



DELTRAN

Friction Clutches & Brakes

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Linear Motion. Optimized.™



Linear Motion. Optimized.™

Thomson - *Linear Motion. Optimized.*

Often the ideal design solution is not about finding the fastest, sturdiest, most accurate or even the least expensive option. Rather, the ideal solution is the optimal balance of performance, life and cost.

Thomson is best positioned to help you most quickly configure the optimal linear motion solution for your application.

- Thomson invented anti-friction linear bearing technology. We own the broadest standard product offering of mechanical motion technologies in the industry.
- Modified versions of standard product are routine. White sheet design solutions available across our entire portfolio.
- Choose Thomson and gain access to over 70 years of global application experience in diverse industries including packaging, factory automation, material handling, medical, clean energy, printing, automotive, machine tool, aerospace and defense.
- At Thomson, we are financially strong and unique in our ability to bring together control, drive, motor, power transmission and precision linear motion technologies.

Thomson is the name you can trust for quality, innovation, on-time delivery, controlled costs, and reduced risk.

In addition to the information contained in this document, a wealth of product and application information is available online at www.thomsonlinear.com. Also online are downloadable 3D models, software tools, our distributor locator and global contact information for Thomson. For immediate assistance in Europe contact us at +44 1271 334 500 or email us at sales.uk@thomsonlinear.com.

Talk to us early in the design process to see how Thomson can help identify the optimal balance of performance, life and cost for your next application. And, call us or any of our 2000+ distribution partners around the world for fast delivery of replacement parts.

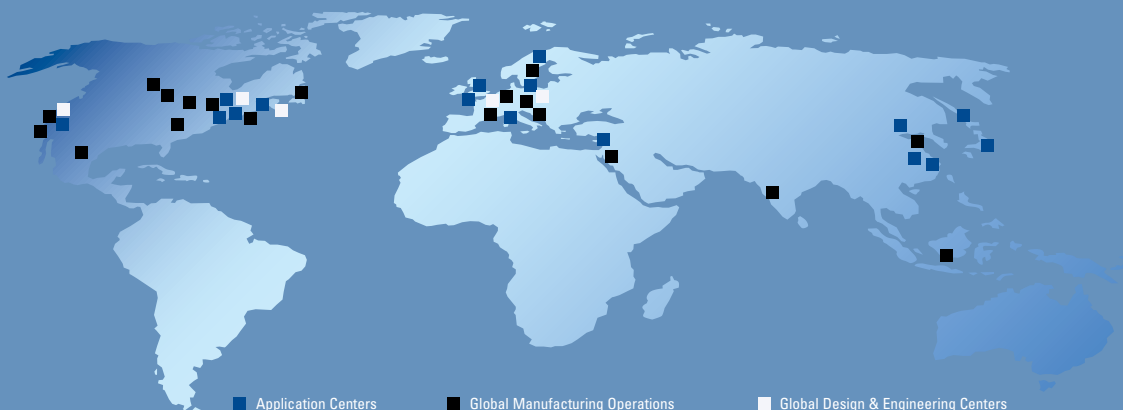
The Fortive Business System

Building sustainable competitive advantage into your business

The Fortive Business System (FBS) was established to increase the value we bring to customers. It is a mature and successful set of tools we use daily to continually improve manufacturing operations and product development processes. FBS is based on the principles of Kaizen which continuously and aggressively eliminate waste in every aspect of our business. FBS focuses the entire organization on achieving breakthrough results that create competitive advantages in quality, delivery and performance – advantages that are passed on to you. Through these advantages Thomson is able to provide you faster times to market as well as unsurpassed product selection, service, reliability and productivity.

Local Support Around the Globe

Application Centers Global Manufacturing Operations Global Design & Engineering Centers



Deltran Clutches & Brakes

Introduction

Building Our Business On a Strong Foundation

Thomson has a long history of manufacturing quality clutches and brakes. Our roots are firmly planted in brand names such as Deltran and API (American Precision Industries), bringing over 100 years of combined manufacturing experience.

Deltran joined Thomson in March 2000. Electromagnetic friction products were then combined under the Thomson name.

As we merged the manufacturing of these product lines into one facility in Amherst, NY we focused on keeping the engineering expertise at the forefront while practicing The Fortive Business System (FBS) of continuous improvement.

Today, our clutch and brake products are working in a wide range of applications specific to factory automation, material handling, automotive, aviation, defense, aerospace, medical, office machine, robotics and servo motor manufacturing industries. These products set the solid foundation for the broad range of standard and custom products currently available to our customers.

Thomson's modern Amherst, NY, facility ISO 9001:2000 and AS9100-B certified for its Design, Manufacturing and Assembly of Motion Control Devices. Our brake and clutch manufacturing experience, technological know-how and commitment to bring our customers a quality product, delivered on time, every time are some of the reasons why Thomson is the best choice for your next motion control product.



For customer service and application support, please call Thomson at 1-540-633-3400. For other contact information, please see the back of this catalog.

