WARNER ELECTRIC

CLUTCH / BRAKE

Fractional HP Clutches/Brakes

Warner Electric

SF Series clutches provide a bearing mounted clutch for use in parallel shaft applications. SF clutches easily adapt to a customer provided pulley, sprocket or gear to transmit torque between two shafts.

SFP Series units provide a bearing mounted field/rotor assembly with a bearing mounted output hub suitable for mounting of pulley or sprocket.

SFC Series clutches provide a bearing mounted clutch coupling for use in transmitting torque between two in-line shafts.

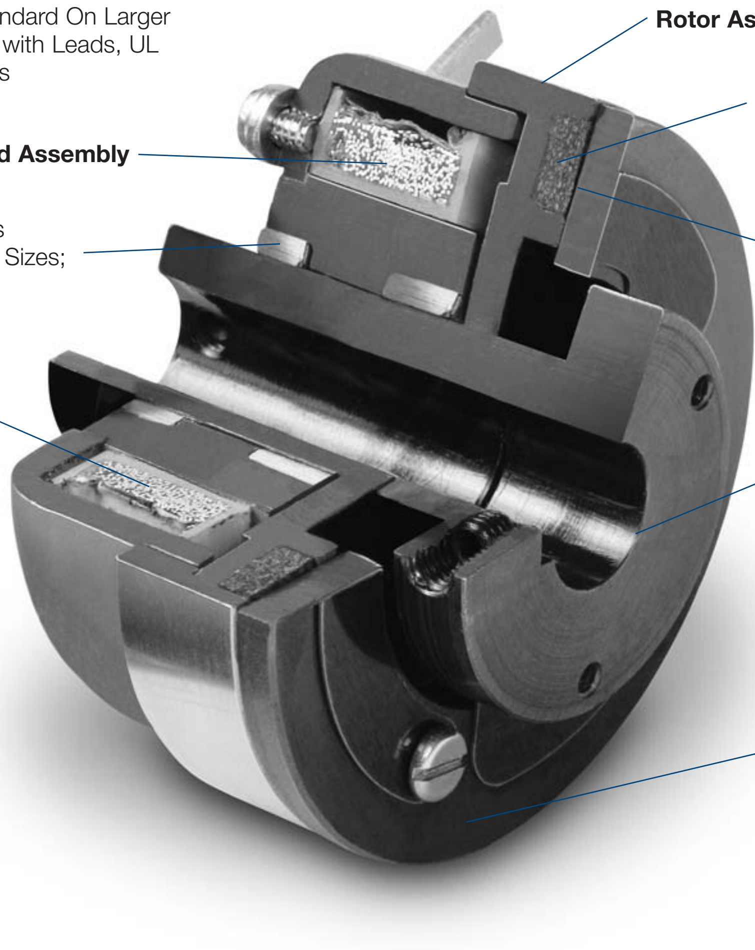
PB Series brakes provide a flange mounted brake design for accurate stopping of rotating shafts.

SFPB Series provides a clutch (SF) and brake (PB) combination for use with pulley or sprocket input. The clutch and brake are mounted back-to-back with a torque arm to provide for simplicity of mounting.

SFPBC Series provides a clutch coupling (SFC) and brake (PB) combination for coupling two in-line shafts. The clutch coupling and brake are mounted back-to-back with a torque arm to provide for simplicity of mounting.

Power-On Clutches & Brakes Description

Features



Typical Applications of Clutches & Brakes

Copiers/Printers
Packaging Machinery
Microfilm Readers
Medical Equipment
Conveyors
Postal Sorters/Readers
Document Feeders
Textile Equipment

Generating the Clutch or Brake Torque

Warner Electric 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 transmit 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 Warner Electric Clutches and Brakes

- Precision centered 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 upon request
- Conforms to ROHS standards

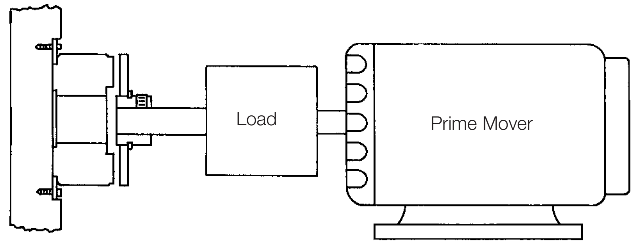
Selection Process

STEP 1

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

PB

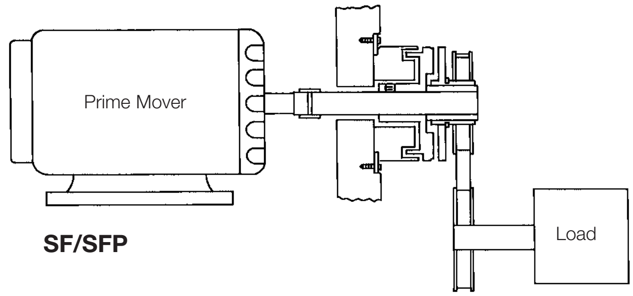
The brake will be mounted on a driven shaft with the magnet secured to the machine frame. When engaged, the brake will bring the rotating load to a stop and hold until power is removed.



PB

SF/SFP

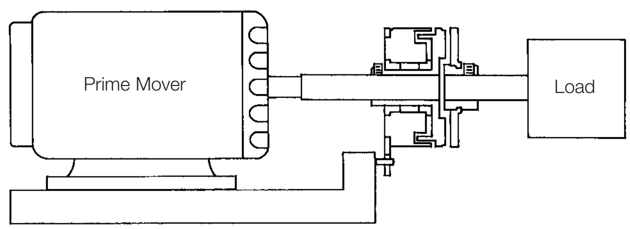
The SF or SFP clutches are designed for parallel shaft mounting and will connect to the load via a chain or belt drive. The clutch can be mounted to either a driving or driven shaft.



SF/SFP

SFC

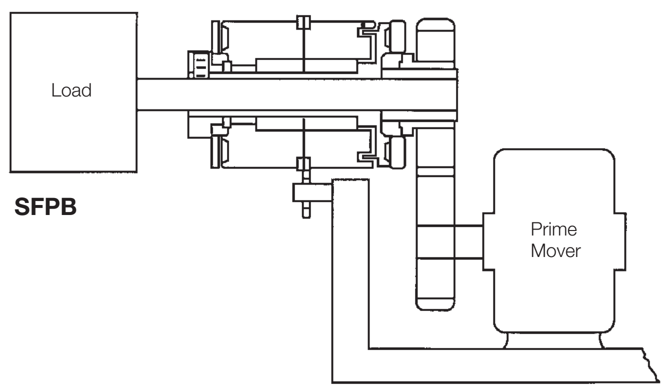
The SFC clutches are designed for use with two in-line shafts. Half of the clutch will mount to the driving shaft and the other half to the driven shaft. When engaged the unit will couple the two shafts together.



