

Wrap Spring Clutches and Clutch/Brakes



 **Warner**[®]
Electric
An Altra Industrial Motion Company



Arten Freios & Embreagens Ltda.
Fone: 11 5594-8333
e-mail: arten@arten.com.br
site: www.arten.com.br

Wrap Spring Product Line

CB Series



Clutch/Brake Package

Each CB Series unit is a completely self-contained, packaged clutch/brake assembly designed to start and stop a load rapidly and accurately without any cumulative error. In fact, at speeds up to 1800 rpm, loads are started and stopped within $\pm 1/2^\circ$ per revolution. CB Series units are solenoid actuated with standard models available in 12, 24, or 90 VDC as well as 115 VAC configurations.

Accurate

Start and stop positioning can be maintained within $\pm 1/2^\circ$ at speeds up to 1800 rpm. The stop point is adjustable by using the adjustable control collar.

Self-Contained

Each CB Series unit is completely self-contained. Assembly and testing before shipment ensure reliable and trouble-free operation.

Interchangeability

The CB Series is completely interchangeable with other comparable clutch/brake packages.

Features

- CW or CCW rotation
- Anti-back: anti-overrun feature
- 12, 24 or 90 VDC, 115 VAC operation
- 1, 2 or 4 stop collars standard; special stop collars also available (up to 24 stops)
- Adjustable stop collar
- Six standard sizes
- Torque ratings from 25 lb.in. to 5000 lb.in.

SCB Series



Long Life Clutch/Brake

The Super CB Series is a high performance version of the standard CB Series, providing up to five times the life. The SCB Series is recommended for heavy-duty applications requiring maximum torque, high cycle rates and minimum maintenance. Like the CB Series, each Super CB Series unit is a complete, factory-assembled package, ready for installation.

Features

- Heavy duty design
- High cycle rate performance
- Long life - up to five times that of a standard CB model
- Three standard models
- Torque ratings up to 5000 lb.in.
- CW or CCW rotation
- Anti-back: anti-overrun feature
- 12, 24, 90 VDC or 115 VAC operation
- 1, 2 or 4 stop collars standard; special stop collars also available (up to 24 stops)
- Adjustable stop collars

WSC Series



Wrap Spring Clutches

WSC Series clutches are simple, mechanically actuated devices providing high torque in a compact design. Specific models are available for use as an overrunning/one-way clutch (Model O), as a start/coast-to-stop clutch (Model SS), or as a single revolution clutch (Model S).

Overrunning/One-Way (Model O)

This clutch continually drives the load. The load is allowed to overrun the input, should its speed exceed input speed. In the reverse direction the unit acts as a one-way clutch, preventing the load from backing up.

Start/Coast-To-Stop (Model SS)

The start/stop clutch is engaged until the collar that contains the spring tang is disengaged. Once it is stopped, the load is disengaged and coasts to a stop.

Start/Stop – Single Revolution (Model S)

Attaching one end of the spring to the output hub results in a single revolution clutch. The load is stopped through the spring to the collar. Precise non-cumulative error single revolution cycling is achieved. Braking torque equals 10% of the maximum torque rating.

Features

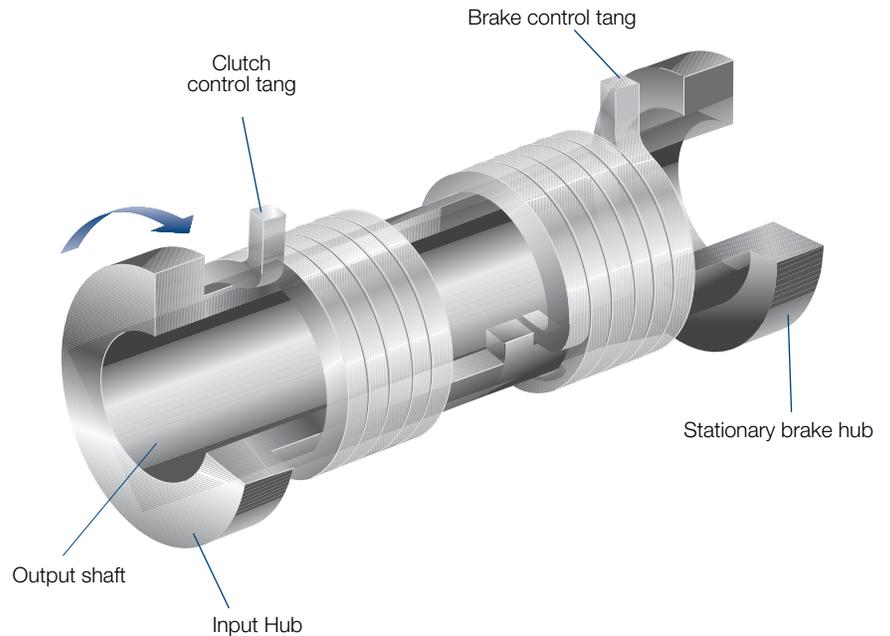
- Five standard sizes
- Torque ratings from 25 lb.in. to 2500 lb.in.
- Hub or shaft input
- Multiple stop collars
- Over-travel stop
- Anti-overrun
- Adjustable stop feature

Principle of Operation

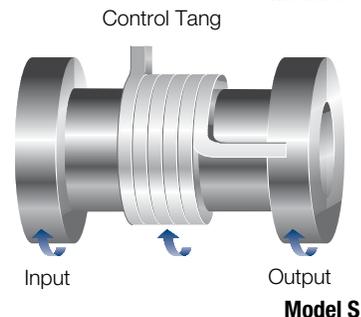
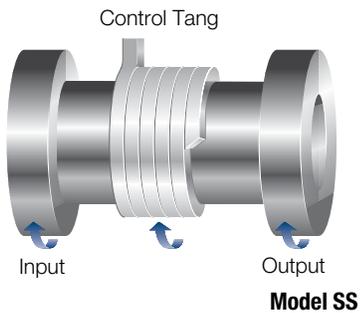
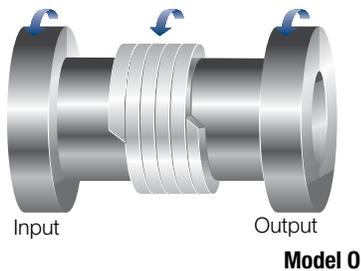
The three basic components of the wrap spring clutch are the input hub, output hub, and spring. The inside diameter of the spring is slightly smaller than the outside diameter of the two hubs. Rotation at the input hub in the direction of the arrow engages the spring and positively locks the two hubs together. Adding a control tang enables the spring to be disengaged, allowing the input hub to overrun.

Combination Clutch/Brake

The control tangs are used to hold open the clutch or brake spring, which are wrapped in opposite directions. When the clutch and brake control tangs rotate with the input hub, the input hub and output shaft are engaged by the clutch spring. When the stop collar locks the control tang of the brake spring, it wraps down engaging the output shaft to the brake hub. The clutch spring unwraps at the same time, allowing the input hub to freely rotate.

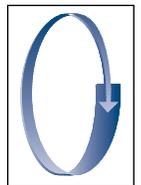


Design Configurations



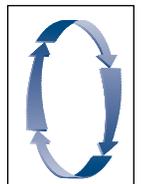
Overrunning (One Way Clutch)

When the input hub is rotated in the direction shown, the spring wraps down and engages the input to the output hub. When the input hub is stopped or reversed, the spring unwraps, allowing the output hub to overrun. These clutches can also be used for backstopping and indexing. In the backstopping mode, either the input or output hub is attached to a fixed member and the other hub on a rotating part. Rotation is permitted in one direction, but locked in reverse rotation. Indexing provides an accurate and smooth intermittent rotary output from reciprocating input in variable angular increments.



Start/Coast-To-Stop Clutch (Random Positioning)

In this mode, the control tang rotates with the input hub, thus the clutch is engaged. When the stop collar locks the control tang, the spring unwraps, allowing the output hub to coast while the input hub continues to run.



Start/Stop – Single Revolution Clutch

In this mode another control tang is added to the spring and fixed to the output hub. When the stop collar engages the control tang, the output hub will not overrun. Remember only a maximum of 10% of the load will be stopped with the single revolution clutch.