Using Our Clutches and Brakes Catalog

Finding just the right clutch or brake product can be a daunting task. The selection process hinges on the application with many variables to take into consideration. Often times there are several brake or clutch options that might do the job—the key is finding the best solution for your application.

This catalog contains several aides to assist in the selection process.

- **CLUTCH AND BRAKE TECHNOLOGIES**—This catalog contains clutch and brake information for Electromagnetic Friction Clutches and Brakes. Pages 4-7 offer operation, design and application examples. The printed tabs offer a quick way to find the technology and products you need. Engineering guidelines begin on page 54.
- **SELECTION BY MOTION TYPE**—The chart on page 3 categorizes our clutches and brakes by type of motion: START, SLIP, STOP and HOLD. Each of these motion types are noted by an icon on the left side of the chart. As you browse through this catalog, you will see motion icons in the top header of the product pages. If you know that your application requires a specific motion, this chart may be a helpful place to start your brake and clutch selection.

Friction Clutches & Brakes

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Friction Clutches & Brakes

Product Overview

FRICITION CLUTCHES & CLUTCH COUPLINGS

Electromagnetic clutches and clutch couplings are available in 6 frame sizes and offered as shaft mounted or flange mounted models. The CS, CSC, CF and CFC series provide an efficient, electrically switchable link between a motor and a load. These models offer full corrosion resistant, rotating components designed for low inertia and minimal drag, zero backlash and integral long-life bearings.

SPRING-SET FRICTION BRAKES

Electromagnetic power-on (BF) brakes provide an efficient, switchable means of stopping and/or holding a load. Spring-set electromagnetic power-off (BRP, SB, FSB, AKB, PMB & MBRP) brakes provide a safe, efficient means of stopping and/or holding a load in the absence of power. New Series included in this section: MBRP (Metric Power-off Brakes).

TORQUE FEEDBACK DEVICE

The TFD Series (Torque Feedback Device) provides a variable torque output, in proportion to a DC input, for steering and other by-wire applications. Electric vehicles, turf and garden equipment, industrial and recreational marine/boats and construction equipment use steer-by-wire.





FRICITION ENGINEERED PRODUCTS

Engineered products are specially designed to solve specific and unique application requirements. The products shown are the result of innovative solutions we provided for applications such as document handling, copiers, ATM machines, dispensing machines, robotics, and military aerospace actuators. The solutions we provided are now available as "engineered" products. Included in this section: TFD Series (Torque Feedback Device), TC/TCR/TCP (Tooth Power-on and Power-off) and MCS (Metric Clutches) and MBF (Metric Brakes).



Friction Clutches & Brakes

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  <i>Motion icons are shown at the top of each product page to make selecting easier.</i>	Friction Clutch	CS-11, 15, 17, 22, 26, 30 CSC-11, 15, 17, 22, 26, 30	125 (14.2)	English: 1/4 - 1" Metric: 8 - 35 mm	5000	DC	12
	Friction Clutch	CF-11, 15, 17, 22, 26, 30 CFC-11, 15, 17, 22, 26, 30	125 (14.2)	English: 1/4 - 5/8" Metric: 8 - 16 mm	5000	DC	12
	Friction Clutch	TC-19, TCR-19 TCP-19	250 (28.2) 50 (5.6)	English: 3/8 - 1/2"	5000	DC	47
	Friction Clutch	MCS	Custom Engineered Product - Consult Factory				49
	Friction Clutch	MDC	Custom Engineered Product - Consult Factory				53
Slipping 	Feedback Device	TFD-30, 40	12 (106)	N/A	300/120**	DC	44
Stopping 	Friction Brake	BF-11, 15, 17, 22, 26, 30	125 (14.13)	English: 3/16 - 1" Metric: 3 - 35 mm	5000	DC	22
	Friction Brake	MBF-26, 30, 40, 50, 60, 80, 100 (L & S)	3540 (400)	Metric: 12 - 60 mm	5000	DC	49
Holding 	Friction Brake	BF-11, 15, 17, 22, 26, 30	125 (14.13)	English: 3/16 - 1" Metric: 3 - 35 mm	5000	DC	22
	Friction Brake	BRP-15, 17, 19, 23, 26, 28, 30, 40, 50, 60, 70	1000 (113.0)	English: 1/4 - 2" Metric: 3 - 45 mm	5000	DC	28
	Friction Brake	SB-15, 17, 19, 23, 26, 28, 30, 40, 50, 60, 70	1200 (135.6)	English: 1/4 - 2" Metric: 3 - 45 mm	5000	DC	28
	Friction Brake	FSB-15, 17	3 (0.34)	English: 3/16 - 3/8" Metric: 3 - 8 mm	5000	DC	28
	Friction Brake	AKB-17, 19, 26, 30, 40, 50	470 (53.0)	English: 1/4 - 1" Metric: 6 - 25 mm	5000	DC	28
	Friction Brake	PMB-30, 40, 50, 60, 65, 75, 85, 100, 120	4250 (480.0)	English: 3/8 - 1 5/8" Metric: 11 - 45 mm	3000	DC	41
	Friction Brake	MBF-26, 30, 40, 50, 60, 80, 100 (L & S)	3540 (400)	Metric: 12 - 60 mm	5000	DC	49
	Friction Brake	MDB	Custom Engineered Product - Consult Factory				53
			<i>*Consult factory for higher speeds</i>		<i>**Intermittent/Continuous</i>		

