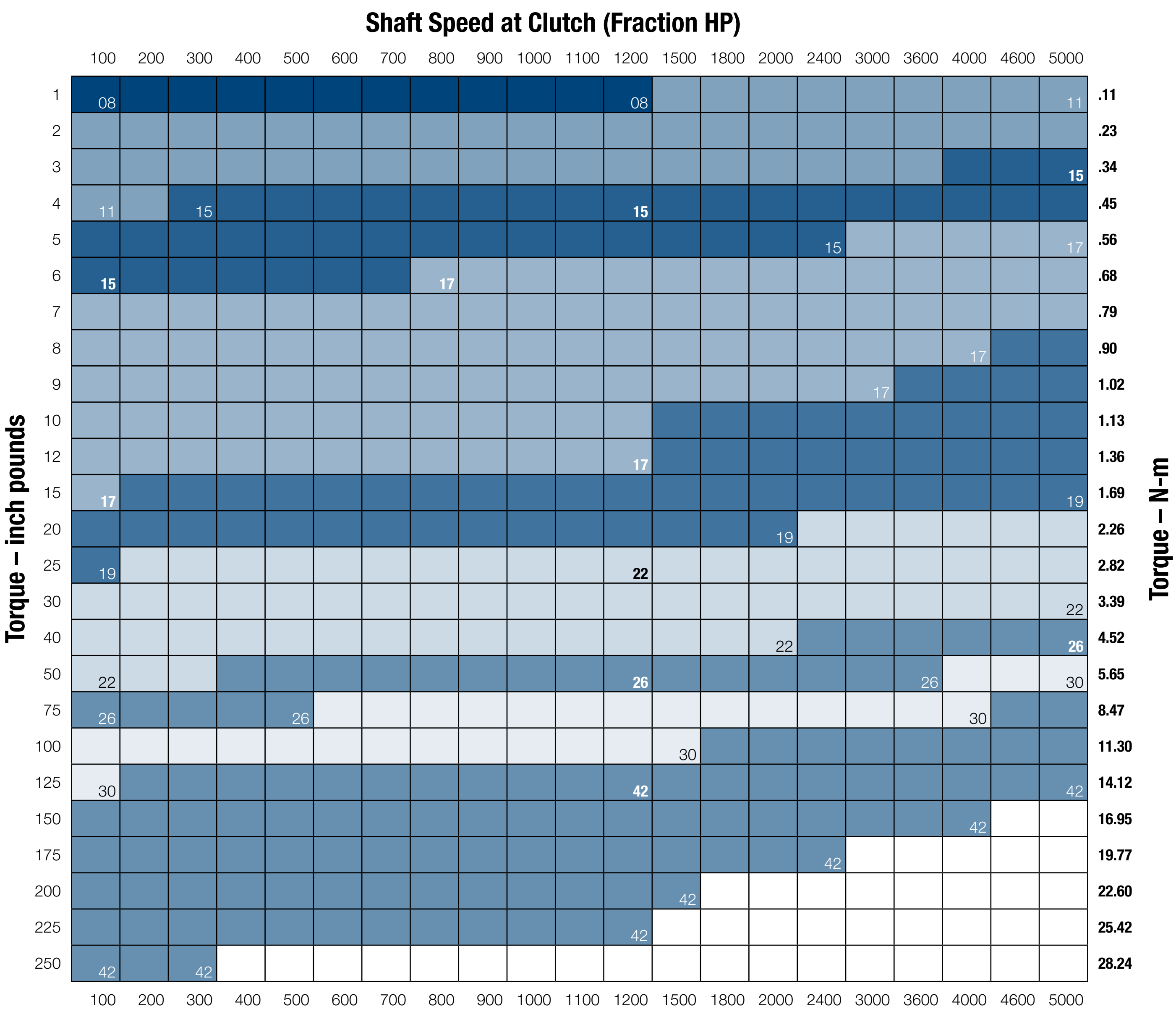
STEP 3

Use the chart below to find the intersection of the speed and torque for your application. This will provide the unit size.

STEP 4

Using the appropriate catalog page, confirm unit dimensions and mounting. Provide unit bore size(s) and coil voltage.

For additional calculation formulae and dynamic torque curves, please refer to following pages.



In addition to the solution steps on previous pages, the dynamic torque required may be calculated.

There are two methods you can use to calculate the dynamic torque required.

$$T_d = \left[\frac{WR^2 \times N \pm T_L}{C \times t}\right] \times S.F.$$

Where:

- WR^2 = Total inertia reflected to the clutch/brake, lb.–in.^{2} (kg.m^2)
- N = Shaft speed at clutch/brake, RPM
- C = Constant, use 3696 for English units and 9.55 for metric units
- t = Desired stopping or acceleration time, seconds
- T_L = Load torque to overcome other than inertia, lb.–in. (N–m)
- S.F. = Service Factor, 1.4 recommended
- T_d = Average dynamic torque, lb.–in. (N–m)

Note: $+ T_L$ = engage a clutch or accelerate
$- T_L$ = brake or decelerate

The relationship between the horsepower and speed can also be calculated to determine the dynamic torque required is expressed as:

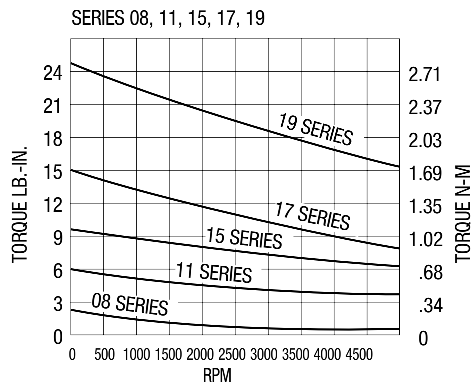
$$T_d = \frac{63{,}025 \times P}{N} \times S.F.$$

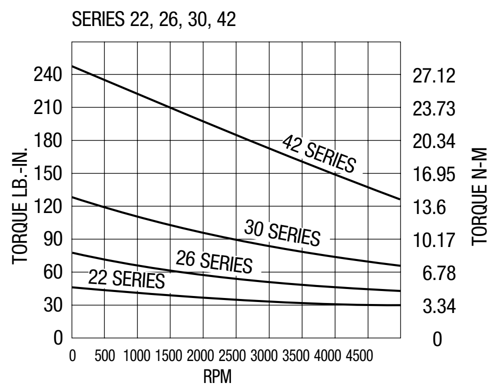
Where:

- T_d = Average dynamic torque, lb.–in.
- P = Horsepower, HP
- N = Shaft Speed
- S.F. = Service Factor
- 63,025 = Constant

Inertia Dynamics clutches and brakes are rated by static torque. The following charts may be used to estimate the dynamic torque.

Dynamic Torque Curve





Torque Data

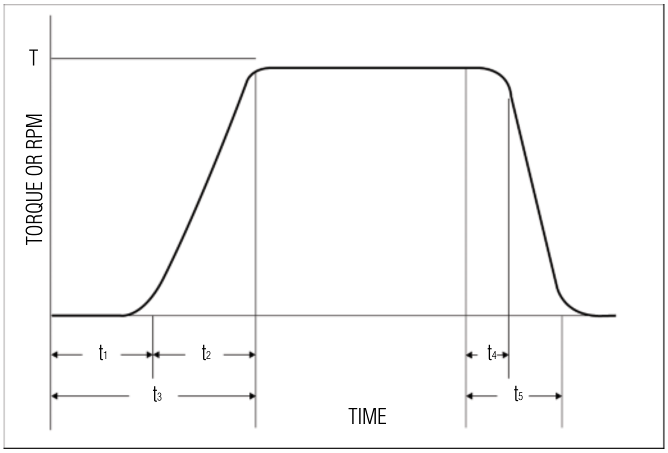
CLUTCHES: CLUTCH COUPLINGS: POWER ON BRAKES			
SERIES	TYPICAL OUT-OF-BOX TORQUES LB. - IN. (N-M)	RATED STATIC TORQUES LB. - IN. (N-M)	TYPICAL TORQUES AFTER BURNISHING LB. - IN. (N-M)
08	2 (.23)	2.5 (.28)	3 (.34)
11	5 (.56)	6 (.68)	8 (.90)
15	8 (.90)	10 (1.13)	15 (1.69)
17	12 (1.36)	15 (1.70)	20 (2.26)
19	20 (2.26)	25 (2.82)	30 (3.39)
22	40 (4.52)	50 (5.65)	60 (6.78)
26	65 (7.34)	80 (9.04)	90 (10.17)
30	100 (11.30)	125 (14.12)	150 (16.95)
42	225 (25.42)	250 (28.25)	275 (31.07)

Burnishing

Burnishing is a wearing-in or mating process which will ensure the highest possible output torques. Burnishing is accomplished by forcing the brake to slip rotationally when energized. Best results are obtained when the unit is energized at 30-40% of rated voltage and forced to slip for a period of 2-3 minutes at a low speed of 30-200 RPM depending on the unit size. Units in applications with high inertial loads and high speed will usually become burnished in their normal operating mode. Whenever possible, it is desirable to perform the burnishing operation in the final location so the alignment of the burnished faces will not be disturbed. For additional information on burnishing procedures for power-on brakes and clutches ask for burnishing spec. #040-1001.

Selection Criteria

Response Times for Clutches & Brakes



Where:

t_1 = Delay time when engaging
t_2 = Torque rise time
t_3 = Time to full torque or speed
t_4 = Disengaging time (90% torque)
t_5= Time to zero speed
T = Full torque or speed

Hi-Pot Testing

All clutches and brakes are tested 100% for Hi-Pot failures,typical tests are 1500 volts RMS. Do not Hi-Pot units with A.C. operating voltages as this will potentially damage the rectifiers and cause failure. For additional information for units with D.C. operating voltages, refer to IDI spec #040-1032.

Response Times

SERIES	RATED STATIC TORQUE LB. - IN. (N-M)	TORQUE BUILD-UP TIME MILLISECONDS		TORQUE DECAY TIME MS
		80% OF RATED TORQUE	100% OF RATED TORQUE	10% OF RATED TORQUE
08	2.5 (.28)	4.8	7.5	6.6
11	6 (.68)	7.2	10.5	11
15	10 (1.13)	9	12	17
17	15 (1.70)	10	14	14
19	25 (2.83)	33	48	35
22	50 (5.65)	27	42	20
26	80 (9.04)	22	40	30
30	125 (14.12)	43	60	36
42	250 (28.24)	45	70	50

Notes:

1. Torque decay time is dependent on the type of arc suppression circuit used. Decay times shown in table assume use of a diode in parallel with the coil for arc suppression. If no arc suppression is used, torque will decay almost instantly.
2. Actual response times depend on several factors such as inertia being accelerated or decelerated, speed, load torque, and type of switching used.
3. Time to full torque can be shortened by applying overexcitation voltages up to 50 times the rated coil voltage.
4. The time to full torque is also dependent on the voltage supply. If the clutch or brake is underpowered (low voltage), a decrease in torque will result. The clutch or brake should be sized based upon the worst-case voltage condition. The DC voltage supply should be filtered full wave for highest efficiency. Half wave DC voltage will result in lower torque output.

SL SERIES POWER-ON CLUTCHES

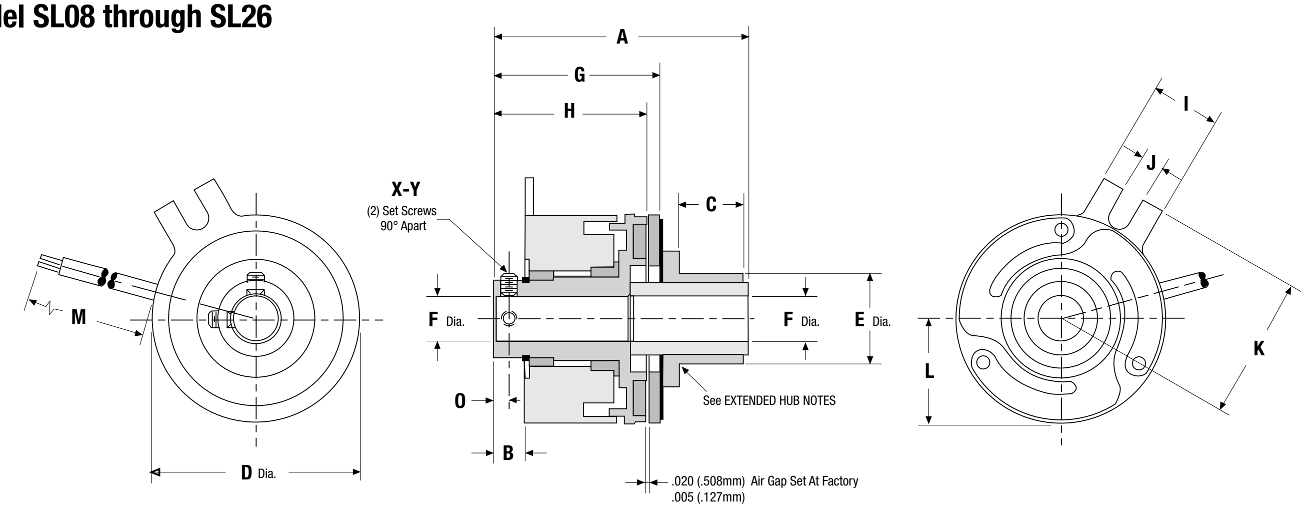
Shaft Mounted Clutches – Type SL

SL series power-on clutches are used to couple two parallel shafts. The armature hub assembly is mounted to the same shaft as the rotor assembly. The armature hub accommodates a pulley, gear, sprocket, etc., to transmit torque to the second shaft. The field assembly is mounted on the shaft and retained by a loose-fitting pin or bracket through the anti-rotation tab.

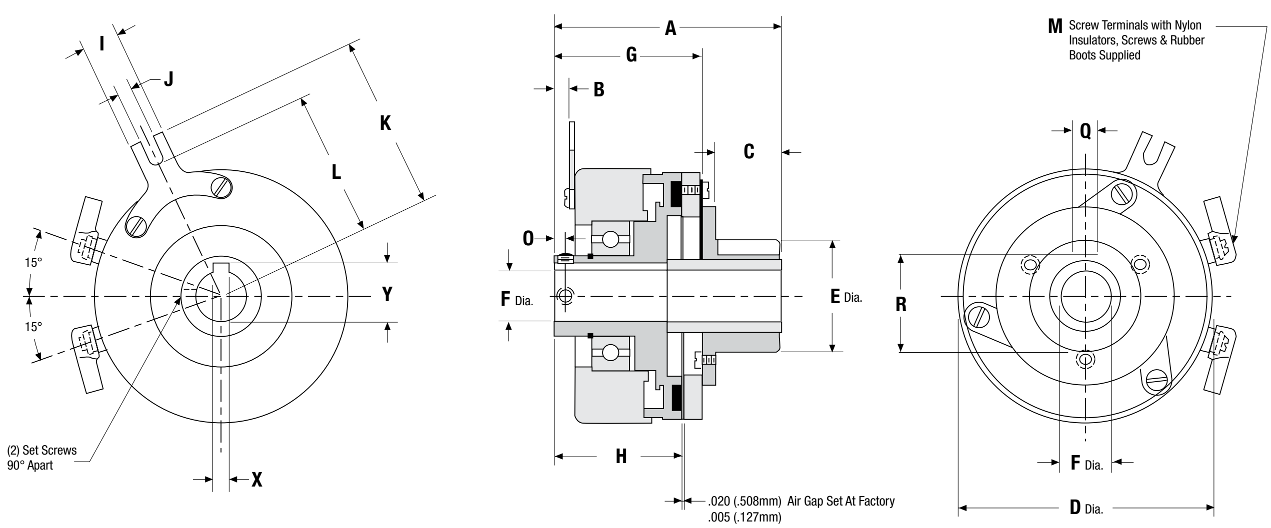
Customer Shall Maintain:

A loose-fitting pin through the anti-rotation tab to prevent preloading the bearings.

Model SL08 through SL26



Model SL30 and SL42



Shaft Mounted Clutches – Type SL Imperial

Mechanical

MODEL NO.	STATIC TORQUE LB. - IN.	INERTIA LB. - IN.²		WEIGHT OZ.
		ROTOR	ARM & HUB	
SL08	2.5	.002	.0015	2.0
SL11	6	.0058	.0029	3.2
SL15	10	.060	.0031	3.8
SL17	15	.061	.036	11
SL19	25	.082	.047	12
SL22	50	.215	.079	20
SL26	80	.362	.292	28
SL30	125	.610	.561	50
SL42	250	2.50	2.30	85

Electrical

MODEL NO.	90 VDC		24 VDC		12 VDC	
	AMPS	OHMS	AMPS	OHMS	AMPS	OHMS
SL08	0.046	1977	0.117	205	0.246	48.8
SL11	0.047	1930	0.198	121	0.447	26.8
SL15	0.042	2150	0.183	132	0.38	31.6
SL17	0.066	1369	0.289	83	0.561	21.4
SL19	0.074	1213	0.294	81.6	0.574	20.9
SL22	0.079	1140	0.322	74.6	0.628	19.1
SL26	0.092	980	0.374	64.2	0.76	15.8
SL30	0.091	988	0.378	65.3	0.729	16.5
SL42	0.124	722	0.468	51.2	0.934	12.84

Lead wire is UL recognized style 1213, 1015 or 1430, 22 gage.
Insulation is .050” O.D. on 08, 11, 15 units; .064 or .095” O.D. on all other units.

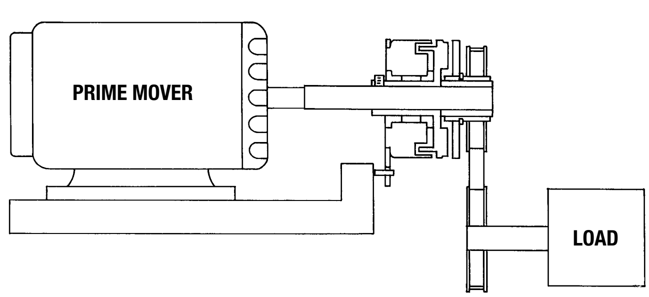
Dimensions

MODEL NO.	A MAX.	B NOM.	C MAX.	D MAX.	E ± .002	F NOM.	G NOM.	H NOM.	I MAX.	J MIN.	K NOM.	L NOM.	M ± .500	O NOM.	ROTOR KEYWAY BORE	KEYWAY X	KEYWAY Y
SL08	1.37	0.191	0.41	0.903	0.507 (Knurl)	1/8 3/16 1/4	0.874	0.763	0.305	0.094	0.625	0.445	12	0.08	N.A.	SET SCREWS ONLY	
SL11	1.409	0.147	0.396	1.16	0.507 (Knurl)	3/16 1/4 5/16	0.935	0.777	0.38	0.122	0.875	0.585	12	0.087	N.A.	SET SCREWS ONLY	
SL15	1.695	0.275	0.303	1.5	0.630 (Knurl)	1/4 5/16 3/8	1.255	1.075	0.52	0.18	1.12	0.75	12	0.125	N.A.	SET SCREWS ONLY	
SL17	1.823	0.279	0.382	1.78	0.630 (Knurl)	1/4 5/16 3/8	1.316	1.06	0.505	0.184	1.325	0.975	12	0.125	N.A.	SET SCREWS ONLY	
SL19	1.948	0.279	0.465	2	0.756 (Knurl)	5/16 3/8 1/2	1.329	1.06	0.505	0.184	1.325	0.975	12	0.125	5/16 3/8 1/2	.0625-.0655 .094-.097 SET SCREWS ONLY	.347-.352 .417-.427
SL22	2.16	0.281	0.432	2.26	0.756 (Knurl)	3/8 1/2	1.578	1.423	0.442	0.17	1.515	1.16	18	0.117	3/8 1/2	.094-.097 .125-.128	.417-.427 .560-.567
SL26	2.454	0.28	0.472	2.645	0.999	3/8 1/2 5/8	1.74	1.437	0.51	0.19	1.75	1.465	18	0.154	3/8 1/2 5/8	.094-.097 .125-.128 .1885-.1905	.417-.427 .560-.567 .709-.716
SL30	2.8	0.25	0.83	3.268	1.374	1/2 5/8 3/4	1.815	1.39	0.442	0.17	2.05	1.695	SCREW TERMI-NALS	0.135	1/2 5/8 3/4	.125-.128 .1885-.1905 .1885-.1905	.560-.567 .709-.716 .836-.844
SL42*	3.82	0.32	1.56	4.27	1.374	1/2 5/8 3/4 7/8 1	2.05	1.625	0.645	0.19	2.5	2.312	SCREW TERMI-NALS	0.187	1/2 5/8 3/4 7/8* 1*	.125-.128 .1885-.1905 .1885-.1905 .1885-.1905 .251-.253	.560-.567 .709-.716 .836-.844 .962-.970 1.113-1.121

*7/8 and 1 inch bore in rotor only.

Notes:

1. 08 units have set screws 120° apart
2. 08 and 19 units have retaining collar
3. 30 and 42 units have single ball bearing between field and rotor
4. 26 units have (3)-#8-32 tapped holes on 1.375 in. B.C. in armature hub face instead of knurl
5. 30 and 42 units have keyway instead of knurl (Q=.312/.314, R=1.198/1.193)
6. 7/8 and 1 inch bore in rotor only for 42 unit



See page 4 for Ordering Information

Shaft Mounted Clutches – Type SL Metric

Mechanical

MODEL NO.	STATIC TORQUE N-m	INERTIA kg-cm^2		WEIGHT kg
		ROTOR	ARM & HUB	
SL08	.28	.006	.004	0.57
SL11	.68	.017	.008	0.91
SL15	1.13	.176	.009	.108
SL17	1.70	.179	.105	.312
SL19	2.83	.240	.138	.340
SL22	5.65	.629	.231	.567
SL26	9.04	1.062	.855	.794
SL30	14.12	1.785	1.642	1.417
SL42	28.24	7.316	6.731	2.410

Electrical

MODEL NO.	90 VDC		24 VDC		12 VDC	
	AMPS	OHMS	AMPS	OHMS	AMPS	OHMS
SL08	0.046	1977	0.117	205	0.246	48.8
SL11	0.047	1930	0.198	121	0.447	26.8
SL15	0.042	2150	0.183	132	0.38	31.6
SL17	0.066	1369	0.289	83	0.561	21.4
SL19	0.074	1213	0.294	81.6	0.574	20.9
SL22	0.079	1140	0.322	74.6	0.628	19.1
SL26	0.092	980	0.374	64.2	0.76	15.8
SL30	0.091	988	0.378	65.3	0.729	16.5
SL42	0.124	722	0.468	51.2	0.934	12.84

Lead wire is UL recognized style 1213, 1015 or 1430, 22 gage.
Insulation is 1.27 mm O.D. on 08, 11, 15 units; 1.63 or 2.41 mm O.D. on all other units.

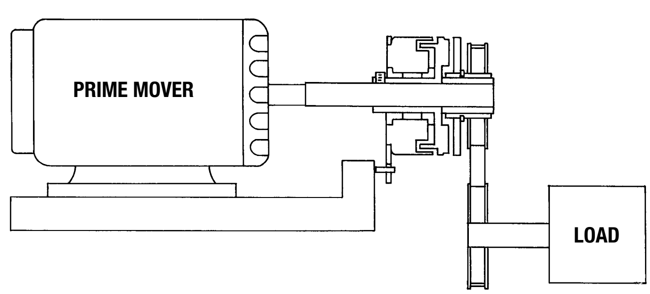
Dimensions

MODEL NO.	A MAX.	B NOM.	C MAX.	D MAX.	E ± .051	F NOM.	G NOM.	H NOM.	I MAX.	J MIN.	K NOM.	L NOM.	M ± 12.7	O NOM	ROTOR KEYWAY		
															BORE	KEYWAY X	KEYWAY Y
SL08	34.798	4.851	10.414	22.936	12.878 (Knurl)	5H9	22.200	19.380	7.747	2.388	15.875	11.303	304.8	2.032	N.A.	SET SCREWS ONLY	
SL11	35.789	.734	10.058	29.464	12.582 (Knurl)	6H9 8H9	23.749	19.736	9.652	3.099	22.225	14.859	304.8	2.210	N.A.	SET SCREWS ONLY	
SL15	43.053	6.985	7.969	38.100	16.022 (Knurl)	8H9 10H9	31.877	27.305	13.208	4.572	28.448	19.050	304.8	3.175	N.A.	SET SCREWS ONLY	
SL17	46.304	7.087	9.703	45.212	16.002 (Knurl)	8H9 10H9	33.426	26.924	12.827	4.674	33.655	24.765	304.8	3.175	N.A.	SET SCREWS ONLY	
SL19	49.479	7.087	11.811	50.800	19.202 (Knurl)	10H9	33.757	26.924	12.827	4.674	33.655	24.765	304.8	3.175	10H9	2.988-3.060	11.40-11.50
SL22	54.864	7.137	10.973	57.404	19.202 (Knurl)	10H9	40.081	32.334	11.227	4.318	38.481	29.464	457.2	2.972	10H9	2.988-3.060	11.40-11.50
SL26	62.586	1.036	11.989	67.183	25.375	10H9 15H9	44.526	36.678	12.954	4.826	44.450	37.211	457.2	3.912	10H9 15H9	2.988-3.060 4.985-5.078	11.40-11.50 17.30-17.40
SL30	71.120	6.350	21.082	83.007	34.900	15H9	46.101	35.306	11.227	4.318	52.070	43.053	SCREW TERMI-NALS	3.429	15H9	4.985-5.078	17.30-17.40
SL42*	97.028	8.128	39.624	108.458	34.900	17H9 20H9 25H9	52.070	41.275	16.383	4.826	63.500	58.725	SCREW TERMI-NALS	4.750	17H9 20H9 25H9	4.985-5.078 5.985-6.078 7.982-8.098	19.30-19.40 22.80-22.90 28.30-28.50

*20 and 25 mm bore in rotor only.

Notes:

1. 08 units have set screws 120° apart
2. 08 and 19 units have retaining collar
3. 30 and 42 units have single ball bearing between field and rotor
4. 26 units have (3)-M#4 tapped holes on (34.93 mm) B.C. in armature hub face instead of knurl
5. 30 and 42 units have keyway instead of knurl (Q= 7.925/7.976, R=30.429/30.302)
6. 20 and 25 mm bore in rotor only for 42 unit



See page 4 for Ordering Information

Shaft Mounted Clutches – Type BSL

BSL SERIES POWER-ON CLUTCHES

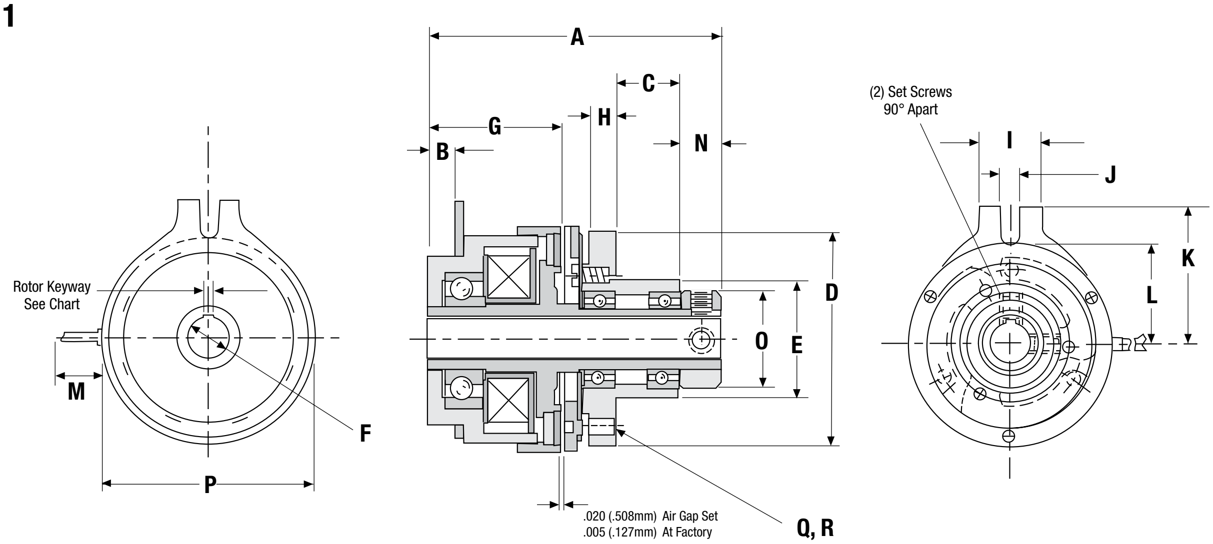
Shaft Mounted Clutches – Type BSL

Inertia Dynamics features four sizes of ball bearing clutches. All sizes have ball bearing armature and field assemblies for heavy duty applications, allowing higher shaft speeds and side loads to be achieved. All BSL clutches are shaft mounted for easy installation and operate in the same manner as our SL series clutches.

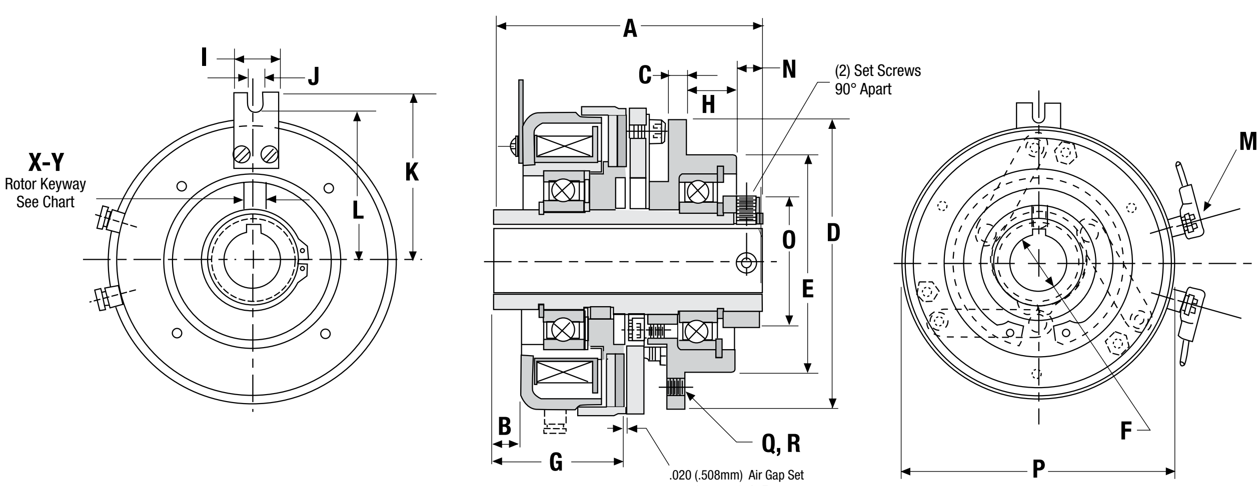
Customer Shall Maintain:

A loose-fitting pin through the anti-rotation tab to prevent preloading the bearings.

Model BSL11



Model BSL26, BSL30 & BSL42



Shaft Mounted Clutches – Type BSL Imperial

Mechanical

MODEL NO.	STATIC TORQUE LB. - IN.	INERTIA LB. - IN.^{2}		WEIGHT OZ.
		ROTOR	ARM & HUB	
BSL11	6	.013	.030	8
BSL26	80	.290	.530	38
BSL30	125	.560	.990	54
BSL42	250	2.250	4.990	94

Electrical

MODEL NO.	90 VDC		24 VDC		12 VDC	
	AMPS	OHMS	AMPS	OHMS	AMPS	OHMS
BSL11	.048	1848	.188	120	.447	26.8
BSL26	.088	1024	.358	67.1	.760	15.8
BSL30	.091	988	.378	65.3	.729	16.5
BSL42	.124	722	.468	51.2	.934	12.84

Lead wire is UL recognized style 1213, 1015 or 1430, 22 gage.
Insulation is .050” O.D. on 11 unit; .064” or .095” O.D. on all other units.

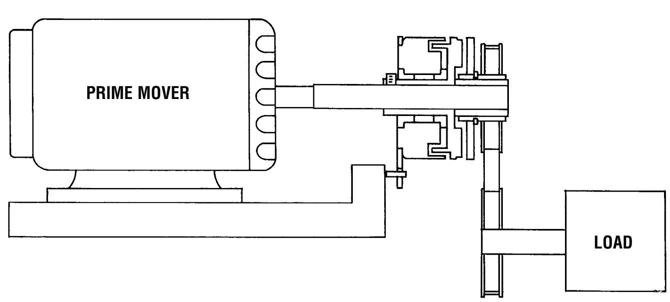
Dimensions

MODEL NO.	A MAX.	B MAX.	C NOM.	D MAX.	E ±.001	F NOM.	G NOM.	H NOM.	I MAX.	J MIN.	K NOM.	L NOM.	M ±.500	N NOM.	O NOM.	P MAX.	ROTOR KEYWAY			Q B.C.	R SIZE
																	BORE	NOMINAL KEYWAY X	NOMINAL KEYWAY Y		
BSL11	1.785	.184	.405	1.380	.7485	3/16 1/4	.812	.163	.380	.125	.875	.625	12.00	.250	.625	1.285	N.A.	SET SCREWS ONLY		1.125 3-Holes	6-32 UNC-2B
BSL26	2.930	.140	.260	2.505	1.498	1/2 5/8	1.375	.500	.510	.190	1.750	1.467	SCREW TERMI-NALS	.420	1.187	2.645	1/2 5/8	.125 – .128 .1885 – .1905	.560 – .567 .709 – .716	1.790 3-Holes	6-32 UNC-2B
BSL30	2.961	.140	.395	2.883	1.498	1/2	1.360	.500	.442	.170	2.050	1.740	SCREW TERMI-NALS	.408	1.187	3.300	1/2	.125 – .128	.560 – .567	1.790 3-Holes	6-32 UNC-2B
BSL42	3.350	.000	.267	4.015	2.999	3/4 7/8 1	1.405	.673	.645	.188	2.500	2.216	SCREW TERMI-NALS	.383	1.810	4.270	3/4 7/8 1	.1885 – .1905 .1885 – .1905 .251 – .253	.836 – .844 .962 – .970 1.113 – 1.121	3.500 3-Holes	1/4-20 UNC-2B

*X denotes keyway width, Y denotes keyway height plus bore.