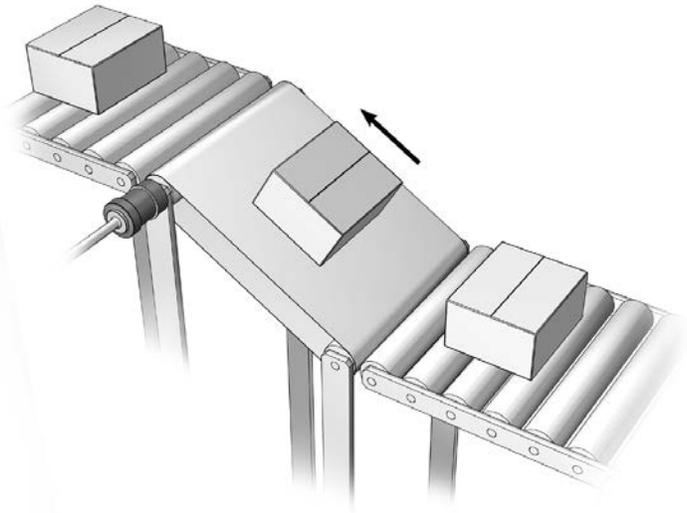


Application Examples

The features of wrap spring clutches and brakes; accuracy, repeatability, high torque-to-size ratio, low power consumption and long life make them an ideal solution for a wide range of motion control applications. Basic functions include overrunning, single revolution, random positioning start-stop, high cycle rate rapid start-stops and accurate, repeatable positioning.

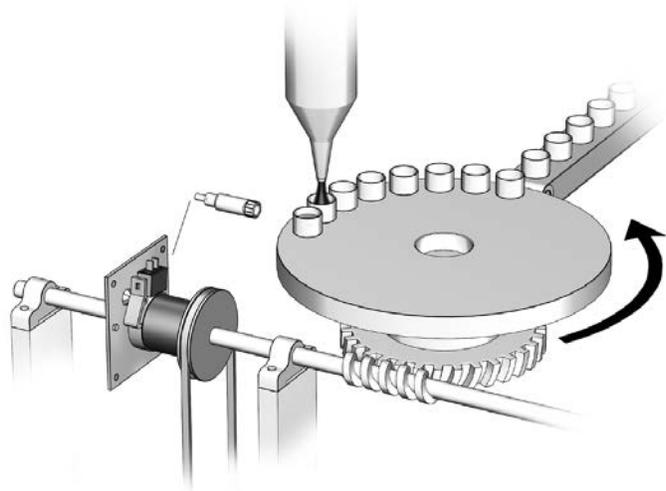
Typical Applications

- Conveyors
- Rotary indexing tables
- Packaging equipment
- Bagging machinery
- Collators
- Cut-off machines
- Vending machines
- Copiers
- Food processing equipment
- Paper feeds
- Folders
- Material handling equipment
- Riveters, staplers and stitching machines
- Sorters
- Punch presses
- Textile machines
- Film and wire processing



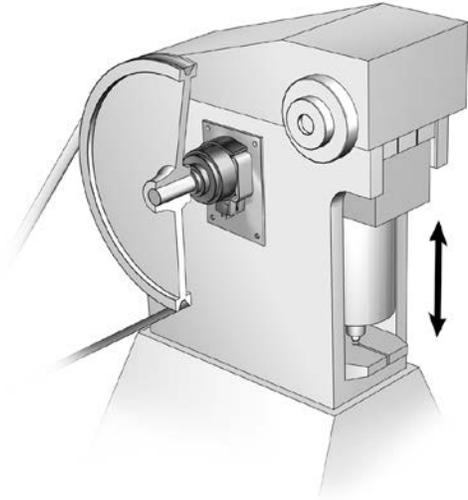
Incline Conveyor

The **WSC Model O** mechanical wrap spring clutch provides maintenance free anti-backup protection for this incline conveyor. While the conveyor is running, the wrap spring is in overrunning mode, allowing the clutch's output to freewheel. When the conveyor drive power is removed, either intentionally or unintentionally, the spring holds the hub stationary and will prevent the conveyor and its load from back-driving.



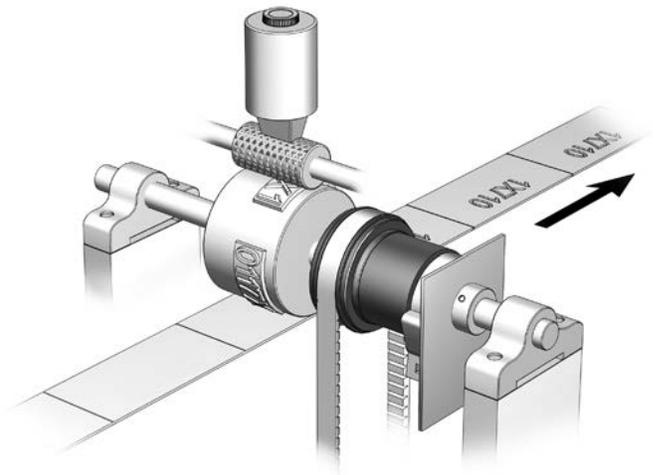
Indexing Rotary Table

Each time the power supply provides a pulse to the solenoid of the Standard CB wrap spring clutch/brake, the table indexes one position for filling, labeling, sorting, staging or inspecting products. **CB, Super CB or WSC Model S** (with customer supplied actuator) units may each be used to perform the indexing function. Please note that while the graphic shows open gearing, a standard enclosed gearbox will work just as effectively.



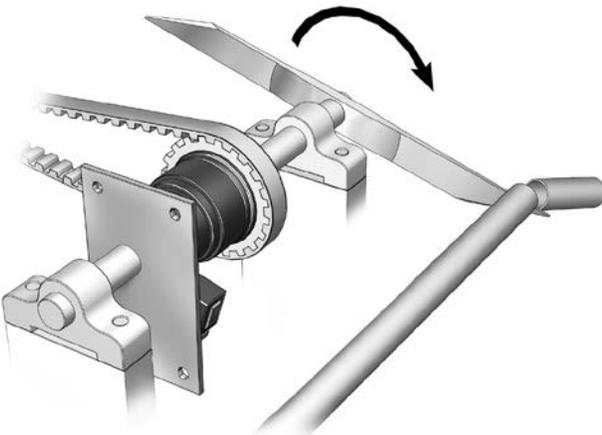
Industrial Stitchers and Staplers

The motor drives a large flywheel and a cam connected to the stitcher head. The **CB** or **Super CB** wrap spring clutch/brake provides one complete cycle, always stopping at the same precise position in time for the next cycle. Warner Electric's **CB** and **Super CB** units never require any adjustment or lubrication, and provide non-cumulative error for cycle-to-cycle accuracy and consistency.



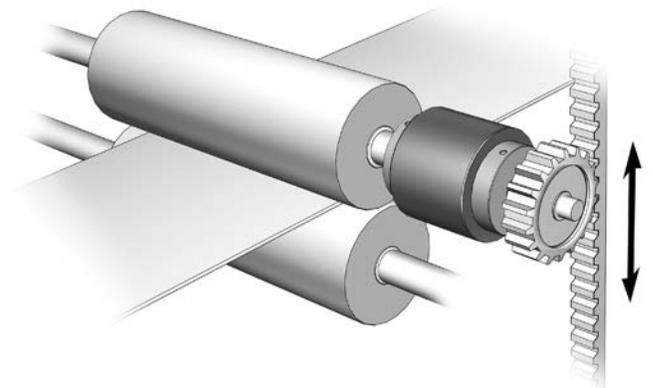
Print Head

In this printing application, a photoelectric sensor detects the registration mark on the web and signals the **CB** or **Super CB** clutch/brake to cycle. Each cycle drives the print wheel in registration with the continuously moving web material. Warner Electric wrap spring clutch/brakes provide start and stop positioning within a $\pm 1/2^\circ$ per revolution (non-cumulative), making them an excellent solution for applications requiring highly accurate, consistent performance.



Cut-Off Knife

As tubing material is fed, a sensor determines when the appropriate length has been reached, and signals the clutch/brake to cycle, driving the knife to cut the tubing to the correct length. This application shows a standard option two-stop collar, which indexes 180° per sensor input, making two cuts per one complete 360° revolution. The **CB** or **Super CB** clutch/brake provides error free indexing, making the reaction time for the knife consistent from cycle-to-cycle.



Rack and Pinion Indexing

The unidirectional **WSC Model O** operates as an indexing drive for this application. As the rack moves upward, the wrap spring clutch drives, providing torque to the in-feed rolls. When the rack moves downward, the wrap spring clutch freewheels, transmitting no torque to the rolls. Since the cam, pinion gear and rolls are all constant diameters, coupled with the accuracy of the **WSC**, the amount fed each cycle remains constant and consistent.

Selection

For Product Selection Follow 3 Easy Steps

Wrap spring clutches and brakes are pre-packaged, pre-assembled units which are as easy to select as they are to install. The simple three step selection process includes:

- Step 1** Determine the clutch or brake function
- Step 2** Determine size function (as on page 7)
- Step 3** Verify design considerations

This selection process is based on the assumption that the diameter of the shaft at the clutch or clutch/brake location has been designed through good machine design practice. For most applications, this process will determine the correct size product. When the performance requirements of a given application are marginally within the capabilities of a specific product, consider using the next larger size. In instances where

required load/speed performance data is known and unit size is uncertain, use the technical selection process starting on page 36 which will help you review the necessary aspects of your application.