CLUTCH &
CLUTCH COUPLINGS

BRAKES

TORQUE FEEDBACK
DEVICEENGINEERED
PRODUCTSENGINEERING
GUIDELINES

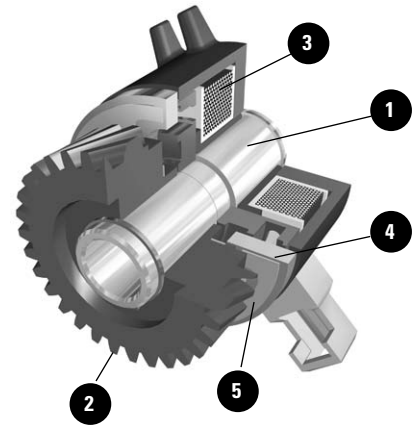
Friction Clutches & Brakes

Operation and Design Principles

Electromagnetic Clutch

An electromagnetic clutch in its simplest form is a device used to connect a motor to a load. Generally the motor shaft is pinned or keyed to the clutch rotor-shaft assembly (1) bore (input), with the load connected to the armature (output) of the clutch (2) by a pulley or gear. Until the coil (3) is energized, this armature assembly is not coupled, thus not rotating with the input rotor-shaft. Upon coil energization, the rotor-shaft assembly becomes part of an electromagnet,

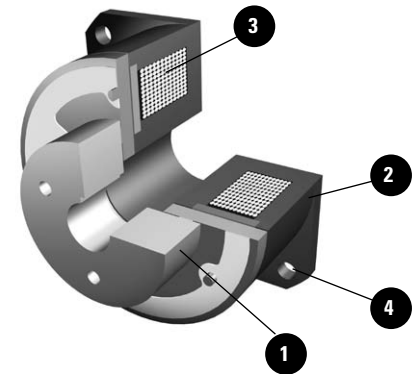
attracting the armature plate (4), engaging this with the rotor assembly, and thus driving the load. When the coil is de-energized, these two attracted elements are no longer attracted and are separated by a spring (5) within the armature assembly. The motor shaft and load are then no longer connected and therefore the load is not driven. The clutch enables the motor to remain on while the load is idle, benefiting in faster cycle time and better overall system efficiency.



Power-On Electromagnetic Brake

A power-on electromagnetic brake operates using the same principle as the clutch, but with only a single rotating component, the armature assembly (1). The brake is generally positioned on the load shaft with the armature assembly secured to the shaft while the field

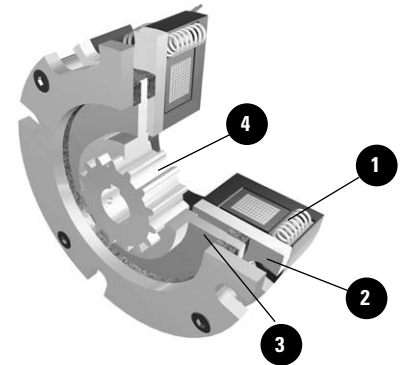
assembly (2) is mounted to a non-rotating component or bulkhead. Until the coil is (3) energized, the armature assembly will rotate freely. Upon energization, the field assembly becomes an electromagnet, attracting the armature plate (4), thus braking the load.



Power-Off Electromagnetic Spring-Set Brake

A power-off electromagnetic spring-set brake operates on a slightly different principle. The actual braking force is applied by the use of compression springs within the field assembly. In normal power-off mode these springs (1) apply pressure to the fixed (non-rotating) armature plate (2) which in-turn applies

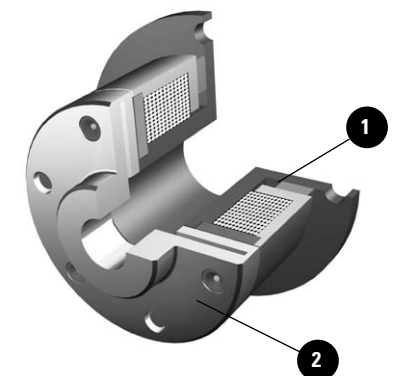
pressure to the rotor (3). This rotor has the ability to "float" back and forth under the applied pressure depending on the state of the coil. It is coupled to the load shaft by a spline or hex through a hub (4). Some rotors are suspended between two diaphragm-like springs to achieve the "floating" state.



