RegalRexnord™

Wrap Spring Clutches and Clutch/Brakes

WARNER ELECTRIC™

PRODUCT CATALOG

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Introduction

Founded in 1927, Warner Electric has grown to become a global leader in the development of innovative electromagnetic clutch & brake solutions. Warner Electric™ engineers utilize the latest materials and manufacturing technologies to design long life, easy-to-use clutches and brakes that provide improved accuracy and repeatability. Warner Electric offers the broadest selection of industrial clutches, brakes, controls and web tension systems available from a single manufacturer.

Reliable Warner Electric components are used in a wide range of markets including material handling, packaging machinery, food & beverage, elevator & escalator, turf & garden, agriculture, off-highway, forklift, crane and motion control. Applications include conveyors, lift trucks, wrapping machines, servo motors, capping equipment, combines, balers, baggage handling systems, military vehicles, hoists and lawn mowers.

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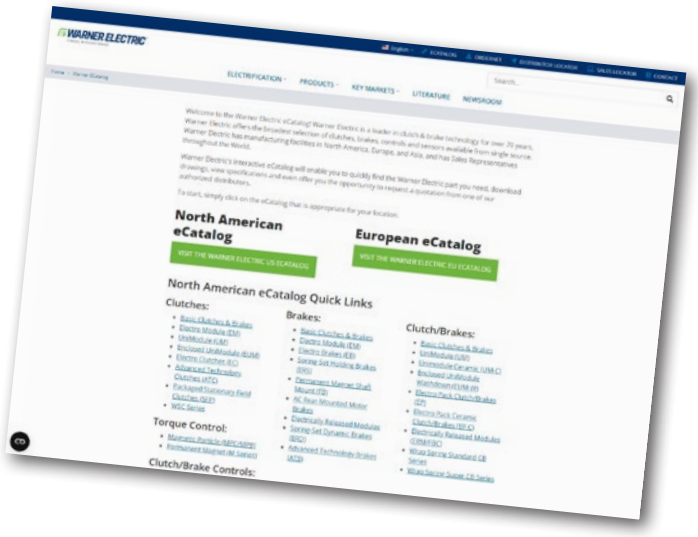
warnerelectric.com features an interactive eCATALOG making it faster and easier to find and spec the motion control products you need.

Within the Warner Electric Interactive eCATALOG, you can start your search for basic components, such as clutches or brakes, and then quickly refine your search from hundreds of possibilities to one that meets your specific power transmission requirements for NEMA, input/output configurations and other factors. You can also download specifications and PDF pages or submit an RFQ for any of your selections.

Find it fast at warnerelectric.com



Product Overview

Wrap Spring Clutches and Clutch/Brakes

Warner Electric offers a complete line of standard wrap spring clutches and clutch/brakes, available for immediate delivery through our nationwide network of power transmission distributors. As the industry leader in clutch/brake technology you can count on Warner Electric for complete application assistance and after sale service.

CB SERIES

CB Series combination clutch/brakes accurately start and stop loads driven by a continuously rotating power source. CB units operate from a single AC or DC pulse, stopping the load within ±½° noncumulative at speeds up to 1800 RPM depending on size. Each unit is pre-engineered and pre-assembled for easy installation. Super CB clutch/brakes provide 3 to 5 times longer life.

SUPER CB SERIES

High performance clutch/brake packages feature extraordinary long life. Ideal for demanding applications involving continuous high cycle rates under heavy load conditions.

SAC AND PSI SERIES

Two clutch series include the Solenoid Actuated SAC Series and the mechanically actuated, basic wrap spring PSI Series clutch.

ACCESSORIES

Several accessories are offered for Genuine Wrap Spring products, including dust cover enclosures; heavy duty actuator and controls. The heavy duty actuator is used with the PSI-6 Series clutches. A plug-in clutch/brake control designed for operation of D-frame, AC or DC wrap spring clutches and brakes is available.

ENGINEERED PRODUCTS

Engineered products are specially designed to solve specific and unique application requirements. The products shown are the result of years of experience in providing innovative solutions for applications, including paper feed drives, agriculture equipment, copiers, robotics, etc. These solutions are now available as “engineered” products, which include the DL, MAC, SP and BDNB.

Product Selection

CLUTCHES & BRAKES SELECTION CHART—BY MOTION TYPE							
Motion Type	**Type**	**Model/Sizes**	**Max Torque lb-in (Nm)**	**Bore Range**	**Max RPM***	**Actuation Method****	**Page**
Starting START *Motion icons are shown at the top of each product page to make selecting easier.*	Wrap Spring Clutch	DL-33	30 (3.4)	English: 1/4 - 5/16" Metric: 6 - 8 mm	1200	DC	62
	Wrap Spring Clutch	MAC-30, 45, 45 w/BC	150 (16)	English: 1/4 - 5/8" Metric: 6 - 16 mm	1200	DC	64
Indexing INDEX	Wrap Spring Clutch	PSI-2, 4, 5, 6, 8	2500 (282.5)	English: 1/4 - 1 1/2" Metric: 6 - 40 mm	1800	Mechanical	53
	Wrap Spring Clutch	SAC-2, 4, 5, 6	500 (56.5)	English: 1/4 - 1" Metric: 6 - 25 mm	1800	AC or DC Solenoid; AIR	47
	Wrap Spring Clutch/Brake	Super CB CB-5, 6, 7, 8, 10	5,000 (565)	English: 1/2 - 1 3/4" Metric: 12 - 45 mm	750	AC or DC Solenoid; AIR	32
	Wrap Spring Clutch/Brake	Standard CB CB-2, 4, 5, 6, 7, 8, 10	5,000 (565)	English: 1/4 - 1 3/4" Metric: 6 - 45 mm	1800	AC or DC Solenoid; AIR	17
	Wrap Spring Clutch	SP-2, 4, 5, 6	500 (56.5)	English: 3/4 - 1" Metric: 20 - 25 mm	1500	AC or DC; AIR	67
Holding HOLD	BDNB	NA	250 (28.23)	0.5"	200 RPM	Mechanical	69

** Consult factory for higher speeds ** Intermittent/Continuous*

BRAKES & CLUTCHES SELECTION CHART—BY CAPABILITY This chart contains basic information to determine when to use a Wrap Spring or Friction product.*		
Capability	**Genuine Wrap Spring**	**Friction**
Torque Capacity Per Unit Size	✔	
Low Power Consumption	✔	
Single Revolution	✔	
Random Start/Stop		✔
Brake: Power-On		✔
Brake: Power-Off		✔
Soft Start/Soft Stop		✔
Positive Engagement	✔	
Stopping Accuracy	✔	
Speeds Up To 1750	✔	✔
Speeds Over 1750		✔
Bi-Directional Rotation		✔
Rapid Cycling	✔	✔
Actuation - Electric	✔	✔
Actuation - Pneumatic	✔	
Actuation - Mechanical	✔	
Manual Release		✔
Torque Adjustment Feature		✔

** Many applications require additional specifications not shown in the chart above. Always review your application requirements before choosing a brake or clutch product.*

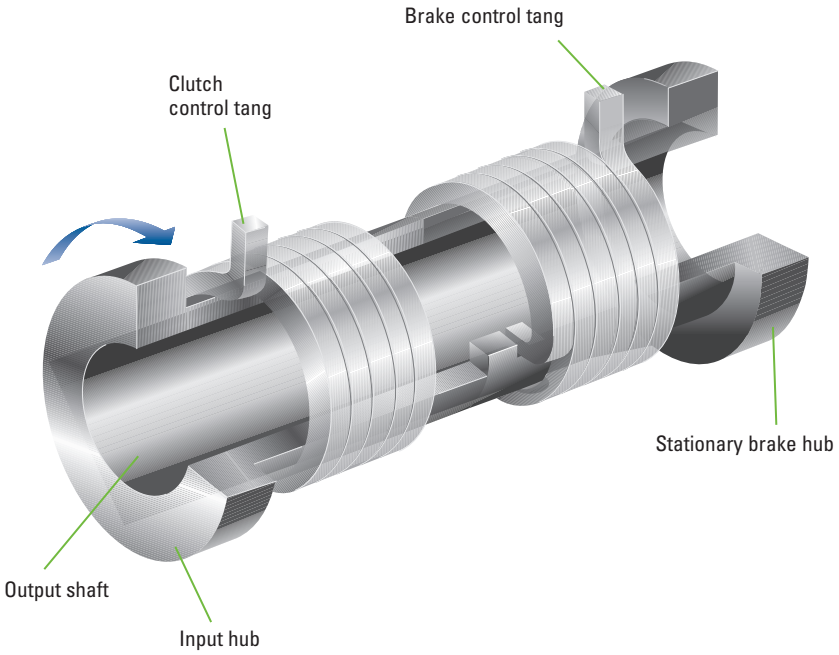
Basic Design Principles

Principle of Operation

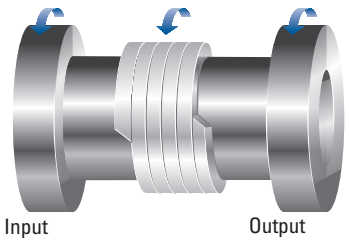
The three basic components of the wrap spring clutch are the input hub, output hub, and spring. The inside diameter of the spring is slightly smaller than the outside diameter of the two hubs. Rotation at the input hub in the direction of the arrow engages the spring and positively locks the two hubs 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.

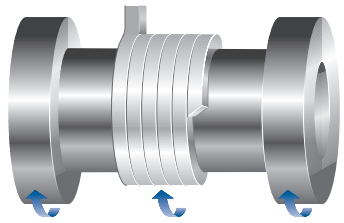


Design Configurations



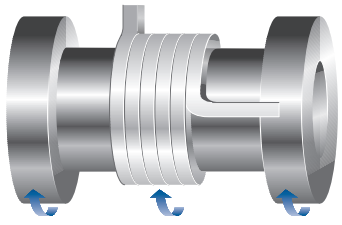
Model O

Control Tang



Model SS

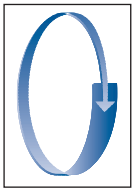
Control Tang



Model S

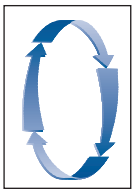
Overrunning (One Way Clutch)

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.



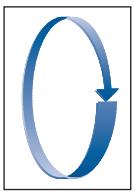
Start/Coast-To-Stop Clutch (Random Positioning)

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.



Applications

Genuine Wrap Spring clutch/brakes provide hundreds of simple motion processes that can be controlled through the three basic wrap spring clutch functions: overrunning, start-stop and single revolution.

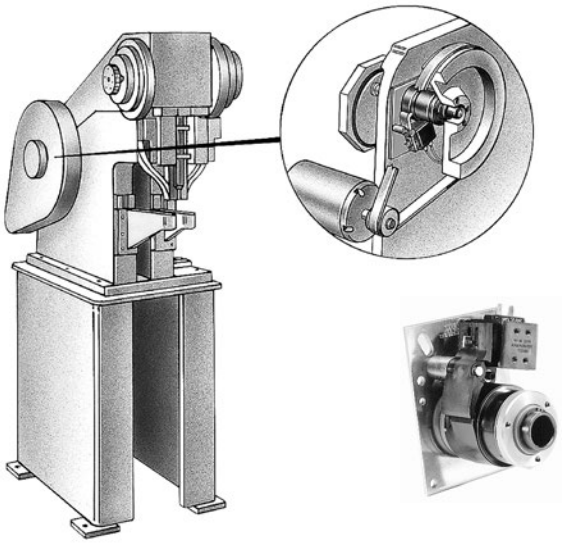
Important Facts

- The torque capacity of a spring clutch or brake is a direct function of the diameter of the hub and the tensile strength of the spring.
- A spring clutch or brake will not slip. It will attempt to supply the torque demanded, up to the mechanical limitations of the spring.
- When the spring is allowed to wrap down (or grip the hubs), the output hub will accelerate to the input RPM in .003 seconds, the output in .0015 seconds.
- The dynamic torque of acceleration or deceleration is proportional to the RPM multiplied by the load inertia and divided by the acceleration time. This fact indicates that spring clutches and brakes are inertia sensitive—the more inertia, the higher the dynamic torque.
- The torque demand of the spring clutch is equal to the system frictional torque of the load plus the dynamic torque of acceleration.
- When coming to the stop position of the cycle, there must be enough energy in the rotating mass of the load to allow the spring to release its grip on the input hub. This means that if there is a large frictional load or a torque demand such as coming up to the top of a cam, there must be sufficient energy in the rotating mass to open the spring. Failure to do so will result in possible input hub wear and/or noise.

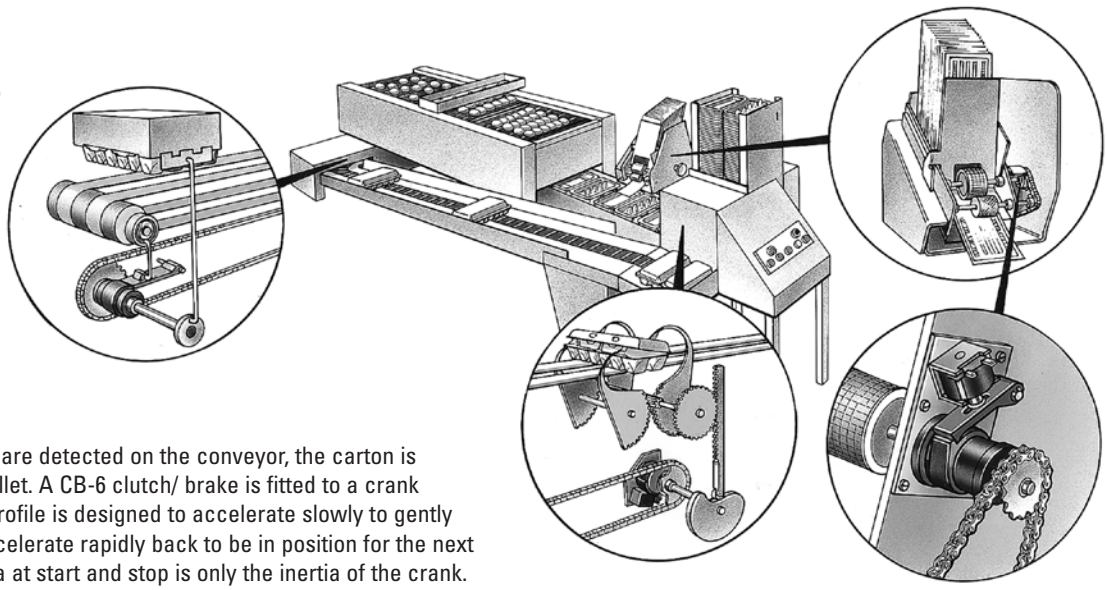
Single Revolution

Riveter

Through a wrap spring clutch, the motor drives a large flywheel and a large eccentric mass connected to the piston-like riveting ram. The wrap spring clutch-brake always stops at just past top dead center position, ready for the next cycle.



Start-Stop
(Accurate Positioning)



Egg Packaging

When cartons of eggs are detected on the conveyor, the carton is pushed off onto the pallet. A CB-6 clutch/ brake is fitted to a crank assembly. The crank profile is designed to accelerate slowly to gently move the eggs and accelerate rapidly back to be in position for the next carton. Thus the inertia at start and stop is only the inertia of the crank.

Applications Cont.

Start-Stop Applications

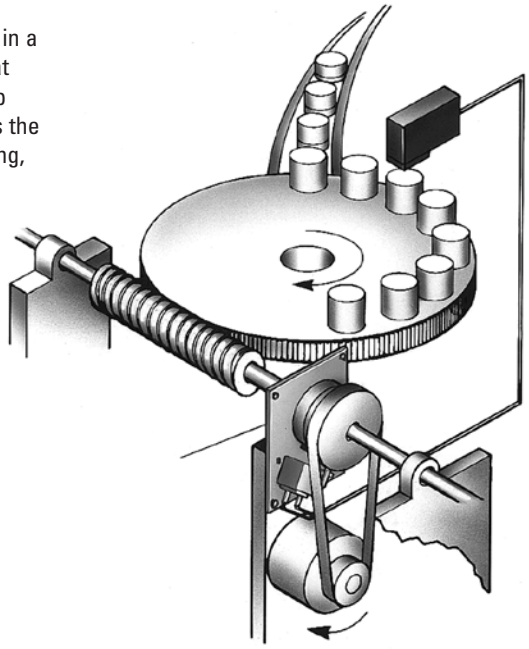
Literally hundreds of simple motion processes can be controlled through the three basic functions of wrap spring clutches and brakes — Overrunning, Start-Stop, and Single Revolution. Here are just a few examples:

- Mail openers and inserters, collators
- Bag making, paper feed
- Food processing
- Metal riveting, stapling and stitching
- Paper edge trimming
- Film advance
- Inclined conveyors
- Stackers
- Conveyor diverter gate
- Wire bending
- Money counter
- Paper printing and folding
- Newspaper vending machine door mechanism
- Wire windup machine/material cutoff
- Conveyor drives
- Heavy duty machinery
- Rapid cycling equipment

Single Revolution

Rotary Table

The worm drive in this application is in a 16:1 ratio to the indexing table so that each power supply pulse to the wrap spring clutch/brake solenoid indexes the table a single position fo filling, sorting, inspecting, etc.



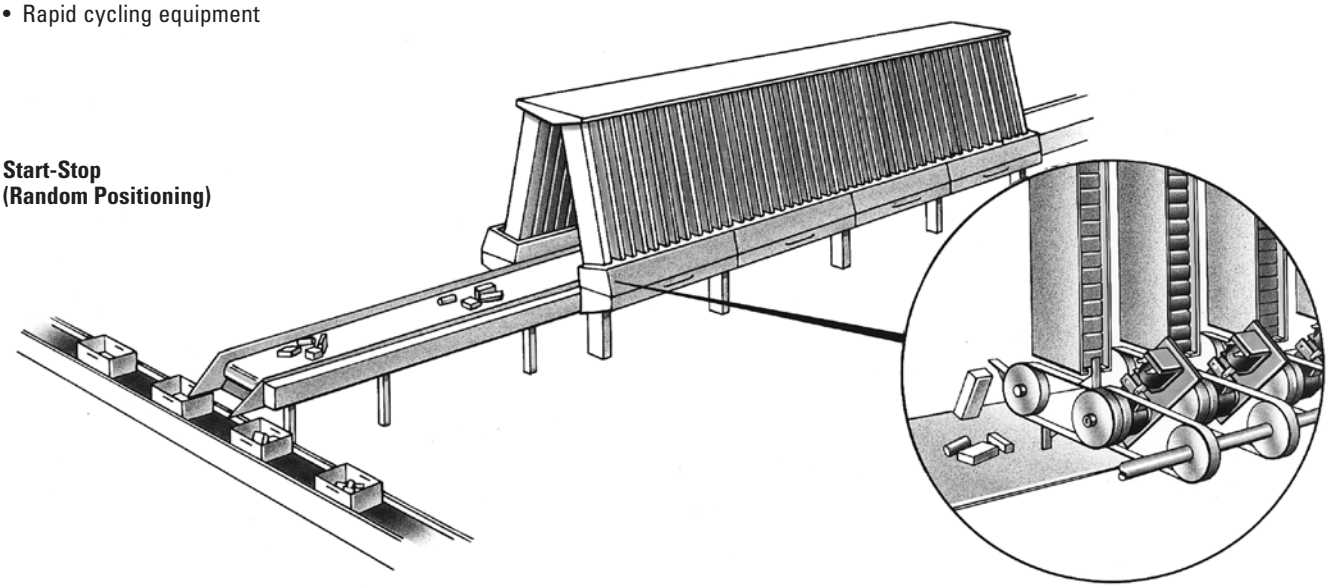
Product Selection

- Super CB
- Standard CB
- SAC
- PSI

Advantages

- Speed and accuracy increases productivity
- Excellent repeatability—no cumulative error
- Minimum system inertia

Start-Stop (Random Positioning)



Computerized Order Picker

800 wrap spring clutches, one at each station, dispense packages at the rate of three per second, onto a constantly moving belt to make up various customer orders. The computer-controlled system signals the appropriate clutch, which drives a paddle wheel-type belt system. This, in turn, ejects one package per computer signal.

Advantages

- Positioned control of paddle ejector made possible with positive, single revolution type clutch
- No cumulative error assures that orders are filled properly
- Simple control. One drive motor for the complete system. Low cost.

Product Selection

- SAC
- PSI

Applications Cont.

Overrunning Applications

Incline Conveyor

Anti-backup, anti-back driving

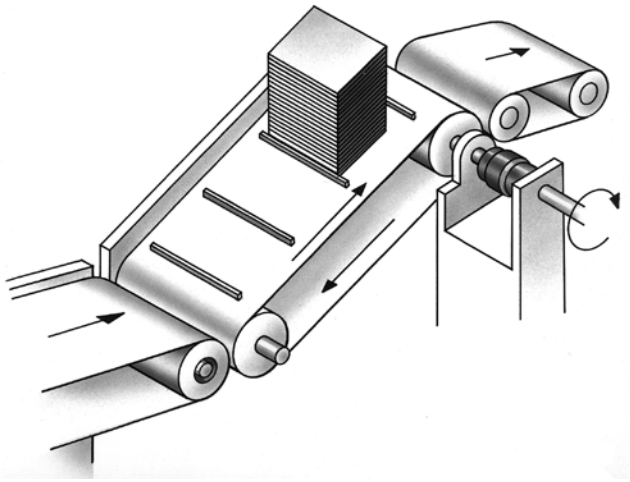
The PSI Series mechanical wrap spring clutch acts as an anti-backup device on this inclined conveyor. When the conveyor is running, the wrap spring is disengaged, allowing the clutch output to freewheel. When the conveyor drive is disengaged, the conveyor starts to reverse and engages the wrap spring, which then acts as an effective brake.

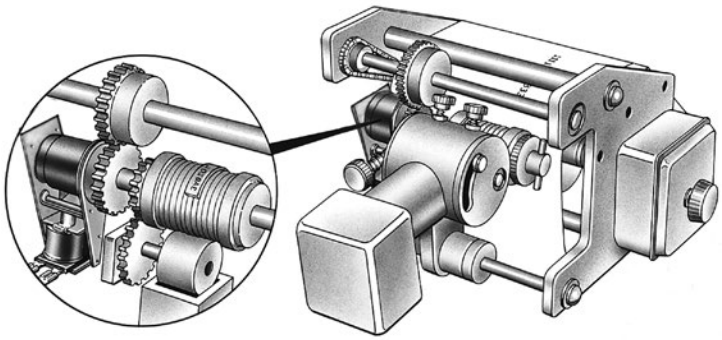
Advantages

- Uni-directional control facilitates low-cost design
- Maintenance free

Product Selection

- PSI





Product Selection

- SAC-5
- SP-5

Precise Registration

Print Wheel

In this high-speed code printing machine, a photo eye scans a mark on the web and signals a single-revolution wrap spring clutch to drive the print wheel in exact registration with the continuously moving web. Variations in printing positioning cannot be tolerated.

Advantages

- Fast/Accurate—the wrap spring clutch rapidly accelerates the print wheel and returns it to home position with no cumulative error. Long acceleration times would cause smearing and misregistration.
- Compact—high torque-to-size ratio makes it easy to fit into the small space, thus reducing overall machine size and cost.
- Control—electric actuation for simple interface with the photo eye signal.

Linear-to-Rotary Translation

Rack and Pinion Indexing Drive

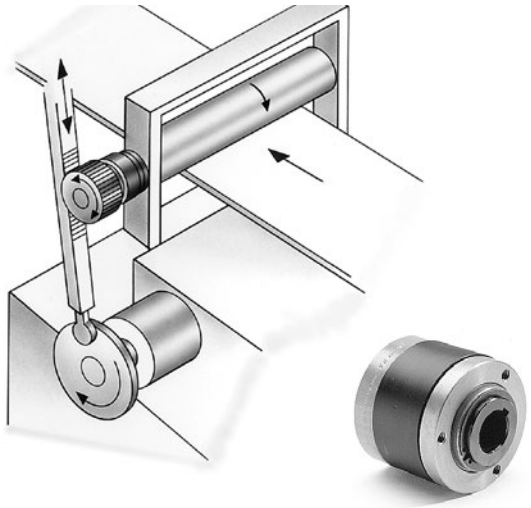
Since wrap spring clutches are inherently uni-directional, the PSI overrunning model "O" clutch in this application operates as a ratchet drive. When the rack is moved upward, the wrap spring clutch engages to translate torque to the feed conveyor. On the downward side of the stroke, the wrap spring clutch is disengaged.

Advantages

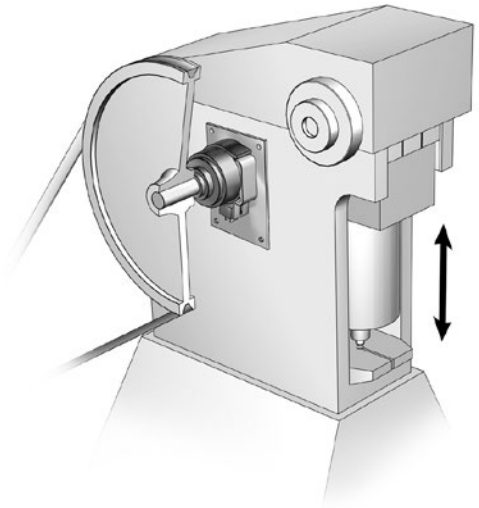
- Simple—requires no external controls or sensors
- Reliable
- Maintenance free

Product Selection

- PSI

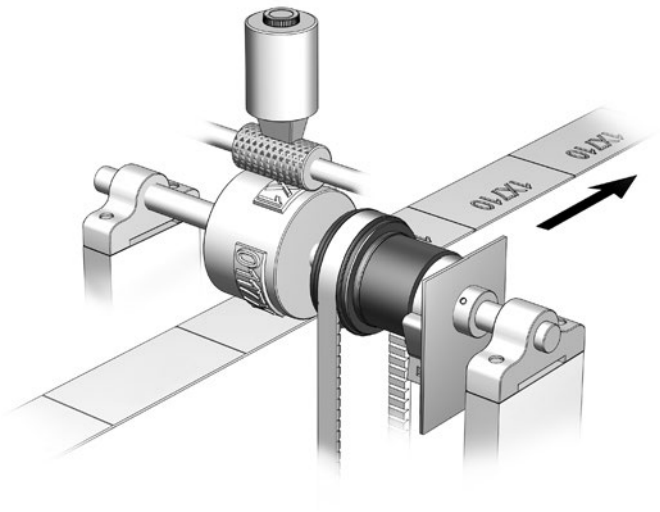


Application Examples



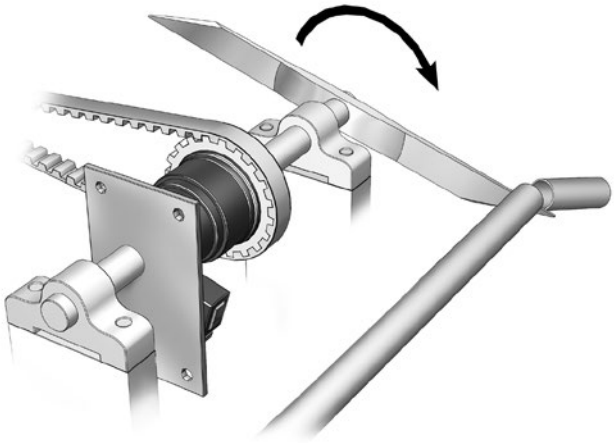
Industrial Stitchers and Staplers

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.



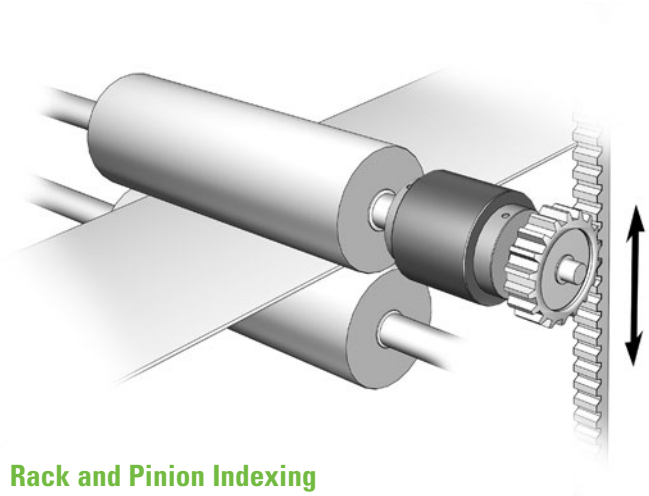
Print Head

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 ± 1/2° 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 PSI Model O operates as an indexing drive for this application. As the rack moves upward, the wrap spring 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 PSI, the amount fed each cycle remains constant and consistent.

How To Select

Warner Electric Genuine Wrap Spring Clutches and Brakes

Wrap spring clutches and brakes are pre-packaged, pre-assembled units that 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 the size

Step 3 Verify the 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 right size product. When the performance requirements of a given application are marginally within the capabilities of a 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 70, which will help you review all necessary aspects of your application.

STEP 1

Determine the clutch or brake function

Wrap spring clutches and brakes can perform three control functions—overrunning, start-stop and single revolution. Determine the function that will provide the best control for your application. The application ideas shown on pages 8–11 may be helpful. Select the series that best fits your application requirements from the chart below.

STEP 2

Determine the size

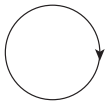
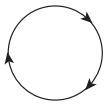
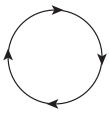
To select the correct size unit, determine the maximum RPM at which the clutch or brake will operate and the shaft diameter on which the wrap spring unit will be mounted. A wrap spring clutch engages almost instantly and, since spring wrap increases with load, the unit must be sized carefully to ensure 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 70. To select the correct wrap spring unit, locate the appropriate speed and shaft diameter points on the chart that correlates to the model that best suits your application. For applications requiring speed or diameter values higher than those illustrated, please contact your local Warner Electric™ distributor or your sales representative.

STEP 3

Verify the 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 are detailed in the "How to Order" section for each series.

Selection by Function

Function	Performance	Wrap Spring Product	Max Torque		Max.* RPM	Max. Cycles/ Minute	Actuation Method
			Starting lb-in (N-m)	Stopping lb-in (N-m)			
Overrunning 	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. *Engaged in one direction only*	PSI Series Model O	2500 (282.5)	N/A	1800	N/A	Reverse input rotation
Start-Stop 	A start-stop clutch will engage and disengage a load either by mechanical or electrical actuation. Start-stop clutches provide a random stop position for the load. *Random Positioning*	PSI Series Model SS	2500 (282.5)	0	1800	N/A	Mechanical
		SAC Series Model SS	500 (56.5)	0	1800	N/A	AC; DC Solenoid or AIR
		SP	500 (56.5)	0	1800	N/A	AC; DC Solenoid or AIR
Single Revolution 	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. *Accurate positioning for single or multiple*	PSI Series Model S	2500 (282.5)	250 (28.25)	1800	1800	Mechanical
		SAC Series Model S	500 (56.5)	50 (5.65)	1800	1200	AC; DC Solenoid or AIR
		Super CB	5000 (565.0)	5000 (565.0)	1800	1200	AC; DC Solenoid or AIR
		Standard CB	5000 (565.0)	5000 (565.0)	1800	1200	AC; DC Solenoid or AIR

** For RPM ranges on specific models, See Selection charts on pages 13.*

Selection

Design Considerations

All Models

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

Super CB and CB Series

- AC or DC solenoid and pneumatic
- CB-5, CB-6, CB-7, CB-8 and CB-10 sizes available in the long life, Super CB Series. See pages 20–29 for specific details.

SAC Series

- AC or DC solenoid and pneumatic

PSI Series

- Hub input/shaft output or shaft input/hub output
- Overrunning Model O, start-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	■	■	■	■													
7	1	■	■	■														
7	1 1/4	■	■	■														
7	1 1/2	■	■	■														
8	1	■	■															
8	1 1/4	■	■															
8	1 3/8	■	■															
8	1 1/2	■	■															
10	1 1/2	■																
10	1 5/8	■																
10	1 3/4	■																

RPM

SAC 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	■	■	■	■													

RPM

PSI 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	■	■															

RPM

Standard CB Series Clutch/Brake

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Solenoid-Activated, Combination Clutch/Brakes

CB Series combination clutches and brakes accurately start and stop loads driven by a continuously rotating power source. CB units operate from a single AC or DC pulse, stopping the load within ±½° noncumulative at speeds up to 1800 RPM, depending on size. Each unit is pre-engineered and pre-assembled for easy installation.

Features

- Available in seven sizes
- Adjustable control collars for easy and accurate output stop position setting
- Load over-travel or backup is eliminated since CB units lock the load in both directions when the solenoid is off
- RoHS compliant
- Cost-effective design
- Split cam design, Models CB-5, CB-6, CB-7, CB-8
- Anti-overrun feature prevents the output from running faster than the input
- Permanently lubricated—never needs adjustment for wear
- Brings load up to speed in 3 milliseconds and stops within 1.5 milliseconds
- Single, 2 and 4 stop collar standard, multi-stop collars with up to 24 stops available as specials
- AC or DC operated
- See pages 59-60 for controls

Typical Applications

- Riveters
- Punch presses
- Packaging equipment
- Conveyor drives
- Heavy duty machinery
- Rapid cycling equipment

How to Order

CB - 6 - CW - 24V - 3/4" bore - 2

CB Series
Specify:
Imperial or Metric

Size
CB-2 = **2**
CB-4 = **4**
CB-5 = **5**
CB-6 = **6**
CB-7 = **7**
CB-8 = **8**
CB-10 = **10**

Direction of Rotation
CW = Clockwise
CCW = Counterclockwise

Coil Voltage
12V = 12VDC
24V = **24VDC**
90V = 90VDC
115V = **115VAC**

Bore Size
CB-2 = ¼"
CB-4 = ⅜"
CB-5 = ½"
CB-6 = **¾", 1"**
CB-7 = **1",1¼",1½"**
*¾"
CB-8 = **1¼",1½"**
*1",*1⅜"
CB-10 = **1½"**
*1⅝",*1¾"
*Special order

Stop Collar
1 = 1 stop
2 = 2 stop
4 = 4 stop
Other stop collars are special order.

OPTIONS	
Dust Covers	See page 56
Stop Collars	See page 57
Pneumatic Actuators	See page 58

Standard CB Series Clutch/Brake

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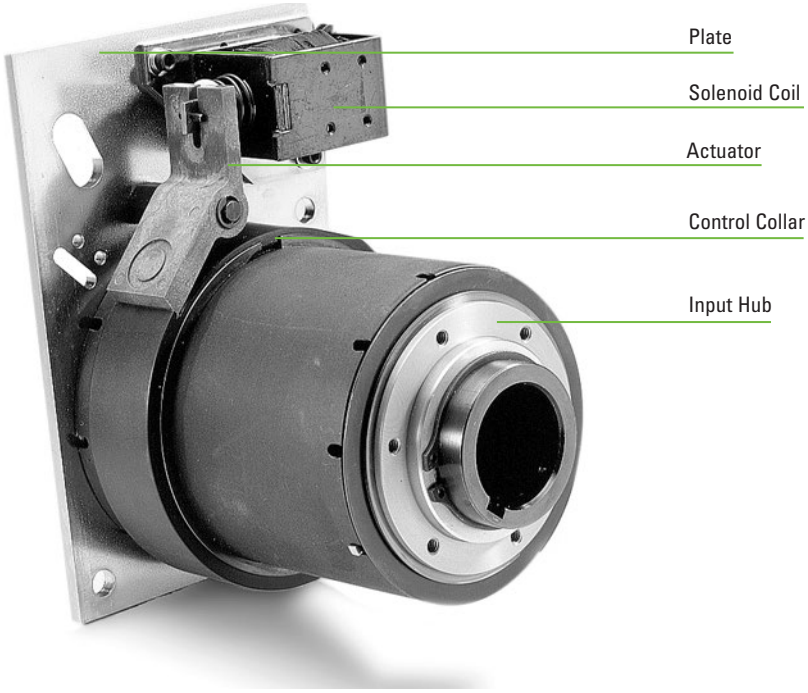
Combination Clutch/Brake Packages



PERFORMANCE							
	CB-2	CB-4	CB-5	CB-6	CB-7	CB-8	CB-10
Static torque	25 lbs.-in. (2.825 Nm)	120 lbs.-in. (13.56 Nm)	250 lbs.-in. (28.25 Nm)	500 lbs.-in. (56.5 Nm)	1,500 lbs.-in. (169.5 Nm)	2,500 lbs.-in. (282.5 Nm)	5,000 lbs.-in. (565 Nm)
Maximum anti-overrun holding capability	10 lbs.-in. (1.13 Nm)	25 lbs.-in. (2.825 Nm)	45 lbs.-in. (5.085 Nm)	300 lbs.-in. (33.9 Nm)	600 lbs.-in. (67.8 Nm)	600 lbs.-in. (67.8 Nm)	1,200 lbs.-in. (135.6 Nm)
Maximum anti-back holding	18 lbs.-in. (2.034 Nm)	80 lbs.-in. (9.04 Nm)	160 lbs.-in. (18.08 Nm)	300 lbs.-in. (33.9 Nm)	600 lbs.-in. (67.8 Nm)	600 lbs.-in. (67.8 Nm)	1,200 lbs.-in. (135.6 Nm)
Inertia, rotating parts	.0207 lbs.-in.^{2}	.0636 lbs.-in.^{2}	.1950 lbs.-in.^{2}	1.718 lbs.-in.^{2}	6.75 lbs.-in.^{2}	12.84 lbs.-in.^{2}	48.0 lbs.-in.^{2}
Maximum radial bearing load at maximum speed	7.5 lbs..	14 lbs..	32 lbs..	63 lbs..	300 lbs..	300 lbs..	500 lbs..
Maximum operating speed	1,800 RPM	1,200 RPM	750 RPM	500 RPM	400 RPM	300 RPM	200 RPM
Response time, voltage on at full speed	20 MS	24 MS	27 MS	45 MS	50 MS	50 MS	70 MS
Weight	1 lbs.	2 lbs.	3 lbs.	7 lbs.	12 lbs.	15 lbs.	27 lbs.

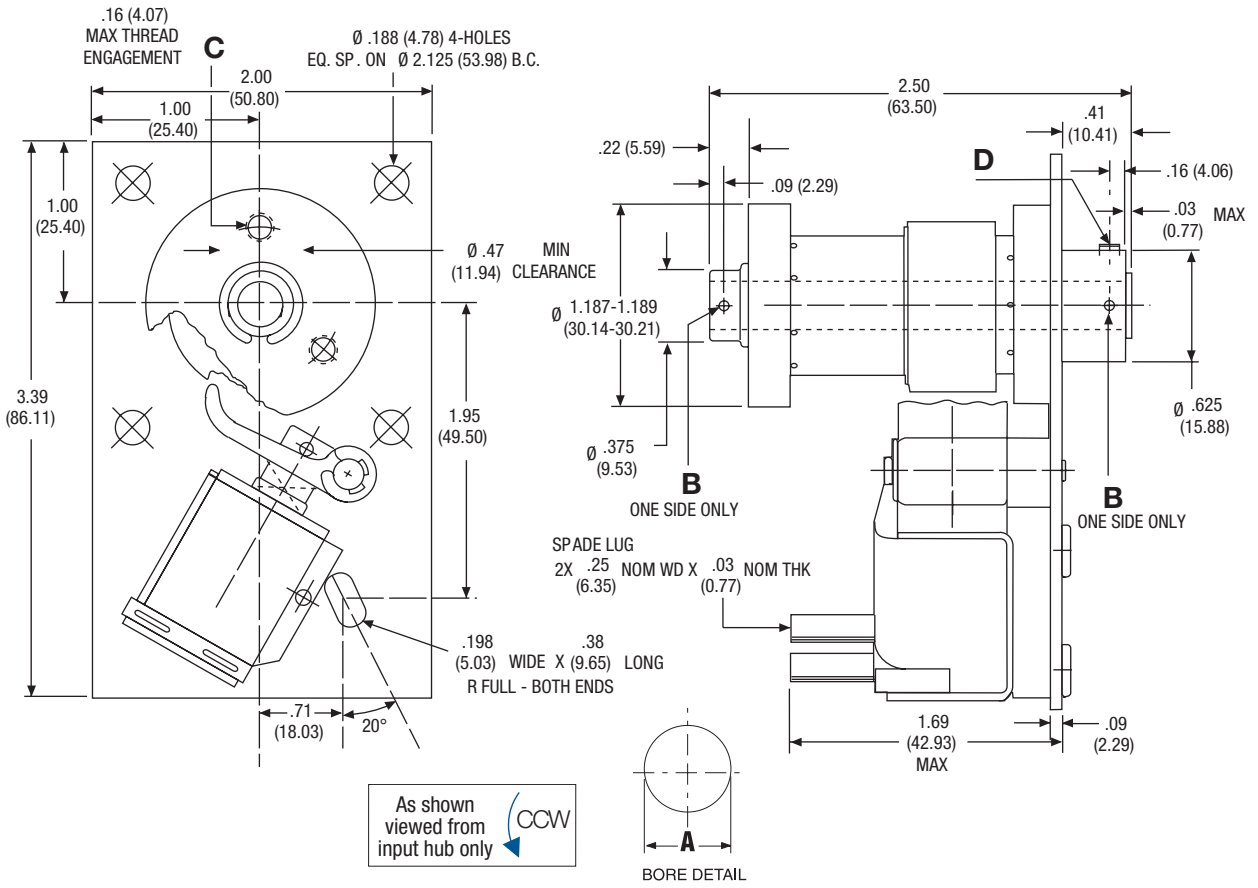
See page 71 for Minimum Inertia Requirements. See pages 77 & 78 for Mounting Requirements.

