CLUTCHES AND BRAKES

A natural addition to constant speed motor/reductor drives and adjustable speed Ratiotrol systems, these products fill a need where high inertial loads exist or frequent starts and stops exceed the capabilities of standard motors.

These products are comprised of four groups; C-face clutch/brakes, C-face clutches, foot-mounted clutch-brakes and shaft-mounted clutches, brakes and combination clutch-brakes.

Boston Clutch and Brake products are a result of many years of manufacturing and application experience resulting in a reliable, rugged and sound design providing maximum performance and life.

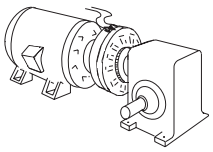
TABLE OF CONTENTS

General Information

These are a few common applications. Clutches and Brakes may be used wherever control of linear or rotary motion starts and stops are required.

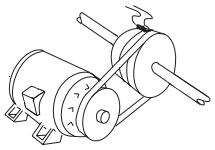
Electric clutches and brakes perform controlled start and stop functions between a constantly-running prime mover and a load. Electrical commands are generated manually (pushbutton) or automatically (switch, photocell, tape, sequence programmer, etc.)

CLUTCH – *Acceleration*



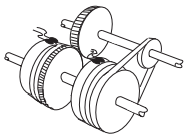
NO SHOCK

In this split-shaft application, the field and rotor are mounted to a motor and the armature to a reducer input shaft. A low setting of the potentiometer on the control allows the clutch to engage the reducer worm gears smoothly, eliminating shock to the machine system.



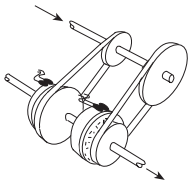
HIGH RESPONSE

In this thru-shaft application, the potentiometer is set to full current. Engaging the clutch produces millisecond power transmission from motor to driven shaft.



REVERSING

In this application, the rotational direction of the driven shaft is determined by engaging different clutches.



SPEED CHANGING

The speed of the driven shaft is determined by engaging the appropriate clutch.

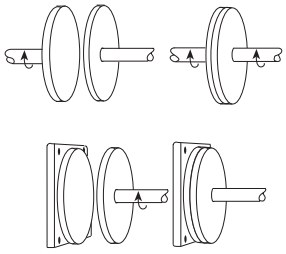
CLUTCH & BRAKE BASICS

DC clutches and brakes are magnetically-activated mechanical power transmission members normally installed between a motor shaft and driven shaft – either a speed reducer or the final driven shafts.

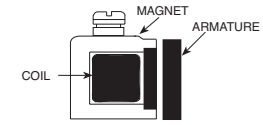
Both a clutch and brake transmit torque mechanically in response to an electrical signal.

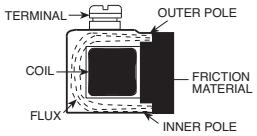
In a clutch, a disc on a revolving shaft is connected by magnetic attraction to a disc on a stationary shaft thus starting the drive.

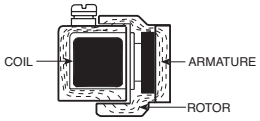
In a brake, one disc is fixed and magnetic attraction stops the revolving disc.



THE DISCS ARE CONNECTED BY MEANS OF ELECTRO-MAGNETIC ATTRACTION





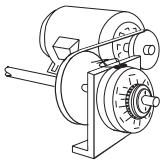


In a brake, one disc (the magnet) contains a coil embedded in a circular horseshoe shaped cavity. The other disc (the armature) consists of segments of iron attached to backing plate.

A friction face is embedded in the magnet of the brake between the inner pole and the outer pole. When direct current is applied to the coil, magnetic force attracts the armature to the magnet.

In the clutch, the magnet is stationary and the magnetic flux passes across an airgap and through a rotating rotor into the armature.

BRAKE – *Deceleration*



NO SHOCK

Potentiometer low: controlled stop.

HIGH RESPONSE

Potentiometer full: fast precise stop.

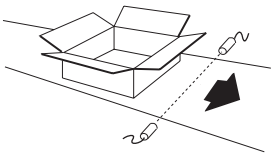
EMERGENCY STOP

Signal to brake brings malfunctioning system to a fast stop.

HOLDING

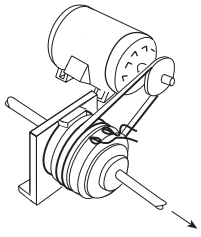
Fully engaged brake holds machine in stopped position.

CLUTCH/BRAKE



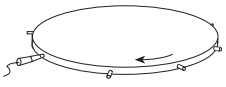
LINEAR POSITIONING

Carton breaks the beam, disengaging the clutch, engaging the brake. Carton (counter timer, pressure switch, etc.) disengages the brake, engages the clutch.



JOGGING

Pushbutton IN, clutch is ON; button OUT, clutch is disengaged and brake is ON. Common in machine setup and registration controls.



ROTARY INDEXING

Proximity switch disengages the clutch, engages the brake for precise positioning.

CYCLING

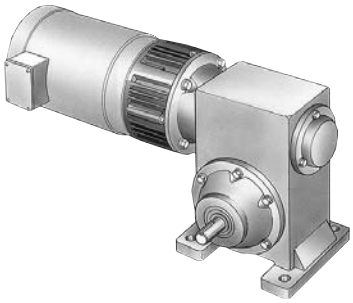
Programmed sequencer alternately engages the clutch and brake, producing programmed start-stop sequence.

C-Face Mounted
90 VDC

Clutches - CC Series
Clutch Brakes - CBC Series

"CC" clutch and "CBC" clutch/brake modules may be mounted directly to NEMA C-face motors and reducers. (Modules have 90VDC coils)

NEMA C-Face Mounting

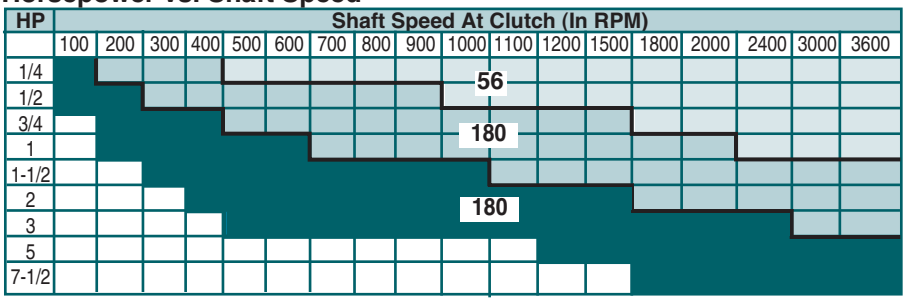


An optional conduit box is available. It has two conduit connection holes for 1/2" standard conduit connectors.

To select the correct module package:

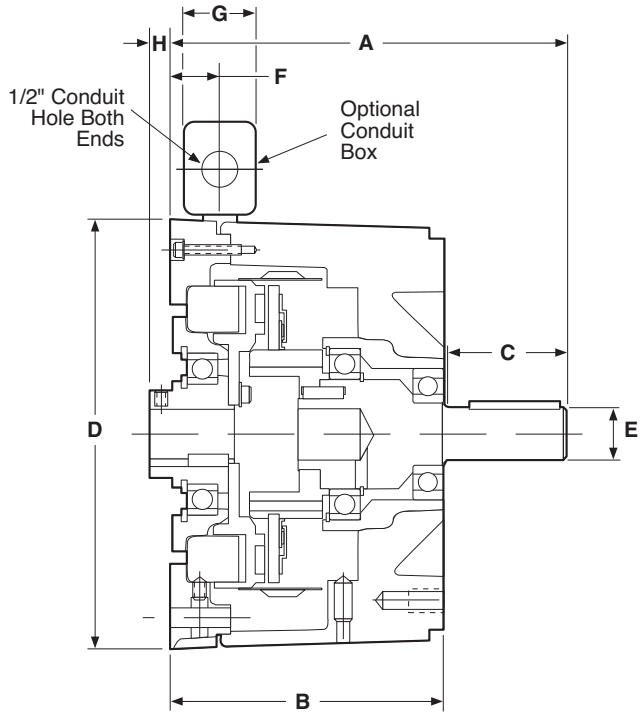
1. Determine the frame size, horsepower and output rpm of your motor.
2. Choose the right size module from the horsepower versus shaft speed chart and the NEMA mounting flange.

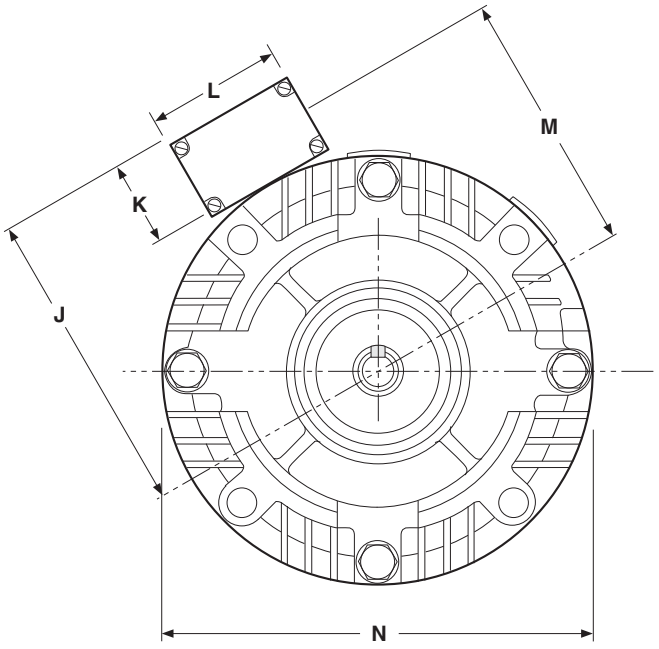
Horsepower vs. Shaft Speed



ORDER BY CATALOG NUMBER OR ITEM CODE

Static Torque (Lb. Ft.)	Maximum Motor HP 3600 RPM	NEMA-C Frame	Reducer Bore Code	Approx. Weight (lbs)		CC Series Clutches		CBC Series Clutch Brakes	
				CC Series	CBC Series	Catalog Number	Item Code	Catalog Number	Item Code
16	1	56C/48Y	B5	8.3	10.0	CC56-16A	82904	CBC56-16A	82907
30	3	143TC, 145TC, 182C, 184C	B7	10.3	13.2	CC180-30A	82905	CBC180-30A	82908
95	7.5	182TC, 184TC, 213C, 215C	B9	24.3	30.6	CC210-95A	82906	CBC210-95A	82909





All dimensions are nominal, unless otherwise noted.