Power-Off Electromagnetic Permanent Magnet Brake

A power-off electromagnetic permanent magnet brake operates on the principle of the attractive force of a permanent magnet creating the braking action, while the electromagnet is used to negate this force allowing load rotation. In normal power-off mode the permanent magnet in the fixed field assembly (1) creates an attractive force on the arma-

ture assembly (2) which is attached to the load shaft by means of set screws or pins, hence stopping or holding the load. Upon coil energization, the electromagnet forms an opposing magnetic force to the permanent magnet, thus allowing the armature assembly free rotation (no brake).



Friction Clutches & Brakes

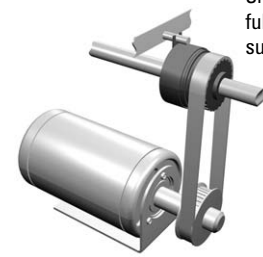
Applications

Electromagnetic Clutches & Clutch Couplings

Electromagnetic clutches provide an efficient, electrically switchable link between a motor and a load. Clutches are used to couple two parallel shafts by the use of pulleys, gears or sheaves. While the field (electromagnet) assembly is prevented from rotating by an anti-rotation tab or flange, the rotor and armature assembly are mounted on a single shaft, with the rotor secured to the shaft. The armature is bearing mounted and free to rotate.

When the coil is energized, the armature engages the friction surface of the rotor, thus driving the load.

Electromagnetic clutch couplings provide this same efficient, electrically switchable link between a motor and a load for in-line shafts. While the field (electromagnet) assembly is prevented from rotating by an anti-rotation tab or flange, the rotor and armature assembly are securely mounted on opposing in-line shafts



Shafts must be fully bearing supported

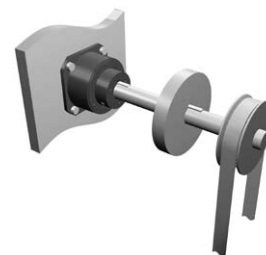
When the coil is energized, the armature engages the friction surface of the rotor, coupling the two in-line shafts, thus driving the load.

Electromagnetic Brakes

Electromagnetic power-on brakes provide an efficient, switchable means of stopping and/or holding the load. While the field (electromagnet) assembly is fixed and prevented from rotating by a flange, the armature assembly is secured to the shaft. When the coil is energized, the armature engages the friction surface of the fixed field (electromagnet) assembly, thus stopping and/or holding the load.

Offered in spring-set or permanent mag-

net designs, electromagnetic power-off brakes provide a safe, efficient means of stopping and/or holding a load in the absence of power. While the field (electromagnet) assembly is fixed and prevented from rotating, the rotor (spring-set design) or armature (permanent magnet design) assembly is secured to the shaft. In the absence of power, the fixed and rotating components are engaged, thus stopping and/or holding the load. When



Shafts must be fully bearing supported

the coil is energized, rotating components are disengaged thus allowing the shaft to freely rotate.

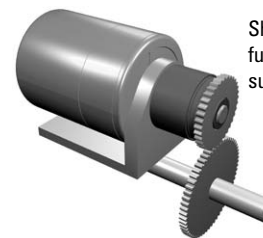
Tooth Brakes & Clutches

When used in either static or low speed engagement applications, tooth clutches and clutch couplings provide an efficient, positive, switchable link between a motor and load on in-line or parallel shafts.

While the field (electromagnet) assembly is prevented from rotating by a fixed flange, the rotor is generally attached to the input shaft. The armature assembly is securely mounted to either an in-line load shaft or a parallel shaft by means of pul-

leys or gears. When the coil is energized, the tooth profile of the armature positively engages the tooth profile of the rotor, coupling the two in-line or parallel shafts, thus driving the load.

Tooth brakes provide an efficient, positive, switchable means of either holding a load or decelerating a load from a slow speed, generally 20 RPM or less. Utilizing the same principle as the tooth clutch, these brakes can be used to effectively



Shafts must be fully bearing supported

hold a load in position. Available in power-on or power-off models, tooth brakes are ideal for applications requiring very

high torque in tight places.

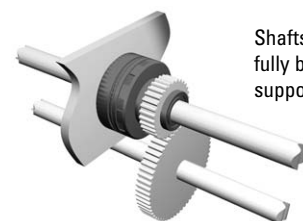
Multi Disc Brakes & Clutches

Multiple Disc Clutches provide a smooth efficient, switchable link between a motor and a load on in-line or parallel shafts.

While the field (electromagnet) assembly is prevented from rotating by an anti-rotation tab or flange, the rotor is securely mounted on the drive shaft. The armature assembly is then mounted either directly on an opposing in-line shaft, or indirectly on a parallel shaft by means of gears or

pulleys. When the coil is energized, the armature engages the friction surface of the rotor, further engaging the multiple discs within the assembly until full torque is achieved, thereby coupling the two in-line or parallel shafts, thus driving the load.