RPM vs. SHAFT BORE				
Size	Max RPM	Shaft Bores Standard in (mm)	Shaft Bores Special in (mm)	Shaft Bores Metric Standard in (mm)
CB–2	1,800	1/4" (6.35)	—	.2362-.2374 (6.0)
CB–4	1,200	3/8" (9.525)	—	.3937-.3951 (10.0)
CB–5	750	1/2" (12.70)	—	.4724-.4741 (12.0)
CB-6	500	3/4" or 1" (19.05 or 25.0)	—	7874-.7894 (20.0) or .9842-.9862 (25.0)
CB-7	400	1", 11/4" or 11/2" (25.4, 31.75 or 38.10)	3/4" (19.05)	.9843-.9863 (25.0), 1.1811-1.1831 (30.0) or 1.3780-1.3804 (35.0)
CB-8	300	11/4" or 11/2" (31.75 or 38.1)	1" or 13/8" (25.4 or 34.925)	1.3780-1.3804 (35.0) or 1.5784-1.5772 (40.0)
CB-10	200	11/2" (38.1)	15/8" or 13/4" (41.275 or 44.45)	1.5749-1.5722 (40.0) or 1.7717-1.7740 (45.0)

** Consult Factory.*

Standard CB-2 Clutch/Brake

Dimensions & Specifications



Dimensions (mm)
See Mounting Requirements on pages 77 & 78.

PERFORMANCE	
Static torque	25 lbs.-in.
Maximum anti-overrun holding capability	10 lbs.-in.
Maximum anti-back holding capability	18 lbs.-in.
Inertia, rotating parts	0.0207 lbs.-in.^{2}
Maximum radial bearing load at maximum speed	7.5 lbs.
Maximum operating speed	1800 RPM
Response time, voltage on at full speed	20 MS
Weight	1 lbs.

ELECTRICAL DATA			
Voltage	**Current (amps)**	**Resistance (ohms)**	**Status**
115 AC 60 Hz	0.104*	825	Standard
24 DC	0.230	104	Standard
12 DC	0.460	26	Modification
90 DC	0.059	1510	Modification

(Coils are rated for continuous duty)

*115 AC - In rush current .10 amps / Holding current .04 amps

Bore & Keyway Data			
Bore A	**Pin Hole B**	**Mtg. Hole C**	**Set Screws D**
0.2505-0.2525 (6.362-6.414)	0.061-0.065 (1.54-1.66)	3x #6-32 UNC-2B on 0.938 BC	#8-32 x 0.190 Lg. Hex Skt. Set Screw
Metric Bores			
0.2362-0.2374 (6.0 H9)	0.055-0.062 (1.4-1.57)	3X M4 x 0.7 on 23.83 BC	M4 x 0.7 x 5.0 Lg. Hex Skt. Set Screw

Standard CB-2 Clutch/Brake

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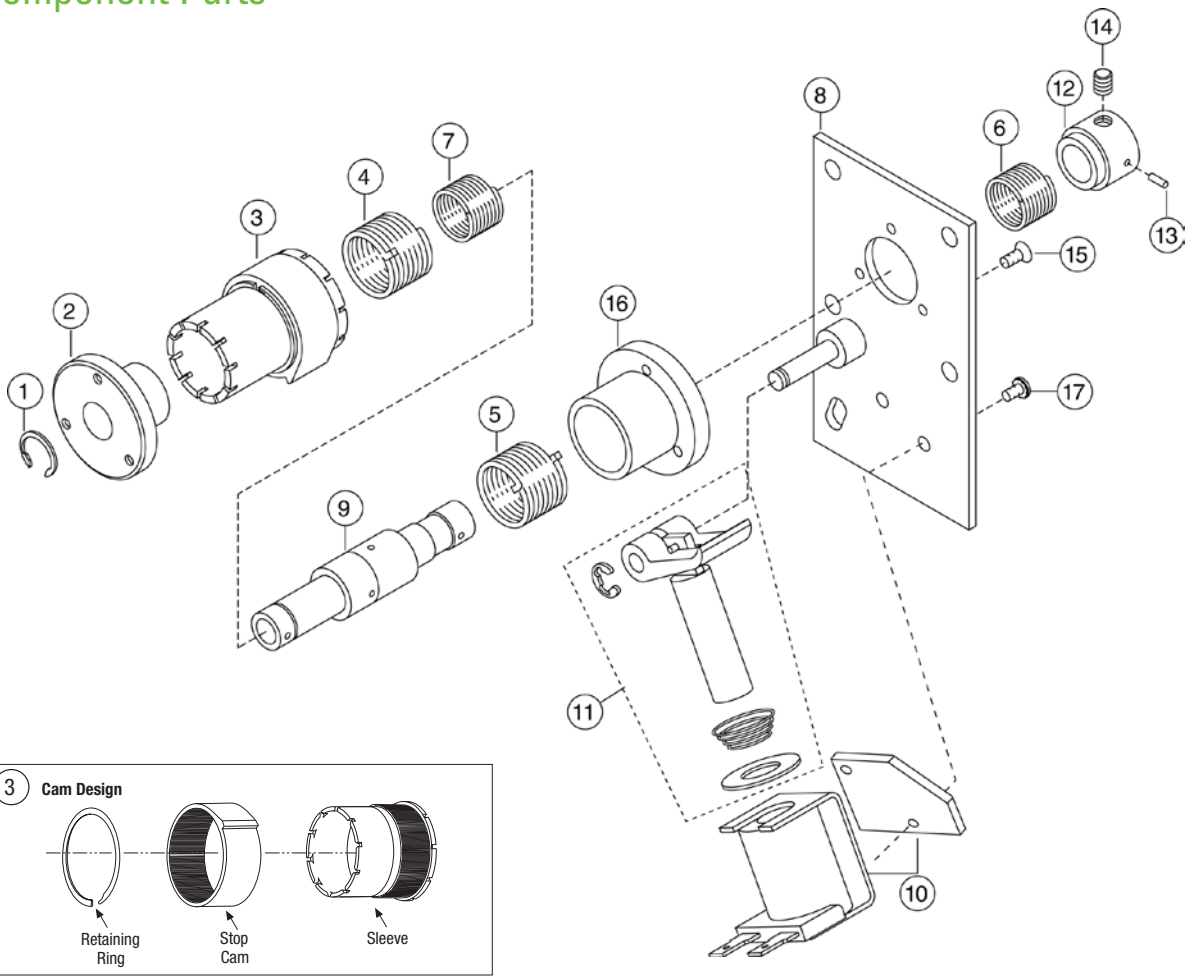
Component Parts



See Disassembly & Assembly Instructions charts on pages 79 & 80.

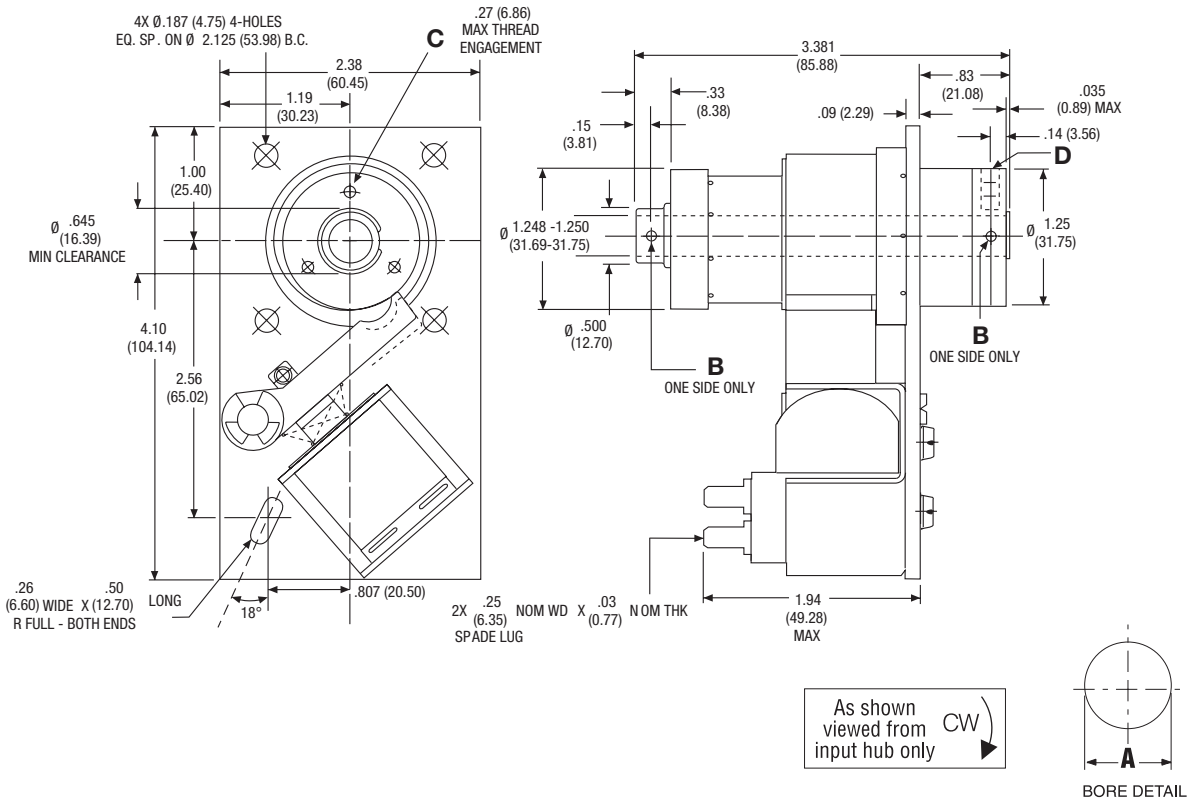
COMPONENT PARTS			
Item	Description	Rotation	Part No. *
1	Retaining Ring		M748-1-0085
2	Input Hub Anti-Overrun		M540-2-0004 (M540-2-0107)
3	Control Collar (Specify No. of Stops) Standard - 2.8° Adjustable	CW CCW	M266-2-0001 M266-2-0031
4	Drive Spring	CW CCW	M808-2-0108 M808-2-0109
5	Brake Spring	CW CCW	M808-2-0101 M808-2-0100
6	Anti-Back Spring	CW CCW	M808-2-0004 M808-2-0003
7	Anti-Overrun Spring	CW CCW	M808-2-0003 M808-2-0004
8	Plate Assembly	CW CCW	M686-2-0001 M686-2-0002
9	Output Assembly with Anti-Overrun (0.25 Bore) (6.0 mm Bore)		 M824-2-0006 (M824-2-0319)

COMPONENT PARTS			
Item	Description	Rotation	Part No. *
10	Coil Assembly 24 DC 115 AC 12 DC 90 DC		 M275-1-0003 M275-1-0006 M275-1-0002 M275-1-0005
11	Actuator Assembly (kit w/ plunger)		M101-2-0001
12	Anti-Back Hub		M540-2-0003 (M540-2-0109)
13	Spring Pin	CCW	M679-1-0019
14	Headless Socket Set Screw		M797-1-0152 (M797-1-0768)
15	Flat Head Socket Cap Screw (3)		M797-1-0311
16	Brake Hub		M540-2-0006
17	Pan Head Machine Screw (Sems) (2)		M797-1-0415

** Part numbers in ( ) are metric.*

Standard CB-4 Clutch/Brake

Dimensions & Specifications



Dimensions (mm)
See Mounting Requirements on pages 77 & 78.

PERFORMANCE	
Static torque	120 lbs.-in.
Maximum anti-overrun holding capability	25 lbs.-in.
Maximum anti-back holding capability	80 lbs.-in.
Inertia, rotating parts	0.0636 lbs.-in.^{2}
Maximum radial bearing load at maximum speed	14 lbs.
Maximum operating speed	1200 RPM
Response time, voltage on at full speed	24 MS
Weight	2 lbs.

ELECTRICAL DATA			
Voltage	**Current (amps)**	**Resistance (ohms)**	**Status**
115 AC 60 Hz	0.103*	280.0	Standard
24 DC	0.325	74.0	Standard
12 DC	0.732	16.4	Modification
90 DC	0.096	936.0	Modification

(Coils are rated for continuous duty)

**115 AC - In rush current .232 amps / Holding current .098 amps*

Bore & Keyway Data			
Bore A	**Pin Hole B**	**Mtg. Hole C**	**Set Screws D**
0.376-0.378 (9.55-9.61)	0.115-0.135 (2.92-3.43)	3x #6-32 UNC-2B on .938 BC	#8-32 x 0.188 Lg. Hex Skt. Set Screw
Metric Bores			
0.3937-0.3951 (10.0 H9)	0.117-0.121 (2.97-3.08)	3X M4 x 0.7 on 23.83 BC	M4 x 0.7 x 5.0 Lg. Hex Skt. Set Screw

Standard CB-4 Clutch/Brake

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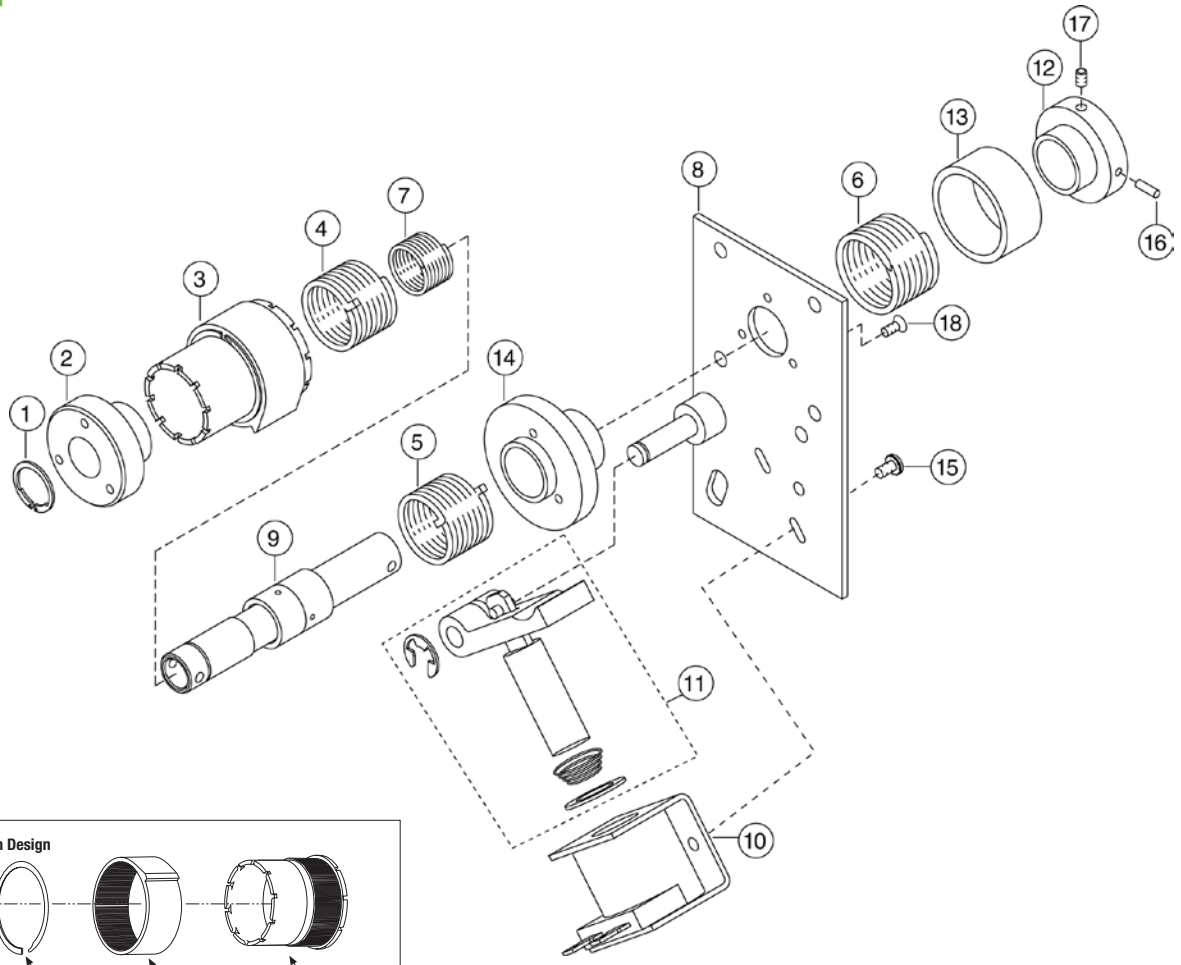
Component Parts



See Disassembly & Assembly Instructions charts on pages 79 & 80.

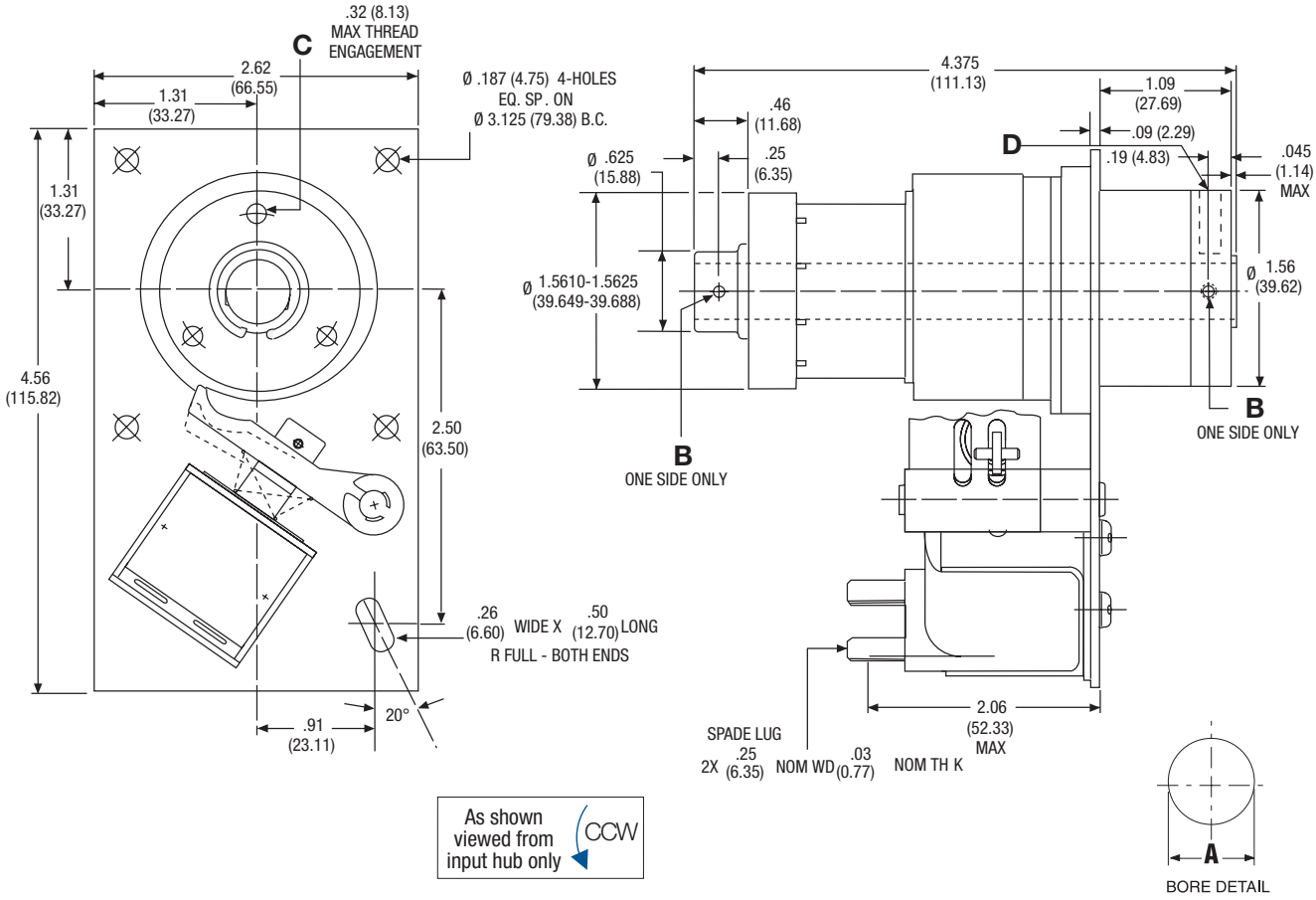
COMPONENT PARTS			
Item	Description	Rotation	Part No. *
1	Retaining Ring		M748-1-0027
2	Input Hub Anti-Overrun		M540-4-0021 (M540-4-0077)
3	Control Collar (Specify No. of Stops) Standard - 2.4° Adjustable	CW CCW	M266-4-0051 M266-4-0081
4	Drive Spring	CW CCW	M808-4-0066 M808-4-0059
5	Brake Spring	CW CCW	M808-4-0016 M808-4-0017
6	Anti-Back Spring	CW CCW	M808-4-0018 M808-4-0019
7	Anti-Overrun Spring	CW CCW	M808-4-0022 M808-4-0023
8	Plate Assembly	CW CCW	M686-4-0001 M686-4-0002
9	Output Assembly with Anti-Overrun 0.38 Bore (10.0 mm Bore)		 M824-4-0015 (M824-4-0300)

COMPONENT PARTS			
Item	Description	Rotation	Part No. *
10	Coil Assembly 24 DC 115 AC 12 DC 90 DC		 M275-1-0163 M275-1-0166 M275-1-0162 M275-1-0165
11	Actuator Assembly		M102-4-0005
12	Anti-Back Hub		M540-4-0018 (M540-4-0078)
13	Dust Cover (AB Spring)		M287-4-9002
14	Brake Hub		M540-4-0015
15	Pan Head Machine Screw (Sems) (2)		M797-1-0412
16	Spring Pin		M679-1-0022
17	Headless Socket Set Screw		M797-1-0152 (M797-1-0768)
18	Flat Head Socket Cap Screw (3)		M797-1-0311

** Part numbers in ( ) are metric.*

Standard CB-5 Clutch/Brake

Dimensions & Specifications



Dimensions (mm)
See Mounting Requirements on pages 77 & 78.

PERFORMANCE	
Static torque	250 lbs.-in.
Maximum anti-overrun holding capability	45 lbs.-in.
Maximum anti-back holding capability	160 lbs.-in.
Inertia, rotating parts	0.1950 lbs.-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 lbs.

ELECTRICAL DATA			
Voltage	**Current (amps)**	**Resistance (ohms)**	**Status**
115 AC 60 Hz	0.103*	280.0	Standard
24 DC	0.325	74.0	Standard
12 DC	0.732	16.4	Modification
90 DC	0.096	936.0	Modification

(Coils are rated for continuous duty)

**115 AC - In rush current .232 amps / Holding current .098 amps*

Bore & Keyway Data			
Bore A	**Pin Hole B**	**Mtg. Hole C**	**Set Screws D**
0.5005-0.5025 (12.712-12.764)	0.124-0.129 (3.14-3.28)	3x #10-32 UNF-2B on 1.25 BC	#8-32 x 0.25 Lg. Hex Skt. Set Screw
Metric Bores			
0.4724-4741 (12.0 H9)	0.117-0.121 (2.97-3.08)	3X M5 x 0.8 on 31.75 BC	M4 x 0.7 x 6.0 Lg. Hex Skt. Set Screw

Standard CB-5 Clutch/Brake

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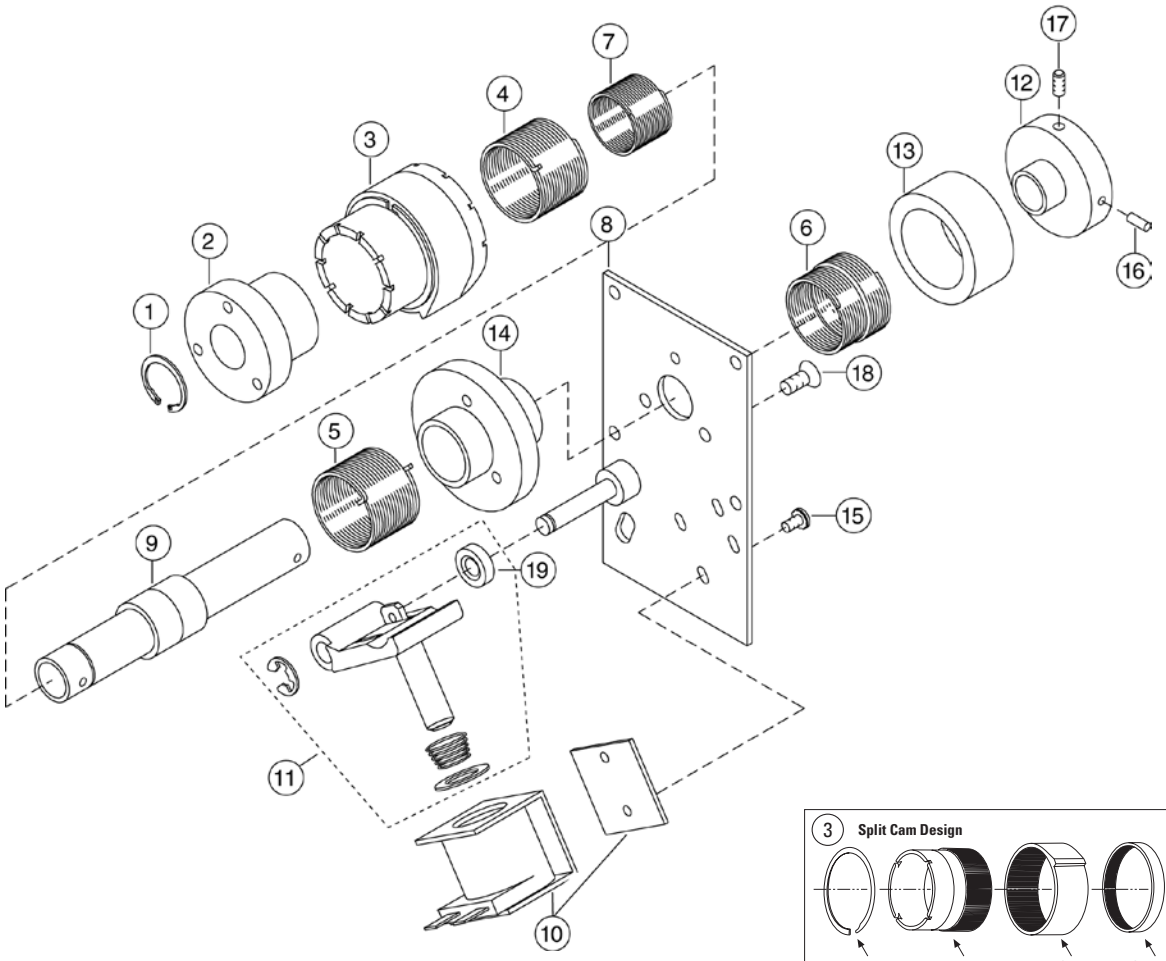
Component Parts



See Disassembly & Assembly Instructions charts on pages 79 & 80.

COMPONENT PARTS			
Item	Description	Rotation	Part No. *
1	Retaining Ring		M748-1-0030
2	Input Hub Anti-Overrun		M540-5-0007 (M540-5-0018)
3	Control Collar (Specify No. of Stops) Standard - 1.8° Adjustable	CW/CCW	M266-5-0801
4	Drive Spring	CW CCW	M808-5-0001 M808-5-0002
5	Brake Spring	CW CCW	M808-5-0001 M808-5-0002
6	Anti-Back Spring	CW CCW	M808-5-0005 M808-5-0006
7	Anti-Overrun Spring	CW CCW	M808-5-0003 M808-5-0004
8	Plate Assembly	CW CCW	M686-5-0001 M686-5-0002
9	Output Assembly with Anti-Overrun (0.50 Bore) (12.0 mm Bore)		 M824-5-0002 (M824-5-0107)

COMPONENT PARTS			
Item	Description	Rotation	Part No. *
10	Coil Assembly 24 DC 115 AC 12 DC 90 DC		 M101-5-0003 M101-5-0006 M101-5-0002 M101-5-0005
11	Actuator Assembly	CW CCW	M101-5-0058 M101-5-0059
12	Anti-Back Hub		M540-5-0006 (M540-5-0047)
13	Dust Cover (AB Spring)		M287-5-9002
14	Brake Hub		M540-5-0004
15	Pan Head Machine Screw (Sems) (2)		M797-1-0414
16	Spring Pin		M679-1-0024
17	Headless Socket Set Screw		M797-1-0153 (M797-1-0769)
18	Flat Head Socket Cap Screw (3)		M797-1-0322
19	Spacer		M807-1-9002

** Part numbers in ( ) are metric.*

Standard CB-6 Clutch/Brake

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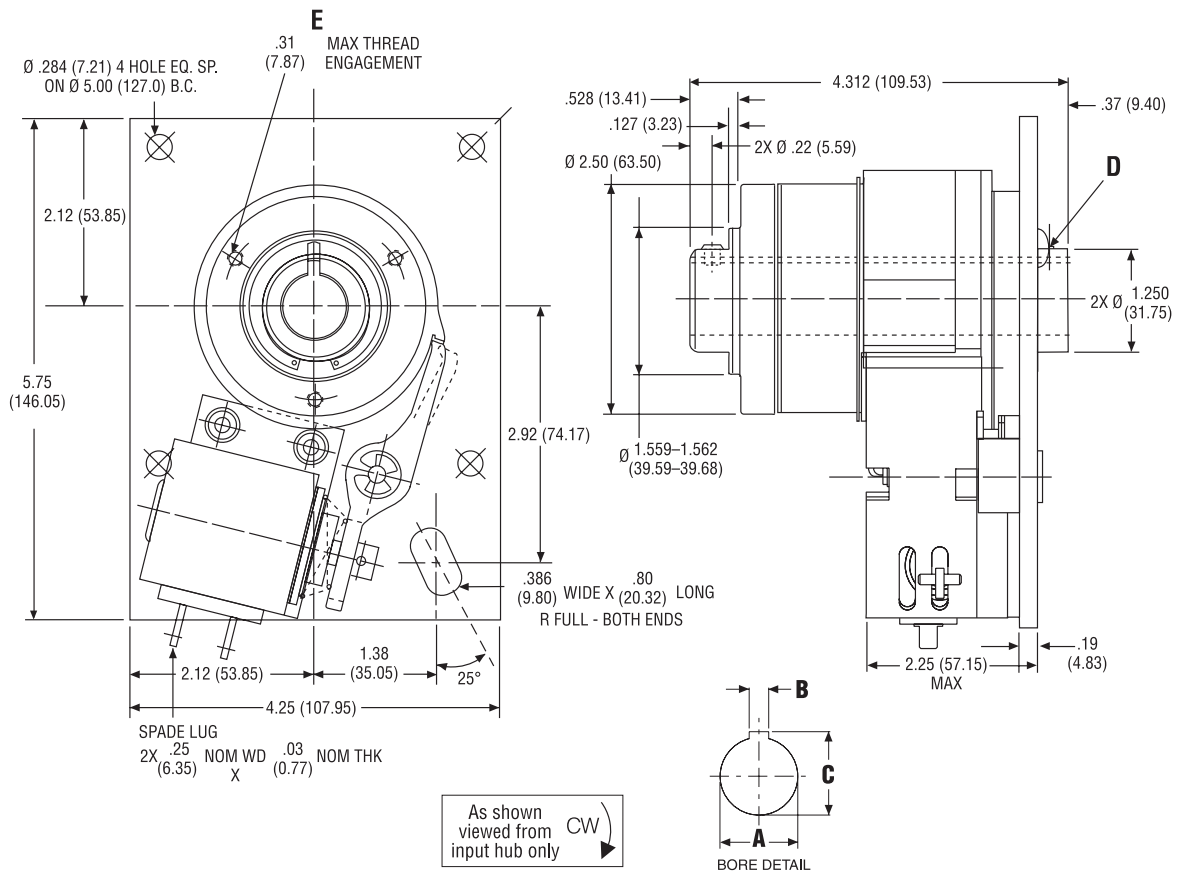
Dimensions & Specifications



Dimensions (mm)
See Mounting Requirements on pages 77 & 78.

PERFORMANCE	
Static torque	500 lbs.-in.
Maximum anti-overrun holding capability	300 lbs.-in.
Maximum anti-back holding capability	300 lbs.-in.
Inertia, rotating parts	1.718 lbs.-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 lbs.

ELECTRICAL DATA			
Voltage	**Current (amps)**	**Resistance (ohms)**	**Status**
115 AC 60 Hz	0.334*	57.5	Standard
24 DC	0.586	41.0	Standard
12 DC	1.150	10.4	Modification
90 DC	0.151	598.0	Modification

(Coils are rated for continuous duty)

**115 AC - In rush current 1.1 amps / Holding current 0.2 amps*

Bore & Keyway Data				
Bore A	**Keyway Width B**	**Keyway Depth C**	**Set Screws D**	**Mounting Holes E**
0.7505-0.7525 (19.062-19.114)	0.1885-0.1905 (4.787-4.839)	0.837-0.842 (21.25-21.39)	2x #10-32 UNC-2B x 0.19 Lg. Hex Skt. Set Screw	3x #1/4-20 UNC-2B 2.062 BC
1.0005-1.0025 (25.412-25.464)	—	—	2x 0.187-0.192 Hole (4.74-4.88)	3x #1/4-20 UNC-2B 2.062 BC
Metric Bores				
0.7874-0.7894 (20.0 H9)	0.2356-0.2368 (5.985-6.015)	0.8976-0.9015 (22.800-22.900)	2x M5 x 0.8 x 5.0 Lg. Hex Skt. Set Screw	3x M6 x 1.0 holes on 52.38 BC
0.9842-0.9862 (25.0 H9)	—	—	2x 4.87-5.14 Hole (.191-.203)	3x M6 x 1.0 holes on 52.38 BC

Standard CB-6 Clutch/Brake

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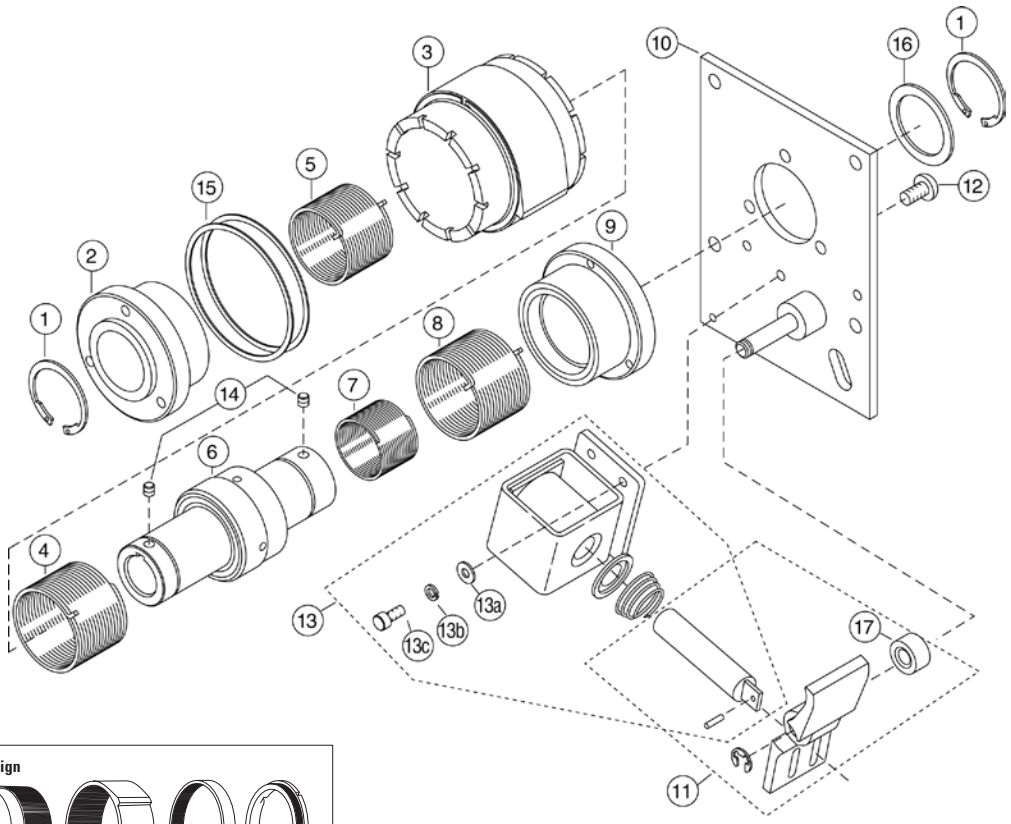
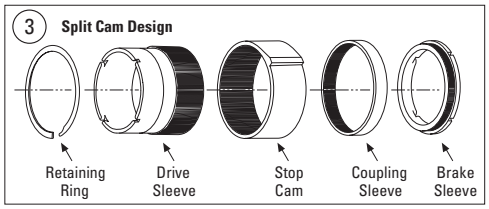
Component Parts





See Disassembly & Assembly Instructions charts on pages 79 & 80.

COMPONENT PARTS			
Item	**Description**	**Rotation**	**Part No. ***
1	Retaining Ring		M748-1-0038
2	Input Hub Anti-Overrun		M540-6-0003 (M540-6-0059)
3	Control Collar (Specify No. of Stops) Standard - 1.8° Adjustable	CW/CCW	M266-6-0726
4	Drive Spring	CW CCW	M808-6-0001 M808-6-0002
5	Anti-Overrun Spring	CW CCW	M808-6-0005 M808-6-0006
6	Output Assembly 0.750 Bore 1.000 Bore (20.0 mm Bore) (25.0 mm Bore)		 M824-6-0002 M824-6-0003 (M824-6-0348) (M824-6-0349)
7	Anti-Back Spring	CW CCW	M808-6-0003 M808-6-0004
8	Brake Spring	CW CCW	M808-6-0001 M808-6-0002
9	Brake Hub		M540-6-0001

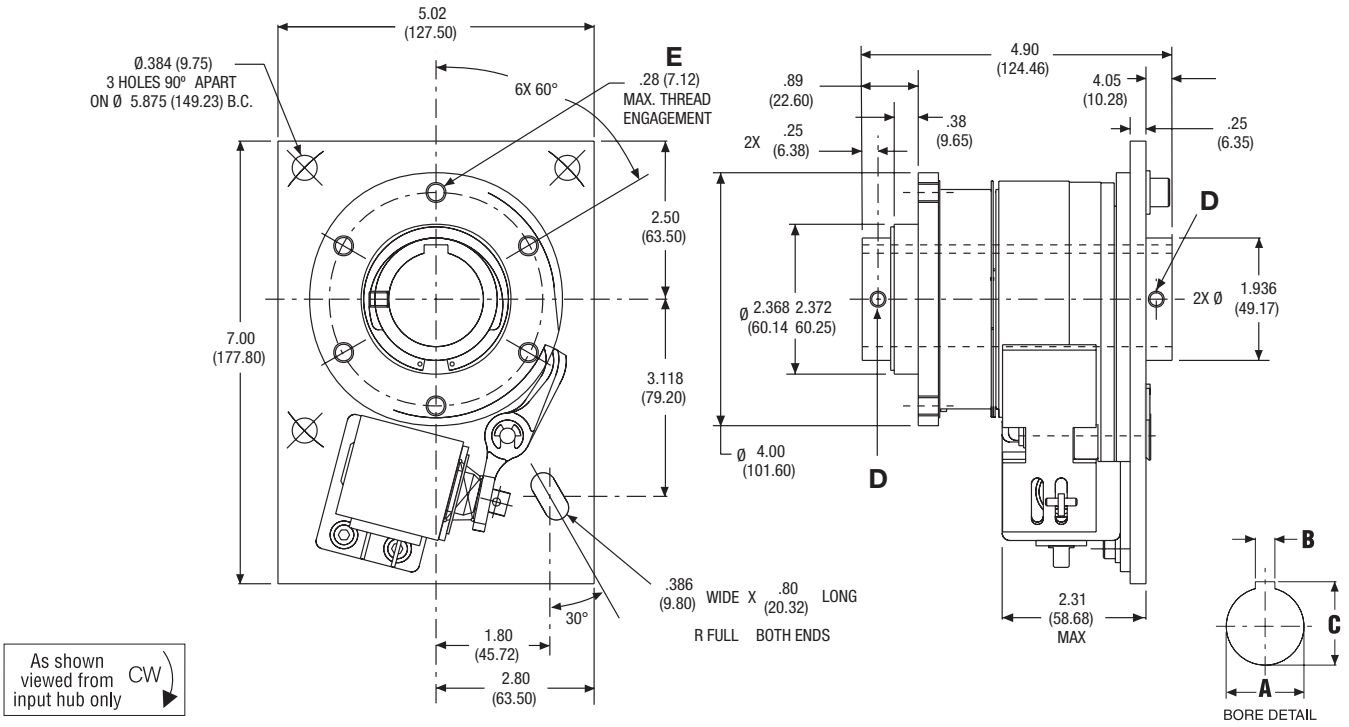
** Part numbers in ( ) are metric.*

COMPONENT PARTS			
Item	**Description**	**Rotation**	**Part No. ***
10	Plate Assembly	CW CCW	M686-6-0076 M686-6-0077
11	Actuator Assembly (includes plunger)	CW CCW	M102-1-0032 M102-1-0033
12	Button Head Cap Screw (3)		M797-1-0243
13	Coil Assembly "D" Frame 24 DC 115 AC 12 DC 90 DC		 M101-1-0028 M101-1-0058 M101-1-0027 M101-1-0030
13a	Flatwasher		M950-1-0006
13b	Lockwasher—Split		M950-1-0020
13c	Skt. Head Cap Screw (2)		M797-1-0044
14	Headless Socket Set Screw (2) (.75 Bore only) Set Screw (2) (20.0 mm Bore only)		 M797-1-0162 (M797-1-0774)
15	Shim (2)		M807-1-0001
16	Shim .005 .010		 M807-1-0014 M807-1-0017
17	Spacer		M807-1-9001

Shims used as required.

Standard CB-7 Clutch/Brake

Dimensions & Specifications



Dimensions (mm)
See Mounting Requirements on pages 77 & 78.

PERFORMANCE	
Static torque	1,500 lbs.-in.
Maximum anti-overrun holding capability	600 lbs.-in.
Maximum anti-back holding capability	600 lbs.-in.
Inertia, rotating parts	6.75 lbs.-in.^{2}
Maximum radial bearing load at maximum speed	300 lbs.
Maximum operating speed	400 RPM
Response time, voltage on at full speed	50 MS
Weight	12 lbs.