SFC

SFPB

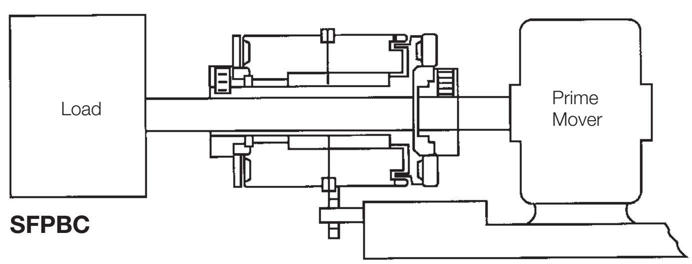
This clutch/brake combination will be mounted on a driven shaft with the brake located closest to the load. SFPB units are designed for parallel shaft mounting and will have input from a chain or belt drive. When the clutch is engaged, it will drive the load, when the brake is engaged, the load will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



SFPB

SFPBC

This clutch/brake combination will be used with two in-line shafts with the brake on the driven shaft. When clutch 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.



SFPBC

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.

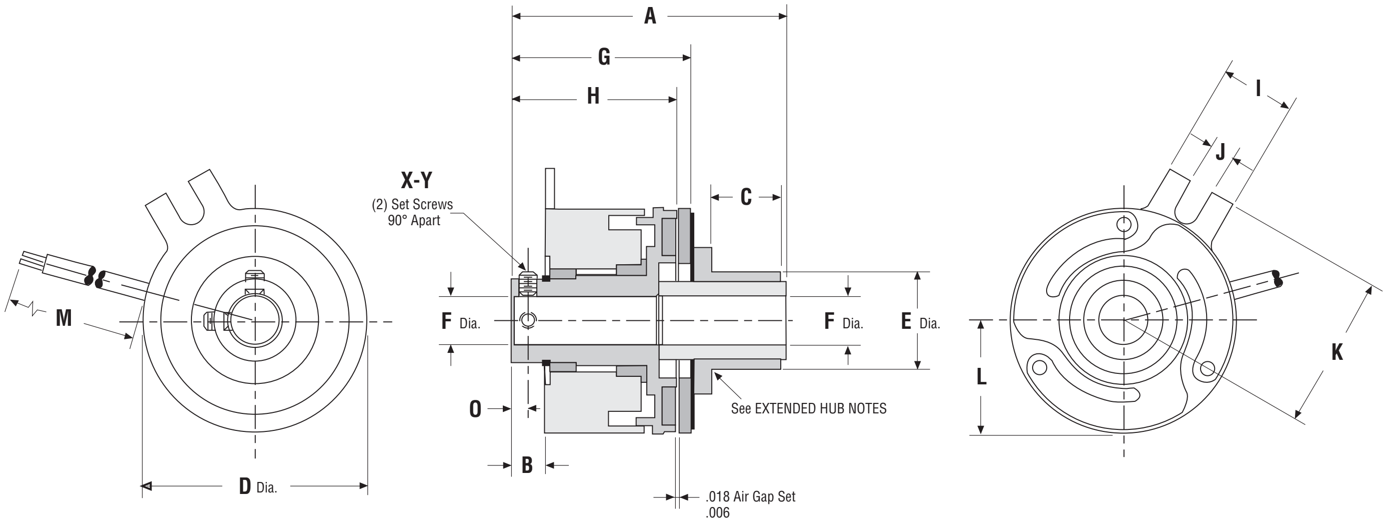
For additional calculation formulae and dynamic torque curves, please refer to page 14.

Shaft Speed at Clutch (In RPM)

Torque – inch pounds	100	200	300	400	500	600	700	800	900	1000	1100	1200	1500	1800	2000	2400	3000	3600	4000	4600	5000
1	90											90									110
2																					110
3																		110			
4		110	150																		
5																150					180
6	150						150														
7																					
8																			180		
9																	180				
10																					
12												180									
15	180																				200
20	200														200						
25	200																				
30																					225
40															225						
50			225															265			325
75	265				265														325		
100													325								
125	325																				425
150																			425		
175																425					
200													425								
225												425									
250	425		425																		

Stationary Field Clutch for Parallel Shafts

Models 090-265



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	Rotor Keyway Nominal Keyway X	Rotor Keyway Nominal Keyway Y
090	1.370	.191	.410	.903	.507 Knurl	1/8 3/16 1/4	.874	.763	.305	.094	.625	.445	12.00	.080	N.A.	Set Screws Only	
110	1.409	.147	.396	1.160	.506 Knurl	3/16 1/4 5/16	.935	.777	.380	.122	.875	.585	12.00	.087	N.A.	Set Screws Only	
150	1.695	.275	.250	1.500	.622	1/4 5/16 3/8	1.255	1.075	.520	.180	1.120	.750	12.00	.125	N.A.	Set Screws Only	
180	1.823	.279	.250	1.780	.622	1/4 5/16 3/8	1.316	1.060	.505	.184	1.325	.975	12.00	.125	N.A.	Set Screws Only	
200	1.948	.279	.250	2.000	.622	5/16 3/8	1.329	1.060	.505	.184	1.325	.975	12.00	.125	5/16 3/8	.0625 – .0655 .094 – .097 Set Screws	.347 – .352 .417 – .427
225	2.160	.281	.238	2.260	.872	3/8 1/2	1.578	1.423	.442	.170	1.515	1.160	18.00	.117	3/8 1/2	.094 – .097 .125 – .128	.417 – .427 .560 – .567
265	2.454	.280	.472	2.645	.998	3/8 1/2 5/8	1.740	1.437	.510	.190	1.750	1.465	18.00	.154	3/8 1/2 5/8	.094 – .097 .125 – .128 .1885 – .1905	.417 – .427 .560 – .567 .709 – .716

EXTENDED HUB NOTES:

1. Extended armature hubs Models 150, 180 and 200 (3) #4-40 tapped holes on a .812 BC
2. Extended armature hub Model 225 (3) #6-32 tapped holes on a 1.187 BC
3. Extended armature hub Model 265 (3) #8-32 tapped holes on a 1.375 BC

Mechanical

Model No.	Static Torque lb. – in.	Inertia lb. – in.² Rotor	Inertia lb. – in.² Arm & Hub	Wt. oz.
090	2.5	.002	.0015	2.0
110	6	.0058	.0029	3.2
150	10	.060	.0031	3.8
180	15	.061	.036	11
200	25	.082	.047	12
225	50	.215	.079	20
265	80	.362	.292	28