Step 1

Determine clutch or brake function

Wrap spring clutches and brakes can perform three control functions—overrunning, start/coast-to-stop, and single revolution. Determine the function which will provide the best control for your application. Using the chart below, select the series which best fits your application requirements.

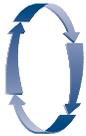
Step 2

Determine size

To select the correct size unit, determine the maximum rpm at which the clutch or brake will be operated and the

shaft diameter on which the wrap spring unit will be mounted. A wrap spring clutch engages almost instantly, and, since spring wrap increases with load, the unit must be sized carefully to insure that it is correct for the application. If there is any uncertainty regarding the correct unit size, we recommend using the technical selection process starting on page 36. To select the correct wrap spring unit, locate the corresponding speed and shaft diameter points on the appropriate chart on page 7. For applications requiring speed or diameter values higher than those illustrated, please contact your local Warner Electric Distributor, your Area Sales Manager, or Warner Electric Technical Support at (800) 825-9050.

Selection by Function

Function	Performance	Wrap Spring Product	Max. Torque			Actuation Method
			Starting lb. in. (N-m)	Stopping lb. in. (N-m)	Max. rpm	
 <p>Overrunning</p> <p>Engaged in one direction only</p>	An overrunning clutch will transmit torque in one direction only when the input hub is stopped or reversed. Consequently, the load is disengaged and free to rotate or overrun.	WSC Series Model O	2,500 (282.5)	N/A	1,800	Reverse input rotation
 <p>Start/Coast-To-Stop</p> <p>Random Positioning</p>	A start/coast-to-stop clutch will engage and disengage a load either by mechanical or electrical actuation. Start/coast-to-stop clutches provide a random stop position for the load.	WSC Series Model SS	2,500 (282.5)	0	1,800	Mechanical
 <p>Single Revolution</p> <p>Accurate positioning for single or multiple stops</p>	A single revolution clutch or clutch/brake will accurately position a load with no cumulative error for each single revolution cycle. Multiple stop collars with up to 24 stops (per revolution) provide fractional revolution capability.	WSC Series Model S Super CB Standard CB	2,500 (282.5) 5,000 (565) 5,000 (565)	250 (282.5) 5,000 (565) 5,000 (565)	1,800 750 1,800	Mechanical AC or DC Solenoid AC or DC Solenoid

Step 3

Verify design function considerations

Once the appropriate series and model size have been determined, review the design considerations. A complete checklist of these and other options available are detailed in the How to Order section for each series.

Design Considerations

All Models

- CW or CCW rotation
- Single or multiple stop collar
- Bore size

Super CB and CB Series

- AC or DC solenoid
- CB-5, CB-6, CB-8 and CB-10 available in the long life, Super CB Series (SCB). See pages 19–25 for specific details.

WSC Series

- Hub input/shaft output or shaft input/hub output
- Overrunning Model O, start/coast-to-stop Model SS or single revolution Model S

Selection Charts – RPM vs. Shaft Diameter

		Super CB and Standard CB Series																
Clutch Size	Bore Size	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800
2	1/4																	
4	3/8																	
5	1/2																	
6	3/4																	
6	1																	
8	1*																	
8	1 1/4																	
8	1 3/8*																	
8	1 1/2																	
10	1 1/4*																	
10	1 1/2																	
10	1 5/8*																	
10	1 3/4																	

* Special Order

		Metric Super CB and Standard CB Series																
Clutch Size	Bore Size	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800
2	6mm																	
4	10mm																	
5	12mm																	
6	20mm																	
6	25mm																	
8	35mm																	
8	40mm																	
10	35mm*																	
10	40mm																	

* Special Order

		WSC Series																
Clutch Size	Bore Size	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800
2	1/4																	
4	3/8																	
5	1/2																	
6	3/4																	
6	1																	
8	1*																	
8	1 1/4																	
8	1 3/8*																	
8	1 1/2																	

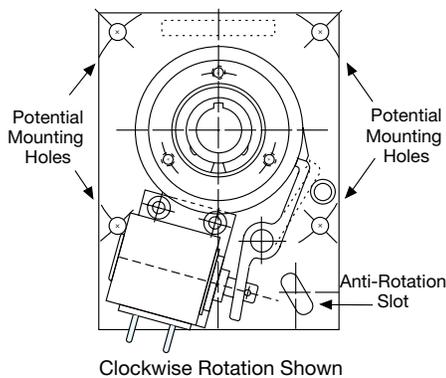
* Special Order

CB Mounting Requirements

While Warner Electric wrap spring clutches are self-contained, packaged products, which are easy to mount, a few simple precautions should be taken to ensure maximum life.

All Warner Electric wrap spring clutch products are designed to be installed in parallel shaft applications where they are fully supported by the shaft on which they are mounted.

Each clutch/brake backing plate assembly has three or four mounting holes, plus an anti-rotation slot, and is designed to serve as a torque arm rather than as a rigid mounting plate. The plate should be restrained from rotating by a pin or shoulder bolt, while allowing for the plate to float axially. The anti-rotation device must be capable of withstanding the braking torque required by the load.



Important: Do not rigidly mount unit. Plate must be allowed to “float” axially.

On CB type units, the input rotation is always connected to the input hub, and the output is always through the shaft through the hollow bore of the clutch/brake.

Connecting the unit to the parallel shaft may be accomplished by pinning (for sizes 4, 5 and 6 with 1 in. bore) or by key and set screw (for sizes 6 with 3/4 bore, 8 and 10). Size 2 uses a clamp collar.

When connecting the parallel shaft to the CB by using a belt, chain or gear drive, the input hub’s radial bearing load capacity must not be exceeded. (See chart in next column). It may be necessary to counter bore or bearing

mount the input pulley sprocket or gear.

Maximum Radial Bearing Load at Maximum Speed

- CB-2 = 7.5 lbs.
- CB-4 = 14 lbs.
- CB-5/Super CB-5 = 32 lbs.
- CB-6/Super CB-6 = 63 lbs.
- CB-8/Super CB-8 = 300 lbs.
- CB-10/Super CB-10 = 500 lbs.

CB and Super CB style clutch/brakes are designed for horizontal shaft mounting. While it is possible to mount units vertically, vertically mounted units will see lower life than those mounted horizontally due to the wear between hubs resulting from gravity.

Horizontal Mounting

Figure 1 illustrates an ideal CB mounting. The unit is attached to the output shaft with both a key and set screws. The plate is restrained from rotating, but not from axial movement, reducing the side load on the CB’s internal plate bearing.

In cases where easy access to the input is desirable, the clutch/brake can be mounted on a stub shaft. However, the unit must still be fully supported, while overhung loads on the input member must be avoided to maintain the life of the radial bearing.

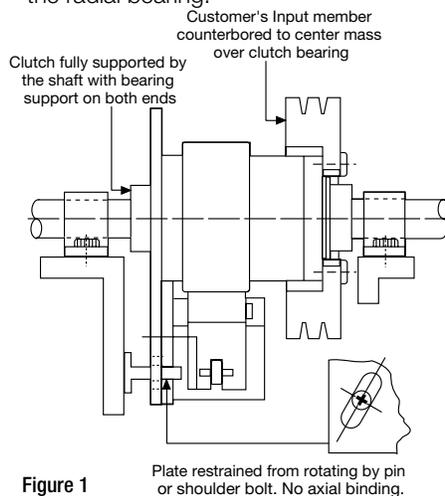


Figure 1

Figures 2 and 3 illustrate alternate mounting configurations for achieving proper support. Inputs are usually face-mounted to the input hub of the CB unit as shown in Figure 1. This type of mounting is facilitated by the drilled and tapped holes provided in the free hub flange. The configuration shown in Figure 2 is a possibility, if the radial load on the input hub of the CB is small compared to the specified load.

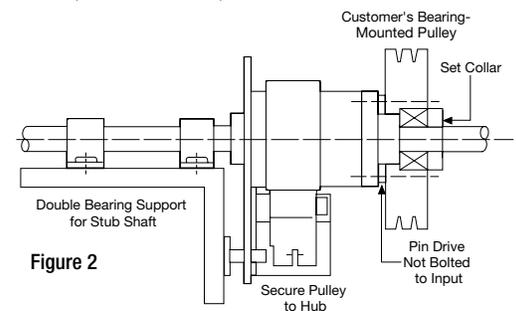


Figure 2

If the application contains a substantial radial bearing load, arrange the pulley over the centerline of the clutch free hub as illustrated in Figure 3. Place one support bearing as close to the pulley as possible, using a torque arm for anti-rotation.