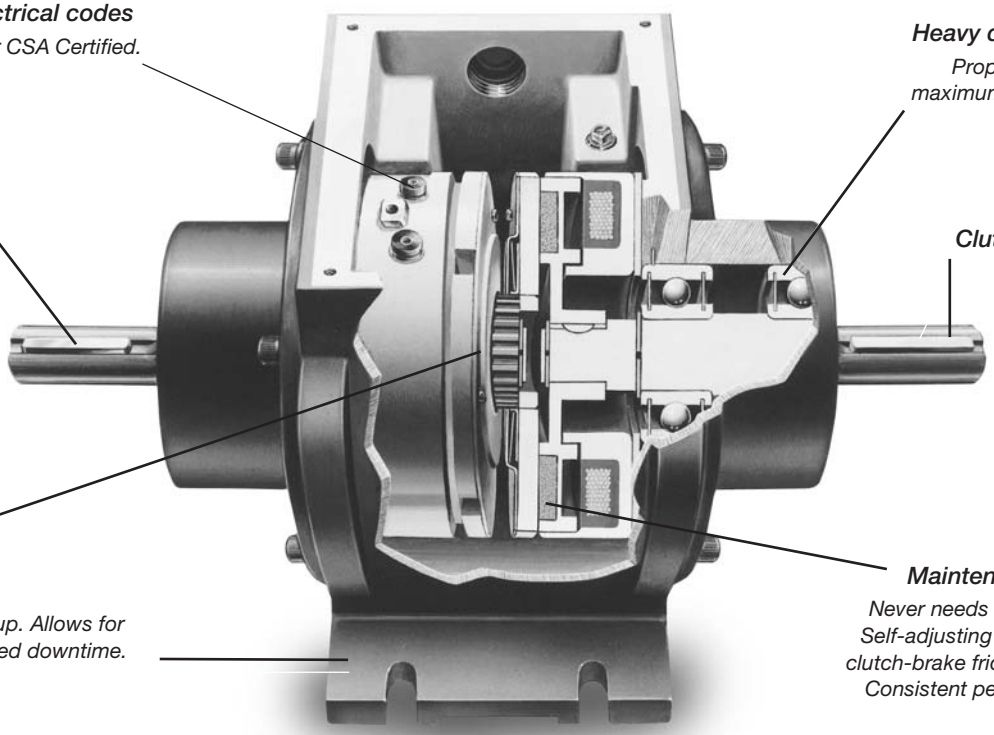
SIZE*	A	B	C	D	E	F	G	H
56 - 16A	6.750	4.844	1.813	6.750	.625	.937	2.203	----
180 - 30A	6.828	4.844	1.891	6.750	.875	.937	2.203	----
210 - 95A	8.891	5.922	2.500	9.250	1.125	.500	2.203	.500

SIZE*	J	K	L	M	N
56 - 16A	5.531	2.188	3.250	4.438	6.688
180 - 30A	5.531	2.188	3.250	4.438	6.688
210 - 95A	6.859	2.188	3.250	5.766	9.688

* Dimensions are the same for “CC” and “CBC” Series

Foot Mounted

Clutch Brakes - CBF Series
90 VDC



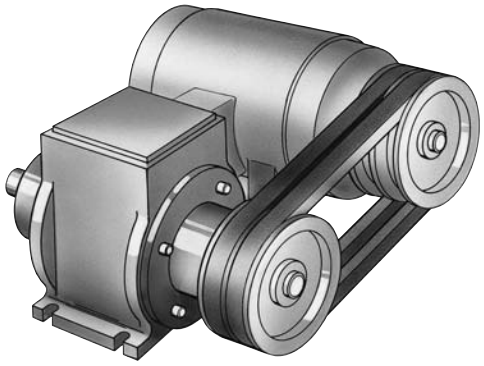
CBF Modules are rugged, pre-assembled clutch and brake combinations in an enclosed, foot mounted housing.

They are factory aligned and pre-assembled and have been designed to mate easily with industry standard motors and reducers with v-belts, pulleys, chain and sprockets, in line couplings and timing belt drives.

FEATURES

- Bolt-it-down and wire-it-up . . . it's ready to go!
- Maintenance free
- Torque range from 22.5 lb. ft. to 50 lb. ft.

TYPICAL APPLICATION

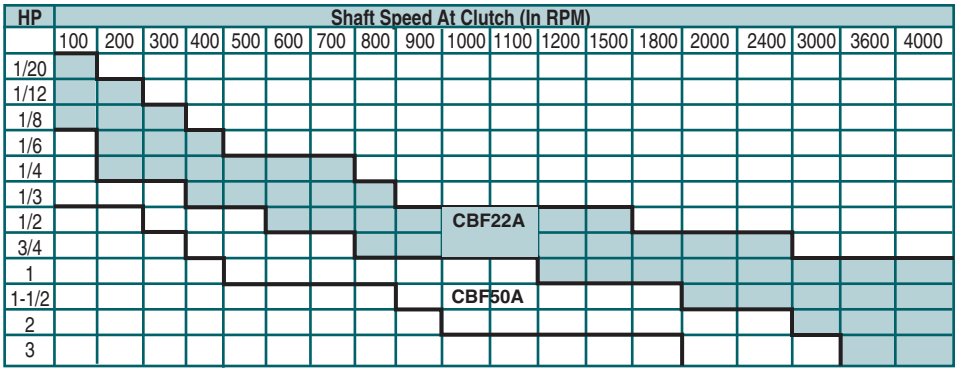


A foot mounted module combines with a motor in a parallel shaft drive application.

SELECTION PROCEDURE

Determine the shaft speed at the clutch/brake module. The number listed at the intersection of horsepower and speed is the size clutch/brake module you require.

Horsepower vs. Shaft Speed



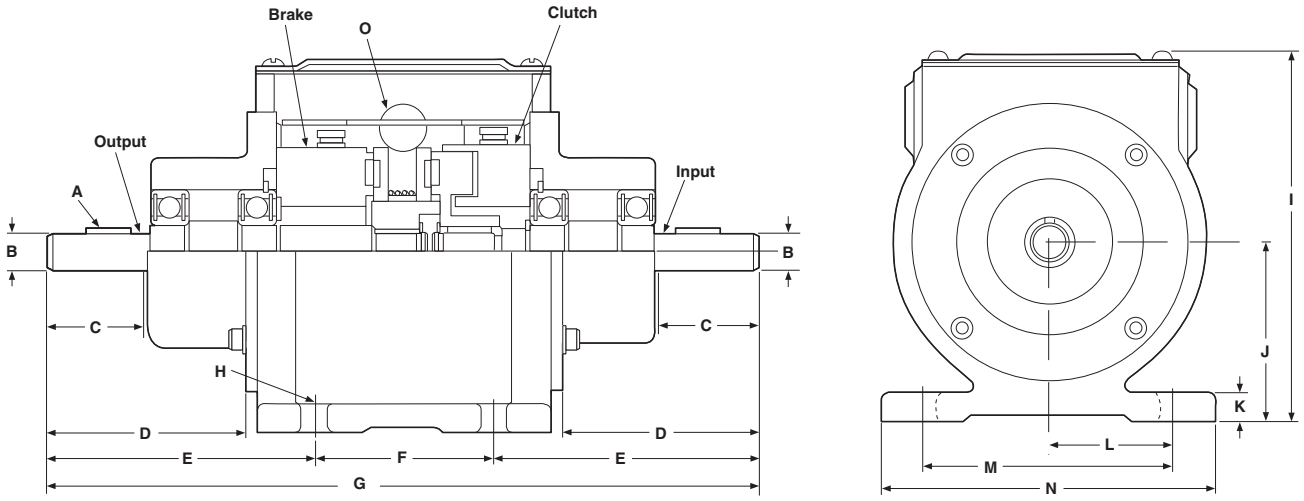
ORDER BY CATALOG NUMBER OR ITEM CODE

Static Torque (Lb. Ft.)	Max. RPM	Approx. Weight (Lbs.)	Totally Enclosed	
			Catalog Number	Item Code
22.5	4500	19.7	CBF22A	82902
50*	4000	56	CBF50A	82903

*Clutch is rated 40 Lb. Ft., brake is rated 50 Lb. Ft.

Foot Mounted

Clutch Brakes - CBF Series
90 VDC

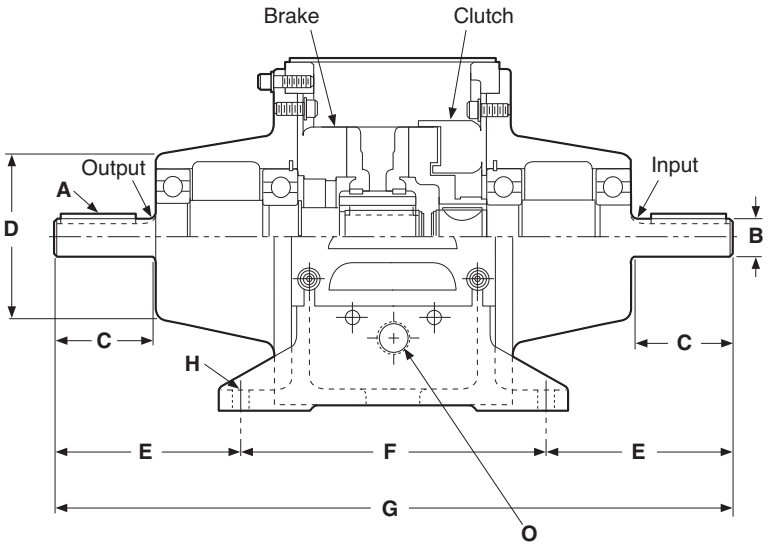


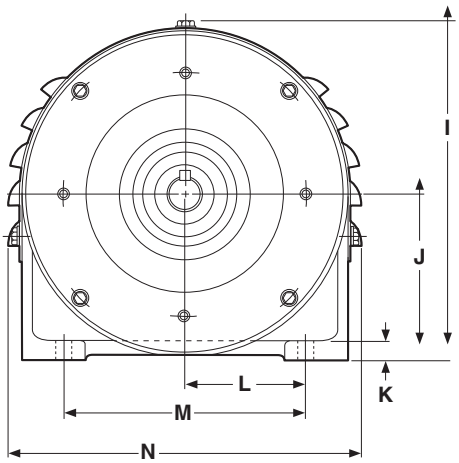
Size	A	B	C Min.	D	E	F	G Max.	H
CBF22A	3/16 x 3/16 x 1-1/2	.7495 / .7485	1.875	3.515	4.593	2.500	11.781	.312 Wide (4 slots)

Size	I	J	K	L	M	N	O
CBF22A	6.937	.3474 / .3464	.500	2.578	5.156	6.000	1/2 conduit x 2

SPECIFICATIONS

Size	Static Torque (lb. ft.)	Inertia-WR (lb-in²)			Max. RPM	Weight lbs.
		Output		Input		
CBF22A	270	2.566	2.222	19.7	4500	





Size	A	B Dia.	C Min.	D Max. Dia.	E	F	G Max.
CBF50A	3/16 X 3/16 1-3/4	.8750 .8745	2.218	3.796	4.234	7.000	15.515

Size	H Dia.	I	J	K	L	M	N Max.	O
CBF50A	.406 (4 holes)	8.218	4.004 3.992	5.00	2.937	5.875	8.734	1/2 conduit x 2

SPECIFICATIONS

Size	Unit	Static Torque (lb. ft.)	Inertia-WR²(lb-ft²)		Max. RPM	Weight lbs.
CBF50A	Clutch 40	50	2.222		4000	56
Brake			Output	Input		
			.063	.039		

DC Shaft Mounted Selection

Clutch and brake components for shaft-mounting provide flexible arrangements to satisfy almost any mechanical arrangement where power transmission capabilities are required.

The most common arrangement is the bearing-mounted ***split-shaft*** application used to couple two in-line shafts.

Clutches for ***through-mounting*** utilize bearing mounted sprockets or pulleys to drive ***parallel*** shafts.