Multiple Disc Brakes offer the very same smooth efficient operation as a braking device. By eliminating the rotor component and using the electromagnet to



Shafts must be fully bearing supported

engage a static field assembly and a rotating armature assembly, braking can be achieved. These units provide high torque in a compact package size primarily for custom applications in the aero-

space industries.

Custom Assemblies (Value-

Added Designs)

Variations of any device shown in this

catalog can be adapted specifically to meet the most demanding needs of your application. Custom gears, pulleys, sprockets, integrally mounted to the clutch can be combined with special



shaft sizes, coil voltages, connector

Friction Applications - Power-Off Brakes

Electric Lift Truck Drive and Lift System

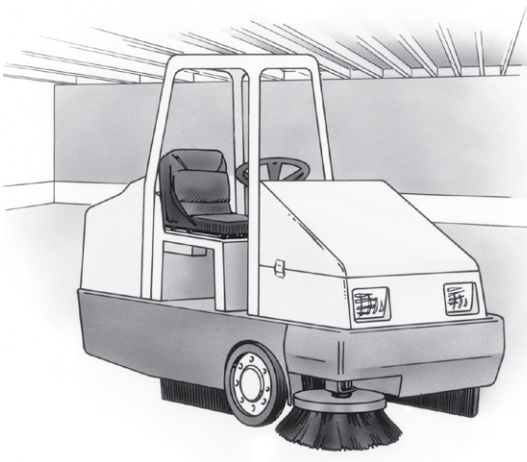
Torque Feedback Device for steer-by-wire application. BRP, SB, AKB, PMB Series Power-Off Brakes for traction motor and lift motor. Brake holds when power is removed.

Advantages

- TFD patented design
- TFD RoHS compliant
- Bi-direction control and holding
- Compact design
- Low cost
- Fast response, repeatable performance
- Energy efficient

Product Selection

- TFD
- BRP
- SB
- AKB
- PM



Floor Sweeper/Scrubber

BRP and SB are used as a parking brake to hold the vehicle on inclines, etc. The BRP/SB eliminates the need for manual brake linkage or expensive hydraulic brakes. TFD is used as a drive-by-wire feedback device.

Advantages

- Uni-directional control
- Compact design
- Non-asbestos friction material
- Factory set air gaps (no need to adjust)
- Manual release options
- Interchangeability with many existing brake designs

Product Selection

- PMB
- BRP
- SB
- AKB
- TFD



Aerospace and Defense

Wrap spring and friction units are used in commercial and military aircraft, vehicles and equipment. Applications include autopilot systems, fuel control, tank gun turrets, helicopter actuators, onboard instrumentation, valves, seat actuation, air cabin control backup systems and missiles/precision guided munition.

Advantages

- Manufacturing facility is AS9100-B Certified
- Fully potted coils with high temperature insulation capabilities
- Able to endure high humidity, shock and vibration
- Mil spec lead wire, plating, fasteners and fastener locking systems
- High performance friction materials for high heat and dynamic low wear applications

Product Selection

- TFD
- TC
- TCR
- MDC
- SB
- AKB



Friction Applications - Power-Off Brakes

Patient Lift

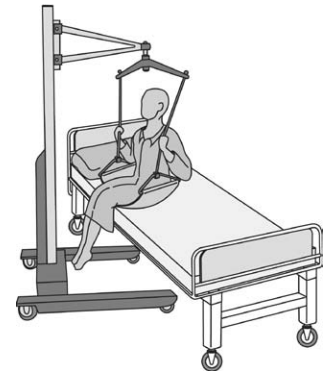
The BRP and SB can be used as a holding brake to consistently hold a load in position at a specific stopping point.

Advantages

- Uni-directional control
- Compact design
- Non-asbestos friction material
- Factory set air gaps (no need to adjust)
- Interchangeability with many existing brake designs

Product Selection

- BRP
- SB
- AKB
- LBRP



Friction Applications - Power-On Clutches & Brakes

Paper Feed

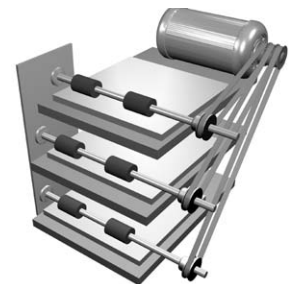
Power-On Clutch Application: CS and CF products are used on paper feed applications. There is a prime motor that drives a series of belts/pulleys that drive feed rollers. The CS or CF are mounted on the feed roller shaft. When power is applied to the CS or CF, the clutch engages and then drives the feed roller. The clutch will continue to drive until power is removed.