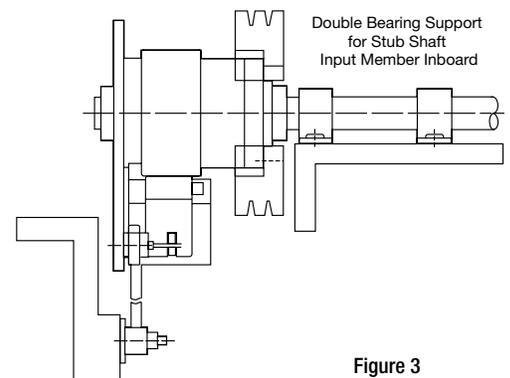


Figure 3

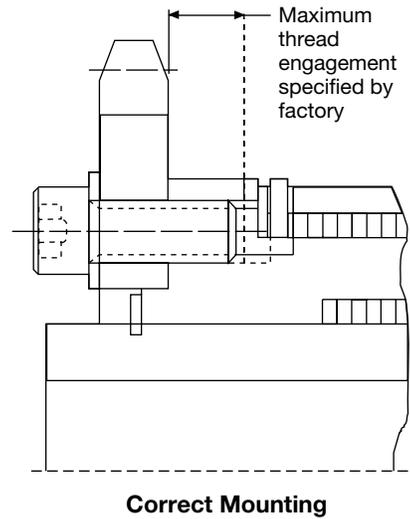
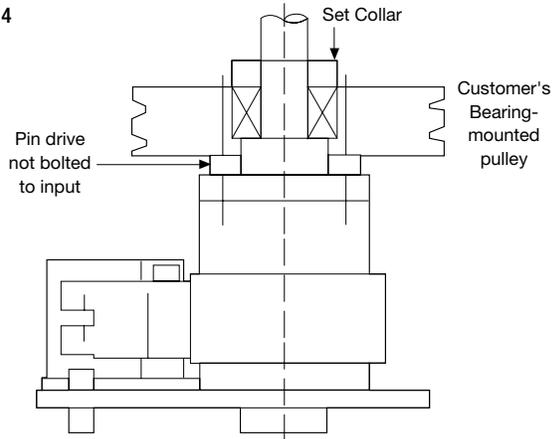
The smaller CB units (sizes 2, 4 and 5) have pilot holes in the output shaft, which guide drilling through the machine shaft for attaching the unit with a pin.

CB Mounting Requirements

Vertical Mounting

When it is necessary to mount a unit vertically, mount it so the input hub is oriented in the upward position as illustrated in Figure 4.

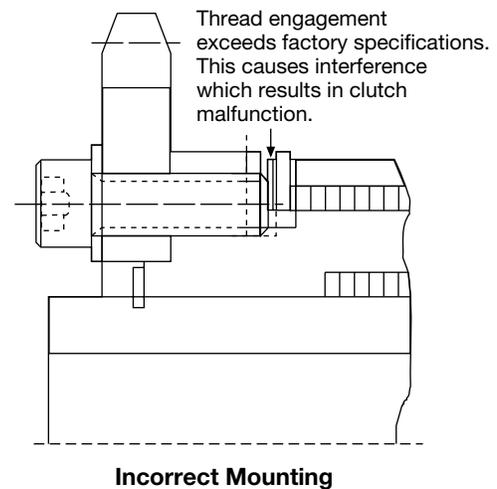
Figure 4



Thread Engagement Requirements

Just a reminder . . . While mounting a sprocket or pulley to the input hub of your CB-2, CB-4, CB-5, CB-6, CB-8 or CB-10 the screws/bolts used must not protrude through the flange or hub. This will interfere or jam the control collar assembly, therefore causing the clutch to malfunction by failing to “drive” or causing the clutch to “slip.” Please refer to the following chart for maximum thread engagement:

CB-2	= .150 in.
CB-4	= .280 in.
CB-5/Super CB-5	= .350 in.
CB-6/Super CB-6	= .312 in.
CB-8/Super CB-8	= .360 in.
CB-10/Super CB-10	= .500 in.

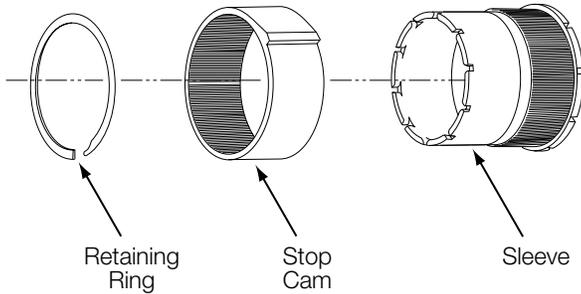


For further information and/or assistance, please call Warner Electric Technical Support at 800-825-9050.

CB Stop Collar Adjustment

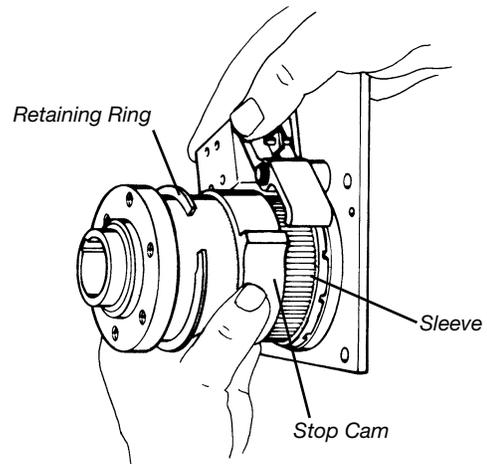
CB Stop Collar Adjustment

Each CB and Super CB Series unit has an incrementally adjustable collar, which allows for changes to the output orientation.



To adjust the stop collar output orientation:

- Wrap the brake spring down completely by rotating the output shaft in the driving direction until it cannot travel any further;
- Remove the retaining ring from its groove and slide it forward on the sleeve; then,
- Hold the actuator clear, while sliding the stop cam off the sleeve. Rotate the cam to the desired stop position, and slide it back onto the sleeve; and,
- Slide the retaining ring back into position.



Adjustment Increments with Standard Stop Collars

CB-2	Infinitely Adjustable
CB-4	2.4° Adjustable
CB-5/Super CB-5	1.8° Adjustable
CB-6/Super CB-6	1.8° Adjustable
CB-8/Super CB-8	1.6° Adjustable
CB-10/Super CB-10	1.5° Adjustable

Combination Clutch/Brake Packages

CB Series clutch/brake combinations are designed for applications requiring a continuous rotational input being converted into starting and stopping a load. To start motion, the solenoid is pulsed, moving the actuator arm away from the control collar. This allows the clutch spring to wrap (wind) down onto the output assembly while the brake spring is unwinding, allowing the output to drive. Motion is stopped when the actuator returns to its rest position and the control collar rotates, stopping against the actuator. This forces the clutch spring to unwind releasing the input from the output and wraps the brake spring down, stopping the output. Anti-back and anti-overrun springs maintain position accuracy by eliminating any backward movement or bounce when stopped. The actual stopping position can be adjusted after installation by moving the splined cam of the control collar assembly.



The input hub is drilled and tapped to allow for mounting of sprockets, gears, sheaves, etc. The output is a hollow quill that mounts onto the customer's driven shaft. The backing plate is not a mounting plate. It must be held in place by a loose fit pin to eliminate any side or radial loads from preloading the unit's bearings.

Features

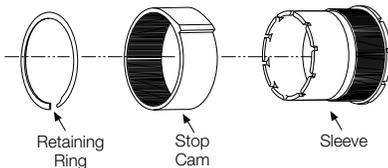
- Stop Position Accuracy $\pm 1/2^\circ$
- Adjustable Output Stop Positions
- Standard Features
 - CW or CCW Rotation
 - Hub Input - Shaft Output
 - Anti-Overrun Output does not overrun Input
 - Anti-Back Output does not Backup
- 1, 2 and 4 stop collars for 360° , 180° , and 90° output increments standard
 - Special multi-stop collars also available (up to 24 stops)
- 115 VAC and 24 VDC Solenoids Standard
 - Other Voltages Available
- Dimensionally Interchangeable with Competitive Units
- 5 Standard Models
 - CB-2
 - CB-4
 - CB-5
 - CB-6
 - CB-8
 - CB-10

CB Series Clutch / Brake

Specifications	CB-2	CB-4	CB-5	CB-6	CB-8	CB-10
Static Torque	25 lb.in. (2.825 N-m)	120 lb.in. (13.56 N-m)	250 lb.in. (28.25 N-m)	500 lb.in. (56.5 N-m)	2,500 lb.in. (282.5 N-m)	5,000 lb.in. (565 N-m)
Maximum anti-ovrunn holding capability	10 lb.in. (1.13 N-m)	25 lb.in. (2.825 N-m)	45 lb.in. (5.085 N-m)	300 lb.in. (33.9 N-m)	600 lb.in. (67.8 N-m)	1,200 lb.in. (135 N-m)
Maximum anti-back holding capability	10 lb.in. (2.034 N-m)	80 lb.in. (9.04 N-m)	160 lb.in. (18.08 N-m)	300 lb.in. (33.9 N-m)	600 lb.in. (67.8 N-m)	1,200 lb.in. (135 N-m)
Inertia, rotating parts	.034 lb.in. ²	.064 lb.in. ²	.195 lb.in. ²	1.718 lb.in. ²	12.84 lb.in. ²	48 lb.in. ²
Maximum radial bearing load at maximum speed	7.5 lbs.	14 lbs.	32 lbs.	63 lbs.	300 lbs.	500 lbs.
Maximum operating speed	1,800 RPM	1,200 RPM	750 RPM	500 RPM	300 RPM	200 RPM
Response time, voltage on at full speed	20 MS	24 MS	27 MS	45 MS	50 MS	85 MS
Weight	1 lb.	2 lbs.	3 lbs.	7 lbs.	15 lbs.	29 lbs.