ELECTRICAL DATA			
Voltage	**Current (amps)**	**Resistance (ohms)**	**Status**
115 AC 60 Hz	0.334*	57.5	Standard
24 DC	0.586	41.0	Standard
12 DC	1.150	10.4	Modification
90 DC	0.151	598.0	Modification

(Coils are rated for continuous duty)

**115 AC - In rush current 1.1 amps / Holding current 0.2 amps*

Bore & Keyway Data				
Bore A	**Keyway Width B**	**Keyway Depth C**	**Set Screws D**	**Mounting Holes E**
1.0005-1.0025 (25.412-25.464)	0.251-0.253 (6.37-6.43)	1.114-1.124 (28.29-28.55)	2x #1/4-20 x 0.31 Lg. Hex Skt. Set Screw	6x #5/16-18 UNC-2B on 3.375 BC
1.2505-1.2525 (31.762-31.814)	0.3135-0.3155 (7.962-8.014)	1.389-1.399 (35.28-35.54)	2x #1/4-20 x 0.31 Lg. Hex Skt. Set Screw	6x #5/16-18 UNC-2B on 3.375 BC
1.5005-1.5025 (38.112-38.164)	0.376-0.378 (9.55-9.61)	1.605-1.615 (40.76-41.02)	2x #1/4-20 x 0.31 Lg. Hex Skt. Set Screw	6x #5/16-18 UNC-2B on 3.375 BC
Metric Bores				
0.9843-0.9863 (25.0 H9)	0.3143-0.3156 (7.983-8.017)	1.1142-1.1241 (28.300-28.552)	2x M6 x 1.0 x 10.0 Lg. Hex Skt. Set Screw	6x M8 x 1.25 on 85.73 BC
1.1811-1.1831 (30.0 H9)	0.3143-0.3156 (7.983-8.017)	1.3110-1.3209 (33.299-33.551)	2x M6 x 1.0 x 10.0 Lg. Hex Skt. Set Screw	6x M8 x 1.25 on 85.73 BC
1.3780-1.3804 (35.0 H9)	0.3930-0.3944 (9.982-10.018)	1.5079-1.5182 (38.300-38.563)	2x M6 x 1.0 x 10.0 Lg. Hex Skt. Set Screw	6x M8 x 1.25 on 85.73 BC

Standard CB-7 Clutch/Brake

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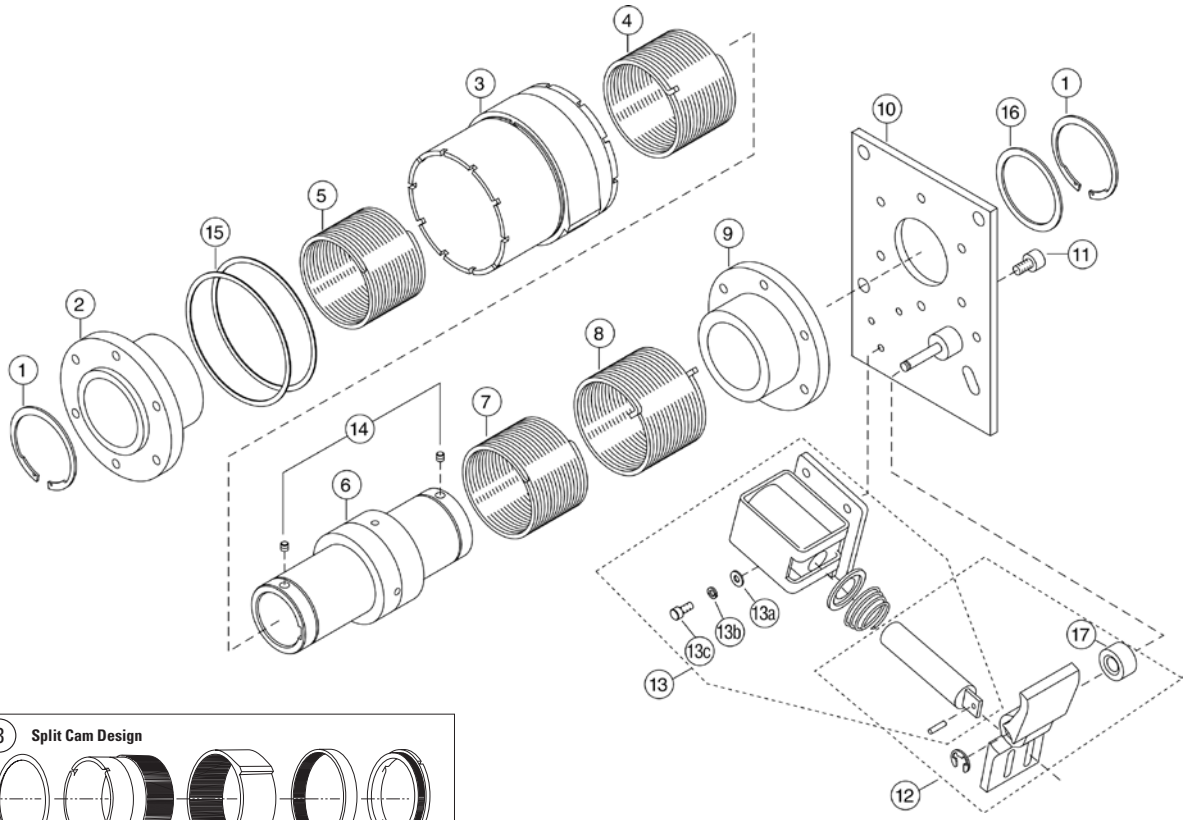
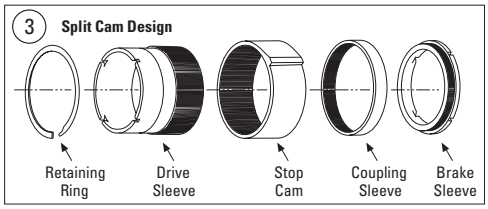
Component Parts





See Disassembly & Assembly Instructions charts on pages 79 & 80.

COMPONENT PARTS			
Item	**Description**	**Rotation**	**Part No. ***
1	Retaining Ring		M748-1-0039
2	Input Hub Anti-Overrun		M540-8-0009 (M540-7-0048)
3	Control Collar (Specify No. of Stops) Standard - 1.6° Adjustable	CW/CCW	M266-1-0026
4	Drive Spring	CW CCW	M808-8-0007 M808-8-0008
5	Anti-Overrun Spring	CW CCW	M808-8-0009 M808-8-0010
6	Output Assembly 1.00 1.50 Anti-Overrun 1.25 (25.0 mm Bore) (30.0 mm Bore) (35.0 mm Bore)		 M824-7-0114 M824-7-0117 M824-7-0115 (M824-7-0123) (M824-7-0125) (M824-7-0127)
7	Anti-Back Spring	CW CCW	M808-1-0012 M808-1-0013
8	Brake Spring	CW CCW	M808-8-0005 M808-8-0006
9	Brake Hub		M540-7-0030

COMPONENT PARTS			
Item	**Description**	**Rotation**	**Part No. ***
10	Plate Assembly	CW CCW	M686-8-0051 M686-8-0052
11	Button Head Cap Screw (6)		M797-1-0064
12	Actuator Assembly (includes plunger)	CW CCW	M102-1-0032 M102-1-0033
13	Coil Assembly "D" Frame 24 DC 115 AC 12 DC 90 DC		 M101-1-0028 M101-1-0058 M101-1-0027 M101-1-0030
13a	Flatwasher (2)		M950-1-0006
13b	Lockwasher—Split (2)		M950-1-0020
13c	Head Cap Screw (2)		M797-1-0044
14	Headless Socket Set Screw (2)		M797-1-0174
15	Shim		M807-1-0002
16	Shim .005 .010		 M807-8-0001 M807-8-0004
17	Spacer		M807-1-9001

Shims used as required.

Standard CB-8 Clutch/Brake

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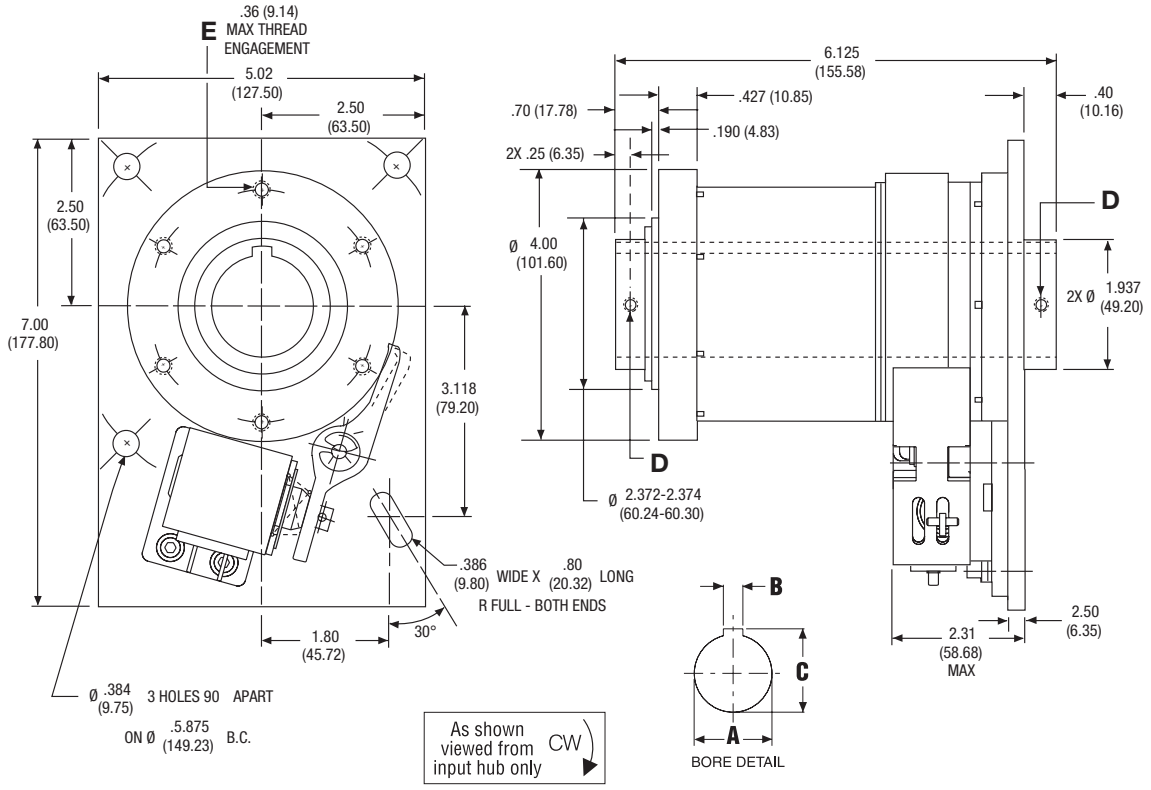
Dimensions & Specifications



Dimensions (mm)
See Mounting Requirements on pages 77 & 78.

PERFORMANCE	
Static torque	2,500 lbs.-in.
Maximum anti-overrun holding capability	600 lbs.-in.
Maximum anti-back holding capability	600 lbs.-in.
Inertia, rotating parts	12.84 lbs.-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 lbs.

ELECTRICAL DATA			
Voltage	Current (amps)	Resistance (ohms)	Status
115 AC 60 Hz	0.334*	57.5	Standard
24 DC	0.586	41.0	Standard
12 DC	1.150	10.4	Modification
90 DC	0.151	598.0	Modification

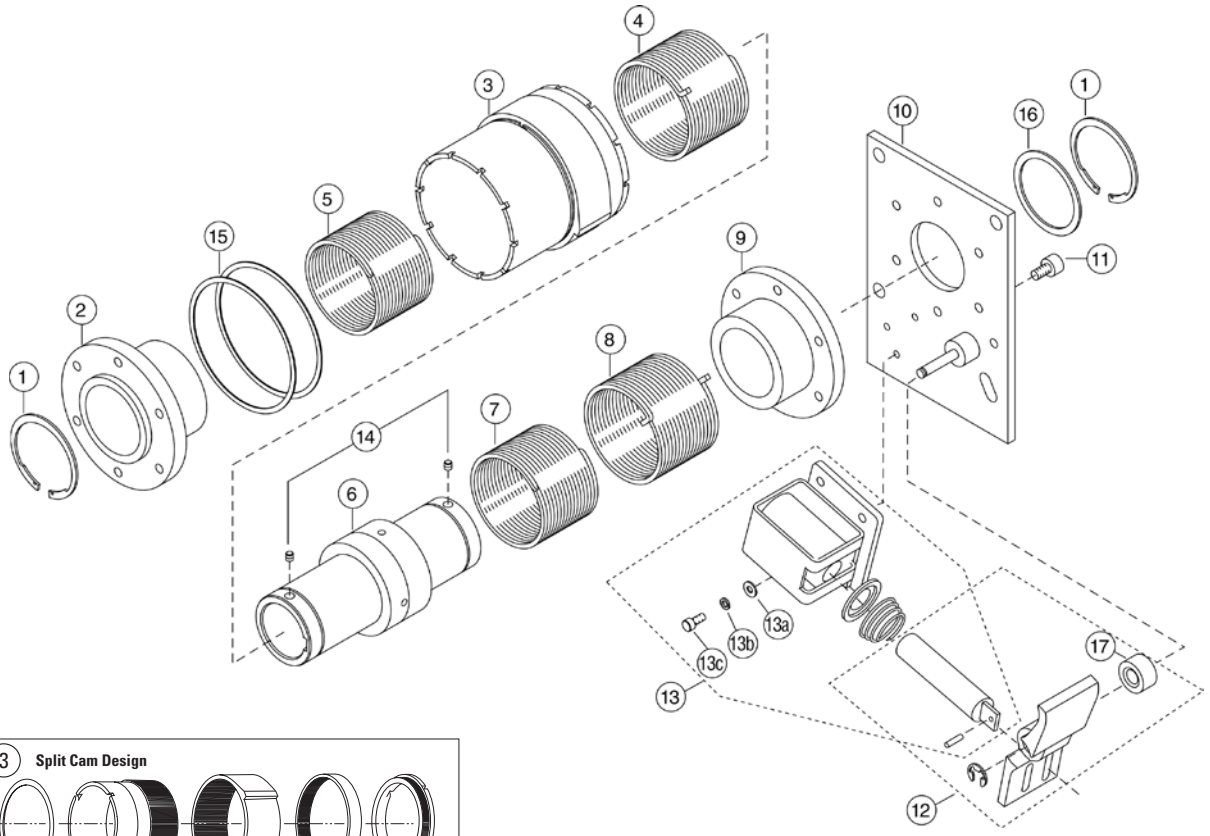
(Coils are rated for continuous duty.)

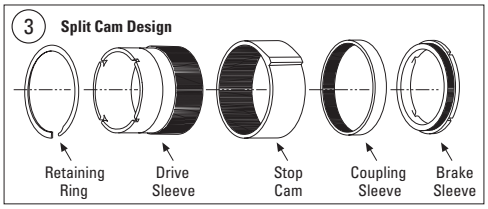
**115 AC - In rush current 1.1 amps / Holding current 0.2 amps.*

Bore & Keyway Data				
Bore A	Keyway Width B	Keyway Depth C	Set Screws D	Mounting Holes E
1.0005-1.0025* (25.412-25.464)	0.251-0.253 (6.37-6.43)	1.114-1.124 (28.29-28.55)	2x #1/4-20 x 0.31 Lg. Hex Skt. Set Screw	6x #5/16-18 UNC-2B on 3.375 BC
1.2505-1.2525 (31.762-31.814)	0.3135-0.3155 (7.962-8.014)	1.389-1.399 (35.28-35.54)	2x #1/4-20 x 0.31 Lg. Hex Skt. Set Screw	6x #5/16-18 UNC-2B on 3.375 BC
1.3755-1.3775* (34.937-34.989)	0.3135-0.3155 (7.962-8.014)	1.518-1.528 (38.55-38.82)	2x #1/4-20 x 0.31 Lg. Hex Skt. Set Screw	6x #5/16-18 UNC-2B on 3.375 BC
1.5005-1.5025 (38.112-38.164)	0.376-0.378 (9.55-9.61)	1.605-1.615 (40.76-41.02)	2x #1/4-20 x 0.31 Lg. Hex Skt. Set Screw	6x #5/16-18 UNC-2B on 3.375 BC
Metric Bores				
1.3780-1.3804 (35.0 H9)	0.3930-0.3944 (9.982-10.018)	1.5079-1.5182 (38.300-38.563)	2x M6 x 1.0 x 10.0 Lg. Hex Skt. Set Screw	6x M8 x 1.25 on 85.73 BC
1.5784-1.5772 (40.0 H9)	—	—	2x M6 x 1.0 x 10.0 Lg. Hex Skt. Set Screw	6x M8 x 1.25 on 85.73 BC

** Special Order.*

Component Parts





See Disassembly & Assembly Instructions charts on pages 79 & 80.

COMPONENT PARTS			
Item	**Description**	**Rotation**	**Part No. ***
1	Retaining Ring		M748-1-0039
2	Input Hub Anti-Overrun		M540-8-0014 (M540-8-0041)
3	Control Collar (Specify No. of Stops) Standard - 1.6° Adjustable	CW/CCW	M266-8-0251
4	Drive Spring Standard	CW CCW	M808-8-0003 M808-8-0004
5	Anti-Overrun Spring	CW CCW	M808-8-0025 M808-8-0026
6	Output Assembly 1.00 1.50 Anti-Overrun 1.38 1.25 (35.0 mm Bore) (40.0 mm Bore)		 M824-8-0329 M824-8-0326 M824-8-0327 M824-8-0328 (M824-8-0420) A/R
7	Anti-Back Spring	CW CCW	M808-8-0025 M808-8-0026
8	Brake Spring	CW CCW	M808-8-0003 M808-8-0004

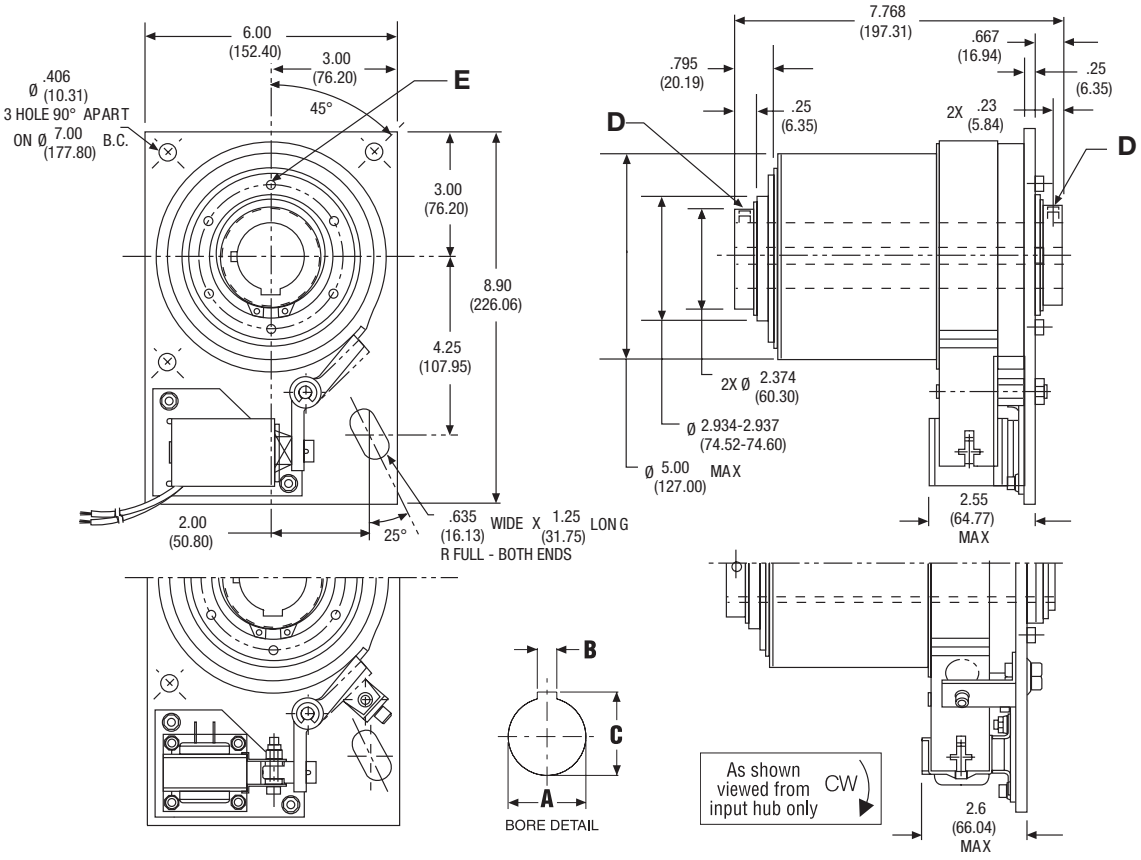
** Part numbers in ( ) are metric.*

COMPONENT PARTS			
Item	**Description**	**Rotation**	**Part No. ***
9	Brake Hub		M540-8-0016
10	Plate Assembly	CW	M686-8-0051
11	Button Head Cap Screw (6)		M797-1-0064
12	Actuator Assembly (includes plunger)	CW CCW	M102-1-0032 M102-1-0033
13	Coil Assembly "D" Frame 24 DC 115 AC 12 DC 90 DC		 M101-1-0028 M101-1-0058 M101-1-0027 M101-1-0030
13a	Flatwasher (2)		M950-1-0006
13b	Lockwasher—Split (2)		M950-1-0020
13c	Head Cap Screw (2)		M797-1-0044
14	Headless Socket Set Screw (2)		M797-1-0174 (M797-1-0784)
15	Shim (2)		M807-1-0002
16	Shim .005 .010		 M807-8-0001 M807-8-0004
17	Spacer		M807-1-9001

Shims used as required.

Standard CB-10 Clutch/Brake

Dimensions & Specifications



Dimensions (mm)
See Mounting Requirements on pages 77 & 78.

PERFORMANCE	
Static torque	5,000 lbs.-in.
Maximum anti-overrun holding capability	1,200 lbs.-in.
Maximum anti-back holding capability	1,200 lbs.-in.
Inertia, rotating parts	48.0 lbs.-in.^{2}
Maximum radial bearing load at maximum speed	500 lbs.
Maximum operating speed	200 RPM
Response time, voltage on at full speed	70 MS
Weight	27 lbs.

ELECTRICAL DATA			
Voltage	Current (amps)	Resistance (ohms)	Status
115 AC 60 Hz	174*	14.5	Standard
24 DC	0.94	25.4	Standard
12 DC	1.86	6.43	Modification
90 DC	0.24	378.6	Modification

(Coils are rated for continuous duty.)

**115 AC - In rush current 2.9 amps / Holding current 0.1 amps.*

Bore & Keyway Data				
Bore A	Keyway Width B	Keyway Depth C	Set Screws D	Mounting Holes E
1.5005-1.5025 (38.112-38.164)	0.376-0.378 (9.55-9.61)	1.669-1.679 (42.39-42.65)	2x #1/4-20 x 0.25 Lg. Hex Skt. Set Screw	6x #1/4-20 UNC-2B 0.50 DP on 3.417 BC
1.6255-1.6275 (41.287-41.339)	0.376-0.378 (9.55-9.61)	1.796-1.806 (45.61-45.88)	2x #1/4-20 x 0.25 Lg. Hex Skt. Set Screw	6x #1/4-20 UNC-2B 0.50 DP on 3.417 BC
1.7505-1.7525 (44.462-44.514)	0.376-0.378 (9.55-9.61)	1.922-1.932 (48.81-49.08)	2x #1/4-20 x 0.25 Lg. Hex Skt. Set Screw	6x #1/4-20 UNC-2B 0.50 DP on 3.417 BC
Metric Bores				
1.5749-1.5772 (40.0 H9)	0.4717-0.4732 (11.979-12.021)	1.705-1.712 (43.300-43.491)	2x M6 x 1.0 x 10.0 Lg. Hex Skt. Set Screw	6x M8 x 1.25 12.70 DP on 86.79 BC
1.7717-1.7740 (45.0 H9)	0.5504-0.5520 (13.980-14.021)	1.922-1.929 (48.80-49.00)	2x M6 x 1.0 x 10.0 Lg. Hex Skt. Set Screw	6x M8 x 1.25 12.70 DP on 86.79 BC

Standard CB-10 Clutch/Brake

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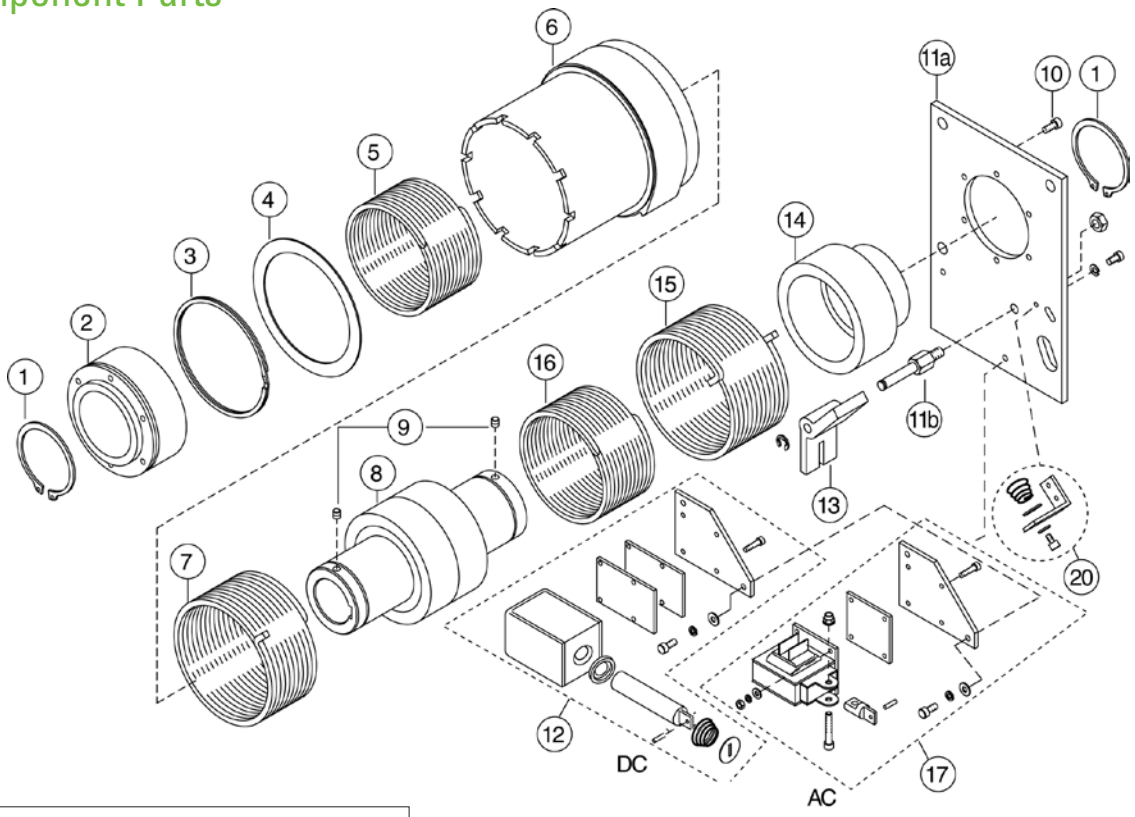
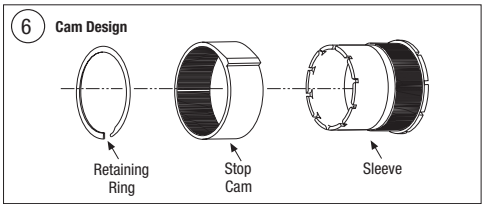
Component Parts





See Disassembly & Assembly Instructions charts on pages 79 & 80.

COMPONENT PARTS			
Item	**Description**	**Rotation**	**Part No. ***
1	Retaining Ring-Truarc		M748-1-0020
2	Input Hub Anti-Overrun		M541-0-0002 (M541-0-0012)
3	Retaining Ring		M748-1-0217
4	Spacer		M807-0-0013
5	Anti-Overrun Spring	CW CCW	M808-0-0001 M808-0-0002
6	Control Collar (Specify No. of Stops) Standard - 1.5° Adjustable	CW CCW	M266-0-0127 M266-0-0151
7	Drive Spring Standard	CW CCW	M808-0-0009 M808-0-0010
8	Shaft Assembly 1.500 1.625 Anti-Overrun 1.750 (40.0 mm Bore) (45.0 mm Bore)		 M824-0-0005 M824-0-0006 M824-0-0007 (M824-0-0039) (M824-0-0040)

** Part numbers in ( ) are metric.*

COMPONENT PARTS			
Item	**Description**	**Rotation**	**Part No. ***
9	Headless Set Screw (2)		M797-1-0173 (M797-1-0784)
10	Skt. Head Cap Screw (6)		M797-1-0055
11	Actuator Plate Assembly 11a Plate 11b Pivot Pin 11c Lock Nut	CW CCW	M101-0-0052 M101-0-0053 M686-0-0001 M679-0-0001 M661-1-0010
12	DC Coil Assembly 24 DC 12 AC 90 DC		 M101-0-0003 M101-0-0002 M101-0-0004
13	Actuator Lever		M102-0-9001
14	Brake Hub		M541-0-0013
15	Brake Spring	CW CCW	M808-0-0009 M808-0-0010
16	Anti-Back Spring	CW CCW	M808-0-0007 M808-0-0008
17	AC Coil Assembly 115 AC 115 AC	 CW CCW	 M101-0-0005 M101-0-0054
20	AC Actuator Return Assembly		M101-0-0009
21	Head Cap Screw (2)		M797-1-0044
22	Lockwasher—Split (2)		M950-1-0020

Super CB Series Clutch/Brake

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Longer Life, Extra Performance Clutch/Brake Packages

Super CB Series combination clutches and brakes accurately start and stop loads driven by a continuously rotating power source. CB units operate from a single AC or DC pulse, stopping the load within ±½° noncumulative at speeds up to 750 RPM, depending on size. Each unit is pre-engineered and pre-assembled for easy installation.

Super CB clutches and brakes provide 3 to 5 times longer life. The five sizes of Super CB clutch/brake packages offer extraordinary performance and durability for those applications requiring long life under high load, high duty cycle conditions. Warner Electric will retrofit standard CB-5, CB-6, CB-7, CB-8, CB-10.

Features

- Available in five sizes
- Cost-effective design
- 3–5 times longer life than Standard CB
- Split cam design sizes CB-5, CB-6, CB-7, CB-8
- Adjustable control collars for easy and accurate output stop position setting
- RoHS compliant
- Load over-travel or backup is eliminated since Super CB units lock the load in both directions when the solenoid is off
- Anti-overrun feature prevents the output from running faster than the input
- ***Roller bearings never need adjustment for wear***
- Bring loads up to speed in 3 milliseconds and stop within 1.5 milliseconds
- AC or DC operated—other voltages available
- See pages 59-60 for controls
- Direct retrofit for Standard CB-5, CB-6, CB-7, CB-8, CB-10
- 1-, 2- or 4-stop collar with steel insert standard
- Reinforced plastic stop collars also available for up to 24-stop maximum
- Heavy duty, industrial-grade coils
- High cycle rate capability
- High torque-to-size ratio
- Repeatable positioning within ±½°

Typical Applications

- Riveters
- Punch presses
- Packaging equipment
- Conveyor drives
- Heavy duty machinery
- Rapid cycling equipment

How to Order

Super CB - 6 - CW - 24V - 3/4" bore - 2

Super CB Series
Specify:
Imperial or Metric

Size
CB-5 = **5**
CB-6 = **6**
CB-7 = **7**
CB-8 = **8**
CB-10 = **10**

Coil Voltage
12V = 12VDC
24V = **24VDC**
90V = 90VDC
115V = **115VAC**

Direction of Rotation
CW = Clockwise
CCW = Counterclockwise

Bore Size
CB-5 = **½"**
CB-6 = **¾", 1"**
CB-7 = **1", 1¼",1½"**
¾"
CB-8 = **1¼", 1½"**
***1", *1⅜"**
CB-10 = **1½"**
***1⅛", *1¾"**
*Special order

Stop Collar
1 = 1 stop
2 = 2 stop
4 = 4 stop
Other stop collars are special order.

OPTIONS	
Dust Covers	See page 56
Stop Collars	See page 57
Pneumatic Actuators	See page 58

Super CB Series Clutch/Brake

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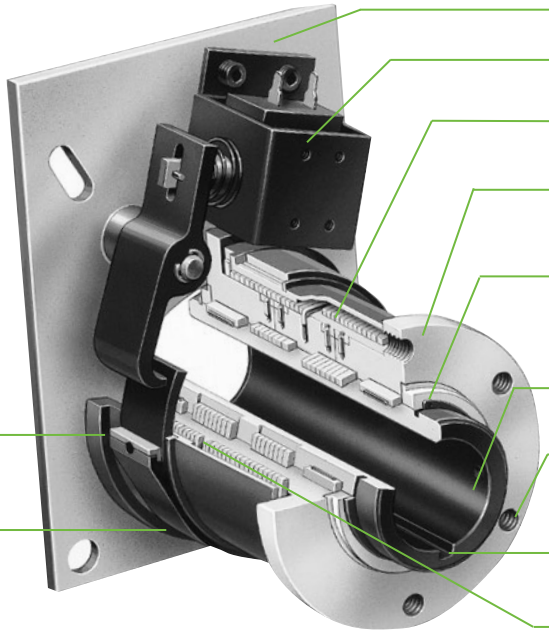
Solenoid-Operated Combination Clutch/Brake Packages



High torque in small package

Actuating solenoid is AC or DC operated

Brake engages automatically when de-clutched

Maintenance-free, self-lubricating hubs are 18% oil by volume

Hardened thrust washers on input and brake end

Sintered metal hub offers easy machining for custom drive attachments

Hub mounting holes for simple pulley or sprocket mounting

Steel tip insert on control cam collar

Single- or multi-stop collars control rotation, ±½° stop repeatability

Hardened and ground shaft

Hardened crossover points on input, output and brake hubs provide increased life

PERFORMANCE					
	CB-5	**CB-6**	**CB-7**	**CB-8**	**CB-10**
Static torque	250 lbs.-in. (28.25 Nm)	500 lbs.-in. (56.5 Nm)	1,500 lbs.-in. (169.5 Nm)	2,500 lbs.-in. (282.5 Nm)	5,000 lbs.-in. (565 Nm)
Maximum anti-overrun holding capability	45 lbs.-in. (5.085 Nm)	300 lbs.-in. (33.9 Nm)	600 lbs.-in. (67.8 Nm)	600 lbs.-in. (67.8 Nm)	1,200 lbs.-in. (135.6 Nm)
Maximum anti-back holding capability	160 lbs.-in. (18.08 Nm)	300 lbs.-in. (33.9 Nm)	600 lbs.-in. (67.8 Nm)	600 lbs.-in. (67.8 Nm)	1,200 lbs.-in. (135.6 Nm)
Inertia, rotating parts	.195 lbs.-in.^{2}	1.718 lbs.-in.^{2}	6.75 lbs.-in.^{2}	12.84 lbs.-in.^{2}	48.0 lbs.-in.^{2}
Maximum radial bearing load at maximum speed	32 lbs.	63 lbs.	300 lbs.	300 lbs.	500 lbs.
Maximum operating speed	750 RPM	500 RPM	400 RPM	300 RPM	200 RPM
Response time, voltage on at full speed	27 MS	45 MS	50 MS	50 MS	70 MS
Weight	3 lbs.	7 lbs.	12 lbs.	15 lbs.	27 lbs.

See page 71 for Minimum Inertia Requirements. See pages 77 & 78 for Mounting Requirements.

RPM vs. SHAFT BORE				
Size	**Max RPM**	**Shaft Bores Standard in. (mm)**	**Shaft Bores Special in. (mm)**	**Shaft Bores Metric in. (mm)**
CB–5	750	1/2" (12.7)	—	.4724-.4741 (12.0)
CB–6	500	3/4" or 1" (19.05 or 25.4)	—	.7874-.7894 (20.0) .9842-.9862 (25.0)
CB–7	400	1", 11/4" or 11/2" (25.4, 31.75 or 38.10)	3/4" (19.05)	.9843-.9863 (25.0) 1.1811-1.8311 (30.0) 1.3780-1.3804 (35.0)
CB–8	300	11/4" or 11/2" (31.75 or 38.1)	1" or 13/8" (25.4 or 34.925)	1.3780-1.3804 (35.0) 1.5784-1.5772 (40.0)
CB–10	200	11/2" (38.1)	15/8" or 13/4" (41.275 or 44.45)	1.5749-1.5772 (40.0) 1.7717-1.7740 (45.0)

** Consult Factory.*

Super CB-5 Clutch/Brake

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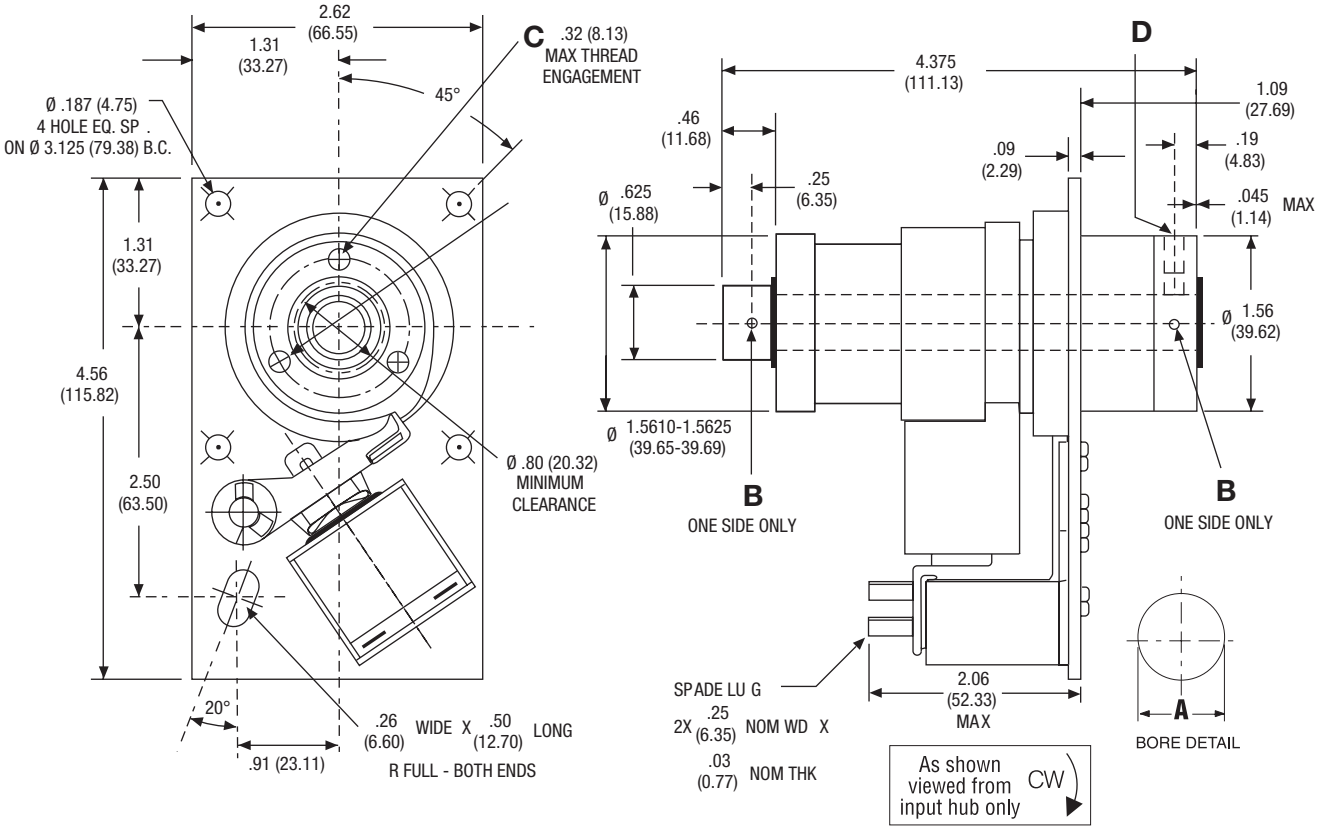
Dimensions & Specifications



Dimensions (mm)
See Mounting Requirements on pages 77 & 78.

PERFORMANCE	
Static torque	250 lbs.-in.
Maximum anti-overrun holding capability	45 lbs.-in.
Maximum anti-back holding capability	160 lbs.-in.
Inertia, rotating parts	0.1950 lbs.-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 lbs.