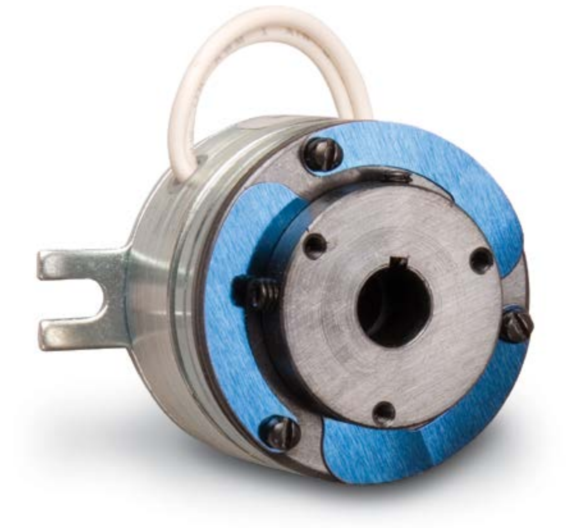
Notes:

1. BSL42 has a .188-.195 diameter hole in the anti-rotation tab.
2. BSL26 has two ball bearings in field and armature assemblies.
3. BSL30 has two ball bearings in armature assembly.
4. BSL26 uses a special key provided by IDI for 5/8 bore.



See page 4 for Ordering Information

Shaft Mounted Clutch Couplings – Type SO



SO SERIES POWER-ON CLUTCH COUPLINGS

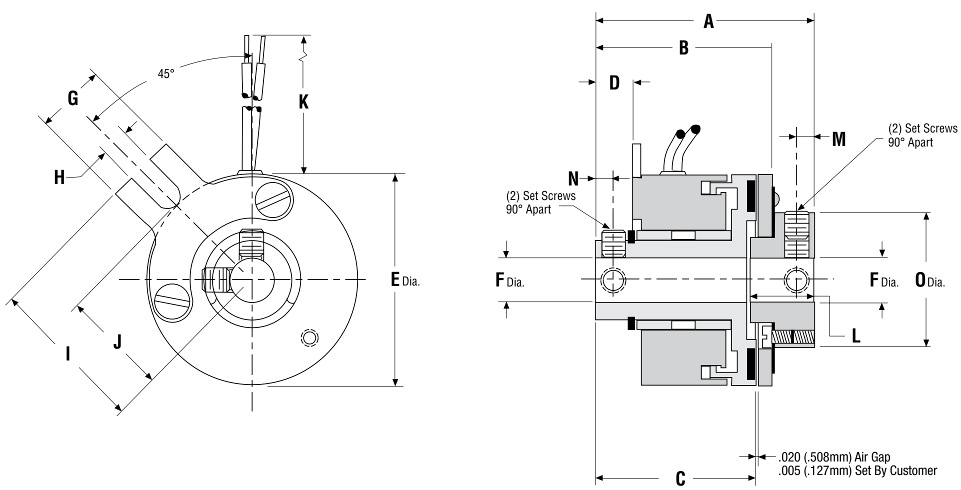
Shaft Mounted Clutch Couplings – Type SO

SO series power-on clutch couplings are used to couple two in-line shafts. The armature hub assembly is mounted to the load shaft, and the rotor assembly is mounted on the input shaft. The field assembly is mounted on the input shaft and retained by a loose-fitting pin or bracket through the anti-rotation tab.

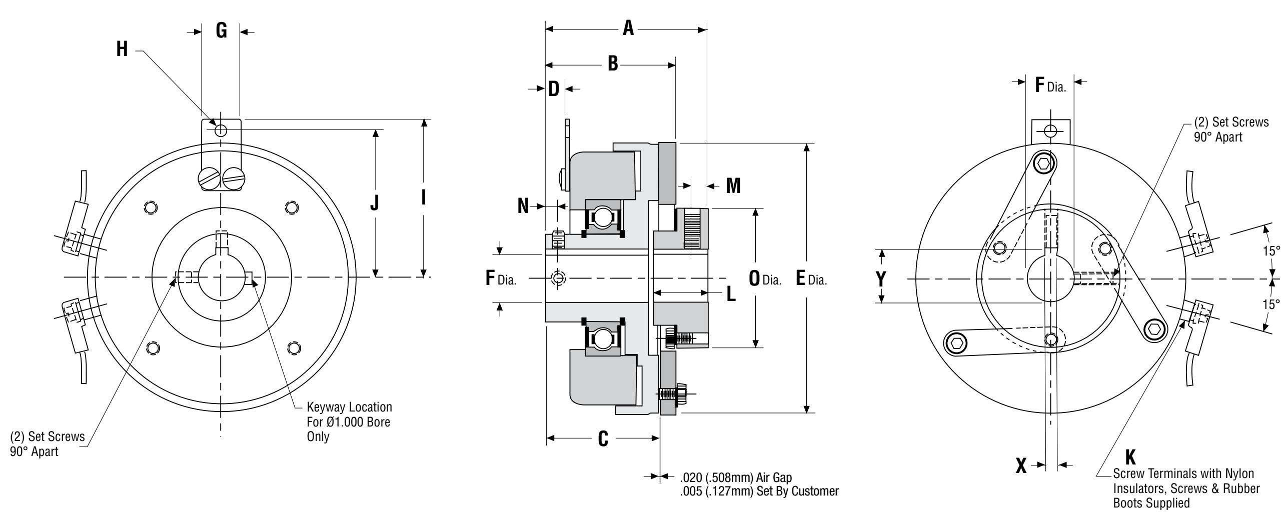
Customer Shall Maintain:

A loose-fitting pin through the anti-rotation tab to prevent preloading the bearings; concentricity between the shafts within .005 inch (.127 mm) T.I.R.; initial air gap setting of .005-.020 inches (.127-.508 mm).

Model SO08 through SO26



Model SO30 and SO42



Shaft Mounted Clutch Couplings – Type SO Imperial

Mechanical

MODEL NO.	STATIC TORQUE LB. - IN.	INERTIA LB. - IN.^{2}		WEIGHT OZ.
		ROTOR	ARM & HUB	
S008	2.5	.002	.0011	2
S011	6	.0058	.0024	3.2
S015	10	.060	.026	3.8
S017	15	.061	.031	11
S019	25	.082	.042	12
S022	50	.215	.070	20
S026	80	.362	.320	28
S030	125	.610	.561	45
S042	250	2.50	2.30	80

Electrical

MODEL NO.	90 VDC		24 VDC		12 VDC	
	AMPS	OHMS	AMPS	OHMS	AMPS	OHMS
S008	.046	1977	.117	205	.246	48.8
S011	.047	1930	.198	121	.447	26.8
S015	.042	2150	.183	132	.380	31.6
S017	.066	1369	.289	83	.561	21.4
S019	.074	1213	.322	74.4	.574	20.9
S022	.079	1140	.322	74.6	.628	19.1
S026	.092	980	.374	64.2	.760	15.8
S030	.091	988	.378	65.3	.729	16.4
S042	.124	722	.468	51.2	.934	12.84

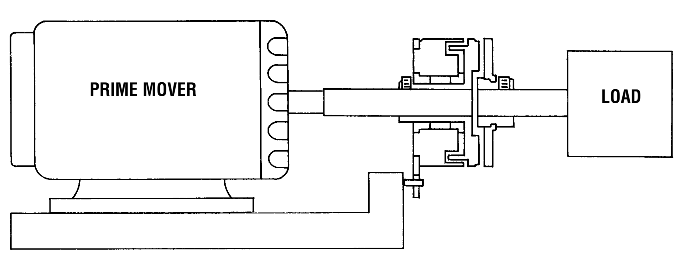
Lead wire is UL recognized style 1213, 1015 or 1430, 22 gage.
Insulation is .050 O.D. on 08, 11, 15 units; .064 or .095 O.D. on all other units.

Dimensions

MODEL NO.	A MAX.	B NOM.	C NOM.	D NOM.	E MAX.	F NOM.	G MAX.	H MIN.	I NOM.	J NOM.	K NOM.	ROTOR KEYWAY			L NOM.	M ± .500	N NOM.	O NOM.
												BORE	KEYWAY X	KEYWAY Y				
S008	1.059	.875	.763	.191	.903	1/8 3/15 1/4	.305	.094	.625	.445	12.00	N.A.	SET SCREWS ONLY		.237	.070	.080	.500
S011	1.168	.933	.777	.147	1.160	3/16 1/4 5/16	.380	.122	.875	.585	12.00	N.A.	SET SCREWS ONLY		.307	.093	2.032	.687
S015	1.575	1.255	1.075	.275	1.500	1/4 5/16 3/8	.520	.180	1.120	.750	12.00	N.A.	SET SCREWS ONLY		.475	.125	.125	.965
S017	1.605	1.311	1.060	.270	1.780	1/4 5/16 3/8	.505	.184	1.325	.975	12.00	1/4 5/16 3/8	SET SCREWS ONLY		.460	.115	.125	1.190
S019	1.609	1.314	1.060	.270	2.000	5/16 3/8 1/2	.505	.184	1.325	.975	12.00	5/16 3/8 1/2	.0625 – .0655 .094 – .097 .125 – .128	.347 – .352 .417 – .427 .560 – .567	.455	.115	.125	1.190
S022	1.989	1.578	1.423	.281	2.260	3/8 1/2	.442	.170	1.515	1.160	18.00	3/8 1/2	.094 – .097 .125 – .128	.417 – .427 .560 – .567	.510	.115	.117	1.005
S026	2.115	1.754	1.444	.277	2.645	3/8 1/2 5/8	.510	.190	1.750	1.465	18.00	3/8 1/2 5/8	.094 – .097 .125 – .128 .1885 – .1905	.417 – .427 .560 – .567 .709 – .716	.610	.150	.154	1.440
S030	2.151	1.815	1.403	.265	3.268	1/2 5/8 3/4	.442	.170	2.050	1.695	SCREW TERMINALS	1/2 5/8 3/4	.125 – .128 .1885 – .1905 .1885 – .1905	.560 – .567 .709 – .716 .836 – .844	.680	.150	.135	1.825
S042	2.570	2.050	1.625	.320	4.270	1/2 5/8 3/4 7/8 1	.645	.190	2.500	2.312	SCREW TERMINALS	1/2 5/8 3/4 7/8 1	.125 – .128 .1885 – .1905 .1885 – .1905 .1885 – .1905 .251 – .253	.560 – .567 .709 – .716 .836 – .844 .962 – .970 1.113 – 1.121	.890	.250	.187	2.195

Notes:

1. 30 and 42 units have a single ball bearing between the field and rotor.
2. 08 units have set screws 120° apart.
3. 08 and 19 units have retaining collar.



See page 4 for Ordering Information

Electromagnetic Friction Clutches & Brakes

Shaft Mounted Clutch Couplings – Type SO Metric

Mechanical

MODEL NO.	STATIC TORQUE N-m	INERTIA kg - cm^2		WEIGHT kg
		ROTOR	ARM & HUB	
S008	0.28	0.006	0.003	.06
S011	0.68	0.017	0.007	.09
S015	1.13	0.176	0.076	.11
S017	1.70	0.179	0.091	.31
S019	2.83	0.240	0.123	.34
S022	5.65	0.629	0.205	.57
S026	9.04	1.059	0.936	.79
S030	14.12	1.785	1.642	1.28
S042	28.24	7.316	6.731	2.27

Electrical

MODEL NO.	90 VDC		24 VDC		12 VDC	
	AMPS	OHMS	AMPS	OHMS	AMPS	OHMS
S008	.046	1977	.117	205	.246	48.8
S011	.047	1930	.198	121	.447	26.8
S015	.042	2150	.183	132	.380	31.6
S017	.066	1369	.289	83	.561	21.4
S019	.074	1213	.322	74.4	.574	20.9
S022	.079	1140	.322	74.6	.628	19.1
S026	.092	980	.374	64.2	.760	15.8
S030	.091	988	.378	65.3	.729	16.4
S042	.124	722	.468	51.2	.934	12.84

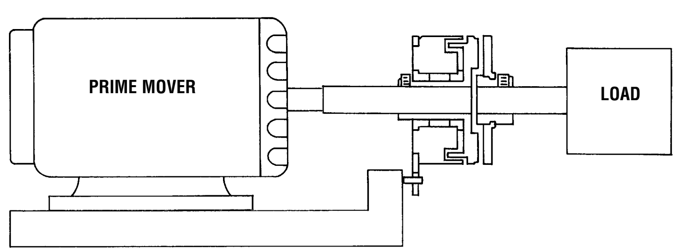
Lead wire is UL recognized style 1213, 1015 or 1430, 22 gage.
Insulation is 1.27 mm O.D. on 08, 11, 15 units; .1.63 mm or 2.41 mm O.D. on all other units.

Dimensions

MODEL NO.	A MAX.	B NOM.	C NOM.	D NOM.	E MAX.	F NOM.	G MAX.	H MIN.	I NOM.	J NOM.	K ± 12.7	ROTOR KEYWAY			L NOM.	M ±12.7	N NOM.	O NOM.
												BORE	KEYWAY					
													X	Y				
S008	26.899	22.225	19.380	4.851	22.936	5H9	7.747	2.388	15.875	11.303	304.800	N.A.	SET SCREWS ONLY		6.020	1.778	2.032	12.700
S011	29.667	23.698	19.736	3.734	29.464	6H9 8H9	9.652	3.099	22.225	14.859	304.800	N.A.	SET SCREWS ONLY		7.798	2.362	51.613	17.450
S015	40.005	31.877	27.305	6.985	38.100	8H9 10H9	13.208	4.572	28.448	19.050	304.800	N.A.	SET SCREWS ONLY		12.065	3.175	3.175	24.511
S017	40.767	33.299	26.924	6.858	45.212	8H9 10H9	12.827	4.674	33.655	24.765	304.800	8H9 10H9	1.988-2.060 2.988-3.060	9.00-9.10 11.40-11.50	11.684	2.921	3.175	30.226
S019	40.869	33.376	26.924	6.858	50.800	10H9	12.827	4.674	33.655	24.765	304.800	10H9	2.988-3.060	11.40-11.50	11.557	2.921	3.175	30.226
S022	50.521	40.081	32.334	7.137	57.404	10H9	11.227	4.318	38.481	29.464	457.200	10H9	2.988-3.060	11.40-11.50	12.954	2.921	2.972	25.527
S026	53.721	44.552	36.678	7.036	67.183	10H9 15H9	12.954	4.826	44.950	37.211	457.200	10H9 15H9	2.988-3.060 4.985-5.078	11.40-11.50 17.30-17.40	15.494	3.810	3.912	36.576
S030	54.635	46.101	35.636	6.731	83.007	15H9	11.227	4.318	52.070	43.053	SCREW TERMINALS	15H9	4.985-5.078	17.30-17.40	17.272	3.810	3.429	46.355
S042	65.278	52.070	41.275	8.128	108.458	17H9 20H9 25H9	16.383	4.826	63.500	58.725	SCREW TERMINALS	17H9 20H9 25H9	4.985-5.078 5.985-6.078 7.982-8.098	19.30-19.40 22.80-22.90 28.30-28.50	22.606	6.350	4.750	55.753

Notes:

1. 30 and 42 units have a single ball bearing between the field and rotor.
2. 08 units have set screws 120° apart.
3. 08 and 19 units have retaining collar.



See page 4 for Ordering Information

Model FL08 through FL26

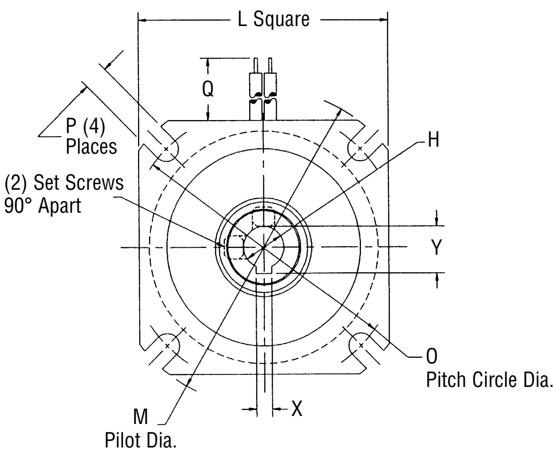
FL SERIES POWER-ON CLUTCHES

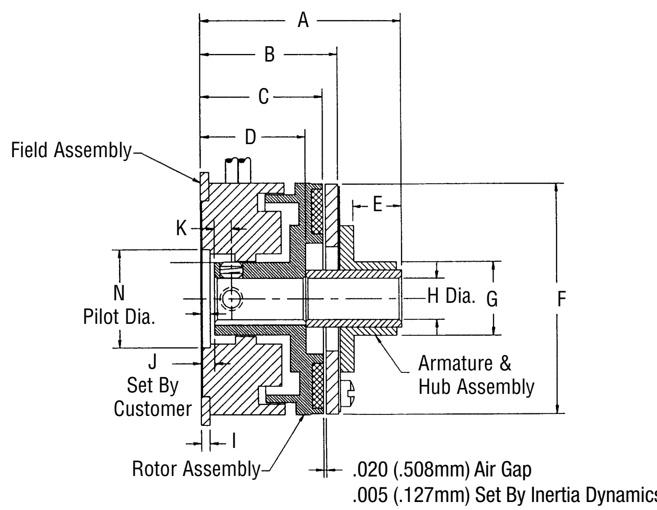
Flange Mounted Clutches – Type FL

FL series power-on clutches are used to couple two parallel shafts. The armature hub assembly is mounted to the same shaft as the rotor assembly. The armature hub accommodates a pulley, gear, sprocket, etc., to transmit torque to the second shaft. The field assembly is mounted to a bulkhead that is perpendicular to the input shaft.

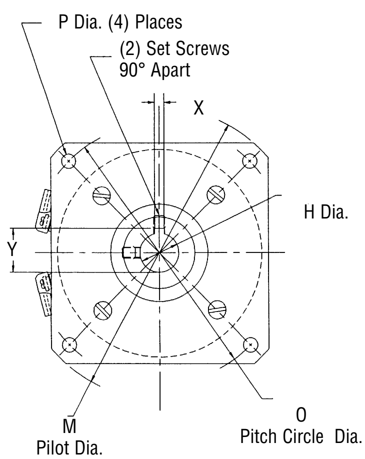
Customer Shall Maintain:

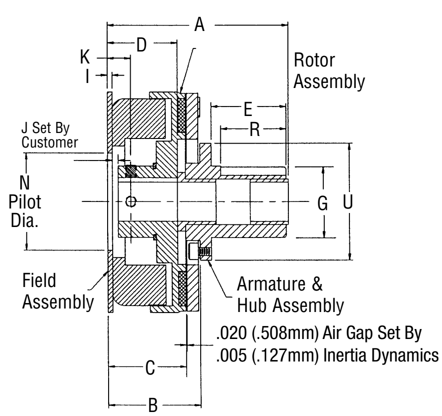
The perpendicularity of the mounting surface with respect to the shaft not to exceed .005 inch (.127 mm) T.I.R. at a diameter equal to the bolt circle; concentricity between the clutch mounting pilot diameter and the shaft not to exceed .004 inch (.102 mm) T.I.R.

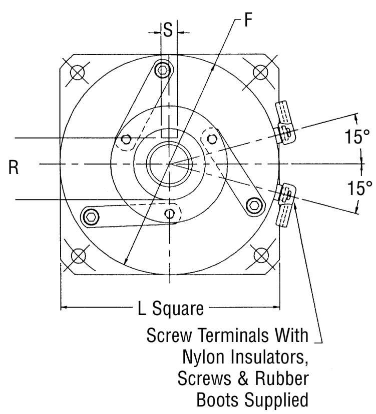




Model FL30 and FL42







Flange Mounted Clutches – Type FL Imperial

Mechanical

MODEL NO.	STATIC TORQUE LB. - IN.	INERTIA LB. - IN.^{2}		WEIGHT OZ.
		ROTOR	ARM & HUB	
FL08	2.5	.002	.0015	2.0
FL11	6	.005	.0029	3.2
FL15	10	.0054	.0031	3.8
FL17	15	.059	.036	11
FL19	25	.080	.047	12
FL22	50	.210	.079	20
FL26	80	.451	.292	28
FL30	125	.610	.561	45
FL42	250	2.50	2.30	80

Electrical

MODEL NO.	90 VDC		24 VDC		12 VDC	
	AMPS	OHMS	AMPS	OHMS	AMPS	OHMS
FL08	.046	1977	.117	205	.246	48.8
FL11	.047	1930	.198	121	.447	26.8
FL15	.042	2150	.183	132	.380	31.6
FL17	.066	1369	.289	83	.561	21.4
FL19	.074	1213	.322	74.4	.574	20.9
FL22	.079	1140	.322	74.6	.628	19.1
FL26	.092	980	.374	64.2	.760	15.8
FL30	.091	988	.378	65.3	.729	16.5
FL42	.124	722	.468	51.2	.934	12.84

Lead wire is UL recognized style 1213, 1015 or 1430, 22 gage.
Insulation is .050” O.D. on 08, 11, 15 units; .064” or .095” O.D. on all other units.

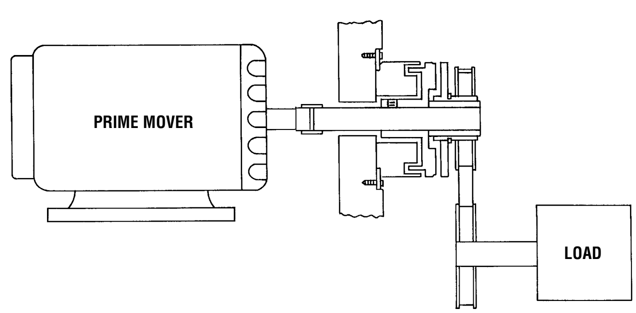
Dimensions

MODEL NO.	A MAX.	B NOM.	C NOM.	D NOM.	E MAX.	F MAX.	G ±.002	H NOM.	I MAX.	J ±.005	K NOM.	L MAX.	M ± .001	N ± .001	O NOM.	P MIN.	Q ± .500	ROTOR KEYWAY			R MIN.	S ± .002
																		BORE	KEYWAY X	KEYWAY Y		
FL08	1.203	.715	.641	.582	.410	.905	.507	1/8 3/16 1/4	.034	.020	.188	.980	1.1995	N.A.	1.030	.094	12.00	N.A.	ONE ROLL PIN PILOT HOLE		–	–
FL11	1.253	.774	.691	.616	.396	1.160	.505	3/16 1/4 5/16	.048	.020	.188	1.230	1.498	N.A.	1.312	.123	12.00	N.A.	ONE ROLL PIN PILOT HOLE		–	–
FL15	1.420	.975	.870	.805	.303	1.500	.630	1/4 5/16 3/8	.063	.100	.130	1.567	1.999	N.A.	1.750	.156	12.00	N.A.	ONE ROLL PIN PILOT HOLE		–	–
FL17	1.568	1.053	.925	.800	.382	1.789	.630	1/4 5/16 3/8	.064	.100	.130	1.943	2.436	.751	2.125	.186	12.00	1/4 5/16 3/8	.0625 – .0655 .0625 – .0655 .094 – .097	.285 – .290 .347 – .352 .417 – .427	–	–
FL19	1.675	1.050	.910	.790	.470	2.000	.756	5/16 3/8 1/2	.062	.100	.130	1.943	2.436	.751	2.125	.186	12.00	5/16 3/8 1/2	.0625 – .0655 .094 – .097 ROLL PIN HOLE	.347 – .352 .417 – .427	–	–
FL22	1.928	1.328	1.173	1.023	.432	2.260	.756	3/8 1/2	.096	.100	.188	2.322	2.873	1.001	2.500	.160	18.00	3/8 1/2	.094 – .097 .125 – .128	.417 – .427 .560 – .567	–	–
FL26	2.173	1.458	1.300	1.150	.472	2.645	.999	3/8 1/2 5/8	.064	.375	.172	2.630	3.499	1.062	3.125	.182	18.00	3/8 1/2 5/8	.094 – .097 .125 – .128 .1885 – .1905	.417 – .427 .560 – .567 .709 – .716	–	–
FL30	2.575	1.580	1.310	1.160	.830	3.268	1.374	1/2 5/8 3/4	.097	.147	.310	3.200	4.186	1.751	3.750	.182	SCREW TERMI-NALS	1/2 5/8 3/4	.125 – .128 .1885 – .1905 .1885 – .1905	.560 – .567 .709 – .716 .836 – .844	1.198 1.193	.312 .314
FL42*	3.540	1.760	1.490	1.345	1.550	4.255	1.374	1/2 5/8 3/4 7/8 1	.097	.190	.250	4.255	5.624	1.875	5.000	.276	SCREW TERMI-NALS	1/2 5/8 3/4 7/8* 1*	.125 – .128 .1885 – .1905 .1885 – .1905 .1885 – .1905 .251 – .253	.560 – .567 .709 – .716 .836 – .844 .962 – .970 1.113 – 1.121	1.198 1.193	.312 .314

*7/8 and 1 inch bore in rotor only.

Notes:

1. 08, 11 and 15 units have one roll pin pilot hole in rotor – no set screws.
2. 26 units have (3) – #8–32 tapped holes on 1.375 in. B.C. in armature hub face instead of knurl.
3. 30 and 42 units have keyway instead of knurl.
4. 7/8 and 1 inch bore in rotor only for 42 unit.



See page 4 for Ordering Information

Flange Mounted Clutches – Type FL Metric

Mechanical

MODEL NO.	STATIC TORQUE N-m	INERTIA kg-cm^2 ROTOR	INERTIA kg-cm^2 ARM & HUB	WEIGHT kg
FL08	.28	.006	.004	.057
FL11	.68	.015	.008	.091
FL15	1.13	.016	.009	.108
FL17	1.70	.173	.105	.312
FL19	2.83	.234	.138	.340
FL22	5.65	.615	.231	.567
FL26	9.04	1.320	.855	.794
FL30	14.12	1.785	1.64	1.28
FL42	28.24	7.316	6.73	2.27

Electrical

MODEL NO.	90 VDC		24 VDC		12 VDC	
	AMPS	OHMS	AMPS	OHMS	AMPS	OHMS
FL08	.046	1977	.117	205	.246	48.8
FL11	.047	1930	.198	121	.447	26.8
FL15	.042	2150	.183	132	.380	31.6
FL17	.066	1369	.289	83	.561	21.4
FL19	.074	1213	.322	74.4	.574	20.9
FL22	.079	1140	.322	74.6	.628	19.1
FL26	.092	980	.374	64.2	.760	15.8
FL30	.091	988	.378	65.3	.729	16.5
FL42	.124	722	.468	51.2	.934	12.84

Lead wire is UL recognized style 1213, 1015 or 1430, 22 gage.
Insulation is 1.27 mm O.D. on 08, 11, 15 units; .1.63 mm or 2.41 mm O.D. on all other units.

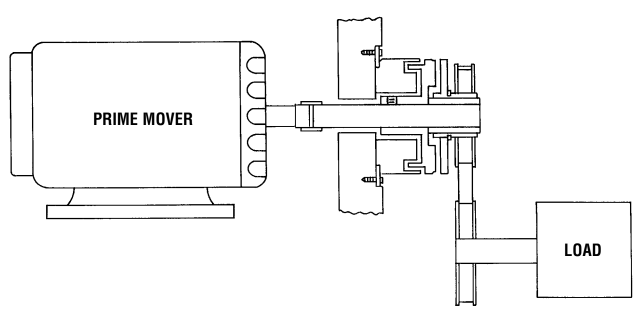
Dimensions

MODEL NO.	A MAX.	B NOM.	C NOM.	D NOM.	E MAX.	F MAX.	G ±.051	H NOM.	I MAX.	J ±.127	K ±.127	L MAX.	M ±.025	N ±.025	O NOM.	P MIN.	Q ± 12.7	ROTOR KEYWAY BORE	ROTOR KEYWAY KEYWAY X	ROTOR KEYWAY KEYWAY Y	R MIN.	S ±.051
FL08	30.556	17.551	16.281	14.783	10.414	22.987	12.878	5H9	0.864	0.508	4.775	24.892	30.467	N.A.	26.162	2.388	304.800	N.A.	ONE ROLL PIN PILOT HOLE		–	–
FL11	31.826	19.660	17.551	15.646	10.058	29.464	12.827	6H9 8H9	.219	0.508	4.775	31.242	38.049	N.A.	33.325	3.124	304.800	N.A.	ONE ROLL PIN PILOT HOLE		–	–
FL15	36.068	24.765	22.098	20.447	7.696	38.100	16.002	8H9 10H9	1.600	2.540	3.302	39.802	50.775	N.A.	44.450	3.962	304.800	N.A.	ONE ROLL PIN PILOT HOLE		–	–
FL17	39.827	26.746	23.495	20.320	9.703	45.441	16.002	8H9	1.626	2.540	3.302	49.352	61.879	19.050	53.975	4.724	304.800	8H9	1.988-2.060	9.00-9.10	–	–
FL19	42.545	26.670	23.114	20.066	11.938	50.800	19.202	10H9	1.575	2.540	3.302	49.352	61.874	19.050	53.975	4.724	308.800	10H9	2.988-3.060	11.40-11.50	–	–
FL22	48.971	33.731	29.794	25.984	10.973	57.404	19.202	10H9	2.438	2.540	4.775	58.979	72.974	25.425	63.500	4.064	457.200	10H9	2.988-3.060	11.40-11.50	–	–
FL26	55.194	37.033	33.020	29.210	11.989	67.183	25.375	10H9 15H9	1.626	9.525	4.369	66.802	88.875	26.975	79.375	4.623	457.200	10H9 15H9	2.988-3.060 4.985-5.078	11.40-11.50 17.30-17.40	–	–
FL30	65.405	40.132	33.274	29.464	26.082	83.007	34.900	15H9	2.464	3.734	7.874	81.280	106.324	44.475	95.250	4.623	SCREW TERMI-NALS	15H9	4.985-5.078	17.30-17.40	30.429 30.302	7.925 7.976
FL42*	89.916	44.704	37.846	34.163	39.370	108.458	34.900	17HP 20H9 25H9	2.464	4.826	6.350	108.077	142.850	47.625	127.000	7.010	SCREW TERMI-NALS	17H9 20H9 25H9	4.985-5.078 5.985-6.078 7.982-8.098	19.30-19.40 22.80-22.90 28.30-28.50	30.429 30.302	7.925 7.976

*20 and 25 mm bore in rotor only.

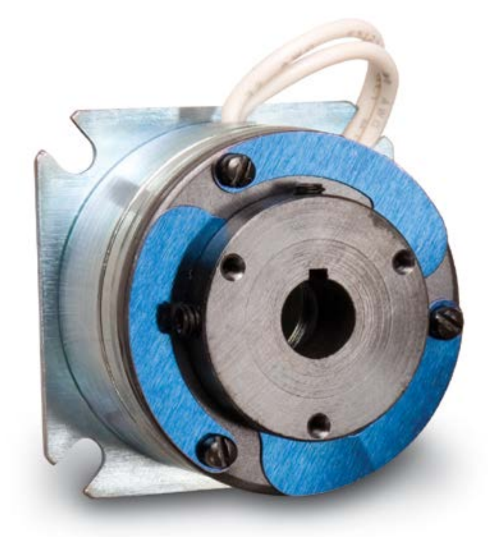
Notes:

1. 08, 11 and 15 units have one roll pin pilot hole in rotor – no set screws.
2. 26 units have (3) – #8–32 tapped holes on 34.925 mm B.C. in armature hub face instead of knurl.
3. 30 and 42 units have keyway instead of knurl.
4. 20 and 25 mm metric bore in rotor only for 42 unit.



See page 4 for Ordering Information

Flange Mounted Clutch Couplings – Type FO



FO SERIES POWER-ON CLUTCH COUPLINGS

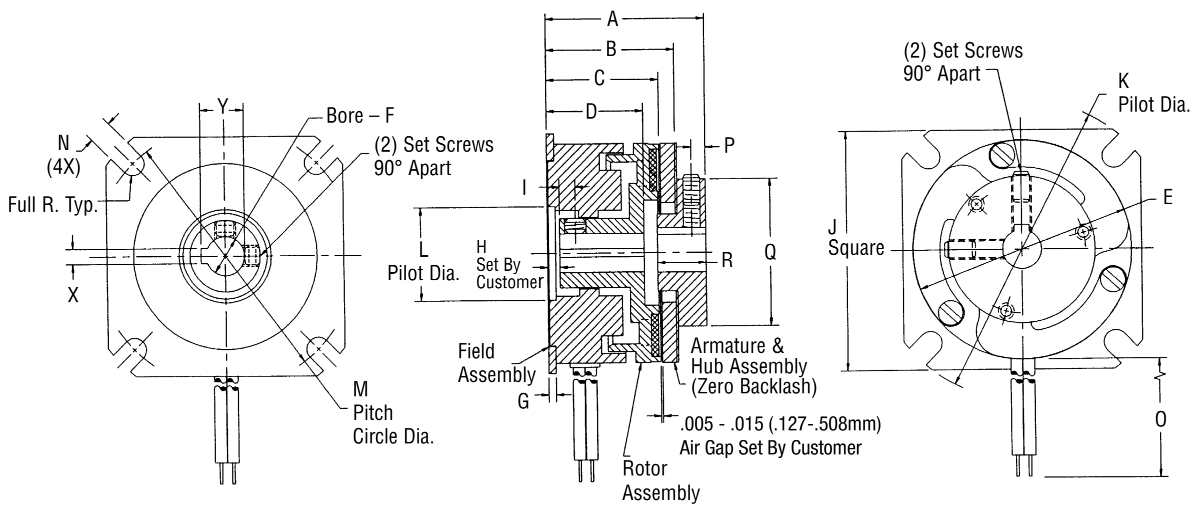
Flange Mounted Clutch Couplings – Type FO

FO series power-on clutch couplings are used to couple two in-line shafts. The armature hub assembly is mounted to the load shaft, and the rotor assembly is mounted on the input shaft. The field assembly is mounted to a bulkhead that is perpendicular to the shaft.