See page 36 for Minimum Inertia Requirements.
See page 8 for Mounting Examples.

Control Collars



These clutch/brakes (except CB-2) offer unique splined stop collars which can be adjusted radially in fine increments. This feature allows the user to reposition the output to comply with specified shaft and keyway placements. Standard stop collar positioning increments are shown below for all models:

CB-2	Infinitely Adjustable
CB-4	2.4° Adjustable
CB-5	1.8° Adjustable
CB-6	1.8° Adjustable
CB-8	1.6° Adjustable
CB-10	1.5° Adjustable

Optional Multiple Stop Collars



A one, two or four stop collar is standard on CB Series clutch/brakes. A variety of stop collar configurations, up to 24 stops maximum, are available. Consult Warner Electric Technical Support at 800-825-9050 for complete information.

Basic Selection

See pages 6–7 for basic product selection guidelines.

For complete Application Engineering information see pages 36-38.

How to Order

Order by part number (see chart on dimensions page) or specify as follows.

Specify:

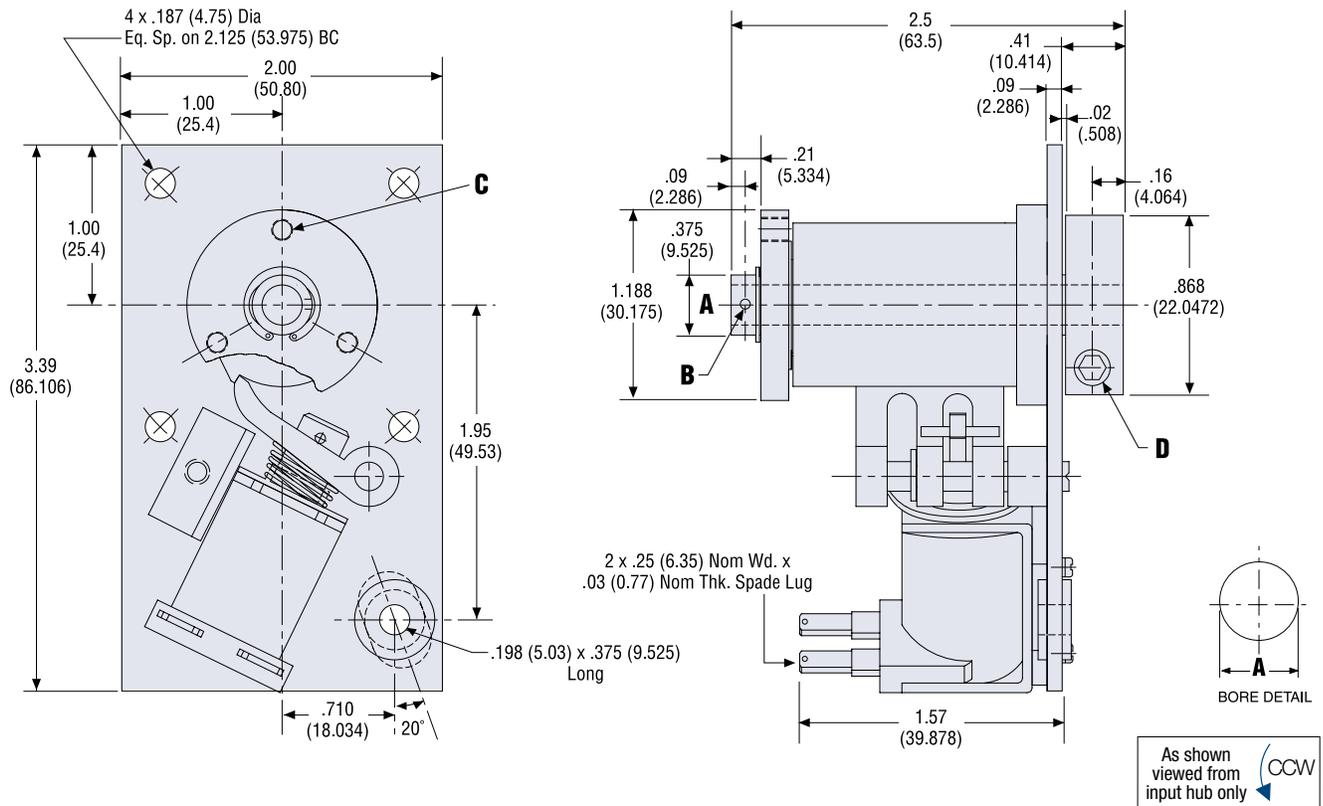
- Series CB:
English
Metric
- Size: CB-2, CB-4, CB-5, CB-6, CB-8, CB-10
- Direction of rotation:
CW Clockwise
CCW Counterclockwise
- Coil voltage:
115 AC or 24 DC are standard
12 DC or 90 DC are options
- Bore size:
CB-2 = 1/4"
CB-4 = 3/8"
CB-5 = 1/2"
CB-6 = 3/4" or 1"
CB-8 = 1 1/4" or 1 1/2" standard
1" or 1 3/8" special order
CB-10 = 1 1/2" or 1 3/4" standard
1 1/4" or 1 5/8" special order
- Stop collar:
1, 2 or 4 stops standard
Other stop collars are available as specials

Example: CB-8, CCW, 115VAC, 1" bore, 4 stop collar

CB	-8	CCW	115VAC	1"	4
1	2	3	4	5	6

CB-2 Clutch / Brake

Dimensions in. (mm)



Bore Sizes

	Bore A	Pin Hole B	Mtg. Holes C	Set Screws D
English in. (mm)	.251-.253 (6.3655-6.4263)	.062 (1.5748)	3x #6-32 Eq. Sp. on .938 BC	#8 SHCS
Metric mm (in.)	6.0 H9 (.2362-.2374)	1.5 (.055-.062)	3x M4 x 0.7 Eq. Sp. on 23.83 BC	M4 x 0.7 SHCS

All dimensions are nominal unless otherwise noted.

CB-2 Part Numbers

Bore Size	Voltage	Rotation	Stops		
			1	2	4
0.25"	24 VDC	CW	302-17-001	302-17-002	302-17-003
		CCW	302-27-001	302-27-011	302-27-003
0.25"	115 VAC	CW	302-17-007	302-17-008	302-17-009
		CCW	302-27-007	302-27-008	302-27-009

These are the most commonly requested parts – other voltages (such as 12VDC and 90VDC), bores and stop collars are available. See page 40 for metric part numbers.

Electrical Data (±10%)

Voltage	Current (amps)	Resistance (ohms)	Status
115 AC 60 Hz	.10*	825	Standard
24 DC	.23	104	Standard
12 DC	.46	26	Option
90 DC	.06	1510	Option

(Coils are rated for continuous duty)