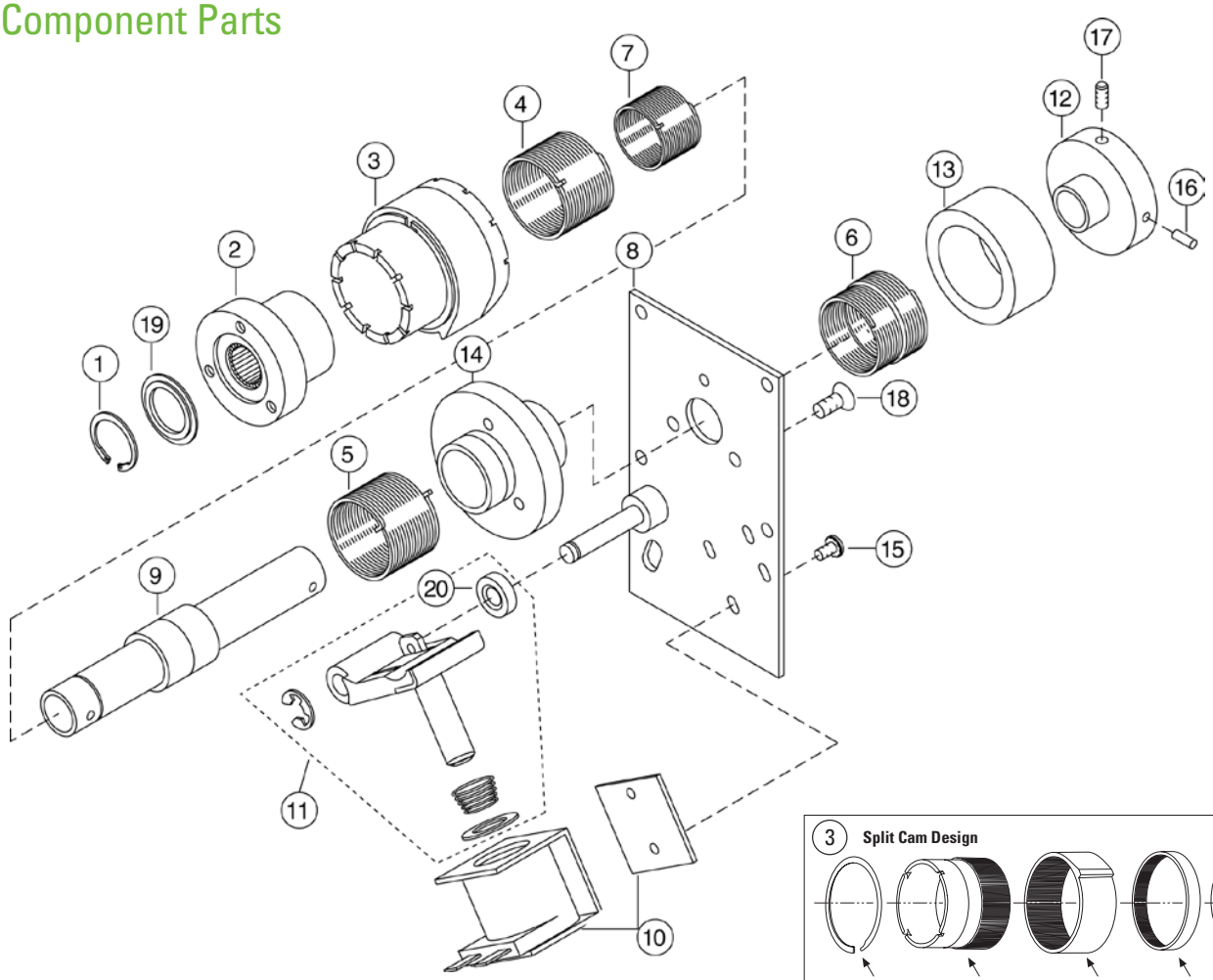
ELECTRICAL DATA			
Voltage	**Current (amps)**	**Resistance (ohms)**	**Status**
115 AC 60 Hz	0.103*	280.0	Standard
24 DC	0.325	74.0	Standard
12 DC	0.732	16.4	Modification
90 DC	0.096	936.0	Modification

(Coils are rated for continuous duty)

**115 AC - In rush current .232 amps / Holding current .098 amps*

Bore & Keyway Data			
Bore A	**Pin Hole B**	**Mtg. Hole C**	**Set Screws D**
0.5005-0.5025 (12.712-12.764)	0.124-0.129 (3.14-3.28)	3x #10-32 UNF-2B on 1.25 BC	#8-32 x 0.25 Lg. Hex Skt. Set Screw
Metric Bores			
0.4724-4741 (12.0 H9)	0.117-0.121 (2.97-3.08)	3X M5 x 0.8 on 31.75 BC	M4 x 0.7 x 6.0 Lg. Hex Skt. Set Screw

Component Parts



See Disassembly & Assembly Instructions charts on pages 79 & 80.

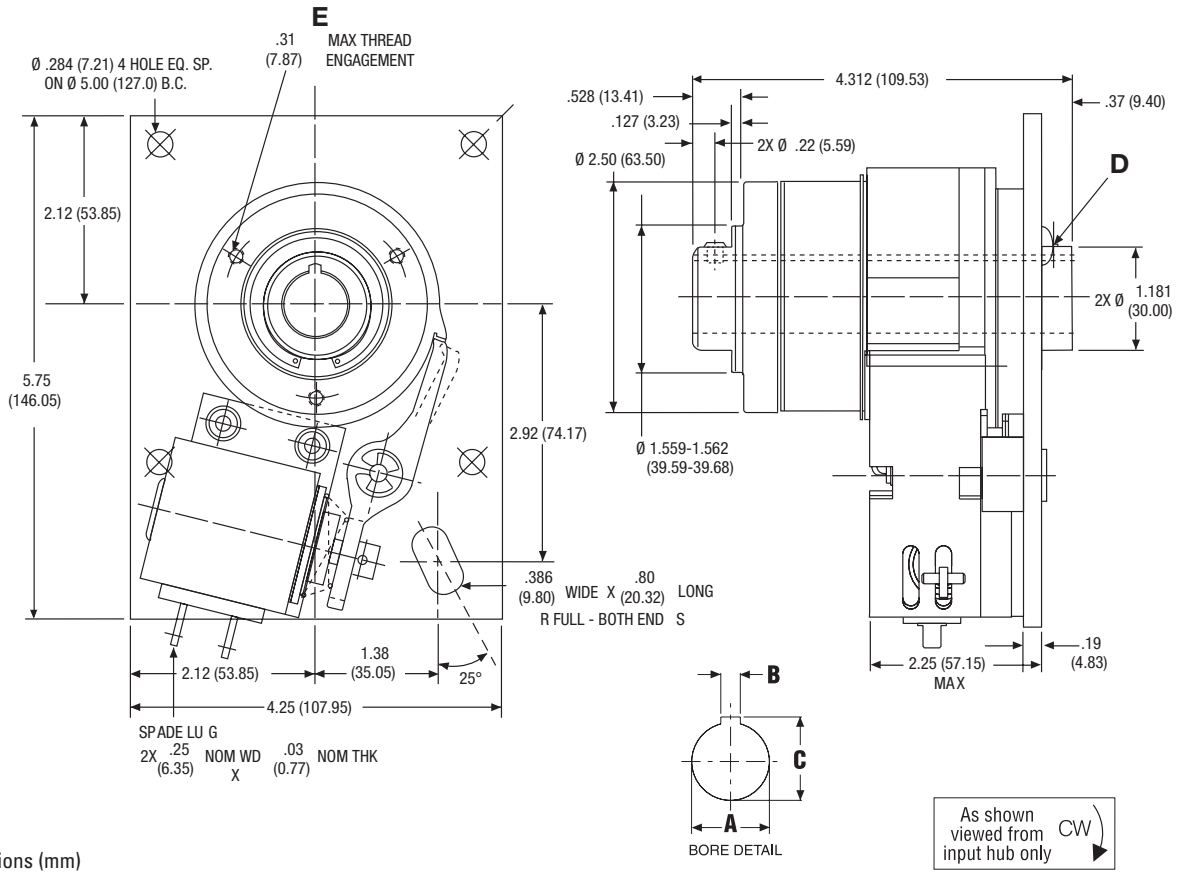
COMPONENT PARTS			
Item	**Description**	**Rotation**	**Part No.***
1	Retaining Ring		M748-5-0006
2	Input Hub Anti-Overrun		M541-5-0029 (M541-5-0030)
3	Control Collar (Specify No. of Stops) Standard - 1.8° Adjustable	CW/CCW	M266-5-0801
4	Drive Spring	CW CCW	M808-5-0001 M808-5-0002
5	Brake Spring	CW CCW	M808-5-0001 M808-5-0002
6	Anti-Back Spring	CW CCW	M808-5-0005 M808-5-0006
7	Anti-Overrun Spring	CW CCW	M808-5-0003 M808-5-0004
8	Plate Assembly	CW CCW	M686-5-0001 M686-5-0002
9	Output Assembly 0.50 Bore (12.0 mm Bore)		M824-5-0469 (M824-5-0470)

COMPONENT PARTS			
Item	**Description**	**Rotation**	**Part No.***
10	Coil Assembly 24 DC 115 AC 12 DC 90 DC		 M101-5-0003 M101-5-0006 M101-5-0002 M101-5-0005
11	Actuator Assembly	CW CCW	M101-5-0060 M101-5-0061
12	Anti-Back Hub		M540-5-0006 (M540-5-0047)
13	Dust Cover (AB Spring)		M287-5-9002
14	Brake Hub		M541-5-0024
15	Pan Head Machine Screw (Sems) (2)		M797-1-0414
16	Spring Pin		M679-1-0024
17	Headless Socket Set Screw		M797-1-0153 (M797-1-0769)
18	Flat Head Socket Cap Screw		M797-1-0322
19	Thrust Washer		M950-5-0006
20	Spacer		M807-1-9002

** Part numbers in ( ) are metric.*

Super CB-6 Clutch/Brake

Dimensions & Specifications



Dimensions (mm)
See Mounting Requirements on pages 77 & 78.

PERFORMANCE	
Static torque	500 lbs.-in.
Maximum anti-overrun holding capability	300 lbs.-in.
Maximum anti-back holding capability	300 lbs.-in.
Inertia, rotating parts	1.718 lbs.-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 lbs.

ELECTRICAL DATA			
Voltage	Current (amps)	Resistance (ohms)	Status
115 AC 60 Hz	0.334*	57.5	Standard
24 DC	0.586	41.0	Standard
12 DC	1.150	10.4	Modification
90 DC	0.151	598.0	Modification

(Coils are rated for continuous duty)

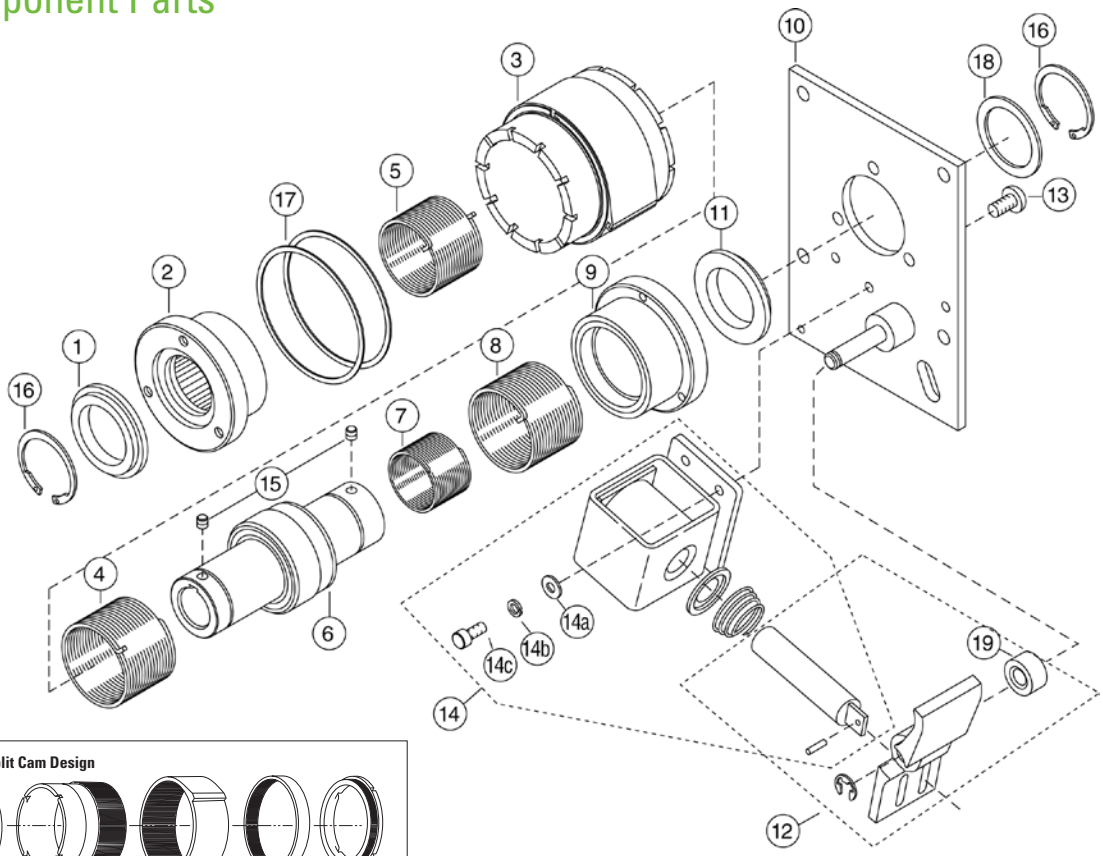
**115 AC - In rush current 1.1 amps / Holding current 0.2 amps*

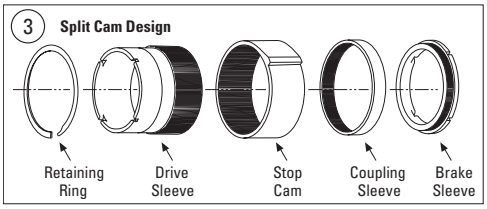
Bore & Keyway Data				
Bore A	Keyway Width B	Keyway Depth C	Set Screws D	Mounting Holes E
0.7505-0.7525 (19.062-19.114)	0.1885-0.1905 (4.787-4.839)	0.837-0.842 (21.25-21.39)	2x #10-32 UNC-2B x.19 Lg. Hex Skt. Set Screw	3x #1/4-20 UNC-2B 2.062 BC
1.0005-1.0025 (25.412-25.464)	—	—	2x 0.187-0.192 Hole (4.74-4.88)	3x #1/4-20 UNC-2B 2.062 BC
Metric Bores				
0.7874-0.7894 (20.0 H9)	0.2356-0.2368 (5.985-6.015)	0.8976-0.9015 (22.800-22.900)	2x M5 x 0.8 x 5.0 Lg. Hex Skt. Set Screw	3x M6 x 1.0 holes on 52.38 BC
0.9842-0.9862 (25.0 H9)	—	—	2x 4.87-5.14 Hole (.191-.203)	3x M6 x 1.0 holes on 52.38 BC

Super CB-6 Clutch/Brake

INDEX

Component Parts





See Disassembly & Assembly Instructions charts on pages 79 & 80.

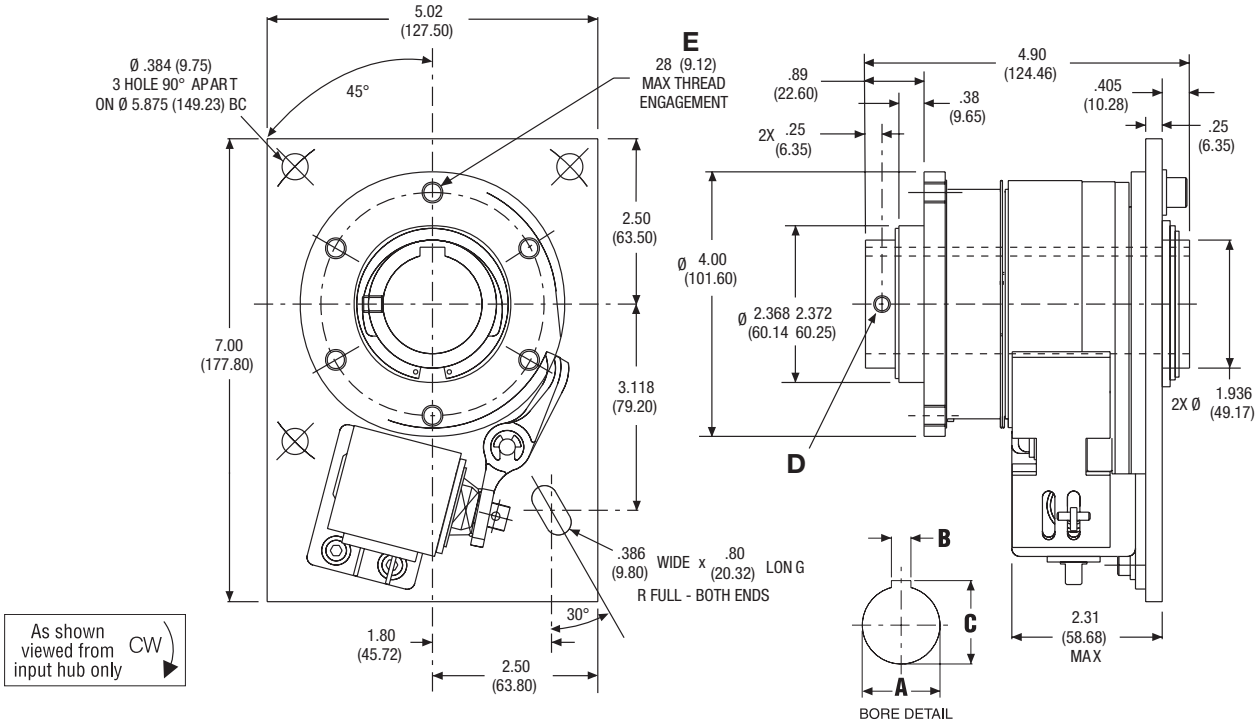
COMPONENT PARTS			
Item	Description	Rotation	Part No.*
1	Thrust Washer (Input)		M950-6-0003
2	Input Hub Assembly with Roller Bearing		M541-6-0035 (M541-6-0036)
3	Control Collar Special Steel Insert (Specify No. of Stops) Standard - 1.8° Adjustable	CW/CCW	M266-6-0750
4	Drive Spring	CW CCW	M808-6-0001 M808-6-0002
5	Anti-Overrun Spring	CW CCW	M808-6-0005 M808-6-0006
6	Output Assembly SPCL 0.750 Bore Hard Shaft and Wear Rings 1.000 Bore (20.0 mm Bore) (25.0 mm Bore)		M824-6-0478 M824-6-0481 (M824-6-0482) (M824-6-0483)
7	Anti-Back Spring	CW CCW	M808-6-0003 M808-6-0004
8	Brake Spring	CW CCW	M808-6-0001 M808-6-0002
9	Brake Hub w/Roller Brg.		M541-6-0045
10	Plate Assembly	CW CCW	M686-6-0076 M686-6-0077

COMPONENT PARTS			
Item	Description	Rotation	Part No.*
11	Thrust Washer (Plate Hub)		M950-6-0004
12	Actuator Assembly Special Actuator (includes plunger & spacer)	CW CCW	M102-1-0032 M102-1-0033
13	Button Head Cap Screw (3)		M797-1-0243
14	Coil Assembly "D" Frame 24 DC 115 AC 12 DC 90 DC		 M101-1-0028 M101-1-0058 M101-1-0027 M101-1-0030
14a	Flatwasher (2)		M950-1-0006
14b	Lockwasher - Split (2)		M950-1-0020
14c	Skt. Head Cap Screw (2)		M797-1-0044
15	Headless Skt. Set Screw (2) (0.75 bore only)		M797-1-0162 (M797-1-0774)
16	Retaining Ring (2)		M748-1-0036
17	Shim (2)		M807-1-0001
18	Shim .005		 M807-1-0014
19	Spacer		M807-1-9001

** Part numbers in ( ) are metric.*

Super CB-7 Clutch/Brake

Dimensions & Specifications



Dimensions (mm)
See Mounting Requirements on pages 77 & 78.

PERFORMANCE	
Static torque	1,500 lbs.-in.
Maximum anti-overrun holding capability	600 lbs.-in.
Maximum anti-back holding capability	600 lbs.-in.
Inertia, rotating parts	6.75 lbs.-in.^{2}
Maximum radial bearing load at maximum speed	300 lbs.
Maximum operating speed	400 RPM
Response time, voltage on at full speed	50 MS
Weight	12 lbs.

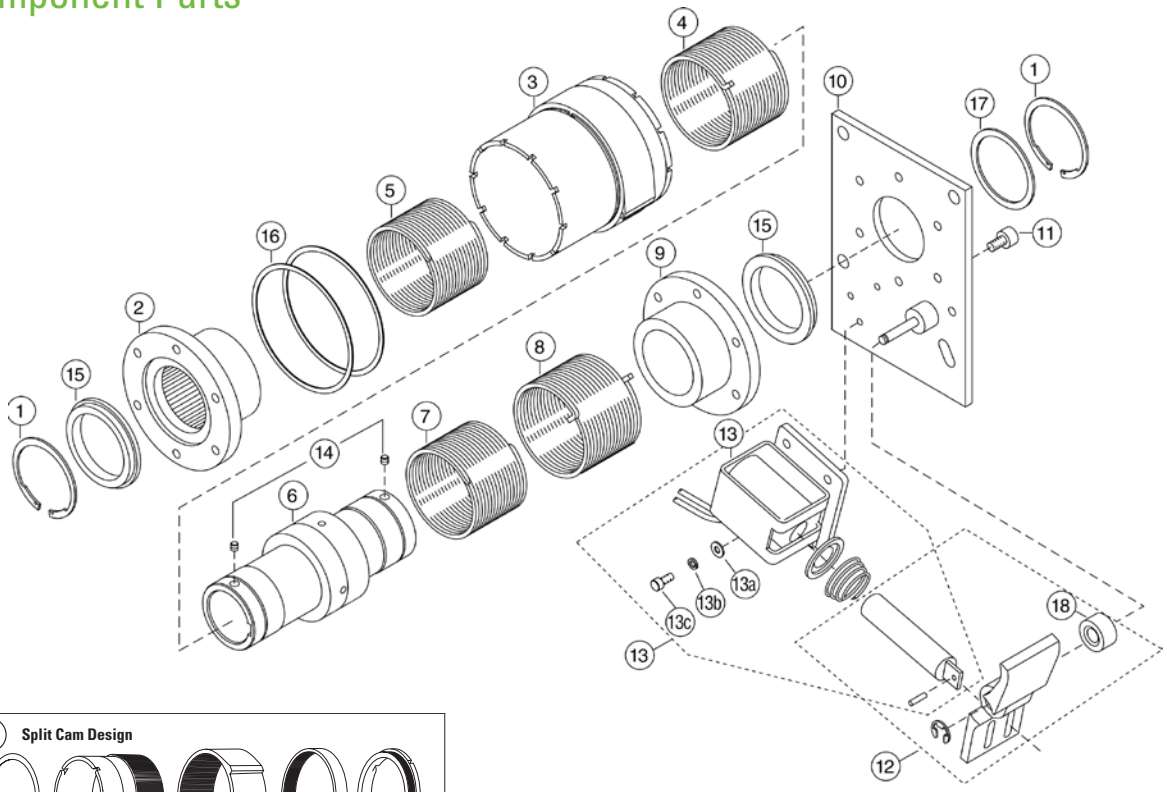
ELECTRICAL DATA			
Voltage	**Current (amps)**	**Resistance (ohms)**	**Status**
115 AC 60 Hz	0.334*	57.5	Standard
24 DC	0.586	41.0	Standard
12 DC	1.150	10.4	Modification
90 DC	0.151	598.0	Modification

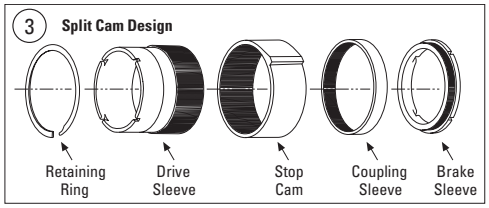
(Coils are rated for continuous duty)

*115 AC - In rush current 1.1 amps / Holding current 0.2 amps

Bore & Keyway Data				
Bore A	**Keyway Width B**	**Keyway Depth C**	**Set Screws D**	**Mounting Holes E**
1.0005-1.0025 (25.412-25.464)	0.251-0.253 (6.37-6.43)	1.114-1.124 (28.29-28.55)	2x #1/4-20 x 0.31 Lg. Hex Skt. Set Screw	6x #5/16-18 UNC-2B on 3.375 BC
1.2505-1.2525 (31.762-31.814)	0.3135-0.3155 (7.962-8.014)	1.389-1.399 (35.28-35.54)	2x #1/4-20 x 0.31 Lg. Hex Skt. Set Screw	6x #5/16-18 UNC-2B on 3.375 BC
1.5005-1.5025 (38.112-38.164)	0.376-0.378 (9.55-9.61)	1.605-1.615 (40.76-41.02)	2x #1/4-20 x 0.31 Lg. Hex Skt. Set Screw	6x #5/16-18 UNC-2B on 3.375 BC
Metric Bores				
0.9843-0.9863 (25.0 H9)	0.3143-0.3156 (7.983-8.017)	1.1142-1.1241 (28.300-28.552)	2x M6 x 1.0 x 10.0 Lg. Hex Skt. Set Screw	6x M8 x 1.25 on 85.73 BC
1.1811-1.1831 (30.0 H9)	0.3143-0.3156 (7.983-8.017)	1.3110-1.3209 (33.299-33.551)	2x M6 x 1.0 x 10.0 Lg. Hex Skt. Set Screw	6x M8 x 1.25 on 85.73 BC
1.3780-1.3804 (35.0 H9)	0.3930-0.3944 (9.982-10.018)	1.5079-1.5182 (38.300-38.563)	2x M6 x 1.0 x 10.0 Lg. Hex Skt. Set Screw	6x M8 x 1.25 on 85.73 BC

Component Parts





See Disassembly & Assembly Instructions charts on pages 79 & 80.

COMPONENT PARTS			
Item	**Description**	**Rotation**	**Part No. ***
1	Retaining Ring		M748-1-0039
2	Input Hub Anti-Overrun		M-7-0027 (M541-7-0030)
3	Control Collar (Steel Insert) (Specify No. of Stops)		(M541-7-8030)
	Standard • 1.6° Adjustable	CW/CCW	M266-1-0030
4	Drive Spring Standard	CW CCW	M808-8-0007 M808-8-0008
5	Anti-Overrun Spring	CW CCW	M808-8-0009 M808-8-0010
6	Output Assembly SPCL		M824-7-0143 (1.00) M824-7-0146 (1.50) (M824-7-0144) (1.25) (M824-7-0133) (M824-7-0135) (M824-7-0137)
	(25.0 mm Bore) (30.0 mm Bore) (35.0 mm Bore)		
7	Anti-Back Spring	CW CCW	M808-1-0012 M808-1-0013
8	Brake Spring	CW CCW	M808-8-0005 M808-8-0006
9	Brake Hub		M541-7-0029

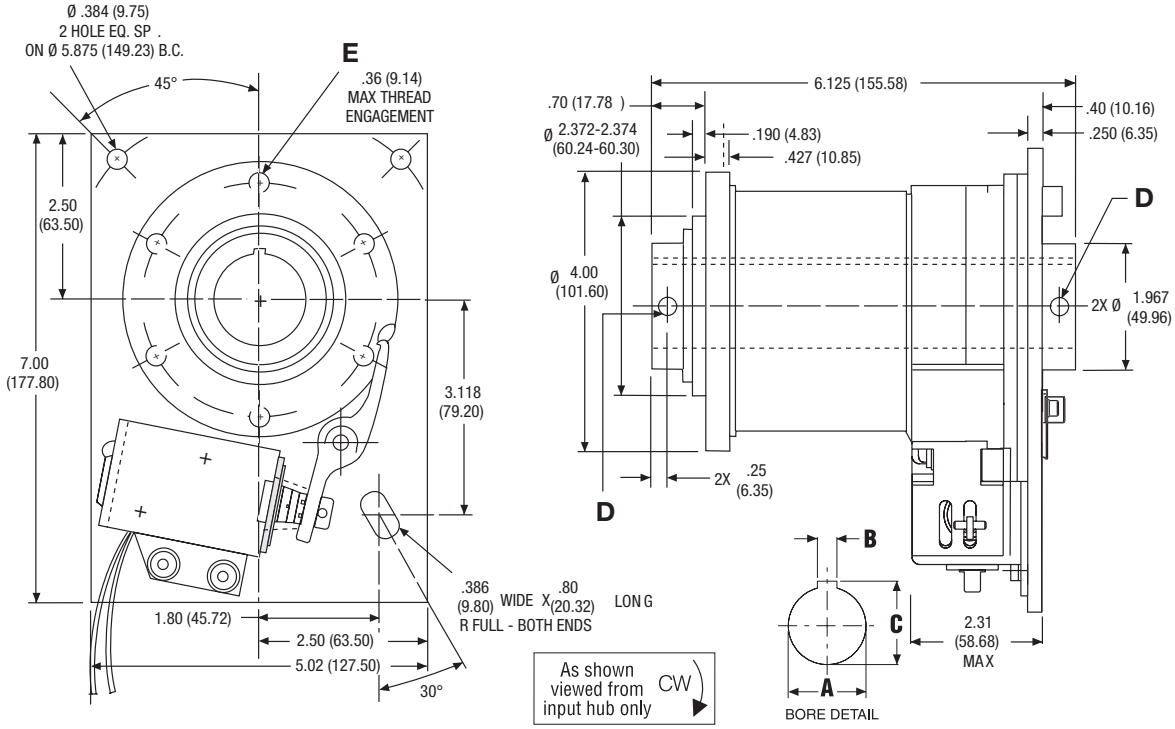
** Part numbers in ( ) are metric.*

COMPONENT PARTS			
Item	**Description**	**Rotation**	**Part No. ***
10	Plate Assembly	CW CCW	M686-7-0009 M686-7-0010
11	Button Head Cap Screw (6)		M797-1-0064
12	Actuator Assembly (includes plunger)	CW CCW	M102-1-0032 M102-1-0033
13	Coil Assembly "D" Frame 24 DC 115 AC 12 DC 90 DC		 M101-1-0028 M101-1-0058 M101-1-0027 M101-1-0030
13a	Flatwasher (2)		M950-1-0006
13b	Lockwasher—Split (2)		M950-1-0020
13c	Head Cap Screw (2)		M797-1-0044
14	Headless Skt. Set Screw (2)		M797-1-0174
15	Thrust Washer (2)		M950-8-0001
16	Shim		M807-1-0002
17	Shim 0.005 0.010		 M801-8-0001 M801-8-0002
18	Spacer		M807-1-9001

Shims used as required.

Super CB-8 Clutch/Brake

Dimensions & Specifications



Dimensions (mm)
See Mounting Requirements on pages 77 & 78.

PERFORMANCE	
Static torque	2,500 lbs.-in.
Maximum anti-overrun holding capability	600 lbs.-in.
Maximum anti-back holding capability	600 lbs.-in.
Inertia, rotating parts	12.84 lbs.-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 lbs.

ELECTRICAL DATA			
Voltage	Current (amps)	Resistance (ohms)	Status
115 AC 60 Hz	0.334*	57.5	Standard
24 DC	0.940	25.4	Standard
12 DC	1.860	6.43	Modification
90 DC	0.240	378.6	Modification

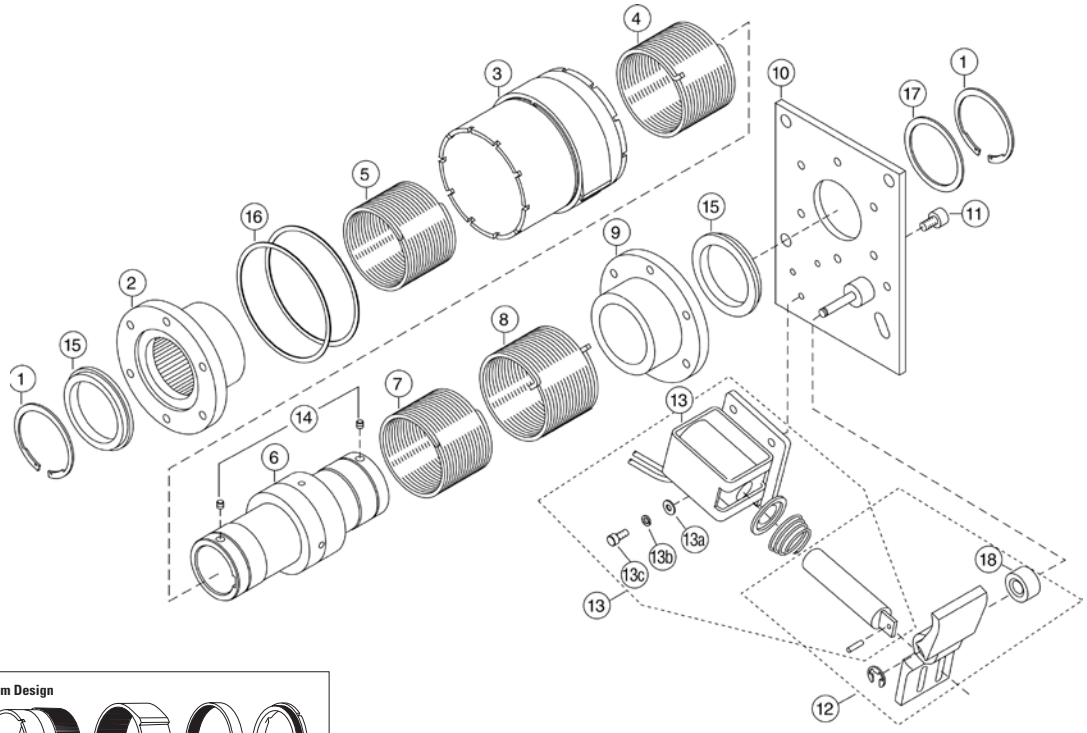
(Coils are rated for continuous duty)

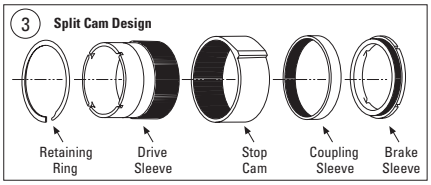
**115 AC - In rush current 1.1 amps / Holding current 0.2 amps*

Bore & Keyway Data				
Bore A	Keyway Width B	Keyway Depth C	Set Screws D	Mounting Holes E
1.0005-1.0025* (25.412-25.464)	0.251-0.253 (6.37-6.43)	1.114-1.124 (28.29-28.55)	2x #1/4-20 x 0.31 Lg. Hex Skt. Set Screw	6x #5/16-18 UNC-2B on 3.375 BC
1.2505-1.2525 (31.762-31.814)	0.3135-0.3155 (7.962-8.014)	1.389-1.399 (35.28-35.54)	2x #1/4-20 x 0.31 Lg. Hex Skt. Set Screw	6x #5/16-18 UNC-2B on 3.375 BC
1.3755-1.3775* (34.937-34.989)	0.3135-0.3155 (7.962-8.014)	1.518-1.528 (38.55-38.82)	2x #1/4-20 x 0.31 Lg. Hex Skt. Set Screw	6x #5/16-18 UNC-2B on 3.375 BC
1.5005-1.5025 (38.112-38.164)	0.376-0.378 (9.55-9.61)	1.605-1.615 (40.76-41.02)	2x #1/4-20 x 0.31 Lg. Hex Skt. Set Screw	6x #5/16-18 UNC-2B on 3.375 BC
METRIC BORES				
1.3780-1.3804 (35.0 H9)	0.3930-0.3944 (9.982-10.018)	1.5079-1.5182 (38.300-38.563)	2x M6 x 1.0 x 10.0 Lg. Hex Skt. Set Screw	6x M8 x 1.25 on 85.73 BC
1.5784-1.5772 (40.0 H9)	—	—	2x M6 x 1.0 x 10.0 Lg. Hex Skt. Set Screw	6x M8 x 1.25 on 85.73 BC

** Special Order*

Component Parts





See Disassembly & Assembly Instructions charts on pages 79 & 80.

COMPONENT PARTS			
Item	**Description**	**Rotation**	**Part No. ***
1	Retaining Ring		M748-1-0039
2	Input Hub Anti-Overrun		M541-8-0009 (M541-8-0012)
3	Control Collar (Steel Insert) (Specify No. of Stops) Standard • 1.6° Adjustable	 CW/CCW	 M266-8-0275
4	Drive Spring Standard	CW CCW	M808-8-0003 M808-8-0004
5	Anti-Overrun Spring	CW CCW	M808-8-0025 M808-8-0026
6	Output Assembly SPCL (35.0 mm Bore) (40.0 mm Bore		M824-8-0579 (1.00) M824-8-0576 (1.50) M824-8-0577 (1.38) (M824-8-0578) (1.25) (M824-8-0589) A/R
7	Anti-Back Spring	CW CCW	M808-8-0025 M808-8-0026
8	Brake Spring	CW CCW	M808-8-0003 M808-8-0004
9	Brake Hub		M541-8-0010
10	Plate Assembly	CW CCW	M686-8-0051 M686-8-0052

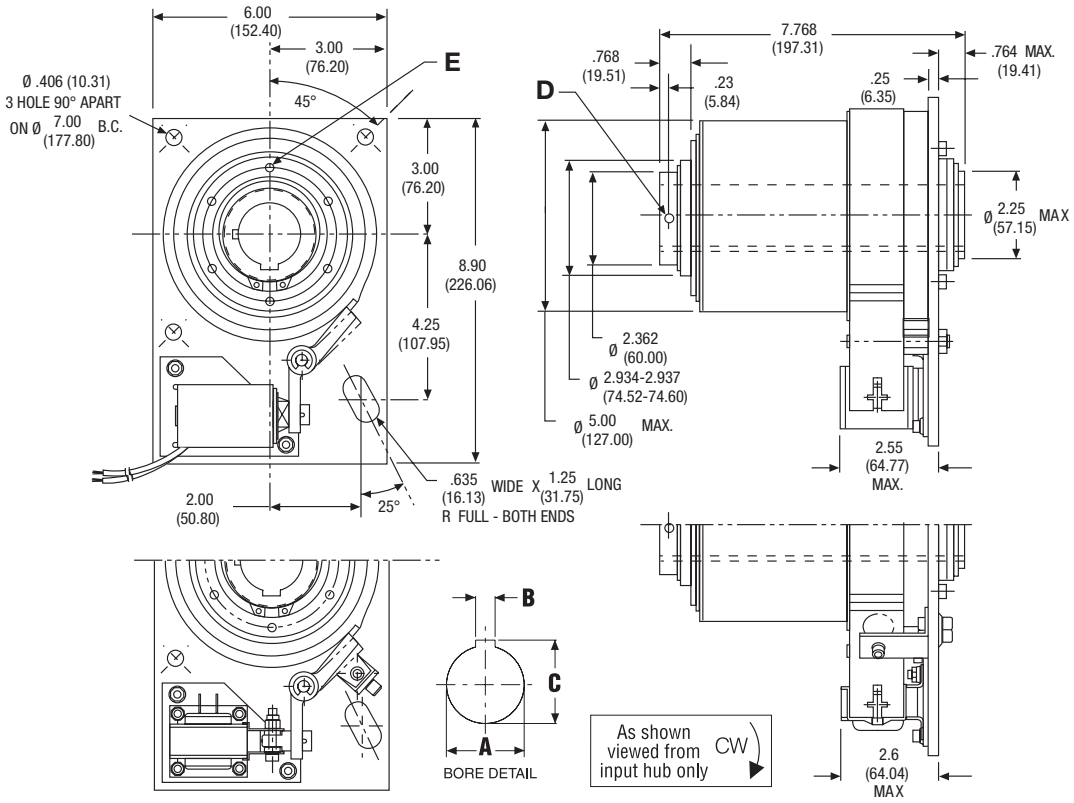
COMPONENT PARTS			
Item	**Description**	**Rotation**	**Part No. ***
11	Button Head Cap Screw (6)		M797-1-0064
12	Actuator Assembly (includes plunger) AC AC DC DC	 CW CCW CW CCW	 M102-1-0032 M102-1-0033 M102-1-0034 M102-1-0035
13	Coil Assembly "D" Frame 24 DC 115 AC 12 DC 90 DC		 M101-1-0053 M101-1-0058 M101-1-0052 M101-1-0055
13a	Flatwasher (2)		M950-1-0006
13b	Lockwasher—Split (2)		M950-1-0020
13c	Head Cap Screw (2)		M797-1-0044
14	Headless Skt. Set Screw (2)		M797-1-0174 (M797-1-0783)
15	Thrust Washer (2)		M950-8-0001
16	Shim (2)		M807-1-0002
17	Shim 0.005 0.010		 M801-8-0001 M801-8-0002
18	Spacer		M807-1-9001

Shims used as required.

** Part numbers in ( ) are metric.*

Super CB-10 Clutch/Brake

Dimensions & Specifications



Dimensions (mm)
See Mounting Requirements on pages 77 & 78.

PERFORMANCE	
Static torque	5,000 lbs.-in.
Maximum anti-overrun holding capability	1,200 lbs.-in.
Maximum anti-back holding capability	1,200 lbs.-in.
Inertia, rotating parts	48.0 lbs..-in.^{2}
Maximum radial bearing load at maximum speed	500 lbs.
Maximum operating speed	200 RPM
Response time, voltage on at full speed	70 MS
Weight	27 lbs.