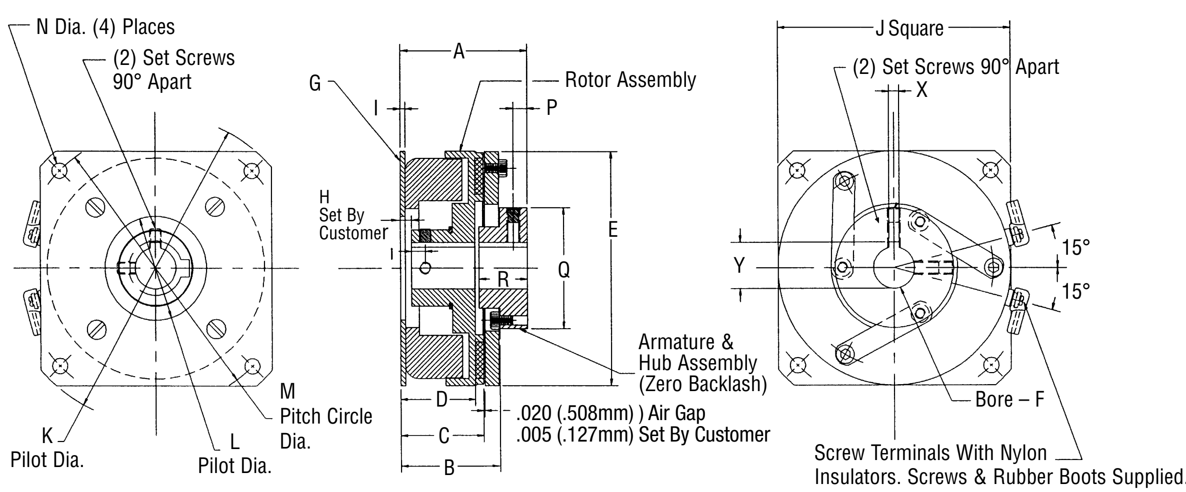
Customer Shall Maintain:

The perpendicularity of the mounting surface with respect to the shaft not to exceed .005 inch (.127mm) T.I.R. at a diameter equal to the bolt circle; initial air gap setting of .005-.020 inches (.127 - .508mm); concentricity between the clutch mounting pilot diameter and the shaft not to exceed .004 inch (.102mm) T.I.R.

Model FO08 through FO26



Model FO30 and FO42



Flange Mounted Clutch Couplings – Type FO Imperial

Mechanical

MODEL NO.	STATIC TORQUE LB. - IN.	INERTIA LB. - IN.² ROTOR	INERTIA LB. - IN.² ARM & HUB	WEIGHT OZ.
F008	2.5	.0019	.0011	2
F011	6	.005	.0024	3.2
F015	10	.0054	.026	3.8
F017	15	.059	.031	11
F019	25	.080	.042	12
F022	50	.210	.070	20
F026	80	.451	.320	28
F030	125	.610	.561	40
F042	250	2.50	2.30	75

Electrical

MODEL NO.	90 VDC		24 VDC		12 VDC	
	AMPS	OHMS	AMPS	OHMS	AMPS	OHMS
F008	.046	1977	.117	205	.246	48.8
F011	.047	1930	.198	121	.447	26.8
F015	.042	2150	.183	132	.380	31.6
F017	.066	1369	.289	83	.561	21.4
F019	.074	1212	.322	74.4	.574	20.9
F022	.079	1140	.322	74.6	.628	19.1
F026	.088	1024	.358	67.1	.667	18.0
F030	.091	988	.378	65.3	.729	16.5
F042	.124	722	.468	51.2	.934	12.84

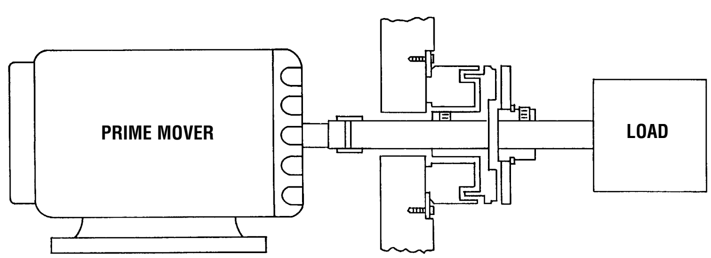
Lead wire is UL recognized style 1213, 1015 or 1430, 22 gage.
Insulation is .050 O.D. on 08, 11, 15 units; .064 or .095 O.D. on all other units.

Dimensions

MODEL NO.	A MAX.	B NOM.	C NOM.	D NOM.	E MAX.	F NOM.	G MAX.	H ±.005	I ±.005	J MAX.	K ±.001	L ±.001	M NOM.	N MIN.	O ±.500	ROTOR KEYWAY BORE	ROTOR KEYWAY X	ROTOR KEYWAY Y	P NOM.	Q MAX.	R MAX.
F008	.882	.693	.641	.582	.905	1/8 3/16 1/4	.034	.020	.188	.980	1.1995	N.A.	1.030	.094	12.00	N.A.	ONE ROLL PIN PILOT HOLE		.070	.500	.237
F011	1.012	.772	.691	.616	1.160	3/16 1/4 5/16	.048	.020	.188	1.230	1.498	N.A.	1.312	.123	12.00	N.A.	ONE ROLL PIN PILOT HOLE		.093	.687	.307
F015	1.302	.972	.865	.800	1.500	1/4 5/16 3/8	.063	.100	.130	1.567	1.999	N.A.	1.750	.156	12.00	N.A.	ONE ROLL PIN PILOT HOLE		.125	.965	.475
F017	1.328	1.051	.925	.800	1.780	1/4 5/16 3/8	.064	.100	.130	1.943	2.436	.751	2.125	.186	12.00	1/4 5/16 3/8	.0625 – .0655 .0625 – .0655 .094 – .097	.285 – .290 .347 – .352 .417 – .427	.115	1.19	.45
F019	1.330	1.029	.901	.781	2.000	5/16 3/8 1/2	.062	.100	.130	1.943	2.436	.751	2.125	.186	12.00	5/16 3/8 1/2	.0625 – .0655 .094 – .097 ROLL PIN HOLE	.347 – .352 .417 – .427	.115	1.19	.455
F022	1.757	1.325	1.173	1.023	2.260	3/8 1/2	.096	.100	.188	2.322	2.873	1.001	2.500	.160	18.00	3/8 1/2	.094 – .097 .125 – .128	.417 – .427 .560 – .567	.115	1.005	.510
F026	1.813	1.460	1.300	1.150	2.645	3/8 1/2 5/8	.080	.375	.172	2.630	3.499	1.062	3.125	.182	18.00	3/8 1/2 5/8	.094 – .097 .125 – .128 .1885 – .1905	.417 – .427 .560 – .567 .709 – .716	.150	1.44	.610
F030	1.900	1.580	1.310	1.160	3.268	1/2 5/8 3/4	.097	.147	.093	3.200	4.186	1.751	3.750	.182	SCREW TERMI-NALS	1/2 5/8 3/4	.125 – .128 .1885 – .1905 .1885 – .1905	.560 – .567 .709 – .716 .836 – .844	.150	1.825	.680
F042	2.280	1.760	1.490	1.490	4.270	1/2 5/8 3/4 7/8 1	.097	.190	.250	4.270	5.624	1.875	5.000	.276	SCREW TERMI-NALS	1/2 5/8 3/4 7/8 1	.125 – .128 .1885 – .1905 .1885 – .1905 .1885 – .1905 .251 – .253	.560 – .567 .709 – .716 .836 – .844 .962 – .970 1.113 – 1.121	.250	2.195	.890

Notes:

1. 08, 11 and 15 units have one roll pin pilot hole in rotor – no set screws.



See page 4 for Ordering Information

Electromagnetic Friction Clutches & Brakes

Flange Mounted Clutch Couplings – Type FO Metric

Mechanical

MODEL NO.	STATIC TORQUE N-m	INERTIA kg-cm² ROTOR	INERTIA kg-cm² ARM & HUB	WEIGHT kg
F008	.28	.006	.003	.06
F011	.68	.015	.007	.09
F015	1.13	.016	.076	.11
F017	1.70	.173	.091	.31
F019	2.83	.234	.123	.34
F022	5.65	.615	.205	.57
F026	9.04	1.320	.936	.79
F030	14.12	1.785	1.642	1.13
F042	28.24	7.316	6.731	2.13

Electrical

MODEL NO.	90 VDC AMPS	90 VDC OHMS	24 VDC AMPS	24 VDC OHMS	12 VDC AMPS	12 VDC OHMS
F008	.046	1977	.117	205	.246	48.8
F011	.047	1930	.198	121	.447	26.8
F015	.042	2150	.183	132	.380	31.6
F017	.066	1369	.289	83	.561	21.4
F019	.074	1212	.322	74.4	.574	20.9
F022	.079	1140	.322	74.6	.628	19.1
F026	.088	1024	.358	67.1	.667	18.0
F030	.091	988	.378	65.3	.729	16.5
F042	.124	722	.468	51.2	.934	12.84

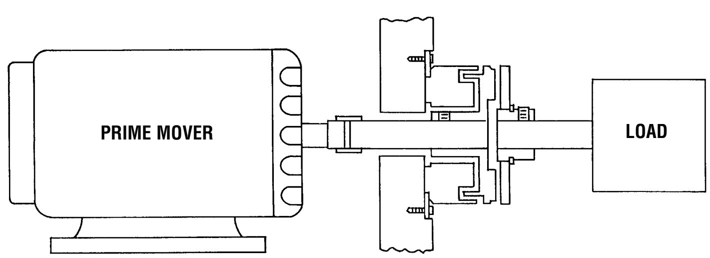
Lead wire is UL recognized style 1213, 1015 or 1430, 22 gage.
Insulation is 1.27 mm O.D. on 08, 11, 15 units; .1.63 mm or 2.41 mm O.D. on all other units.

Dimensions

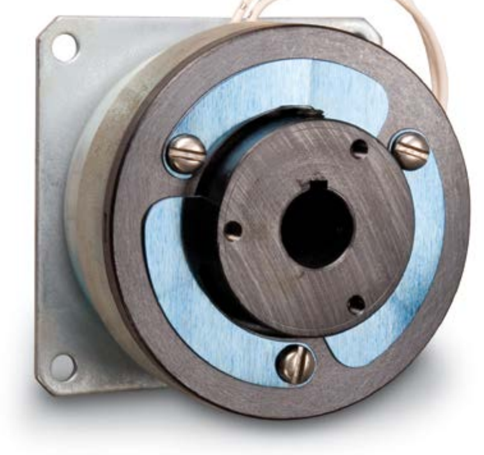
MODEL NO.	A MAX.	B NOM.	C NOM.	D NOM.	E MAX.	F NOM.	G MAX.	H ±.127	I ±.127	J MAX.	K ±.025	L ±.025	M NOM.	N MIN.	O ±12.7	ROTOR KEYWAY BORE	ROTOR KEYWAY X	ROTOR KEYWAY Y	P NOM.	Q MAX.	R MAX.
F008	22.403	17.602	16.281	14.783	22.987	5H9	0.864	0.508	4.755	24.892	30.467	N.A.	26.162	2.388	304.800	N.A.	ONE ROLL PIN HOLE		1.778	12.700	6.020
F011	25.705	19.609	17.551	15.646	29.469	6H9 8H9	1.219	0.508	4.775	31.242	38.049	N.A.	33.325	3.124	304.800	N.A.	ONE ROLL PIN HOLE		2.362	17.450	7.798
F015	33.071	24.689	21.971	20.320	38.100	8H9 10H9	1.600	2.540	3.302	39.802	50.775	N.A.	44.450	3.962	304.800	N.A.	ONE ROLL PIN HOLE		3.175	24.511	12.065
F017	34.239	26.695	23.495	20.320	45.212	8H	1.626	2.540	3.302	49.352	61.874	19.050	53.975	4.724	304.800	8H9	1.988-2.060	9.00-9.10	2.921	30.226	11.43
F019	33.782	26.137	22.885	19.837	50.800	10H9	1.575	2.540	3.302	49.352	61.874	19.050	53.975	4.724	304.800	10H9	2.988-3.060	11.40-11.50	2.921	30.226	11.557
F022	44.628	33.655	29.794	25.984	57.404	10H9	2.438	2.540	4.775	58.979	72.974	25.425	63.500	4.064	457.200	10H9	2.988-3.060	11.40-11.50	2.921	25.527	12.954
F026	46.050	37.084	33.020	29.210	67.183	10H9 15H9	1.626	9.525	4.639	66.802	88.875	26.975	79.375	4.623	457.700	10H9 15H9	2.988-3.060 4.985-5.078	11.40-11.50 17.30-17.40	3.810	36.576	15.494
F030	48.260	40.132	33.274	29.464	83.007	15H9 17H9	2.464	3.734	7.874	81.280	106.324	44.475	95.250	4.623	SCREW TERMI-NALS	15H9 17H9	4.985-5.078 4.985-5.078	17.30-17.40 19.30-19.40	3.810	46.355	17.272
F042	57.912	44.704	37.846	34.163	108.458	17H9 20H9 25H9	2.464	4.826	6.350	108.077	142.850	47.625	127.000	7.010	SCREW TERMI-NALS	17H9 20H9 25H9	4.985-5.078 5.985-6.078 7.982-8.098	19.30-19.40 22.80-22.90 28.30-28.50	6.350	55.753	22.606

Notes:

1. 08, 11 and 15 units have one roll pin pilot hole in rotor – no set screws.



See page 4 for Ordering Information



FB SERIES POWER-ON BRAKES

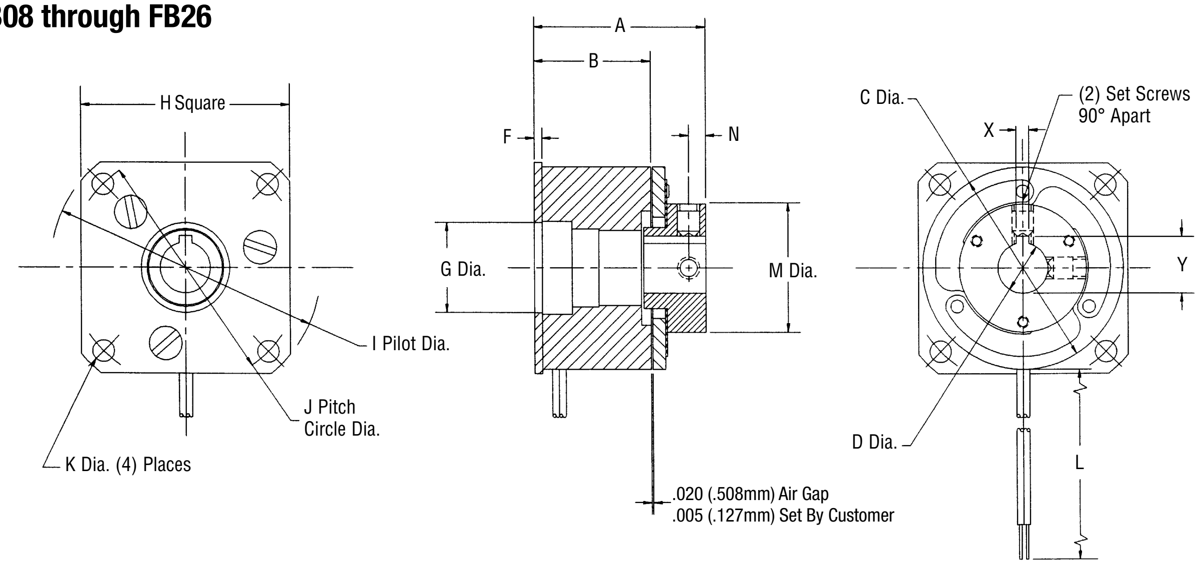
Flange Mounted Brakes – Type FB

FB series power-on brakes are used to stop or hold a load that is coupled to the armature hub assembly. The armature hub is attached to the load shaft. The field assembly is mounted to a bulkhead that is perpendicular to the shaft.

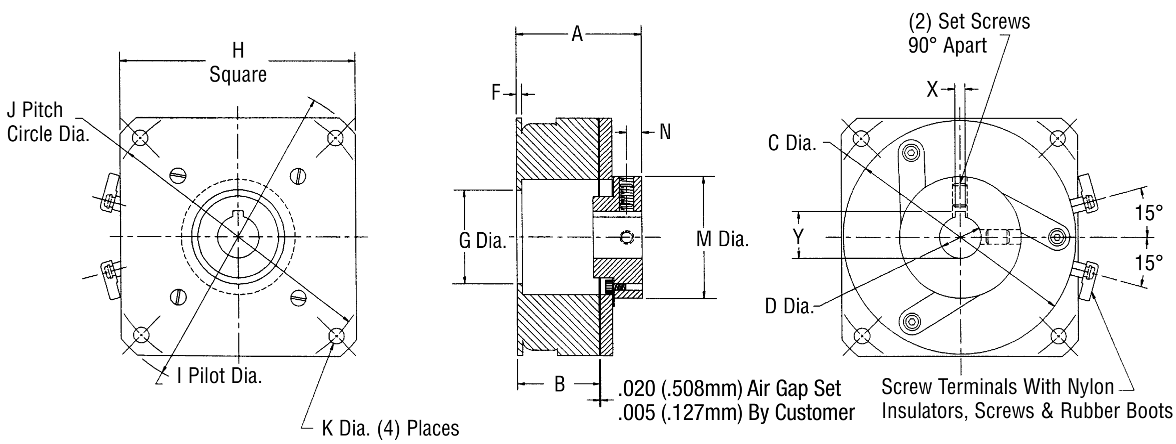
Customer Shall Maintain:

The perpendicularity of the mounting surface with respect to the shaft not to exceed .005 inch (.127mm) T.I.R. at a diameter equal to the bolt circle; concentricity between the brake mounting pilot diameter and the shaft not to exceed .010 inch (.254mm) T.I.R; initial air gap setting of .005-.020 (.127-.508mm) inches.

Model FB08 through FB26



Model FB30 and FB42



Flange Mounted Brakes – Type FB Imperial

Mechanical

MODEL NO.	STATIC TORQUE LB. - IN.	INERTIA LB. - IN.² ARM & HUB	WEIGHT OZ.
FB08	2.5	.0011	2.0
FB11	6	.0024	3.2
FB15	10	.026	3.8
FB17	15	.031	11
FB19	25	.042	12
FB22	50	.070	20
FB26	80	.320	28
FB30	125	.561	35
FB42	250	2.30	60

Electrical

MODEL NO.	90 VDC		24 VDC		12 VDC	
	AMPS	OHMS	AMPS	OHMS	AMPS	OHMS
FB08	.049	1970	.117	205	.246	48.8
FB11	.047	1930	.198	121	.447	26.8
FB15	.042	2150	.183	132	.380	31.6
FB17	.066	1369	.289	83	.561	21.4
FB19	.074	1213	.322	74.4	.574	20.9
FB22	.079	1140	.322	74.6	.628	19.1
FB26	.092	980	.374	64.2	.760	15.8
FB30	.091	988	.378	65.3	.729	16.5
FB42	.124	722	.468	51.2	.934	12.84

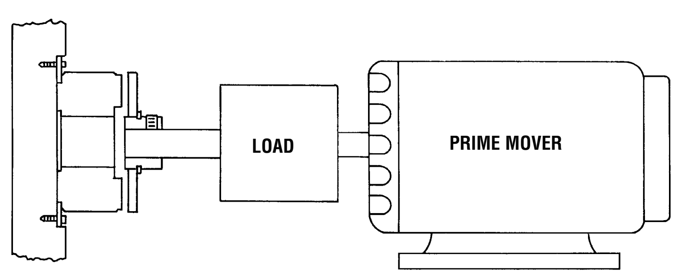
Lead wire is UL recognized style 1213, 1015 or 1430, 22 gage.
Insulation is .050 O.D. on 08, 11, 15 units; .064 or .095 O.D. on all other units.

Dimensions

MODEL NO.	A MAX.	B NOM.	C MAX.	D NOM.	F MAX.	G ±.001	H MAX.	I ±.001	J NOM.	K MIN.	L ±.500	HUB KEYWAY			M MAX.	N NOM.
												BORE	KEYWAY			
													X	Y		
FB08	.885	.634	.905	1/8 3/16 1/4	.034	N.A.	.980	1.1995	1.030	.094	12.00	N.A.	SET SCREWS ONLY		.500	.070
FB11	.954	.650	1.160	3/16 1/4 5/16	.052	N.A.	1.230	1.498	1.312	.123	12.00	N.A.	SET SCREWS ONLY		.687	.093
FB15	1.304	.867	1.500	1/4 5/16 3/8	.063	N.A.	1.567	1.999	1.750	.156	12.00	N.A.	SET SCREWS ONLY		.960	.125
FB17	1.269	.848	1.780	1/4 5/16 3/8	.064	.751	1.943	2.436	2.125	.186	12.00	1/4 5/16 3/8	.0625 – .0655 .0625 – .0655 .094 – .097	.285 – .290 .347 – .352 .417 – .427	1.190	.115
FB19	1.330	.901	2.000	5/16 3/8 1/2	.062	.751	1.943	2.436	2.125	.186	12.00	5/16 3/8 1/2	.0625 – .0655 .094 – .097 .125 – .128	.347 – .352 .417 – .427 .560 – .567	1.190	.115
FB22	1.757	1.173	2.260	3/8 1/2	.096	1.001	2.322	2.873	2.500	.160	18.00	3/8 1/2	.094 – .097 .125 – .128	.417 – .427 .560 – .567	1.005	.115
FB26	1.815	1.300	2.645	3/8 1/2 5/8	.080	1.062	2.630	3.499	3.125	.182	18.00	3/8 1/2 5/8	.094 – .097 .125 – .128 .1885 – .1905	.417 – .427 .560 – .567 .709 – .716	1.440	.150
FB30	1.900	1.310	3.268	1/2 5/8 3/4	.097	1.751	3.200	4.186	3.750	.182	SCREW TERMI-NALS	1/2 5/8 3/4	.125 – .128 .1885 – .1905 .1885 – .1905	.560 – .567 .709 – .716 .836 – .844	1.825	.150
FB42	2.280	1.490	4.270	1/2 5/8 3/4 7/8 1	.097	1.875	4.255	5.624	5.000	.276	SCREW TERMI-NALS	1/2 5/8 3/4 7/8 1	.125 – .128 .1885 – .1905 .1885 – .1905 .1885 – .1905 .251 – .253	.560 – .567 .709 – .716 .836 – .844 .962 – .970 1.113 – 1.121	2.195	.250

Notes:

1. 08 units have set screws 120° apart.



See page 4 for Ordering Information

Flange Mounted Brakes – Type FB Metric

Mechanical

MODEL NO.	STATIC TORQUE N-m	INERTIA kg - cm² ARM & HUB	WEIGHT kg
FB08	.28	.003	.057
FB11	.68	.007	.091
FB15	1.13	.076	.108
FB17	1.70	.091	.312
FB19	2.83	.123	.340
FB22	5.65	.205	.567
FB26	9.04	.936	.794
FB30	14.12	1.642	.992
FB42	28.24	6.731	1.70

Electrical

MODEL NO.	90 VDC		24 VDC		12 VDC	
	AMPS	OHMS	AMPS	OHMS	AMPS	OHMS
FB08	.049	1970	.117	205	.246	48.8
FB11	.047	1930	.198	121	.447	26.8
FB15	.042	2150	.183	132	.380	31.6
FB17	.066	1369	.289	83	.561	21.4
FB19	.074	1213	.322	74.4	.574	20.9
FB22	.079	1140	.322	74.6	.628	19.1
FB26	.092	980	.374	64.2	.760	15.8
FB30	.091	988	.378	65.3	.729	16.5
FB42	.124	722	.468	51.2	.934	12.84

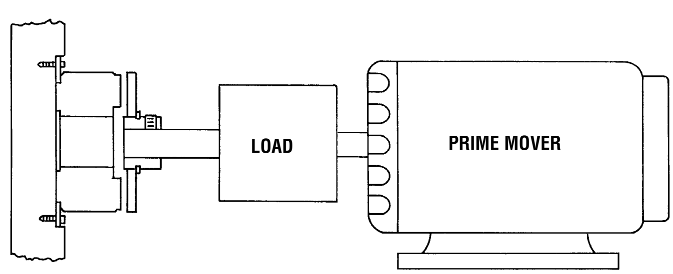
Lead wire is UL recognized style 1213, 1015 or 1430, 22 gage.
Insulation is .127 mm O.D. on 08, 11, 15 units; 1.63 mm or 2.41 mm O.D. on all other units.

Dimensions

MODEL NO.	A MAX.	B NOM.	C MAX.	D NOM.	E NOM.	F MAX.	G ±..025	H MAX.	I ±.025	J NOM.	K MIN.	L ±12.7	HUB KEYWAY BORE	HUB KEYWAY X	HUB KEYWAY Y	M MAX.	N NOM.
FB08	22.479	16.104	22.987	5H9	14.529	0.864	N.A.	24.892	30.4673	26.162	2.388	304.800	N.A.	SET SCREWS ONLY		12.700	1.778
FB11	24.740	16.510	29.464	6H9 8H9	15.138	1.321	N.A.	31.242	38.049	33.325	3.124	304.800	N.A.	SET SCREWS ONLY		17.450	2.362
FB15	33.122	22.022	38.100	8H9 10H9	20.371	1.600	N.A.	39.802	50.775	44.450	3.962	304.800	N.A.	SET SCREWS ONLY		24.384	3.175
FB17	32.233	21.539	45.212	8H9 10H9	18.847	1.626	19.075	49.352	61.874	53.975	4.724	304.800	8H9 10H9	1.988-2.060 2.988-3.060	9.00-9.10 11.40-11.50	30.226	2.921
FB19	33.782	22.885	50.800	10H9	19.710	1.575	19.075	49.352	61.874	53.975	4.724	304.800	10H9	2.988-3.060	11.40-11.50	30.226	2.921
FB22	44.628	29.794	57.404	10H9	25.984	2.438	25.425	58.979	72.974	63.500	4.064	457.200	10H9	2.988-3.060	11.40-11.50	25.527	2.921
FB26	46.101	33.020	67.183	10H9 15H9	29.210	2.032	26.975	66.802	88.875	79.375	4.623	457.200	10H9 15H9	2.988-3.060 4.985-5.078	11.40-11.50 17.30-17.40	36.576	3.810
FB30	48.260	33.274	83.007	15H9 17H9	29.464	2.464	44.475	81.280	106.324	95.250	4.623	SCREW TERMI-NALS	15H9 17H9	4.985-5.078 4.985-5.078	17.30-17.40 19.30-19.40	46.355	3.810
FB42	57.912	37.846	108.458	17H9 20H9 25H9	N.A.	2.464	47.625	108.077	142.850	127.000	7.010	SCREW TERMI-NALS	17H9 20H9 25H9	4.985-5.078 5.985-6.078 7.982-8.098	19.30-19.40 22.80-22.90 28.30-28.50	55.753	6.350

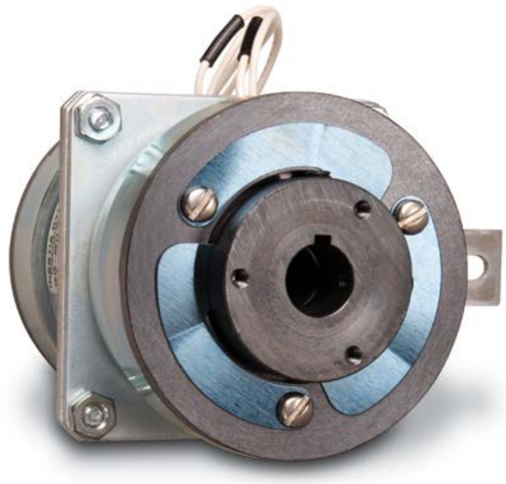
Notes:

1. 08 units have set screws 120° apart.



See page 4 for Ordering Information

Shaft Mounted Clutch/Power-On Brake – Type SLB & SOB



SLB & SOB SERIES POWER-ON BRAKES

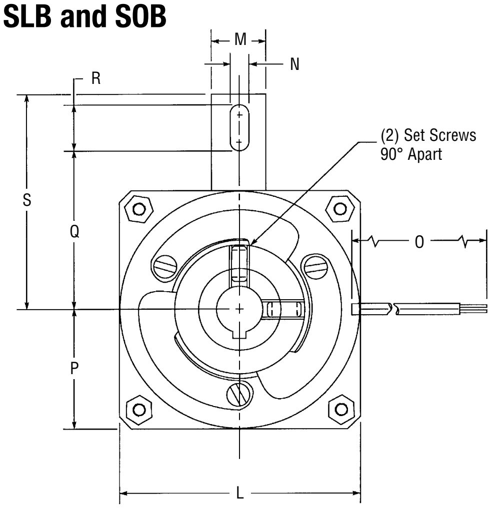
Shaft Mounted Clutch Brakes – Type SLB & SOB

The SLB and SOB series are shaft mounted clutch/power-on brake packages that are used to couple two parallel or in-line shafts. The clutch/brake package combines the features of our model SL or SO with an FB into one unit for easy installation. The clutch armature hub accommodates a pulley, gear, sprocket, etc., to transmit torque to the second shaft. The brake is used to stop or hold the load. The clutch/brake package is shaft mounted and retained by a loose-fitting pin or bracket through the anti-rotation tab.

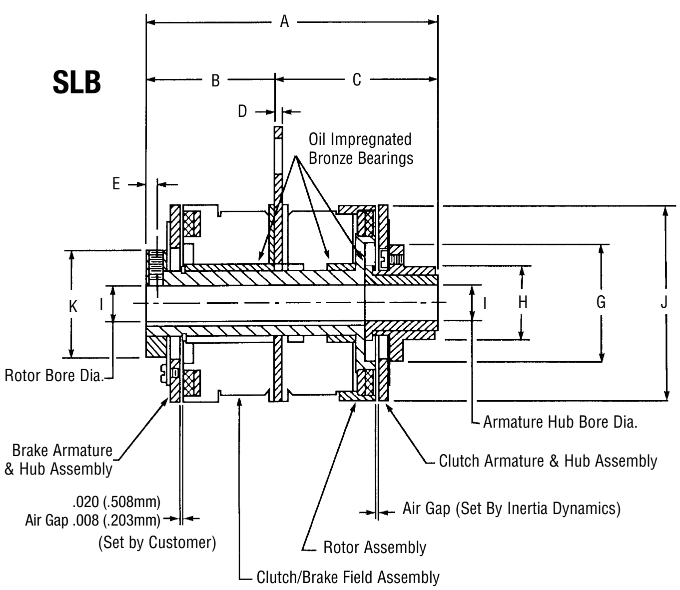
Customer Shall Maintain:

A loose-fitting pin through the anti-rotation tab to prevent preloading the bearings; initial air gap setting of .008-.020 inches (.203-.508mm) on the brake side. On SOB models concentricity between the shafts within .005 (.127mm) T.I.R.

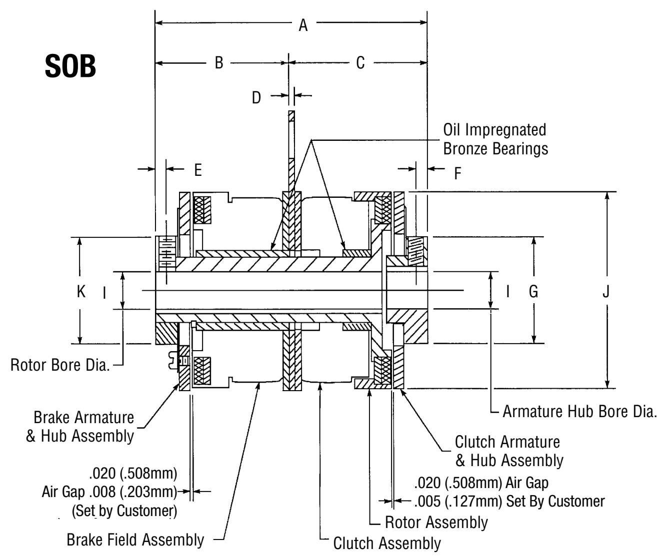
SLB and SOB



SLB



SOB



Shaft Mounted Clutch/Power-On Brake – Type SLB & SOB Imperial

Mechanical

MODEL NO.	STATIC TORQUE LB. - IN.	INERTIA LB. - IN.^{2} ROTOR	INERTIA LB. - IN.^{2} ARM & HUB	WEIGHT OZ.
SLB11 SOB11	6	.0011	.0029 .0024	7
SLB17 SOB17	15	.0024	.0360 .0310	22
SLB19 SOB19	25	.026	.0470 .0420	25
SLB22 SOB22	50	.031	.0790 .0700	45
SLB26 SOB26	80	.042	.2920 .3200	60

Electrical

MODEL NO.	90 VDC		24 VDC		12 VDC	
	AMPS	OHMS	AMPS	OHMS	AMPS	OHMS
SLB11 SOB11	.047	1930	.198	121	.447	26.8
SLB17 SOB17	.066	1369	.289	83	.561	21.4
SLB19 SOB19	.074	1213	.322	74.4	.574	20.9
SLB22 SOB22	.079	1140	.322	74.6	.628	19.1
SLB26 SOB26	.088	1024	.350	67.1	.667	18.0

Lead wire is UL recognized style 1213, 1015 or 1429, 22 gage.
Insulation is .050 O.D. on 11 unit; .064 or .095 O.D. on all other units.