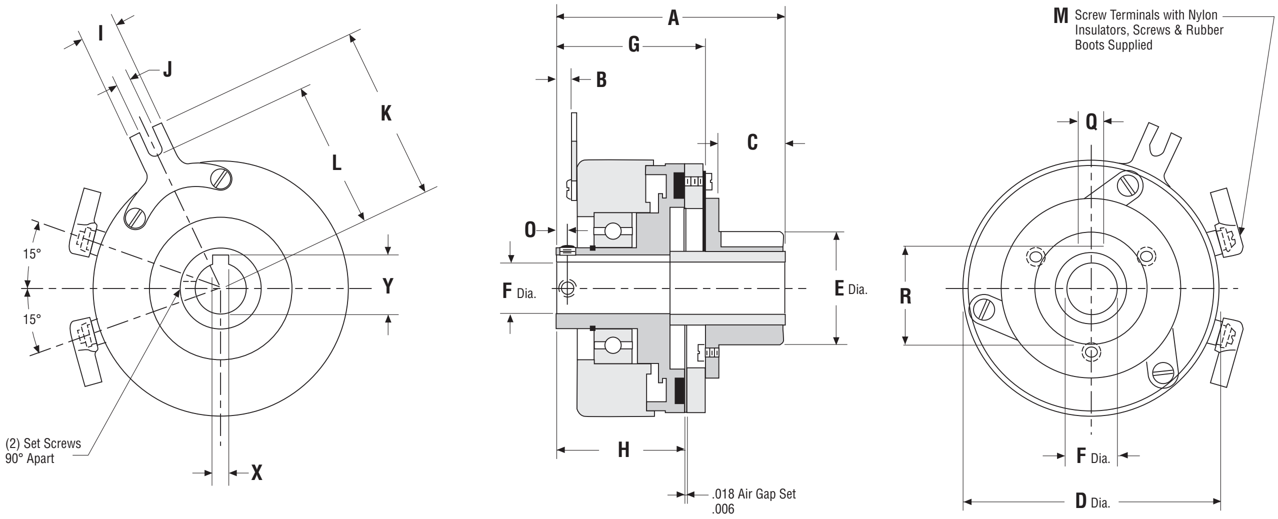
Electrical

Model No.	90 VDC Amps	90 VDC Ohms	24 VDC Amps	24 VDC Ohms	12 VDC Amps	12 VDC Ohms
090	.046	1977	.117	205	.246	48.8
110	.047	1930	.198	121	.447	26.8
150	.042	2150	.183	132	.380	31.6
180	.066	1369	.289	83	.561	21.4
200	.074	1213	.294	81.6	.574	20.9
225	.079	1140	.322	74.6	.628	19.1
265	.092	980	.374	64.2	.760	15.8

Lead wire is UL recognized style 1213, 1015 or 1430, 22 gage.
Insulation is .0509 O.D. on 090, 110, 150 units; .0649 or .0959 O.D. on all other units.

Stationary Field Clutch for Parallel Shafts

Models 325-425



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	O Nom.	Rotor Keyway Bore	Nominal Keyway X	Nominal Keyway Y
325	2.800	.250	.830	3.268	1.374	1/8 1/2 5/8 3/4	1.815	1.390	.442	.170	2.050	1.695	Screw Terminals	.135	1/2 5/8 3/4	.125 – .128 .1885 – .1905 .1885 – .1905	.560 – .567 .709 – .716 .836 – .844
425*	3.820	.320	1.560	4.270	1.374	1/2 5/8 3/4 7/8 1	2.050	1.625	.645	.190	2.500	2.312	Screw Terminals	.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.

Mechanical

Model No.	Static Torque lb. – in.	Inertia lb. – in.² Rotor	Inertia lb. – in.² Arm & Hub	Wt. oz.
325	125	.610	.561	50
425	250	2.50	2.30	85

Electrical

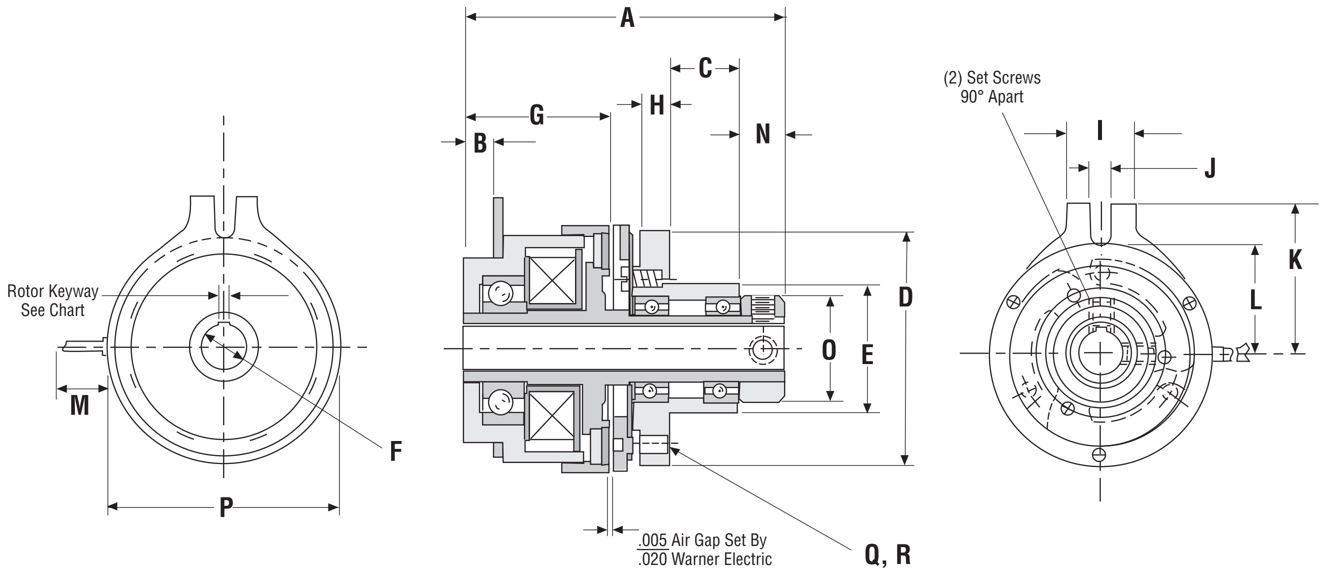
Model No.	90 VDC Amps	90 VDC Ohms	24 VDC Amps	24 VDC Ohms	12 VDC Amps	12 VDC Ohms
325	.091	988	.378	65.3	.729	16.5
425	.124	722	.468	51.2	.934	12.84

Lead wire is UL recognized style 1213, 1015 or 1430, 22 gage.
Insulation is .0509 O.D. on 090, 110, 150 units; .0649 or .0959 O.D. on all other units.