ELECTRICAL DATA			
Voltage	**Current (amps)**	**Resistance (ohms)**	**Status**
115 AC 60 Hz	0.174*	14.5	Standard
24 DC	0.940	25.4	Standard
12 DC	1.860	6.43	Modification
90 DC	0.240	378.6	Modification

(Coils are rated for continuous duty)

**115 AC - In rush current 2.9 amps / Holding current 0.1 amps*

Bore & Keyway Data				
Bore A	**Keyway Width B**	**Keyway Depth C**	**Set Screws D**	**Mounting Holes E**
1.5005-1.5025 (38.112-38.164)	0.376-0.378 (9.55-9.61)	1.669-1.679 (42.39-42.65)	2x #1/4-20 x 0.25 Lg. Hex Skt. Set Screw	6x #1/4-20 UNC-2B 0.50 DP on 3.417 BC
1.6255-1.6275 (41.287-41.339)	0.376-0.378 (9.55-9.61)	1.796-1.806 (45.61-45.88)	2x #1/4-20 x 0.25 Lg. Hex Skt. Set Screw	6x #1/4-20 UNC-2B 0.50 DP on 3.417 BC
1.7505-1.7525 (44.462-44.514)	0.376-0.378 (9.55-9.61)	1.922-1.932 (48.81-49.08)	2x #1/4-20 x 0.25 Lg. Hex Skt. Set Screw	6x #1/4-20 UNC-2B 0.50 DP on 3.417 BC
Metric Bores				
1.5749-1.5772 (40.0 H9)	0.4717-0.4732 (11.979-12.021)	1.705-1.712 (43.300-43.491)	2x M6 x 1.0 x 10.0 Lg. Hex Skt. Set Screw	6x M6 x 1.25 12.70 DP on 86.79 BC
1.7717-1.7740 (45.0 H9)	0.5504-0.5520 (13.980-14.021)	1.922-1.929 (48.80-49.00)	2x M6 x 1.0 x 10.0 Lg. Hex Skt. Set Screw	6x M6 x 1.25 12.70 DP on 86.79 BC

Super CB-10 Clutch/Brake

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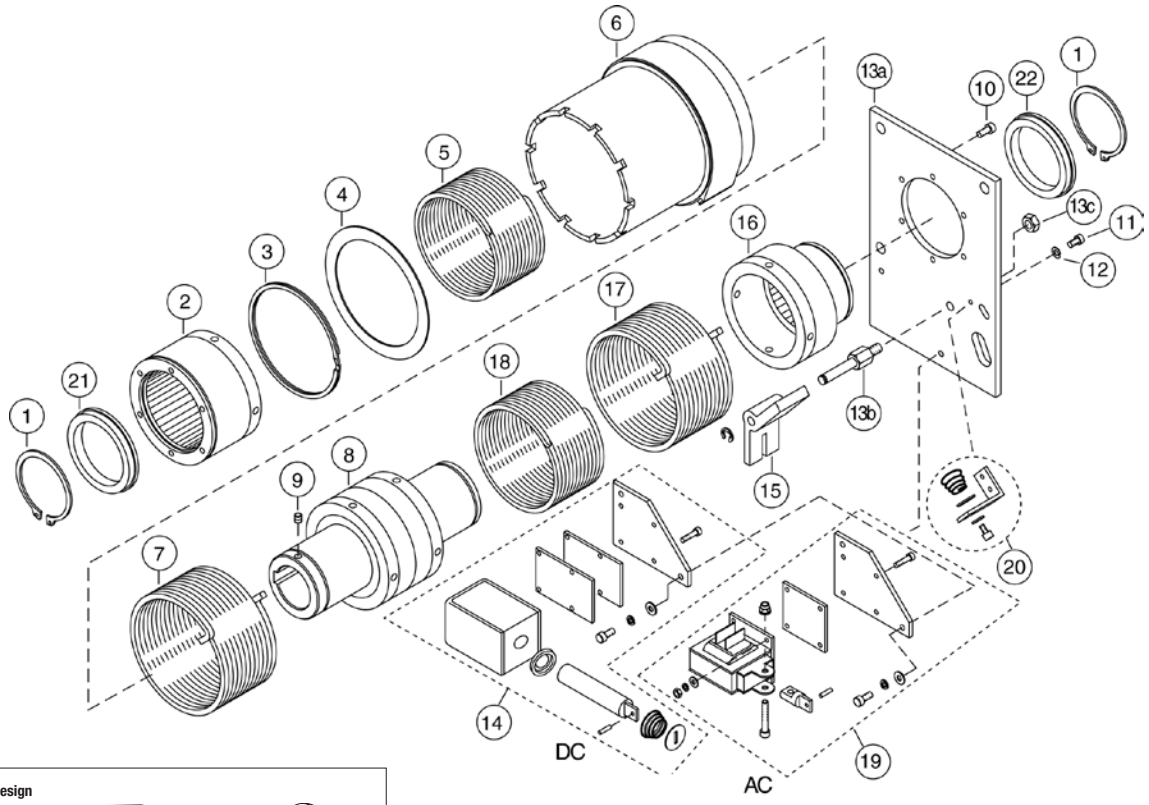
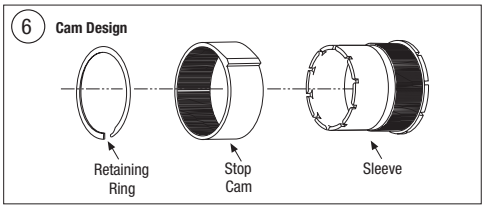
Component Parts





See Disassembly & Assembly Instructions charts on pages 79 & 80.

COMPONENT PARTS			
Item	**Description**	**Rotation**	**Part No. ***
1	Retaining Ring-Truarc		748-1-0020
2	Input Hub Anti-Overrun		541-0-0017 (541-0-0022)
3	Retaining Ring		748-1-0217
4	Spacer		807-0-0013
5	Anti-Overrun Spring	CW CCW	808-0-0001 808-0-0002
6	Control Collar Steel Insert Assembly (Specify No. of Stops) Standard 1.5° • Adjustable	CW CCW	266-0-0201 266-0-0211
7	Drive Spring	CW CCW	808-0-0009 808-0-0010
8	Shaft Assembly (Specify Bore) Anti-Overrun (40.00 mm Bore)	1.500 1.625 1.750	824-0-0097 824-0-0098 824-0-0099 (824-0-0100)
9	Headless Set Screw		797-1-0173 (797-1-0784)
10	Skt Head Cap Screw		797-1-0055
11	Head Cap Screw		797-1-0044
12	Lockwasher—Split		950-1-0020

COMPONENT PARTS			
Item	**Description**	**Rotation**	**Part No. ***
13	Actuator Plate Assembly	CW CCW	101-0-0052 101-0-0053
13a	Plate		686-0-0001
13b	Pivot Pin		679-0-0001
13c	Lock Nut		661-1-0010
14	DC Coil Assembly 24 DC 12 DC 90 DC		 101-0-0003 101-0-0002 101-0-0004
15	Actuator Lever		102-0-9001
16	Brake Hub		541-0-0019
17	Brake Spring	CW CCW	808-0-0009 808-0-0010
18	Anti-Back Spring	CW CCW	808-0-0007 808-0-0008
19	AC Coil Assembly 115 AC	CW CCW	101-0-0005 101-0-0054
20	AC Actuator Return Assembly		101-0-0009
21	Thrust Washer (Input)		950-0-0002
22	Thrust Washer (Plate)		950-0-0003

** Part numbers in ( ) are metric.*

SAC Series Clutch

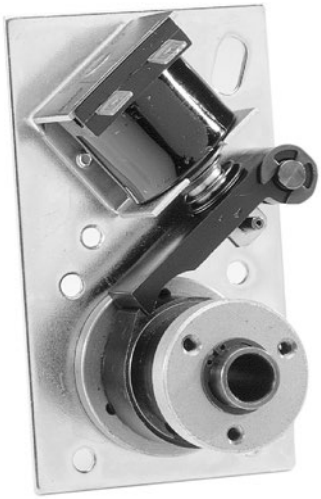
INDEX

Solenoid-Actuated, Wrap Spring Clutches

The SAC Series features four models of pre-assembled, solenoid-actuated, wrap spring clutch packages. SAC units operate from a single AC or DC pulse to accurately start loads at speeds up to 1800 RPM, depending on size. Adjustable stop control collars provide easy and accurate output stop position settings. A typical SAC Series clutch will bring the load up to speed within 3 milliseconds. They are easy to interface with PCs and industrial control systems. SAC Series clutches are accurate, repeatable, fast acting, simple, maintenance free and low cost.

Features

- Available in four standard model sizes
- Solenoid-actuated, wrap spring clutch package
- Torque range from 25 lbs.-in. to 500 lbs.-in.
- 1, 2 and 4 stops standard—other stops available, up to 24 maximum
- Hub input (shaft input available, consult factory)
- RoHS compliant



Typical Applications

- Computer peripherals
- Business machines
- Packaging equipment
- Check cancellers
- Riveters

How to Order

SAC - 6 - CW - 24V - 3/4" bore - 2

SAC Series
Specify:
Imperial or Metric

Size
SAC-2 = **2**
SAC-4 = **4**
SAC-5 = **5**
SAC-6 = **6**

Coil Voltage
12V = 12VDC
24V = 24VDC
90V = 90VDC
115V = 115VAC

Bore Size
SAC-2 = ¼"
SAC-4 = ⁵/₁₆"
SAC-5 = ½"
SAC-6 = ¾", **1**"

Stop Collar
1 = 1 stop
2 = 2 stop
4 = 4 stop
Other stop collars are special order.

Direction of Rotation
CW = Clockwise
CCW = Counterclockwise

OPTIONS	
Dust Covers	See page 56
Stop Collars	See page 57
Pneumatic Actuators	See page 58

SAC Series Clutch

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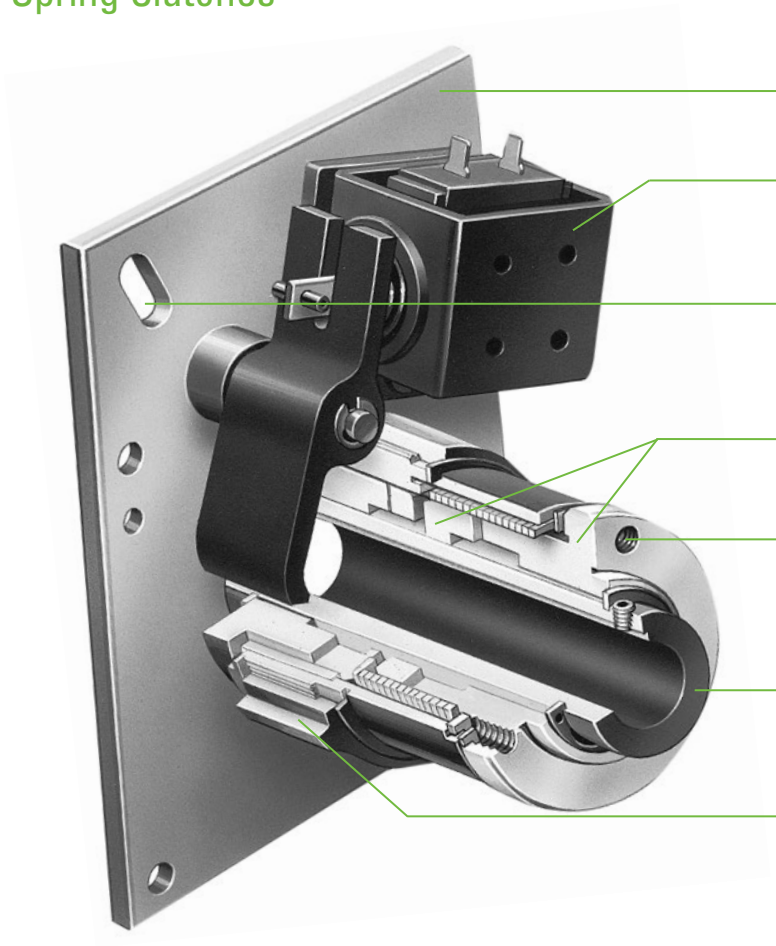
Wrap Spring Clutches



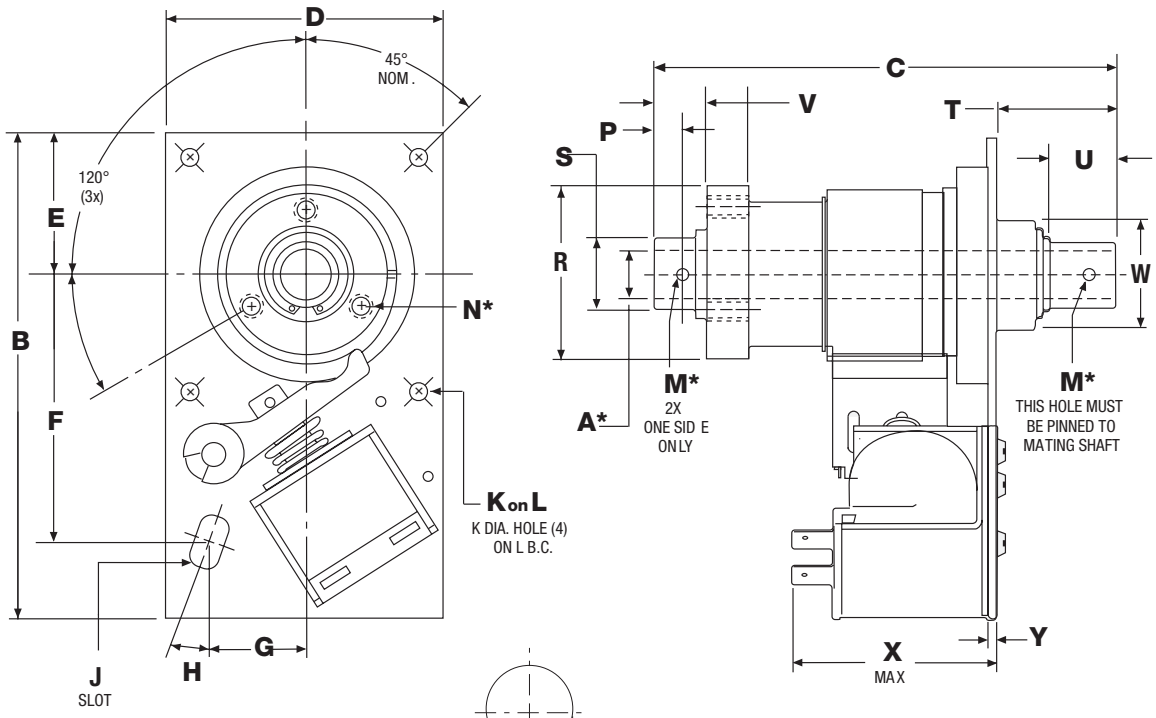
PERFORMANCE				
	SAC-2	**SAC-4**	**SAC-5**	**SAC-6**
Static torque	25 lbs.-in. (2.825 Nm)	120 lbs.-in. (13.56 Nm)	250 lbs.-in. (28.25 Nm)	500 lbs.-in. (56.5 Nm)
Shaft bores (standard)	0.250 (6.35 mm)	0.375 (9.525 mm)	0.500 (12.70 mm)	0.750 or 1.00 (19.05 mm or 25.40 mm)
RPM (maximum)	1,800 RPM	1,200 RPM	750 RPM	500 RPM
Inertia, rotating parts	0.0207 lbs.-in.^{2}	0.0636 lbs.-in.^{2}	0.1950 lbs.-in.^{2}	1.718 lbs.-in.^{2}
Maximum radial bearing load at maximum speed	7.5 lbs.	14.0 lbs.	32.0 lbs.	63.0 lbs.
Response time, voltage on at full speed	20 MS	24 MS	27 MS	45 MS
Weight	1 lbs.	2 lbs.	3 lbs.	7 lbs.

See page 71 for Minimum Inertia Requirements. See pages 77 & 78 for Mounting Requirements.

RPM vs. SHAFT BORE			
Size	**Max. RPM**	**Shaft Bores Standard in (mm)**	**Shaft Bores Metric in (mm)**
SAC-2	1,800	1/4" (6.35)	0.2362-0.2374 (6.0)
SAC-4	1,200	3/8" (9.525)	0.3937-0.3951 (10.0)
SAC-5	750	1/2" (12.70)	0.4724-0.4741 (12.0)
SAC-6	500	3/4" or 1" (19.05 or 25.40)	0.7874-0.7894 (20) or 0.9842-0.9862 (25)

SAC-2, SAC-4 & SAC-5 Clutch

Dimensions



Dimensions (mm)
See Mounting Requirements on pages 77 & 78.

DIMENSIONS											
Model	Torque (lbs.-in.)	B Nom.	C Nom.	D Nom.	E Nom.	F Nom.	G Nom.	H Nom.	J Nom.	K Nom.	L Nom.
SAC-2	25	3.39 (86.11)	2.50 (63.50)	2.00 (50.80)	1.00 (25.40)	1.95 (49.53)	0.71 (18.03)	20.0°	0.201 W x 0.375 L (5.10 x 9.53)	0.194 (4.93)	2.125 (53.98)
SAC-4	120	4.10 (104.14)	3.38 (85.85)	2.38 (50.45)	1.00 (25.40)	2.56 (65.02)	0.807 (20.50)	17.5°	.26 W x 50 L (6.60 x 12.70)	0.187 (4.75)	2.125 (53.98)
SAC-5	250	4.56 (115.82)	4.37 (111.00)	2.62 (66.55)	1.31 (33.27)	2.50 (63.50)	0.91 (23.11)	20.0°	.26 W x .50 L (6.60 x 12.70)	0.187 (4.75)	3.125 (79.38)

Model	Torque (lbs.-in.)	P Nom.	R Nom.	S Nom.	T Nom.	U Min.	V Nom.	W Max.	X Max.	Y Nom.
SAC-2	25	0.09 (2.29)	1.188 (30.17)	0.375 (9.525)	0.405 (10.29)	0.13 (3.30)	0.215 (5.46)	0.62 (15.75)	1.70 (43.18)	0.09 (2.29)
SAC-4	120	0.15 (3.81)	1.249 (31.72)	0.500 (12.70)	0.83 (21.08)	0.51 (12.95)	0.330 (8.38)	0.75 (19.05)	1.94 (49.28)	0.09 (2.29)
SAC-5	250	0.25 (6.35)	1.562 (39.67)	0.625 (15.87)	1.09 (27.69)	0.73 (18.54)	0.470 (11.94)	1.00 (25.40)	2.00 (50.80)	0.09 (2.29)

** See bore data on next page.*

SAC-2, SAC-4 & SAC-5 Clutch

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Specifications

PERFORMANCE			
	SAC-2	SAC-4	SAC-5
Static torque	25 lbs.-in. (2.825 Nm)	120 lbs.-in. (13.56 Nm)	250 lbs.-in. (28.25 Nm)
Shaft bores (standard)	0.250 (6.35 mm)	0.375 (9.525 mm)	0.500 (12.70 mm)
RPM (maximum)	1,800 RPM	1,200 RPM	750 RPM
Inertia, rotating parts	0.0207 lbs.-in.^{2}	0.0636 lbs.-in.^{2}	0.1950 lbs.-in.^{2}
Maximum radial bearing load at maximum speed	7.5 lbs.	14 lbs.	32 lbs.
Response time, voltage on at full speed	20 MS	24 MS	27 MS
Weight	1 lbs.	2 lbs.	3 lbs.

See page 71 for Minimum Inertia Requirements. See pages 77 & 78 for Mounting Requirements.

SAC-2 ELECTRICAL DATA			
Voltage	Current (amps)	Resistance (ohms)	Status
120 AC 60 Hz	0.104*	825	Standard
24 DC	0.230	104	Standard
12 DC	0.460	26	Modification
90 DC	0.059	1510	Modification

(Coils are rated for continuous duty.)

**120 AC - In rush current .10 amps / Holding current .04 amps.*

SAC-4 and 5 ELECTRICAL DATA			
Voltage	Current (amps)	Resistance (ohms)	Status
115 AC 60 Hz	0.103*	280	Standard
24 DC	0.325	74	Standard
12 DC	0.732	16.4	Modification
90 DC	0.096	936	Modification

(Coils are rated for continuous duty.)

**115 AC - In rush current .232 amps / Holding current .098 amps.*

Bore & Keyway Data			
Model	Bore A	M	Mtg. Holes N
SAC-2	0.2505-0.2525 (6.362-6.414)	0.061-0.065 (1.55-1.65)	3x 6-32 UNC-2B on .938 BC
SAC-4	0.376-0.378 (9.55-9.61)	0.124-0.129 (3.14-3.28)	3x 6-32 UNC-2B on .938 BC
SAC-5	0.5005-0.5025 (12.712-12.764)	0.124-0.129 (3.14-3.28)	3x 10-32 UNC-2B on 1.250 BC
Metric Bores			
SAC-2	0.2362-0.2374 (6.0 H9)	2x 1.49-1.58 (2x 0.059-0.062)	3x M4 x 0.7 on 23.83 BC
SAC-4	0.3937-0.3951 (10.0 H9)	2x 2.97-3.08 (2x 0.117-0.121)	3x M4 x 0.7 on 23.83 BC
SAC-5	0.4724-0.4741 (12.0 H9)	2x 2.97-3.08 (2x 0.117-0.121)	3x M5 x 0.8 on 31.75 BC

See Disassembly & Assembly Instructions charts on pages 79 & 80.

SAC-2, SAC-4 & SAC-5 Clutch

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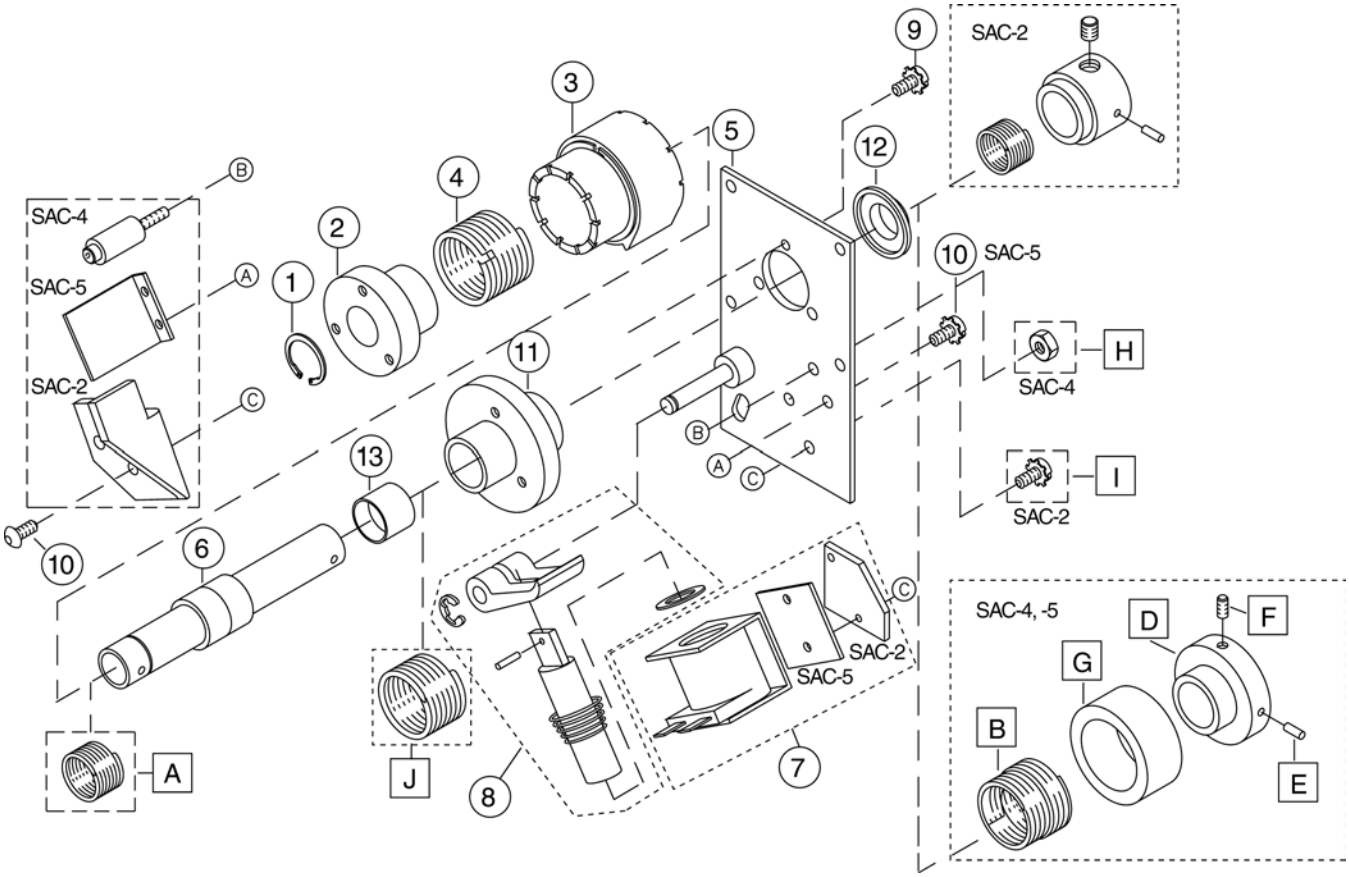
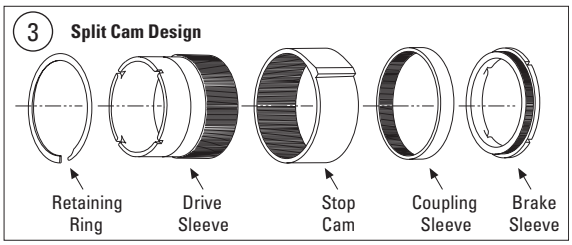
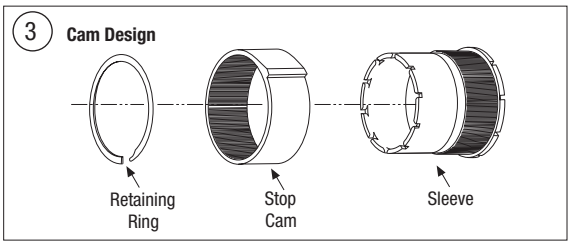
Component Parts





Sizes 5 and 6 only



Sizes 2 and 4 only

See Disassembly & Assembly Instructions charts on pages 79 & 80.

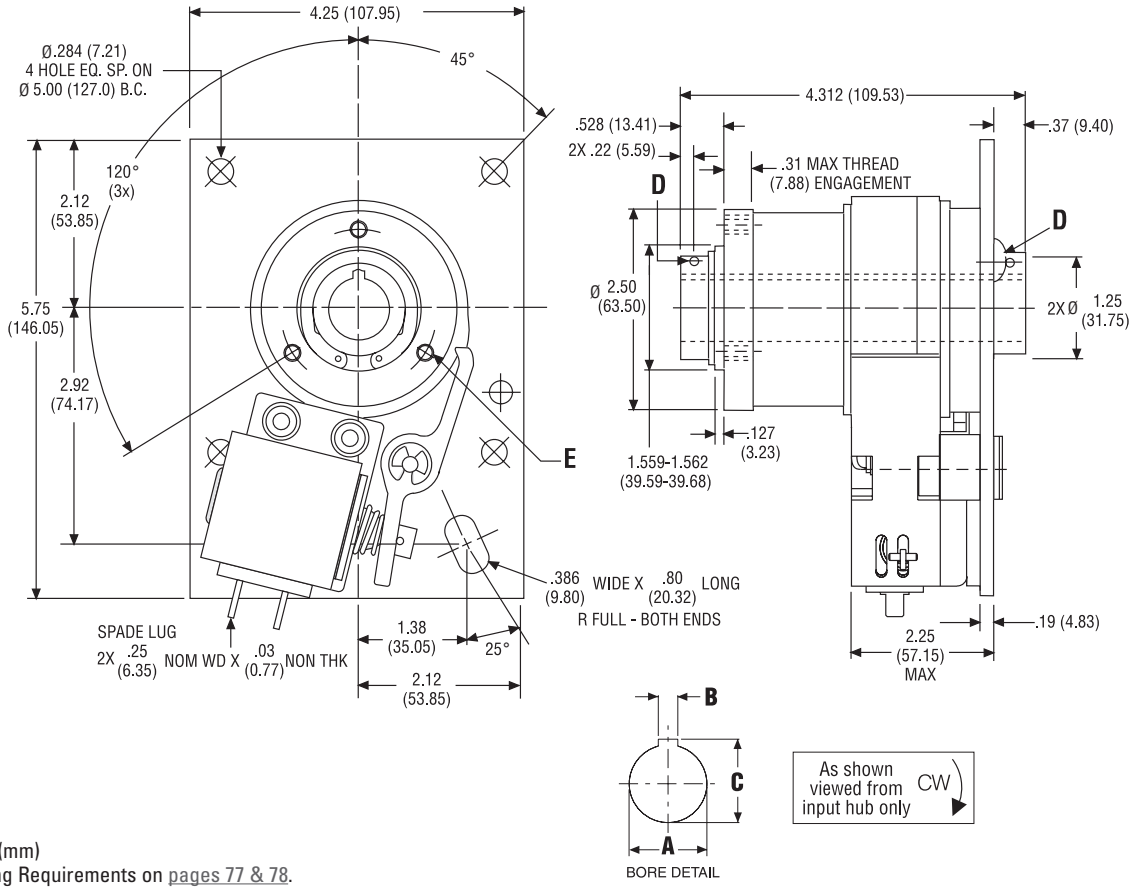
Component Parts

COMPONENTS				
Item	**Description**	**SAC-2**	**SAC-4**	**SAC-5**
1	Retaining Ring	M748-1-0085	M748-1-0027	M748-1-0030
2	Input Hub	M540-2-0004	M540-4-0021	M540-5-0007
3	Stop Collar (Specify no. of stops) Standard CW (1) Standard CCW (1)	 M266-2-0001 M266-2-0031	 M266-4-0051 M266-4-0081	 M266-5-0801 M266-5-0801
4	Drive Spring CW Drive Spring CCW	M808-2-0108 M808-2-0109	M808-4-0066 M808-4-0059	M808-5-0001 M808-5-0002
5	Plate Assembly CW Plate Assembly CCW	M686-2-0001 M686-2-0002	M686-4-0001 M686-4-0002	M686-5-0001 M686-5-0002
6	Output Assembly	M824-2-0006	M824-4-0015	M824-5-0002
7	Coil Assembly (Specify voltage) 24 DC 115 AC *12 DC (optional) *90 DC (optional)	 M275-1-0003 M275-1-0006 M275-1-0002 M275-1-0005	 M275-1-0163 M275-1-0166 M275-1-0162 M275-1-0165	 M101-5-0003 M101-5-0006 M101-5-0002 M101-5-0005
8	Actuator Assembly (kit w/plunger)	M101-2-0001	M102-4-0005	M101-5-0058 CW M101-5-0059 CCW
9	Flat Head Socket Cap Screw (3)	M797-1-0311	M797-1-0311	M797-1-0322
10	Pan Head Machine Screw (Sems) (2)	M797-1-0415	M797-1-0412	M797-1-0414
11	Plate Hub	M540-2-0006	M540-4-0015	M540-5-0004
12	Grooveless Retaining Ring	M748-1-0384	M748-1-0377	M748-1-0398
13	Sleeve	M803-2-003	M803-4-0010	M803-5-0014

COMPONENTS				
Item	**Description**	**SAC-2**	**SAC-4**	**SAC-5**
A	Anti-Overrun Spring CW Anti-Overrun Spring CCW	M808-2-0003 M808-2-0004	M808-4-0022 M808-4-0023	M808-5-0003 M808-5-0004
B	Anti-Back Spring CW Anti-Back Spring CCW	M808-2-0004 M808-2-0003	M808-4-0018 M808-4-0019	M808-5-0005 M808-5-0006
C	Actuator Limit Stop Actuator Limit Stop	M816-2-0001 CW M816-2-0002 CCW	M816-1-0003 CW M816-1-0003 CCW	M816-5-0013 CW M816-5-0013 CCW
D	Anti-Back Hub	M540-2-0003	M540-4-0018	M540-5-0006
E	Spring Pin	M679-1-0019	M679-1-0022	M679-1-0024
F	Headless Socket Set Screw	M797-1-0152	M797-1-0152	M797-1-0153
G	Dust Cover (AB spring)	—	M287-4-9002	M287-5-9002
H	Hex Nut	—	M661-1-0022	—
I	Pan Head Machine Screw (Sems)	—	M797-1-0412	M797-1-0414
J	Brake Spring	M808-2-0101 CW M808-2-0100 CCW	M808-4-0016 CW M808-4-0017 CCW	M808-5-0001 CW M808-5-0002 CCW

SAC-6 Clutch

Dimensions



Dimensions (mm)
See Mounting Requirements on pages 77 & 78.

PERFORMANCE	
Static torque	500 lbs.-in. (58.5 Nm)
Inertia, rotating parts	1.718 lbs.-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 lbs.

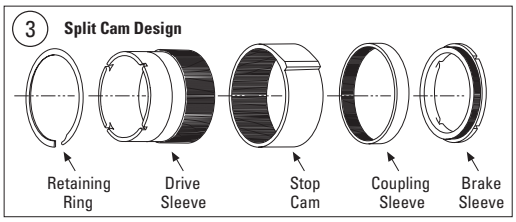
ELECTRICAL DATA			
Voltage	**Current (amps)**	**Resistance (ohms)**	**Status**
115 AC 60 Hz	0.334*	57.5	Standard
24 DC	0.586	41.0	Standard
12 DC	1.150	10.4	Modification
90 DC	0.151	598.0	Modification

(Coils are rated for continuous duty.)

** 115 AC - In rush current 1.1 amps / Holding current 0.2 amps.*

Bore & Keyway Data				
Bore A	**Keyway Width B**	**Keyway Depth C**	**Set Screws D**	**Mounting Holes E**
0.7505-0.7525 (19.062-19.114)	0.1885-0.1905 (4.787-4.839)	0.837-0.842 (21.25-21.39)	2x #10-32 UNC-2B x 0.19 (4.83) Lg. Hex Skt. Set Screw	3x #1/4-20 UNC-2B on 2.062 BC
1.0005-1.0025 (25.412-25.464)	—	—	2x 0.187-0.192 Hole (4.74-4.88)	3x #1/4-20 UNC-2B on 2.062 BC
Metric Bores				
.7874-.7894 (20.0 H9)	.2356-.2368 (5.985-6.015)	.8976-.9015 (22.800-22.900)	2x M5 x 0.8 x 5.00 Nom. Lg. Hex Skt. Set Screw	3x M6 x 1.0 on 52.38 BC
.9842-.9862 (25.0 H9)	—	—	2x 4.87-5.14	3x M6 x 1.0 on 52.38 BC

Component Parts



(Sizes 5 & 6 only)

See Disassembly & Assembly Instructions charts on pages 79 & 80.

COMPONENT PARTS			
Item	**Description**	**Rotation**	**Part No.**
1	Retaining Ring		M748-1-0038
2	Input Hub Anti-Overrun		M540-6-0003
3	Control Collar (Specify No. of Stops) Standard - 1.8° Adjustable	CW/CCW	M266-6-0726
4	Drive Spring	CW CCW	M808-6-0001 M808-6-0002
5	Output Assembly 0.750 Bore 1.000 Bore		 M824-6-0002 M824-6-0003
6	Brake Hub		M540-6-0001
7	Plate Assembly	CW CCW	M686-6-0076 M686-6-0077
8	Actuator Assembly Includes Plunger	CW CCW	M102-1-0032 M102-1-0033
9	Coil Assembly "D" Frame 24 DC 115 AC 12 DC 90 DC		 M101-1-0028 M101-1-0058 M101-1-0027 M101-1-0030

COMPONENT PARTS			
Item	**Description**	**Rotation**	**Part No.**
9a	Flatwasher (2)		M950-1-0006
9b	Lockwasher – Split (2)		M950-1-0020
9c	Skt. Head Cap Screw (2)		M797-1-0044
10	Headless Skt. Set Screw (0.75 Bore only)		 M797-1-0162
11	Button Head Cap Screw (3)		M797-1-0243
12	Sleeve		M803-6-0014
13	Shim (2)		M807-1-0001
*14	Shim 0.005 0.010		 M807-1-0014 M807-1-0017
15	Spacer		M807-1-9001
Options			
A	Anti-Overrun Spring	CW CCW	M808-6-0005 M808-6-0006
B	Anti-Back Spring	CW CCW	M808-6-0003 M808-6-0004

Shims used as required.

PSI Series Clutch

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Mechanically Actuated, Basic Wrap Spring Clutch Design

Ideal for Overrunning, Start-Stop and Single Revolution Applications.

PSI Series clutches represent the most fundamental wrap spring clutch design. As a start-stop or single revolution clutch, it is actuated simply by external blocking or releasing of the stop collar. As a simple overrunning clutch, it provides positive engagement of load to power source, but permits free overrunning when input power is slowed, stopped or reversed.

All units can be supplied with hub input/shaft output or vice versa. Designed for applications where direct mechanical control is desired, the PSI Series clutch is a reliable, easily applied, low-cost solution.

Features

- Single revolution models can stop 10% of rated drive torque capacity
- Mechanically actuated clutches
- Five models fit ¼" to 1½" shafts
- Torque ranges from 25 lbs.-in. to 2500 lbs.-in.
- Single revolution, start-stop or overrunning clutch functions
- RoHS compliant

Typical Applications

- Business machines
- Copying machines
- Material handling conveyors
- Packaging equipment
- Ribbon drives

How to Order

PSI - 2 - S - CW - SI - 1/4" bore - 2

PSI Series
Specify:
Imperial or Metric

Model
S = Single Revolution
SS = **Start-Stop**
O = Overrunning

Input
HI = Hub Input
SI = Shaft Input

Bore Size
PSI-2 = ¼"
PSI-4 = $^{3}/_{8}$"
PSI-5 = ½"
PSI-6 = **¾, 1"**
PSI-8 = **1¼", 1½"**
***1"**, ***1$^{1}/_{8}$"**
*Special order

Stop Collar
1 = 1 stop
2 = 2 stop
4 = 4 stop
Other stop collars are special order

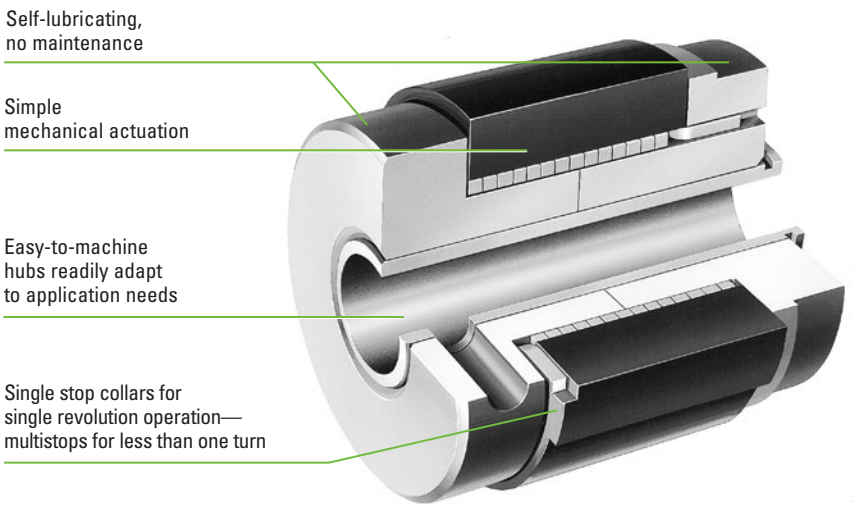
Size
PSI-2 = **2**
PSI-4 = **4**
PSI-5 = **5**
PSI-6 = **6**
PSI-8 = **8**

Direction of Rotation
CW = Clockwise
CCW = Counterclockwise
Look into the input end to determine the direction of rotation

OPTIONS	
Stop Collars	See page 57

PSI Series Clutch

Wrap Spring Clutch Specifications & Capabilities

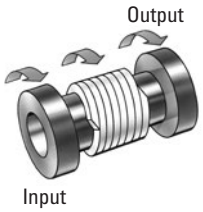


PERFORMANCE						
		PSI-2	PSI-4	PSI-5	PSI-6	PSI-8
Static torque		25 lbs.-in. (2.825 Nm)	120 lbs.-in. (13.56 Nm)	250 lbs.-in. (28.25 Nm)	500 lbs.-in. (56.5 Nm)	2500 lbs.-in. (282.5 Nm)
Inertia, rotating parts	SI HI	0.006 lbs.-in.2 0.008 lbs.-in.2	0.015 lbs.-in.2 0.023 lbs.-in.2	0.059 lbs.-in.2 0.069 lbs.-in.2	0.570 lbs.-in.2 0.73 lbs.-in.2 (0.75 bore) 0.68 lbs.-in.2 (1.00 bore)	4.990 lbs.-in.2 11.91 lbs.-in.2 (1.25 bore) 11.60 lbs.-in.2 (1.50 bore)
Weight		0.132 lbs.	0.22 lbs.	0.62 lbs.	2.60 lbs.	8.25 lbs.
Maximum radial bearing load at max. speed		6.75 lbs.	13.50 lbs.	31.50 lbs.	63.0 lbs.	300.0 lbs.
Maximum operating speed		1,800 RPM	1,200 RPM	750 RPM	500 RPM	300 RPM

Operation Capabilities

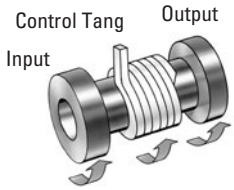
Overrunning
Model O

The overrunning clutch (Model O) transmits torque up to the rated value in the positive direction; when disengaged it only transmits some drag torque in the reverse direction. Major applications for this unit are anti-overrun protection and anti-back-up devices.



Start-Stop (random positioning)
Model SS

The start-stop clutch (Model SS) accelerates the load just after the control collar has been released, thus the collar is free to rotate, allowing the spring to grip both hubs together. To disconnect the clutch, the collar must be restrained, stopping the collar from rotating via the stop face. The spring will then be opened and the clutch will be disengaged. The output is free to rotate and will be stopped by system friction and clutch drag torque.

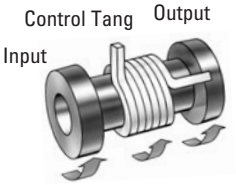


Single Revolution
Model S

The single revolution clutch (Model S) accelerates in the same manner as the model SS. The deceleration starts when the collar is restrained, and the spring is opened, disengaging the clutch.

For Model S, the brake torque capability is limited to 10% of the rated torque.

All PSI Series clutches are easy to install. The shaft can be pinned or, on larger units, delivered with keyways.