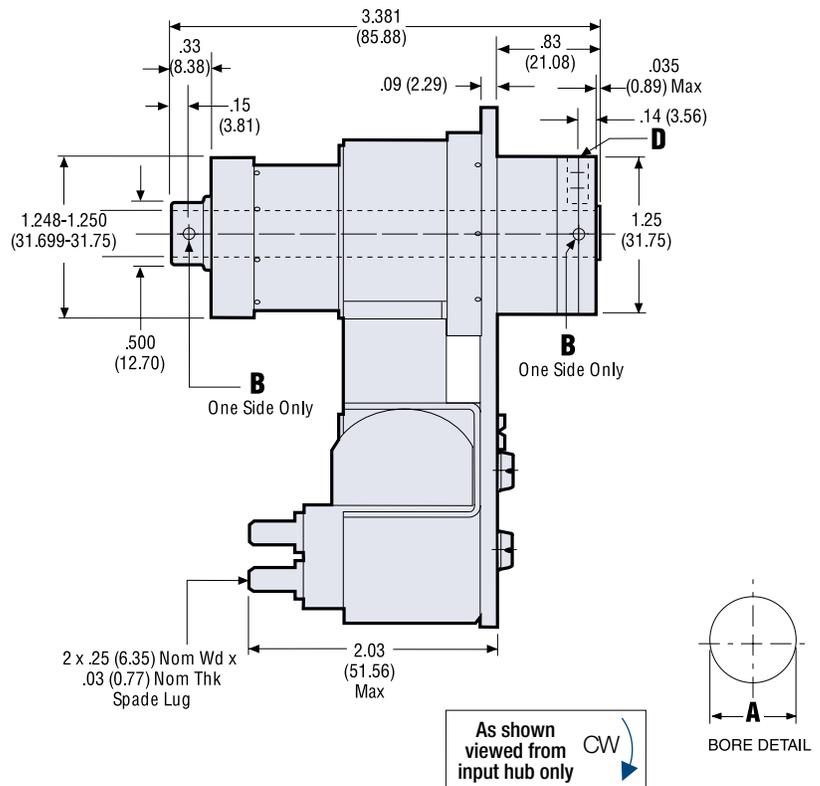
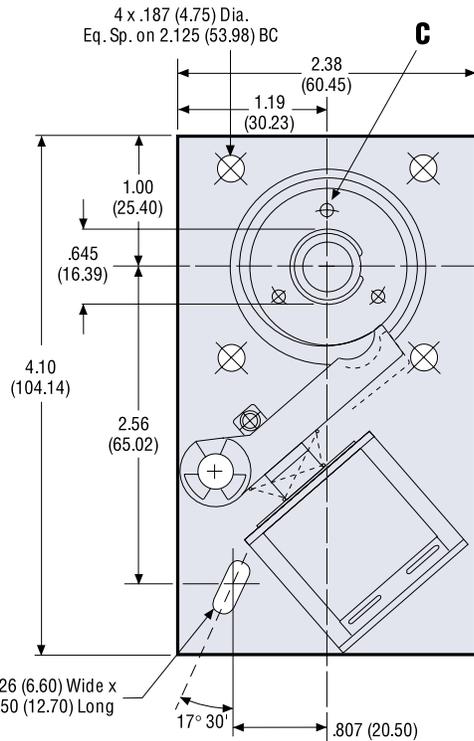
*115 AC-In rush current .10 amps, Holding current .05 amps

Specifications

Static Torque	25 lb.in.
Maximum anti-overnun holding capability	10 lb.in.
Maximum anti-back holding capability	10 lb.in.
Inertia, rotating parts	.034 lb.in. ²
Maximum radial bearing load at maximum speed	7.5 lbs.
Maximum operating speed	1,800 RPM
Response time, voltage on at full speed	20 MS
Weight	1 lb.

CB-4 Clutch / Brake

Dimensions in. (mm)



Bore Sizes

	Bore A	Pin Hole B	Mtg. Holes C	Set Screws D
English in. (mm)	.376-.378 (9.55-9.60)	.125 (3.175)	3x #6-32 Eq. Sp. on .938 BC	#8-32 x .188 Lg. Hex Skt. Set Screw
Metric mm (in.)	10.0 H9 (.3937-.3951)	3.0 (.117-.121)	3x M4 x 0.7 on 23.83 BC	M4 x 0.7 x 5.0 Lg. Hex Skt. Set Screw

All dimensions are nominal unless otherwise noted.

CB-4 Part Numbers

Bore Size	Voltage	Rotation	Stops		
			1	2	4
0.375"	24 VDC	CW	304-17-001	304-17-011	304-17-007
		CCW	304-27-001	304-27-007	304-27-026
0.375"	115 VAC	CW	304-17-003	304-17-008	304-17-018
		CCW	304-27-003	304-27-015	304-27-025

These are the most commonly requested parts – other voltages (such as 12VDC and 90VDC), bores and stop collars are available. See page 40 for metric part numbers.

Electrical Data (±10%)

Voltage	Current (amps)	Resistance (ohms)	Status
115 AC 60 Hz	.10*	280	Standard
24 DC	.32	74	Standard
12 DC	.73	16.4	Option
90 DC	.10	936	Option

(Coils are rated for continuous duty)

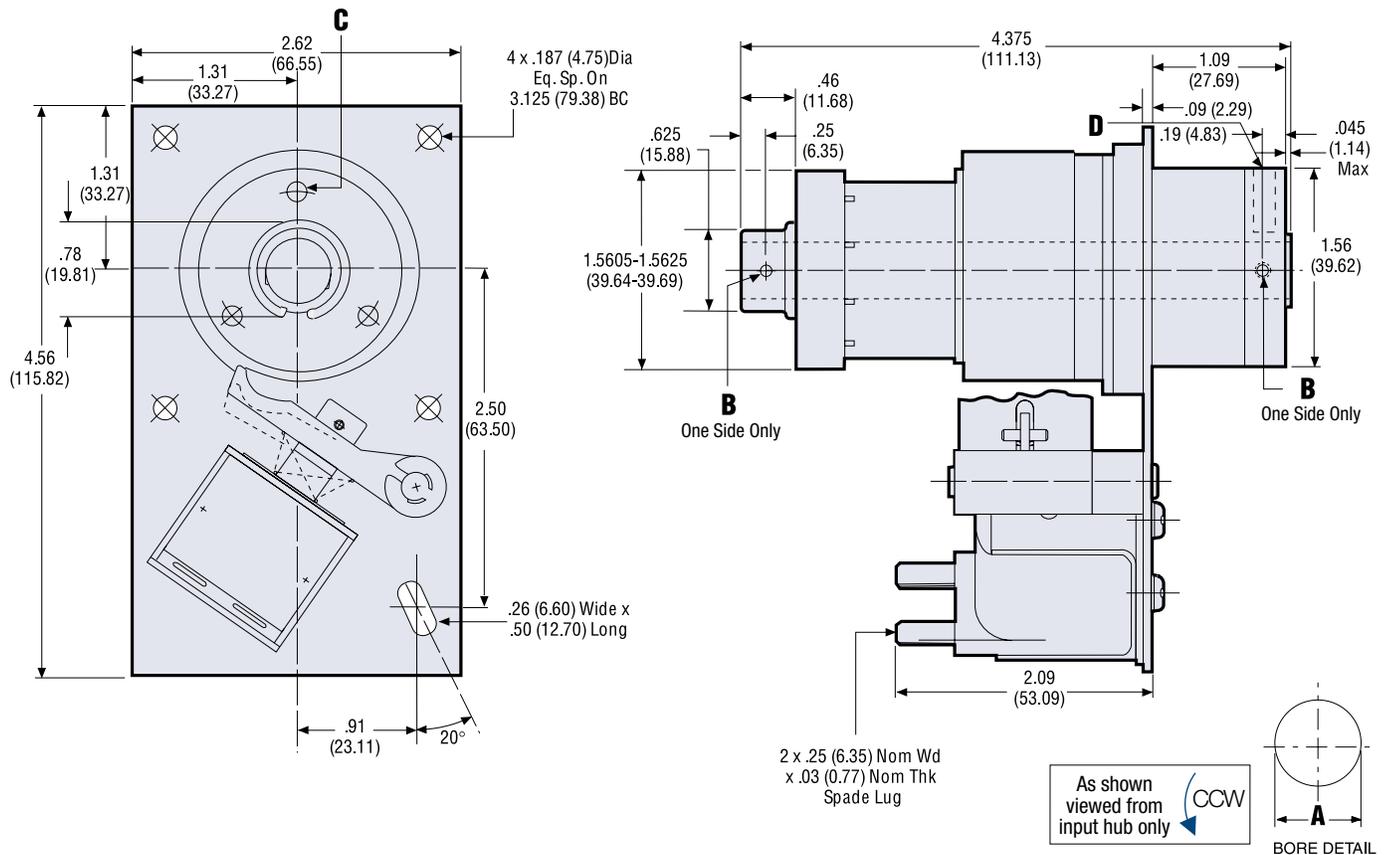
*115 AC-In rush current .22 amps, Holding current .09 amps

Specifications

Static Torque	120 lb.in.
Maximum anti-overrun holding capability	25 lb.in.
Maximum anti-back holding capability	80 lb.in.
Inertia, rotating parts	.064 lb.in. ²
Maximum radial bearing load at maximum speed	14 lbs.
Maximum operating speed	1,200 RPM
Response time, voltage on at full speed	24 MS
Weight	2 lb.

CB-5 Clutch / Brake

Dimensions in. (mm)



Bore Sizes

	Bore A	Pin Hole B	Mtg. Holes C	Set Screws D
English in. (mm)	.5005-.5025 (12.712-12.764)	.125 (3.175)	3x #10-32 UNF-2B Eq. Sp. on 1.25 BC	#8-32 x .25 Skt. Set Screw
Metric mm (in.)	12.0 H9 (.4724-.4741)	3.0 (.117-.121)	3x M5 x 0.8 on 31.75 BC	

All dimensions are nominal unless otherwise noted.