Customer shall maintain:

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

Pre-Assembled SF Clutch For Parallel Shafts
Models 110-180



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 Bore	Rotor Keyway Nominal Keyway	Q B.C.	R SIZE
110	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
180	2.515	.304	.500	1.755	.9985	1/4 5/16 3/8	1.290	.193	.505	.184	1.325	.975	12.00	.315	.875	1.620	N.A.	Set Screws Only	1.437 3-Holes	8-32 UNC-2B

Mechanical

Model No.	Static Torque lb. – in.	Inertia lb. – in.² Rotor	Inertia lb. – in.² Arm & Hub	Wt. oz.
110	6	.013	.030	8
180	15	.052	.095	26

Electrical

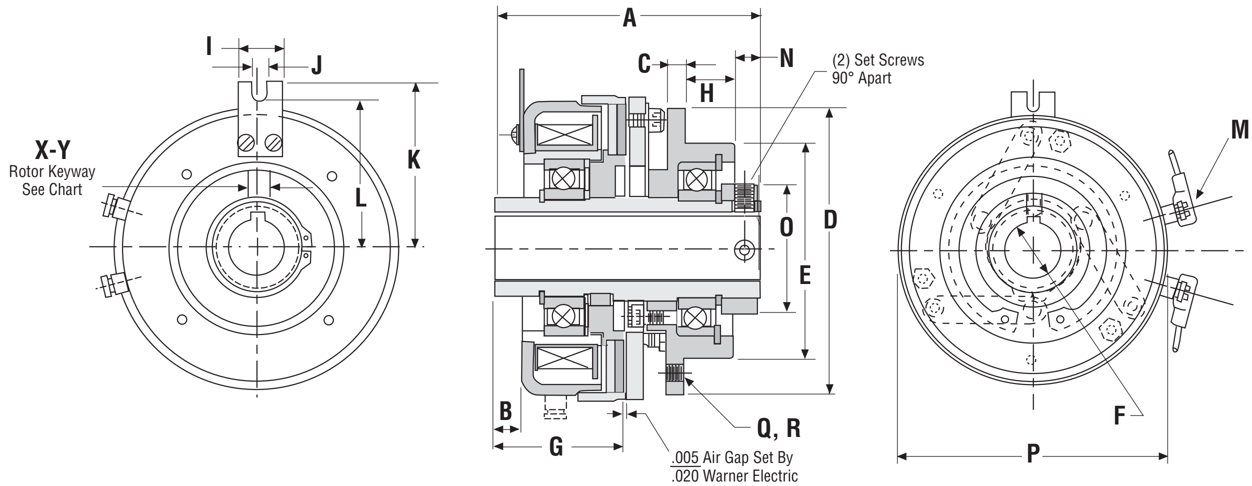
Model No.	90 VDC Amps	90 VDC Ohms	24 VDC Amps	24 VDC Ohms	12 VDC Amps	12 VDC Ohms
110	.048	1848	.188	120	.447	26.8
180	.066	1369	.289	83.1	.561	21.4

Customer shall maintain:

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

Pre-Assembled SF Clutch For Parallel Shafts

Models 265-425



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	N Nom.	O Nom.	P Max	Rotor Keyway Bore	Rotor Keyway Nominal Keyway X*	Rotor Keyway Nominal Keyway Y*	Q B.C.	R SIZE
265	2.930	.140	.260	2.505	1.498	1/2 5/8	1.375	.500	.510	.190	1.750	1.467	Screw Terminals	.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
325	2.961	.140	.395	2.883	1.498	1/2	1.360	.500	.442	.170	2.050	1.740	Screw Terminals	.408	1.187	3.300	1/2	.125 – .128	.560 – .567	1.790 3-Holes	6-32 UNC-2B
425	3.350	.000	.267	4.015	2.999	3/4 7/8 1	1.405	.673	.645	.188	2.500	2.216	Screw Terminals	.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

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

Mechanical

Model No.	Static Torque lb. – in.	Inertia lb. – in.² Rotor	Inertia lb. – in.² Arm & Hub	Wt. oz.
265	80	.290	.530	38
325	125	.560	.990	54
425	250	2.250	4.990	94

Electrical

Model No.	90 VDC Amps	90 VDC Ohms	24 VDC Amps	24 VDC Ohms	12 VDC Amps	12 VDC Ohms
265	.088	1024	.358	67.1	.760	15.8
325	.091	988	.378	65.3	.729	16.5
425	.124	722	.468	51.2	.934	12.84

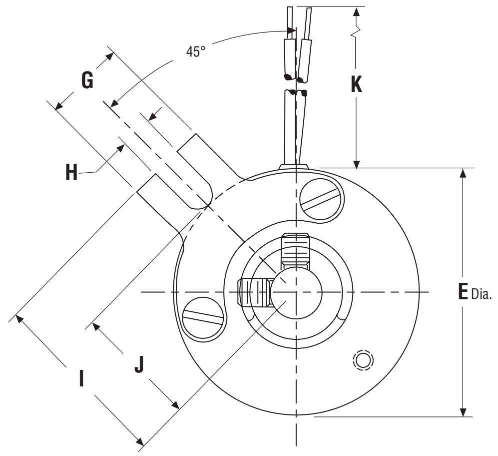
Lead wire is UL recognized style 1213, 1015 or 1430, 22 gage.
Insulation is .0509 O.D. on 110 units; .0649 or .0959 O.D. on all other units.

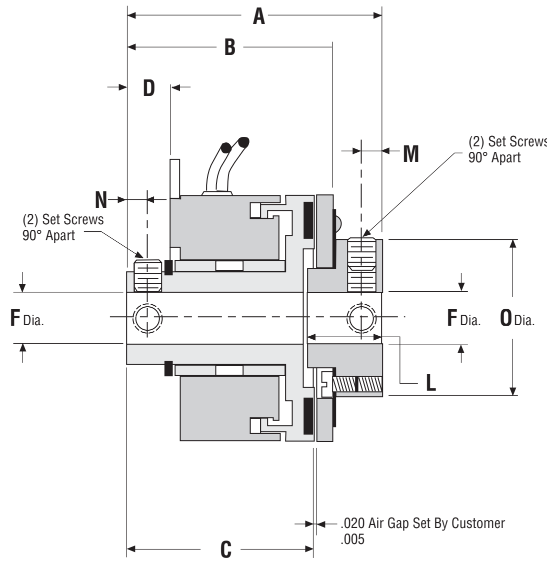
Customer shall maintain:

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

Stationary Field Clutch Coupling For In-Line Shafts

Models 090-265





Dimensions

Model No.	A Max.	B Nom.	C Nom.	D Nom.	E Max.	F Nom.	G Max.	H Min.	I Nom.	J Nom.	K ± .500	Rotor Keyway Bore	Rotor Keyway Nominal Keyway		L Max.	M Nom.	N Nom.	O Max.
090	1.059	.875	.763	.191	.903	1/8 3/16 1/4	.305	.094	.625	.445	12.00	N.A.	Set Screws Only		.237	.070	.080	.500
110	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	.087	.687
150	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
180	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	.0625 – .0655 .0625 – .0655 .094 – .097	.285 – .290 .347 – .352 .417 – .427	.460	.115	.125	1.190
200	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
225	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
265	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	.187	1.440

Mechanical

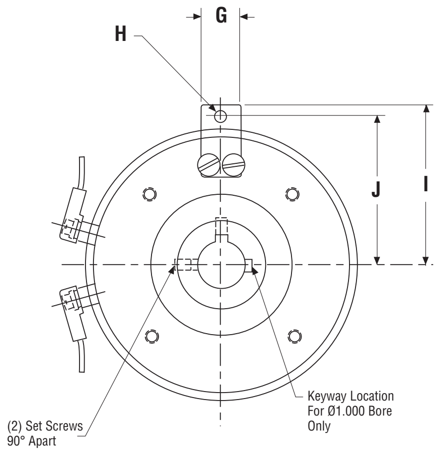
Model No.	Static Torque lb. – in.	Inertia lb. – in.² Rotor	Inertia lb. – in.² Arm & Hub	Wt. oz.
090	2.5	.002	.0011	2
110	6	.0058	.0024	3.2
150	10	.060	.026	3.8
180	15	.061	.031	11
200	25	.082	.042	12
225	50	.215	.070	20
265	80	.362	.320	28

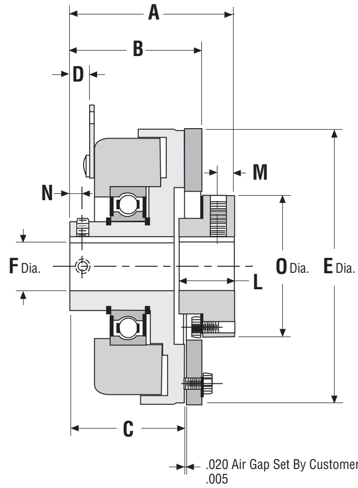
Electrical

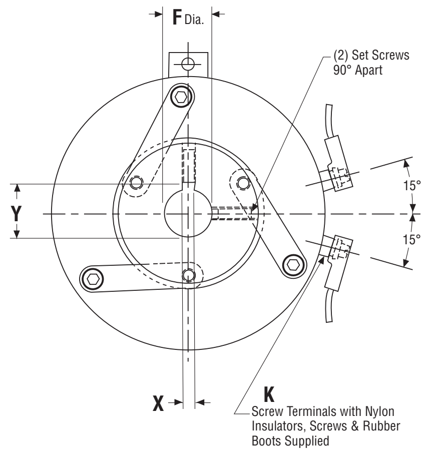
Model No.	90 VDC Amps	90 VDC Ohms	24 VDC Amps	24 VDC Ohms	12 VDC Amps	12 VDC Ohms
090	.046	1977	.117	205	.246	48.8
110	.047	1930	.198	121	.447	26.8
150	.042	2150	.183	132	.380	31.6
180	.066	1369	.289	83	.561	21.4
200	.074	1213	.322	74.4	.574	20.9
225	.079	1140	.322	74.6	.628	19.1
265	.092	980	.374	64.2	.760	15.8

Stationary Field Clutch Coupling For In-Line Shafts

Models 325-425







Dimensions

Model No.	A Max.	B Nom.	C Nom.	D Nom.	E Max.	F Nom.	G Max.	H Min.	I Nom.	J Nom.	K	Rotor Keyway Bore	Rotor Keyway Nominal Keyway X	Rotor Keyway Nominal Keyway Y	L Max.	M Nom.	N Nom.	O Max.
325	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
425	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

Mechanical

Model No.	Static Torque lb. – in.	Inertia lb. – in.² Rotor	Inertia lb. – in.² Arm & Hub	Wt. oz.
325	125	.610	.561	45
425	250	2.50	2.30	80

Electrical

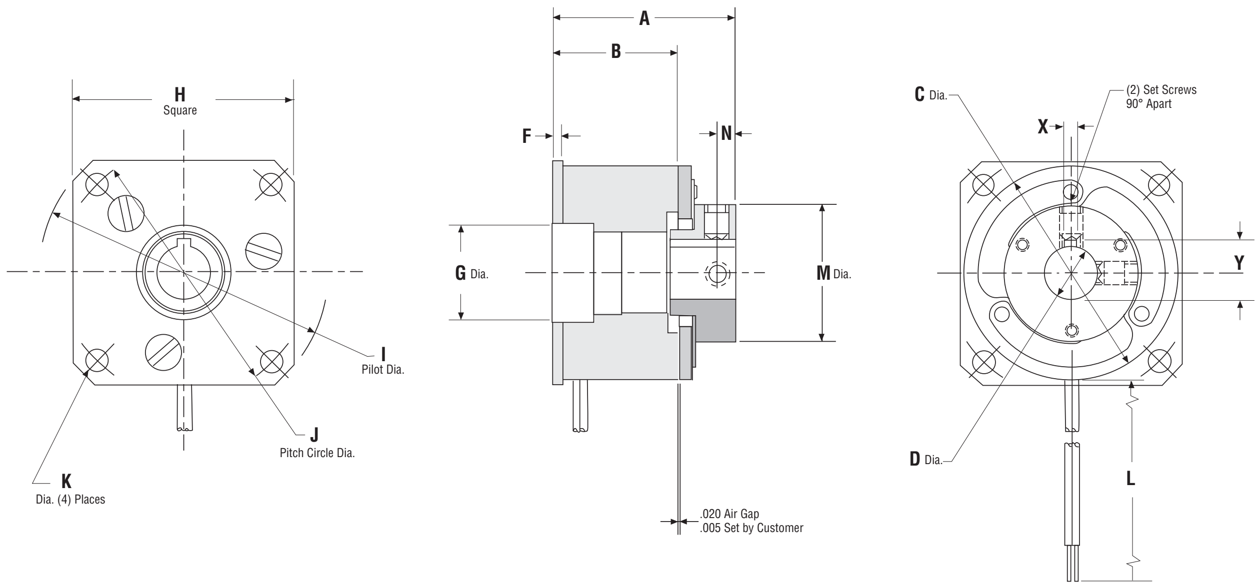
Model No.	90 VDC Amps	90 VDC Ohms	24 VDC Amps	24 VDC Ohms	12 VDC Amps	12 VDC Ohms
325	.091	988	.378	65.3	.729	16.4
425	.124	722	.468	51.2	.934	12.84

Lead wire is UL recognized style 1213, 1015 or 1430, 22 gage.
Insulation is .050" O.D. on 110 units; .064" or .095" O.D. on all other units.