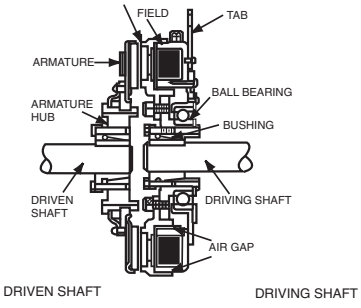
Brakes are ***flanged mounted*** with the field held stationary on a machine member.

Clutch brakes are bearing-mounted for split-shaft coupling.

For application engineering see Pages 113-127.

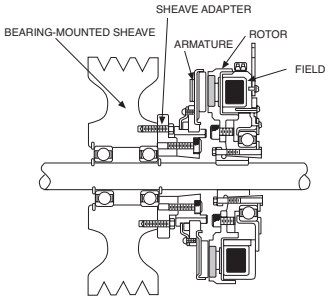
CLUTCH, BEARING-MOUNTED, SPLIT SHAFT (TYPE S)

Clutches consist of a field, rotor, armature and its hub. The field is mounted on sealed ball bearings and remains stationary while the rotor revolves. The rotor extends through the field assembly and is attached to the drive shaft by a bushing, in many sizes. A small tab holds the field stationary. The armature is mounted on a splined hub held on the shaft by standard tapered bushings.



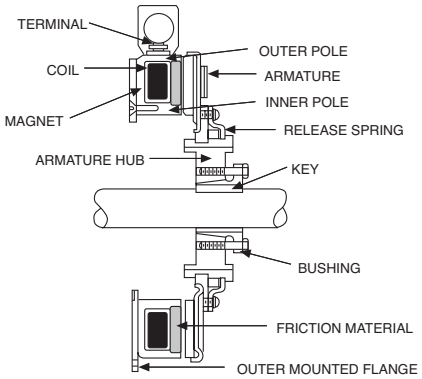
CLUTCH, BEARING MOUNTED, THROUGH SHAFT (TYPE T)

The through-shaft mounting of the field and rotor is as described for the split-shaft version. The armature in this application is mounted to a bearing mounted sheave, sprocket or gear. A special sheave adapter is necessary to assist in the mounting of the armature sheave. (Typical C50 and larger)



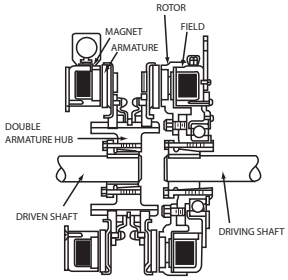
BRAKE, FLANGE MOUNTED

The magnet is mounted to a machine member, or a stationary mounting plate by inner or outer mounted flanges. The space available determines which flange to use. Terminals are wired directly to the brake control terminals. The armature rides on a splined drive hub. Standard tapered bushings secure the hub to the rotating shaft, in most units.



CLUTCH BRAKE

When the clutch field is energized and the brake coil is de-energized, the clutch and brake armatures rotate with the drive shaft. When the clutch coil is de-energized and the brake coil energized, the two armatures are stopped. The rotor continues to turn. Operation is the same whether the clutch is bearing or flange mounted.



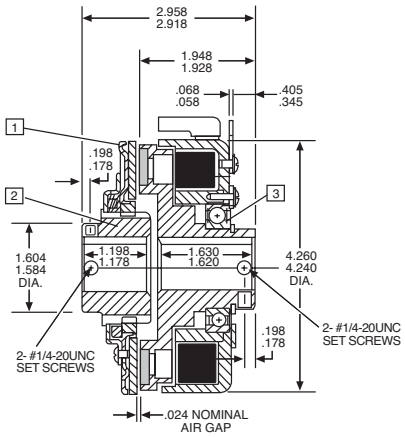
RATINGS

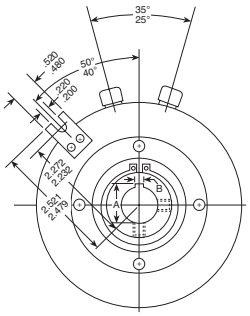
Static Torque: 20 Lb. Ft.
Maximum Speed: 4500 RPM
Voltage: 90 VDC
Resistance at 20°C: 1087 ±5% ohms
Maximum Current: .087 Amps
Maximum Watts: 7.83
Coil Build-up: 95 ms
Coil Decay: 23 ms

INSTALLATION REQUIREMENTS — C20S

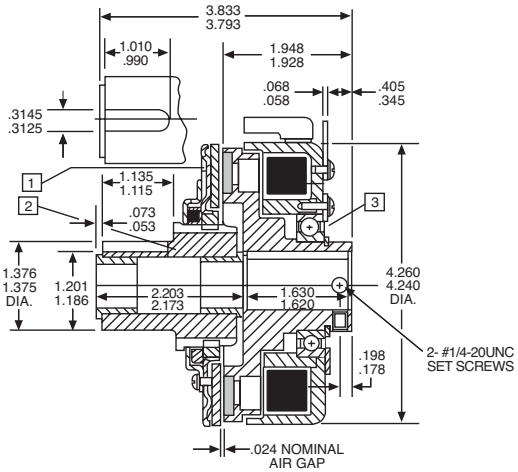
Angular alignment of shafts within .006" TIR at 5" diameter
Armature mounting shaft concentric with rotor mounting shaft within .003" TIR

SPLIT SHAFT MODELS — C20S





THROUGH SHAFT MODELS — C20T



AVERAGE WEIGHTS AND INERTIAS		
Part	**Wt. (lbs.)**	**Inertia (lb ft²)**
Field and Rotor	3.890	—
Field	2.343	—
Rotor 3/4 bore	1.547	.0159
Armature	.815	.0151
Armature hub (C20S)	.604	.0023
Armature hub (C20T)	.802	.0023
Total C20S	5.309	
Total C20T	5.507	

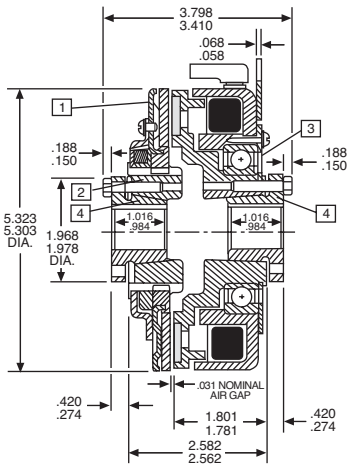
ALL DIMENSIONS IN INCHES					ORDER BY ITEM CODE			
STANDARD BORES		KEYWAY DIMENSIONS*			ITEM CODES			
					No. 1 Armature	No. 2 Armature Hub		No. 3 Field and Rotor Assembly
Nominal	Actual	Keyway	A	B	C20S/C20T	C20S	C20T	C20S/C20T
1/2	.5005/.5015	1/8 × 1/16	.560/.565	.126/.128		45062	45067	45070
5/8	.6255/.6270	3/16 × 3/32	.709/.715	.188/.190		45063	45068	45071
3/4	.7505/.7520	3/16 × 3/32	.837/.845	.188/.190	45061	45064	45069	45072
7/8†	.8755/.8770	3/16 × 3/32	.964/.970	.188/.190		45065	—	45073†
1 †	1.0005/1.0020	1/4 × 1/8	1.114/1.122	.251/.253		45066	—	45074†

*Armature Hub Data not applicable to C20T.
†Not applicable to C20T.
HOW TO ORDER: Specify Item Codes for Armature, Armature Hub (desired bore) and Field and Rotor Assembly (desired bore) for desired Type, C20S or C20T.

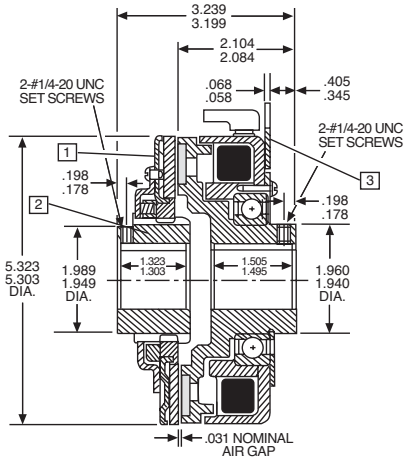
Clutches

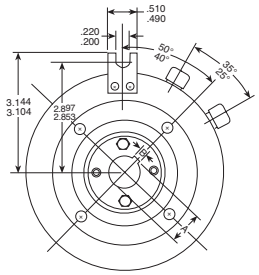
C50 Series
90 VDC

SPLIT SHAFT MODELS — C50S



1/2-1" BORES





1-1/8" & 1-1/4" BORES

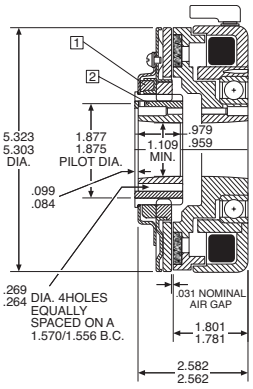
RATINGS

Static Torque: 50 Lb. Ft.
Maximum Speed: 4000 RPM
Voltage: 90 VDC
Resistance at 20°C: 237 ±5% ohms
Maximum Current: 400 Amps
Coil Build-up: 70 ms
Coil Decay: 15 ms

INSTALLATION REQUIREMENTS — C50S

Rotor shaft concentric with armature shaft within .004" TIR Angular misalignment of shafts within .008" TIR at 5" diameter.

THROUGH SHAFT MODELS — C50T



AVERAGE WEIGHTS AND INERTIAS		
Part	**Wt. (lbs.)**	**Inertia (lb ft²)**
Field and Rotor Assy	6.074	—
Field	3.408	—
Rotor 3/4" bore	2.666	.053
Armature	1.516	.044
Armature hub & 3/4" bushing	.958	.005
Total	8.548	—

ALL DIMENSIONS IN INCHES					ORDER BY ITEM CODE					
STANDARD BORES		KEYWAY DIMENSIONS			ITEM CODES					
					No. 1 Armature	No. 2 Armature Hub		No. 3 Field and Rotor Assembly		No. 4 Bushing*
Nominal	Actual	Keyway	A	B	C50S/C50T	C50S	C50T	C50S	C50T	C50S/C50T
1/2	.5000/.5015	—	.555/.565	.124/.126	45091	45092	45092	45095	45095	45163
5/8	.6250/.6265	—	.704/.714	.1865/.1885						45164
3/4	.7500/.7515	—	.832/.842	.1865/.1885						45165
7/8	.8750/.8765	—	.959/.969	.1865/.1885						45166
1	1.0000/1.0015	—	1.110/1.120	.250/.252						45167
1-1/8†	1.1255/1.1270	1/4 × 1/8	1.241/1.251	.251/.253		45093	—	45096	—	—
1-1/4†	1.2505/1.2520	1/4 × 1/8	1.367/1.377	.251/.253		45094	—	45097	—	—

*Two required for C50S Models, one for C50T Models.
†Not applicable to C50T Models.
HOW TO ORDER: Specify Item Codes for Armature, Armature Hub (desired bore), Field and Rotor Assembly and Bushing (desired bore and quantity required) for desired Type, C50S or C50T.