CB-5 Part Numbers

Bore Size	Voltage	Rotation	Stops		
			1	2	4
0.5"	24 VDC	CW	305-17-001	305-17-002	305-17-003
		CCW	305-27-001	305-27-002	305-27-003
0.5"	115 VAC	CW	305-17-007	305-17-008	305-17-009
		CCW	305-27-007	305-27-008	305-27-009

These are the most commonly requested parts – other voltages (such as 12VDC and 90VDC), bores and stop collars are available. See page 40 for metric part numbers.

Electrical Data (±10%)

Voltage	Current (amps)	Resistance (ohms)	Status
115 AC 60 Hz	.10*	280	Standard
24 DC	.32	74	Standard
12 DC	.73	16.4	Option
90 DC	.10	936	Option

(Coils are rated for continuous duty)

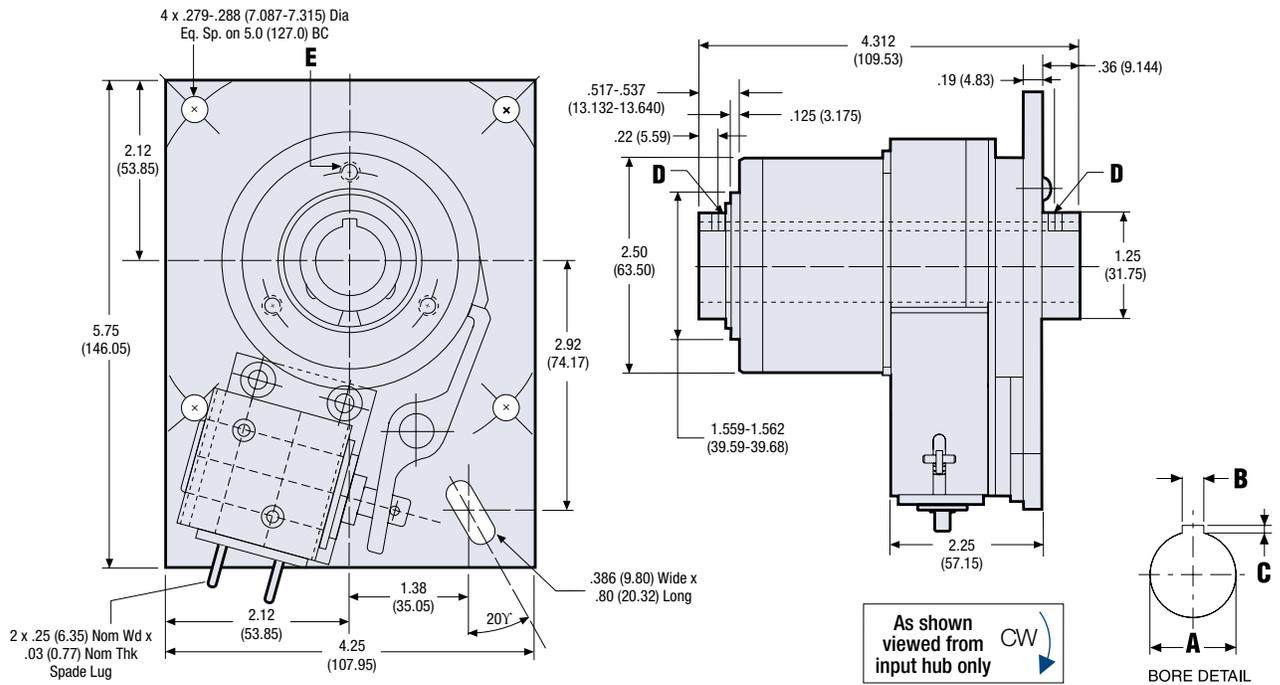
*115 AC-In rush current .22 amps, Holding current .09 amps

Specifications

Static Torque	250 lb.in.
Maximum anti-overnun holding capability	45 lb.in.
Maximum anti-back holding capability	160 lb.in.
Inertia, rotating parts	.195 lb.in. ²
Maximum radial bearing load at maximum speed	32 lbs.
Maximum operating speed	750 RPM
Response time, voltage on at full speed	27 MS
Weight	3 lb.

CB-6 Clutch / Brake

Dimensions in. (mm)



Bore & Keyway Sizes

	Bore A	Keyway Width B	Keyway Depth C	Set Screws/Pin Hole D	Mtg. Holes E
English in.	.7505-.7525	.1875	.09375	2x #10-32 UNF-2B	3x #1/4-20 UNC-2B
(mm)	(19.062-19.114)	(4.7625)	(2.381)		Eq. Sp. on 2.062 BC
	1.0005-1.0025	—	—	2x .187 Hole	3x #1/4-20 UNC-2B
	(25.412-25.464)			(4.7498)	Eq. Sp. on 2.062 BC
Metric mm	20.0 H9	6.0	2.8	2x M5 x 0.8 x 5.0	3x M6 x 1.0 on
(in.)	(.7874-.7894)	(.2362)	(.1102)	Lg. Hex Soc. Set Screw	52.38 BC
	25.0 H9	—	—	2x 5.0 Hole	3x M6 x 1.0 on
	(.9842-.9862)			(.191-.203)	52.38 BC

All dimensions are nominal unless otherwise noted.

CB-6 Part Numbers

Bore Size	Voltage	Rotation	Stops		
			1	2	4
0.75"	24 VDC	CW	306-17-051	306-17-074	306-17-162
		CCW	306-27-029	306-27-046	306-27-134
0.75"	115 VAC	CW	306-17-053	306-17-060	306-17-073
		CCW	306-27-031	306-27-039	306-27-045
1.0"	24 VDC	CW	306-17-057	306-17-061	306-17-031
		CCW	306-27-032	306-27-147	306-27-150
1.0"	115 VAC	CW	306-17-059	306-17-062	306-17-075
		CCW	306-27-034	306-27-044	306-27-037

These are the most commonly requested parts – other voltages (such as 12VDC and 90VDC), bores and stop collars are available. See page 40 for metric part numbers.

Electrical Data (±10%)

Voltage	Current (amps)	Resistance (ohms)	Status
115 AC 60 Hz	.33*	53.5	Standard
24 DC	.60	39.9	Standard
12 DC	1.15	10.4	Option
90 DC	.15	598	Option

(Coils are rated for continuous duty)

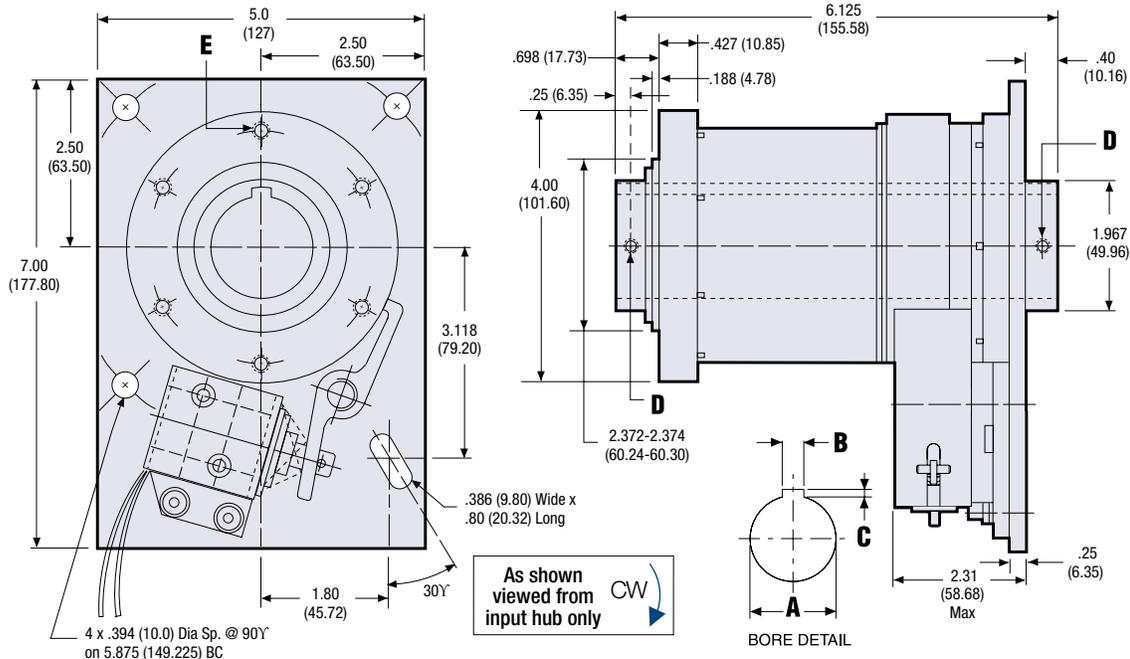
*115 AC-In rush current .62 amps, Holding current .31 amps

Specifications

Static Torque	500 lb.in.
Maximum anti-overrun holding capability	300 lb.in.
Maximum anti-back holding capability	300 lb.in.
Inertia, rotating parts	1.718 lb.in. ²
Maximum radial bearing load at maximum speed	63 lbs.
Maximum operating speed	500 RPM
Response time, voltage on at full speed	45 MS
Weight	7 lb.