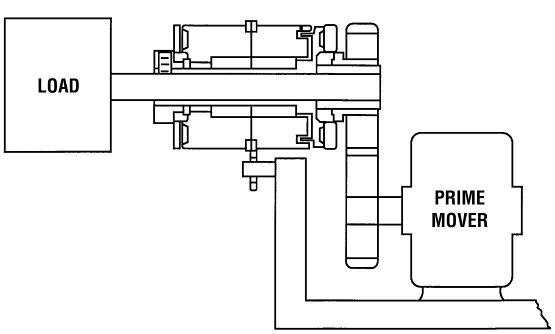
Dimensions

MODEL NO.	A MAX.	B REF.	C NOM.	D MAX.	E NOM.	F *	G MAX.	H **	I NOM.	J MAX.	K MAX.	L MAX.	M MAX.	N MIN.	O ± .5	P MAX.	Q MIN.	R MIN.	S MAX.	KEYWAYS BORE	KEYWAYS NOMINAL KEYWAY X	KEYWAYS NOMINAL KEYWAY Y
SLB11	2.225	.974	1.229	.051	.094	.410	.700	.506	1/4 5/16	1.160	.700	1.240	.520	.140	12.00	.630	.630	.300	1.050	N.A.	SET SCREWS ONLY	
SOB11	1.970	.974	.983	.051	.094	.094	.700	–	1/4 5/16	1.160	.700	1.240	.520	.140	12.00	.630	.630	.300	1.050	N.A.	SET SCREWS ONLY	
SLB17	2.855	1.245	1.590	.066	.114	.390	1.207	.629	1/4 5/16 3/8	1.780	1.207	1.960	.520	.190	12.00	.990	1.100	.510	1.707	1/4 5/16 3/8	.0625 – .0655 .0625 – .0655 .094 – .097	.285 – .290 .347 – .352 .417 – .427
SOB17	2.608	1.245	1.340	.066	.114	.114	1.207	–	1/4 5/16 3/8	1.780	1.207	1.960	.520	.190	12.00	.990	1.100	.470	1.707	1/4 5/16 3/8	.0625 – .0655 .0625 – .0655 .094 – .097	.285 – .290 .347 – .352 .417 – .427
SLB19	2.993	1.258	1.715	.066	.114	.475	1.207	.756	5/16 3/8	2.000	1.207	1.960	.520	.190	12.00	.990	1.100	.470	1.707	5/16 3/8	.0625 – .0655 .094 – .097	.347 – .352 .417 – .427
SOB19	2.615	1.258	1.337	.066	.114	.114	1.207	–	5/16 3/8	2.000	1.207	1.960	.520	.190	12.00	.990	1.100	.470	1.707	5/16 3/8	.0625 – .0655 .094 – .097	.347 – .352 .417 – .427
SLB22	3.737	1.722	1.995	.093	.115	.450	1.453	.756	3/8 1/2	2.260	1.453	2.340	.580	.190	18.00	1.180	1.136	.480	1.832	3/8 1/2	.094 – .097 .125 – .128	.417 – .427 .560 – .567
SOB22	3.552	1.722	1.810	.093	.115	.115	1.453	–	3/8 1/2	2.260	1.453	2.340	.580	.190	18.00	1.180	1.136	.480	1.832	3/8 1/2	.094 – .097 .125 – .128	.417 – .427 .560 – .567
SLB26	4.050	1.778	2.240	.093	.150	.427	1.610	.999	3/8 1/2 5/8	2.640	1.450	2.650	.645	.190	18.00	1.335	1.730	.480	2.395	3/8 1/2 5/8	.094 – .097 .125 – .128 .1885 – .1905	.417 – .427 .560 – .567 .709 – .716
SOB26	3.677	1.815	1.842	.093	.150	.150	1.450	–	3/8 1/2 5/8	2.640	1.450	2.650	.645	.190	18.00	1.335	1.730	.480	2.395	3/8 1/2 5/8	.094 – .097 .125 – .128 .1885 – .1905	.417 – .427 .560 – .567 .709 – .716

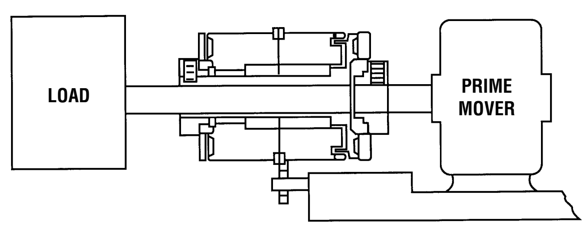
*SLB maximum; SOB nominal.
**SLB hub O.D. ± .002; SOB hub length nominal.

Notes:

1. SLB 26 units have (3)–#8-32 tapped holes on 1.375 in. B.C. in armature hub face instead of knurl.



SLB



SOB

See page 4 for Ordering Information

Ordering Information

Spring Applied Brakes

PART NUMBERING SYSTEM FOR PRODUCTS ON PAGES 30 TO 49 OF THIS CATALOG

(For Imperial Units) **A A B B – C D E F**

DIGIT	DIGIT	MODEL NO.
1	7	FSB
1	9	FSBR
2	1	FSBR (MANUAL RELEASE)
1	8	SAB

DIGIT	DIGIT	SIZE
0	1	001
0	2	003
0	3	007
0	4	015
0	5	035
0	6	050
0	7	100
1	8	20
1	9	90
2	1	180
2	3	400
2	5	1200

DIGIT	VOLTS
1	90 VDC
2	24 VDC
3	12 VDC
4	120 VAC

DIGIT	BORE (INCH)
1	1/8
2	3/16
3	1/4
4	5/16
5	3/8
6	1/2
7	5/8
8	3/4
9	7/8
0	1
11	1 1/8
12	1 1/4
13	1 3/8
14	1 1/2

DIGIT	DRIVE
1	ZERO BACKLASH
2	HEX/SQUARE
3	DYNAMIC (MANUAL RELEASE BRAKE ONLY)
4	STATIC (MANUAL RELEASE BRAKE ONLY)
5	SPLINE

DIGIT	CONNECTION
1	LEAD WIRES
2	SCREW TERMINALS
3	SWITCH (MANUAL RELEASE BRAKE ONLY)
4	CONDUIT BOX

How To Order

A. Select the model number from the product guide.
B. Select the size of the brake.
C. Select the voltage.
D. Select the bore diameter.
E. 1. For model FSBR and SAB-20, & 90, select 2. For model FSB spring applied brakes, select 1 or 2. For manual release brakes, select 3 or 4. For SAB-180, 400, & 1200, select 5.
F. For all, refer to the product guide and specify 1 or 2. For manual release brakes, if a switch is desired, select 3, otherwise use a 1.

Example (Imperial)
FSB050 brake, 24 volts, 1/2 bore, Hex drive
Part No. 1706-2621

Example (Metric)
FSB050 brake, 90 volts, 15mm bore, Hex drive
Part No. M1706-2621

(For Metric Units) **M A A B B – C D E F**

DIGIT	DIGIT	MODEL NO.
1	7	FSB
1	9	FSBR
2	1	FSBR (MANUAL RELEASE)

DIGIT	DIGIT	SIZE
0	1	001
0	2	003
0	3	007
0	4	015
0	5	035
0	6	050
0	7	100

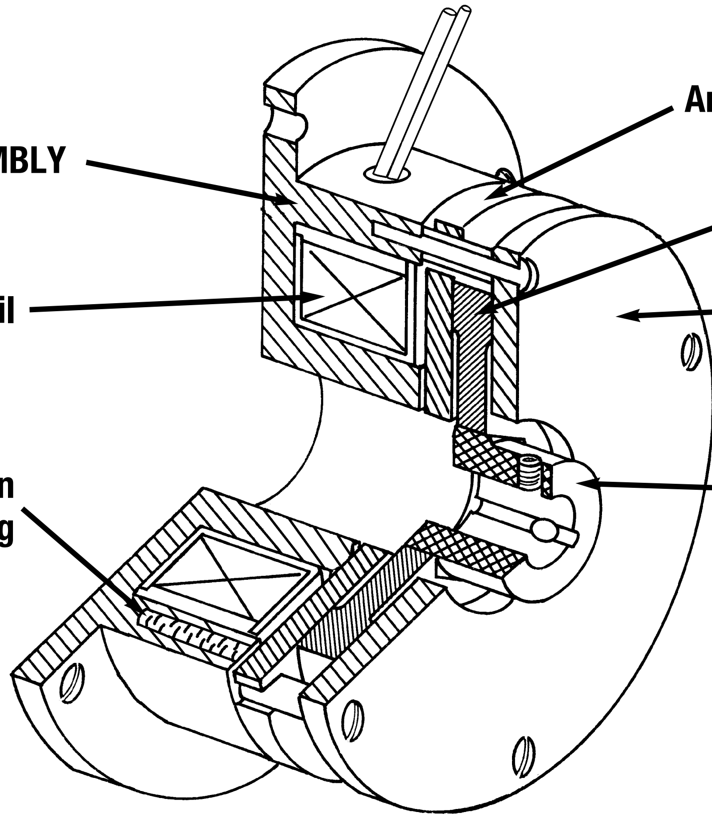
DIGIT	VOLTS
1	90 VDC
2	24 VDC
3	12 VDC
4	120 VAC

DIGIT	BORE (MM)
1	5
2	6
3	8
4	10
6	15
7	17

DIGIT	DRIVE
1	ZERO BACKLASH
2	HEX/SQUARE
3	DYNAMIC (MANUAL RELEASE BRAKE ONLY)
4	STATIC (MANUAL RELEASE BRAKE ONLY)

DIGIT	CONNECTION
1	LEAD WIRES
2	SCREW TERMINALS
3	SWITCH (MANUAL RELEASE BRAKE ONLY)

Spring Applied Brake Description



Generating the Braking Torque

Inertia Dynamics FSB/FSBR spring applied brakes are designed to decelerate or park inertial loads when the voltage is turned off, either intentionally or accidentally, as in the case of a power failure. The friction disc with the hub is coupled to the shaft to be braked but is capable of moving axially. Through several compression springs, the axial force acts against the axially moving armature plate which compresses the friction disc against the pressure plate. Brake torque is generated on both faces of the friction disc.

When voltage is applied to the coil, the magnetic force caused by the magnetic flux pulls the armature across the air gap against the force of the compression springs. The friction disc is released, and the brake is free of torque.

Special Features of the IDI Brake

- Several compression springs on the outermost radius of the friction disc increase the torque-to-size ratio and provide greater repeatability.
- Factory-set air gap needs no adjustments and is practically maintenance-free.
- All parts effectively protected against corrosion.
- Advanced friction material technology for long life and high torque. Always asbestos-free.
- Two mounting styles offered to accommodate your specific application.
- Manual release brakes available as standard or custom-designed for your needs.
- Metric bore sizes available.
- ROHS compliant.

Selecting a Spring Applied Brake Imperial

Determining the Brake Size

Static Applications

A static application is one in which there is no dynamic braking. In this mode the brake is used to hold the inertial load in a fixed or parked position. Match your required torque to the static torque rating of the brake. Be sure the brake torque exceeds your requirement. A service factor of 1.4 is recommended.

Dynamic Applications

A dynamic application is one in which the brake decelerates an inertial load. To properly size the brake you need to calculate the dynamic torque required. There are two methods that can be used.

$$T_d = \left[\frac{WR^2 \times N}{C \times t}\right] \times S.F.$$

Where:

- WR^2 = Total inertia reflected to the clutch/brake, lb.–in.^{2} (kg.m^2)
- N = Shaft speed at clutch/brake, RPM
- C = Constant, use 3696 for English units and 9.55 for metric units
- t = Desired stopping or acceleration time, seconds
- S.F. = Service Factor, 1.4 recommended
- T_d = Average dynamic torque, lb.–in. (N–m)

Inertia Dynamics brakes are rated by static torque. Therefore, the dynamic torque rating obtained should be converted to a static torque value:

$$T_s = \frac{T_d}{0.80}$$

NOTE:
The 80% derating factor should be used as a guide only.

Where:

- T_s = Static torque
- 0.80 = Derating factor

The brake size can also be determined using the selection charts. Find the intersection of the prime mover horsepower (HP) and shaft speed at the brake using the selection charts. (Fig. A & B). The relationship between the horsepower and speed to determine the dynamic torque required is expressed as:

$$T_d = \left[\frac{63{,}025 \times P}{N}\right] \times S.F.$$

Where:

- T_d = Average dynamic torque, lb.–in.
- P = Horsepower, HP
- N = Shaft Speed
- S.F. = Service Factor
- 63,025 = Constant

Additional formulas and conversion charts are found on pages 60 and 79.

Fig. A

Type FSBR Series Selection

HP	SHAFT SPEED AT BRAKE (RPM)																			
	100	200	300	400	500	600	700	800	900	1000	1100	1200	1500	1800	2000	2400	3000	3600	4000	5000
1/50																				
1/20																				
1/12											7									
1/8																				
1/6											15									
1/4																				
1/3																				
1/2											35									
3/4											50									
1																				
1 1/2											100									
2																				
3																				
5																				
7 1/2																				
10																				

Selecting a Spring Applied Brake Metric

Determining the Brake Size

Static Applications

A static application is one in which there is no dynamic braking. In this mode the brake is used to hold the inertial load in a fixed or parked position. Match your required torque to the static torque rating of the brake. Be sure the brake torque exceeds your requirement. A service factor of 1.4 is recommended.

Dynamic Applications

A dynamic application is one in which the brake decelerates an inertial load. To properly size the brake you need to calculate the dynamic torque required. There are two methods that can be used.

$$T_d = \left[\frac{WR^2 \times N}{C \times t}\right] \times S.F.$$

Where:

WR^2 = Total inertia reflected to the clutch/brake, kg-m^2
N = Shaft speed at inertial load, RPM
C = Constant, use 9.55
t = Desired stopping time, seconds
S.F. = Service Factor, 1.4 recommended
T_d = Average dynamic torque, N–m

Inertia Dynamics brakes are rated by static torque. Therefore, the dynamic torque rating obtained should be converted to a static torque value:

$$T_s = \frac{T_d}{0.80}$$

Where:

T_s = Static torque
0.80 = Derating factor

The brake size can also be determined using the selection charts. Find the intersection of the prime mover kilowatt (kW) and shaft speed at the brake using the selection charts. (Fig. A & B). The relationship between the kilowatts and speed to determine the dynamic torque required is expressed as:

$$T_d = \left[\frac{9{,}550 \times kW}{N}\right] \times S.F.$$

Where:

T_d = Average dynamic torque, N-m.
P = Power, kW
N = Shaft Speed
S.F. = Service Factor
9,550 = Constant

Additional formulas and conversion charts are found on pages 61 and 79.

NOTE:
The 80% derating factor should be used as a guide only.

Fig. A
Type FSBR Series Selection

kW	SHAFT SPEED AT BRAKE (RPM)																			
	100	200	300	400	500	600	700	800	900	1000	1100	1200	1500	1800	2000	2400	3000	3600	4000	5000
.0149																				
.0373																				
.0621											7									
.0932																				
.124											15									
.186																				
.249																				
.373											35									
.559											50									
.743																				
1.12											100									
1.49																				
2.24																				
3.73																				
5.59																				
7.46																				

Selecting a Spring Applied Brake Imperial

Fig. B

Type FSB Series Selection

Torque Rating vs. RPM (Sizes 001 through 007) - Selection Chart

TORQUE LB.-IN.*	SHAFT SPEED AT BRAKE (RPM)																			
	100	200	300	400	500	600	700	800	900	1000	1100	1200	1500	1800	2000	2400	3000	3600	4000	5000
.50											001									
.75																				
1.0																				
2.0											003									
2.5																				
2.75																				
3.0																				
5.0																				
6.25											007									
6.5																				
6.75																				
7.0																				

*Slightly higher torque ratings may be allowable for some speeds. Consult Inertia Dynamics.

HP vs. RPM (Sizes 15 through 100) – Selection

HP	SHAFT SPEED AT BRAKE (RPM)																			
	100	200	300	400	500	600	700	800	900	1000	1100	1200	1500	1800	2000	2400	3000	3600	4000	5000
1/50																				
1/20																				
1/12											15									
1/8																				
1/6																				
1/4																				
1/3											35									
1/2																				
3/4											50									
1																				
1 1/2											100									
2																				
3																				
5																				
7 1/2																				
10																				

Selection Considerations

The required size is determined mostly from the brake torque needed. The inertia to be braked, the speed, the braking times, duty cycle, and life requirements are all considerations in brake sizing. Other conditions to be considered are ambient temperatures, humidity, dust, and contaminants which may affect the brake performance. For these reasons, brake performance should be evaluated under actual application conditions.

Brake Location

Whenever possible, the brake should be mounted to the highest-speed shaft. This will allow a brake with the lowest possible torque to be used. However, the maximum allowable shaft speed should not be exceeded.

120 VAC Operation

All brakes include full wave rectification.

Maintenance

Inertia Dynamics brakes are virtually maintenance-free. The air gap is set at the factory and requires no adjustments. The friction faces must be kept free of grease and oil for proper operation.

Fig. B

Type FSB Series Selection

Torque Rating vs. RPM (Sizes 001 through 007) - Selection Chart

TORQUE N-m	SHAFT SPEED AT BRAKE (RPM)																			
	100	200	300	400	500	600	700	800	900	1000	1100	1200	1500	1800	2000	2400	3000	3600	4000	5000
.056											001									
.085																				
.113																				
.226											003									
.282																				
.311																				
.339																				
.565																				
.706											007									
.734																				
.763																				
.791																				

kW vs. RPM (Sizes 15 through 100) – Selection

kW	SHAFT SPEED AT BRAKE (RPM)																			
	100	200	300	400	500	600	700	800	900	1000	1100	1200	1500	1800	2000	2400	3000	3600	4000	5000
.0149																				
.0373																				
.0621											15									
.0932																				
.124																				
.186																				
.249											35									
.373																				
.559											50									
.746																				
1.12											100									
1.49																				
2.24																				
3.73																				
5.59																				
7.46																				

Selection Considerations

The required size is determined mostly from the brake torque needed. The inertia to be braked, the speed, the braking times, duty cycle, and life requirements are all considerations in brake sizing. Other conditions to be considered are ambient temperatures, humidity, dust, and contaminants which may affect the brake performance. For these reasons, brake performance should be evaluated under actual application conditions.

Brake Location

Whenever possible, the brake should be mounted to the highest-speed shaft. This will allow a brake with the lowest possible torque to be used. However, the maximum allowable shaft speed should not be exceeded.

120 VAC Operation

All brakes include full wave rectification.

Maintenance

Inertia Dynamics brakes are virtually maintenance-free. The air gap is set at the factory and requires no adjustments. The friction faces must be kept free of grease and oil for proper operation.

Spring Applied Friction Brakes

Selecting a Spring Applied Brake Imperial

Response Time - Standard Power-Off Brakes

The following is a list of typical “Pick” and “Drop” times for standard power-off brakes.
“Pick” is defined as time to electrically energize and free the brake of torque.
“Drop” is defined as time to electrically de-energize and produce torque.

SERIES	PICK TIME	DROP TIME WITH DIODE ARC SUPPRESSION	DROP TIME WITH MOV ARC SUPPRESSION
001	8	14	77
003	26	30	14
007	39	88	30
015	30	92	35
035	60	205	70
050	68	60	32
100	100	140	50
20	30	92	40
90	45	75	25
180	40	140	40
400	85	160	45
1200	138	170	50

All times are measured in milliseconds.

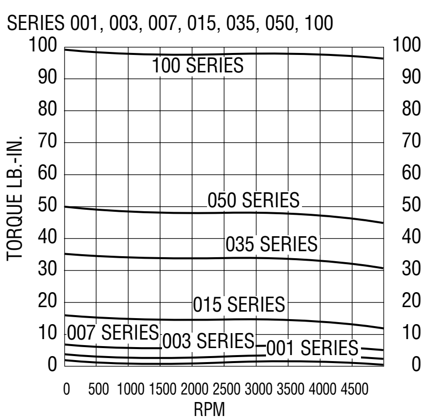
Torque Data

CLUTCHES: CLUTCH COUPLINGS: POWER ON BRAKES			
SERIES	TYPICAL OUT-OF-BOX TORQUES LB. - IN.	RATED STATIC TORQUES LB. - IN.	TYPICAL TORQUES AFTER BURNISHING LB. - IN.
001	1	1	1.5
003	3	3	4
007	7	7	9
015	15	15	18
035	35	35	42
050	50	50	60
100	100	100	120

NOTES:

1. Brakes tested at 20°C and at nominal voltage and air gap.
2. The Pick and Drop values are typical and should only be used as a guide.
3. For special applications consult Inertia Dynamics engineering.

Dynamic Torque Curve



Selecting a Spring Applied Brake Metric

Response Time - Standard Power-Off Brakes

The following is a list of typical “Pick” and “Drop” times for standard power-off brakes.
“Pick” is defined as time to electrically energize and free the brake of torque.
“Drop” is defined as time to electrically de-energize and produce torque.

SERIES	PICK TIME	DROP TIME WITH DIODE ARC SUPPRESSION	DROP TIME WITH MOV ARC SUPPRESSION
001	8	14	1
003	35	34	2
007	39	88	1
015	30	92	1
035	60	205	1
050	68	60	3
100	100	140	5

All times are measured in milliseconds.

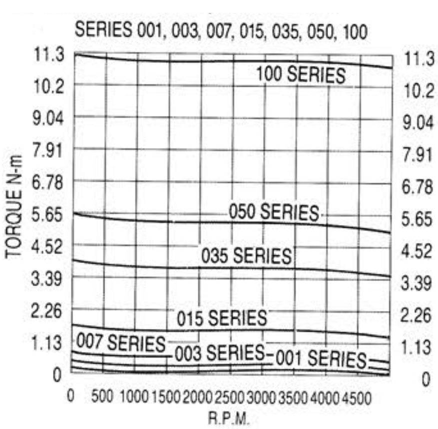
Torque Data

CLUTCHES: CLUTCH COUPLINGS: POWER ON BRAKES			
SERIES	TYPICAL OUT-OF-BOX TORQUES N-m	RATED STATIC TORQUES N-m	TYPICAL TORQUES AFTER BURNISHING N-m
001	.113	.113	.17
003	.339	.339	.45
007	.791	.791	1.0
015	1.69	1.69	2.0
035	3.95	3.95	4.8
050	5.65	5.65	6.8
100	11.3	11.3	13.6

NOTES:

1. Brakes tested at 22°C and at nominal voltage and air gap.
2. The Pick and Drop values are typical and should only be used as a guide.
3. For special applications consult Inertia Dynamics engineering.

Dynamic Torque Curve



Selecting a Spring Applied Brake Imperial

Maximum Recommended/ Safe Input RPM

(Note: Consult Inertia Dynamics Engineering for Special Applications)

Type: FSB and FSBR

SIZE	MAX. INPUT RPM
001 003	9,000
007 015	7,500
035 050	7,000
100	5,000

Burnishing

Burnishing is a wearing-in or mating process which will ensure the highest possible output torques. Burnishing is accomplished by forcing the brake to slip rotationally when engaged (brake coil not energized). Best results are obtained when the unit is forced to slip for a period of 1-3 minutes at a low speed of 60-200 RPM. Units in applications with high inertial loads and high speed will usually become burnished in their normal operating mode. Whenever possible, it is desirable to perform the burnishing operation in the final location so the alignment of the burnished faces will not be disturbed. For additional information on burnishing procedures for Spring Applied Brakes ask for burnishing spec. #040-1069.

FSB Allowable Cycles/Minutes*

MODEL NO.	RPM	INERTIA (LB. – IN.^{2})				MODEL NO.	RPM	INERTIA (LB. – IN.^{2})			
		1	5	10	50			10	50	100	500
001	1800	60	12	6	1	035	1800	25	5	2.5	5
	3600	15	3	1.5	–		3600	5	1	.5	–
003	1800	80	16	8	2	050	1800	25	5	2.5	.5
	3600	20	4	2	–		3600	5	1	.5	–
007	1800	150	30	15	3	100	1800	50	10	5	1
	3600	150	30	15	3		3600	12	2.5	1.2	–
015	1800	150	30	15	3						
	3600	40	8	4	3						

*Chart intended as a guide. For other speeds and inertias, consult Inertia Dynamics.

FSBR Allowable Cycles/Minutes*

MODEL NO.	RPM	INERTIA (LB. – IN.^{2})			
		5	10	50	100
007	1800	30	15	3	–
	3600	8	4	.8	–
015	1800	30	15	3	–
	3600	8	4	.8	–
035	1800	50	25	5	2.5
	3600	10	5	1	.5
050	1800	50	25	5	2.5
	3600	10	5	1	.5
100	1800	100	50	10	5
	3600	25	12	2.5	1.2

*Chart intended as a guide. For other speeds and inertias, consult Inertia Dynamics.

Hi-Pot Testing

All brakes are tested 100% for Hi-Pot failures. Typical tests are at 1500 volts RMS. Do not Hi-Pot brakes with A.C. operating voltages as this will potentially damage the rectifiers and cause failure. For additional information for brakes with D.C.opperating voltages, refer to IDI spec #040-1032.

Selecting a Spring Applied Brake Metric

Maximum Recommended/ Safe Input RPM

(Note: Consult Inertia Dynamics Engineering for Special Applications)

Type: FSB and FSBR

SIZE	MAX. INPUT RPM
001 003	9,000
007 015	7,500
035 050	7,000
100	5,000

Burnishing

Burnishing is a wearing-in or mating process which will ensure the highest possible output torques. Burnishing is accomplished by forcing the brake to slip rotationally when engaged (brake coil not energized). Best results are obtained when the unit is forced to slip for a period of 1-3 minutes at a low speed of 60-200 RPM. Units in applications with high inertial loads and high speed will usually become burnished in their normal operating mode. Whenever possible, it is desirable to perform the burnishing operation in the final location so the alignment of the burnished faces will not be disturbed. For additional information on burnishing procedures for Spring Applied Brakes ask for burnishing spec. #040-1069.

FSB Allowable Cycles/Minutes*

MODEL NO.	RPM	INERTIA (kg-cm²)				MODEL NO.	RPM	INERTIA (kg-cm²)			
		2.86	14.6	29	146			29.3	146	293	1463
001	1800	175	35.1	17.6	2.93	035	1800	73.2	14.6	7.32	14.6
	3600	43.9	8.78	4.39	–		3600	14.6	2.93	1.46	–
003	1800	234	46.8	23.4	5.85	050	1800	73.2	14.6	7.32	1.46
	3600	58.5	11.7	5.85	–		3600	14.6	2.93	1.46	–
007	1800	439	87.8	43.9	8.78	100	1800	146	29.3	14.3	2.93
	3600	439	87.8	43.9	8.78		3600	35.1	7.32	3.51	–
015	1800	439	87.8	43.9	8.78						
	3600	117	23.4	11.7	2.34						

*Chart intended as a guide. For other speeds and inertias, consult Inertia Dynamics.

FSBR Allowable Cycles/Minutes*

MODEL NO.	RPM	INERTIA (kg-cm²)			
		14.6	29.3	146	293
007	1800	87.8	43.9	8.78	–
	3600	23.4	11.7	2.34	–
015	1800	87.8	43.9	8.78	–
	3600	23.4	11.7	2.34	–
035	1800	146	73.2	14.6	7.32
	3600	29.3	14.6	2.93	1.46
050	1800	146	73.2	14.6	7.32
	3600	29.3	14.6	2.93	1.46
100	1800	293	146	29.3	14.6
	3600	73.2	35.2	7.32	3.51

*Chart intended as a guide. For other speeds and inertias, consult Inertia Dynamics.

Hi-Pot Testing

All brakes are tested 100% for Hi-Pot failures. Typical tests are at 1500 volts RMS. Do not Hi-Pot brakes with A.C. operating voltages as this will potentially damage the rectifiers and cause failure. For additional information for brakes with D.C.opperating voltages, refer to IDI spec #040-1032.

Spring Applied Friction Brakes

Flange Mounted Spring Applied Brakes – Type FSB

FSB001 Shown

FSB SERIES SPRING APPLIED BRAKES

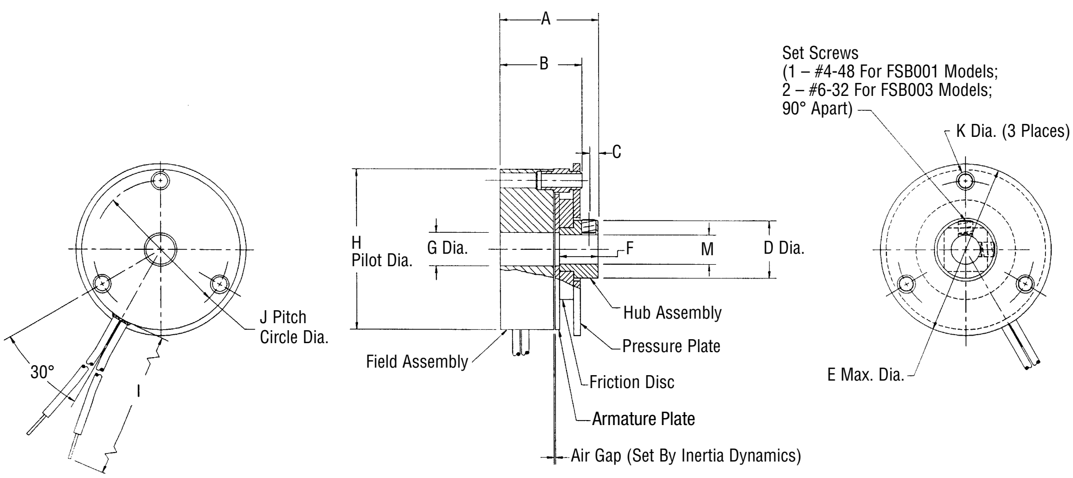
Flange Mounted Spring Applied Brakes – Type FSB

Inertia Dynamics type FSB brakes are designed to decelerate or hold inertial loads when the voltage is turned off. These brakes can be mounted to a bulkhead or motor.

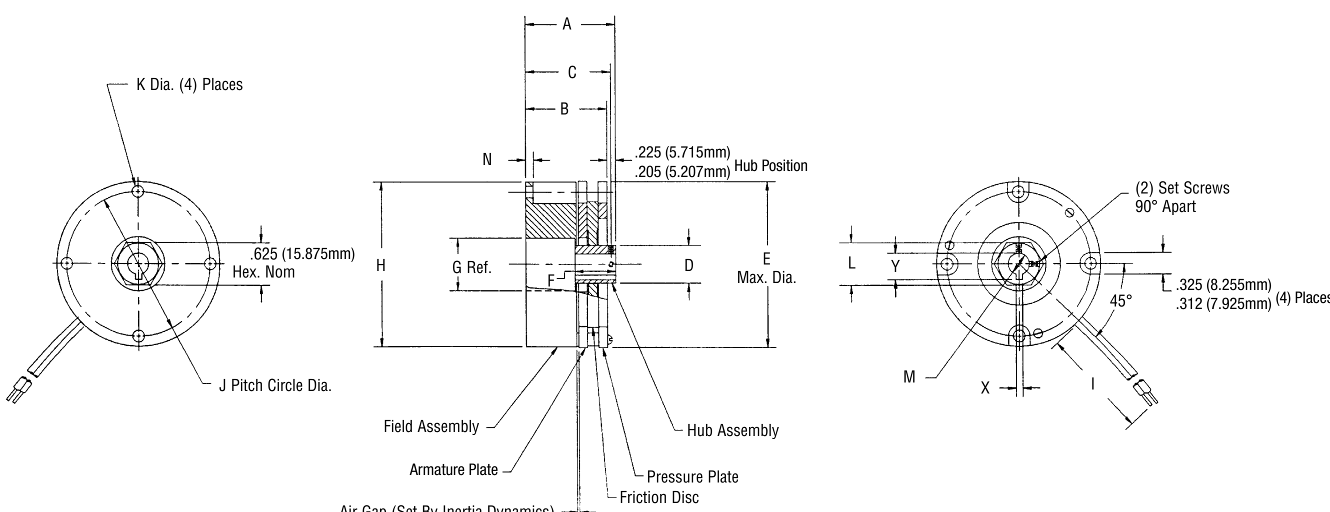
Customer Shall Maintain:

The perpendicularity of the mounting surface with respect to the shaft not to exceed .005 inch (0.127 mm) T.I.R. at a diameter equal to the brake body outside diameter; the concentricity between the mounting holes and the shaft not to exceed .010 T.I.R. for sizes 001-015 and .020 (0.508 mm) T.I.R. for sizes 035-100. Refer to instruction manual #040-10110.

Model FSB001 or FSB003 - Square Drive

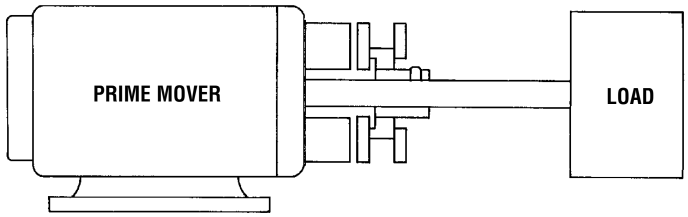


Model FSB007 or FSB015 - Hex Drive

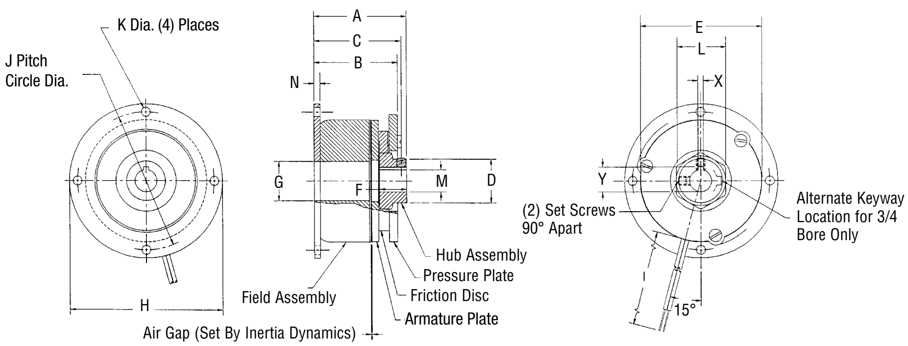


See page 41 for Dimensional Information

Flange Mounted Spring Applied Brakes – Type FSB

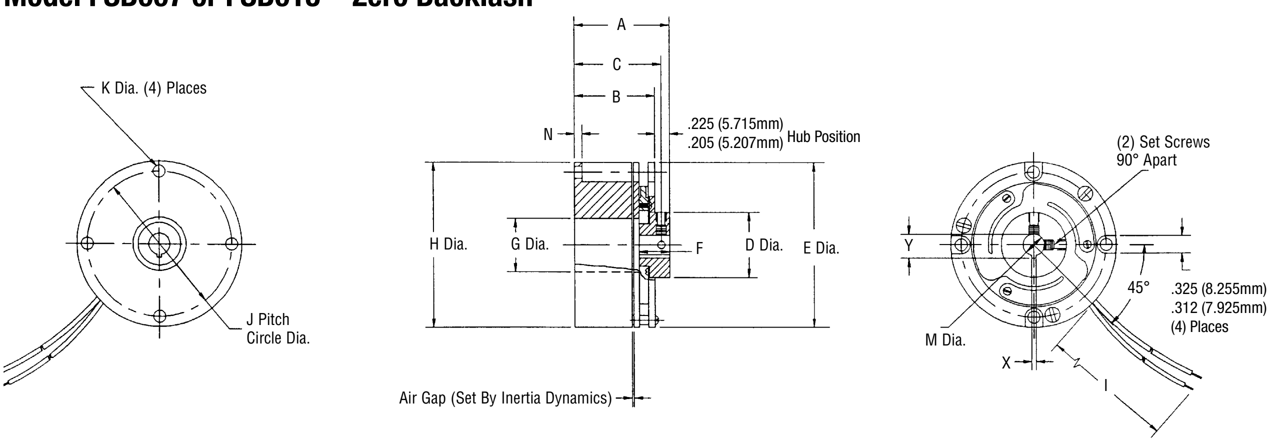


Model FSB035, FSB050,or FSB100 - Hex Drive

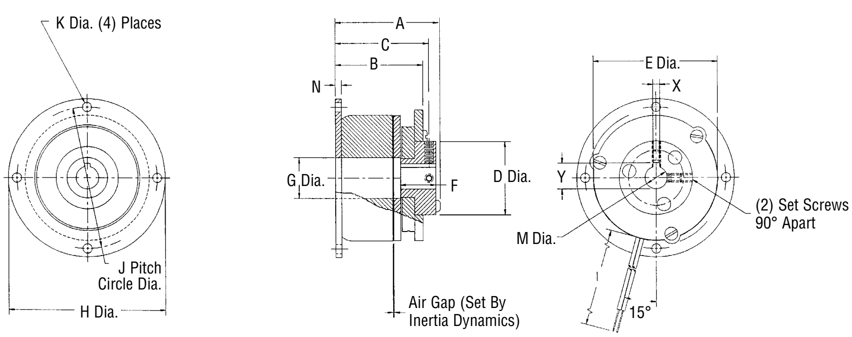


FSB007 Shown

Model FSB007 or FSB015 – Zero Backlash



Model FSB035, FSB050



FSB035 Shown

See page 41 for Dimensional Information

Spring Applied Friction Brakes

Flange Mounted Spring Applied Brakes – Type FSB Imperial

Mechanical

MODEL NO.	STATIC TORQUE LB. - IN.	INERTIA LB. - IN.^{2} ARMATURE & HUB ASSEMBLY		WEIGHT OZ.
		SQUARE OR HEX DRIVE	ZERO BACKLASH	
FSB001	1	.0004	N.A.	2
FSB003	3	.0017	N.A.	3
FSB007	7	.0133	.0176	15
FSB015	15	.0133	.0176	16
FSB035	35	.084	.1733	33
FSB050	50	.084	.1733	36
FSB100	100	.205	N.A.	64

Electrical

MODEL NO.	90 VDC		24 VDC		12 VDC		120 VAC	
	AMPS	OHMS	AMPS	OHMS	AMPS	OHMS	AMPS	OHMS
FSB001	.051	1880	.220	117	.430	30	.044	N.A.
FSB003	.041	2177	.182	132	.353	34	.050	N.A.
FSB007	.059	1520	.247	97.3	.477	25.1	.045	N.A.
FSB015	.098	922	.369	65.1	.719	16.7	.077	N.A.
FSB035	.093	964	.394	61.0	.755	15.9	.073	N.A.
FSB050	.194	465	.717	33.5	1.54	7.75	.140	N.A.
FSB100	.180	501	.707	34	1.41	8.5	.142	N.A.