Customer shall maintain:

- A loose-fitting pin through the anti-rotation tab to prevent preloading the bearings.
- Contentricity between the shafts within .005 T.I.R.
- Initial airgap setting of .005 - .020 inches.

Flange Mounted Brake
Models 090-265



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 Bore	Hub Keyway Nominal Keyway		M Nom.	N Max.
090	.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
110	.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
150	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
180	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
200	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
225	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
265	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

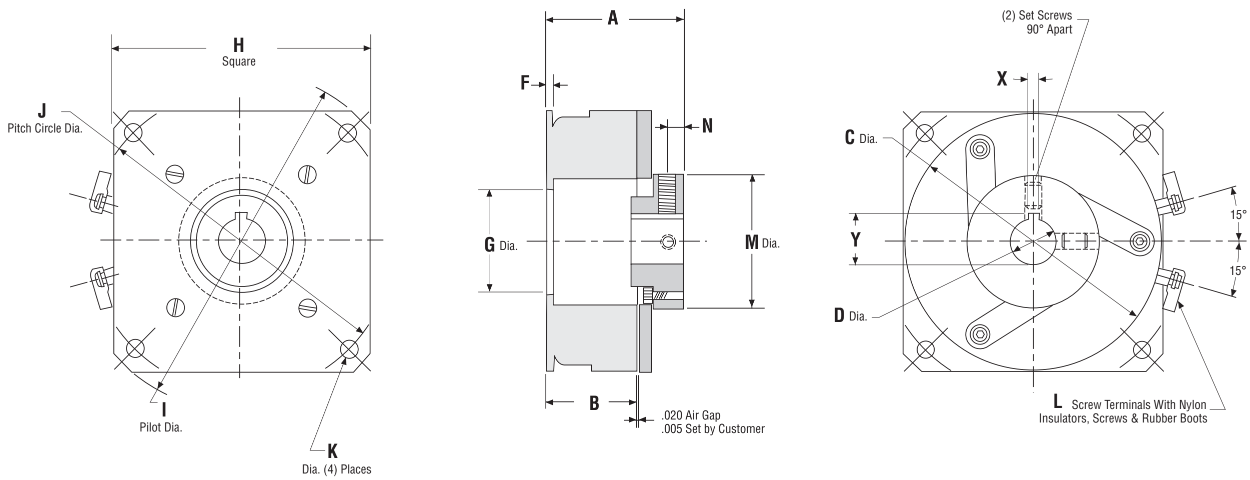
Mechanical

Model No.	Static Torque lb. – in.	Inertia lb. – in.² Arm & Hub	Wt. oz.
090	2.5	.0011	2.0
110	6	.0024	3.2
150	10	.026	3.8
180	15	.031	11
200	25	.042	12
225	50	.070	20
265	80	.320	28

Electrical

Model No.	90 VDC Amps	90 VDC Ohms	24 VDC Amps	24 VDC Ohms	12 VDC Amps	12 VDC Ohms
090	.049	1970	.117	205	.246	48.8
110	.047	1930	.198	121	.447	26.8
150	.042	2150	.183	132	.380	31.6
180	.066	1369	.289	83	.561	21.4
200	.074	1213	.322	74.4	.574	20.9
225	.079	1140	.322	74.6	.628	19.1
265	.092	980	.374	64.2	.760	15.8

Flange Mounted Brake
Models 325-425



Dimensions

Model No.	A Max.	B Nom.	C Max.	D Nom.	F Max.	G ± .001	H Max.	I ± .001	J Nom.	K Min.	L	Hub Keyway Bore	Nominal Keyway X	Nominal Keyway Y	M Nom.	N Max.
325	1.900	1.310	3.268	1/2 5/8 3/4	.097	1.751	3.200	4.186	3.750	.182	Screw Terminals	1/2 5/8 3/4	.125 – .128 .1885 – .1905 .1885 – .1905	.560 – .567 .709 – .716 .836 – .844	1.825	.150
425	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 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	2.195	.250

Mechanical

Model No.	Static Torque lb. – in.	Inertia lb. – in.^{2} Arm & Hub	Wt. oz.
325	125	.561	35
425	250	2.30	60

Electrical

Model No.	90 VDC Amps	90 VDC Ohms	24 VDC Amps	24 VDC Ohms	12 VDC Amps	12 VDC Ohms
325	.091	988	.378	65.3	.729	16.5
425	.124	722	.468	51.2	.934	12.84

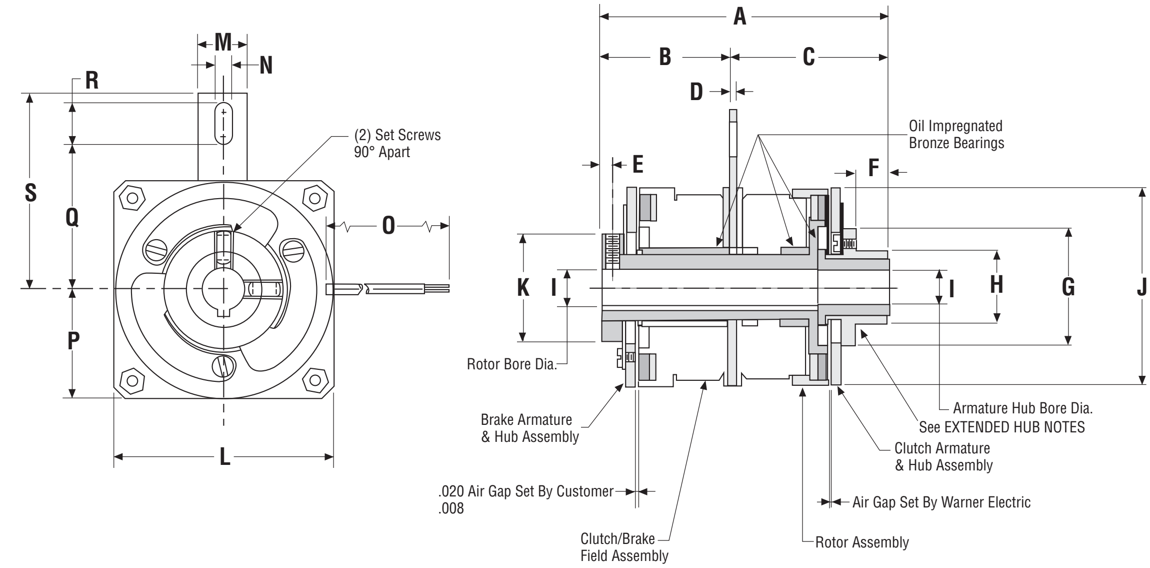
Lead wire is UL recognized style 1213, 1015 or 1430, 22 gage.
Insulation is .050" O.D. on 090, 110, 150 units; .064" or .095" O.D. on all other units.