Advantages

- Low inertia and minimal drag
- Fast response, repeatable performance
- Energy efficient
- Simple installation
- Non-asbestos friction material

Product Selection

- CS
- CF



Power Sliding Door

Power-On Tooth Clutch Application: TC is a power-on tooth clutch used to drive a mechanical drive assembly in either direction

Advantages

- Simple installation
- Energy efficient
- Torque to size ratio
- Positive engagement, indexing capability

Product Selection

- TC
- CS
- CF



Conveyor Drive System

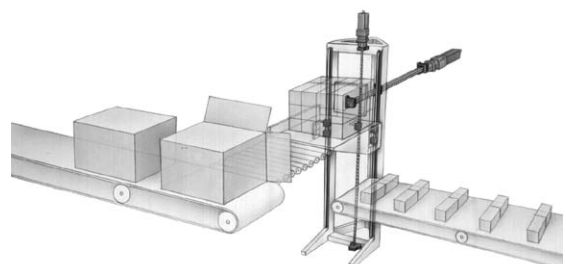
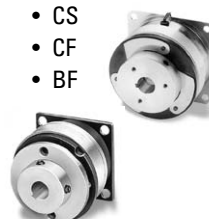
Power-On Clutch and Brake Application: CS, CF power-on clutches are used to drive the conveyor belt. The BF power-on brake is used to stop the conveyor belt.

Advantages

- Fast response, repeatable performance
- Static or dynamic engagement
- Simple installation
- Energy efficient
- Economic cost
- Non-asbestos friction material

Product Selection

- CS
- CF
- BF



Application Data Form

Worksheet

Application Data Form			
Customer	Contact	Dept	
Address		City	State
Phone	Fax		Zip
E-mail			
Project Information			
Project Type	Price Target	Avg Yearly Qty	
Initial Release Date	Initial Ship Qty	Current Source	
Product Type	Project Life		
Application			
Application Data			
Function	Unit Type		
Other			
Min. Torque Required	Type	Inertia	
Input	Rotation	Friction	
Shaft or Bore Size	Other		
Life (Hours)	TTS		
Cycle Life (M)	TTZ		
On Time	Input Speed		
Off Time	Output Speed		
Power Source			
Actuation	Suppression		
Other			
Volts	DC Type		
Other Volts	Min. Res.		
External Environment →			
Vibration g (max)	at Hz		
Shock g (max)	Rel. humidity % max		
Operating Temperature minus ° C	plus ° C		
Protection			
Corrosion Protection			
Special Protection	Other IP		
Miscellaneous			
Safety Requirements			
Fire Resistance			
If possible insert drawing or sketch below, otherwise indicate drawing reference			
Drawing / Comments			



Friction Clutches & Brakes

How to Select

Brake Selection

Step 1

Determine if the application requires a *static* (holding) or *dynamic* (stopping) brake.

Step 2

For *static brake applications*, determine the required static torque to hold the load under worst case conditions, considering system drag. Skip to Step 5.

Step 3

For *dynamic braking applications* with a specific stopping time requirement, first calculate the dynamic torque necessary to decelerate the load, using the ***inertia-time*** equation:

$$T_D = (0.1047 (I \times \omega) / t) - D$$

where I = total system inertia lb-in-sec², ω = shaft speed in RPM, t = time to zero and D = load drag. Next multiply by 1.25 to convert to static torque. Skip to Step 5.

Step 4

For those *dynamic braking applications* requiring only an ability to stall a load, calculate the appropriate static torque using the ***horsepower-RPM*** equation:

$$T_S = 1.25 \times 63000 \times (HP \times K) / \omega$$

where HP = horsepower, K = service factor and ω = RPM **OR** refer to the charts found on page 11.

Step 5

Select a brake model from the catalog with a static torque rating greater than the required torque (service factor dependent). Verify that the selected brake fits into the available application envelope and mounting configuration.

Note: When braking dynamically, careful consideration must be given to proper energy dissipation. Calculate the total kinetic energy dissipation per cycle (E_k), and compare this to the allowable braking energy (E_b) based on the frequency of engagement (N) given in the Energy Dissipation Chart on page 53. If the total kinetic energy dissipation **per cycle** is more than allowable, given the frequency of engagement, then consider using a larger series brake.

Clutch Selection

Step 1

For clutch applications with a *specific acceleration time* requirement, first calculate the dynamic torque (T_D) required to accelerate the load using the ***inertia-time*** equation:

$$T_D = 0.1047 (I \times \omega) / t + D$$

where I = rotational load inertia in lb-in-sec² units, ω = differential slip speed in RPM, t = time to speed, and D = load drag torque reflected to the clutch. Next convert to static torque by multiplying by 1.25. Skip to Step 3.

Step 2

For clutch applications requiring only an *ability to accelerate a load*, calculate the appropriate static torque using the ***horsepower-RPM*** equation:

$$T_S = 1.25 \times 63000 \times (HP \times K) / \omega$$

where HP = horsepower, K = service factor, and ω = differential slip speed in RPM **OR** refer to the charts in the engineering guidelines section.

Step 3

Select a clutch model from the catalog with a static torque rating greater than the required torque (service factor dependent). Verify that the selected clutch fits into the available application envelope and mounting configuration.

Note: When engaging a clutch dynamically (under load at speed), careful consideration must be given to proper energy dissipation. Calculate the total energy dissipated per minute:

$$E = (E_k + E_s) \times N$$

where E_k = kinetic energy, E_s = slip energy, and N = cycle rate. If the total energy dissipation is more than allowable (see performance data tables), then consider using a larger series clutch.