Lead wire is UL recognized style 1430 or 1015, 22 gage.
Insulation is .064 O.D. on 001 & 003 units; .095 O.D. on 007, 015, 035, 050 & 100 units.

Dimensions

MODEL NO.	HUB STYLE	A MAX.	B MAX.	C NOM.	D MAX.	E MAX.	F MIN.	G REF.	H MAX	I ± .500	J NOM.	K MIN.	L NOM.	N MAX.	M BORES & KEYWAY		
															BORE	NOMINAL KEYWAY X	NOMINAL KEYWAY Y
FSB001	Square Drive	.890	.710	.072	.510	1.485	.320	.280	1.375	12.0	1.180	.113	3/8	N.A.	1/8 3/16 1/4	SET SCREWS ONLY	
FSB003	Square Drive	1.060	.870	.115	.755	1.910	.380	.410	1.752	12.0	1.545	.113	9/16	N.A.	3/16 1/4 5/16 3/8	SET SCREWS ONLY	
FSB007	Hex Drive	1.400	1.200	1.255	.722	2.465	.605	.781	2.436	12.0	2.125	.170	5/8	.120	1/4 5/16 3/8 1/2*	.0625 – .0655 .0625 – .0655 .094 – .097 .125 – .128	.285 – .290 .347 – .352 .417 – .427 .560 – .567
	Zero Backlash	1.400	1.200	1.255	.955	2.465	.450	.781	2.436	12.0	2.125	.170	N.A.	—			
FSB015	Hex Drive	1.400	1.200	1.255	.722	2.465	.605	.781	2.436	12.0	2.125	.170	5/8	.120	1/4 5/16 3/8 1/2*	.0625 – .0655 .0625 – .0655 .094 – .097 .125 – .128	.285 – .290 .347 – .352 .417 – .427 .560 – .567
	Zero Backlash	1.400	1.200	1.255	.955	2.465	.450	.781	2.436	12.0	2.125	.170	N.A.	—			
FSB035	Hex Drive	2.110	1.920	1.960	1.000	3.010	.580	.891	3.500	18.0	3.125	.200	11/8	.142	3/8 1/2 5/8 3/4	.094 – .097 .125 – .128 .1885 – .1905 .1885 – .1905	.417 – .427 .560 – .567 .709 – .719 .836 – .844
	Zero Backlash	2.230	1.915	1.998	1.625	3.010	.730	.891	3.500	18.0	3.125	.200	N.A.	—			
FSB050	Hex Drive	2.110	1.920	1.960	1.000	3.010	.580	.891	3.500	18.0	3.125	.200	11/8	.142	3/8 1/2 5/8 3/4	.094 – .097 .125 – .128 .1885 – .1905 .1885 – .1905	.417 – .427 .560 – .567 .709 – .719 .836 – .844
	Zero Backlash	2.230	1.915	1.998	1.625	3.010	.730	.891	3.500	18.0	3.125	.200	N.A.	—			
FSB100	Hex Drive	2.320	2.080	2.100	.975	4.000	.555	1.188	5.250	18.0	4.750	.216	11/2	.210	1/2 5/8 3/4	.125 – .128 .1885 – .1905 .1885 – .1905	.560 – .567 .709 – .716 .836 – .844

*1/2 bore available in Zero Backlash only.

Notes:

Hex Drive – FSB

1. For sizes 001 and 003, position hub .010- .020 inches back from friction disc with coil de-energized.
2. For sizes 007 and larger, position hub .010- .030 inches back from armature plate with coil de-energized.
3. 1/2 inch bore not available for sizes 007 and 015.

Zero Backlash – FSB

1. Position hub to run freely with coil energized taking care to center the friction disc between the armature and pressure plate.

See page 29 for Ordering Information

Flange Mounted Spring Applied Brakes – Type FSB Metric

Mechanical

MODEL NO.	STATIC TORQUE N-m	INERTIA kg-cm² ARMATURE & HUB ASSEMBLY		WEIGHT kg
		SQUARE OR HEX DRIVE	ZERO BACKLASH	
FSB001	.113	.0012	N.A.	.06
FSB003	.339	.0050	N.A.	.09
FSB007	.791	.0389	.0515	.43
FSB015	1.69	.0389	.0515	.45
FSB035	3.95	.2458	.5071	.94
FSB050	5.65	.2458	.5071	1.0
FSB100	11.3	.5999	N.A.	1.8

Electrical

MODEL NO.	90 VDC		24 VDC		12 VDC		120 VAC	
	AMPS	OHMS	AMPS	OHMS	AMPS	OHMS	AMPS	OHMS
FSB001	.051	1880	.220	117	.430	30	.044	N.A.
FSB003	.064	2177	.190	132	.353	34	.048	N.A.
FSB007	.059	1520	.247	97.3	.481	25	.045	N.A.
FSB015	.098	922	.369	65.1	.719	16.7	.071	N.A.
FSB035	.093	964	.394	61.0	.755	15.9	.073	N.A.
FSB050	.194	465	.717	33.5	1.54	7.75	.140	N.A.
FSB100	.180	501	.707	34	1.41	8.5	.142	N.A.

Lead wire is UL recognized style 1430 or 1015, 22 gage. Insulation is 1.63 mm O.D. on 001 & 003 units; 2.41 mm O.D. on 007, 015, 035, 050 & 100 units.

Dimensions

MODEL NO.	HUB STYLE	A MAX.	B MAX.	C NOM.	D MAX.	E MAX.	F MIN.	G REF.	H MAX	I ± 12.7	J NOM.	K MIN.	L NOM.	N MAX.	M BORES & KEYWAY		
															BORE	NOMINAL KEYWAY	
																X	Y
FSB001	Square Drive	22.606	18.034	1.829	12.594	37.719	8.128	7.112	34.925	304.800	29.972	2.870	9.525	N.A.	5H9 6H9	SET SCREWS ONLY	
FSB003	Square Drive	26.924	22.098	2.921	19.177	48.514	9.652	10.414	44.501	304.800	39.243	2.870	14.288	N.A.	6H9 8H9	SET SCREWS ONLY	
FSB007	Hex Drive	35.560	30.480	36.877	18.339	62.611	15.367	19.837	61.874	304.800	53.975	4.369	15.875	3.048	6H9 8H9	1.988-2.060 1.988-2.060	7.00-7.10 9.00-9.10
	Zero Backlash	35.560	30.480	31.877	24.257	62.611	11.430	19.837	61.874	304.800	53.975	4.369	N.A.	—			
FSB015	Hex Drive	35.560	30.480	31.877	18.339	62.611	15.367	19.837	61.874	304.800	53.975	4.369	15.875	3.048	6H9 8H9	1.988-2.060 1.988-2.060	7.00-7.10 9.00-9.10
	Zero Backlash	35.560	30.480	31.039	24.257	62.611	11.430	19.837	61.874	304.800	53.975	4.569	N.A.	—			
FSB035	Hex Drive	53.594	48.768	49.784	25.400	76.454	14.732	22.631	88.900	457.200	79.375	5.080	28.575	3.607	10H9 15H9	2.988-3.060 4.985-5.078	11.40-11.50 17.30-17.40
	Zero Backlash	56.642	48.641	50.749	41.275	76.454	18.542	22.631	88.900	457.200	79.375	5.080	N.A.	—			
FSB050	Hex Drive	53.594	48.768	49.784	25.400	76.454	14.732	22.631	88.900	457.200	79.375	5.080	28.575	3.607	10H9 15H9 17H9	2.988-3.060 4.985-5.078 4.985-5.078	11.40-11.50 17.30-17.40 19.30-19.40
	Zero Backlash	56.642	48.641	50.749	41.275	76.454	18.542	22.631	88.900	457.200	79.375	5.080	N.A.	—			
FSB100	Hex Drive	58.928	52.832	53.340	24.765	101.600	14.097	30.175	133.350	457.200	120.65	5.486	38.100	5.334	15H9	4.985-5.078	17.30-17.40

Notes:

Hex Drive – FSB

1. For sizes 001 and 003, position hub .254-.508 mm back from friction disc with coil de-energized.
2. For sizes 007 and larger, position hub .254-.762 mm back from clapper plate with coil de-energized.
3. Dimension "C" is the centerline of the set screw(s) in the hub.

Zero Backlash – FSB

1. Position hub to run freely with coil energized taking care to center the friction disc between the clapper and pressure plate.
2. Dimension "C" is the centerline of the set screw(s) in the hub.

See page 29 for Ordering Information

Reverse Mounted Spring Applied Brakes – Type FSBR Imperial

FSBR007 Shown

FSBR SERIES SPRING APPLIED BRAKES

Reverse Mounted Spring Applied Brakes – Type FSBR

Inertia Dynamics type FSBR brakes are designed for applications requiring minimum space (short axial length) or for motors with short shaft extensions. When mounted, the hub is installed on the shaft first, then the brake is installed over the hub and attached to the motor.

Customer Shall Maintain:

The perpendicularity of the mounting surface with respect to the shaft not to exceed .005 inch T.I.R. at a diameter equal to the brake body outside diameter; the concentricity between the mounting holes and the shaft not to exceed .020 inch T.I.R.

Mechanical

MODEL NO.	STATIC TORQUE LB. - IN.	INERTIA LB. - IN.^{2} ARMATURE & HUB ASSEMBLY	WGT. OZ.
FSBR007	7	.0133	11
FSBR015	15	.0133	12
FSBR035	35	.084	24
FSBR050	50	.084	27
FSBR100	100	.205	56

Electrical

MODEL NO.	90 VDC		24 VDC		12 VDC		120 VAC	
	AMPS	OHMS	AMPS	OHMS	AMPS	OHMS	AMPS	OHMS
FSBR007	.059	1520	.247	97.3	.477	25.1	.048	N.A.
FSBR015	.098	922	.369	65.1	.719	16.7	.077	N.A.
FSBR035	.093	964	.394	61.0	.755	15.9	.073	N.A.
FSBR050	.194	465	.717	33.5	1.43	8.4	.140	N.A.
FSBR100	.180	501	.707	34	1.41	8.5	.142	N.A.

Lead wire is UL recognized style 1015, 22 gage. Insulation is .095 O.D.

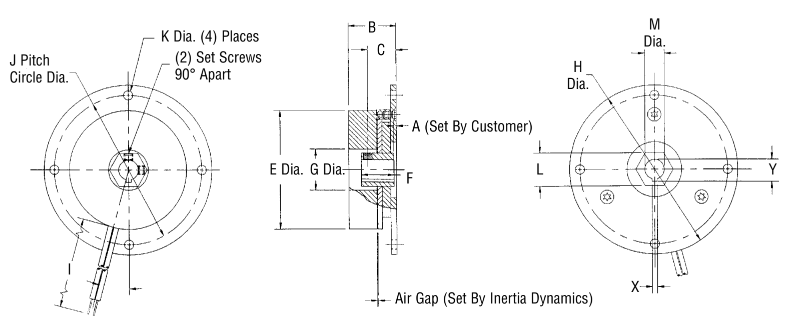
Dimensions

MODEL NO.	HUB STYLE	A MAX.	B MAX.	C NOM.	E MAX.	F MIN.	G REF.	H MAX.	I ± .500	J NOM.	K MIN.	L NOM.	M BORES & KEYWAY		
													BORE	NOMINAL KEYWAY X	NOMINAL KEYWAY Y
FSBR007	Hex Drive Only	.062	.960	.550	2.260	.605	.781	3.235	12.0	2.844	.172	5/8	1/4 5/16 3/8	.0625 – .0655 .0625 – .0655 .094 – .097	.285 – .290 .347 – .352 .417 – .427
FSBR015	Hex Drive Only	.062	1.200	.600	2.400	.605	.945	3.235	12.0	2.844	.187	5/8	5/16 3/8 1/2	.0625 – .0655 .094 – .097 .125 – .128	.347 – .352 .417 – .427 .560 – .567
FSBR035	Hex Drive Only	.094	1.905	.239	2.810	.280	.891	3.500	18.0	3.125	.200	1 1/8	3/8 1/2 5/8 3/4	.094 – .097 .125 – .128 .1885 – .1905 .1885 – .1905	.417 – .427 .560 – .567 .709 – .719 .836 – .844
FSBR050	Hex Drive Only	.094	1.905	.239	2.810	.280	.891	3.500	18.0	3.125	.200	1 1/8	3/8 1/2 5/8 3/4	.094 – .097 .125 – .128 .1885 – .1905 .1885 – .1905	.417 – .427 .560 – .567 .709 – .719 .836 – .844
FSBR100	Hex Drive Only	.140	1.870	.545	4.000	.555	1.188	5.250	18.0	4.750	.216	1 1/2	1/2 5/8 3/4	.125 – .128 .1885 – .1905 .1885 – .1905	.560 – .567 .709 – .716 .836 – .844

Notes:

Hex Drive – FSBR

1. Refer to dimension "A" for the distance the hub should be installed on the shaft from the mounting surface.
2. Dimension "F" is the minimum length of the hex hub.



See page 29 for Ordering Information

Reverse Mounted Spring Applied Brakes – Type FSBR Metric

FSBR007 Shown

FSBR SERIES SPRING APPLIED BRAKES

Reverse Mounted Spring Applied Brakes – Type FSBR

Inertia Dynamics type FSBR brakes are designed for applications requiring minimum space (short axial length) or for motors with short shaft extensions. When mounted, the hub is installed on the shaft first, then the brake is installed over the hub and attached to the motor.

Customer Shall Maintain:

The perpendicularity of the mounting surface with respect to the shaft not to exceed .127 mm T.I.R. at a diameter equal to the brake body outside diameter; the concentricity between the mounting holes and the shaft not to exceed .508 mm T.I.R.

Mechanical

MODEL NO.	STATIC TORQUE N-m	INERTIA kg-cm² ARMATURE & HUB ASSEMBLY	WGT. kg
FSBR007	.791	.039	.31
FSBR015	1.69	.039	.34
FSBR035	3.95	.246	.68
FSBR050	5.65	.246	.77
FSBR100	11.3	.600	1.58

Electrical

MODEL NO.	90 VDC		24 VDC		12 VDC		120 VAC	
	AMPS	OHMS	AMPS	OHMS	AMPS	OHMS	AMPS	OHMS
FSBR007	.059	1520	.247	97.3	.477	25.1	.045	N.A.
FSBR015	.098	922	.369	65.1	.719	16.7	.077	N.A.
FSBR035	.093	964	.394	61.0	.755	15.9	.073	N.A.
FSBR050	.194	465	.717	33.5	1.43	8.4	.140	N.A.
FSBR100	.180	501	.707	34	1.41	8.5	.142	N.A.

Lead wire is UL recognized style 1015, 22 gage. Insulation is 2.41 mm O.D.

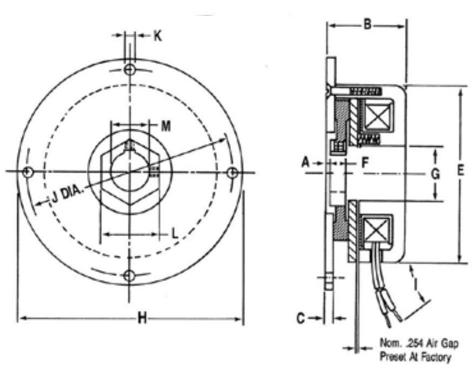
Dimensions

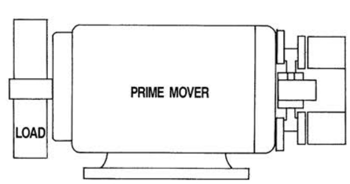
MODEL NO.	HUB STYLE	A MAX.	B MAX.	C NOM.	E MAX.	F MIN.	G REF.	H MAX.	I ± 12.7	J NOM.	K MIN.	L NOM.	M BORES & KEYWAY BORE	NOMINAL KEYWAY X	NOMINAL KEYWAY Y
FSBR007	Hex Drive Only	1.575	24.384	2.921	57.404	15.367	19.837	82.169	304.800	72.238	4.369	15.875	6H9 8H9	1.988-2.060 1.988-2.060	7.00-7.10 9.00-9.10
FSBR015	Hex Drive Only	1.575	30.480	2.921	60.960	15.367	24.003	82.169	304.800	72.238	4.369	15.875	8H9 10H9	1.988-2.060 2.988-3.060	9.00-9.10 11.40-11.50
FSBR035	Hex Drive Only	2.388	48.387	4.572	71.374	7.112	22.631	88.900	457.200	79.375	5.080	28.575	10H9 15H9	2.988-3.060 4.985-5.078	11.40-11.50 17.30-17.40
FSBR050	Hex Drive Only	2.388	48.387	4.572	71.374	7.112	22.631	88.900	457.200	79.375	5.080	28.575	15H9 17H9	4.985-5.078 4.985-5.078	17.30-17.40 4.985-5.078
FSBR100	Hex Drive Only	3.556	47.498	4.191	101.600	14.907	30.175	133.350	457.200	120.650	5.486	38.100	15H9 17H9	4.985-5.078 4.985-5.078	17.30-17.40 4.985-5.078

Notes:

Hex Drive – FSBR

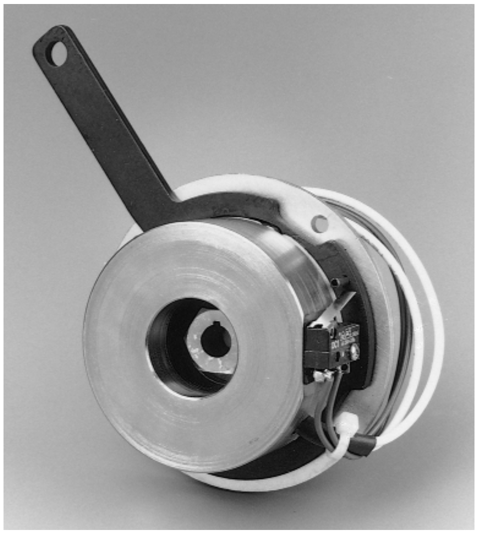
1. Refer to dimension "A" for the distance the hub should be installed on the shaft from the mounting surface.
2. Dimension "F" is the minimum length of the hex hub.





See page 29 for Ordering Information

Manual Release, Spring Applied Brakes – Type FSBR



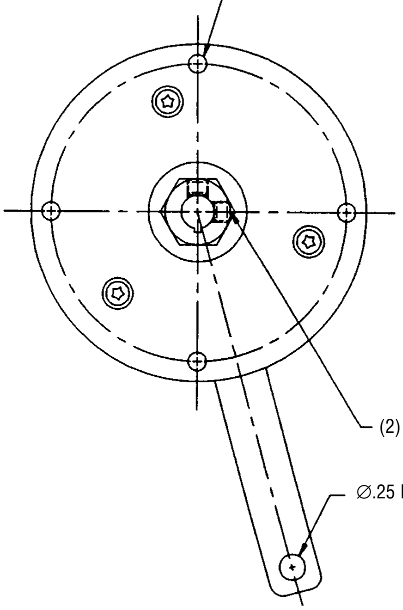
FSBR SERIES SPRING APPLIED BRAKE

Manual Release Spring Applied Brake – Type FSBR

Inertia Dynamics features a type FSBR015 spring applied brake with a manual release lever. The brake incorporates a lever which is rotated to mechanically engage the clapper plate. The armature plate acts against the compression springs and allows the friction disc to spin freely. The brake is then free of torque. An optional microswitch is activated on the field assembly to disconnect power to your system in case of an accidental start-up with the brake manually released. To return the brake to normal operation, the lever is rotated to re-engage the brake and produce torque.

Typical applications include wheelchairs, three-wheel carts/ scooters, and fractional horsepower motors. The brake is available with a higher static torque rating for non-dynamic braking applications where only a statically engaged parking brake is needed.

For variations on the manual release brake configuration, in support of high volume OEM applications, consult Inertia Dynamics.



Customer Shall Maintain:

The concentricity between mounting holes and mounting shaft not to exceed .020 (.508 mm) T.I.R.; the perpendicularity of mounting face with respect to shaft not to exceed .005 (.127 mm) T.I.R.

Caution:

Inertia Dynamics recommends the use of a switch or other method to ensure this brake is not operated while it is in the manually released mode.

Manual Release, Spring Applied Brakes – Type FSBR Imperial

Bore Dimensions

HUB BORE	NOM. HEX	KEYWAY
.3130 – .3145 5/16	5/8	1/32 x 1/16
.3755 – .3770 3/8	5/8	3/64 x 3/32
.5005 – .5020 1/2	3/4	1/16 x 1/8

Electrical

VOLTS	WATTS	AMPS.	OHMS.
90 VDC	8.8	.098	922
24 VDC	8.9	.369	65.1
12 VDC	8.6	.719	16.7
120 VAC	8.7	.077	N.A.

Notes:

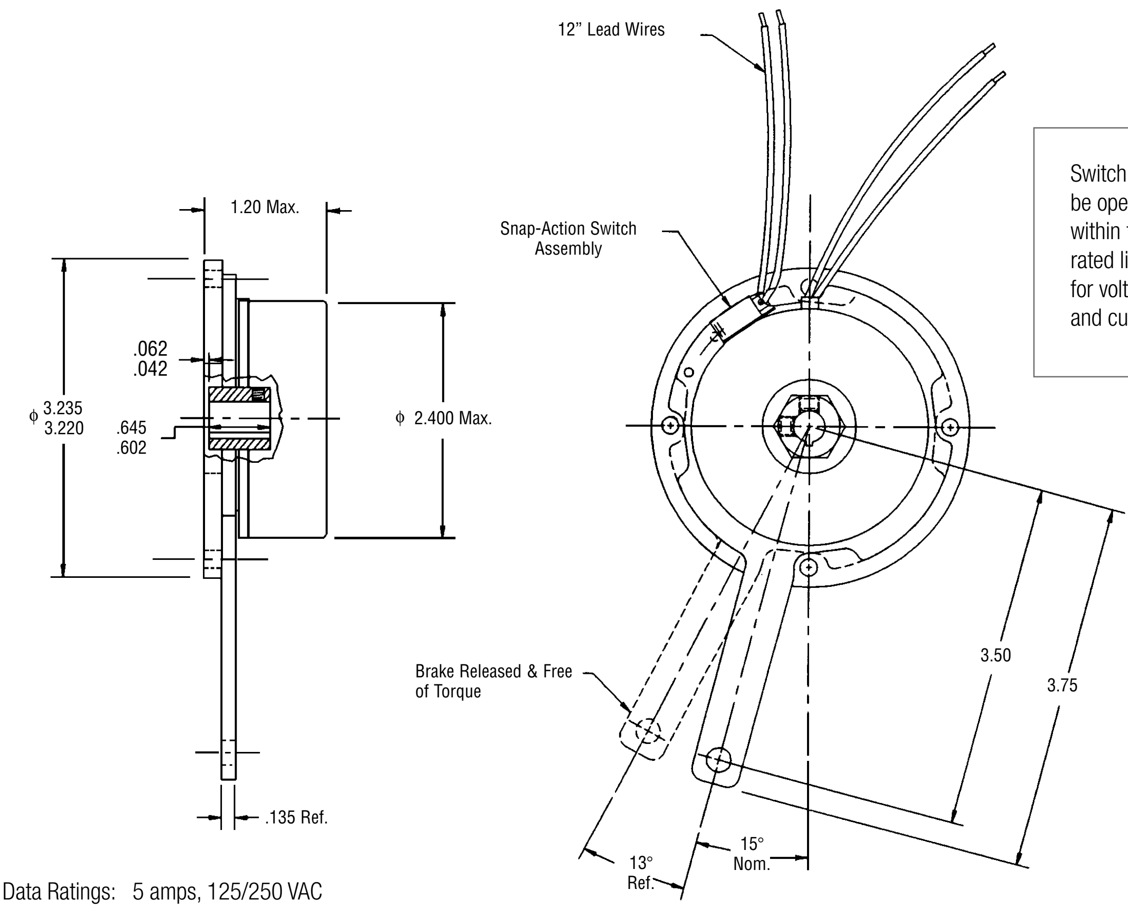
1. Coil lead data: 22 AWG, 7/30 stranded, 105°C, 600V, UL style 1430, insulation is .064" O.D .

Mechanical

	DYNAMIC STYLE	STATIC* STYLE	INERTIA (LB. - IN.^{2}) ARM & HUB	WEIGHT OZ.
Static Torque (LB. – IN.)	5/8	1/32 x 1/16	1/32 x 1/16	1/32 x 1/16

* For park & hold, static braking conditions only.

- 16 lbs. pull force maximum at 3.500 length on lever arm.



Switch must be operated within the rated limits for voltage and current.

Switch Data Ratings: 5 amps, 125/250 VAC
Double-Throw Contacts
Short Solder Terminals

Engineering may substitute a switch of equal specifications.

See page 29 for Ordering Information

Manual Release, Spring Applied Brakes – Type FSBR Metric

Bore Dimensions

HUB BORE	NOM. HEX	KEYWAY	
		X	Y
8H9	15.875	1.988-2.060	9.00-9.10
10H9	19.050	2.988-3.060	11.40-11.50

Electrical

VOLTS	WATTS	AMPS.	OHMS.
90 VDC	8.8	.098	922
24 VDC	8.9	.369	65.1
12 VDC	8.6	.719	16.7
120 VAC	8.7	.077	N.A.

Notes:

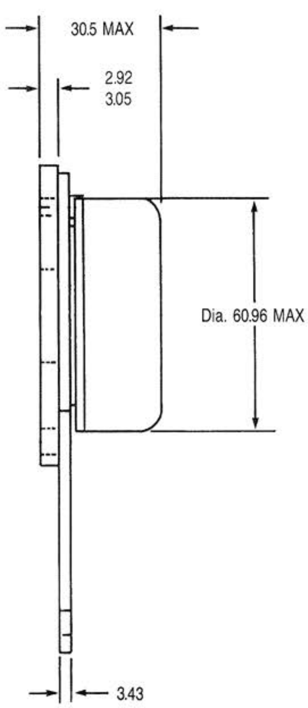
1. Coil lead data: 22 AWG, 7/30 stranded, 105°C, 600V, UL style 1430, insulation is 1.63 mm OD .

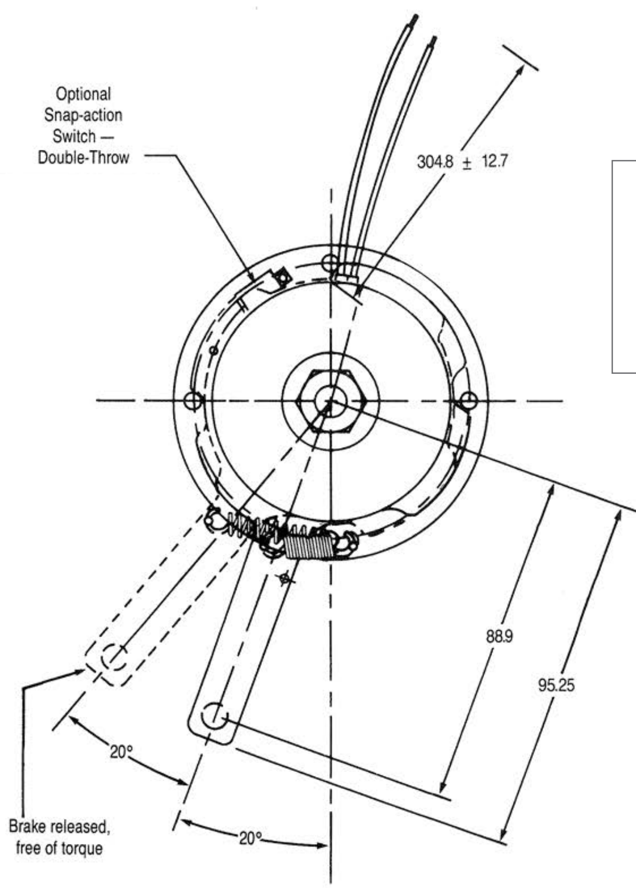
Mechanical

	DYNAMIC STYLE	STATIC* STYLE	INERTIA (k-cm^2) ARM & HUB	WEIGHT kg
Static Torque (N-m)	1.69	3.39	0.389	.96 kg

* For park & hold, static braking conditions only.

- 67 Newtons pull force maximum at 88.900 mm length on lever arm.





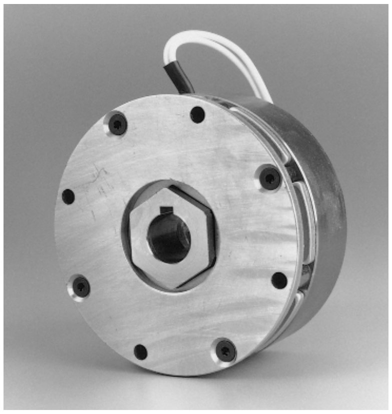
Switch must be operated within the rated limits for voltage and current.

Switch Data Ratings: 5 amps, 125/250 VAC
Double-Throw Contacts
Short Solder Terminals

Engineering may substitute a switch of equal specifications.

See page 29 for Ordering Information

Spring Applied Brakes – Type SAB

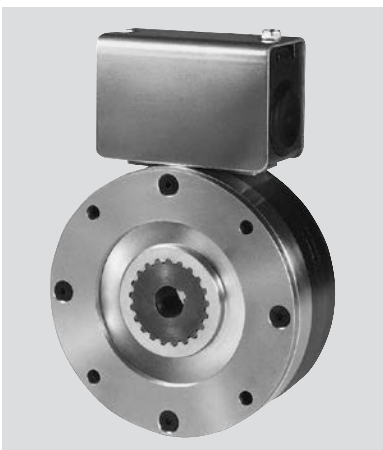


SAB90 Shown

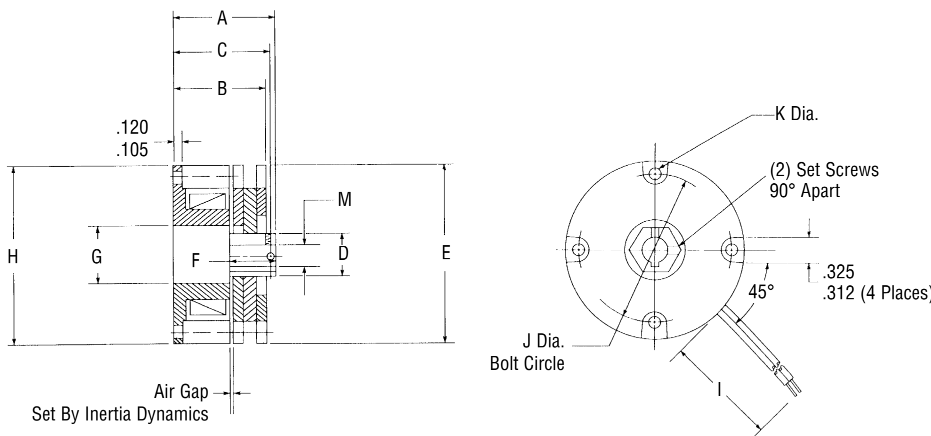
SAB SERIES SPRING APPLIED BRAKE

Manual Release Spring Applied Brake – Type SAB

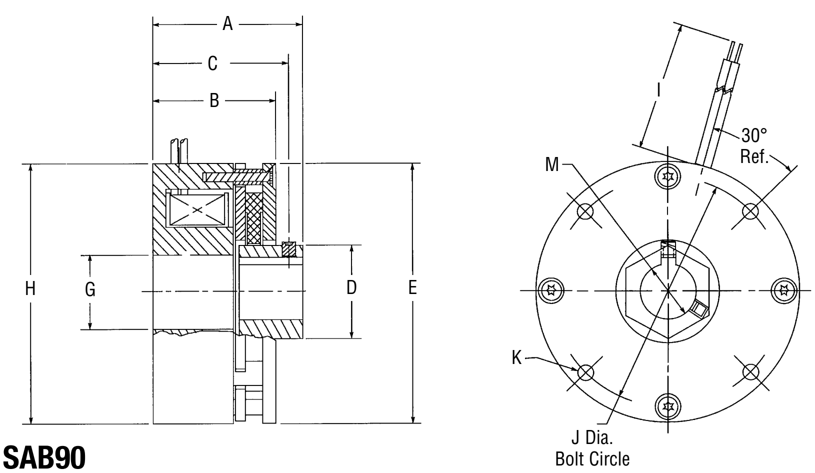
Inertia Dynamics features a type SAB spring applied brake. SAB brakes are designed to be engaged and disengaged in a static condition at zero RPM. They are best used as parking brakes to hold loads in position. These brakes can be mounted to a flange or motor using thru-holes or tapped holes in the field cup. A conduit box is optional. SAB brakes have been used extensively for servo brake applications with minor modifications. High-temperature coil insulations are available upon request.