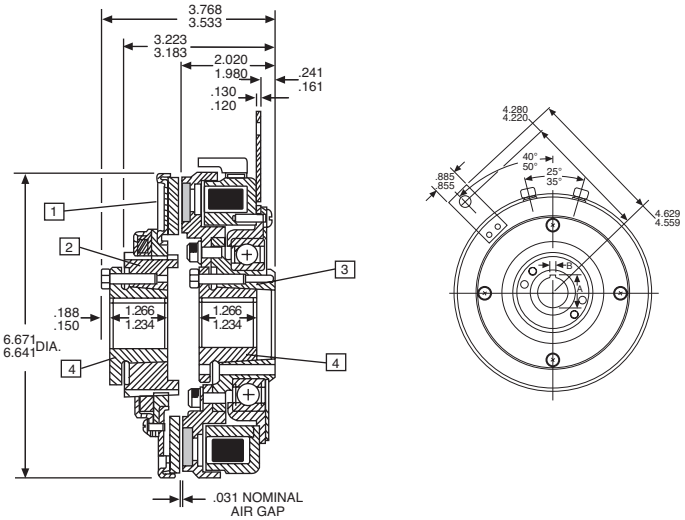
RATINGS

Static Torque: 100 Lb. Ft.
Maximum Speed: 3600 RPM
Voltage: 90 VDC
Resistance at 20°C: 202 ±5% ohms
Maximum Current: .469 Amps
Maximum Watts: 42.3
Coil Build-up: 65 ms
Coil Decay: 15 ms

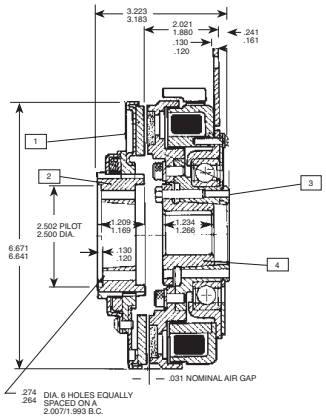
INSTALLATION REQUIREMENTS

Rotor shaft concentric with armature shaft within .004" TIR
Angular misalignment of shafts within .008" TIR at 5" diameter

SPLIT SHAFT MODELS — C100S



THROUGH SHAFT MODELS — C100T



AVERAGE WEIGHTS AND INERTIAS		
Part	**Wt. (lbs.)**	**Inertia (lb ft²)**
Field and Rotor Assy	10.90	—
Field	6.25	—
Rotor 3/4" bore	4.65	.123
Armature	2.43	.115
Armature hub & 3/4" bushings	1.79	.015
Total	15.12	

ALL DIMENSIONS IN INCHES				ORDER BY ITEM CODE			
STANDARD BORES		KEYWAY DIMENSIONS		ITEM CODES			
Nominal	Actual	A	B	No. 1 Armature C100S/C100T	No. 2 Armature Hub C100S/C100T	No. 3 Field and Rotor Assembly C100S/C100T	No. 4 Bushing* C100S/C100T
1/2	.5000/.5015	.555/.565	.124/.126	45119	45120	45121	45168
5/8	.6250/.6265	.704/.714	.1865/.1885				45169
3/4	.7500/.7515	.832/.842	.1865/.1885				45170
7/8	.8750/.8765	.959/.969	.1865/.1885				45171
1	1.0000/1.0015	1.110/1.120	.249/.251				45172
1-1/8	1.125/1.127	1.236/1.246	.249/.251				45173
1-1/4	1.250/1.252	1.300/1.310	.249/.251				45174
1-3/8	1.375/1.377	1.419/1.429	.3115/.3135				45175
1-1/2	1.500/1.502	1.540/1.570	.375/.377				45176

*Two required for C100S Models, one for C100T Models.
HOW TO ORDER: Specify Item Codes for Armature, Armature Hub, Field and Rotor Assembly and Bushing (desired bore and quantity required) for desired type, C100S or C100T.

Clutches

C150 Series
90 VDC

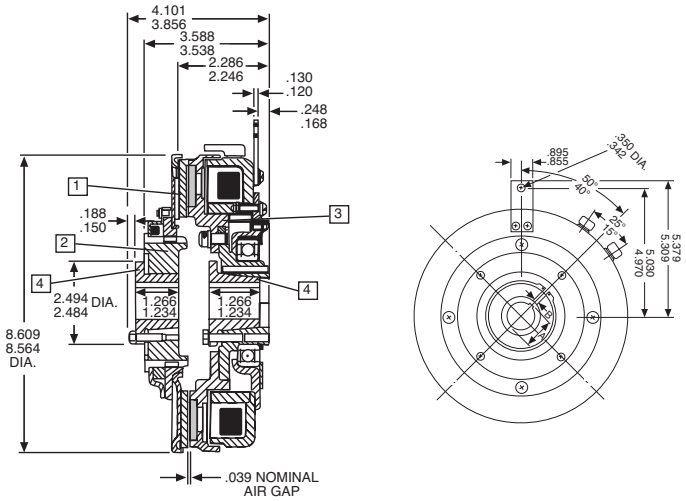
RATINGS

Static Torque: 150 Lb. Ft.
Maximum Speed: 3600 RPM
Voltage: 90 VDC
Resistance at 20°C: 219 ±5% ohms
Maximum Current: .433 Amps
Maximum Watts: 39
Coil Build-up: 155 ms
Coil Decay: 36 ms

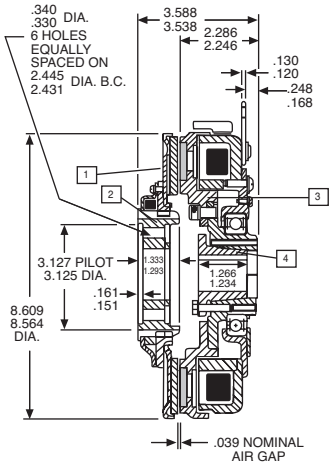
INSTALLATION REQUIREMENTS

Rotor shaft concentric with armature shaft within .006" TIR
Angular misalignment of shafts within .010" TIR at 8" diameter

SPLIT SHAFT MODELS — C150S



THROUGH SHAFT MODELS — C150T



AVERAGE WEIGHTS AND INERTIAS		
Part	**Wt. (lbs.)**	**Inertia (lb ft²)**
Field and Rotor Assy	18.33	—
Field	10.85	—
Rotor 3/4" bore	7.48	.354
Armature	4.85	.326
Armature hub & 3/4" bushings	2.74	.033
Total	25.92	

ALL DIMENSIONS IN INCHES				ORDER BY ITEM CODE			
STANDARD BORES		KEYWAY DIMENSIONS		ITEM CODES			
Nominal	Actual	A	B	No. 1 Armature C150S/C150T	No. 2 Armature Hub C150S/C150T	No. 3 Field and Rotor Assembly C150S/C150T	No. 4 Bushing* C150S/C150T
1/2	.5000/.5015	.555/.565	.124/.126	45136	45137	45138	45168
5/8	.6250/.6265	.704/.714	.1865/.1885				45169
3/4	.7500/.7515	.832/.842	.1865/.1885				45170
7/8	.8750/.8765	.959/.969	.1865/.1885				45171
1	1.0000/1.0015	1.110/1.120	.249/.251				45172
1-1/8	1.125/1.127	1.236/1.246	.249/.251				45173
1-1/4	1.250/1.252	1.300/1.310	.249/.251				45174
1-3/8	1.375/1.377	1.419/1.429	.3115/.3135				45175
1-1/2	1.500/1.502	1.540/1.570	.375/.377				45176

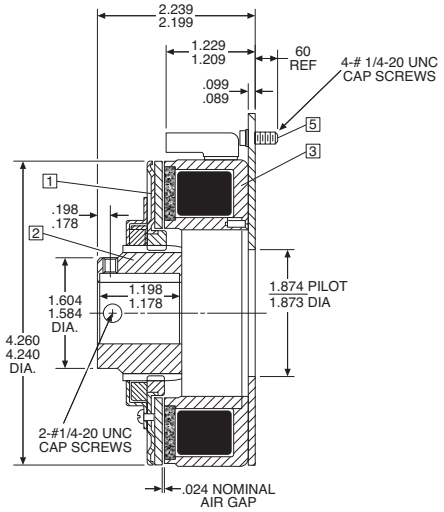
*Two required for C150S Models, one for C150T Models.
HOW TO ORDER: Specify Item Codes for Armature, Armature Hub, Field and Rotor Assembly and Bushing (desired bore and quantity required) for desired type C150S or C150T.

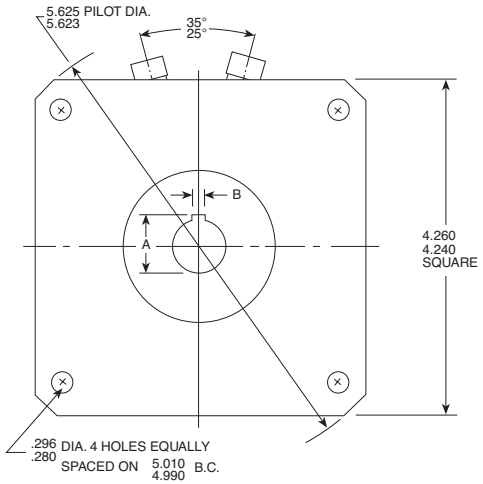
RATINGS

Static Torque: 20 Lb. Ft.
Maximum Speed: 4500 RPM
Voltage: 90 VDC
Resistance at 20°C: 1087 ±5% ohms
Maximum Current: .087 Amps
Maximum Watts: 7.83
Coil Build-up: 100 ms
Coil Decay: 22 ms

INSTALLATION REQUIREMENTS

Squareness of brake mounting surface with armature shaft within .006" TIR at 5" diameter.
Concentricity of brake mounting pilot diameter with armature shaft within .006" TIR.





AVERAGE WEIGHTS AND INERTIAS		
Part	**Wt. (lbs.)**	**Inertia (lb ft²)**
Field	2.586	—
Armature	.815	.0151
Armature hub	.604	.0023
Total	4.005	.0174

ALL DIMENSIONS IN INCHES					ORDER BY ITEM CODE			
STANDARD BORES		KEYWAY DIMENSIONS			ITEM CODES			
Nominal	**Actual**	**Keyway**	**A**	**B**	**No. 1 Armature**	**No. 2 Armature Hub**	**No. 3 Field Assembly Outside Mounted**	**No. 5 Field Mounting Hardware Outside Mounting**
1/2	.5005/.5015	1/8 × 1/16	.560/.565	.126/.128	45061	45062	45075	45081
5/8	.6255/.6270	3/16 × 3/32	.709/.715	.188/.190		45063		
3/4	.7505/.7520	3/16 × 3/32	.837/.845	.188/.190		45064		
7/8	.8755/.8770	3/16 × 3/32	.964/.970	.188/.190		45065		
1	1.0005/1.0020	1/4 × 1/8	1.114/1.122	.251/.253		45066		

HOW TO ORDER: Specify Item Codes for Armature, Armature Hub (desired bore), Field Assembly, and Field Mounting Hardware.