PSI-2, PSI-4 & PSI-5 Clutch

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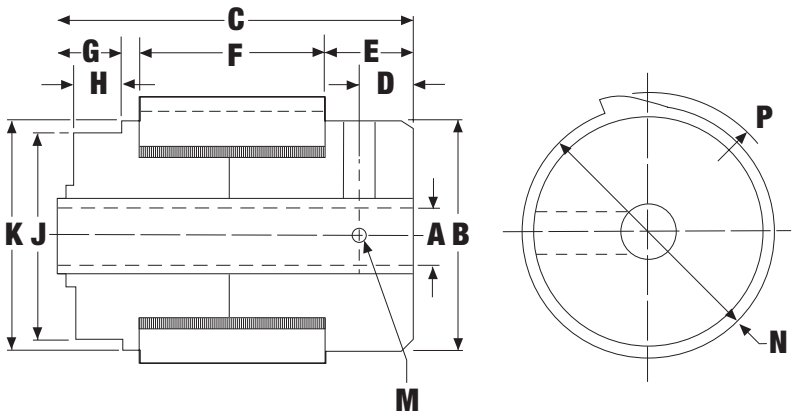
Dimensions & Specifications



DIMENSIONS (mm)												
Model	Torque lbs.-in.	B	C	D	E	F	G	H	J Dia	K Dia.	N	P Rad.
PSI-2	25	0.94 (23.90)	1.25 (31.75)	0.16 (4.10)	0.34 (8.60)	0.49 (12.4)	0.33 (8.40)	0.25 (6.35)	0.8765-0.8775 (22.263-22.289)	0.94 (23.9)	1.00 (25.4)	0.57 (14.76)
PSI-4	120	1.25 (31.75)	1.38 (35.05)	0.16 (4.05)	0.28 (7.10)	0.68 (17.27)	0.34 (8.64)	0.25 (6.35)	1.1265-1.1275 (28.639-28.613)	1.25 (31.75)	1.31 (33.27)	0.72 (18.29)
PSI-5	250	1.56 (39.60)	1.88 (47.75)	0.22 (5.56)	0.38 (9.70)	1.00 (25.4)	0.34 (8.64)	0.25 (6.35)	1.502-1.503 (38.15-38.18)	1.56 (39.60)	1.69 (42.93)	0.96 (24.38)

Bore Data		
Model	Bore A	M
PSI-2	0.2515-0.2525 (6.36-6.39)	#8-32
PSI-4	0.376-0.378 (9.55-9.61)	0.125 Dia. (3.175 Dia.)
PSI-5	0.501-0.503 (12.725-12.776)	0.188 Dia. (4.775 Dia.)
Metric Bores		
PSI-2	0.2362-0.2374 (6.0 H9)	M3 x 0.5, 5.0 Lg. Set Screw (2@120)°
PSI-4	0.3937-0.3951 (10.0 H9)	M4 x 0.7, 5.0 Lg. Set Screw (2@120)°
PSI-5	0.4724-0.4741 (12.0 H9)	0.197 Dia. (5.0 Dia.)

See Disassembly & Assembly Instructions charts on pages 79 & 80.

PSI-2, PSI-4 & PSI-5 Clutch

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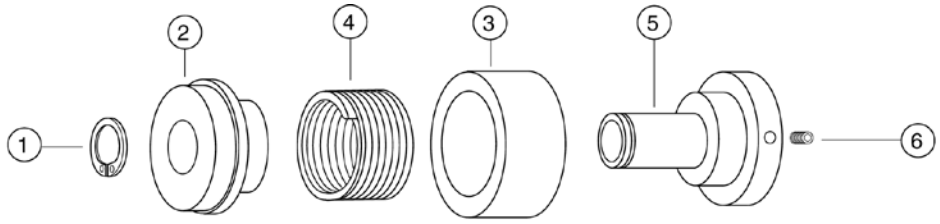
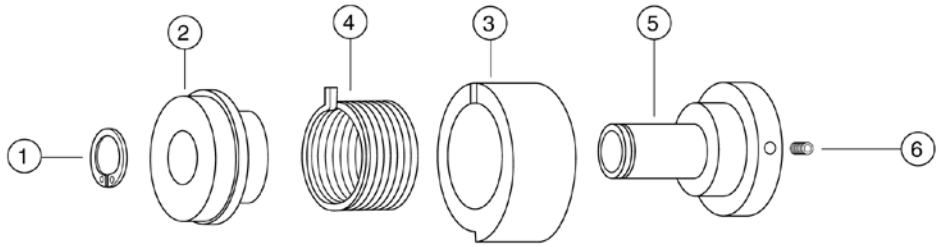
Component Parts

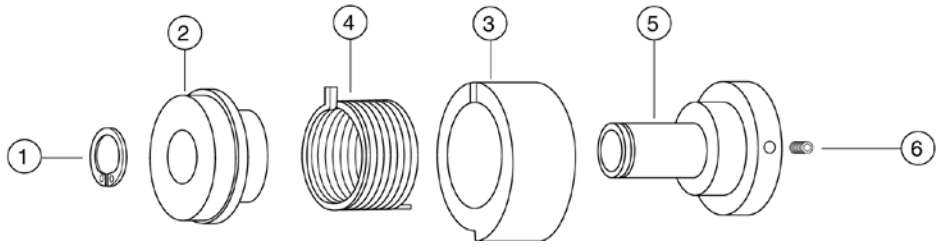
Model "O"



Model "SS"



Model "S"

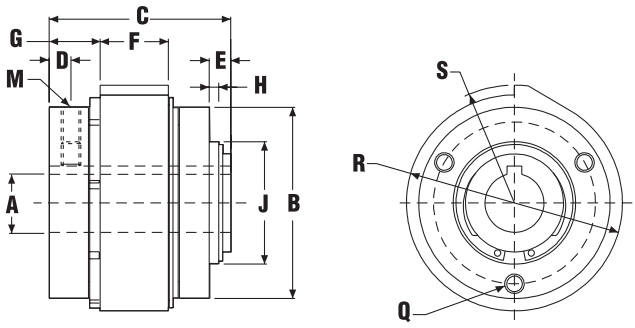


COMPONENT PARTS					
Item	Description	Rotation	PSI-2 Part No.	PSI-4 Part No.	PSI-5 Part No.
1	Retaining Ring		M748-1-0005	M748-1-0087	M748-1-0090
2	Free Hub		M540-2-0047	M540-4-0027	M540-5-0113
3	Control Collar	CW	M266-2-9046	M266-4-9005	M266-5-9010
		CCW	M266-2-9046	M266-4-9005	M266-5-9010
		Model O	M287-2-0003	M287-4-0001	M287-5-0015
4	Drive Spring	Model S CW	M808-2-0036	M808-4-0024	M808-5-0030
		Model S CCW	M808-2-0037	M808-4-0030	M808-5-0034
		Model SS CW	M808-2-0051	M808-4-0026	M808-5-0031
		Model SS CCW	M808-2-0052	M808-4-0033	M808-5-0035
		Model O CW	M808-2-0040	M808-4-0042	M808-5-0033
		Model O CCW	M808-2-0041	M808-4-0043	M808-5-0037
5	Shaft Assembly		M824-2-0048	M824-4-0037	M824-5-0110
6	Headless Skt. Set Screw		M797-1-0152	0.125 dia. hole	0.188 dia. hole

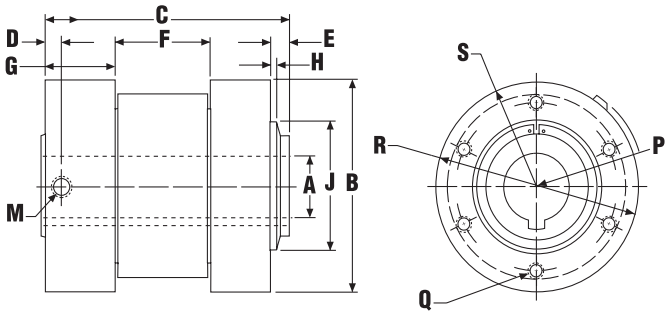
PSI-6 & PSI-8 Clutch

Dimensions & Specifications

PSI-6



PSI-8



Dimensions (mm)

See Disassembly & Assembly Instructions charts on pages 79 & 80.

DIMENSIONS (mm)											
Model	Torque lbs.-in.	B Dia.	C	D	E	F	G	H	J Dia	R Dia.	S Rad.
PSI-6	500	Ø 2.437 Ø (61.90)	2.312 (58.72)	0.28 (7.10)	0.27 (6.86)	0.87 (22.1)	0.63 (16.00)	0.12 (3.05)	1.559-1.562 (39.60-39.67)	2.75 (69.85)	1.50 (38.1)
PSI-8	2500	Ø 4.00 Ø (101.6)	4.25 (107.95)	0.62 (15.75)	0.35 (8.89)	2.20 (55.9)	1.27 (32.26)	0.188 (4.78)	2.372-2.374 (60.25-60.30)	4.00 (101.6)	2.00 (50.8)

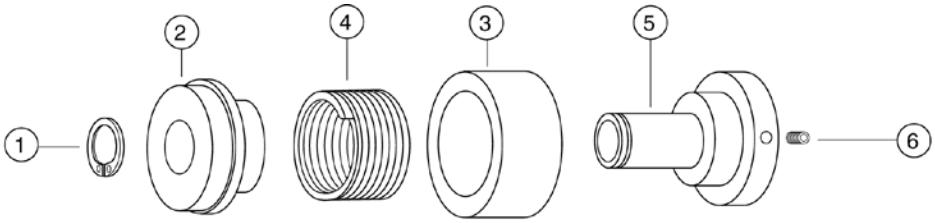
Bore & Keyway Data					
Model	Bore A	Keyway Width B	Keyway Height C	M	Q
PSI-6	0.7505-0.7525 (19.063-19.114)	0.1885-0.1905 (4.787-4.839)	0.837-0.842 (21.25-21.52	#1/4-20 Tap	#1/4-20 x 1/2 DP 3 on 2.062 BC Max. Thread Engage Free Hub 0.312
PSI-6	1.0005-1.0025 (25.412-25.464)	—	—	0.25 Dia. (6.35)	#1/4-20 x 1/2 DP 3 on 2.062 BC Max. Thread Engage Free Hub 0.312
PSI-8	1.0005-1.0025 (25.412-25.464)	0.251-0.253 (6.37-6.43)	1.114-1.124 (28.29-28.55)	3/8-16 Tap 2 @ 90°	5/16-18 6 on 3.375 BC Max. Thread Engage Free Hub 0.375
PSI-8	1.2505-1.2525 (31.762-31.814)	0.3135-0.3155 (7.962-8.014)	1.389-1.399 (35.28-35.54)	3/8-16 2 @ 90°	5/16-18 6 on 3.375 BC Max. Thread Engage Free Hub 0.375
PSI-8	1.3755-1.3775 (34.937-34.989)	0.3135-0.3155 (7.962-8.014)	1.518-1.528 (38.55-38.82)	3/8-16 2 @ 90°	5/16-18 6 on 3.375 BC Max. Thread Engage Free Hub 0.375
PSI-8	1.5005-1.5025 (38.112-38.164)	0.376-0.378 (9.55-9.61)	1.605-1.615 (40.76-41.02)	3/8-16 2 @ 90°	5/16-18 6 on 3.375 BC Max. Thread Engage Free Hub 0.375
Metric Bores					
PSI-6	0.7874-0.7894 (20.0 H9)	0.2356-0.2368 (5.985-6.015)	0.8976-0.9015 (22.80-22.90)	M5 x 0.8 Tap	M6 x 1.0 THD 3 Holes on a 52.37 BC
PSI-6	0.9842-0.9862 (25.0 H9)	—	—	5.0 Dia. (1.97 Dia.)	M6 x 1.0 THD 3 Holes on a 52.37 BC
PSI-8	1.378-1.3804 (35.0 H9)	0.3930-0.3944 (9.982-10.018)	1.508-1.516 (38.30-38.50)	M10 x 1.5, 25.0 Lg. Set Screw 2 @ 120°	M8 x 1.25 THD 6 Holes on a 85.73 BC
PSI-8	1.5748-1.5772 (40.0 H9)	—	—	M10 x 1.5, 25.0 Lg. Set Screw 2 @ 120°	M8 x 1.25 THD 6 Holes on a 85.73 BC

PSI-6 & PSI-8 Clutch

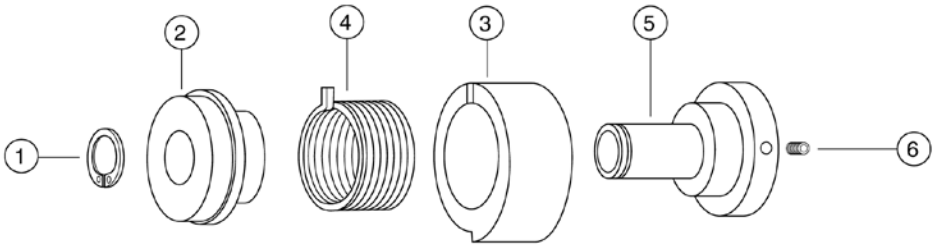
INDEX

Component Parts

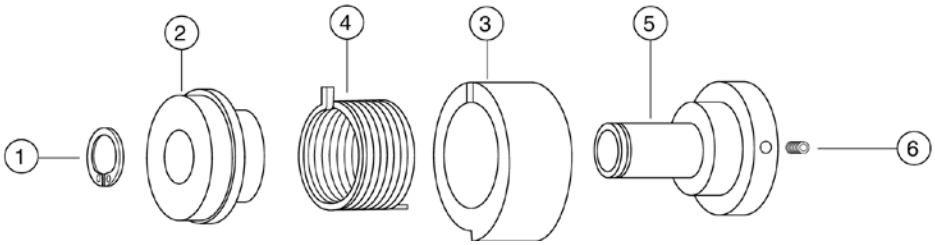
Model "O"



Model "SS"



Model "S"



COMPONENT PARTS				
Item	**Description**	**Rotation**	**PSI-6 Part No.**	**PSI-8 Part No.**
1	Retaining Ring		M748-1-0038	M748-1-0039
2	Free Hub		M540-6-0009	M540-8-0014
3	Control Collar	CW	M266-6-0301	M266-8-0127
		CCW	M266-6-0401	M266-8-0127
		Model O	M287-6-0001	M287-8-0002
4	Drive Spring	Model S CW	M808-6-0001	M808-8-0011
		Model S CCW	M808-6-0002	M808-8-0012
		Model SS CW	M808-6-0007	M808-8-0013
		Model SS CCW	M808-6-0008	M808-8-0014
		Model O CW	M808-6-0009	M808-8-0015
		Model O CCW	M808-6-0010	M808-8-0016
5	Shaft Assembly		0.75" M824-6-0052	1.000" M824-8-0213
			1.00" M824-6-0056	1.250" M824-8-0212
				1.375" M824-8-0211
				1.500" M824-8-0210
6	Headless Skt. Set Screw		M797-1-0174	M797-1-0199 (2)

Dust Cover Clutch Enclosures – Accessories

Provide protection from contaminants for Super CB, CB and SAC Series Models

Plastic Clutch Cover

We offer plastic enclosures designed to complement the following clutches: Super CB-6, -8, -10; CB-2, -4, -5, -6, -8, -10 and SAC-2, -4, -5, -6.

Plastic Cover

- Protect units from dirt, contaminants and moisture
- Help to assure longer life
- Flexible soft plastic construction is durable
- Simple to remove and reinstall
- Low cost

Plastic

Model	Part No.
Super CB-6	M287-6-0007
Super CB-8	M287-8-0003
Super CB-10	M287-0-0002
CB-2	M287-2-0007
CB-4	M287-4-0002
CB-5	M287-5-0007
CB-6	M287-6-0007
CB-8	M287-8-0003
CB-10	M287-0-0002
SAC-2	M287-2-0007
SAC-4	M287-4-0002
SAC-5	M287-5-0007
SAC-6	M287-6-0007

Aluminum Clutch Cover Kits

The environmentally designed cast aluminum enclosure will protect a CB-6, Super CB-6 or SAC-6 clutch from indoor and outdoor hazards such as falling dirt, non-corrosive liquids, dust, rain, sleet and snow.

- Sturdy cast aluminum construction
- Offers NEMA 3 & 12 protection
- Can be installed at any time
- Quieter clutch operation
- USDA-approved black powder coat paint finish

Benefits

- Prevents premature failure of clutches caused by moisture, dust and debris
- Extends clutch life
- Seals and protects bearings
- Reduces clutch operating temperature

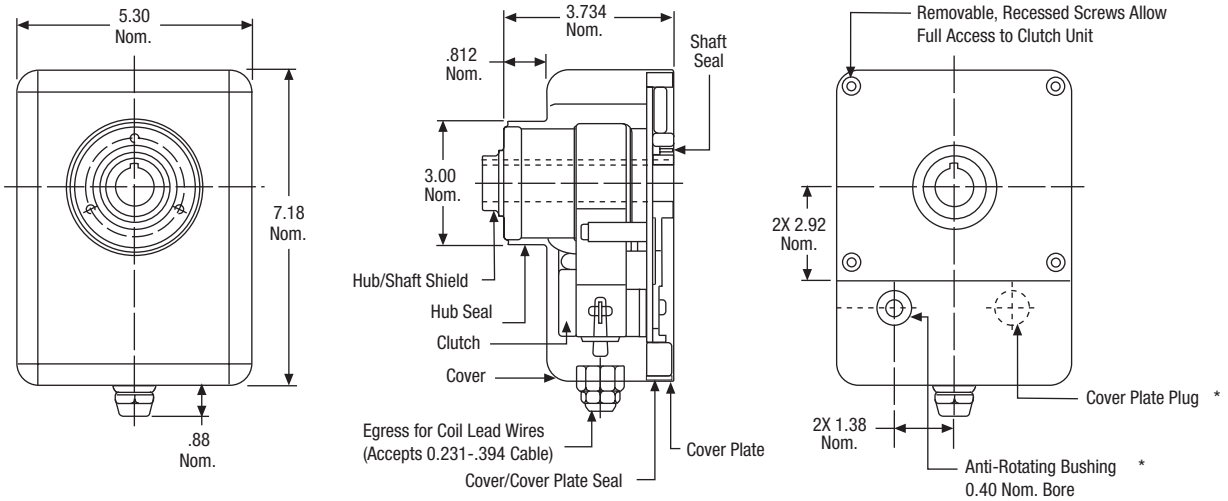
Typical Applications

- Food processing
- Packaging
- Material handling
- Medical equipment
- Agriculture

Aluminum
(Size 6 only)

Model	Part No.
Super CB-6	M101-6-0096
CB-6 (Std.)	M101-6-0095
SAC-6	M101-6-0095

Note: A kit contains all components and hardware necessary to enclose a Super CB-6, CB-6 and SAC-6 clutch.



Dimensions (Aluminum)

Stop Collars – Accessories

Specifications and Adjustments

Stop Collars

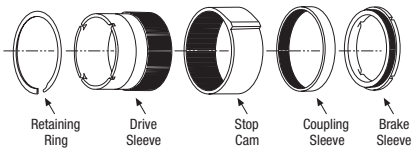
Stop Collars			
Model	**Collar Type**	**Stops**	**Status**
Super CB	Reinforced Plastic with steel insert Reinforced Plastic	1, 2 or 4 3, 5 through 24 stops	Standard Optional
Standard CB	Reinforced Plastic	1, 2 or 4 up to 24 max*	Standard Optional
PSI	Reinforced Plastic	1, 2 or 4 up to 24 max*	Standard Optional
SAC	Reinforced Plastic	1, 2 or 4 up to 24 max*	Standard Optional
ACCM	Powder Metal	4	Standard
ACCE	Powder Metal	4	Standard

** Consult factory for complete information.*

Stop Collar Adjustments

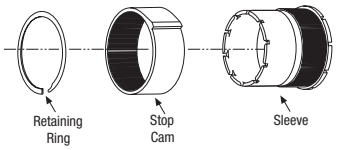
Unique splined stop collars are a standard feature of Super and Standard CB, as well as the PSI and SAC model clutches. These stop collars can be adjusted radially in fine increments. This feature allows the user to reposition the output to comply with specified shaft and keyway placements. Standard stop collar positioning increments are shown at right.

Split Cam Design



The Split Cam stop collar design is a standard feature on Super CB Sizes 5, 6, 7, 8; Standard CB Sizes 5, 6, 7, 8 and SAC Sizes 5, 6.

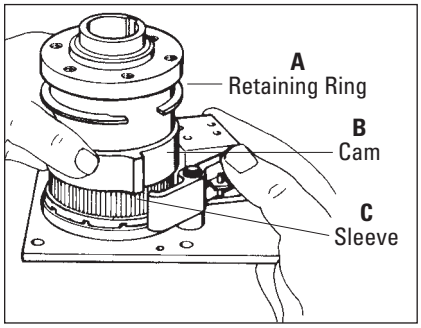
Traditional Cam Design



The Cam stop collar design is a standard feature on Super CB Size 10; Standard CB Sizes 2, 4, 10 and SAC Sizes 2, 4.

Stop Collar Removal and Adjustment

To adjust the stop collar, remove retaining ring A, slide cam B off sleeve C, rotate the cam to the desired position, slide it onto the sleeve again, and replace the retaining ring.



Note: While adjusting the stop collar on split cam units, the coupling sleeve must be held secure so that it does not move.

Standard Stop Collar Adjustments			
Series	**Size**	**Collar Design**	**Adjustment**
Super CB	CB-5	Split Cam	1.8°
Super CB	CB-6	Split Cam	1.8°
Super CB	CB-7	Split Cam	1.6°
Super CB	CB-8	Split Cam	1.6°
Super CB	CB-10	Cam	1.5°
Standard CB	CB-2	Cam	2.8°
Standard CB	CB-4	Cam	2.4°
Standard CB	CB-5	Split Cam	1.8°
Standard CB	CB-6	Split Cam	1.8°
Standard CB	CB-7	Split Cam	1.6°
Standard CB	CB-8	Split Cam	1.6°
Standard CB	CB-10	Cam	1.5°
SAC	SAC-2	Cam	2.8°
SAC	SAC-4	Cam	2.4°
SAC	SAC-5	Split Cam	1.8°
SAC	SAC-6	Split Cam	1.8°

Consult factory for complete information on non-standard stop collars.

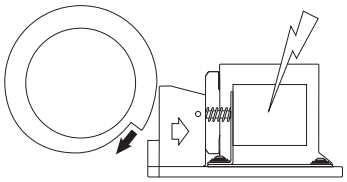
Heavy Duty Actuator – Accessories

For use with PSI-6 and PSI-8 Clutches

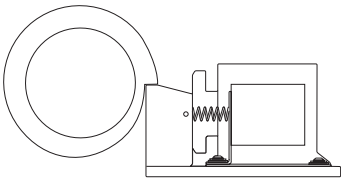
The Heavy Duty Actuator is offered as a simple laminated AC solenoid-actuated mechanical device to operate in conjunction with the PSI-6 and PSI-8 clutches. Mounted in the proper proximity to the clutches, it will control single, multiple, or partial revolution. It is designed as a no power, no revolution device. Ruggedly constructed from steel and nylon for maximum strength and long life.

Operation

When voltage is applied to the coil, the stop block is pulled back from the clutch stop collar, allowing the clutch to engage. It is not necessary to hold power on the coil for the entire revolution. A pulse to the coil will allow the clutch to start, the return spring pressure on the collar will not disengage the clutch and the stop block will be in position to disengage the clutch after one revolution. No "On" timing is necessary.



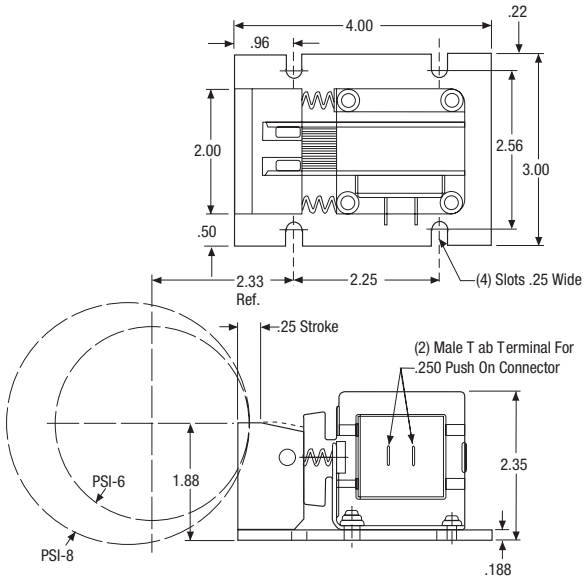
Energized



De-Energized

PN M901-00-002

SPECIFICATIONS	
Input	Line power 120 AC, 60 Hz
DC Resistance	14.5 ohms
Load current	In rush current 2.9 amps
Holding current	0.1 amps
Terminals	1/4" spade lug connections



Dimensions

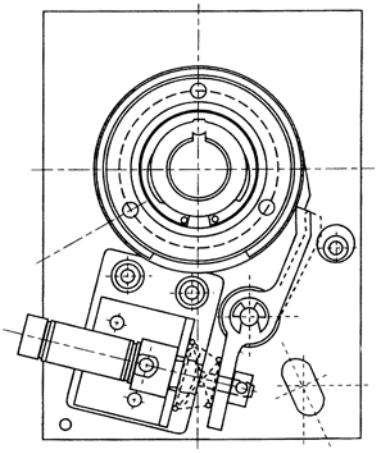
Pneumatic Actuation

Pneumatic actuation is available on the Standard CB-4, -5, -6, -7, -8 and -10 as well as the respective Super CB models; SAC-4, -5, -6, -8.

- No electrical sparks
- Not subject to power line voltage fluctuations
- Longer life of control members

Air pressure required: 4,5 - 16,5 bar

Retrofit kits available.



One Shot Octal Socket Power Supply
Model WSCC-102

Warner Electric's One Shot Power Supply is a plug-in clutch/brake control designed for operation of AC or DC wrap spring clutches and brakes with a D-frame coil. The One Shot provides a single voltage pulse of 160 or 325 VDC for approximately 20MS, whether the customer supplied switch is momentarily closed or held closed.

This unit may be mounted in any convenient position using the two mounting holes provided on the socket.

Actuating the single pole, double throw (SPDT) switch energizes the solenoid coil. Releasing or resetting the switch charges an internal capacitor.

Note: Designed for use with actuator limit stop option.

One Shot
Octal Socket Control
P/N 901-00-019

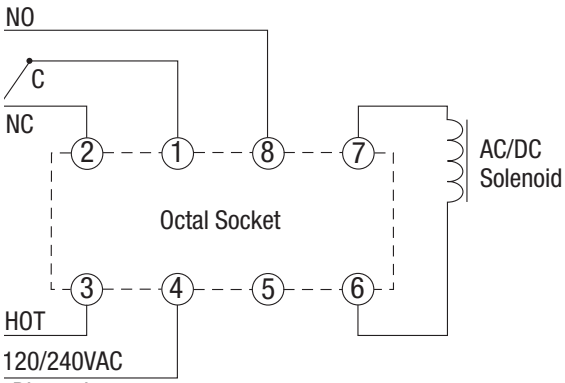
SPECIFICATIONS	
Input:	120/240 VAC, 50/60 Hz
Output:	160/290 VDC Peak, 3 amps max at 160 VDC output, 5 amps max. at 290 VDC ouput
Ambient Temperature:	+ 32° F to + 122° F 0° C to + 50° C
Cycle Rate:	The maximum cycle rate is 300 CPM*.

** See below for maximum cycle rates by input.*

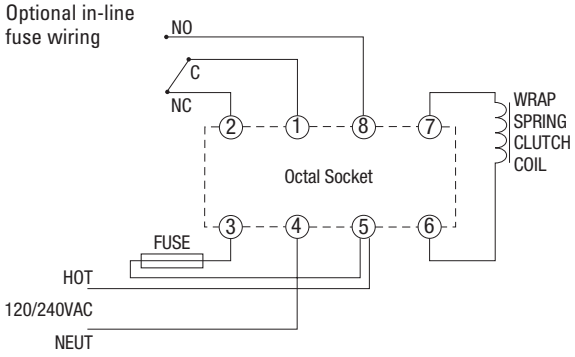
VAC Input	Maximum Cycle Rate
120	300 CPM
240	40 CPM

Connection Diagram

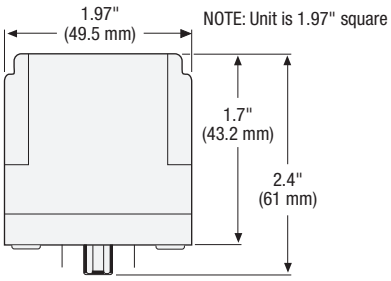
Panel Mount fuse wiring



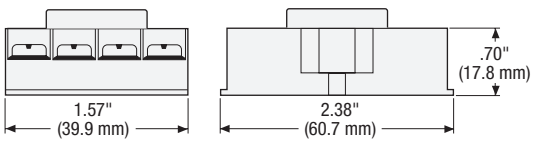
Optional in-line fuse wiring



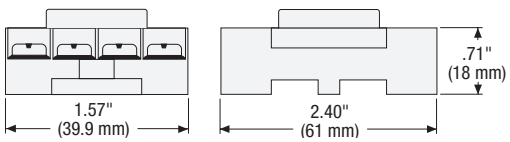
Dimensions in. (mm)



One Shot Control
PN 901-00-019



Octal Socket P/N 6001-101-001



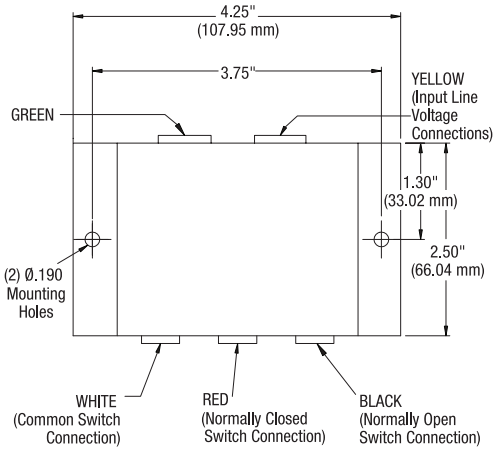
Power Supply Units – Accessories

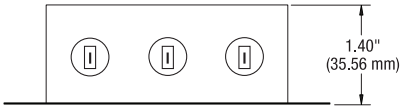
One Shot Power Supply Model WSCC-101

The One Shot Power Supply is available for use with standard AC as well as DC D-Frame coils. The one shot provides a single overexcite voltage pulse whether the switch is momentarily closed, or held closed. The unit operates on either 120 or 230 AC, 50/60 Hz power and may be mounted in any convenient position by use of two mounting holes for #8-32 screws.

Note: Designed for use with actuator limit stop option and D-Frame coil.

One Shot Control
P/N 901-00-014



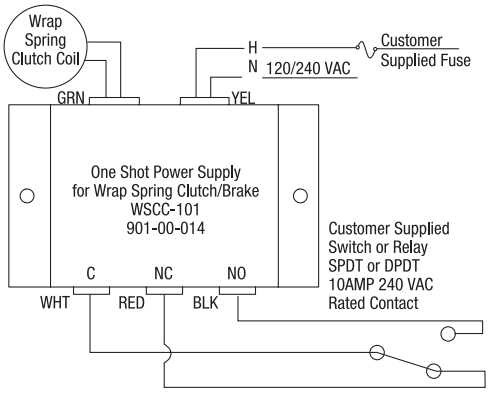


Dimensions in. (mm)

SPECIFICATIONS	
Input:	120/240 VAC, 50/60Hz
Output:	160/290 VDC Peak, 3 amps max at 160 VDC output, 5 amps max at 290 VDC output
Ambient Temperature:	+32°F to +122°F 0°C to +50°C
Terminals:	Amp Inc., Fast-on 250 Series Tabs (.250 X .032), For 14-16AWG AMP #640905-1 For 18-22AWG AMP #640903-1

VAC Input	Maximum Cycle Rate
120	300 CPM
240	40 CPM

Connection Diagram



Actuating the single pole, double throw (SPDT) switch energizes the solenoid coil. Releasing or resetting the switch charges an internal capacitor.

DL Series Clutch

START

DuraLIFE™ Clutches

DuraLIFE Series clutches (DL) are electro-mechanical wrap spring clutches that combine high torque, reliability and rapid acceleration into one small package at a competitive cost. It is offered in two configurations: headed coil or flying leads.

Wrap spring technology provides very fast response to bring loads up to speed in less than 3 ms (after spring wrap-down and depending on rpm).

The DL-33 is a drop-in alternative for high-cost clutches used in office automation applications such as printers and copiers. The long life and reliable performance make the DL-33 an ideal clutch for many packaging and automotive applications.

Features

- Wrap spring technology
- High torque, small package
- Rapid acceleration
- Consistent performance
- Low wattage required
- RoHS compliant

Applications

The DL-33 is suitable for high-load, tight-fitting applications requiring quick response, rapid acceleration and high torque. These requirements are common in office automation, packaging and automotive markets.

Application Considerations

Single Direction
Wrap spring clutches provide torque only in the direction in which they wrap down. This allows for overrunning.

Relative High Shock
Due to the rapid acceleration of the DL-33, system inertia effects can be significant. In some applications, an inline slip device may be used for shock absorption.

Engagement Relative to Speed
The DL-33 relies on relative motion between the input and output for engagement. Thus the slower the speed, the longer the time until engagement.

Typical Applications

Office Automation
- Copiers & printers
- Paper feed systems
- Collators & sorters
- Mailing equipment
- Ticket & receipt dispensers

Packaging
- Labeller
- Dispensing machines
- Conveyors

Automotive
- Cruise control
- Power lift gate
- Trunk cinch actuator systems
- Trunk power door closer

How to Order

DL - 33 - HI - CW - 24 - MC - 1/4" - P

Series
DL = DuraLIFE Clutch Imperial Metric

Size
33 = 33 mm

Input
HI = Hub Input
SI = Shaft Input

Direction of Rotation
CW = Clockwise
CCW = Counterclockwise
Look into the 3-lug drive end to determine the direction of rotation

Coil Voltage
12 = 12DC
24 = 24DC
90 = 90DC

Electrical Connection
MC = Molded Connector
FL = Flying Leads

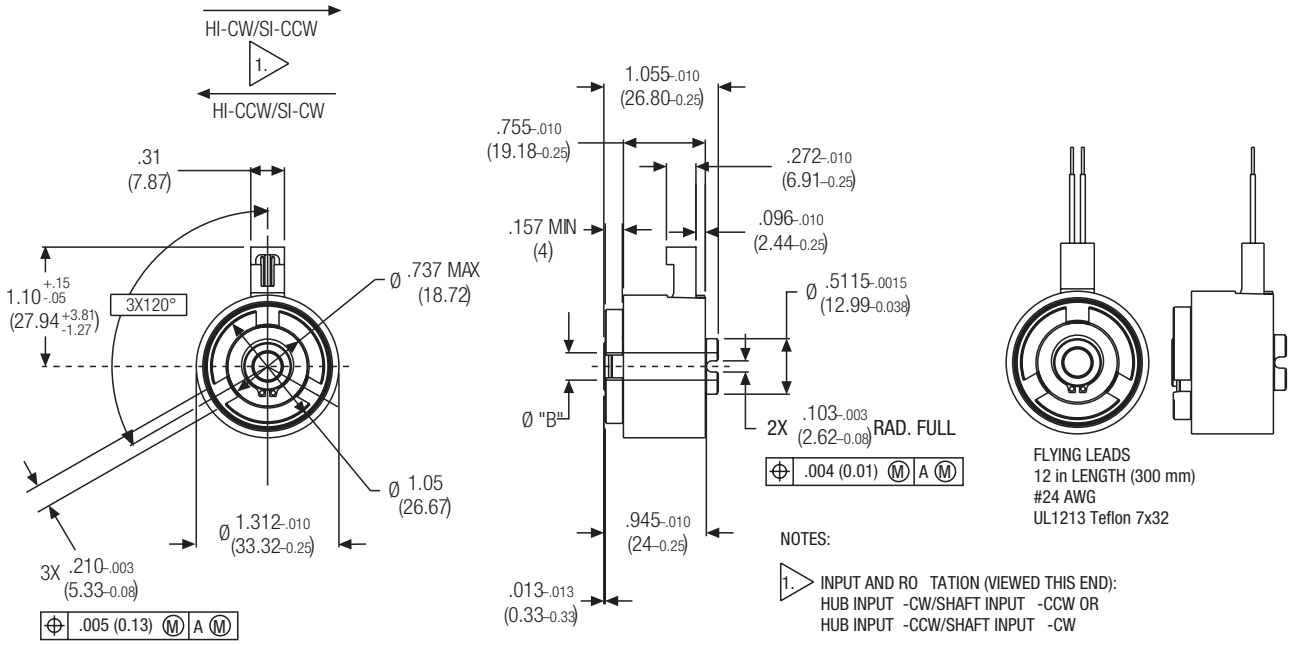
Bore Size
1/4"
5/16"
6mm
8mm

Drive Type
P = Pin
D = "D" Bore

OPTIONS
3-Dog Drive Adapter
Flexible Coupling

DL-33 Clutch

Dimensions & Specifications



NOTES:

1. INPUT AND RO TATION (VIEWED THIS END):
HUB INPUT -CW/SHAFT INPUT -CCW OR
HUB INPUT -CCW/SHAFT INPUT -CW

RECOMMENDED MA TING CONNECTORS:
TERMINAL - POLARIZED LA TCHING
CRIMP ON CONT ACTS
HOUSING: AMP NO 104257-1
CONT ACTS:
LOOSE: AMP NO 1-530151-0
STRIP: AMP NO 530151-9
ALTERNA TE TERMINAL-
INSUL. DISPLACEMENT CONT ACTS
ASSEMBL Y - AMP NO 103956-1
ASSEMBL Y - MOLEX NO 70400-0141

Dimensions (mm)
For more information see page 73.

PERFORMANCE	
Static torque	30 lbs.-in. (3.4 Nm)
Inertia, rotating parts	0.016 lbs.-in.^{2}
Maximum operating speed	1,200 RPM
Temperature	32°-140° F (0-60° C)
Cycle Life	1 x 106 @ 30 lbs.-in. Total Load
Weight	0.22 lbs.

ELECTRICAL DATA			
Voltage*	**Current (amps)**	**Resistance (ohms ±10%)**	**Status**
24 DC	0.130	185.0	Standard
12 DC	0.267	45.0	Standard
90 DC	0.034	2670.0	Standard

** Custom voltages available.*

(Coils are rated for continuous duty; 3.5 watts nominal.)

Molded connector or 12" flying leads.

Bore Data	
Bore Sizes	**Bore B Ø**
1/4 inch	0.2505-0.2530 (6.362-6.427)
5/16 inch	0.3130-0.3181 (7.950-8.090)
Metric Bores	
6 mm	0.237-0.239 (6.01-6.09)
8 mm	0.315-0.318 (8.01-8.09)

Cross Pin or Standard "D" Bores available, consult factory.

MAC Series Clutch

High-Performance Clutches at a Low Cost

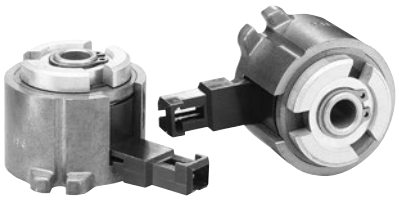
Years of experience in developing magnetically actuated clutches for paper transport drives are all wrapped up in the MAC 30 & 45. These units meet the highest industry performance standards at an outstanding price, using state-of-the-art engineering, materials and processes.

Features

- Wrap spring technology allows for fast response to bring loads up to speed within 50 ms (less depending on RPM)
- Exceeds industry life requirements with little cycle-to-cycle variation
- Enclosed construction effectively eliminates contaminants
- Electrical actuation for simple control interface
- Drag- and friction-free operation results in less wear
- Unidirectional input
- Output freewheels when disengaged
- RoHS compliant

Design Advantages

- Optional connector head plugs directly into wire harnesses
- Eliminate the need to custom fit lead lengths with connector head
- No leads to get tangled or damaged with connector head
- Rapid engagement time
- High torque-to-size ratio
- Simple construction – only three main assemblies
- High performance at low cost



Typical Applications

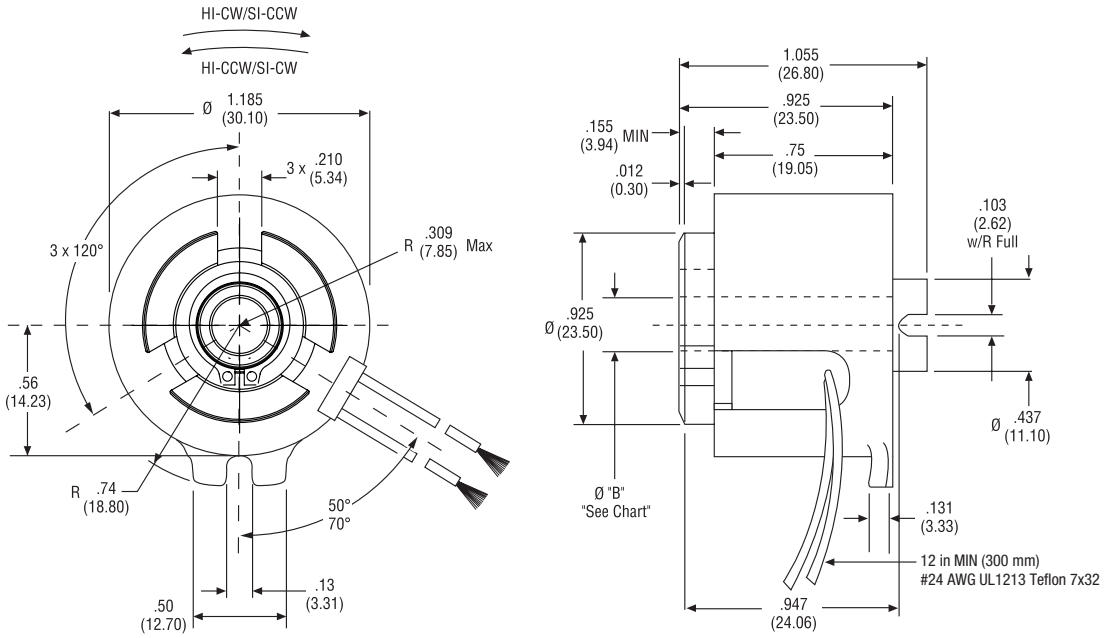
- Paper transport drives
- Forms handling equipment
- Sheet feeders
- Conveyors
- Film processing machines
- Copiers
- Printers
- Collators

PERFORMANCE		
	MAC-30	MAC-45
Static torque	25 lbs.-in. (2.83 Nm)	150 lbs.-in. (16 Nm)
Maximum radial bearing load	15 lbs.	30 lbs.
Maximum operating speed	1,200 RPM	1,000 RPM
Response time, voltage on at full speed	50 MS Max. 20 MS Nom.	150 MS Max. 40 MS Nom.
Input configuration	Hub input or shaft input	
Bearing	Reinforced polyetherimide with internal lubricant	
Weight	0.22 lbs.	1.00 lbs.