Customer shall maintain:

- Squareness of the brake mounting surface with armature shaft within .005 T.I.R.
- Concentricity between the brake mounting pilot diameter and the shaft not to exceed .010 T.I.R.
- Initial air gap setting of .005 - .020 inches.

Stationary Field Clutch/Flange Mount Brake Combination For Parallel Shaft Application

Models 110-265



Dimensions

Model No.	A Max.	B Ref.	C Nom.	D Max.	E Nom.	F Max.	G Max.	H ± .002	I Nom.	J Max.	K Max.	L Max.	M Max.	N Min.	O ± .500	P Max.	Q Min.	R Min.	S Max.	Keyways: Bore	Keyways: Nominal Keyway	
110	2.225	.974	1.229	.051	.094	.410	.700	.506 Knurl	1/4 5/16	1.160	.700	1.240	.520	.140	12.00	.630	.630	.300	1.050	N.A.	Set Screws Only	
180	2.855	1.245	1.590	.066	.114	.390	1.207	.622	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
200	2.993	1.258	1.715	.066	.114	.475	1.207	.622	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
225	3.737	1.722	1.995	.093	.115	.450	1.453	.872	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
265	4.050	1.778	2.240	.093	.150	.427	1.610	.998	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

EXTENDED HUB NOTES:

1. Extended armature hubs Models 180 and 200 (3) #4-40 tapped holes on a .812 BC
2. Extended armature hub Model 225 (3) #6-32 tapped holes on a 1.187 BC
3. Extended armature hub Model 265 (3) #8-32 tapped holes on a 1.375 BC

Mechanical (SFPB & SFPBC)

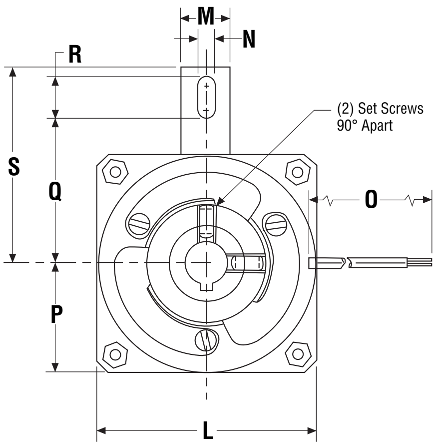
Model No.	Static Torque lb. – in.	Inertia lb. – in.² Rotor	Inertia lb. – in.² Arm & Hub	Wt. oz.
110	6	.0089	.0029 .0024	7
180	15	.098	.0360 .0310	22
200	25	.129	.0470 .0420	25
225	50	.295	.0790 .0700	45
265	80	.660	.2920 .3200	60

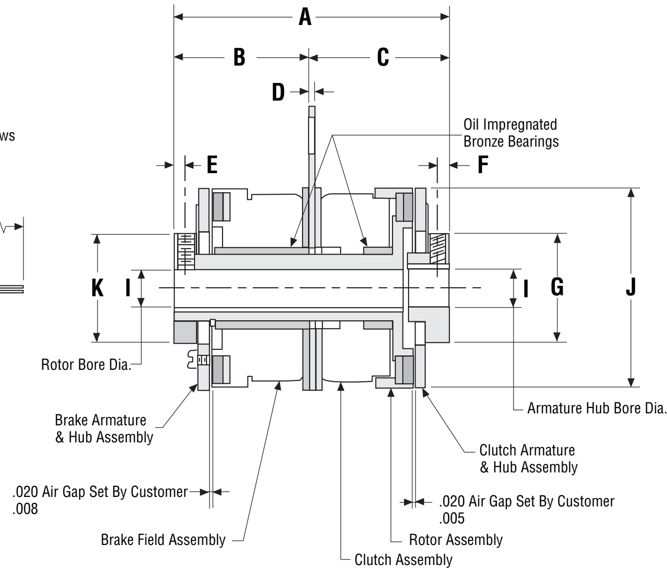
Customer shall maintain:

- A loose-fitting pin through the anti-rotation tab to prevent preloading the bearings.
- Initial air gap setting of .008 - .020 inches.

Stationary Field Clutch Coupling/Flange Mount Brake Combination For In-Line Shaft Application

Models 110-265





Dimensions

Model No.	A Max.	B Ref.	C Nom.	D Max.	E Nom.	F Nom.	G Max.	H Nom.	I Nom.	J Max.	K Max.	L Max.	M Max.	N Min.	O ± .500	P Max.	Q Min.	R Min.	S Max.	Keyways Bore	Keyways Nominal Keyway	
110	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	
180	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
200	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
225	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
265	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

Electrical (SFPB & SFPBC)

Model No.	90 VDC Amps	90 VDC Ohms	24 VDC Amps	24 VDC Ohms	12 VDC Amps	12 VDC Ohms
110	.047	1930	.198	121	.447	26.8
180	.066	1369	.289	83	.561	21.4
200	.074	1213	.322	74.4	.574	20.9
225	.079	1140	.322	74.6	.628	19.1
265	.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 110 unit; .064" or .095" O.D. on all other units.

Customer shall maintain:

- A loose-fitting pin through the anti-rotation tab to prevent preloading the bearings.
- Contentricity between the shafts within .005 T.I.R.
- Initial air gap setting of .008 - .020 inches.

Determining the Clutch or Brake Size

First, determine which style clutch or brake you need. The type of unit selected depends upon the function to be performed.

Next, determine the size of the clutch or brake. 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

Warner Electric clutches and brakes are rated by static torque. The clutch or brake size can also be determined using the selection chart. Find the intersection of the prime mover horsepower (HP) and shaft speed at the brake using the selection chart on Page 3. The relationship between the horsepower and speed 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.