Brakes

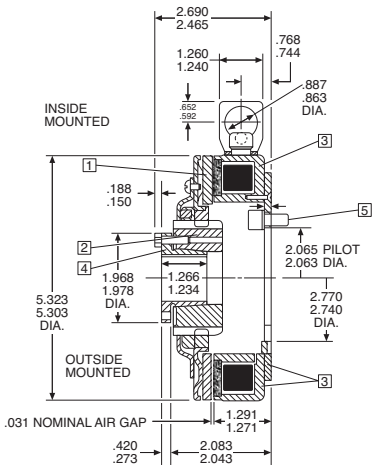
B50 Series
90 VDC

RATINGS

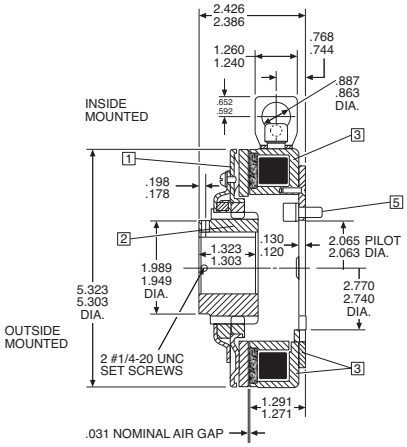
Static Torque: 50 Lb. Ft.
Maximum Speed: 4000 RPM
Voltage: 90 VDC
Resistance at 20°C: 237 ±5% ohms
Maximum Current: .400 Amps
Maximum Watts: 36
Coil Build-up: 65 ms
Coil Decay: 13 ms

INSTALLATION REQUIREMENTS

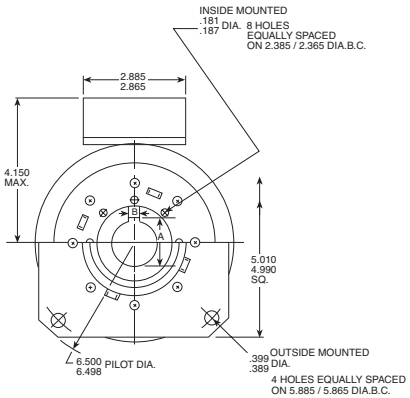
Squareness of brake mounting surface with armature shaft within .006" TIR at 4" diameter.
Concentricity of brake mounting pilot diameter with armature shaft within .010" TIR.



1/2" To 1" MODELS



1-1/8" AND 1-1/4" MODELS



AVERAGE WEIGHTS AND INERTIAS		
Part	**Wt. (lbs.)**	**Inertia (lb ft²)**
Field	3.763	—
Armature	1.516	.044
Armature hub	.958	.005
Total	6.237	.049

ALL DIMENSIONS IN INCHES					ORDER BY ITEM CODE						
STANDARD BORE			KEYWAY DIMENSIONS		ITEM CODES						
							No. 3 Field Assembly			No. 5 Field Mounting Hardware	
Nominal	Actual	Keyway	A	B	No. 1 Armature	No. 2 Armature Hub	Inside	Outside	No. 4 Bushing	Inside Mounting	Outside Mounting
1/2	.5000/.5015	—	.555/.565	.124/.126				45163			
5/8	.6250/.6265	—	.704/.714	.1865/.1885				45164			
3/4	.7500/.7515	—	.832/.842	.1865/.1885		45092		45165			
7/8	.8750/.8765	—	.959/.969	.1865/.1885	45091		45098	45099	45166	45107	45108
1	1.0000/1.0015	—	1.110/1.120	.250/.252				45167			
1-1/8	1.1255/1.1270	1/4 × 1/8	1.241/1.251	.251/.253		45093		—			
1-1/4	1.2505/1.2520	1/4 × 1/8	1.367/1.377	.251/.253		45094		—			

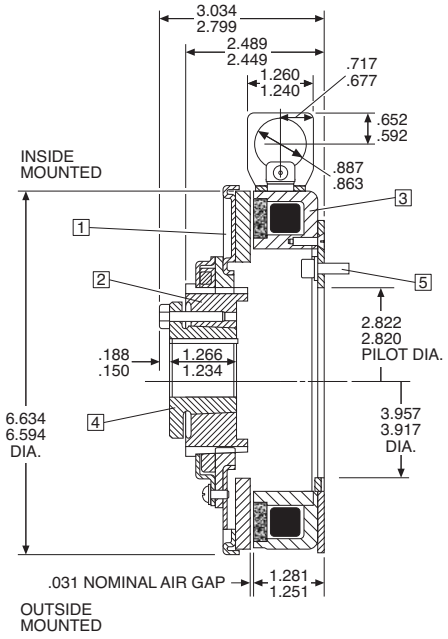
HOW TO ORDER: Specify Item Codes for Armature, Armature Hub (desired bore), Field Assembly, (inside or outside mounting) Bushing (desired bore) and Field Mounting Hardware.

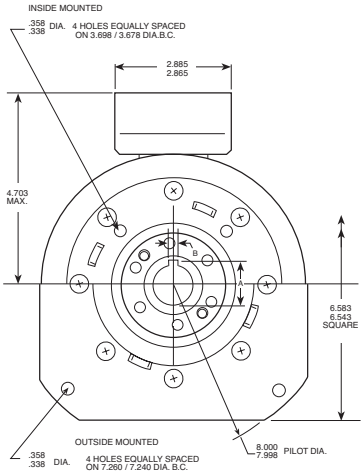
RATINGS

Static Torque: 100 Lb. Ft.
Maximum Speed: 3600 RPM
Voltage: 90 VDC
Resistance at 20°C: 202 ±5% ohms
Maximum Current: .469 Amps
Maximum Watts: 42.3
Coil Build-up: 76 ms
Coil Decay: 12 ms

INSTALLATION REQUIREMENTS

Squareness of brake mounting surface with armature shaft within .006" TIR at 5" diameter.
Concentricity of brake mounting pilot diameter with armature shaft within .010" TIR.





AVERAGE WEIGHTS AND INERTIAS		
Part	**Wt. (lbs.)**	**Inertia (lb ft²)**
Field	4.85	—
Armature	2.43	.115
Armature hub	1.79	.015
Total	9.07	.130

ALL DIMENSIONS IN INCHES				ORDER BY ITEM CODE						
STANDARD BORE		KEYWAY DIMENSIONS		ITEM CODES						
						No. 3 Field Assembly			No. 5 Field Mounting Hardware	
Nominal	Actual	A	B	No. 1 Armature	No. 2 Armature Hub	Inside Mounted	Outside Mounted	No. 4 Bushing	Inside Mounting	Outside Mounting
1/2	.5000/.5015	.555/.565	.124/.126					45168		
5/8	.6250/.6265	.704/.714	.1865/.1885					45169		
3/4	.7500/.7515	.832/.842	.1865/.1885					45170		
7/8	.8750/.8765	.959/.969	.1865/.1885					45171		
1	1.0000/1.0015	1.110/1.120	.249/.251	45119	45120	45122	45123	45172	45124	45124
1-1/8	1.125/1.127	1.236/1.246	.249/.251					45173		
1-1/4	1.250/1.252	1.300/1.310	.249/.251					45174		
1-3/8	1.375/1.377	1.419/1.429	.3115/.3135					45175		
1-1/2	1.500/1.502	1.540/1.570	.375/.377					45176		

HOW TO ORDER: Specify Item Codes for Armature, Armature Hub, Field Assembly (inside or outside mounting), Bushing (desired bore) and Field Mounting Hardware.

Brakes

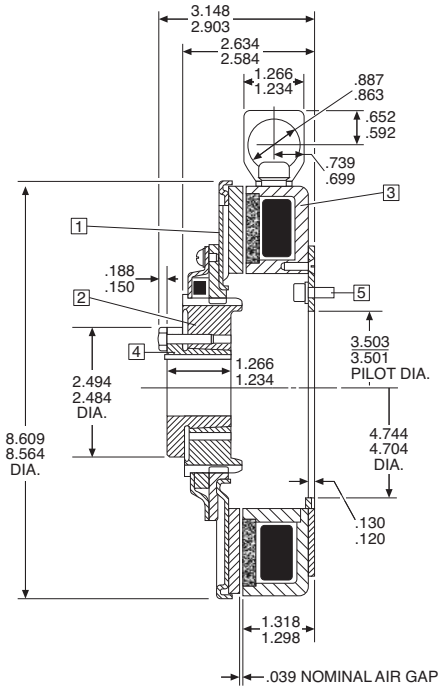
B150 Series
90 VDC

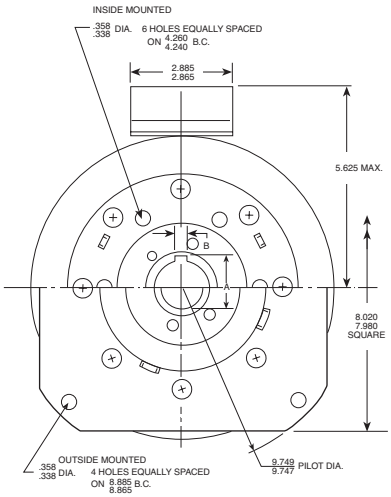
RATINGS

Static Torque: 150 Lb. Ft.
Maximum Speed: 3600 RPM
Voltage: 90 VDC
Resistance at 20°C: 219 ±5% ohms
Maximum Current: .433 Amps
Maximum Watts: 39
Coil Build-up: 110 ms
Coil Decay: 20 ms

INSTALLATION REQUIREMENTS

Squareness of brake mounting surface with armature shaft within .006" TIR at 6" diameter.
Concentricity of brake mounting pilot diameter with armature shaft within .010" TIR.





AVERAGE WEIGHTS AND INERTIAS		
Part	**Wt. (lbs.)**	**Inertia (lb ft²)**
Field	8.46	—
Armature	4.85	.326
Armature hub	2.74	.033
Total	16.05	.359

ALL DIMENSIONS IN INCHES				ORDER BY ITEM CODE						
STANDARD BORE		KEYWAY DIMENSIONS		ITEM CODES						
Nominal	Actual	A	B	No. 1 Armature	No. 2 Armature Hub	No. 3 Field Assembly Inside Mounted	No. 3 Field Assembly Outside Mounted	No. 4 Bushing	No. 5 Field Mounting Bushing Hardware Inside Mounting	No. 5 Field Mounting Bushing Hardware Outside Mounting
1/2	.5000/.5015	.555/.565	.124/.126					45168		
5/8	.6250/.6265	.704/.714	.1865/.1885					45169		
3/4	.7500/.7515	.832/.842	.1865/.1885					45170		
7/8	.8750/.8765	.959/.969	.1865/.1885					45171		
1	1.0000/1.0015	1.110/1.120	.249/.251	45136	45137	45139	45140	45172	45141	45124
1-1/8	1.125/1.127	1.236/1.246	.249/.251					45173		
1-1/4	1.250/1.252	1.300/1.310	.249/.251					45174		
1-3/8	1.375/1.377	1.419/1.429	.3115/.3135					45175		
1-1/2	1.500/1.502	1.540/1.570	.375/.377					45176		

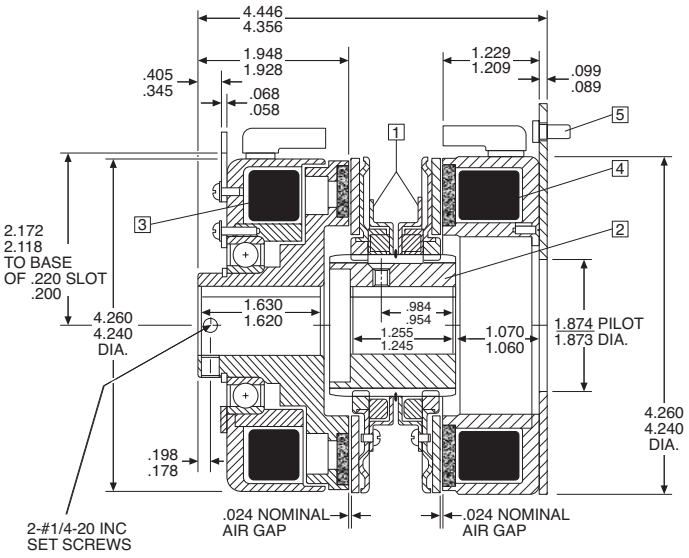
HOW TO ORDER: Specify Item Codes for Armature, Armature Hub (desired bore), Field Assembly (inside or outside mounting), Bushing (desired bore) and Field Mounting Hardware.