For more information see page 73.

MAC-30 Clutch

Dimensions & Specifications



Dimensions (mm)
For more information see page 73.

Bore Data	
Bore B	**Status**
0.2505-0.2530 (6.362-6.427)	Standard
0.3130-0.3155 (7.950-8.014)	Optional
Metric Bores	
0.2366-0.2394 (6.009-6.081)	Standard
0.3153-0.3190 (8.008-8.103)	Standard

OPTIONS
Lug Drive Adapter
Connector Head
Consult Factory

ELECTRICAL DATA			
MAC-30			
Voltage	**Current (amps)**	**Resistance (ohms)**	**Status**
24 DC	0.110	227 ±21	Standard

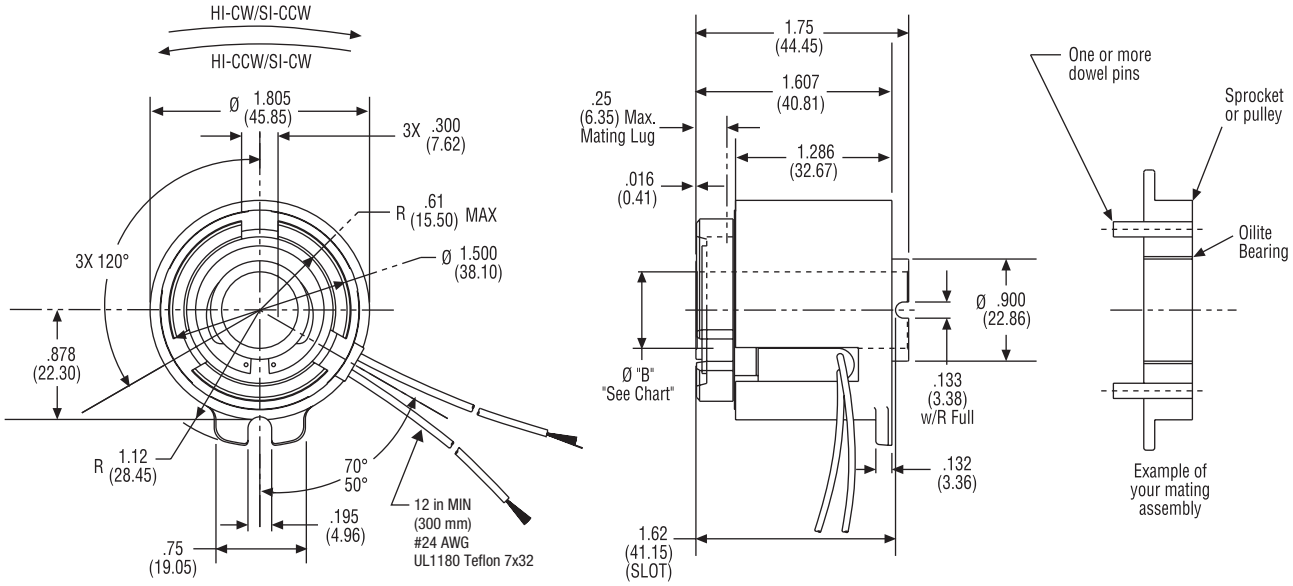
Leads: 12.0 inches (300 mm) long standard.
Ends stripped: .19/.31 inches (4.9/7.8 mm) (Optional: terminated with a connector of your choice.)

MAC-30 with Connector Head			
Voltage	**Current (amps)**	**Resistance (ohms)**	**Status**
24 DC	0.110	227	Standard
12 DC	0.243	49	Modification
90 DC	–	–	Available

Termination: 2 x .023 - .027 x .24 (0.58 - 0.69 x (6.09) square pin, pre-tinned alloy.
(Molex #08-52-0601)
Leadsets: Teflon insulated lead wires per UL1213 are available to suit any wire harness.

MAC-45 Clutch

Dimensions & Specifications



Dimensions (mm)
For more information see page 73.

Bore Data	
Bore B	**Status**
0.3755-0.3780 (9.537-9.602)	Optional
0.5010-0.5035 (12.725-12.789)	Optional
0.6260-0.6295 (15.900-15.990)	Standard
Metric Bores	
0.3941-0.3968 (10.010-10.079)	Optional
0.4729-0.4755 (12.011-12.078)	Optional
0.5516-0.5555 (14.010-14.110)	Optional
0.6304-0.6346 (16.012-16.119)	Optional

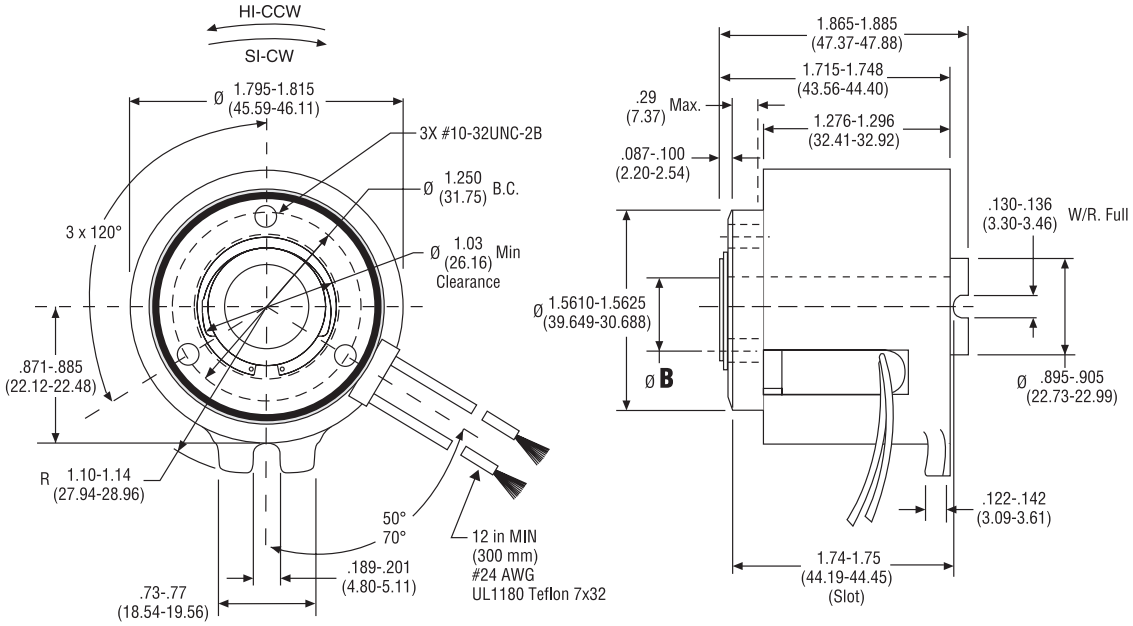
PERFORMANCE
Bolt Circle Attachment
Ball Bearing Design
Lug Drive Adapter
Integral Connector Block (future option)
Consult factory

ELECTRICAL DATA			
Voltage	**Current (amps)**	**Resistance (ohms +/-10%)**	**Status**
24 DC	0.257	93	Standard
12 DC	0.526	23	Modification
90 DC	0.054	1680	Modification

Leads: 12.0 in. (300 mm) long standard.
Ends stripped: 0.19/0.31 in. (4.9/7.8 mm)
(Optional: terminated with a connector of your choice.)

MAC-45 Clutch (with Bolt Circle Attachment)

Dimensions & Specifications



Dimensions (mm)
For more information see page 73.

Bore Data	
Bore B	**Status**
0.3755-0.3780 (9.537-9.602)	Optional
0.5010-0.5035 (12.725-12.789)	Optional
0.6260-0.6295 (15.900-15.990)	Standard
Metric Bores	
0.3941-0.3968 (10.010-10.079)	Optional
0.4729-0.4755 (12.011-12.078)	Optional
0.5516-0.5555 (14.010-14.110)	Optional
0.6304-0.6346 (16.012-16.119)	Optional

PERFORMANCE
Ball Bearing Design
Lug Drive Adapter
Integral Connector Block (future option)
Consult factory

ELECTRICAL DATA			
Voltage	**Current (amps)**	**Resistance (ohms +/-10%)**	**Status**
24 DC	0.257	93	Standard
12 DC	0.526	23	Modification
90 DC	0.054	1680	Modification

Leads: 12.0 in. (300 mm) long standard.
Ends stripped: 0.19/0.31 in. (4.9/7.8 mm)
(Optional: terminated with a connector of your choice.)

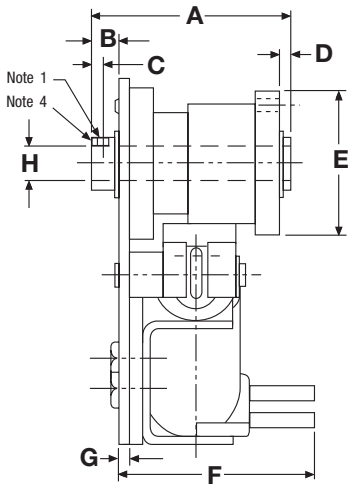
SP-2, 4, 5 Clutch

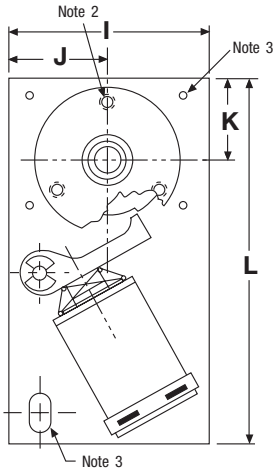
Dimensions & Specifications

Designed specifically for computer peripheral and business machine applications, these clutches and brakes are suitable for indexing, rapid cycling and positive displacement clutching drives.

Features

- Low cost
- Trouble-free design for long life
- Complete package for immediate installation
- High torque
- Standard hub input; shaft input special
- RoHS compliant





Notes

1. Output connection
   SP-2: .062 dia. hole
   SP-4: .125 dia. hole
   SP-5: .125 dia hole
2. Tapped holes on input hub:
   SP-2: 3 holes, #6-32 on .938 B.C.
   SP-4: 3 holes, #6-32 on .938 B.C.
   SP-5: 3 holes, #10-32 on 1.250 B.C.
3. Mounting holes:
   SP-2: .187 x .312 slot
   SP-4: 4 holes, .187 dia. on 2.125 B.C.
   SP-5: 4 holes, .187 dia. on 3.125 B.C.

Options

- Anti-overrun
- Anti-back (HI only)
- Overtravel stop

Typical Applications

- Paper drives
- Card readers and sorters
- Copying machines
- Ribbon drives
- Material handling conveyors

Dimensions (mm)

DIMENSIONS (mm)												
Model	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**
SP-2	1.670	0.250	0.125	0.080	1.188 1.187	1.620	0.090	0.2515 0.2505	1.620	0.810	0.690	3.00
SP-4	2.000	0.430	0.160	0.080	1.250 1.249	1.910	0.090	0.376 0.378	2.380	1.190	1.00	4.10
SP-5	2.375	0.340	0.150	0.090	1.5625 1.5615	2.180	0.090	0.5015 0.5005	2.620	1.310	1.310	4.56

PERFORMANCE				
		SP-2	**SP-4**	**SP-5**
Static torque	**lbs.-in. (Nm)**	25 (2.825)	120 (13.56)	250 (28.25)
Maximum anti-overrun holding capability	**lbs.-in. (Nm)**	10 (1.13)	25 (2.825)	60 (6.78)
Inertia, rotating parts	**lbs.-in.²**	0.0086	0.0522	0.09774
Maximum radial bearing load at maximum speed	**lbs.**	7.5	13	31
Maximum operating speed	**RPM**	1500	1200	750
Response time, voltage on at full speed	**MS**	25	30	30
Optional – Anti-overrun operation				
Weight	**lb**	0.55	0.88	1.32

Note: By adding an optional over travel stop (OTS), the braking torque is increased from 10% to 20% of the rated clutch torque.

ELECTRICAL DATA				
Voltage	**Current (amps)**	**Current (amps)**	**Resistance (ohms)**	**Resistance (ohms)**
	SP-2	SP-4, SP-5	SP-2	SP-4, SP-5
115 AC 60 Hz	0.104	0.103	825	280
24 DC	0.230	0.325	104	74.0
12 DC*	0.460	0.732	26	16.4
90 DC*	0.059	0.096	1510	936

** Modifications*

SP-6 Clutch

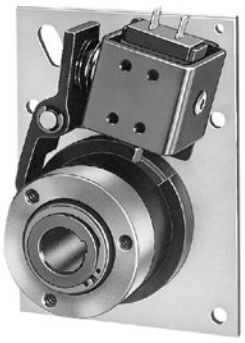
INDEX

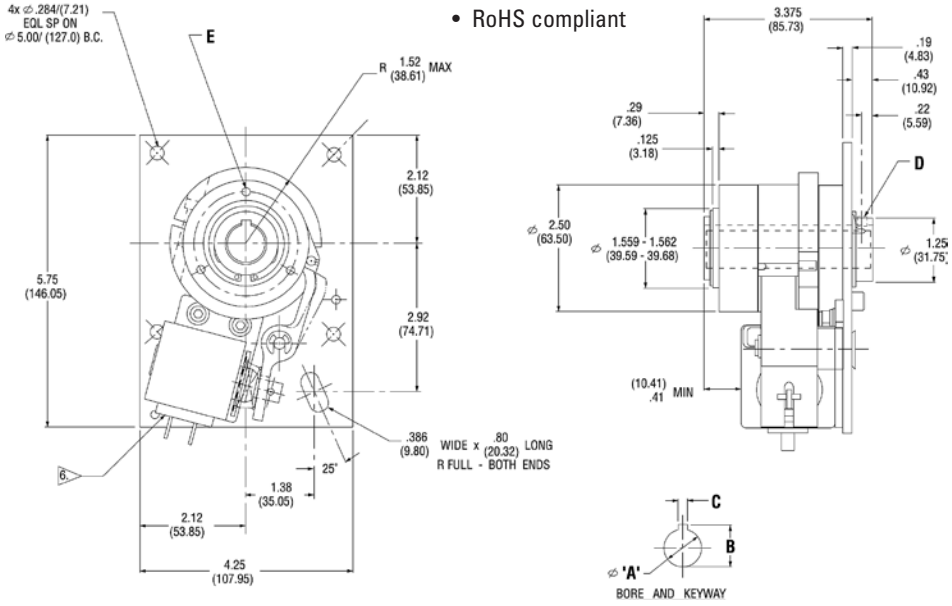
Dimensions & Specifications

Designed specifically for computer peripheral and business machine applications, these clutches and brakes are suitable for indexing, rapid cycling and positive displacement clutching drives.

Features

- Low cost
- Trouble-free design for long life
- Complete package for immediate installation
- High torque
- Standard hub input; Shaft input special
- RoHS compliant





Options

- Anti-overrun
- Anti-back (HI only)
- Overtravel stop

Typical Applications

- Paper drives
- Card readers and sorters
- Copying machines
- Ribbon drives
- Material handling conveyors

Dimensions (mm)

Bore & Keyway Data				
Bore A	**Keyway Width B**	**Keyway Depth C**	**Set Screws D**	**Mounting Holes E**
0.7505-0.7525 (19.062-19.114)	0.1885-0.1905 (4.787-4.839)	0.837-0.842 (21.25-21.39)	#10-32 UNC-2B x0.19 Lg. Hex Skt. Set Screw	3x #1/4-20 UNC-2B 0.48 MIN DP 2.062 BC
1.0005-1.0025 (25.412-25.464)	—	—	0.187-0.192 Hole (4.74-4.88)	3x #1/4-20 UNC-2B 0.48 MIN DP 2.062 BC
METRIC BORES				
0.7874-0.7894 (20.0 H9)	0.2356-0.2368 (5.985-6.015)	0.8976-0.9015 (22.800-22.900)	M5 x 0.8 x 5.0 Lg. Hex Skt. Set Screw	3x M6 x 1.0 holes on 52.38 BC
0.9842-0.9862 (25.0 H9)	—	—	4.87-5.14 Hole (0.191-0.203)	3x M6 x 1.0 holes on 52.38 BC

PERFORMANCE	
Static torque	500 lbs.-in. (56.5 Nm)
Maximum anti-overrun holding capability	300 lbs.-in. (33.9 Nm)
Inertia, rotating parts	2.0 lbs.-in.^{2}
Maximum radial bearing load at maximum speed	63 lbs.
Maximum operating speed	500 RPM
Response time, voltage on at full speed	60 MS
Optional – Anti-overrun operation	Hub input or Shaft input
Weight	5.29 lbs.

Note: By adding an optional over travel stop (OTS), the braking torque is increased from 10% to 20% of the rated clutch torque.

ELECTRICAL DATA		
Voltage	**Current (amps)**	**Resistance (ohms)**
115 AC 60 Hz	0.334	57.5
24 DC	0.586	41.0
12 DC*	1.150	10.4
90 DC*	0.151	598

** Modifications*

BDNB Series Clutch

HOLD

Bi-Directional, No-Back Design Clutches

The Bi-Directional No-Back offers an extraordinary combination of functions at low cost. The basic function of this unit may be easily adapted to a large range of applications requiring automatic position holding with rotary driven capability.

The BDNB can be turned only when torque is applied to the input shaft. The input shaft may be driven in either direction with torque being transmitted directly to the output shaft.

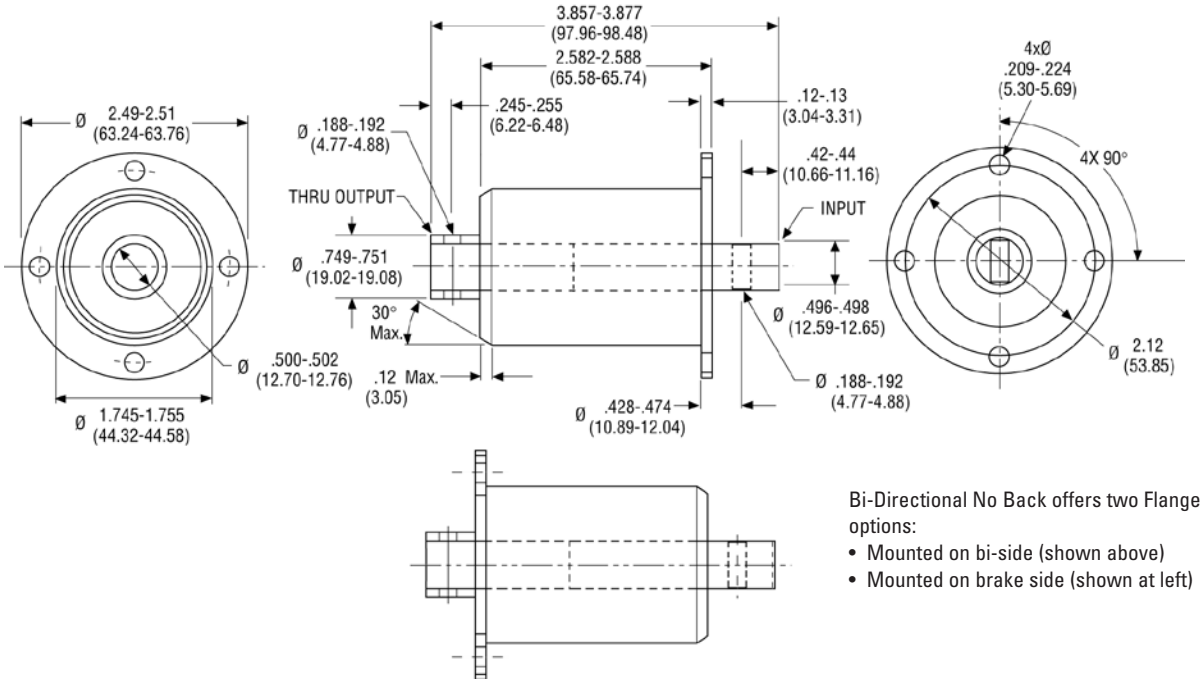
When there is no torque on the input, the output shaft is "locked" and cannot be rotated in either direction. Any torque applied to the output shaft is transmitted directly to the clutch body, and will not be reflected to the input.

Features

- Input operates in CW and CCW direction; output will hold loads within specified torque ranges
- Modifications and special design variations available
- Maximum operating speed 200 RPM
- Flange can be oriented on the bi-side or the brake side, depending on the application
- RoHS compliant

Typical Applications

- Tank turret drives
- Boat or aircraft trim tabs
- Robotics
- Rudderlocks
- Hoists
- Manlifts
- Actuator holdbacks



Bi-Directional No Back offers two Flange options:

- Mounted on bi-side (shown above)
- Mounted on brake side (shown at left)

Dimensions (mm)

PERFORMANCE	
Torque ratings	250 lbs.-in. (28.23)
Clutch holding torque, both directions	250 lbs.-in. (28.23)
Output to housing lost motion	6°†
Input to output lost motion	25°
Maximum additional input torque	10*
Weight	2 lbs.

† *Angular movement is determined with 25 lbs.-in. of torque applied to output.*
* *Or less than 1.15 times the output shaft load, whichever is greater.*

Application Engineering - Selection Considerations

Inertia and Torque Values

Application Analysis

1. Function
The process for establishing the clutch or brake function is illustrated in Step 1 on page 12. In review, the three functions and the appropriate series selections are noted below.

Overrunning
Unidirectional torque transmission with free wheeling in opposite direction.

Selection
PSI (Model 0)

Start - Coast To Stop
Engage/disengage with random stop position.

Selection
SAC (Model SS)
PSI (Model SS)

Single Revolution
Accurate stop position in single or fraction revolution cycles.

Selection
CB Model S SAC Model S
PSI Model S

2. Calculate load inertia (WR^2)
Use the inertia chart on page 71 to determine the inertia of the application components. To determine WR^2 of a given shaft or disc, multiply the WR^2 from the chart by the length of shaft or thickness of disc in inches. **Note:** For hollow shafts, subtract WR^2 of the I.D. from the WR^2 of the O.D. and multiply by length.

In order to calculate the inertias of components which are made of material other than steel, use the multipliers found in the conversion chart (right) to establish the inertias of these components.

Inertia Conversion Chart

In order to determine the inertia of a rotating member (shaft, disc, etc.) of a material other than steel, multiply the inertia of the appropriate steel diameter from the chart on page 71 by:

Material	Multiplier
Bronze	1.05
Steel	1.00
Iron	.92
Powdered Metal Bronze	.79
Powdered Metal Iron	.88
Aluminum	.35
Nylon	.17

3. Determine clutch or brake torque value
With the inertia value calculated in Step 2, determine the torque requirement for the function determined in Step 1.

A) For Overrunning and Start-Stop (random start-stop) (SAC and PSI Models SS and O)

$$T = \frac{WR^2 \times RPM}{3700 \times t} + \text{friction torque}^*$$

Where—
T = Torque required from wrap spring
WR^2 = load inertia (Step 2)
RPM = shaft speed at clutch location
t = time to engagement (.003 for clutch)

B) For single revolution applications (CB, SAC and PSI Models S)

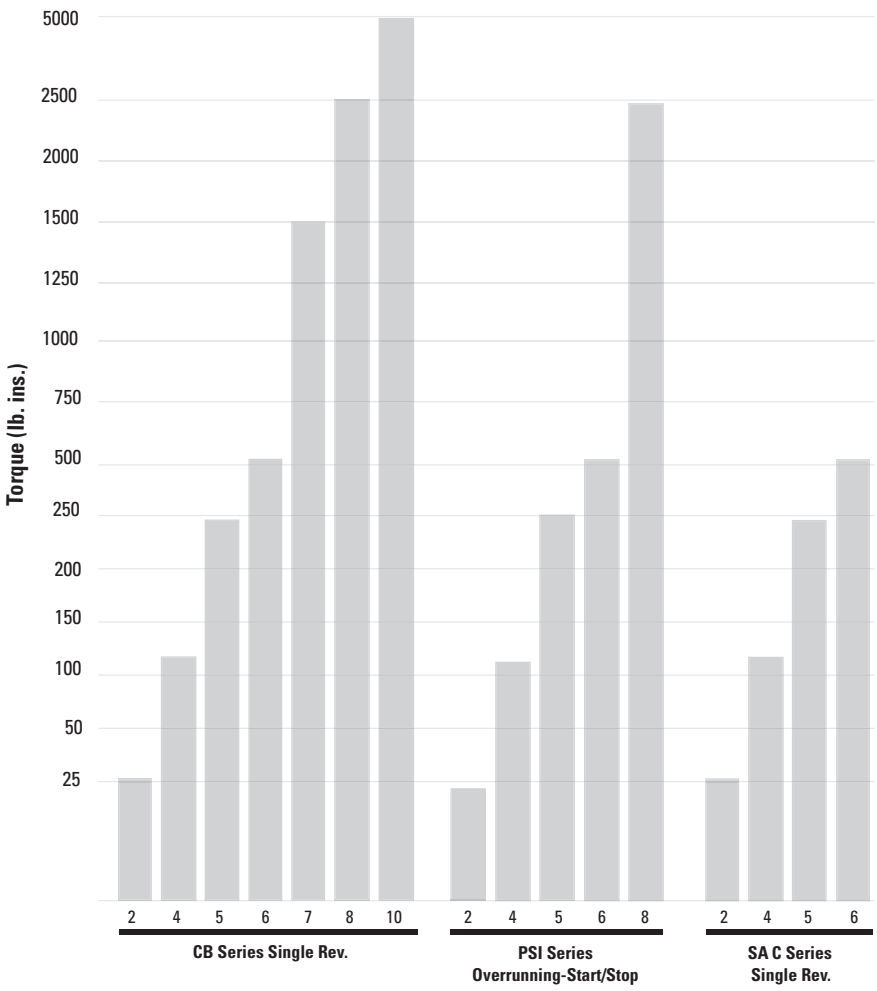
$$T = \frac{WR^2 \times RPM}{3700 \times t} - \text{friction torque}^*$$

Where—
T = torque required from wrap spring
WR^2 = Load inertia (Step 2)
RPM = Shaft speed at clutch or brake location
t = time to disengagement (.0015 for brake)

Find the value of T on the Torque vs. Model Comparison Chart below.

** Frictional (drag) torque is the torque necessary to overcome static friction. It may be measured by a spring-scale or by dead-weights, applied to a known moment arm so gradually as to make inertia negligible. It is that torque found just sufficient to induce motion.*

Torque vs. Model Comparison



Selection Considerations Cont.

Inertia and Torque Values

4. Verify selection with unit inertia

From the individual product specifications, find the unit inertia of the model selected in Step 3. Add this to the load inertia previously determined to arrive at the total torque requirement.

A) For Overrunning and On-Off (PSI Models SS and O)

$$A)\ T_t = \frac{(WR^2_{LOAD} + WR^2_{UNIT})RPM}{3700 \times t} + \text{friction torque}$$

B) For Single Revolution Start-Stop (CB, SAC-S and PSI Models S)

$$A)\ T_t = \frac{(WR^2_{LOAD} + WR^2_{UNIT})RPM}{3700 \times t} - \text{friction torque}$$

Where–T_t = total system torque
(WR^2_{LOAD}) = load inertia
(WR^2_{UNIT}) = clutch inertia

Find this torque value on the Torque vs. Model Comparison Chart on page 70 to verify the model selected in Step 3.

Minimum Load Inertia— Super CB and CB Clutch/Brakes

In order to achieve the CB accuracy capability of ±1/2°, a minimum load inertia is required to fully engage the brake spring and disengage the clutch spring. This minimum inertia (I) can be calculated from the accompanying formula and chart:

$$I = \frac{(t)\ (T_c + T_o)\ (3700)}{RPM} - I_c$$

I = Minimum inertia required to fully activate the clutch/brake—lb-in^2
t = Time—Seconds
T_c = Torque required to fully activate the clutch/brake—lb-in
T_o = Drag torque—lb-in

RPM = Revolutions per minute

I_c = Inertia at the output side of the clutch—lb-in^2

EXAMPLE:

CB-6 in a system running at 200 RPM with 3/4" bore and 20 lb-in drag. What inertia is required to fully activate the clutch/brake?

$$I = \frac{(0.005)\ (8.75 + 20)\ (3700)}{(200)} - 1.221 = 1.438 \text{ lb-in}^2$$

NOTE: When calculated inertia is zero or negative, no further action is required. If the calculation result is positive, additional inertia equal to or exceeding the result should be added.

INERTIA OF STEEL SHAFTING (Per Inch of Length or Thickness)					
Dia. (in.)	WR² (lbs.-in.²)	Dia. (in.)	WR² (lbs.-in.²)	Dia. (in.)	WR² (lbs.-in.²)
1/4	.00011	7	66.816	13	803.52
3/8	.00055	7 1/4	77.04	13 1/4	858.24
1/2	.00173	7 1/2	87.984	13 1/2	924.48
3/4	.00864	7 3/4	100.656	13 3/4	995.04
1	.0288	8	113.904	14	1068.48
1 1/4	.072	8 1/4	128.88	14 1/4	1147.68
1 1/2	.144	8 1/2	144	14 1/2	1229.75
1 3/4	.288	8 3/4	162.72	14 3/4	1317.6
2	.432	9	182.88	15	1404
2 1/4	.72	9 1/4	203.04	16	1815.84
2 1/2	1.152	9 1/2	223.2	17	2314.08
2 3/4	1.584	9 3/4	252	18	2910.24
3	2.304	10	277.92	19	3611.52
3 1/2	4.176	10 1/4	306.72	20	4433.76
3 3/4	5.472	10 1/2	338.4	21	5389.92
4	7.056	10 3/4	371.52	22	6492.96
4 1/4	9.072	11	407.52	23	7757.28
4 1/2	11.376	11 1/4	444.96	24	9195.84
5	17.28	11 1/2	486.72	25	10827.36
5 1/2	25.488	11 3/4	529.92	26	12666.24
6	36	12	576	27	14731.2
6 1/4	42.624	12 1/4	626.4	28	17036.64
6 1/2	49.68	12 1/2	679.68	29	19604.16
6 3/4	57.888	12 3/4	735.84	30	22452.48

TORQUE & INERTIA VALUES			
Model	T_c	t	I_c
CB-2	1.65	0.003	0.0116
CB-4	6.60	0.004	0.0450
CB-5	6.88	0.004	0.1663
CB-6	8.75	0.005	1.221 (0.75 in. bore) 1.138 (1.0 in. bore)
CB-7	17.0	0.005	9.43 (0.75 in. bore) 7.72 (1.0 in. bore) 6.70 (1.25 in. bore) 6.55 (1.50 in. bore)
CB-8	20.0	0.005	9.32 (1.0 in. bore)
			8.15 (1.5 in. bore)
CB-10	50.0	0.006	30 (1.5 in. bore)

How to determine maximum inertia load of CBs

$$\frac{T \times 3700 \times t}{RPM} = WR^2$$

T = Clutch Torque
t = .0015

To obtain this information for materials other than steel, multiply the inertia of the proper steel diameter from the above chart using the correct multiplier in the chart at right.

Reflected inertia can now be calculated as $I_R = I_L(\omega_l/\omega_c)^2$, where ω_L = load RPM and ω_c = clutch input RPM.

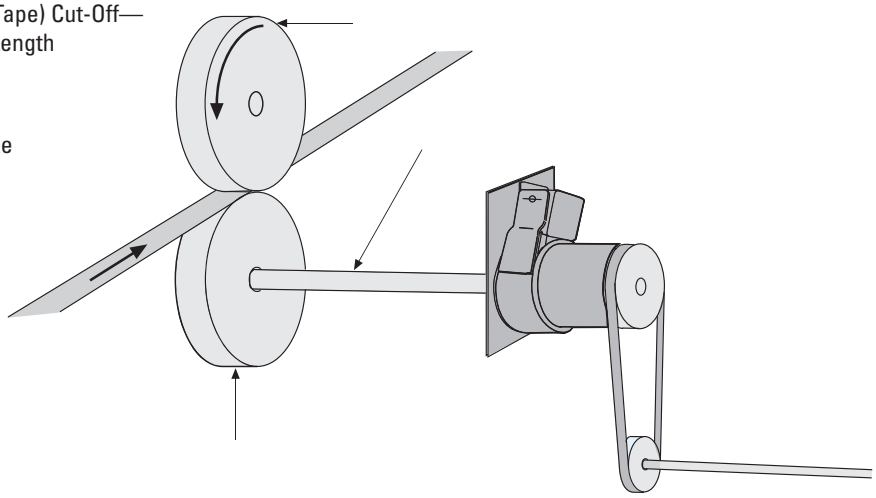
Material	Multiplier
Bronze	1.05
Steel	1.00
Iron	0.92
Powder Metal Bronze	0.79
Powder Metal Iron	0.88
Aluminum	0.35
Nylon	0.17

Selection Considerations Cont.

Example

Nip Feed for Ribbon (Tape) Cut-Off—
Indexes 180° for 5½" Length

Determine Correct Size
Clutch/Brake



Nip Feed for Ribbon (Tape) Cut-Off—
Indexes 180° for 5½" Lengths

1. Determine function: Application requires accurate 180° start and stop positioning, therefore a CB or PSI Model S is chosen.

2. Calculate Load Inertia (WR^2)
   WR^2 NIPS (2) = 4.176 lbs.-in.^{2} each
   (ref. inertia chart, pg. 71)
   x 2 = 8.352 lbs.-in.^{2}

WR^2_{SHAFT} = .0288 x 6 = .1728 lbs.-in.^{2}

WR^2_{LOAD} = 8.5248 lbs.-in.^{2}
TOTAL

3. Apply results to Step 3 formulas to determine torque required for start/stop.

   T = 8.5248 x 200/5.55 – 20 = 287.2 lbs.-in.

   Estimate friction torque
   (about 20 lbs.-in. for this example).

   Make initial unit selection from Torque vs. Model Comparison Chart (pg. 70) based on load torque requirements:

   i.e., 287.2 in.lbs. Size CB-6

4. After making initial unit selection, add unit inertia (ref. Torque and Inertia Values, pg. 71) to load inertia (rotating components).

i.e.: 8.525 lbs.-in.^{2} (Load WR^2)
+1.718 lbs.-in.^{2}*
10.268 lbs.-in.^{2} (Total System WR^2)

Double-check size by computing new data with torque formula.

** (CB-6 WR2 — Pg. 71)*

$$T = \frac{WR^2 \times RPM}{5.55 \text{ (for brake)}}$$

$$T = \frac{10.268 \times 200}{5.55} = 370 \text{ lbs.-in.}$$

CB-6 is correct size.

Note: All calculations shown assume zero compliance in driven, as well as driving, components. Compliance in the system reduces the torque required to accelerate the total inertial load to full RPM.

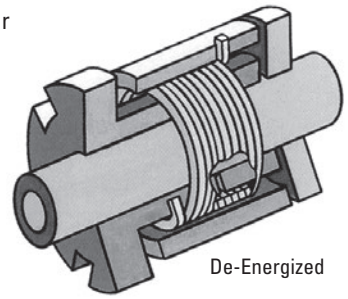
Magnetically Actuated Clutch Operation Principles & Performance

DL & MAC Series

Clutch Operation

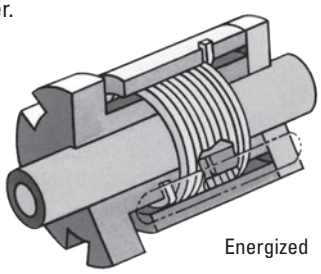
The inside diameter of the spring is larger than the outside diameter of the shaft hub. One end of the spring (control tang) is fastened to the control collar (or armature). When the coil is de-energized, the hubs rotate independently of each other. The free hub (affixed to the spring), the spring and the collar rotate as a unit. The opposing shaft hub is not fastened to the spring and rotates as another unit. The coil housing is stationary and piloted on the shaft bearing. A ground pin placed in the retaining tab secures the coil housing from rotating.

De-Energized



De-Energized

When the coil is energized, the control collar is pulled and held against the shaft flange. The momentary relative motion between spring and hubs "wraps" the spring, coupling the two hubs positively. All torque is transmitted through the wrapped spring. Magnetic force is only necessary to maintain a tight spring grip for total torque transfer.



Energized

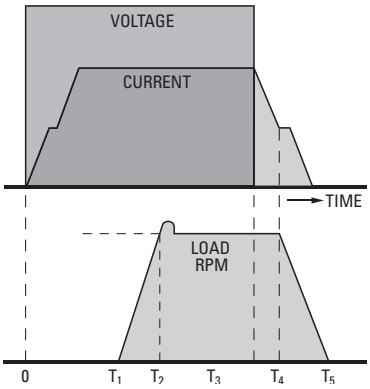
Operational Performance

The time-to-speed of the DL and MAC Series clutches is defined as the time required to accelerate the load to 100% of the input speed from the initial voltage pulse. The spring wrap down time is the only portion dependent on the input speed. Variation in time-to-speed is caused by:

1. Clutch to Clutch — statistical variation due to piece part tolerance
2. Cycle to Cycle — comprised of speed, voltage and temperature changes
3. Lifetime — enlargement of the normal band due to component wear.

If dictated by the application, cycle-to-cycle variation can be minimized by careful selection of system hardware and software. Statistical variation may also be reduced through tighter part tolerance but would result in a higher cost.

Performance Profile



Current and speed response profile

T_1 = Time to engage (TTE) (Electrical build up and collar movement and spring wrap time).

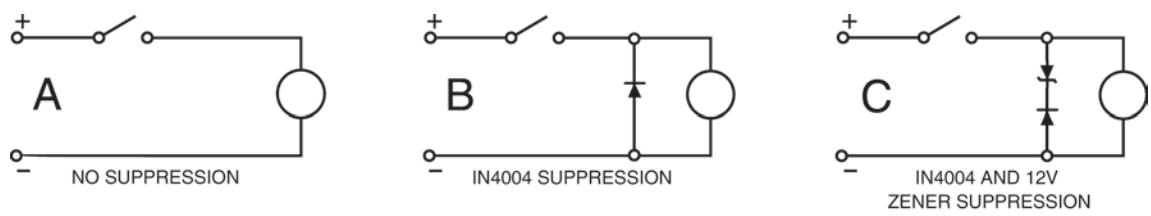
T_2 = Time to speed (TTS).

T_3 - T_4 = Armature disengagement time (ADT).

T_5 - T_3 = Time to zero (TTZ) (Load and speed dependent).

Characteristics of Disengagement

Control collar release time (ADT) is affected somewhat by speed, load and the above three variables. The electrical circuit, however, has a major impact on the MAC-45's disengagement performance. Voltage transients and bleed down time should be minimized. The optimum suppression network for an application using the MAC-45 is represented by circuit C, which incorporates a 1N4004 series diode and a zener diode with two times the coil voltage. Omitting the zener (circuit B) would result in a less expensive circuit but at the expense of minor decrease in performance. Circuit A represents the quickest disengagement time but provides no protection for voltage transients.



Questions & Answers

Relating to Standard Genuine Wrap Spring Products

1. **Question:** What changes are necessary to convert a CB series clutch from CW to CCW and vice versa?

   Answer: For all CB units, the following parts must be changed; the drive spring, brake spring, anti-overrun spring, anti-back spring and plate subassembly. The cams must also be reversed. Additional requirements: on CB-5, -6 and -8 units, the actuator subassembly must be changed. On CB-6, -8 and -10 (DC only) the coil subassembly must be changed. On CB-10 (AC only), the coil subassembly would require a new coil kit. All other components can be reused. The differential must also be reset after the unit has been reassembled.

2. **Question:** How is the spring differential set on a CB Series clutch? Why is this important?

   Answer: This setting is important because it establishes the relationship of the clutch spring to the brake spring. If the setting is incorrect, the unit may fail due to excessive wear or may not operate at all. The differential setting has been preset by the factory for "out-of-the-box" CB Series clutches. See page 76 for a detailed explanation of spring differential adjustment.

3. **Question:** Can the input or output of a CB Series clutch/brake be reversed?

   Answer: The standard CB Series clutch, which includes the anti-overrun clutch feature, cannot readily be reversed. However, if input reversal is required, please contact your local Warner Electric™ representative for additional information.

   One of the standard features of the CB Series clutch/brake is the anti-back spring. While this spring is required to achieve stopping accuracy, it also prevents the output from being reversed. Therefore, like the input of a standard CB Series clutch/brake (incorporating the AO feature), the output cannot and should not be reversed.

4. **Question:** How often should a Warner Electric wrap spring clutch be lubricated?

   Answer: Under normal operating conditions, lubrication is not necessary because the bearing surface components are manufactured from oil-impregnated, powdered metal materials.

5. **Question:** Can a single-stop CB Series clutch readily be changed to a multiple-stop unit and vice versa?

   Answer: The serrated control of the CB collar design facilitates easy changeover to a multiple-stop collar. Please refer to the assembly/disassembly instructions for the appropriate CB model. See Stop Collars, page 57.

6. **Question:** Can the output of the CB Series clutch be adjusted after installation?

   Answer: Certainly. The serrated design of the control collar assembly allows repositioning the cam after the unit has been installed. See page 57.

7. **Question:** How is rotation determined?

   Answer: For the CB, SAC & SP Series, determine the proper rotation by viewing the unit from the input hub end. For sizes 2 through 6, the input hub has three holes, while sizes 8 and 10 input hubs each have six holes. For the PSI Series, determine the proper rotation by viewing the clutch from the input end. For HUB input units, look at the free hub when determining rotation. For SHAFT input units, look at the shaft hub when determining rotation. Also, see the appropriate pages of this catalog or contact your local Warner Electric representative.

8. **Question:** What is necessary to assure that a CB model wrap spring clutch/brake stops consistently and accurately?

   Answer: In most cases when a CB does not position accurately, there is insufficient inertia to fully wrap down the brake spring. This situation can easily be resolved by either adding mass to the output or increasing machine speed.

   Remember, the CB Series clutch is an RPM-inertia-sensitive device. The specified minimum inertia must be met for the CB Series clutch/brake to operate properly.