SAB180 Shown with Optional Conduit Box



SAB20



SAB90

Spring Applied Brakes – Type SAB Imperial

Mechanical

MODEL NO.	STATIC TORQUE LB. - IN.	INERTIA LB. - IN.^{2} ARMATURE & HUB ASSEMBLY	WEIGHT LB.
SAB20	20	.018	1
SAB90	90	.130	3
SAB180	180	.312	5
SAB400	400	.748	7.1
SAB1200	1200	1.732	12.4

Electrical

MODEL NO.	90 VDC		24 VDC		12 VDC		120 VAC	
	AMPS	OHMS	AMPS	OHMS	AMPS	OHMS	AMPS	OHMS
SAB20	.098	922	.37	65	.72	16.7	.08	N.A.
SAB90	.17	534	.68	35.3	1.34	8.95	.13	N.A.
SAB180	.29	314	1.14	21.10	2.25	5.33	.25	N.A.
SAB400	.39	230	1.54	15.50	3.01	3.98	.33	N.A.
SAB1200	.58	156	2.27	10.60	4.51	2.66	.49	N.A.

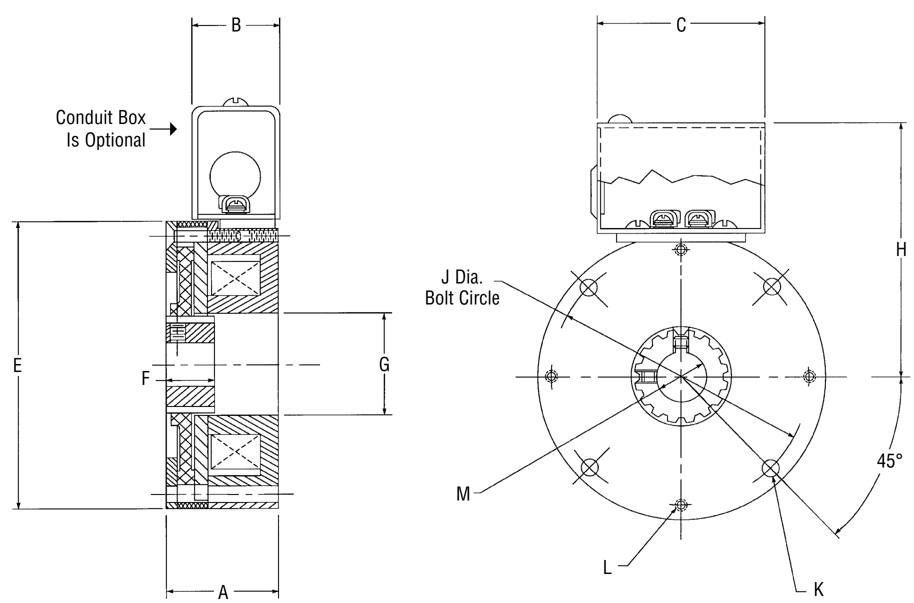
Dimensions

MODEL NO.	HUB STYLE	A MAX.	B MAX.	C NOM.	D MAX.	E MAX.	F MIN.	G REF.	H MAX	I ±.500	J NOM.	K DIA	L	M BORES & KEYWAYS		
														BORE	NOMINAL KEYWAY	
															X**	Y**
SAB20	HEX	1.400	1.200	1.255	0.722	2.465	0.605	0.781	2.436	12.0	2.125	0.172	–	3/8 5/16 3/8	.094 – .097 .0625 – .0655 .094 – .097	.417 – .427 .347 – .352 .417 – .427
SAB90	HEX	1.938	1.658	1.753	1.298	3.530	0.740	1.375	3.530	18.0	3.125	0.190	#6 – 32 X .5	3/8 1/2 5/8 3/4	.094 – .097 .125 – .128 .1885 – .1905 .1885 – .1905	.417 – .427 .560 – .567 .709 – .716 .836 – .844
SAB180	SPLINE	1.770	1.500	2.930	–	4.260	0.800	1.500	4.129*	–	3.75	0.223	#8 – 32 X .5	3/8 1/2 5/8 3/4 7/8	.094 – .097 .125 – .128 .1885 – .1905 .1885 – .1905 .1885 – .1905	.417 – .427 .560 – .567 .709 – .716 .836 – .844 .962 – .970
SAB400	SPLINE	1.940	1.500	2.930	–	5.010	0.800	1.770	4.514*	–	4.5	0.283	#10 – 24 X .5	1/2 5/8 3/4 7/8 1	.125 – .128 .1885 – .1905 .1885 – .1905 .1885 – .1905 .251 – .253	.560 – .567 .709 – .716 .836 – .844 .962 – .970 1.113 – 1.121
SAB1200	SPLINE	2.050	1.500	2.930	–	6.510	0.900	2.425	5.252*	–	5.875	0.409	1/4 – 20 X .5	1 1 1/8 1 1/4 1 3/8 1 1/2	.251 – .253 .251 – .253 .251 – .253 .3135 – .3155 .376 – .379	1.114 – 1.124 1.241 – 1.251 1.367 – 1.377 1.518 – 1.528 1.606 – 1.616

* Reference Dimension
** X denotes keyway width, Y denotes keyway height plus bore

Notes:

1. SAB1200 – Special .375 x .250 key is supplied with unit. Mating shaft to have conventional ASA Standard Keyway.
2. Conduit box is optional on models SAB180, 400 & 1200. Screw terminals supplied in place of conduit box.
3. Consult factory for Zero Backlash Hub Style



SAB180, 400, 1200

See page 29 for Ordering Information

Ordering Information

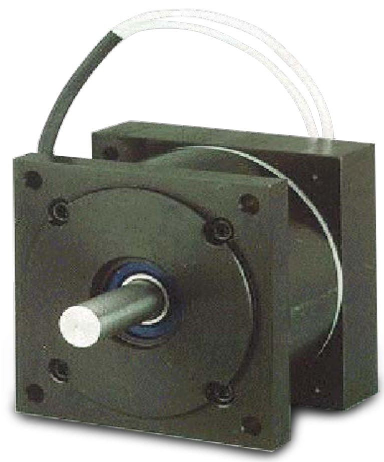
MPC PART NUMBERING SYSTEM

MODEL	PART NUMBER *	NEMA FRAME	INPUT SHAFT DIAMETER (INCH)	OUTPUT SHAFT DIAMETER (INCH)	STATIC TORQUE (INCH/LB)	*AVAILABLE VOLTAGE
MPC17	8917-2221	17	3/16	3/16	1	24 VDC
MPC23	8923-x331	23	1/4	1/4	3	24 VDC, 12 VDC, 90 VDC, 120 VAC
MPC23	8923-x551	23	3/8	3/8	3	24 VDC, 12 VDC, 90 VDC, 120 VAC
MPC23	8923-x531	23	3/8	1/4	3	24 VDC, 12 VDC, 90 VDC, 120 VAC
MPC23	8923-x631	23	1/2	1/4	3	24 VDC, 12 VDC, 90 VDC, 120 VAC
MPC23	8923-x651	23	1/2	3/8	3	24 VDC, 12 VDC, 90 VDC, 120 VAC
MPC23	8923-x335	23	1/4	1/4	5	24 VDC, 12 VDC, 90 VDC, 120 VAC
MPC23	8923-2556	23	3/8	3/8	10	24 VDC
MPC34	8934-x551	34	3/8	3/8	15	24 VDC, 12 VDC, 90 VDC, 120 VAC
MPC34	8934-x661	34	1/2	1/2	15	24 VDC, 12 VDC, 90 VDC, 120 VAC
MPC34	8934-2555	34	3/8	3/8	25	24 VDC
MPC34	8934-2665	34	1/2	1/2	25	24 VDC
MPC42	8942-x661	42	1/2	1/2	50	24 VDC, 12 VDC, 90 VDC, 120 VAC
MPC42	8942-x771	42	5/8	5/8	50	24 VDC, 12 VDC, 90 VDC, 120 VAC
MPC42	8942-x881	42	3/4	3/4	50	24 VDC, 12 VDC, 90 VDC, 120 VAC

*REPLACE "X" WITH THE FOLLOWING WHEN ORDERING	
1	90VDC
2	24 VDC
3	12 VDC
4	120 VDC

* Please call to confirm availability

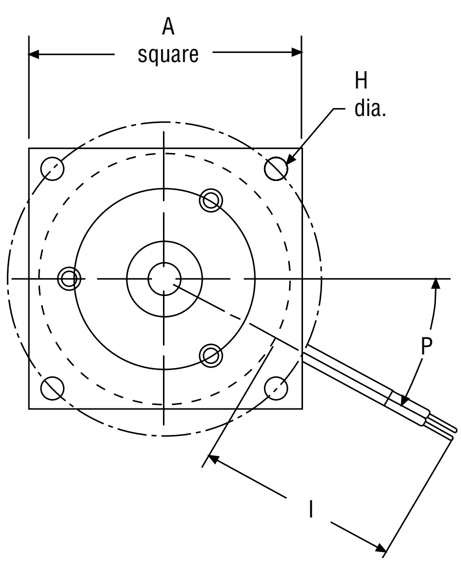
Double C-Face Power-Off Brakes for Nema 17, 23, 34 and 42 Frames

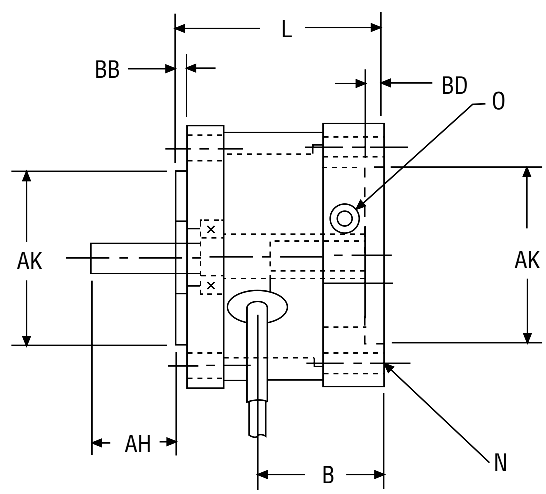


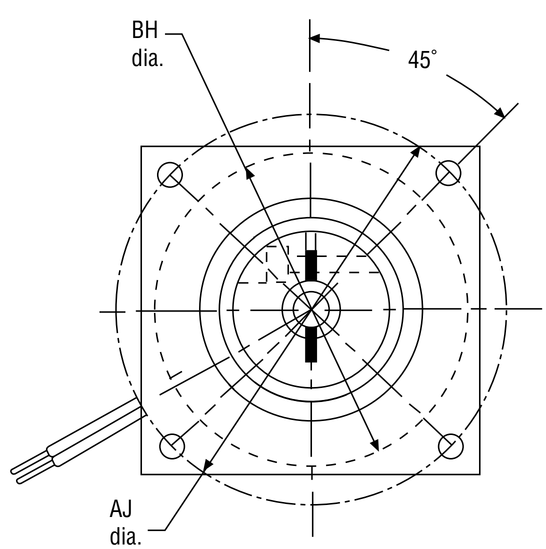
MPC BRAKE ONLY MODULE (POWER-OFF) WITH OUTPUT SHAFT C-FACE

Double C-Face Power-Off Brakes – Type MPC

The MPC is a power-off brake module with an output shaft. The unit mounts on a C-Face motor, and the output can be coupled to a C-Face gear reducer. Ideal for creating brake/motor packages on smaller servo and stepper frame motors.







Double C-Face Power-Off Brakes for Nema 17, 23, 34 and 42 Frames

Mechanical

MODEL NO.	STATIC TORQUE LB. - IN.	INERTIA LB. - IN.^{2}	WGT. OZ.
MPC17	1	.0024	7
MPC23	3, 5, 10	.0087	17
MPC34	15, 25	.1120	46
MPC42	50	.2060	96

[1] Also available in higher torque sizes – consult Inertia Dynamics for more information.

Electrical

MODEL NO.	90 VDC		24 VDC		12 VDC		120 VAC	
	AMPS	OHMS	AMPS	OHMS	AMPS	OHMS	AMPS	OHMS
MPC17	.051	1880	.220	117	.430	30	.044	N.A.
MPC23	.041	2177	.182	132	.353	34	.048	N.A.
MPC34	.098	922	.369	65.1	.719	16.7	.077	N.A.
MPC42	.194	465	.717	35.5	1.54	7.8	.140	N.A.

Dimensions – Imperial

MODEL NO.	PART #	NEMA FRAME	INPUT SHAFT DIA.	OUTPUT SHAFT DIA.	TORQUE	A	AH[1]	AJ	AK	B	BB	BD	BH	H	N	I	L	O***	P
MPC17	8917-2221	17	3/16	3/16	1	1.65	.71	1.725	.866	.82	.080	.100	1.50	(4) #4-40-2B	(4) .125	11.50	1.57	#4-40	60
MPC23	8923-x331	23	1/4	1/4	3	2.25	.70	2.625	1.500	1.18	.100	.145	2.13	(4) .205	(4) #10-24-2B	16.75	1.876	#6-32	30
MPC23	8923- x551	23	3/8	3/8	3	2.25	.70	2.625	1.500	1.18	.100	.145	2.13	(4) .205	(4) #10-24-2B	16.75	2.506	#6-32	30
MPC23	8923-x531	23	3/8	1/4	3	2.25	.70	2.625	1.500	1.18	.100	.145	2.13	(4) .205	(4) #10-24-2B	16.75	2.506	#6-32	30
MPC23	8923 -x631	23	1/2	1/4	3	2.25	.70	2.625	1.500	1.18	.100	.145	2.13	(4) .205	(4) #10-24-2B	16.75	2.506	#6-32	30
MPC23	8923-x651	23	1/2	3/8	3	2.25	.70	2.625	1.500	1.18	.100	.145	2.13	(4) .205	(4) #10-24-2B	16.75	2.506	#6-32	30
MPC23	8923- x335	23	1/4	1/4	5	2.25	.70	2.625	1.500	1.18	.100	.145	2.13	(4) .205	(4) #10-24-2B	16.75	1.876	#6-32	30
MPC23	8923-2556	23	3/8	3/8	10	2.25	1.09	2.625	1.500	1.18	.100	.145	2.13	(4) .205	(4) #10-24-2B	16.75	2.831	#8-32	30
MPC34	8934-X551	34	3/8	3/8	15	3.25	1.16	3.875	2.875	1.58	.100	.145	2.878	(4) .222	(4) #10-24-2B	18.00	2.578	1/4-28	15
MPC34	8934- x661	34	1/2	1/2	15	3.25	1.16	3.875	2.875	1.58	.100	.145	2.878	(4) .222	(4) #10-24-2B	18.00	2.578	1/4-28	15
MPC34	8934-2555	34	3/8	3/8	25	3.25	1.16	3.875	2.875	1.58	.100	.145	2.878	(4) .222	(4) #10-24-2B	18.00	2.578	1/4-28	15
MPC34	8934-2665	34	1/2	1/2	25	3.25	1.16	3.875	2.875	1.58	.100	.145	2.878	(4) .222	(4) #10-24-2B	18.00	2.578	1/4-28	15
MPC42	8942- x661	42	1/2	1/2	50	4.25	1.23	4.950	2.189	2.27	.100	.125	3.50	(4) .320	(4) #5/16-18-2B	18.00	4.056	1/4-28	90
MPC42	8942-x771	42	5/8	5/8	50	4.25	1.23	4.950	2.189	2.27	.100	.125	3.50	(4) .320	(4) #5/16-18-2B	18.00	4.056	1/4-28	90
MPC42	8942-x881	42	3/4	3/4	50	4.25	1.23	4.950	2.189	2.27	.100	.125	3.50	(4) .320	(4) #5/16-18-2B	18.00	4.056	1/4-28	90

* 23 and 34 frame also available in 3/8 bore.
** 42 frame also available with 3/8 and 1/2" hub and shaft.
*** Socket head cap screw for clamp collar.
[1] Alternate shaft lengths available – consult factory.

Dimensions – Metric

MODEL NO.	PART #	NEMA FRAME	INPUT SHAFT DIA.	OUTPUT SHAFT DIA.	TORQUE N-M	A	AH[1]	AJ	AK	B	BB	BD	BH	H	N	I	L	O***	P
MPC17	M8917-x111	17	5mm	5mm	.11	41.91	18.034	43.815	21.996	20.828	2.032	2.54	38.1	(4) #4-40-2B	(4) 3.175	292.1	39.88	#4-40	60
MPC34	M8934-2551	34	14mm	14mm	1.7	82.55	29.464	98.425	79.985	40.132	2.54	3.683	73.101	(4) 7.00	(4) M5x.8	457.2	65.48	M5	15
MPC34	M8934-2552	34	14mm	14mm	1.7	82.55	29.464	98.425	73.025	40.132	2.54	3.683	73.101	(4) 5.588	(4) #10-24-2B	457.2	65.48	M5	15

See page 50 for Ordering Information

Spring Set Holding Brakes

300 Series

Description

Spring set or electromagnetic release brakes provide braking action via springs when in the de-energized state. As the brake is energized, the load is released and allowed to rotate. 300 Series spring set brakes are of high quality and are ruggedly engineered for holding applications. Typical applications include medical equipment, robotics, packaging machinery, lifts, and motor braking. Use the torque ratings below for sizing/selection.

Section Index

Products Complete information is shown for each product; including specifications, drawings, dimensions, parts list, recommended controls and information for ordering

MODEL	NOMINAL SIZE	MOUNTING	STATIC TORQUE (IN. - LBS.)	PAGE
303	3 inch	Spline Drive	35	54
303HQ	3 inch	High TorQ, Spline Drive	60	55
304	4 inch	Spline Drive	225	56
305	5 inch	Spline Drive	425	57
305HQ	5 inch	High TorQ, Spline Drive	800	58
308	8 inch	Spline Drive	1200	59

Model 303

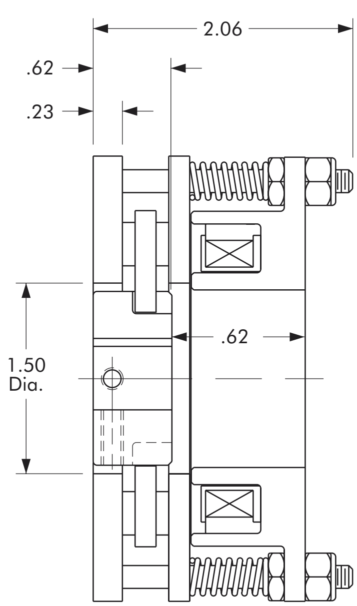
SPRING SET HOLDING BRAKE

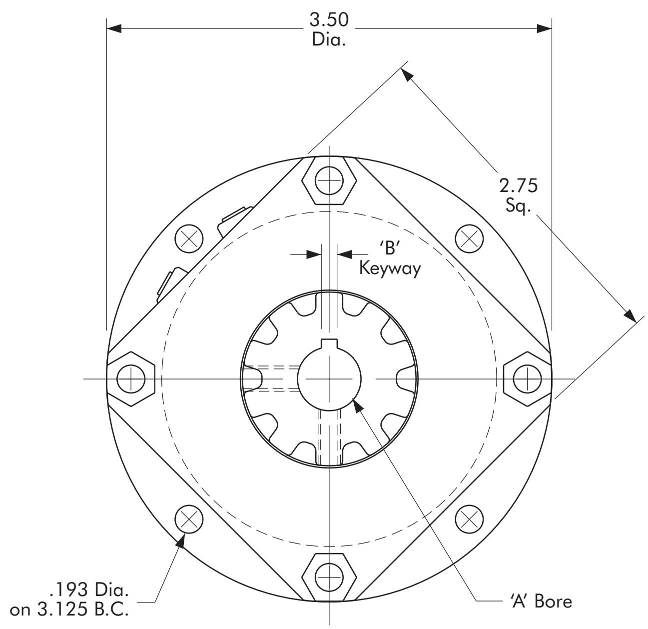
Model 303

- Factory Assembled and Tested
- Spline Drive

Customer Shall Maintain:

The concentricity between mounting flange and shaft within .006; the perpendicularity between mounting surface and shaft within .006.





Technical Data

MODEL NO.	WEIGHT LBS.	STATIC TORQUE IN. LBS.	COIL VOLTAGE VDC	*RATED CURRENT AMPS
303	1.8	35	90	.157

* Rated Current for 90v.

"A" Bore	"B" Keyway
3/8"	None
1/2"	.125 x .062
5/8"	.188 x .093
3/4"	.188 x .093

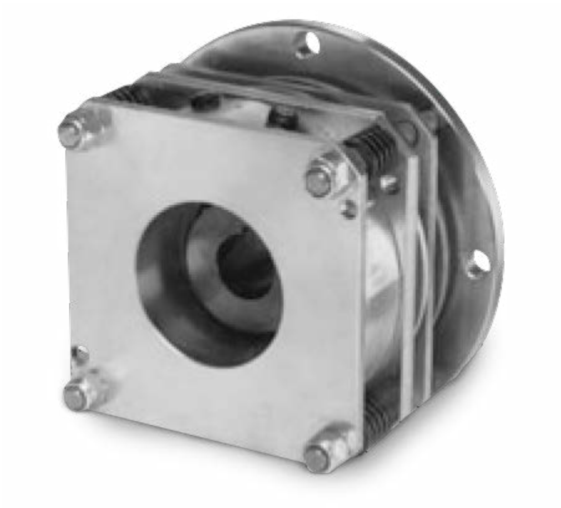
Order Parts for Assembly No. FC303069

ITEM	QTY.	DESCRIPTION	MODEL NO. 303
A	1	Rotor Hub Assembly	
		3/8" Plain Bore	303453-PB
		1/2" Bore	303451-3
		5/8" Bore	303451-5
		3/4" Bore	303453-8
M	1	Spring Set Holding Brake	
		24 Volts	303070-3
		90 Volts	303070-4

To order, specify: 1, Spring Set Holding Brake of required voltage
1, Rotor Hub Assembly of required bore size.

Spring Set Holding Brakes

Model 303HQ



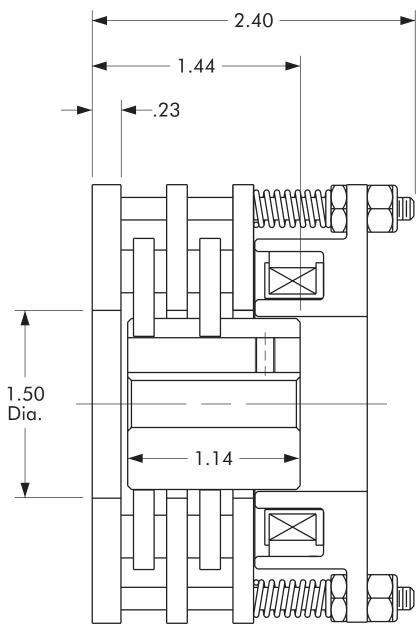
SPRING SET HOLDING BRAKE

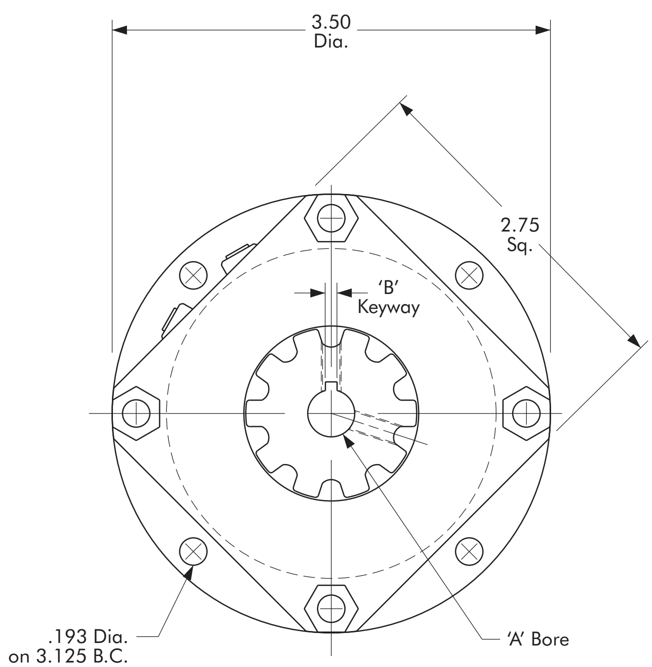
Model 303HQ

- Factory Assembled and Tested
- Spline Drive
- Double Disc

Customer Shall Maintain:

The concentricity between mounting flange and shaft within .006; the perpendicularity between mounting surface and shaft within .006.





Technical Data

MODEL NO.	WEIGHT LBS.	STATIC TORQUE IN. LBS.	COIL VOLTAGE VDC	*RATED CURRENT AMPS
303HQ	2.12	60	90	.157

* Rated Current for 90v.

"A" Bore	"B" Keyway
1/2"	None
5/8"	.188 x .093
3/4"	.188 x .093

Order Parts for Assembly No. FC303071

ITEM	QTY.	DESCRIPTION	MODEL NO. 303HQ
A	1	Rotor Hub Assembly	
		1/2" Plain Bore	303466-DPB
		5/8" Bore	303465-3
		3/4" Bore	303465-4
M	1	Spring Set Holding Brake	
		Double Disc	
		24 Volts	303072-3
		90 Volts	303072-4

To order, specify: 1, Spring Set Holding Brake of required voltage
1, Rotor Hub Assembly of required bore size.

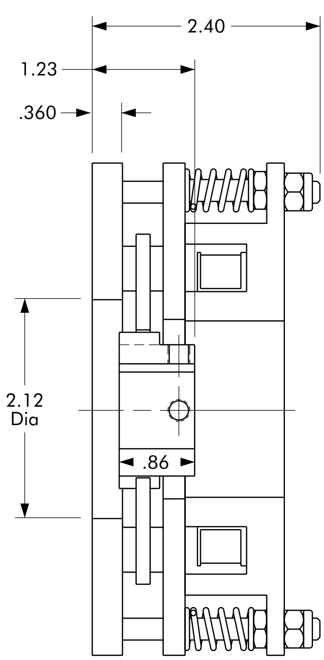
SPRING SET HOLDING BRAKE

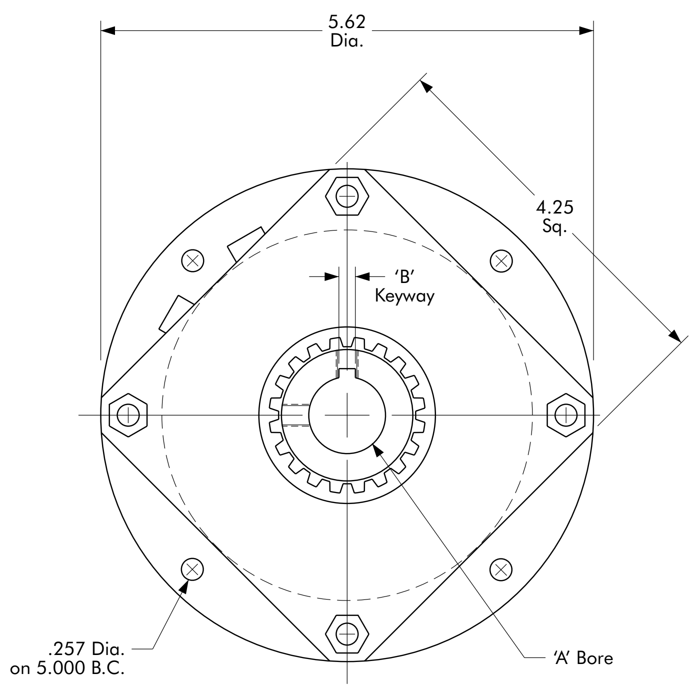
Model 304

- Factory Assembled and Tested
- Spline Drive

Customer Shall Maintain:

The concentricity between mounting flange and shaft within .006; the perpendicularity between mounting surface and shaft within .006.





Technical Data

MODEL NO.	WEIGHT LBS.	STATIC TORQUE IN. LBS.	COIL VOLTAGE VDC	*RATED CURRENT AMPS
304	6.12	225	90	.17

* Rated Current for 90v.

"A" Bore	"B" Keyway
1/2"	None
3/4"	.187 x .094
7/8"	.187 x .094
1"	.250 x .125

Order Parts for Assembly No. FC304069

ITEM	QTY.	DESCRIPTION	MODEL NO. 304
A	1	Rotor Hub Assembly	
		1/2" Plain Bore	304466-PB
		3/4" Bore	304465-9
		7/8" Bore	304465-10
		1" Bore	304465-11
M	1	Spring Set Holding Brake	
		12 Volts	304070-2
		24 Volts	304070-3
		90 Volts	304070-4

To order, specify: 1, Spring Set Holding Brake of required voltage
1, Rotor Hub Assembly of required bore size.

Spring Set Holding Brakes

Model 305

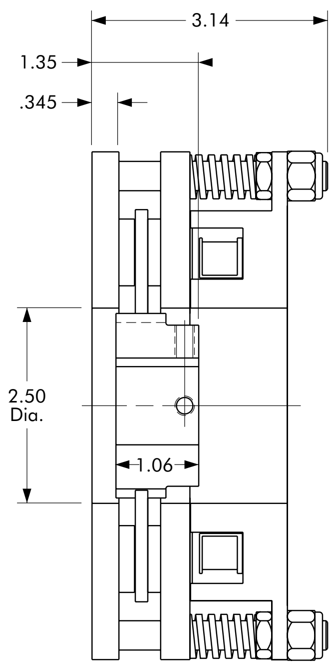
SPRING SET HOLDING BRAKE

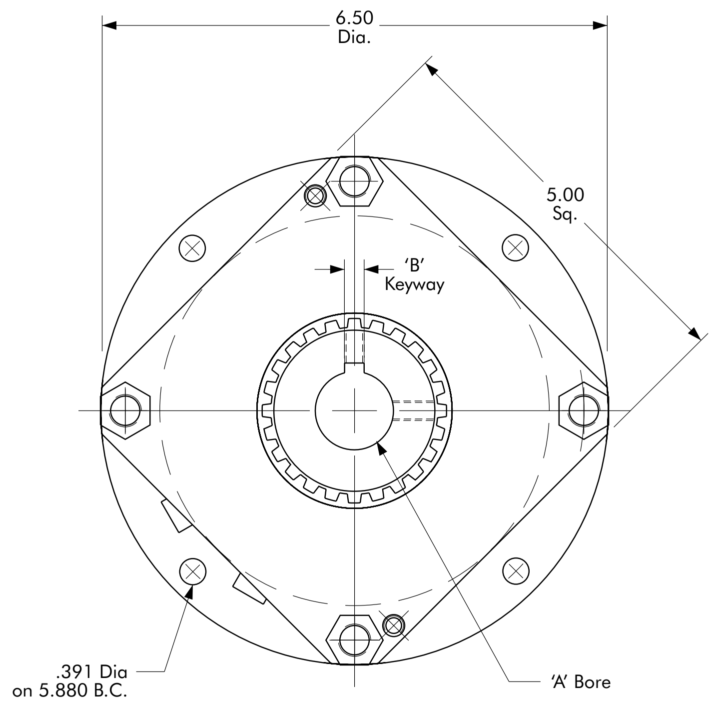
Model 305

- Factory Assembled and Tested
- Spline Drive

Customer Shall Maintain:

The concentricity between mounting flange and shaft within .006; the perpendicularity between mounting surface and shaft within .006.





Technical Data

MODEL NO.	WEIGHT LBS.	STATIC TORQUE IN. LBS.	COIL VOLTAGE VDC	*RATED CURRENT AMPS
305	9.75	425	90	.427

* Rated Current for 90v.

"A" Bore	"B" Keyway
3/4"	.187 x .094
7/8"	.187 x .094
1"	.250 x .125
1-1/8"	.250 x .125
1-1/4"	.250 x .125

Order Parts for Assembly No. FC305069

ITEM	QTY.	DESCRIPTION	MODEL NO. 305
A	1	Rotor Hub Assembly	
		3/4" Plain Bore	305454-PB
		3/4" Bore	305453-11
		7/8" Bore	305453-12
		1" Bore	305453-13
		1-1/8" Bore	305453-14
		1-1/4" Bore	305453-15
M	1	Spring Set Holding Brake	
		24 Volts	305070-3
		90 Volts	305070-4
		36 Volts	305070-5

To order, specify: 1, Spring Set Holding Brake of required voltage
1, Rotor Hub Assembly of required bore size.