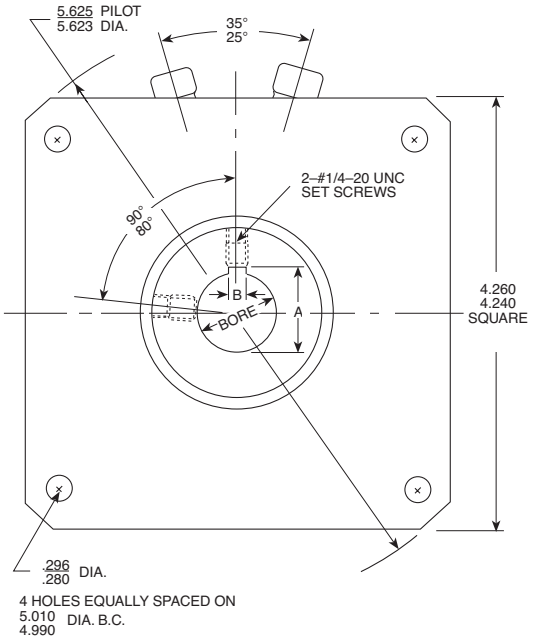
RATINGS

Static Torque: 20 Lb. Ft.
Maximum Speed: 4500 RPM
Average Weight: 9.01 Lbs.
Output Inertia: .0336 Lb. Ft.^{2}
Coil Build-up: (Clutch): 95 ms, (Brake): 100 ms
Coil Decay: (Clutch): 23 ms, (Brake): 22 ms
Voltage: 90 VDC
Maximum Watts: 7.83
Maximum Current: .087 Amps
Resistance at 20°C: 1087 ±5% ohms

INSTALLATION REQUIREMENTS

Angular alignment of shafts within .006" TIR at 5" diameter.
Shafts to be concentric within .003" TIR
Armature shaft square to brake mounting surface within .006" TIR at 5" diameter
Brake pilot diameter to be concentric with shaft within .006" TIR





ALL DIMENSIONS IN INCHES					ORDER BY ITEM CODE				
STANDARD BORES		KEYWAY DIMENSIONS			ITEM CODES				
Nominal	Actual	Keyway	A	B	No. 1 Armature (2 req'd.)	No. 2 Armature Hub	No. 3 Field Rotor Assembly	No. 4 Brake Field	No. 5 Brake Field Mounting Assy.
1/2	.5005/.5015	1/8 × 1/16	.560/.565	.126/.128		45076	45070		
5/8	.6255/.6270	3/16 × 3/32	.709/.715	.188/.190		45077	45071		
3/4	.7505/.7520	3/16 × 3/32	.837/.845	.188/.190	45061	45078	45072	45075	45081
7/8	.8755/.8790	3/16 × 3/32	.964/.970	.188/.190		45079	45073		
1	1.0005/1.0020	1/4 × 1/8	1.114/1.122	.251/.253		45080	45074		

HOW TO ORDER: Specify Item Codes for Armatures, Armature Hub (desired bore), Field Rotor Assembly (desired bore), Brake Field and Brake Field Mounting Assembly.

Clutch/Brakes

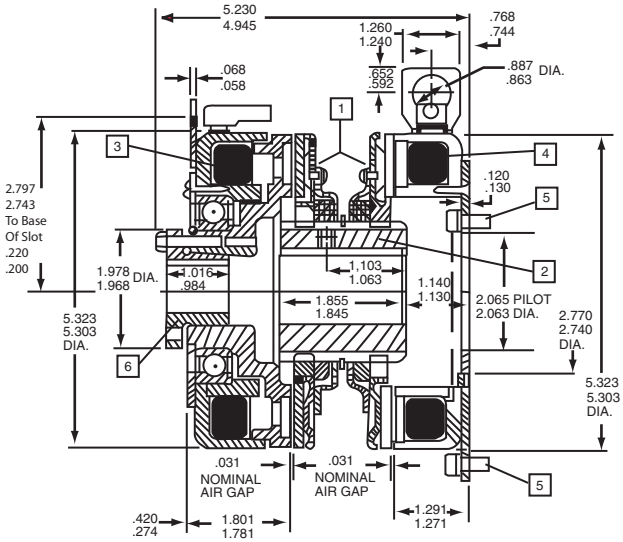
CB-50S Series
90 VDC

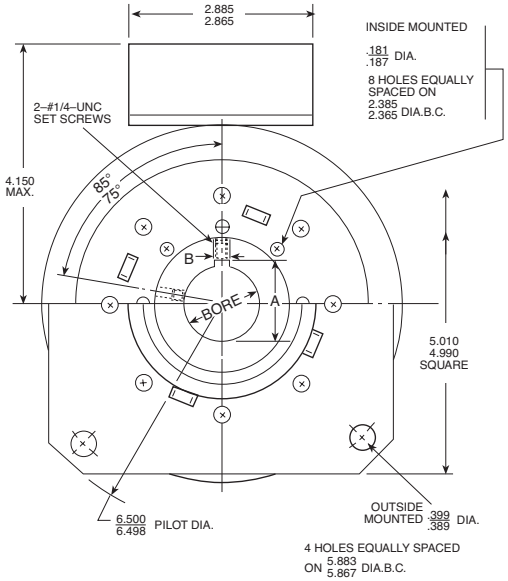
RATINGS

Static Torque: 50 Lb. Ft.
Maximum Speed: 4000 RPM
Average Weight: 14.31 Lbs.
Output Inertia: .0955 Lb. Ft.^{2}
Coil Build-up: (Clutch): 70 ms, (Brake): 65 ms
Coil Decay: (Clutch): 15 ms, (Brake): 12 ms
Voltage: 90 VDC
Maximum Watts: 34
Maximum Current: .38 Amps
Resistance at 20°C: 237 ±5% ohms

INSTALLATION REQUIREMENTS

Angular alignment of shafts within .008" TIR at 5" diameter.
Shafts to be concentric within .004" TIR
Armature shaft square to brake mounting surface within .006" TIR at 5" diameter
Brake pilot diameter to be concentric with shaft within .010" TIR





ALL DIMENSIONS IN INCHES				ORDER BY ITEM CODE							
STANDARD BORES		KEYWAY DIMENSIONS		ITEM CODES							
Nominal	Actual	A	B	No. 1 Armature (2 Req'd.)	No. 2 Armature Hub	No. 3 Field Rotor Assembly	No. 4 Brake Field		No. 5 Brake Field Mounting Hardware		No. 6 Bushing
							Inside Mounted	Outside Mounted	Inside Mounting	Outside Mounting	
1/2	.5000/.5015	.555/.565	.124/.126	45091	45100	45095	45098	45099	45107	45108	45163
5/8	.6250/.6265	.704/.714	.1865/.1885		45101						45164
3/4	.7500/.7515	.832/.842	.1865/.1885		45102						45165
7/8	.8750/.8765	.959/.969	.1865/.1885		45103						45166
1	1.0000/1.0015	1.110/1.120	.250/.252		45104						45167
1-1/8	1.1255/1.1270	1.241/1.251	.251/.253		45105	45096					—
1-1/4	1.2505/1.2520	1.367/1.377	.251/.253		45106	45097					—

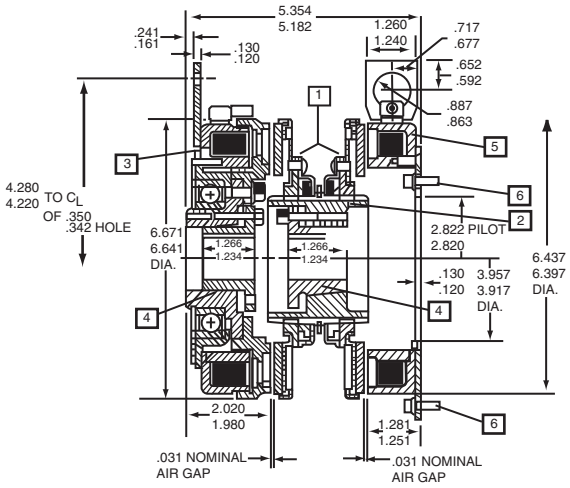
HOW TO ORDER: Specify Item Codes for Armatures, Armature Hub (desired bore), Field Rotor Assembly (desired bore), Brake Field (inside or outside mounting), Brake Field Mounting Hardware and Bushing (desired bore).

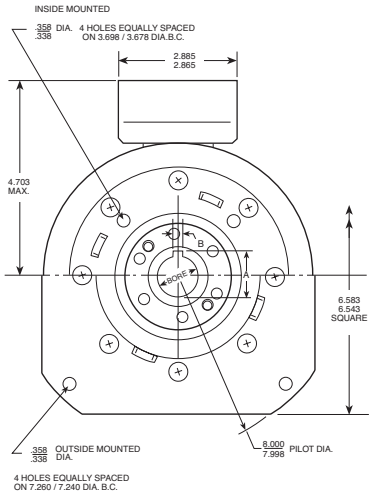
RATINGS

Static Torque: 100 Lb. Ft.
Maximum Speed: 3600 RPM
Average Weight: 23.30 Lbs.
Output Inertia: .2525 Lb. Ft.^{2}
Coil Build-up: (Clutch): 65 ms, (Brake): 76 ms
Coil Decay: (Clutch): 15 ms, (Brake): 12 ms
Voltage: 90 VDC
Maximum Watts: 42.3
Maximum Current: .469 Amps
Resistance at 20°C: 202 ±5% ohms

INSTALLATION REQUIREMENTS

Angular alignment of shafts within .008" TIR at 5" diameter.
Shafts to be concentric within .004" TIR
Armature shaft square to brake mounting surface within .006" TIR at 5" diameter
Brake pilot diameter to be concentric with shaft within .010" TIR





ALL DIMENSIONS IN INCHES				ORDER BY ITEM CODE							
STANDARD BORES		KEYWAY DIMENSIONS		ITEM CODES							
								No. 5 Brake Field		No. 6 Brake Field Mtg. Hardware	
Nominal	Actual	A	B	No. 1 Armature (2 Req'd.)	No. 2 Armature Hub	No. 3 Field Rotor Assembly	No. 4 Bushing	Inside Mounted	Outside Mounted	Inside Mounting	Outside Mounting
1/2	.5000/.5015	.555/.565	.124/.126				45168				
5/8	.6250/.6265	.704/.714	.1865/.1885				45169				
3/4	.7500/.7515	.832/.842	.1865/.1885				45170				
7/8	.8750/.8765	.959/.969	.1865/.1885	45119	45125	45121	45171	45122	45123	45124	45124
1	1.0000/1.0015	1.072/1.102	.249/.251				45172				
1-1/8	1.125/1.127	1.236/1.246	.249/.251				45173				
1-1/4	1.250/1.252	1.300/1.310	.249/.251				45174				
1-3/8	1.375/1.377	1.419/1.429	.3115/.3135				45175				
1-1/2	1.500/1.502	1.540/1.570	.375/.377				45176				

HOW TO ORDER: Specify Item Codes for Armatures, Armature Hub Field Rotor Assembly, Bushing (desired bore), Brake Field (inside or outside mounting) and Brake Field Mounting Hardware.