9. **Question:** What are the possible causes of CB Series clutch slippage?

   Answer: Any slippage in a CB is usually caused by an incorrect differential setting. See the adjustment and repair section of this catalog on page 76.

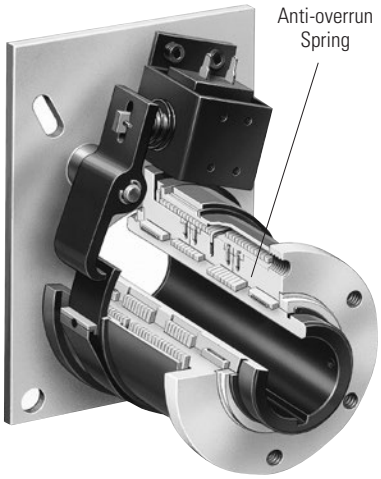
10. **Question:** What does the anti-overrun spring do?

    Answer: The anti-overrun spring feature prevents overhauling loads from over-running the input. The anti-overrun is an internal spring with an interference fit that slips in one direction but transmits torque in the other.

11. **Question:** Can the anti-overrun feature easily be incorporated into a non-anti-overrun CB Series clutch?

    Answer: This is easily accomplished on the CB-5, 6, 7 and 8 units, which only require a new input hub and anti-overrun spring. All other CB models must be completely disassembled to replace the output shaft assembly and input hub and add the anti-overrun spring.

    The "standard" CB Series clutch has the anti-overrun spring included. We recommend all CB Series clutches be purchased with the AO spring, if possible.



12. **Question:** How much torque can a Genuine Wrap Spring unit brake?

    Answer: The PSI, SAC & SP model S units are capable of braking 10% of their static torque rating. By incorporating the over-travel stop feature into the PSI and SP series model S units, brake torque increases to 20% of static torque rating.

    In general, the CB Series clutch is capable of stopping 50% of the unit's static torque rating.

Questions & Answers Cont.

Relating to Standard Genuine Wrap Spring Products

13. Question: What should be checked when a CB Series unit doesn't actuate on each revolution?

Answer:

a) Check for coil input voltage.

b) Check actuator cam clearance. With the collar biased towards the actuator, there should be a .010" to .030" air gap between the bottom of the actuator and tip of the cam.

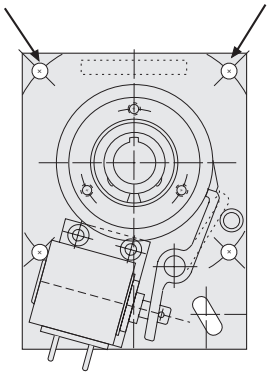
c) Check the setting. See Question 21 to reset or replace the solenoid.

14. Question: Can I use any coil with a one-shot power supply?

Answer: Yes, the one-shot power supply can be used with either AC or DC coils. However, when selecting a coil, remember that higher resistance results in slower response and conversely, lower resistance increases response speed.

15. Question: What is the purpose of the holes in the CB, SAC & SP Series plate assembly?

Answer: There are either three or four holes plus an anti-rotation slot on the CB, SAC & SP Series plate assemblies. These holes are intended for mounting convenience. These clutch/brake units are shaft mounted, so the plate should simply be restricted from rotating. These units must have some axial compliance to operate properly.



16. Question: How can coil voltage of a wrap spring clutch coil be determined?

Answer: Models CB-6, 7, 8 and 10 have voltage markings near the terminal tabs. CB-2, 4 and 5, as well as SAC models, show the voltage on the back of the coil bracket.

17. Question: What is the meaning of the numbers stamped on The Genuine Wrap Spring clutches?

Answer: Genuine Wrap Spring clutches are given an eight-digit number. This number translates into a description of your product. Example: 123-45-678

#1 identifies the product series.

#2 identifies whether the unit is domestic or metric.

#3 identifies the size of the unit.

#4 identifies hub input and rotation.

#5 identifies special features.

#6, #7, #8—this three-digit number is serial number assigned to identify specific features of each unit.

18. Question: Why doesn't a model CB-6 with 1" bore include a keyway?

Answer: There is not enough material in the shaft of a 1" bore CB-6 to accommodate a keyway. If a keyway is necessary for a specific application requiring a CB-6, the ¾" bore size should be chosen.

19. Question: How do I know if my clutch was made with the old style, one piece collar or the split cam design?

Answer: Currently, all new Genuine Wrap Spring Standard and Super CB-5, -6, -7, -8, and SAC-5, and SAC-6 units are manufactured with the split cam design. The easiest way to identify the split cam design is by looking at the pivot pin and actuator. If the unit is configured with the split cam design, there will be a small plastic spacer between the pivot pin and the actuator. The actuator will also have two slots for the plunger. The older design had no spacer, and there was only one slot for the plunger and actuator interface.

20. Question: How can I convert my existing one-piece collar to the split cam design?

Answer: To upgrade an older style (single-piece) collar to the split cam design, the sleeve must be replaced. (For CB-5, 6, 7 and 8 models only). The single-piece unit is replaced by a brake sleeve, coupling sleeve and a drive sleeve. In addition to changing the sleeve, the actuator must also be replaced. The position of the actuator on the cam is slightly different, and the new actuator compensates for this change. Refer to the appropriate pages of this catalog for replacement part numbers.

21. Question: How can the solenoid be reset or replaced?

Answer: The following instructions are to be used when resetting or replacing the solenoid.

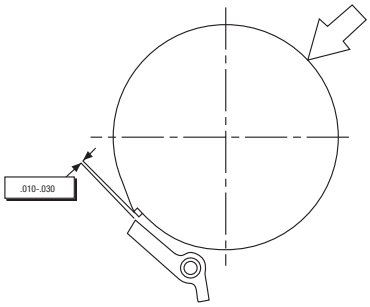
Collar-Actuator Clearance

1. Loosen the solenoid adapter plate such that the solenoid can be easily repositioned.
2. If the clutch is equipped with an actuator limit stop, loosen it and move it out of the way.
3. Energize the solenoid.
4. Align the cam face and actuator tip as shown in Figure 1.
5. Push the collar as indicated by the arrow in Figure 1 to take up the free collar play.
6. Check to ensure that the plunger is properly seated.
7. Using a shim between the actuator tip and cam face, set the collar actuator clearance between .010 and .030 by repositioning the solenoid assembly.
8. Tighten the solenoid adapter plate screws.
9. De-energize the solenoid and repeat steps 2 through 5.
10. Re-check the clearance.
11. If equipped with an actuator limit stop, re-energize the coil and set the limit stop as follows:

DC Coils –Set the limit stop so it just contacts the actuator.

AC Coils –Set the actuator-limit stop clearance of .005-.020 at the closest point.

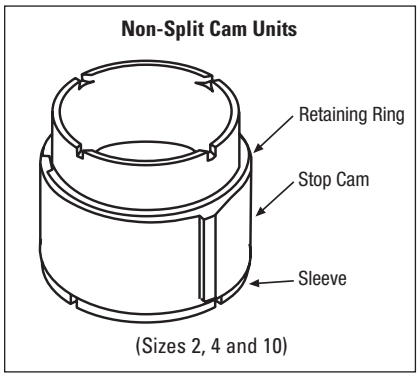
NOTE: It may not be possible to completely eliminate solenoid buzzing on AC solenoids.



CB Spring Differential Adjustments

Non-Split and Split Cam Units

All Super CB and all CB series clutch/brakes are factory preset to the proper spring differential overtravel. Should a component require replacement and the springs are affected, it is advisable to mark the two spring tang slots to ensure correct reassembly. If this is not possible, use the following procedure to reset the springs.



Spring Differential Adjustments for Non-Split Cam Units Super CB and CB Series (Sizes 2, 4 and 10 Only)

1. Remove the retaining ring from the input hub.
2. Rotate the clutch so the brake spring is fully wrapped down.

Note: Merely rotating the unit until the actuator hits the cam will not fully engage the brake spring. The output shaft must be rotated in the driving direction until the brake spring fully wraps down.

3. With the brake fully engaged (per step 2), pull the clutch spring out of its slot and allow it to jump to wherever it comes to rest.
4. The clutch spring should be between two slots. Unwrap the spring and push it back into the nearest slot.
5. Push the input hub back into place, release the actuator.
6. Rotate the clutch until the brake spring fully wraps down again.
7. With the brake fully engaged, hold the shaft with one hand and release the actuator.
8. The collar will jump forward as the brake is released and the clutch engages.

The amount of overtravel varies with the unit.

Model	Overtravel
CB-2	.09 to .19"
CB-4	.19 to .31"
CB-10	.62 to .75"

Note: Non-Split Cam design units

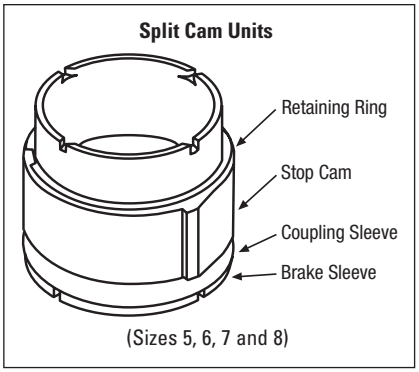
9. To obtain the overtravel, use a scale to measure the distance between the tip of the actuator and the tip of the cam. (See picture below)
10. If the overtravel is within specified limits, reinstall the retaining ring, the unit is set.
11. If the overtravel exceeds the specified amount, move the brake spring back one slot against the direction of rotation and repeat steps 2-9.
12. If the overtravel is less than the specified amount, move the brake spring forward one slot in the direction of rotation.

Note: If the unit is disassembled and the drive and/or brake springs do not need to be replaced, proceed as follows:

— Reposition the drive and brake springs to their original positions onto the output shaft assembly.

— Reassemble the clutch and position the spring tangs of the drive and brake springs in the factory marked locations on the control collar assembly (on the control collar, there are designated slots marked with a recessed punch mark).

— After the unit is completely assembled, the differential setting should be back to its original setting.



Spring Differential Adjustments For Split Cam Units (5, 6, 7, and 8)

To adjust the differential on split cam units (Sizes 5, 6, 7 and 8), use the following procedure:

1. Slide the retaining ring, stop cam and coupling towards the free hub (input), separating the two split sleeves.
2. Move the brake sleeve spline in the opposite direction of the drive to wrap down the brake spring.
3. Hold the brake spring sleeve spline in place and slide the coupling onto the splines to secure the two sleeves.
4. Slide the stop cam onto the splined section and re-insert the retaining ring into the groove.
5. Rotate the clutch until the brake spring fully wraps down again.
6. With the brake fully engaged, hold the shaft with one hand and release the actuator.
7. The collar will jump forward as the brake is released and the clutch engages.
8. To obtain the overtravel, use a scale to measure the distance between the tip of the actuator and the tip of the cam. (See picture at left)

If the overtravel is too small or large, repeat steps 1-8 above.

The amount of overtravel varies with the unit.

Model	Overtravel
CB-5	.15 to .25"
CB-6	.19 to .37"
CB-7	.37 to .50"
CB-8	.37 to .50"

Note: Split cam design units

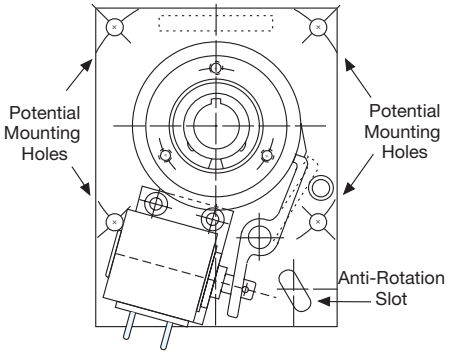
Mounting Requirements

Important Information and Horizontal Mounting

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.



Clockwise Rotation Shown

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-7/Super CB-7 = 300 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.

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.

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.

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.

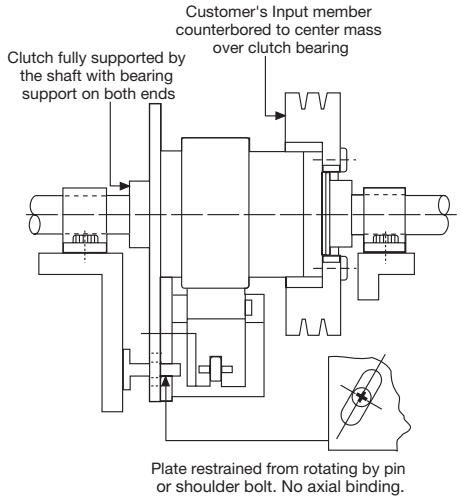


Figure 1

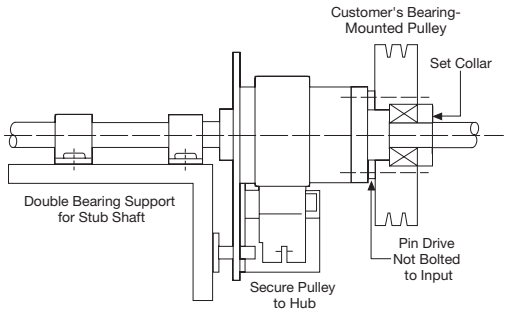


Figure 2

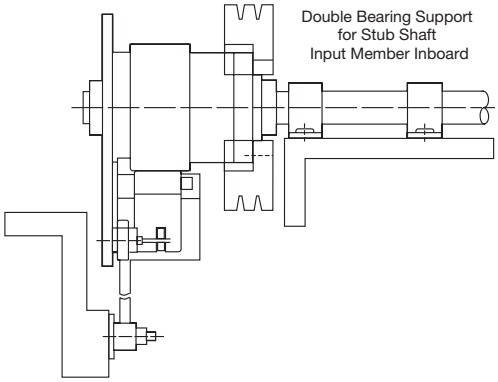


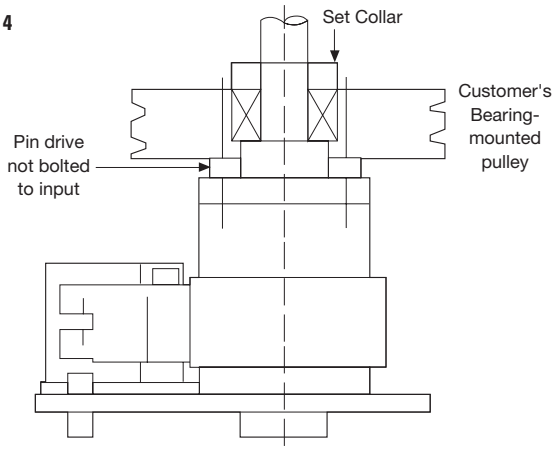
Figure 3

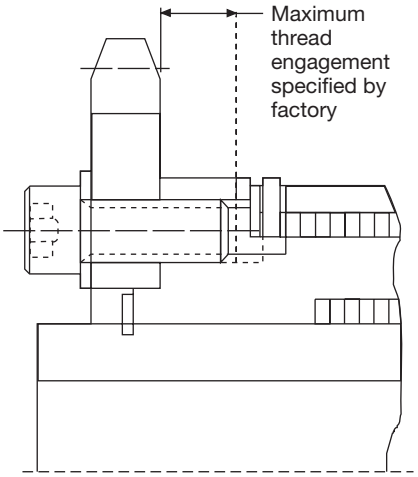
Mounting Requirements Cont.

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





Correct Mounting

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.

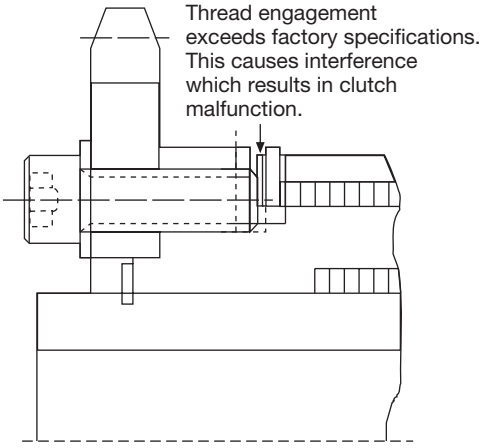
CB-5/Super CB-5 = .350 in.

CB-6/Super CB-6 = .312 in.

CB-7/Super CB-7 = .28 in.

CB-8/Super CB-8 = .360 in.

CB-10/Super CB-10 = .500 in.



Incorrect Mounting

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

Disassembly & Assembly Instructions

CB-2 and -4

DISASSEMBLY

1. Important—Ensure that the spring tang location is marked before the unit is taken apart.
2. Rotate the input hub until the actuator hits the stop cam. Continue to apply torque in the direction of rotation to the output shaft until the brake spring is fully wrapped down.
3. Remove the retaining ring from the input hub end.
4. Remove input hub – turn in direction of rotation only.
5. Release the actuator so that the brake is disengaged.
6. Remove the collar assembly – extract the collar toward the clutch spring end.

ASSEMBLY

1. Replace parts as needed.
2. Install the collar assembly over the output shaft and spring assembly. (Pull the clutch spring tang through the collar with needle-nosed pliers, taking care not to distort the spring.)
3. Install the input hub – turn in direction of rotation only.
4. Reset spring differential as needed. (See "CB Spring Differential Adjustments" on page 76.)
5. Install the retaining ring with smooth surface facing input hub.

Note: Anti-back springs and hubs should not be disassembled because of the difficulty in maintaining endplay setting between hubs. The unit should be returned to the factory for service.

CB-5 and Super CB-5

DISASSEMBLY

1. Rotate the input hub until the actuator hits the stop cam. Continue to apply torque in the direction of rotation to the output shaft until the brake spring is fully wrapped down.
2. Remove the retaining ring from the input hub end.
3. Remove thrust washer (Super CB-5 only).
4. Remove input hub – turn in direction of rotation only.
5. Release the actuator so that the brake is disengaged.
6. Remove the collar assembly (see split cam design) by extracting the collar toward the clutch spring end.

ASSEMBLY

1. Replace parts as needed.
2. Install the collar assembly over the output shaft and spring assembly. (Pull the clutch spring tang through the collar with needle-nosed pliers, taking care not to distort the spring.)
3. Install the input hub – turn in direction of rotation only.
4. Install thrust washer (Super CB-5 only).
5. Install the retaining ring with smooth surface facing input hub.
6. Reset spring differential as needed. (See "CB Spring Differential Adjustments" on page 76.)

Note: Anti-back springs and hubs should not be disassembled because of the difficulty in maintaining endplay setting between hubs. The unit should be returned to the factory for service.

CB-6, -7 and -8

DISASSEMBLY

1. Rotate the input hub until the actuator hits the stop cam. Continue to apply torque in the direction of rotation to the output shaft until the brake spring is fully wrapped down.
2. Remove the retaining ring from the input hub end.
3. Remove input hub – turn in direction of rotation only.
4. Remove the retaining ring from the mounting plate end.
5. Remove the output shaft and collar assembly (see split cam design) from the mounting plate – turn in direction of rotation only. **Do not remove brake hub from mounting plate.**
6. Remove the collar assembly (see split cam design) from the output shaft by extracting the collar toward the brake side of the output shaft.

ASSEMBLY

1. Replace parts as needed.
2. Install the collar assembly (see split cam design) over the output shaft and spring assembly. (Pull the brake spring through the collar with needle-nosed pliers, taking care not to distort the spring.)
3. Install the output shaft and collar assembly on the mounting plate – turn in direction of rotation only.
4. Install retaining ring on the mounting plate end with its smooth surface facing brake hub.
5. Install the input hub.
6. Install the retaining ring on the input hub with smooth surface facing the hub.
7. Reset spring differential as needed. (See "CB Spring Differential Adjustments" on page 76.)

Super CB-6, -7 and -8

DISASSEMBLY

1. Rotate the input hub until the actuator hits the stop cam. Continue to apply torque in the direction of rotation to the output shaft until the brake spring is fully wrapped down.
2. Remove the retaining ring from the input hub end.
3. Remove the input hub with thrust washer — turn in direction of rotation only. (Super CB-7 and 8 note the orientation of the flange for assembly.)
4. Remove the retaining ring from the mounting plate end.
5. Remove the output shaft and collar assembly (see split cam design) from the mounting plate – turn in direction of rotation only. Do not remove brake hub from mounting plate.
6. Remove the collar assembly (see split cam design) from the output shaft by extracting the collar toward the brake side of the output shaft.

ASSEMBLY

1. Replace parts as needed.
2. Install the collar assembly (see split cam design) over the output shaft and spring assembly. (Pull the brake spring through the collar with needle-nosed pliers, taking care not to distort the spring.)
3. Install the output shaft and collar assembly on the mounting plate – turn in direction of rotation only.
4. Install the retaining ring on the mounting plate end with its smooth surface facing the brake hub.
5. Install the input hub with thrust washer (flange oriented correctly on Super CB-7 and 8).
6. Install the retaining ring on the input hub with its smooth surface facing the hub.
7. Reset spring differential as needed. (See "CB Spring Differential Adjustments" on page 76.)

Disassembly & Assembly Instructions Cont.

CB-10 and Super CB-10

DISASSEMBLY

1. Important—Ensure that the spring tang location is marked before the unit is taken apart.
2. Rotate the input hub until the actuator hits the stop cam. Continue to apply torque in the direction of rotation to the output shaft until the brake spring is fully wrapped down.
3. Remove the retaining ring from the input hub end.
4. Remove the input hub – turn in direction of rotation only (CB-10). (Super CB-10 remove the input hub with the thrust washer – turn in direction of rotation only and note the orientation of the flange for assembly.
5. Remove the retaining ring from the mounting plate end.
6. Remove the output shaft and collar assembly from the mounting plate – turn in direction of rotation only. Do not remove brake hub from mounting plate.
7. Remove the collar assembly from the output shaft by extracting the collar toward the brake side of the output shaft.

ASSEMBLY

1. Replace parts as needed.
2. Install the collar assembly over the output shaft and spring assembly. (Pull the brake spring through the collar with needle-nosed pliers, taking care not to distort the spring.)
3. Install the output shaft and collar assembly on the mounting plate – turn in direction of rotation only.
4. Install the retaining ring on the mounting plate end with its smooth surface facing the brake hub.
5. Install the input hub and reset spring differential as needed (CB-10). Install the input hub with thrust washer flange oriented correctly and reset the spring differential as needed (Super CB-10). (See "CB Spring Differential Adjustments"on page 76.)
6. Install the retaining ring with smooth surface facing the hub.

SAC-2, -4 and -5

DISASSEMBLY

1. Remove the retaining ring from the input hub end.
2. Remove input hub – turn in direction of rotation only.
3. Remove the stop collar by extracting the collar toward the clutch spring end.

ASSEMBLY

1. Replace parts as needed.
2. Install the stop collar over the output shaft and spring assembly. (Pull the clutch spring tang through the collar with needle-nosed pliers, taking care not to distort the spring.)
3. Install input hub – turn in direction of rotation only.
4. Install retaining ring.

SAC-6

DISASSEMBLY

1. Remove the retaining ring from the input hub end.
2. Remove input hub – turn in direction of rotation only.
3. Remove the retaining ring from the mounting plate end.
4. Remove the output shaft and stop collar assembly from the mounting plate – turn in the direction of rotation only. Do not remove plate hub from mounting plate.
5. Remove the control stop from the output shaft by extracting the collar towards plate side of the output shaft.

ASSEMBLY

1. Replace parts as needed.
2. Install the stop collar over the output shaft and spring assembly.
3. Install the output shaft and stop collar assembly on the mounting plate – turn in direction of rotation only.
4. Install the retaining ring to output shaft.
5. Install the input hub.
6. Install the retaining ring on the shaft input end.

PSI

DISASSEMBLY

1. Remove retaining ring from shaft.
2. Remove hub end by rotating opposite to drive direction.
3. For Model S, remove stop collar and spring by rotating opposite to drive direction and pulling to remove output tang from hub.

ASSEMBLY MODEL S

1. Assemble spring to output hub by rotating opposite to direction of rotation. Output tang must be inserted completely into hole in hub during this assembly.
2. Assemble stop collar over spring by deflecting input tang with long-nose pliers. (Reach through collar with pliers.)
3. Assemble input hub by rotating opposite to direction of rotation.
4. Assemble retaining ring to shaft.

ASSEMBLY MODEL O & SS

1. Assemble spring and stop collar (or sleeve) with control tang located in slot in collar.
2. Assemble spring and collar to output hub by rotating opposite to direction of rotation.
3. Assemble input hub by rotating opposite to direction of rotation.
4. Assemble retaining ring to shaft.

Custom Clutch & Brake Capabilities

Can't find what you're looking for in this catalog? Warner Electric has you covered.

Warner Electric offers a wide variety of standard clutches and brakes that can be utilized in many applications. However, sometimes your design considerations fall outside of standard component specifications. In cases such as these, Warner Electric™ experts work closely with you and your team to provide customized solutions that meet the unique challenges of your applications.

Ask us about our highly engineered solutions – from small-volume aerospace and defense to high-volume automotive applications – all at a competitive cost.

Custom Clutch & Brake Capabilities Cont.

Warner Electric builds custom clutches and brakes for a wide variety of markets and applications, including:

Medical

Our brakes are used in medical equipment as holding brakes to consistently hold a load in position at a specific stopping point. Our clutches are used to drive belts and cables for patient lifts and other medical applications.

- Patient tables and lifts
- Patient beds
- Mammography equipment
- Pill dispensing machines
- Digital Imaging
- X-ray machinery applications

Semiconductor and Electronic Assembly

Our clutch/brake technology ensures high reliability and quality while being cost effective in semiconductor applications.

- Wafer-handling robots
- Inspection test sytems
- Pick-and-place machines
- Automated die bonding equipment
- Product handling storage elevator
- Surface mount technology (SMT)

Material Handling/Packaging

Long life and reliability are key attributes for clutches and brakes used in material handling and packaging applications.

- Conveyor systems
- Baggage handling conveyors
- Pick-and-place machines
- Strapping machines
- Food labelling systems
- Food dispensing
- Egg packing equipment
- Crimping machines

Aerospace and Defense

Wrap spring and friction units are used in commercial and military aircraft vehicles and equipment.

- Autopilot systems
- Satellites
- Fuel control
- Tank gun turret
- Helicopter actuators
- Onboard instrumentation
- Valves
- Air cabin control backup systems

Automotive

Cars, vans and SUV utilize wrap spring clutches, custom power-off brakes and power-on tooth clutches in many applications.

- Cinch/latch mechanisms for doors and trunks
- Actuators
- Cruise control
- Power liftgate
- Transaxles
- Power sliding doors

Electric Vehicle Systems

Friction brakes are utilized in many battery-powered vehicle applications, including lift tucks, golf cars and sweeping machines.

- Scissor lifts
- Electric hoists and cranes
- Steering applications
- Lift trucks
- By wire applications
- Electric sweeping machines

Office Automation

Wrap spring and friction clutches and brakes are widely used in office equipment.

- Copiers
- Label dispensing
- Staplers
- Paper punching
- Folding machines
- Printers
- Wire stitchers

Agricultural

Wrap spring and friction clutches and brakes are used in agricultural equipment.

- Seeders
- Balers
- Tractors
- Ride-on lawnmowers
- Harvesters
- Electric vehicle systems equipment

Glossary of Terms

Acceleration Time - The time requred to change the speed of a system from the moment the clutch engages until it is statically engaged and the system is moving at a constant speed.

Actuator Limit Stop - The optional actuator limit stop is a restraining pin or plate on a wrap spring clutch that limits the motion of the actuator on solenoid-actuated models.

Anti-Backup (AB) - The anti-backup spring prevents oscillation between the clutch and brake springs on a wrap spring device and prevents the output load from reversing. Anti-backup is a standard feature on CB Series clutch/brake combinations.

Anti-Overrun (AO) - The anti-overrun spring prevents overhauling loads from overrunning the input on a wrap spring. For example, anti-overrun is being applied when an eccentric output load is held at the same speed as the constant speed input. Anti-overrun is a standard feature on all CB Series products.

Anti-Rotation Slot - A slot used to prevent rotation during operation.

Collar-Actuator Clearance - The physical axial space between the Actuator Tip and the top of Control Collar Stop in Actuator released state.

Control Collar - A combination of protective cover and controlling device in a wrap spring product. The control tang of the spring fits in this collar; thus by allowing or preventing rotation of this collar, the spring is allowed or not allowed to wrap tight on the hubs. Stops are molded or machined on this plastic collar and can be engaged by an external arm to control engagement. A single stop is standard and most any number up to 24 can be machined for special applications.

Control Tang - A control tang at the end(s) of the wrap spring is/are used to engage and disengage the input and output hubs on on-off, start-stop and indexing units.

Drag Torque - The torque necessary to overcome static friction in a clutch or brake.

Dust Cover - Wrap Spring are available with a optional dust cover. The dust cover protects the unit against, dust, dirt and dripping water. This feature is made from flexible rubber and is fitted over the unit and the mounting plate.

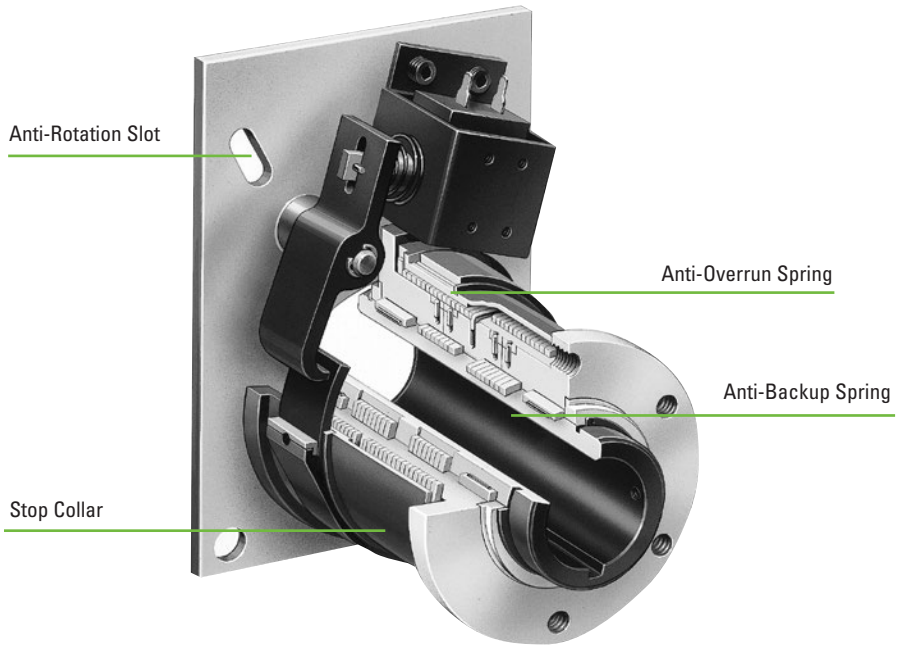
Inertia - That property of a body to continue in the state of motion or rest in which it may be placed until acted on by some force.

Inertial Torque - The torque developed by accelerating or decelerating a given load.

OTS/AB - If the load inertia is greater than the wrap spring tang can absorb without damage, an overtravel stop can be added to absorb a portion of the stopping torque. The anti-backup feature will prevent the output from reversing.

Overrunning - The most basic control function performed by PSI Series wrap spring clutches in which the clutch transmits torque in one direction and allows the load to free wheel or overrun when the input drive is stopped or reversed.

Wrap Spring Clutch/Brake



Glossary of Terms Cont.

Positive Engagement - An engagement that will not slip.

Radial Bearing Load - The maximum permissible load that can be applied to a clutch or brake unit at maximum velocity without incurring damage.

Residual Magnetism - The condition in electromagnets where low-level magnetism remains after the electrical current is removed.

Split Cam - A sleeve design incorporated in all standard and super CB-5, CB-6, CB-7, CB-8, and SAC-5 & SAC-6 units. This design makes setting the spring differential (overtravel) simple. With the one-piece construction (older style), the relative position of the brake and drive springs are set together. The split cam design allows the user to set the position of the brake spring by just wrapping the spring in the direction opposite of the clutch input rotation.

Spring Differential - Spring differential is the positional relationship of the drive spring to the brake spring. Correctly adjusted spring differential is imperative for proper clutch/ brake performance. The spring differential is factory set.

Start-Stop Clutch - This control function is a basic engage-disengage operation resulting in random load-stopping positions. Both SP and PSI Series (mechanically actuated) clutches can be used as start-stop clutches, as can the SAC, BIMAC, MAC and DL.

Start-Stop Clutches and Brakes - Most wrap spring clutches and brakes can be configured to perform the start-stop control function in which loads are started and stopped accurately.

Static Torque - In wrap springs this is defined as the maximum torque that can be applied statically with the spring completely wrapped down before damage occurs. In friction devices this is the torque level beyond which the clutch or brake will slip or overrun.

Stop Collar - A combination cover and control device on a wrap spring device that has detent positions to enable the clutch or brake to be engaged or disengaged. Standard stop collars have one stop per revolution. Specials are available with as many as 24 stops per revolution.

Time To Engagement (TTE) - The time required from the instant the actuation system is signaled until the clutch is engaged. At this point the system begins to accelerate. Time to Engagement is also often referred to as Pull-In Time.

Time To Speed (TTS) - The time required from the instant the actuation system is signaled until the output reaches the input RPM. Time to Speed is the equivalent of the sum of engagement time and acceleration time.

Time to Zero - The time required to fully disengage the motor from its load, thus allowing the load to drop to zero speed. Note: Factors such as system friction and inertia naturally play an important role in both of these critical measurements.

Torque - The product of the force and the perpendicular distance from its line of action to the instantaneous center of rotation, generally expressed in lbs.-in. or Nm. Static torque occurs when there is no relative movement or slippage between mating friction surfaces. Fully engaged clutches, or a brake holding a load are examples of static torque. Dynamic torque is developed when there is relative motion between mating friction surfaces.

Total Cycle Time - Sum of the device time-on and time-off as measured in seconds. Duty cycle is the percentage of total cycle time that a clutch or brake is engaged. For example, 5 seconds on/5 seconds off corresponds to a 50% duty cycle and a 10 second cycle time. Cycle rate is expressed in cycles per minute (CPM), as the number of times the clutch or brake is engaged and disengaged during a one minute period.

Wrap Angle - The number of degrees a spring tang must rotate in order to engage or disengage a load in a wrap spring device.

Wrap Spring - High tensile strength coiled wire, which transmits a substantial amount of torque when wrapped tightly around two hubs.

Conversion Chart

Listed Alphabetically

To Convert From	To	Multiply By	To Convert From	To	Multiply By	To Convert From	To	Multiply By
cm	feet	3.281×10^{-2}	(lbs.-ft.)(RPM)	Watts	.142	Nm	oz.-in.	141.69
cm	inches	.3937	lbs.-ft.^{2}	gm-cm^2	4.214×10^{5}	Nm^2	lbs.-in.^{2}	348.47
degrees/sec	RPM	.1667	lbs.-ft.^{2}	lbs.-in.^{2}	144	Nm-sec^2	lbs.-in.^{2}	3417
degrees/sec	rad/sec	1.745×10^{-2}	lbs.-ft.^{2}	lbs.-in.-sec^2	.37272	Newtons	pounds	.225
feet	cm	30.48	lbs.-ft.^{2}	oz.-in.^{2}	2304	oz.-in.	lbs.-ft.	5.208×10^{-3}
ft.-lbs./min	Watts	2.259×10^{-2}	lbs.-ft.^{2}	oz.-in.-sec^2	5.969	oz.-in.	lbs.-in.	6.25×10^{-2}
g-cm	lbs.-ft.	7.233×10^{-5}	lbs.-in.	g-cm	165960	(oz.-in.)(RPM)	HP	9.917×10^{-7}
g-cm	oz.-in.	1.389×10^{-2}	lbs.-in.	kg-cm	165.96	(oz.-in.)(RPM)	Watts	7.395×10^{-4}
g-cm^2	lbs.-in.^{2}	3.417×10^{-4}	lbs.-in.	kg-m	1.6596	oz.-in.^{2}	gm-cm^2	182.9
g-cm^2	lbs.-ft.^{2}	2.373×10^{-6}	lbs.-in.	lbs.-ft.	.083	oz.-in.^{2}	lbs.-ft.^{2}	4.340×10^{-4}
gm-cm^2	oz.-in.^{2}	5.467×10^{-3}	lbs.-in.	Nm	.113	oz.-in.^{2}	lbs.-in.^{2}	6.25×10^{-2}
horsepower	ft.-lbs./min	33,000	lbs.-in.	oz.-in.	16	oz.-in.^{2}	oz.-in.-sec^2	2.590×10^{-3}
horsepower	watts	7.457×10^{-2}	(lbs.-in.)(RPM)	HP	1.587×10^{-5}	oz.-in.-sec^2	oz.-in.^{2}	3.8609×10^{-2}
inches	cm	2.540	(lbs.-in.)(RPM)	Watts	.0118	oz.-in.-sec^2	lbs.-in.^{2}	24.125
kg-m	lbs.-ft.	7.233	lbs.-in.^{2}	kg-cm^2	2.926	RPM	rad/sec	.1047
kg-m	lbs.-in.	.6026	lbs.-in.^{2}	Nm^2	2.870×10^{-3}	radians	degrees	57.3
kg-cm^2	lbs.-in.^{2}	3.417×10^{-1}	lbs.-in.^{2}	kg-m^2	2.9265×10^{-4}	rad/sec	RPM	9.549
kg-cm-sec^2	lbs.-in.^{2}	335.1	lbs.-in.^{2}	lbs.-in.-sec^2	2.590×10^{-3}	revolutions	radians	6.283
kg-m^2	lbs.-ft.^{2}	23.73	lbs.-in.^{2}	lbs.-ft.^{2}	6.944×10^{-2}	revolutions/min.	degrees/sec	6
kg-m^2	lbs.-in.^{2}	3417	lbs.-in.^{2}	oz.-in.^{2}	16	square-inches	square-mm	645.2
kilograms	pounds	2.205	meters	millimeters	1000	temp. (°C) +17.78	temp. (°F)	1.8
lbs.-ft.	lbs.-in.	12	millimeters	inches	3.937×10^{-2}	temp. (°F) -32	temp. (°C)	.555
lbs.-ft.	oz.-in.	192	Nm	lbs.-ft.	.738	Watts	ft.-lbs./min	44.2
(lbs.-ft.)(RPM)	HP	1.904×10^{-4}	Nm	lbs.-in.	8.85	Watts	HP	1.341×10^{-3}

Application Data Form

Mail or Fax to:

Warner Electric
Technical Support
449 Gardner Street, South Beloit, Illinois 61080
Phone 800-825-9050 • Fax 815-389-2582 • warnerelectric.com
Email: uscustomercare@regalrexnord.com

Actuation

Mechanical	(	)
Electrical	(	)
Voltage	AC DC	

Motion

Single Revolution	(	)
Fractional Revolution	(	)
Angle	(	)

Accuracy

Start	(ms	)
Stop	(±__°	)

Shaft Diameter

Minimum	(	")
Maximum	(	")

Technical Data

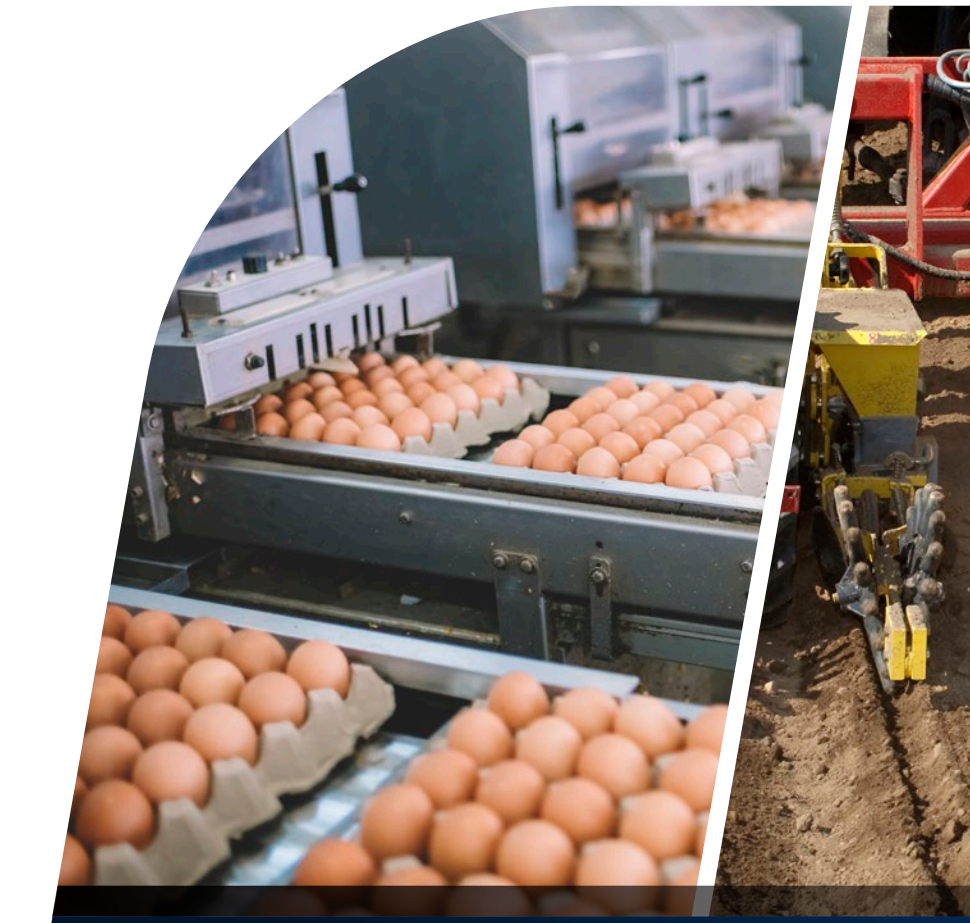
Speed _____ (rpm)
Inertia_____(lb.in.)
Friction Load Torque_____ (lb.in.)
Cycle Rate_____ (per second)
Life Expectancy_____ (hrs or cycles)

Environmental Consideration

_____
_____
_____
_____
_____
_____

Describe the application function

Notes



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