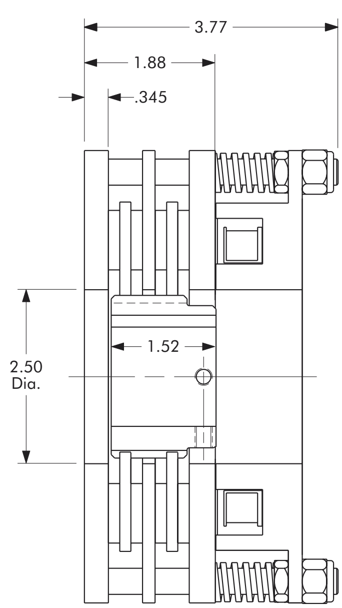
SPRING SET HOLDING BRAKE

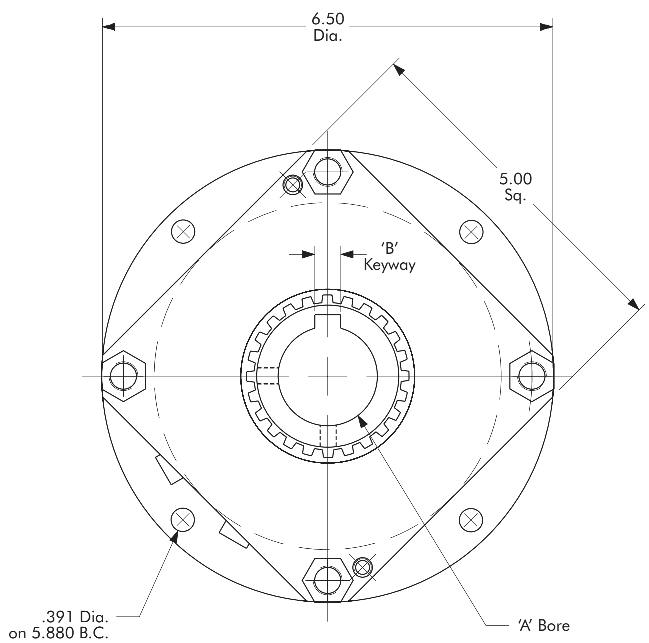
Model 305HQ

- Factory Assembled and Tested
- Spline Drive
- Double Disc

Customer Shall Maintain:

The concentricity between mounting flange and shaft within .006; the perpendicularity between mounting surface and shaft within .006.





Technical Data

MODEL NO.	WEIGHT LBS.	STATIC TORQUE IN. LBS.	COIL VOLTAGE VDC	*RATED CURRENT AMPS
305HQ	11.5	800	90	.427

* Rated Current for 90v.

"A" Bore	"B" Keyway
3/4"	None
1"	.250 x .125
1-1/4"	.250 x .125
1-1/2"	.250 x .187

Order Parts for Assembly No. FC305071

ITEM	QTY.	DESCRIPTION	MODEL NO. 305HQ
A	1	Rotor Hub Assembly	
		3/4" Plain Bore	305466-DPB
		1" Bore	305453-20
		1-1/4" Bore	305453-22
		1-1/2" Bore	305453-17
M	1	Spring Set Holding Brake	
		Double Disc	
		24 Volts	305072-3
		90 Volts	305072-4

To order, specify: 1, Spring Set Holding Brake of required voltage
1, Rotor Hub Assembly of required bore size.

Spring Set Holding Brakes

Model 308

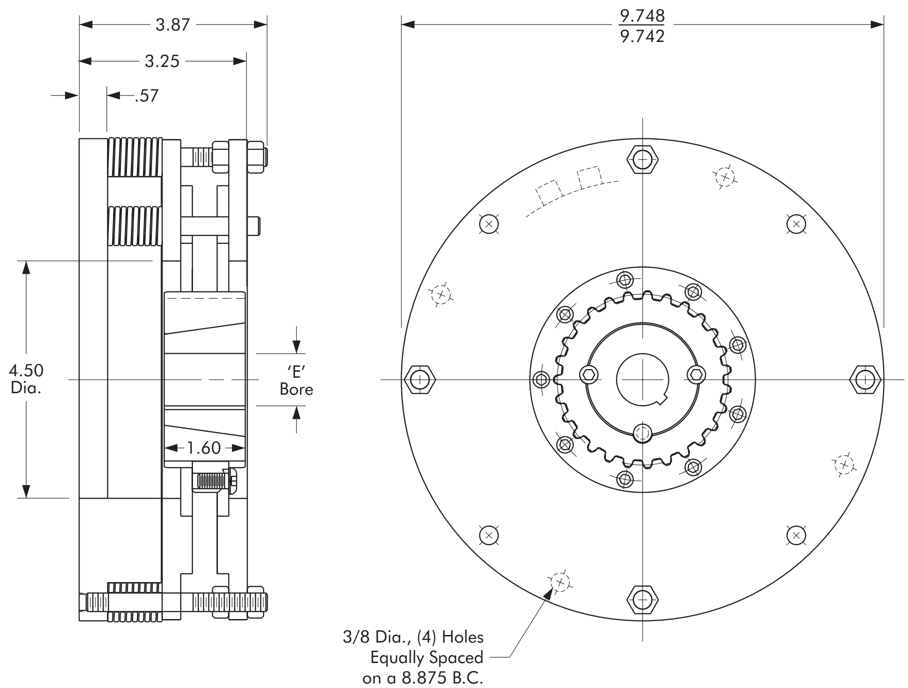
SPRING SET HOLDING BRAKE

Model 308

- Factory Assembled and Tested
- Spline Drive

Customer Shall Maintain:

The concentricity between mounting flange and shaft within .010; the perpendicularity between mounting surface and shaft within .010.



Technical Data

MODEL NO.	WEIGHT LBS.	STATIC TORQUE IN. LBS.	COIL VOLTAGE VDC	*RATED CURRENT AMPS
308	21	1200	90	.59

* Rated Current for 90v.

Order Parts for Assembly No. FC308069

ITEM	QTY.	DESCRIPTION	MODEL NO. 308
1	1	Armature Hub	308680
M	1	Spring Set Holding Brake	
		24 Volts	308070-3
		90 Volts	308070-4
E	1	Taper Bushing (1615)	326015-XX

To order, specify: 1, Armature Hub
1, Spring Set Holding Brake of required voltage
1, Bushing plus bore size.

Bushing 1615

BORE "E"		KEYWAY	PART NO.
1/2"	.500	.125 x .062	326015 - 1
9/16"	.562	.125 x .062	326015 - 2
5/8"	.625	.187 x .093	326015 - 3
11/16"	.687	.187 x .093	326015 - 4
3/4"	.750	.187 x .093	326015 - 5
13/16"	.812	.187 x .093	326015 - 6
7/8"	.875	.187 x .093	326015 - 7
15/16"	.937	.250 x .125	326015 - 8
1"	1.000	.250 x .125	326015 - 9
1-1/16"	1.062	.250 x .125	326015 - 10
1-1/8"	1.125	.250 x .125	326015 - 11
1-3/16"	1.187	.250 x .125	326015 - 12
1-1/4"	1.250	.250 x .125	326015 - 13
1-5/16"	1.312	.312 x .156	326015 - 14
1-3/8"	1.375	.312 x .156	326015 - 15
1-7/16"	1.437	.375 x .187	326015 - 16
1-1/2"	1.500	.375 x .187	326015 - 17
1-9/16"	1.562	.375 x .187	326015 - 18
1-5/8"	1.625	.375 x .187	326015 - 19
1-3/8"	1.375	.375 x .125	326015 - 20
1-5/8"	1.625	.375 x .125	326015 - 21

Torque

$$T_d = \frac{63{,}025 \times P}{N} \times S.F.$$

Where:

- T_d = Dynamic Torque (lb.–in.)
- P = Horsepower, HP
- N = RPM = Shaft Speed
- S.F. = Service Factor
- 63,025 = Constant

Reflected Inertia

$$\text{Equivalent } WR^2_A = WR^2_B \left(\frac{N_B}{N_A}\right)^2$$

Where:

- WR^2_A = Inertia of rotating load reflected to the clutch or brake shaft (lb.–in.^{2})
- WR^2_B = Inertia of rotating load (lb.–in.^{2})
- N_B = Shaft speed at load (RPM)
- N_A = Shaft speed at clutch or brake (RPM)

Linear Inertia

$$\text{Equivalent } WR^2_A = W\left(\frac{V}{2\pi N_A}\right)$$

Where:

- WR^2_A = Inertia of linear moving load reflected to the clutch or brake shaft (lb.–in.^{2})
- V = Linear velocity of load (in./min.)
- W = Weight of linear moving load (lb.)
- N_A = Shaft speed at clutch or brake (RPM)
- 2π = Constant

Thermal Capacity

$$TC = \frac{WR^2 \times N_A \times n}{4.63 \times 10^8}$$

Where:

- TC = Thermal capacity required for rotational or linear moving loads (hp–sec./min.)
- WR^2 = Total system inertia reflected to the clutch or brake shaft (lb.–in.^{2})
- N_A = Shaft speed at clutch or brake (RPM)
- n = Number of stops or starts per minute, not less than one
- 4.63×10^8 = Constant

Linear Velocity

$IPM = PD \times N \times \pi$

Where:

- IPM = Velocity of object (inches per minute)
- PD = Pitch diameter of object (inches)
- N = Speed of shaft at the object (RPM)
- π = Constant

Inertia – (WR^2)

To calculate the inertia for a cylinder, the formula is:

$$WR^2 = \frac{\pi}{32} \times D^4 \times L \times \rho$$

Where:

- WR^2 = Inertia – lb.–in.^{2} (kg–m^2)
- D = Diameter – inches (meters)
- L = Length – inches (meters)
- ρ = Density – lb./in.^{3} (kg/m^3)

Approximate values for ρ are:

Steel –	.284 (7860)
Aluminum –	.098 (2700)
Plastic –	.047 (1300)
Rubber –	.047 (1300)

For steel shafting, refer to the inertia chart, Fig. A.

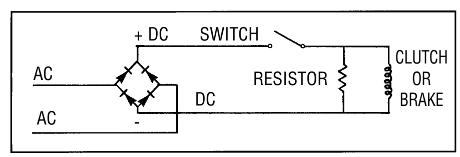
Arc Suppression

When the clutch or brake is deenergized, a reverse voltage is generated in the coil. The reverse voltage can be very high and may cause damage to the coil and switch in the circuit. To protect the coil and switch, the voltage should be suppressed using an arc suppression circuit. Arc suppression does not affect the clutch or brake engagement time.

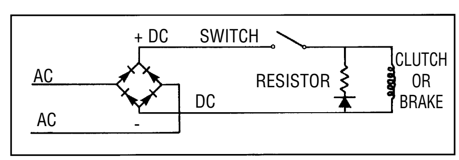
Resistor/Diode/Zener Diode –

Normal Disengagement Time

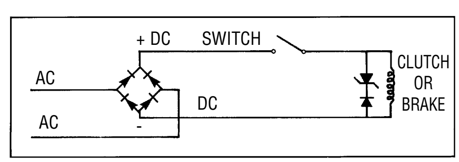
For most applications, a resistor connected in parallel with the clutch/brake coil is adequate. The resistor should be rated at six times the coil resistance and approximately 25% of the coil wattage.



To eliminate the added current draw, a diode may be added as shown below.



For faster release, use a zener diode with a rating two times the coil voltage.



Technical Data & Formulas Metric

Torque

$$T_d = \frac{9,550 \times kW}{N} \times S.F.$$

Where:

T_d = Dynamic Torque (N-m)
kW = Power, kW
N = RPM = Shaft Speed
S.F. = Service Factor
9,550 = Constant

Reflected Inertia

$$\text{Equivalent } WR_A^2 = WR_B^2 \left(\frac{N_B}{N_A}\right)^2$$

Where:

WR_A^2 = Inertia of rotating load reflected to the clutch or brake shaft (kg-m^2)
WR_B^2 = Inertia of rotating load (kg-m^2)
N_B = Shaft speed at load (RPM)
N_A = Shaft speed at clutch or brake (RPM)

Linear Inertia

$$\text{Equivalent } WR_A^2 = W\left(\frac{V}{2\pi N_A}\right)$$

Where:

WR_A^2 = Inertia of linear moving load reflected to the clutch or brake shaft (lb.–in.^{2})
V = Linear velocity of load (in./min.)
W = Weight of linear moving load (lb.)
N_A = Shaft speed at clutch or brake (RPM)
2π = Constant

Thermal Capacity

$$TC = \frac{WR^2 \times N_A \times n}{4.63 \times 10^8}$$

Where:

TC = Thermal capacity required for rotational or linear moving loads (hp–sec./min.)
WR^2 = Total system inertia reflected to the clutch or brake shaft (lb.–in.^{2})
N_A = Shaft speed at clutch or brake (RPM)
n = Number of stops or starts per minute, not less than one
4.63×10^8 = Constant

Linear Velocity

$IPM = PD \times N \times \pi$

Where:

IPM = Velocity of object (inches per minute)
PD = Pitch diameter of object (inches)
N = Speed of shaft at the object (RPM)
π = Constant

Inertia – (WR^2)

To calculate the inertia for a cylinder, the formula is:

$$WR^2 = \frac{\pi}{32} \times D^4 \times L \times \rho$$

Where:

WR^2 = Inertia – lb.–in.^{2} (kg–m^2)
D = Diameter – inches (meters)
L = Length – inches (meters)
ρ = Density – lb./in.^{3} (kg/m^3)

Approximate values for ρ are:

Steel –	.284 (7860)
Aluminum –	.098 (2700)
Plastic –	.047 (1300)
Rubber –	.047 (1300)

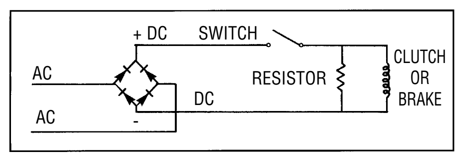
For steel shafting, refer to the inertia chart, Fig. A.

Arc Suppression

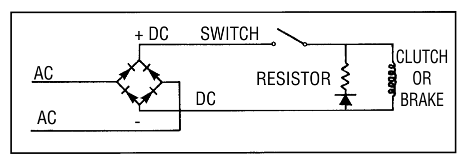
When the clutch or brake is deenergized, a reverse voltage is generated in the coil. The reverse voltage can be very high and may cause damage to the coil and switch in the circuit. To protect the coil and switch, the voltage should be suppressed using an arc suppression circuit. Arc suppression does not affect the clutch or brake engagement time.

Resistor/Diode/Zener Diode – Normal Disengagement Time

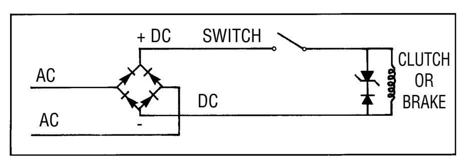
For most applications, a resistor connected in parallel with the clutch/brake coil is adequate. The resistor should be rated at six times the coil resistance and approximately 25% of the coil wattage.



To eliminate the added current draw, a diode may be added as shown below.

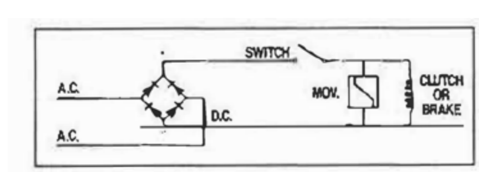


For faster release, use a zener diode with a rating two times the coil voltage.



Metal Oxide Varistor (MOV) – Fast Disengagement Time

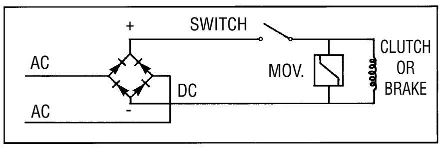
For applications requiring fast clutch or brake disengagement a capacitor or MOV connected in parallel with the clutch/brake coil should be used.



Metal Oxide Varistor (MOV) –

Fast Disengagement Time

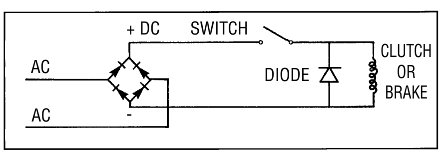
For applications requiring fast clutch or brake disengagement, an MOV connected in parallel with the clutch/ brake coil should be used.



Diode

Slow Disengagement Time

For applications where a delayed disengagement is desired, a diode should be used in parallel with the clutch/brake coil or switch the AC side of the circuit.



Inertia Conversion Chart

To determine the inertia of a rotating member of a material other than steel, multiply the inertia of the steel diameter from Fig. A at right by:

MATERIAL	MULTIPLIER
Bronze	1.05
Steel	1.00
Iron	.92
Powdered Bronze	.79
Powdered Metal Iron	.88
Aluminum	.35
Nylon	.17

Fig. A
Inertia Chart
I = WR^2 of Steel
(per inch of length)

DIA. (IN.)	WR2 (LB. - $IN.^2$)
1/4	.00011
5/16	.00027
3/8	.00055
7/16	.00102
1/2	.00173
9/16	.00279
5/8	.00425
11/16	.00623
3/4	.00864
13/16	.01215
7/8	.01634
15/16	.02154
1	.0288
1 1/4	.0720
1 1/2	.144
1 3/4	.288
2	.432
2 1/4	.720
2 1/2	1.152
2 3/4	1.584
3	2.304
3 1/2	4.176
3 3/4	5.472
4	7.056
4 1/4	9.072
4 1/2	11.376
5	17.280
5 1/2	25.488
6	36.000
6 1/4	42.624
6 1/2	49.680
6 3/4	57.888
7	66.816

Note:

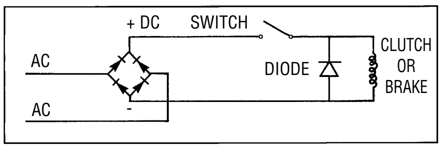
1. To determine WR^2 of a given shaft, multiply the WR^2 given above by the length of the shaft or the thickness of the disc in inches.
2. For hollow shafts, subtract WR^2 of I.D. from WR^2 of O.D. and multiply by length.

Technical Data & Formulas Metric

Diode

Slow Disengagement Time

For applications where a delayed disengagement is desired, a diode should be used in parallel with the clutch/brake coil or switch the AC side of the circuit.



Full Load Running Torque of Motors N-m

kW	3450 RPM	1750 RPM	1150 RPM	870 RPM
.015	0.041	.081	0.124	0.164
.037	0.103	.203	0.309	0.409
.062	0.172	.339	0.516	0.682
.093	0.258	.508	0.774	1.023
.12	0.344	.678	1.034	1.366
.19	0.516	1.017	1.548	2.045
.25	0.687	1.356	2.061	2.724
.37	1.032	2.034	3.095	4.091
.56	1.548	3.051	4.643	6.136
.75	2.063	4067	6.189	8.181
1.1	3.095	6.101	9.284	12.27
1.5	4.126	8.135	12.38	16.36
2.2	6.189	12.20	18.56	24.54
3.7	10.32	20.34	30.95	40.90
5.6	15.48	30.51	46.41	61.36

and Standards

All Inertia Dynamics standard clutches, brakes, and spring applied brakes are recognized by Underwriters Laboratories and the Canadian Standards Association. Products built to meet their construction requirements are labeled with the UL and CSA recognized symbol. All products meet UL Class B requirements.

Fig. A
Inertia Chart
I = WR² of Steel (per cm of length)

DIA. cm	kg-cm²	DIA. cm	DIA. kg-cm²	cm	kg-cm²
1.91	.0253	26.67	990.3	81.28	85038.7
2.54	.0843	27.31	1087.2	83.83	961163.7
3.18	.2107	27.94	1192.6	86.36	108384.4
3.81	.4214	28.58	1302. 1	88.90	121700.6
4.45	.9428	29.21	1424.3	91.44	136196.8
5.08	1.264	29.85	17351.	93.98	151999.4
5.72	2.107	30.48	1685.6	96.52	1691083
6.35	3.371	31.12	1832.2	99.06	18764.99
6.99	4.635	31.75	1989.0	101.6	207666.5
7.62	6.742	32.39	2153.4	104.1	229200.1
8.89	12.221	33.02	2351.4	106.7	252335.0
9.53	16.013	33.66	2511.6	109.2	277324.1
10.16	20.649	34.29	2705.4	111.8	303998.8
10.80	26.548	34.93	2911.9	114.3	332611.9
11.43	33.291	35.56	3126.8	116.8	363163.5
12.70	50.568	36.20	3358.6	119.4	395822.1
13.97	74.588	36.83	3598.8	121.9	430587.6
15.24	105.350	37.47	3855.8	124.5	467586.7
15.88	124.735	38.10	4108.7	127.0	506987 .7
16.51	145.383	40.64	5313.9	129.5	548748 .5
17.15	169.403	43.18	6771.9	132.1	593079 .9
17.78	195.530	45.72	8516.5	134.6	640024.0
18.42	225.450	48.26	10568.7	137.1	689707.2
19.05	257.476	50.80	12974 .9	139.7	742255.9
19.69	294.559	53.34	15773.0	142.2	797754.4
20.32	333.328	55.88	19001.0	144.8	856244.9
20.96	377.154	58.42	22700.9	147.3	917937.4
21.59	421.401	60.96	26910.7	149.9	982918.1
22.23	476.183	63.50	316851.	152.4	1051269.3
22.86	535.179	66.04	37066.4	167.6	1539167.5
23.50	594.176	68.58	43109.3	182.9	2179486.5
24.13	682.436	71.12	49856.0	198.1	3002482.8
24.77	737.452	73.66	57327.4	213.4	4038708.2
25.40	813.304	76.20	65704.9	228.6	532187.54
26.04	897.584	78.74	74912.5	243.8	6889486.6
				259.1	8780313.3

Note:

1. To determine WR² of a given shaft, multiply the WR² given above by the length of the shaft or the thickness of the disc in centimeters.
2. For hollow shafts, subtract WR² of I.D. from WR² of O.D. and multiply by length.

General Information

Spring Applied — Power-Off Operation

Power-Off Operation Inertia Dynamics AC-style, spring applied motor brakes are designed to decelerate or park inertial loads when the voltage is turned off, either intentionally or accidentally, as in the case of power failure. The friction disc with the hub is coupled to the motor shaft to be braked but is capable of moving axially. When power is off, a spring force clamps the friction disc between a pressure plate and a stationary plate, hence retarding motion. When an AC voltage is applied, the solenoid creates a magnetic force which pulls a lever arm through a linkage mechanism and releases the friction disc. This allows the hub and motor shaft to turn freely.

Application

The motor brakes are commonly used as parking brakes to hold a load in place or as stopping brakes to dynamically decelerate a load. Applications include:

- Material Handling
- Food Processing
- Machine Tools

Features

- External Manual Release Lever
- Totally Enclosed Construction
- Torque adjustable from full rated torque down to 50%
- Single phase AC coils provide fast engagement and release times and easy wiring

Mounting

Two styles are available: the single C-Face brake and the double C-Face brake. The single C-Face mounts on the fan end or non-driven end of a motor. The C-Face brake is interchangeable with existing brakes and can be used on motors that are modified to accept a brake. The double C-Face brake can be used as a coupler between standard C-Face motors and C-Face gear reducers. All motor brakes are interchangeable with competitive motor brakes.

Add-On Brakes

A complete kit is available to convert a standard Reliance Electric TEFC motor to a brake motor. The frame size must be 56 or 140. The kit is not available for special enclosures such as washdown or explosion proof.

Motor Brake Coil Current

VOLTS (VAC)	HZ	BRAKE CURRENT (AMPS)	
		HOLDING	INRUSH
115/230	60	.54/.27	4.8/2.4
200/400		.31/.15	2.8/1.4
208/416		.32/.16	2.6/1.3
230/460		.27/.13	2.6/1.3
287/575		.22/.11	2.1/1.05
104/208	50	.5/.25	5.3/2.65
115/230		.5/.25	5.4/2.7
190/380		.26/.13	3.0/1.5
220/440		.3/.15	3.3/1.65
230/460		.26/.13	2.7/1.36

Selection Procedure

1. To make an accurate brake selection, first determine the motor frame size, shaft size, hp, and RPM where the brake will be mounted.
2. Use chart on the right for static brake torque selection. Note that chart selections are based on a 1.4 service factor and increased to the next highest standard brake torque rating. To select a brake using a different service factor, use the formula below to determine the required brake static torque. Once your torque requirement has been determined, select a brake with at least that capacity.
3. Consult Part Number chart on the following pages for appropriate part number. Brake voltage should be matched with motor voltage rating.

Static Brake Torque Ratings* (Lb.- Ft.) Selection

HP	MOTOR SPEED (RPM)						
	750	900	1200	1500	1800	3000	3600
1/4	3	3	3	3	3	3	3
1/3	6	3	3	3	3	3	3
1/2	6	6	6	3	3	3	3
3/4	10	10	6	6	6	3	3
1	10	10	10	6	6	3	3
1 1/2	15	15	10	10	10	6	6
2	–	–	15	10	10	6	6
3	–	–	–	15	15	10	10
5	–	–	–	–	–	15	15

* Selections based on 1.4 service factor and increased to next highest standard brake torque rating.

$$T = \frac{HP \times 5252}{RPM} \times SF$$

T = Brake Static Torque (FT.–LBS.)
HP = Motor Horsepower
SF = Service Factor Desired
RPM = Motor Speed

Motor Brakes

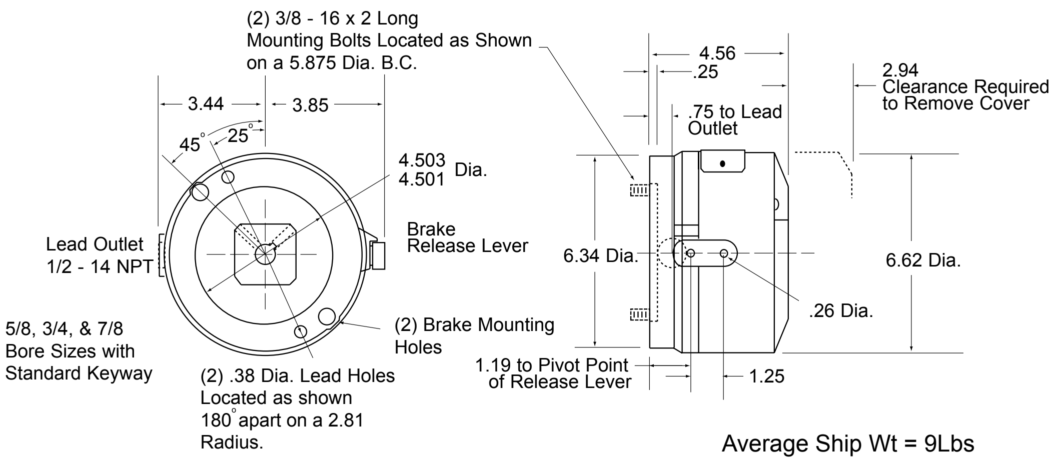
AC Motor Brakes - Nema 2 Housing

AC MOTOR BRAKES

56,000 & 56,100 Nema 2 Housing **F Series**
56,300 Nema 1 Housing

Factory Assembled and Tested	3 Ft-Lb
Manual Release	6 Ft-Lb
AC Power Off	10 Ft-Lb
Rear Mounted	15 Ft-Lb
Aluminum Head	
Steel Cover	

AC Rear Mounted Brake



Average Ship Wt = 9Lbs

Brake Part Numbers

COIL VOLTAGE	5/8 BORE HUB			
	3 FT. LB. BRAKES	6 FT. LB. BRAKES	10 FT. LB. BRAKES	15 FT. LB. BRAKES
115/230, 60HZ	F51A0321	F52A0621	F52A0721	F53A0821
230/460, 60 HZ	F51A0324	F52A0624	F52A0724	F53A0824
287/575, 60 HZ	F51A0325	F52A0625	F52A0725	F53A0825
115/230, 50HZ	F51A0328	F52A0628	F52A0728	F53A0828
230/460, 50 HZ	F51A0329	F52A0629	F52A0729	F53A0829

COIL VOLTAGE	3/4 BORE HUB			
	3 FT. LB. BRAKES	6 FT. LB. BRAKES	10 FT. LB. BRAKES	15 FT. LB. BRAKES
115/230, 60HZ	F51B0321	F52B0621	F52B0721	F53B0821
230/460, 60 HZ	F51B0324	F52B0624	F52B0724	F53B0824
287/575, 60 HZ	F51B0325	F52B0625	F52B0725	F53B0825
115/230, 50HZ	F51B0328	F52B0628	F52B0728	F53B0828
230/460, 50 HZ	F51B0329	F52B0629	F52B0729	F53B0829

COIL VOLTAGE	7/8 BORE HUB			
	3 FT. LB. BRAKES	6 FT. LB. BRAKES	10 FT. LB. BRAKES	15 FT. LB. BRAKES
115/230, 60HZ	F51C0321	F52C0621	F52C0721	F53C0821
230/460, 60 HZ	F51C0324	F52C0624	F52C0724	F53C0824
287/575, 60 HZ	F51C0325	F52C0625	F52C0725	F53C0825
115/230, 50HZ	F51C0328	F52C0628	F52C0728	F53C0828
230/460, 50 HZ	F51C0329	F52C0629	F52C0729	F53C0829

Technical Data

60 HZ BRAKE COILS SINGLE PHASE			50HZ BRAKE COILS SINGLE PHASE		
VOLTAGE	CURRENT HOLDING AMPS	CURRENT INRUSH AMPS	VOLTAGE	CURRENT HOLDING AMPS	CURRENT INRUSH AMPS
115/230	.50/.25	3.66/1.83	115/230	.45/.22	3.27/1.64
230/460	.28/.14	1.94/.97	230/460	.24/.12	1.76/.88
287/575	.22/.11	1.54/.77			

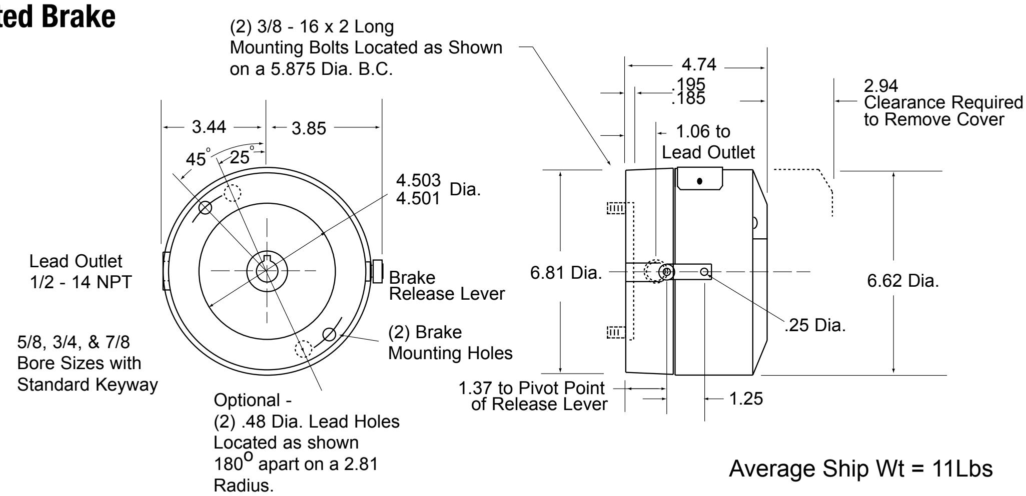
STATIC TORQUE FT. LB.	NUMBER DISCS
3	1
6	2
10	2
15	3

AC Motor Brakes - Nema 2 Housing

AC MOTOR BRAKES

56,400 Nema 2 Housing	F Series
Factory Assembled and Tested	3 Ft-Lb
Manual Release	6 Ft-Lb
AC Power Off	10 Ft-Lb
Rear Mounted	15 Ft-Lb
Cast Iron Head	
Steel Cover	

AC Rear Mounted Brake



Average Ship Wt = 11Lbs

Brake Part Numbers

COIL VOLTAGE	5/8 BORE HUB			
	3 FT. LB. BRAKES	6 FT. LB. BRAKES	10 FT. LB. BRAKES	15 FT. LB. BRAKES
115/230, 60HZ	F51A7321	F52A7621	F52A7721	F53A7821
230/460, 60 HZ	F51A7324	F52A7624	F52A7724	F53A7824
287/575, 60 HZ	F51A7325	F52A7625	F52A7725	F53A7825
115/230, 50HZ	F51A7328	F52A7628	F52A7728	F53A7828
230/460, 50 HZ	F51A7329	F52A7629	F52A7729	F53A7829

COIL VOLTAGE	3/4 BORE HUB			
	3 FT. LB. BRAKES	6 FT. LB. BRAKES	10 FT. LB. BRAKES	15 FT. LB. BRAKES
115/230, 60HZ	F51B7321	F52B7621	F52B7721	F53B7821
230/460, 60 HZ	F51B7324	F52B7624	F52B7724	F53B7824
287/575, 60 HZ	F51B7325	F52B7625	F52B7725	F53B7825
115/230, 50HZ	F51B7328	F52B7628	F52B7728	F53B7828
230/460, 50 HZ	F51B7329	F52B7629	F52B7729	F53B7829

COIL VOLTAGE	7/8 BORE HUB			
	3 FT. LB. BRAKES	6 FT. LB. BRAKES	10 FT. LB. BRAKES	15 FT. LB. BRAKES
115/230, 60HZ	F51C7321	F52C7621	F52C7721	F53C7821
230/460, 60 HZ	F51C7324	F52C7624	F52C7724	F53C7824
287/575, 60 HZ	F51C7325	F52C7625	F52C7725	F53C7825
115/230, 50HZ	F51C7328	F52C7628	F52C7728	F53C7828
230/460, 50 HZ	F51C7329	F52C7629	F52C7729	F53C7829

Technical Data

60 HZ BRAKE COILS SINGLE PHASE			50HZ BRAKE COILS SINGLE PHASE		
VOLTAGE	CURRENT HOLDING AMPS	CURRENT INRUSH AMPS	VOLTAGE	CURRENT HOLDING AMPS	CURRENT INRUSH AMPS
115/230	.50/.25	3.66/1.83	115/230	.45/.22	3.27/1.64
230/460	.28/.14	1.94/.97	230/460	.24/.12	1.76/.88
287/575	.22/.11	1.54/.77			

STATIC TORQUE FT. LB.	NUMBER DISCS
3	1
6	2
10	2
15	3

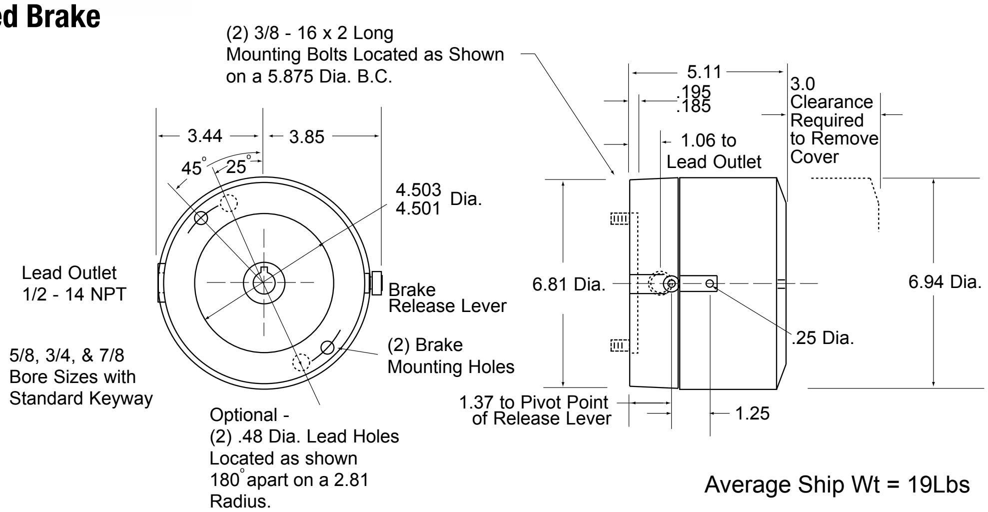
AC Motor Brakes - Nema 4 Housing

AC MOTOR BRAKES

56,200 Nema 4 Housing — **F Series**

Factory Assembled and Tested	3 Ft-Lb
Manual Release	6 Ft-Lb
AC Power Off	10 Ft-Lb
Rear Mounted	15 Ft-Lb
Cast Iron Head	
Cast Iron Cover	
Includes O-Ring Seals to create a dust-tight brake enclosure	