Clutch/Brakes

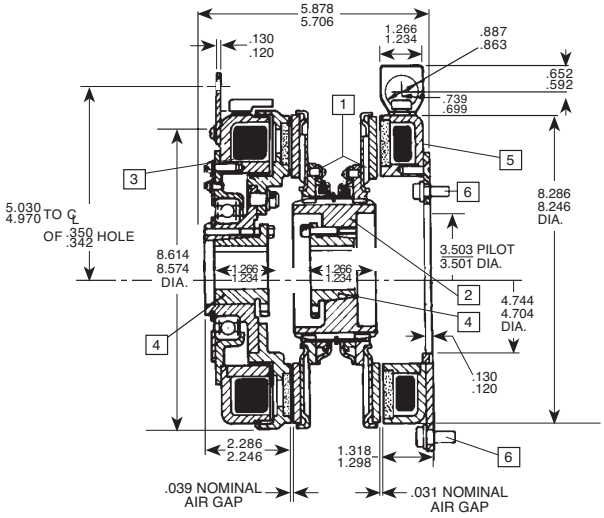
CB-150S Series
90 VDC

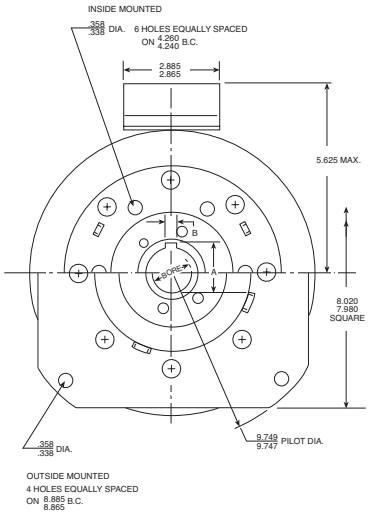
RATINGS

Static Torque: 150 Lb. Ft.
Maximum Speed: 3600 RPM
Average Weight: 40.60 Lbs.
Output Inertia: .7015 Lb. Ft.^{2}
Coil Build-up (Clutch): 155 ms (Brake): 110 ms
Coil Decay (Clutch): 36 ms (Brake): 20 ms
Voltage: 90 VDC
Maximum Watts: 39
Maximum Current: .433 Amps
Resistance at 20°C: 219 ±5% ohms

INSTALLATION REQUIREMENTS

Angular alignment of shafts within .010" TIR at 5" diameter.
Shafts to be concentric within .006" TIR
Armature shaft square to brake mounting surface within .006" TIR at 5" diameter
Brake pilot diameter to be concentric with shaft within .010" TIR





ALL DIMENSIONS IN INCHES				ORDER BY ITEM CODE							
STANDARD BORES		KEYWAY DIMENSIONS		ITEM CODES							
Nominal	Actual	A	B	No. 1 Armature (2 Req'd.)	No. 2 Armature Rotor	No. 3 Field Assembly Hub	No. 4 Inside Bushing	No. 5 Brake Field		No. 6 Brake Field Mounting Hardware	
								Inside Mounted	Outside Mounted	Inside Mounting	Outside Mounting
1/2	.5000/.5015	.555/.565	.124/.126	45136	45142	45138	45168	45139	45140	45141	45124
5/8	.6250/.6265	.704/.714	.1865/.1885				45169				
3/4	.7500/.7515	.832/.842	.1865/.1885				45170				
7/8	.8750/.8765	.959/.969	.1865/.1885				45171				
1	1.0000/1.0015	1.110/1.120	.249/.251				45172				
1-1/8	1.125/1.127	1.236/1.246	.249/.251				45173				
1-1/4	1.250/1.252	1.300/1.310	.249/.251				45174				
1-3/8	1.375/1.377	1.419/1.429	.3115/.3135				45175				
1-1/2	1.500/1.502	1.540/1.570	.375/.377				45176				

HOW TO ORDER: Specify Item Codes for Armatures, Armature Hub, Field Rotor Assembly, Bushing (desired bore), Brake Field (inside or outside mounting) and Brake Field Mounting Hardware.

DC Power Supplies/Controls

The following standard controls provide 90 VDC from 115 VAC lines and fulfill most clutch and brake power supply requirements.

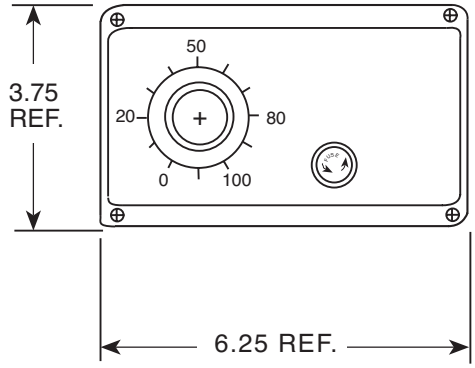
Other versions, modified or special, are available.

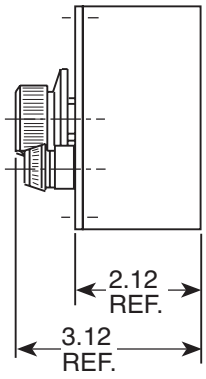
All controls operate one or two units – one unit at a time – through the use of SPDT switch, 15 Amp rated. (Customer supplied)

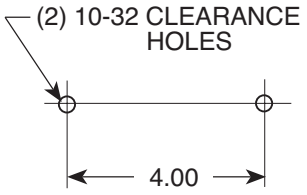
ORDER BY CATALOG NUMBER OR ITEM CODE

Description	Catalog Number	Item Code
Basic Power Supply – Plug in Fixed output	PS90B	45153
As above, fused	PS90F	45154
Octal socket for PS90B, F	Octal Socket	67530
Dual output, one fixed and one adjustable 0-90VDC	PS90-1	45156
Dual output, both adjustable	PS90-2	45157
Dual; relay output	PS90-2R	45158

PS90 (-1, -2, -2R)

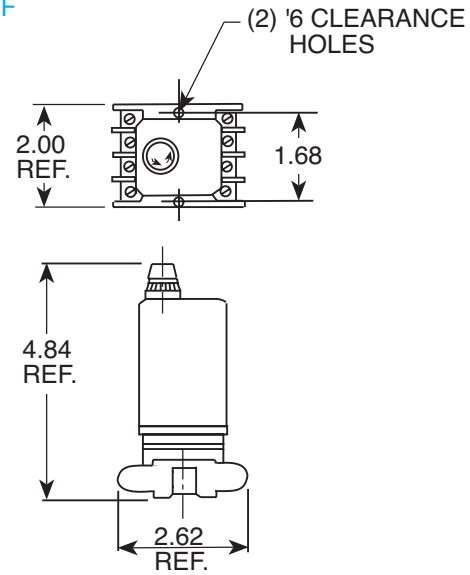




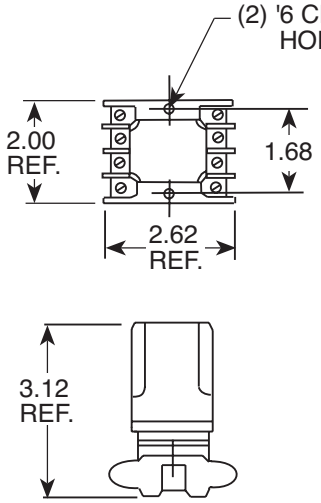


WALL MOUNTING HOLE PATTERN

PS90F



PS90B



All Dimensions in Inches.
Dimensions subject to change.

AC BRAKES

Double C-Face AC Brakes — *CMBA Series*

These double C-Face Brakes are direct acting with only one moving part. They are spring set and electro-magnetically released. Movement is limited to a spring loaded pressure plate. Release is instantaneous. If power fails, the brake will immediately set and hold.

FEATURES

- *Automatic Reset*
- *Compact*
- *Continuous Duty*
- *Dependable*
- *Full Torque Stop*
- *Horizontal/Vertical Mount*
- *Instant Magnetic Release*
- *One Moving Part*
- *Ready to Mount*
- *Shock Mounted Magnet*
- *Direct Acting*
- *Flange/Foot Mounting*
- *Splined Hub*
- *Standard NEMA Voltages/Frequencies*
- *Superior Disc Life*
- *Superior Thermal Capacity*
- *Double C-Face*

OPERATION

Friction discs rotate with the motor shaft and are free to move axially on the hub. When the magnet coil is de-energized, a spring loaded pressure plate (magnet armature) presses against the rotating discs. Friction force stops and holds the motor shaft.

The pressure plate retracts against torque springs by magnetic force when the magnet is energized. Friction discs are then released and free to rotate with the hub and motor shaft. A manual release is also provided.

Brake coil leads connect directly to motor leads so that power is simultaneously supplied to both brake and motor. No control equipment is required. An instruction bulletin on mounting and hookup are included with each brake.

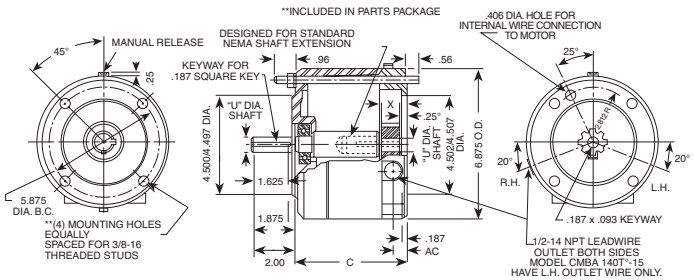
SPLINED HUB

These C-Face brakes use splined hubs and internally splined friction discs as standard equipment. The spline design virtually eliminates backlash which is a delayed action effect caused by excessive clearances between hub and discs. Splines increase disc life because the many contact points between hub and discs reduce the concentration of stresses encountered with non-splined hubs having only a few contact points.

ORDER BY CATALOG NUMBER OR ITEM CODE

Torque (Lb. Ft.)	NEMA Frame	Bore Code	Mounting	Coil Voltage: 115/230 VAC, 60 Hz — Catalog Number	115/230 VAC, 60 Hz — Item Code	208-230/460 VAC, 60 Hz 190/380 VAC, 50 Hz — Catalog Number	208-230/460 VAC, 60 Hz 190/380 VAC, 50 Hz — Item Code	575 VAC, 60 Hz — Catalog Number	575 VAC, 60 Hz — Item Code
3	56C	B5	Horizontal/Vertical	CMBA56R-3	67545	CMBA56U-3	67546	CMBA56Y-3	67547
		B5	Horizontal	CMBA56R-6	67548	CMBA56U-6	67549	CMBA56Y-6	67550
6	140TC	B7	Horizontal	CMBA140TR-6	67551	CMBA140TU-6	67552	CMBA140TY-6	67553
		B7	Vertical Shaft Up	CMBA140TR-6U	67554	CMBA140TU-6U	67556	—	—
		B7	Vertical Shaft Down	CMBA140TR-6D	67555	CMBA140TU-6D	67557	—	—

DIMENSIONS



ALL DIMENSIONS IN INCHES							
Size	AC	C	G	X	U	Housing O.D.	Approx. Weight
56-3 56-6 140T-6	9/16	4-15/16	1-3/16	7/8	5/8 5/8 7/8	6-7/8	12 Lbs.