CB-8 Clutch / Brake

Dimensions in. (mm)



Bore & Keyway Sizes

	Bore A	Keyway Width B	Keyway Depth C	Set Screws D	Mtg. Holes E
English in. (mm)	1.2505-1.2525 (31.762-31.814)	.3125 (7.9375)	.15625 (3.9688)	2x #1/4-20 UNC-2B	6x 5/16-18 UNC-2B Eq. Sp. on 3.375 BC
	1.5005-1.5025 (38.112-38.164)	.375 (9.525)	.125 (3.175)	2x #1/4-20 x UNC-2B	6x 5/16-18 UNC-2B Eq. Sp. on 3.375 BC
Metric mm (in.)	35.0 H9 (1.3780-1.3804)	10.0 (.3937)	3.3 (.1299)	2x M6 x 1.0 x 10.0 Lg. Hex Soc. Set Screw	6x M8 x 1.25 on 85.73 BC
	40.0 H9 (1.5784-1.5772)	—	—	2x M6 x 1.0 x 10.0 Lg. Hex Soc. Set Screw	6x M8 x 1.25 on 85.73 BC

All dimensions are nominal unless otherwise noted.

CB-8 Part Numbers

Bore Size	Voltage	Rotation	Stops		
			1	2	4
1.25"	24 VDC	CW	308-17-101	308-17-102	308-17-103
		CCW	308-27-101	308-27-102	308-27-103
1.25"	115 VAC	CW	308-17-107	308-17-108	308-17-109
		CCW	308-27-107	308-27-108	308-27-109
1.5"	24 VDC	CW	308-17-119	308-17-120	308-17-121
		CCW	308-27-119	308-27-120	308-27-121
1.5"	115 VAC	CW	308-17-125	308-17-126	308-17-127
		CCW	308-27-125	308-27-126	308-27-127

These are the most commonly requested parts – other voltages (such as 12VDC and 90VDC), bores and stop collars are available. See page 40 for metric part numbers.

Electrical Data (±10%)

Voltage	Current (amps)	Resistance (ohms)	Status
115 AC 60 Hz	.33*	53.5	Standard
24 DC	.60	39.8	Standard
12 DC	1.15	10.4	Option
90 DC	.15	598	Option

(Coils are rated for continuous duty)

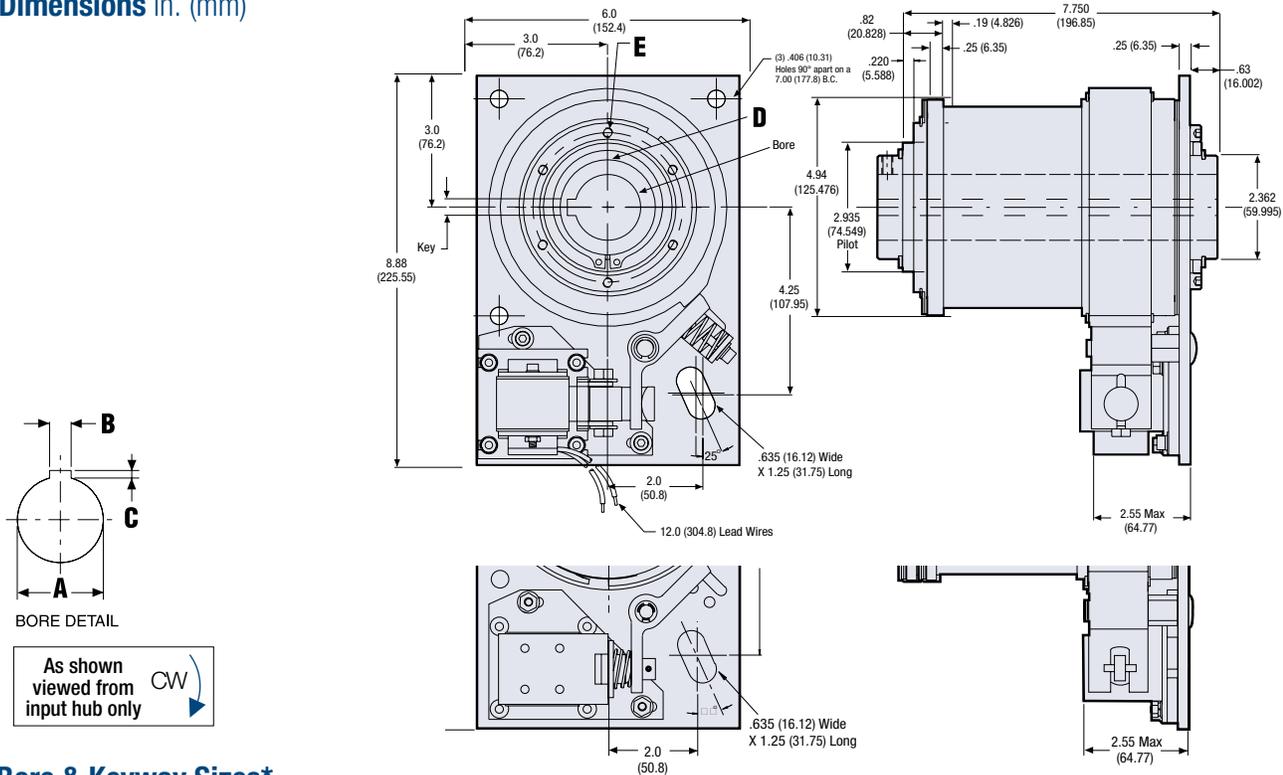
*115 AC-In rush current .62 amps, Holding current .31 amps

Specifications

Static Torque	2,500 lb.in.
Maximum anti-overnun holding capability	600 lb.in.
Maximum anti-back holding capability	600 lb.in.
Inertia, rotating parts	12.840 lb.in. ²
Maximum radial bearing load at maximum speed	300 lbs.
Maximum operating speed	300 RPM
Response time, voltage on at full speed	50 MS
Weight	15 lb.

CB-10 Clutch / Brake

Dimensions in. (mm)



Bore & Keyway Sizes*

	Bore A	Keyway Width B	Keyway Depth C	Set Screws D	Mtg. Holes E
English in.	1.5005-1.503	.375	.187	#1/4-20 x UNC-2B	6x 1/4-20 UNC-2B
(mm)	(38.113-38.177)	(9.525)	(4.75)		Eq. Sp. on 3.417 BC
	1.7505-1.753	.375	.187	#1/4-20 x UNC-2B	6x 1/4-20 UNC-2B
	(44.464-44.527)	(9.525)	(4.75)		Eq. Sp. on 3.417 BC
Metric mm	40.0 H9	12.0	4.0	M6 x 1.0 x 10.0	6x M8 x 1.25 on
(in.)	(1.5784-1.5772)	(.4724)	(.1574)	Lg. Hex Soc. Set Screw	86.79 BC

All dimensions are nominal unless otherwise noted. * Optional Bores and Keys: 1.2505/1.2530 (31.7627/31.8262) for .3125 (7.9375) Sq Key
1.6255/1.6280 (41.2877/41.3512) for .375 (9.525) Sq Key

CB-10 Part Numbers

Bore Size	Voltage	Rotation	Stops		
			1	2	4
1.5"	24 VDC	CW	300-17-051	300-17-052	300-17-053
		CCW	300-27-030	300-27-051	300-27-052
1.5"	115 VAC	CW	300-12-033	300-12-051	300-12-044
		CCW	300-22-033	300-22-047	300-22-041
1.75"	24 VDC	CW	300-17-031	300-17-070	
		CCW	300-27-031		
1.75"	115 VAC	CW	300-12-034	300-12-053	300-12-054
		CCW	300-22-034	300-22-054	300-22-055

These are the most commonly requested parts – other voltages (such as 12VDC and 90VDC), bores and stop collars are available. See page 40 for metric part numbers.

Electrical Data (±10%)

Voltage	Current (amps)	Resistance (ohms)	Status
115 AC 60 Hz	.6*	11.5	Standard
24 DC	.94	25.4	Standard
12 DC	1.90	6.3	Option
90 DC	.24	378	Option

(Coils are rated for continuous duty)

*115 AC-In rush current 5.3 amps, Holding current .6 amps

Specifications

Static Torque	5,000 lb.in.
Maximum anti-overnun holding capability	1,200 lb.in.
Maximum anti-back holding capability	1,200 lb.in.
Inertia, rotating parts	48 lb.in. ²
Maximum radial bearing load at maximum speed	500 lbs.
Maximum operating speed	200 RPM
Response time, voltage on at full speed	85 MS
Weight	29 lb.