AC Rear Mounted Brake



Average Ship Wt = 19Lbs

Brake Part Numbers

COIL VOLTAGE	5/8 BORE HUB			
	3 FT. LB. BRAKES	6 FT. LB. BRAKES	10 FT. LB. BRAKES	15 FT. LB. BRAKES
115/230, 60HZ	F51A1311	F52A1611	F52A1711	F53A1811
230/460, 60 HZ	F51A1314	F52A1614	F52A1714	F53A1814
287/575, 60 HZ	F51A1315	F52A1615	F52A1715	F53A1815
115/230, 50HZ	F51A1318	F52A1618	F52A1718	F53A1818
230/460, 50 HZ	F51A1319	F52A1619	F52A1719	F53A1819

COIL VOLTAGE	3/4 BORE HUB			
	3 FT. LB. BRAKES	6 FT. LB. BRAKES	10 FT. LB. BRAKES	15 FT. LB. BRAKES
115/230, 60HZ	F51B1311	F52B1611	F52B1711	F53B1811
230/460, 60 HZ	F51B1314	F52B1614	F52B1714	F53B1814
287/575, 60 HZ	F51B1315	F52B1615	F52B1715	F53B1815
115/230, 50HZ	F51B1318	F52B1618	F52B1718	F53B1818
230/460, 50 HZ	F51B1319	F52B1619	F52B1719	F53B1819

COIL VOLTAGE	7/8 BORE HUB			
	3 FT. LB. BRAKES	6 FT. LB. BRAKES	10 FT. LB. BRAKES	15 FT. LB. BRAKES
115/230, 60HZ	F51C1311	F52C1611	F52C1711	F53C1811
230/460, 60 HZ	F51C1314	F52C1614	F52C1714	F53C1814
287/575, 60 HZ	F51C1315	F52C1615	F52C1715	F53C1815
115/230, 50HZ	F51C1318	F52C1618	F52C1718	F53C1818
230/460, 50 HZ	F51C1319	F52C1619	F52C1719	F53C1819

Technical Data

60 HZ BRAKE COILS SINGLE PHASE			50HZ BRAKE COILS SINGLE PHASE		
VOLTAGE	CURRENT HOLDING AMPS	CURRENT INRUSH AMPS	VOLTAGE	CURRENT HOLDING AMPS	CURRENT INRUSH AMPS
115/230	.50/.25	3.66/1.83	115/230	.45/.22	3.27/1.64
230/460	.28/.14	1.94/.97	230/460	.24/.12	1.76/.88
287/575	.22/.11	1.54/.77			

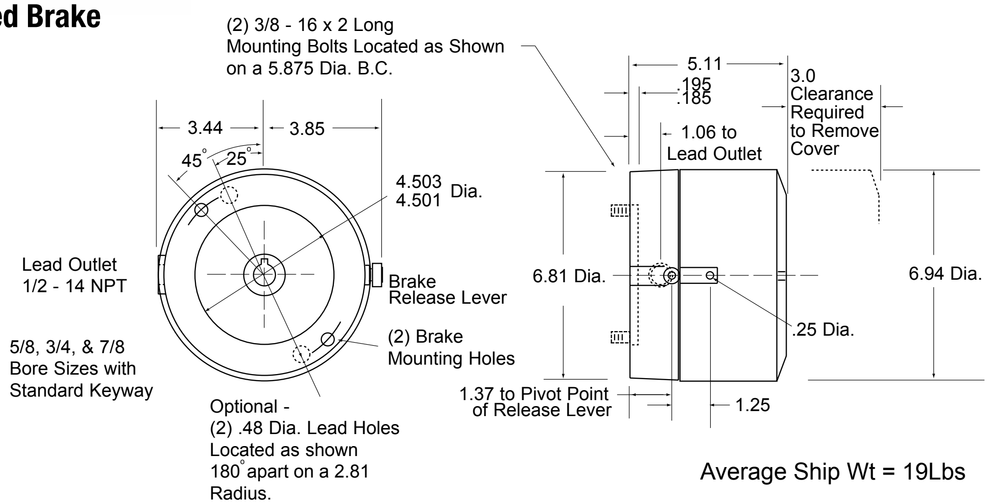
STATIC TORQUE FT. LB.	NUMBER DISCS
3	1
6	2
10	2
15	3

AC Motor Brakes - Nema 2 Housing

AC MOTOR BRAKES

56,000 Nema 2 Housing	**F Series**
Factory Assembled and Tested	3 Ft-Lb
Manual Release	6 Ft-Lb
AC Power Off	10 Ft-Lb
Rear Mounted	15 Ft-Lb
Cast Iron Head	
Cast Iron Cover	

AC Rear Mounted Brake



Average Ship Wt = 19Lbs

Brake Part Numbers

COIL VOLTAGE	5/8 BORE HUB			
	3 FT. LB. BRAKES	6 FT. LB. BRAKES	10 FT. LB. BRAKES	15 FT. LB. BRAKES
115/230, 60HZ	F51A8311	F52A8611	F52A8711	F53A8811
230/460, 60 HZ	F51A8314	F52A8614	F52A8714	F53A8814
287/575, 60 HZ	F51A8315	F52A8615	F52A8715	F53A8815
115/230, 50HZ	F51A8318	F52A8618	F52A8718	F53A8818
230/460, 50 HZ	F51A8319	F52A8619	F52A8719	F53A8819

COIL VOLTAGE	3/4 BORE HUB			
	3 FT. LB. BRAKES	6 FT. LB. BRAKES	10 FT. LB. BRAKES	15 FT. LB. BRAKES
115/230, 60HZ	F51B8311	F52B8611	F52B8711	F53B8811
230/460, 60 HZ	F51B8314	F52B8614	F52B8714	F53B8814
287/575, 60 HZ	F51B8315	F52B8615	F52B8715	F53B8815
115/230, 50HZ	F51B8318	F52B8618	F52B8718	F53B8818
230/460, 50 HZ	F51B8319	F52B8619	F52B8719	F53B8819

COIL VOLTAGE	7/8 BORE HUB			
	3 FT. LB. BRAKES	6 FT. LB. BRAKES	10 FT. LB. BRAKES	15 FT. LB. BRAKES
115/230, 60HZ	F51C8311	F52C8611	F52C8711	F53C8811
230/460, 60 HZ	F51C8314	F52C8614	F52C8714	F53C8814
287/575, 60 HZ	F51C8315	F52C8615	F52C8715	F53C8815
115/230, 50HZ	F51C8318	F52C8618	F52C8718	F53C8818
230/460, 50 HZ	F51C8319	F52C8619	F52C8719	F53C8819

Technical Data

60 HZ BRAKE COILS SINGLE PHASE			50HZ BRAKE COILS SINGLE PHASE		
VOLTAGE	CURRENT HOLDING AMPS	CURRENT INRUSH AMPS	VOLTAGE	CURRENT HOLDING AMPS	CURRENT INRUSH AMPS
115/230	.50/.25	3.66/1.83	115/230	.45/.22	3.27/1.64
230/460	.28/.14	1.94/.97	230/460	.24/.12	1.76/.88
287/575	.22/.11	1.54/.77			

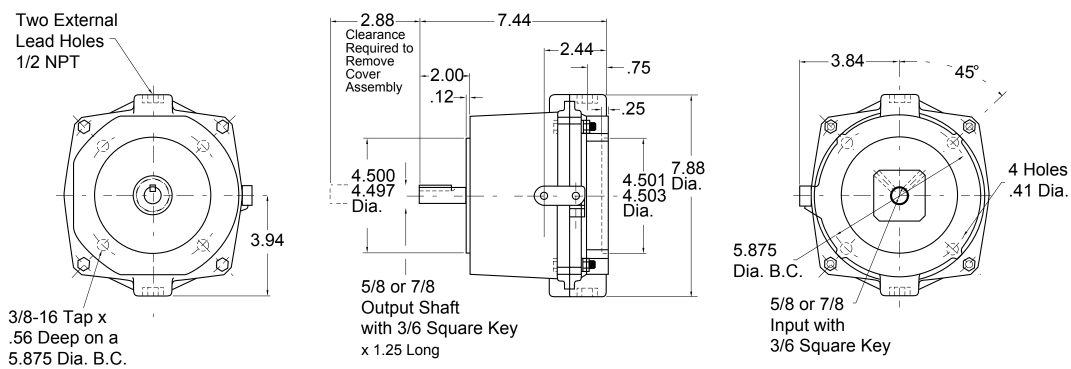
STATIC TORQUE FT. LB.	NUMBER DISCS
3	1
6	2
10	2
15	3

AC C-Face Coupler Brakes - Nema 2 Housing

C-Face Mounted Brake

AC C-FACE COUPLER BRAKES

Nema 2 Housing	**M Series**
Factory Assembled and Tested	3 Ft-Lb
Manual Release	6 Ft-Lb
AC Power Off	10 Ft-Lb
C-Face 56 C and 145TC	
Aluminum Head	
Aluminum Cover	



Average Ship Wt = 12.5Lbs

Brake Part Numbers

COIL VOLTAGE	56C - 5/8 BORE SHAFT AND HUB		
	3 FT. LB. BRAKES	6 FT. LB. BRAKES	10 FT. LB. BRAKES
115/230, 60HZ	M51A0321	M52A0621	M52A0721
230/460, 60 HZ	M51A0324	M52A0624	M52A0724
287/575, 60 HZ	M51A0325	M52A0625	M52A0725
115/230, 50HZ	M51A0328	M52A0628	M52A0728
230/460, 50 HZ	M51A0329	M52A0629	M52A0729

COIL VOLTAGE	145TC - 7/8 BORE SHAFT AND HUB		
	3 FT. LB. BRAKES	6 FT. LB. BRAKES	10 FT. LB. BRAKES
115/230, 60HZ	M51C0321	M52C0621	M52C0721
230/460, 60 HZ	M51C0324	M52C0624	M52C0724
287/575, 60 HZ	M51C0325	M52C0625	M52C0725
115/230, 50HZ	M51C0328	M52C0628	M52C0728
230/460, 50 HZ	M51C0329	M52C0629	M52C0729

Technical Data

60 HZ BRAKE COILS SINGLE PHASE			50HZ BRAKE COILS SINGLE PHASE		
VOLTAGE	CURRENT HOLDING AMPS	CURRENT INRUSH AMPS	VOLTAGE	CURRENT HOLDING AMPS	CURRENT INRUSH AMPS
115/230	.50/.25	3.66/1.83	115/230	.45/.22	3.27/1.64
230/460	.28/.14	1.94/.97	230/460	.24/.12	1.76/.88
287/575	.22/.11	1.54/.77			

STATIC TORQUE FT. LB.	NUMBER DISCS
3	1
6	2
10	2

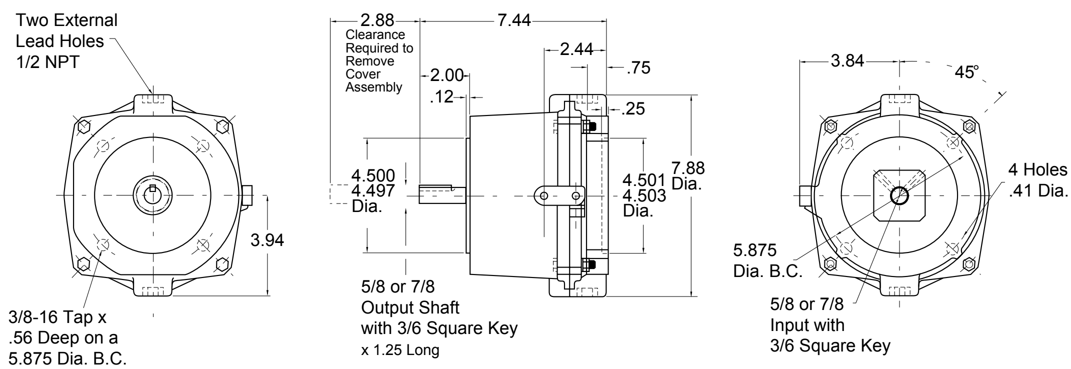
Must be direct-coupled; mounted between motor and speed reducer.
Not recommended for belted or other overhung load applications.

DC C-Face Coupler Brakes - Nema 2 Housing

C-Face Mounted Brake

DC C-FACE COUPLER BRAKES

Nema 2 Housing	M Series
Factory Assembled and Tested	3 Ft-Lb
Manual Release	6 Ft-Lb
DC Power Off	10 Ft-Lb
C-Face 56 C and 145TC	
Aluminum Head	
Aluminum Cover	



Average Ship Wt = 12.5Lbs

Brake Part Numbers

COIL VOLTAGE	56C - 5/8 BORE SHAFT AND HUB		
	3 FT. LB. BRAKES	6 FT. LB. BRAKES	10 FT. LB. BRAKES
24 VDC	M51A032Y	M52A062Y	M53A072Y
90 VDC	M51A032X	M52A062X	M53A072X

COIL VOLTAGE	145TC - 7/8 BORE SHAFT AND HUB		
	3 FT. LB. BRAKES	6 FT. LB. BRAKES	10 FT. LB. BRAKES
24 VDC	M51C032Y	M52C062Y	M53C072Y
90 VDC	M51C032X	M52C062X	M53C072X

Technical Data

DC BRAKE COILS		
VOLTAGE	CURRENT AMPS	RESISTANCE OHMS
24 VDC	.91	26.4
90 VDC	.25	365

STATIC TORQUE FT. LB.	NUMBER DISCS
3	1
6	2
10	3

Must be direct-coupled; mounted between motor and speed reducer.
Not recommended for belted or other overhung load applications.

Controls

Power Supply Overview

Inertia Dynamics offers a comprehensive line of power supplies to interface electrical control systems with electric clutches and brakes.

CONTROL TYPE	MODEL	PART #	INPUT	OUTPUT	DESCRIPTION
On/Off Plug-In	N/A	65-22-3	N/A	N/A	Octal Socket For Plug-In Power Supplies
On/Off Plug-In	D2101	D6001-448-004	120 VAC	90 VDC	Dual Channel Rectifier, Fused, Arc Suppression
On/Off Plug-In	D2110	224215	230 VAC	90 VDC	Dual Channel Rectifier, Fused, Arc Suppression
On/Off Din Rail Mount	D2550	214247-040-2201 214247-040-2202 214247-040-2203	120 VAC	90 VDC	Dual Channel Rectifier, Arc Suppression, PLC Compatible
Accel/Decel Din Rail Mount	D2750	214257-040-2230 214257-040-2231 214257-040-2232	120 VAC	90 VDC	Dual Channel Variable Voltage Power Supply, Arc Suppression, PLC Compatible
Overexcitation Din Rail Mount	D2950	214277-040-2211 214277-040-2212 214277-040-2213	120 VAC	90 VDC	Dual Channel Overexcitation Control, Arc Suppression, PLC Compatible
Adjustable Torque Din Rail Mount	D2650	214237-040-2233	120 VAC	0-90 VDC	Dual Channel Variable Voltage Power Supply, Arc Suppression, PLC Compatible

Control Functions

On/Off Controls: Electric clutches and brakes are turned on and off by a controlled DC voltage. This DC voltage is typically obtained by rectifying AC voltage. The On/Off controls rectify 120 or 230 VAC and provide a 90 VDC output for a clutch and/or brake. Actual switching is provided by a customer- supplied switch, such as a relay, PLC, photo eye, or proximity sensor.

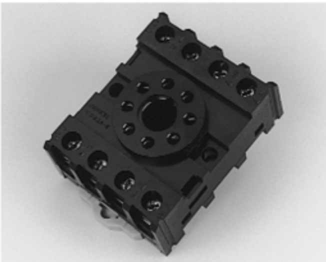
Adjustable Torque: Varying the current to a power-on clutch and/or brake provides variable torque output. Fine-tuning of the torque allows smooth and repeatable starts and stops.

Overexcitation Control: To obtain high cycle rates and/or accurate positioning with electric clutches and brakes, overexcitation controls can be used. Inertia Dynamics offers OEX controls for individual, combination, or wrap spring clutches and brakes.

Mounting Options: Two different mounting options are available with Inertia Dynamics power supplies:

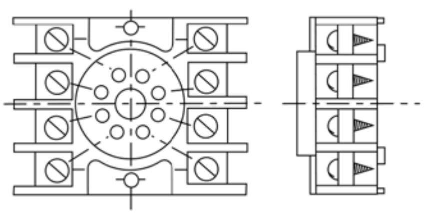
1. Octal socket mount for individual or combination clutches and brakes
2. Din rail mount for individual, combination, or wrap spring clutches and brakes.

Controls



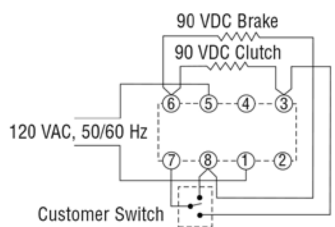
Octal Socket

- Socket used with octal bases
- Prewired
- UL approved
- Standard design
- Dimensions: 3⁄4" H, 2 1⁄2" W, 2" D
- Part Number: 65-22-3



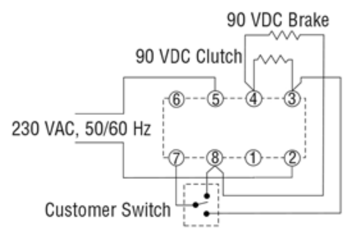
D2101 — On/Off Control

- Formerly Model PS200
- Octal socket mount
- Controls one brake and clutch
- Input: 120 VAC; 50/60 Hz, fused
- Output: 90 VDC
- Rating: 2.0 amps
- Full wave rectifier
- Dimensions: 2 7⁄8" H, 2" W, 15⁄8" D
- Fused for overload protection
- Part Number: D6001-448-004



D2100 — On/Off Control

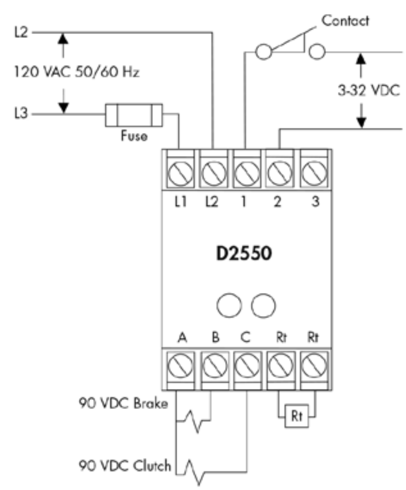
- Formerly Model PS200A
- Octal socket mount
- Controls one brake and clutch
- Input: 230 VAC; 50/60 Hz, fused
- Output: 90 VDC
- Rating: 2.0 amps
- Half wave rectifier
- Dimensions: 2 1⁄2" H, 2" W, 2" D
- Fused for overload protection
- Part Number: 214215



LOGIC INPUT	PART #
120 VAC, 50/60Hz	214247-040-2201
3-32 VDC	214247-040-2202
Contact Closure	214247-040-2203

D2550 — On/Off Control

- Formerly Model PS300
- All solid state
- PLC compatible
- Fast response time
- Epoxied for high resistance to shock and vibration
- Adjustable switching time delay
- Status indicator
- Controls one clutch and brake
- Full wave rectifier
- Standard din rail mount
- Line Input: 120 VAC, 50/60 Hz
- Output: 90 VDC
- Rating: 1.0 amp
- Dimensions: 2.76" H, 1.97" W, 4.30" D
- Part Number: 21247-040-2201, 2202, 2203



Wiring example for logic input 3-32 VDC

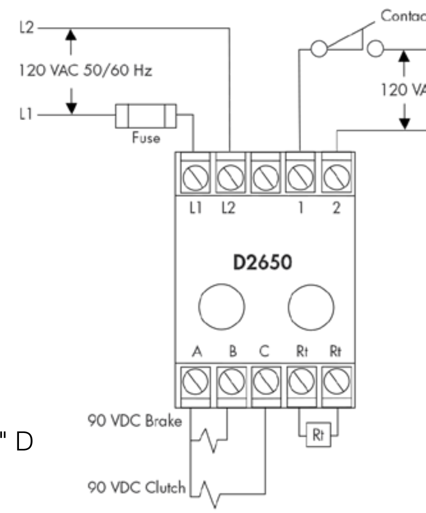
Controls

Controls

LOGIC INPUT	PART #
120 VAC, 50/60Hz	214237-040-2233

D2650 —
DUAL CHANNEL ANTI-OVERLAP TORQUE ADJUST CLUTCH/BRAKE CONTROL

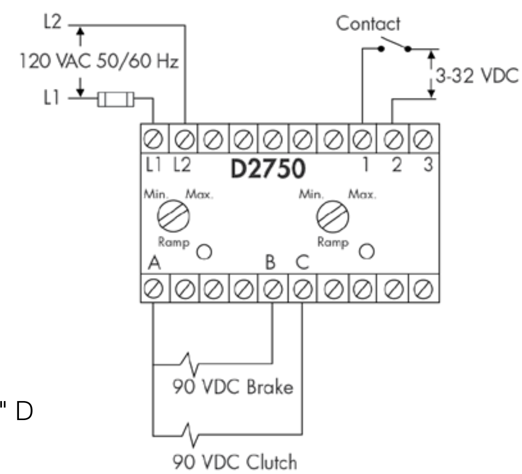
- All solid state
- Operates one or two coils, incorporating adjustable output voltage (torque) for each channel and an anti-overlap circuit
- Soft-start and soft-stop
- Meets UL and cUL certification
- Standard din rail mount
- Line Input: 120 VAC, 50/60 Hz
- Output: 90 VDC
- Rating: 1.0 amp
- Dimensions: 2.76" H, 1.97" W, 4.30" D
- Part Number: 214237-040-2233



LOGIC INPUT	PART #
120 VAC, 50/60Hz	214257-040-2230
3-32 VDC	214257-040-2231
Contact Closure	214257-040-2232

D2750 —
ACCEL/DECEL DUAL CHANNEL CLUTCH/BRAKECONTROL

- All solid state
- Operates one or two coils, incorporating an anti-overlap circuit
- Soft-start and soft-stop
- Meets UL and cUL certification
- Standard din rail mount
- Line Input: 120 VAC, 50/60 Hz
- Output: 90 VDC (adjustable 0-2 second time ramps)
- Rating: 1.0 amp
- Dimensions: 2.76" H, 3.94" W, 5.28" D
- Part Number: 214257-040-2230, 2231, 2232



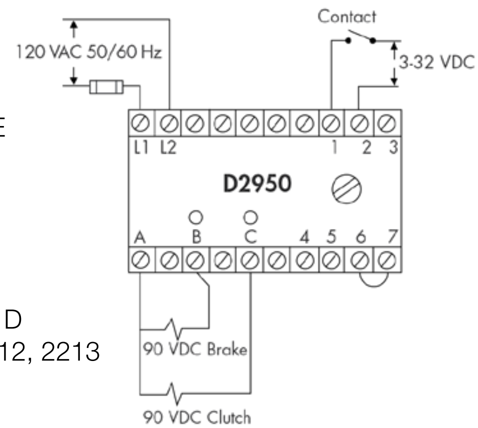
Wiring example for logic input 3-32 VDC

Controls

LOGIC INPUT	PART #
120 VAC, 50/60Hz	214277-040-2211
3-32 VDC	214277-040-2212
Contact Closure	214277-040-2213

D2950 — ACCEL/DECEL DUAL CHANNEL CLUTCH/BRAKE CONTROL

- Formerly Model No. PS500
- All solid state
- Operates one or two coils, with an adjustable anti-overlap circuit and OE
- Meets UL and cUL certification
- Standard din rail mount
- Line Input: 120 VAC, 50/60 Hz
- Output: 90 VDC (105 V actual)
- Rating: 1.0 amp
- Dimensions: 2.76" H, 3.94" W, 5.28" D
- Part Number: 214277-040-2211, 2212, 2213



Wiring example for logic input 3-32 VDC

General Information

Conversion Charts

Fig. A
Inertia Chart
I = WR^2 of Steel (per inch of length)

DIA. (IN.)	WR^2 (LB. - $IN.^2$)	DIA. (IN.)	WR^2 (LB. - $IN.^2$)	DIA. (IN.)	WR^2 (LB. - $IN.^2$)
1⁄4	.00011	8 3⁄4	162.72	29	19589.76
5⁄16	.00027	9	182.88	30	22452.48
3⁄8	.00055	9 1⁄4	203.04	31	25598.88
7⁄16	.00102	9 1⁄2	233.20	32	29059.2
1⁄2	.00173	9 3⁄4	252.00	33	32860.8
9⁄16	.00279	10	277.92	34	37036.8
5⁄8	.00425	10 1⁄4	306.72	35	41587.2
11⁄16	.00623	10 1⁄2	338.40	36	46540.8
3⁄4	.00864	10 3⁄4	371.52	37	51940.8
13⁄16	.01215	11	407.52	38	57787.2
7⁄8	.01634	11 1⁄4	444.96	39	64123.2
15⁄16	.02154	11 1⁄2	486.72	40	70963.2
1	.0288	11 3⁄4	592.92	41	78321.6
1 1⁄4	.0720	12	576.00	42	86227.2
1 1⁄2	.144	12 1⁄4	626.10	43	94766.4
1 3⁄4	.288	12 1⁄2	679.88	44	103881.6
2	.432	12 3⁄4	735.84	45	113659.2
2 1⁄4	.720	13	803.52	46	124099.2
2 1⁄2	1.152	13 1⁄4	858.24	47	135259.2
2 3⁄4	1.584	13 1⁄2	924.48	48	147139.2
3	2.304	13 3⁄4	995.04	49	159782.4
3 1⁄2	4.176	14	1068.48	50	173246.4
3 3⁄4	5.472	14 1⁄4	1147.68	51	187516.8
4	7.056	14 1⁄2	1229.76	52	202665.6
4 1⁄4	9.072	14 3⁄4	1317.60	53	218707.2
4 1⁄2	11.376	15	1404.00	54	235684.8
5	17.280	16	1815.84	55	253641.6
5 1⁄2	25.488	17	2314.08	56	272606.4
6	36.000	18	2910.24	57	292593.6
6 1⁄4	42.624	19	3611.52	58	313675.2
6 1⁄2	49.680	20	4433.76	59	335880.0
6 3⁄4	57.888	21	5389.92	60	359238.8
7	66.816	22	6492.96	66	525960.0
7 1⁄4	77.040	23	7757.28	72	744768.0
7 1⁄2	87.984	24	9195.84	78	1026000.0
7 3⁄4	100.656	25	10827.36	84	1380096.0
8	113.904	26	12666.24	90	1818576.0
8 1⁄4	128.880	27	14731.20	96	2354256.0
8 1⁄2	144.00	28	17036.64	102	3000384.0

NOTES:
1. To determine WR^2 of a given shaft, multiply the WR^2 given above by the length of the shaft or the thickness of the disc in inches.
2. For hollow shafts, subtract WR^2 of I.D. from WR^2 of O.D. and multiply by length.

Full Load Running Torque of Motors in Lb.–In.

HP	3450 RPM	1750 RPM	1150 RPM	870 RPM
1⁄50	.365	0.720	1.096	1.448
1⁄20	.913	1.800	2.739	3.621
1⁄12	1.521	3.000	4.563	6.032
1⁄8	2.283	4.500	6.848	9.051
1⁄6	3.044	6.000	9.148	12.09
1⁄4	4.565	9.000	13.70	18.10
1⁄3	6.081	12.00	18.24	24.11
1⁄2	9.130	18.00	27.39	36.21
3⁄4	13.70	27.00	41.09	54.31
1	18.26	36.00	54.78	72.41
1 1⁄2	27.39	54.00	82.17	108.6
2	36.52	72.00	109.56	144.8
3	54.78	108.00	164.3	217.2
5	91.30	180.00	273.96	362.0
7 1⁄2	137.0	270.00	410.8	543.1

Inertia Conversion Chart

To determine the inertia of a rotating member of a material other than steel, multiply the inertia of the steel diameter from Fig. A at right by:

MATERIAL	MULTIPLIER
Bronze	1.05
Steel	1.00
Iron	.92
Powdered Bronze	.79
Powdered Metal Iron	.88
Aluminum	.35
Nylon	.17

Conversion Charts

INERTIA		
TO CONVERT FROM	**TO**	**MULTIPLY BY**
g – cm^2	lb.–$in.^2$	3.417 x 10^{-4}
g – cm^2	lb.–$ft.^2$	2.373 x 10^{-6}
kg – cm^2	lb.–in^2	3.417 x 10^{-1}
kg – cm – sec^2	lb.–$in.^2$	335.1
N – m – sec^2	lb.–$in.^2$	3417
kg – m^2	lb.–$in.^2$	3417
N – m^2	lb. – $in.^2$	348.47
lb. – $in.^2$	kg – cm^2	2.926
lb. – $in.^2$	kg – m^2	2.9265 x 10^{-4}
lb. – $in.^2$	N – m^2	2.870 x 10^{-3}
lb. – $in.^2$	lb. – in. – $sec.^2$	2.590 x 10^{-3}
lb. – $in.^2$	lb. – $ft.^2$	6.944 x 10^{-3}
lb. – $in.^2$	oz. – $in.^2$	16
lb. – $ft.^2$	lb. – $in.^2$	144
lb. – $ft.^2$	oz. – $in.^2$	2304
lb. – $ft.^2$	oz. – in. – $sec.^2$	5.969
oz. – $in.^2$	oz. – in. – $sec.^2$	2.590 x 10^{-3}
oz. – $in.^2$	lb. – $in.^2$	6.25 x 10^{-2}
oz. – in. – $sec.^2$	oz. – $in.^2$	3.8609 x 10^{-2}
oz. – in. – $sec.^2$	lb. – $in.^2$	24.125

MISCELLANEOUS		
TO CONVERT FROM	**TO**	**MULTIPLY BY**
horsepower	ft.–lb./min.	33,000
kilograms	pounds	2.2
meters	millimeters	1000
millimeters	inches	3.937 x 10^{-2}
Newtons	pounds	.225
radians	degrees	57.30
revolutions	radians	6.283
revolutions/min.	degrees/sec.	6
square–inches	square–millimeters	645.2
temp. (°C) + 17.78	temp. (°F)	1.8
temp. (°F) – 32	temp. (°C)	5/9

TORQUE		
TO CONVERT FROM	**TO**	**MULTIPLY BY**
kg–m	lb.–in.	.6026
N–m	lb.–in.	8.850
N–m	oz.–in.	141.69
lb.–in.	g–cm	1152
lb.–in.	kg–cm	1.152
lb.–in.	kg–m	1.6596
lb.–in.	N–m	.1130
lb.–in.	oz.–in.	16.0
lb.–in.	lb.–ft.	.083
lb.–ft.	lb.–in.	12.0

General Information

Glossary – General Terms

Acceleration Time – The amount of time required to change the speed of an inertial load, from the instant an electrical signal is applied to the time the system is at full speed.

Air Gap – The space between the armature and field when the clutch or brake is disengaged.

Brake-Power Off – Unit used to stop a load when turned off electrically.

Brake-Power On – Unit used to stop a load when turned on electrically.

Build Up Time – The time required to build up 90% of the flux which yields 80% of the rated torque.

Burnishing – A "wearing in" process of the mating friction surfaces for maximum torque.

Clutch – Unit used to couple two parallel shafts via pulleys, gears, or sprockets.

Clutch Coupling – Unit used to couple two in-line shafts.

Decay Time – The time required to decay to 10% of the flux which yields 10% of the rated torque.

Deceleration Time – The amount of time required to stop an inertial load, from the instant an electrical signal is applied to the time the system is at rest.

Dynamic Torque – Torque measured at instant of clutch or brake engagement when one friction member is rotating and the other is stationary or rotating at a different speed. Approximately 80% of static torque.

Field – Coil and housing assembly which forms part of the electromagnet.

Flange – Mounting plate located on brake magnets and clutch fields.

Frictional Torque – The torque required to overcome static friction in the system.

Friction Material – Composition material (nonasbestos) inserted between poles of clutch or brake magnet, used to retard wear rate of iron poles and armature.

Inertia – The property of matter that causes an object to remain at rest or in motion until acted on by an outside force.

Inertial Torque – The torque generated by accelerating or decelerating a load.

Moment of Inertia – WR^2 = Weight of an object times its radius of gyration squared.

Overexcitation – Applying a high voltage for a brief time period to shorten the engagement time. Sometimes referred to as "spiking."

Positive Engagement – An engagement with no slip.

Radial Bearing Load – The maximum load that can be applied to a clutch at maximum speed without causing premature wear.

Residual Magnetism – A condition in magnets where low levels of magnetism remain after electric current is removed.

Rotor – The rotating component of a stationary field clutch that carries the friction material.

Spline Drive – Heavy duty clutch or brake drive comprised of mating armature and hub splines.

Static Torque – Torque measured at instant of breakaway when both friction members are locked in at the same speed or at rest.

Thermal Capacity – Brake rating that takes into consideration number of stops/minute, total inertia, and brake rotational speed.

Time to Speed – The amount of time required to change the speed of an inertial load, from the instant an electrical signal is applied to the time the system is at full speed.

Time to Zero Speed – The amount of time required to stop an inertial load, from the instant an electrical signal is removed to the time the system is at rest.

Torque – The action of a force producing rotation. Torque is comprised of a force (lb.) acting upon a lever arm of length (in.). The product of the force and lever arm is pound–inches (lb.–in.) used to express torque. See "static" and "dynamic" torque.

UL – Underwriters Laboratories – An organization which tests electrical equipment for product safety.

Zero Backlash Armature – A spring mounted armature used to eliminate backlash and dragging of the armature against the field magnet.

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