PARTS

ORDER BY ITEM CODE	
Description	Item Code
Base Kit	67561
Coil–115/230 VAC 60 Hz	67558
Coil–208-200-380-440 VAC	67559
Coil–575 VAC 60 Hz	67560
Disc–Stationary	67562
Disc–Rotating	67563

Double C-Face AC Brakes Washdown (BISSC)

CMBWB Series

Double C-Face brakes provide the simplest solution for adding a brake between a C-Face motor and a flanged gear reducer. These brakes offer the added feature of meeting BISSC standards, AAA standards and other food industry washdown requirements. The CMB-WB double C-Face brakes are a perfect compliment to our AC washdown motors.

OPERATION

The brake hub is attached to the motor shaft. The friction disk fits around the hub and is free to move axially along the hub. When the motor and the brake solenoid coil are de-energized, the brake is in a set condition. In a set condition, the pressure spring applies a force against the pressure plate to clamp the friction disc against the stationary disc and endplate to retard motion. The clamped friction disc prevents the hub and motor shaft from rotating.

The brake is released electrically when voltage is applied to the solenoid coil of the brake. This produces an electromagnetic force which pulls the lever arm away from the pressure plate, releasing the clamping force on the friction disc. This allows the brake hub and motor shaft to turn freely. An important feature of this spring set brake is it's power failure characteristic. If a loss of electric power to the motor and brake occurs, the brake will automatically engage and hold the load provided that it has been properly applied and maintained.

The brake coil is connected directly to the motor leads so that power is simultaneously supplied to the brake and the motor. No additional control equipment is required.

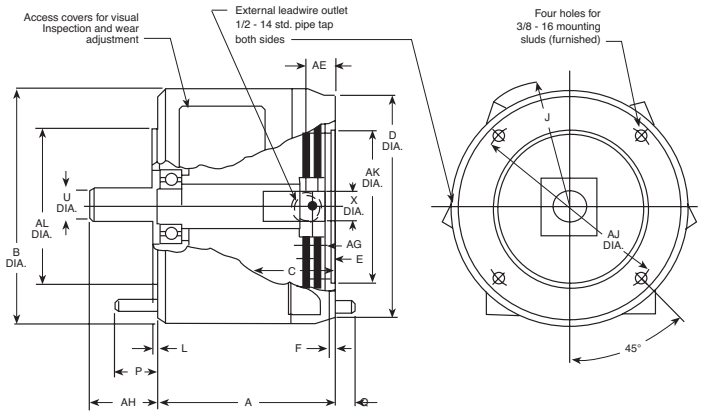
FEATURES

- *BISSC Certified*
- *CSA Certified*
- *Meets National AAA Dairy Standards*
- *Complies with Wisconsin Food and Dairy Regulations*
- *White FDA Approved Epoxy Paint*
- *Stainless Steel Hardware*
- *Neoprene Gasketing*
- *Splined Hub for Increased Disc Life*
- *Sizes for NEMA 56C to 184TC Frame Motors*
- *Standard Torque Ranges from 3 to 10 lb-ft*
- *Maximum RPM: 5000 (56C and 140TC) and 4000 (180TC)*
- *Manual Adjust for Lining Wear (56C and 140TC)*
- *Self-Adjusting for Lining Wear (180TC only)*
- *Automatic Reset, Manual Brake Release*
- *Rated for Continuous Duty*
- *Available in AC or DC Voltages*

ORDER BY CATALOG NUMBER OR ITEM CODE

Nominal Static Torque (Lb. Ft.)	Bore Code	NEMA Frame	Mounting	Coil Voltage					
				115/208-230 VAC, 60 Hz		208-230/460 VAC, 60 Hz 190/380 VAC, 50 Hz		575 VAC, 60 Hz	
				Catalog Number	Item Code	Catalog Number	Item Code	Catalog Number	Item Code
3	B5	56C	Horizontal/ Vertical	CMBWB-3-R-B5	58106	CMBWB-3-U-B5	58107	CMBWB-3-Y-B5	58108
6	B5	56C	Horizontal/ Vertical	CMBWB-6-R-B5	58110	CMBWB-6-U-B5	58111	CMBWB-6-Y-B5	58112
6	B7	143/145TC	Horizontal/ Vertical	CMBWB-6-R-B7	58114	CMBWB-6-U-B7	58115	CMBWB-6-Y-B7	58116
10	B9	182/184TC	Horizontal/ Vertical Down	CMBWB-10-R-B9	58125	CMBWB-10-U-B9	58126	CMBWB-10-Y-B9	58127
			Vertical Up	CMBWB-10U-R-B9	58128	CMBWB-10U-U-B9	58130	CMBWB-10U-Y-B9	58131

DIMENSIONS



DIMENSIONS											
Unit*	**A**	**AE**	**AG**	**AJ**	**AK**	**AL**	**B**	**C**	**D**	**E**	**F**
CMBWB-3-*-B5 CMBWB-6-*-B5	5.22	.88	.41	5.88	4.502/4.507	4.500/4.497	7.00	2.19	6.50	.25	.19
CMBWB-6-*-B7	5.22	.88	.41	5.88	4.502/4.507	4.500/4.497	7.00	2.19	6.50	.25	.19
CMBWB-10-*-B9	8.38	2.12	.18	7.25	8.500/8.502	8.500/8.498	10.38	2.81	9.00	1.00	.19

					Input Shaft		Output Shaft		
Unit*	**J**	**L**	**P**	**Q**	**X**	**Keyway**	**U**	**Keyway**	**AH**
CMBWB-3-*-B5 CMBWB-6-*-B5	3.88	.12	1.25	.56	.626/.627	.19 X .09	.625/.624	.19 X .09	2.00
CMBWB-6-*-B7	3.88	.12	1.25	.56	.876/.877	.19 X .09	.875/.874	.19 X .09	2.00
CMBWB-10-*-B9	12.12	.25	—	—	1.125/1/126	.25 X .12	1.125/1.124	.25 X .12	2.62

Dimensions for estimating only. For installation purposes, request certified prints.
* Voltage

SPECIFICATIONS								
Unit*	**Nominal Static Torque (lb-ft)**	**No. of Friction Discs**	**Maximum Solenoid Cycle Rate[1] (cycles/min)**	**Max. RPM[2]**	**Thermal Capacity[3] (hp-sec/min)**	**Inertia (Wk^2) ($lb\text{-}ft^2$)**	**Kinetic Energy Absorption[4] (ft-lb)**	**Net Weight (lb)**
CMBWB-3-*-B5	3	1	40	5,000	5	.008	9,750	11
CMBWB-6-*-B5 CMBWB-6-*-B7	6	1	40	5,000	5	.008	9,750	11
CMBWB-10-*-B9	10	1	30	4,000	20	.078	34,000	57

1 Maximum solenoid cycle rate is based on ambient temperature of 72° F (22°C) with 50% duty cycle. Does not relate to brake cycle rate (see Thermal Capacity).
2 Maximum RPM rating based on horizontal operation. Contact factory for maximum RPM on vertical applications.
3 Thermal capacity rating is based on ambient temperature of 72°F (22°C), stop time of one second or less, with no heat absorbed from motor and brake mounted horizontally.
4 Total kinetic energy absorption is based on ambient temperatures at 100°F (38°C) or less, including motor heat, with brake mounted horizontally. At the given rating, a 1-1/2 hour cool-down interval between stops is required. (3 hours for 10 lb ft unit.)
* Voltage

AC Motor Brake Kit

BRAKE KITS

These brakes are for quick field conversion of stock Boston Gear brand motors to brakemotors* using only hand tools.

All brakes are totally enclosed, fail-safe, spring set and electrically released for positive stop and hold operation. A manual release is provided for power off operation. The manual release automatically resets when power is restored.

The brake torque rating should equal 100% to 150% or more of the full load torque of the motor. The brake coils are AC single phase for use with single or three phase motors.

*1/3 to 2 HP TEFC Motors Shown Below.

Kit includes all of the components needed for conversion of a 56C or 143-5TC frame totally enclosed fan cooled motor* to a brakemotor. (Totally enclosed Stearns brake, replacement cast fan cover, shaft extension and fan/hub.) Mounts on fan end of motor. May be used on single or three phase motors.

Two 1/2" NPT holes with 18" leads are provided for connections. The BRAKE KIT adds 5-1/8" to the overall length of TEFC motors.

FOR MOTOR VOLTAGES—

230/460 VOLTS THREE PHASE OR 230 VOLTS SINGLE PHASE				
Catalog Number	Item Code	Brake Rating (lb-ft)	Max HP @ 1725 RPM	Mounts to NEMA Frame
MBRK3	60000	3	1	56C/143-5TC
MBRK6	60002	6	2	56C/143-5TC
MBRK10	60003	10	3	56C/143-5TC

FOR MOTOR VOLTAGES—

575 VOLTS THREE PHASE				
Catalog Number	Item Code	Brake Rating (lb-ft)	Max HP @ 1725 RPM	Mounts to NEMA Frame
MBR5K3	69765	3	1	56C/143-5TC
MBR5K6	69766	6	2	56C/143-5TC
MBR5K10	69767	10	3	56C/143-5TC

FOR USE WITH THESE MOTORS					
HP	NEMA Mtg.	Bore Code	Voltage Phase-Hz	Catalog Number	Item Code
1/3	56C	B5	115/230-1-60	ERTF-W	65348
1/3	56C	B5	230/460-3-60	EUTF-W	65383
1/3	56C	B5	575-3-60	EYTF-W	65454
1/2	56C	B5	115/230-1-60	FRTF-W	65350
1/2	56C	B5	230/460-3-60	FUTF-W	65404
1/2	56C	B5	575-3-60	FYTF-W	65455
3/4	56C	B5	115/230-1-60	GRTF-W	65351
3/4	56C	B5	230/460-3-60	GUTF-W	65405
3/4	56C	B5	575-3-60	GYTF-W	65457
1	56C	B5	115/230-1-60	HRTF-5/8-W	65354
1	143TC	B7	115/230-1-60	HRTF-W	66234
1	56C	B5	230/460-3-60	HUTF-5/8-W	65406
1	143TC	B7	230/460-3-60	HUTF-W	65412
1	143TC	B7	575-3-60	HYTF-W	65460
1-1/2	145TC	B7	115/230-1-60	JRTF	63800
1-1/2	56C	B5	230/460-3-60	JUTF-5/8-W	65407
1-1/2	145TC	B7	230/460-3-60	JUTF-W	65437
1-1/2	145TC	B7	575-3-60	JYTF-W	65475
2	56C	B5	230/460-3-60	KUTF-5/8-W	65440
2	145TC	B7	230/460-3-60	KUTF-W	65445
2	145TC	B7	575-3-60	KYTF	64950