General Notes

In some applications it may be necessary to consider clutch or brake inertia and engagement time in calculating load acceleration. If the inertia or engagement time of the clutch or brake selected represents more than 10% of the load inertia or acceleration time, use the above referenced ***Inertia-time*** equation to solve for acceleration time (t), using an inertia equivalent to the sum of the load inertia and the clutch or brake inertia (see performance data tables). Then verify that the sum of the acceleration and clutch or brake engagement times is still within the required acceleration time for the application.

For more information on other key factors that greatly affect clutch or brake life, such as ambient temperature, slip-speed and load energy, please contact us at 1-540-633-3549.

Selecting a Clutch or Brake

Torque, Horsepower & Speed

Disregarding frictional losses in a pulley, gear or sprocket system incorporating a clutch and running at a constant speed, the HP delivered by the clutch equals the HP of the prime mover. However, the torque imposed on the clutch may be greater or less than the torque on the

prime mover depending on the ratio of the speed of the shafts. Generally, the faster the clutch shaft speed, the lower the torque required to drive the load.

The application charts below can be used as a quick and easy reference to

determine the proper sizing of a clutch or brake based on motor horsepower and speed. However, when precise control and life expectancy are critical all design considerations should be evaluated.

Light to Medium Duty Applications (K = 1.5)

		Kupplungs- oder Bremswellendrehzahl in U/min																					
		100	200	300	400	500	600	700	800	900	1000	1100	1200	1500	1800	2000	2400	3000	3600	4000	4600	5000	
P S	1/50	■																					
	1/20	■	■							Serie 17													
	1/12	■	■	■																			
	1/8	■	■	■	■																		
	1/6	■	■	■	■	■				Serie 19													
	1/4	■	■	■	■	■	■																
	1/3	■	■	■	■	■	■	■		Serie 22/23													
	1/2	■	■	■	■	■	■	■	■														
	3/4	■	■	■	■	■	■	■	■	■		Serie 26/28											
	1	■	■	■	■	■	■	■	■	■	■												
	1 1/2	■	■	■	■	■	■	■	■	■	■	■		Serie 30									
	2	■	■	■	■	■	■	■	■	■	■	■	■										
	3	■	■	■	■	■	■	■	■	■	■	■	■	■									
	5	■	■	■	■	■	■	■	■	■	■	■	■	■	■		Serie 40						
	7 1/2	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

Heavy Duty Applications (K = 3.0)

		Kupplungs- oder Bremswellendrehzahl in U/min																					
		100	200	300	400	500	600	700	800	900	1000	1100	1200	1500	1800	2000	2400	3000	3600	4000	4600	5000	
H O R S E P O W E R	1/50	■	■							Serie 17													
	1/20	■	■	■																			
	1/12	■	■	■	■					Serie 19													
	1/8	■	■	■	■	■																	
	1/6	■	■	■	■	■	■				Serie 22/23												
	1/4	■	■	■	■	■	■	■															
	1/3	■	■	■	■	■	■	■	■		Serie 26/28												
	1/2	■	■	■	■	■	■	■	■	■													
	3/4	■	■	■	■	■	■	■	■	■	■		Serie 30										
	1	■	■	■	■	■	■	■	■	■	■	■											
	1 1/2	■	■	■	■	■	■	■	■	■	■	■	■										
	2	■	■	■	■	■	■	■	■	■	■	■	■	■		Serie 40							
	3	■	■	■	■	■	■	■	■	■	■	■	■	■	■								
	5	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	7 1/2	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

CS/CSC and CF/CFC Series

Shaft and Flange Mounted Clutches and Clutch Couplings

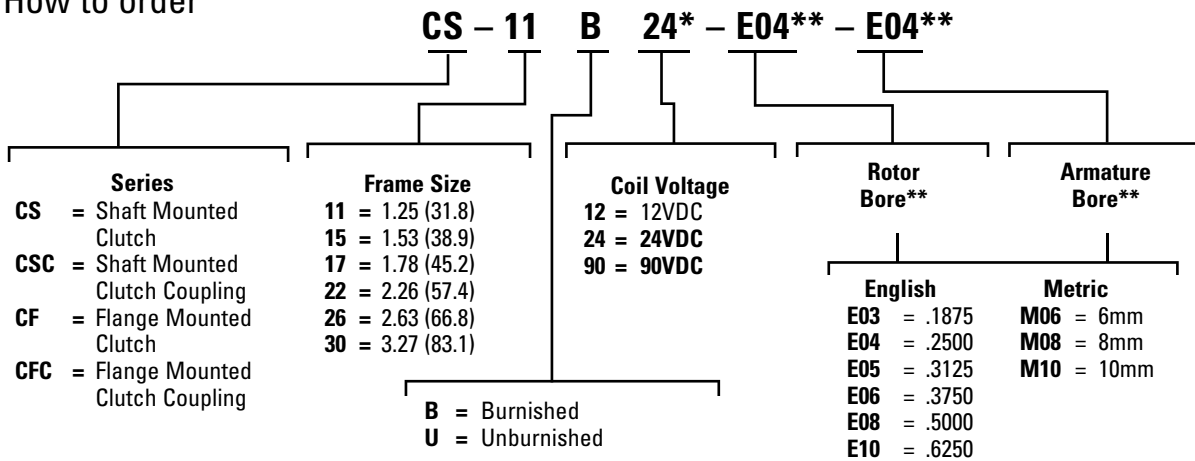
Electromagnetic clutches provide an efficient, electrically switchable link between a motor and a load. Clutches are used to couple two parallel shafts by the use of pulleys, gears or sheaves. While the field (electromagnet) assembly is prevented from rotating by an anti-rotation tab or flange, the rotor and armature assembly are mounted on a single shaft, with the rotor secured to the shaft. The armature is bearing mounted and free to rotate. When the coil is energized, the armature engages the friction surface of the rotor, thus driving the load.