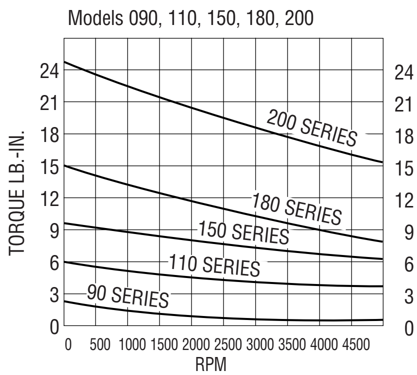
P = Horsepower, HP

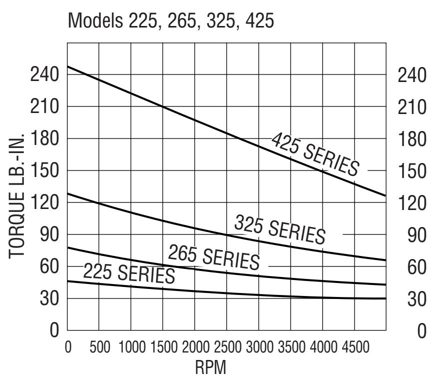
N = Shaft Speed

S.F. = Service Factor

63,025 = Constant

Dynamic Torque Curve

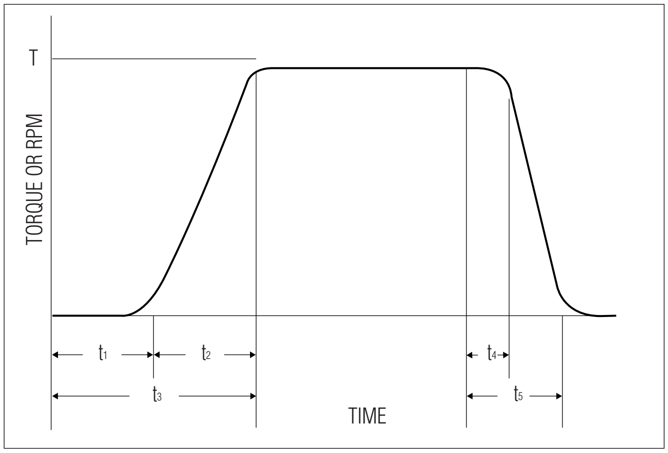




Torque Data

CLUTCHES: CLUTCH COUPLINGS: POWER ON BRAKES			
MODELS	TYPICAL OUT-OF-BOX TORQUES LB. – IN.	RATED STATIC TORQUES LB. – IN.	TYPICAL TORQUES AFTER BURNISHING LB. – IN.
090	2	2.5	3
110	5	6	8
150	8	10	15
180	12	15	20
200	20	25	30
225	40	50	60
265	65	80	90
325	100	125	150
425	225	250	275

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

Response Times

MODEL	RATED STATIC TORQUE LB. – IN.	TORQUE BUILD-UP TIME MILLISECONDS		TORQUE DECAY TIME MS
		80% OF RATED TORQUE	100% OF RATED TORQUE	10% OF RATED TORQUE
090	2.5	4.8	7.5	6.6
110	6	7.2	10.5	11
150	10	9	12	17
180	15	10	14	14
200	25	33	48	35
225	50	27	42	20
265	80	22	40	30
325	125	43	60	36
425	250	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.

How To Order

Building an Ordering Part Number is fast and easy using the Specifications charts on each product page. Simply select the clutch type, clutch size, bore size(s) and voltage you require.

Ordering Number System Example: SFC200-516-316-12

SFC	200	- 516	- 316	- 12	XX
Unit Type	**Unit Size**	**Input Bore Size**	**Output Bore Size**	**Voltage**	**Options**
SF	090	1/8 = 18	1/8 = 18	6	
SFC	110	3/16 = 316	3/16 = 316	12	
SFP	150	1/4 = 14	1/4 = 14	24	
PB	180	5/16 = 516	5/16 = 516	90	
SFPB	200	3/8 = 38	3/8 = 38		
SFPBC	225	1/2 = 12	1/2 = 12		
	265	5/8 = 58	5/8 = 58		
	325	3/4 = 34	3/4 = 34		
	425	7/8 = 78	7/8 = 78		
		1.0 = 1	1.0 = 1		

Other products available from Altra Industrial Motion

Clutches and Brakes

Warner Electric designed and patented the first electromagnetic clutch/brake over seventy years ago, and has led every major innovation since. Every product in Warner Electric's extensive offering is designed for long life, exceptional reliability, and low cost of operation. Models are available to meet the demands of applications throughout the world.

Enclosed Gear Drives

Boston Gear's comprehensive line of enclosed gear drives, including worm, in-line and parallel-shaft helical, miter, and bevel, provides the product variety you need to get the job done. Boston Gear's speed reducers are preferred by manufacturers worldwide. In fact, every time you specify a Boston Gear product, you incorporate quality, responsiveness, and Boston Gear's 123-year reputation into your design.

Electrically Released Brakes

Spring-set designs are available for stopping or holding a load in the event of a power failure; or choose permanent magnet designs for dynamic stopping or cycling moving loads. Choose from C-face, UniModule or Electro Module series brakes available in shaft mounted or flange mounted designs with a torque range from 35 lb. in. to 400 lb. ft.

Precision Couplings

Huco is recognized as the world leader in the specialized field of precision couplings. By engineering plastics in combination with metals, to develop a full range of innovative misalignment couplings, Huco has achieved an enviable record of application engineering success and a reputation for quality products and service.

Linear Actuators

Rugged, energy efficient A-Track linear actuators from Warner Electric have been carefully designed to provide long-lasting, maintenance free operation in light, moderate and heavy-duty applications both in-plant and mobile in all types of conditions worldwide. Models are available with Acme and Ball Screw drives to meet specific requirements.

Precision Gearheads

Boston Gear's unique motor adapter and bushing module system design allow for quick and easy mounting of our gearheads to all popular servomotors. These stainless steel precision gearheads provide almost zero backlash with virtually no slippage. In-line, right angle and high speed models are available.

Magnetic Headsets

The Precision Tork™ line of hysteresis capping clutches from Warner Electric, utilizes the most efficient torque control technology on the market to provide extremely smooth, consistent application of torque with less adjustment and downtime.

Bearing Products

When you want the freedom to select from the widest range of the highest quality bearings, come to the power transmission specialists at Boston Gear. Everything from plain sleeve bearings, ball bearings, rod ends, and spherical bearings to linear bearings, pillow blocks and flanged units are in stock.

Open Gearing

Boston Gear has been a leader and pioneer in manufacturing gearing products since 1877, when we introduced the concept of gear standardization and stock gears - innovations of enormous benefit to power transmission system designers, specifiers, and users. Today, Boston Gear manufactures a wide range of open gearing solutions to meet your specific needs.

ALTRA INDUSTRIAL MOTION

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For application assistance:
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For sales office:
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260-244-6183

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P-1630-WE 2/08 Printed in USA