- Torque: 2.5 to 125 lb-in (0.28 to 14.12 Nm)
- Diameters: 1.25 to 3.27 in (31.8 to 83.1 mm)
- Efficient means of cycling load
- Fast response, repeatable performance
- Static or dynamic engagement
- Simple installation
- Economic cost
- Energy efficient



Electromagnetic clutch couplings provide this same efficient, electrically switchable link between a motor and a load for in-line shafts. While the field (electromagnet) assembly is prevented from rotating by an anti-rotation tab or flange, the rotor and armature assembly are securely mounted on opposing in-line shafts. When the coil is energized, the armature engages the friction surface of the rotor, coupling the two in-line shafts, thus driving the load.

How to order



* Other voltages available upon request

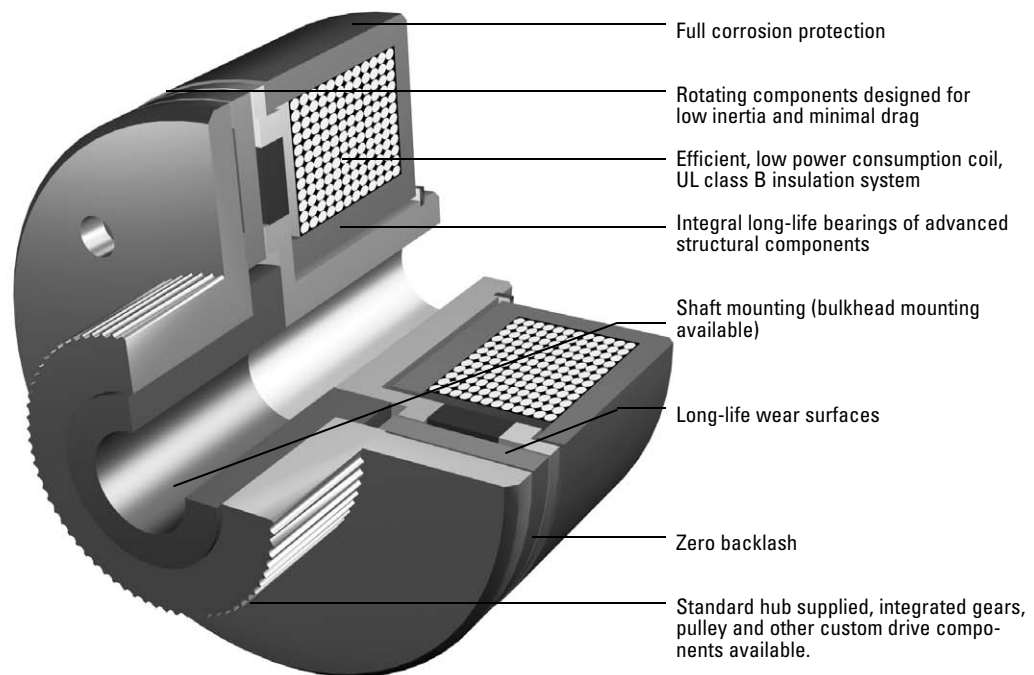
** See dimension tables for appropriate bore sizes available for each frame size.

General Notes

- The air gap should be checked periodically to insure proper operation. If it exceeds maximum recommended dimensions, the clutch or brake may not function properly.
- All friction faces must be kept free of grease and oil for proper operation.
- Consult factory for additional options.
- Actual starting and/or stopping times depend on application variables, manufacturing tolerances and friction material wear. Please consult factory for evaluation of actual use before applying specific values to your application.
- Flying leads are provided as standard, terminal style connection available upon request.
- Armature and rotor bore dimensions are minimums, with tolerance generally .001/.002 larger to accommodate varying environmental conditions.
- Coil of 24 & 90 volts are provided as standard, other coil voltages are available upon request.



Clutches and Clutch Couplings

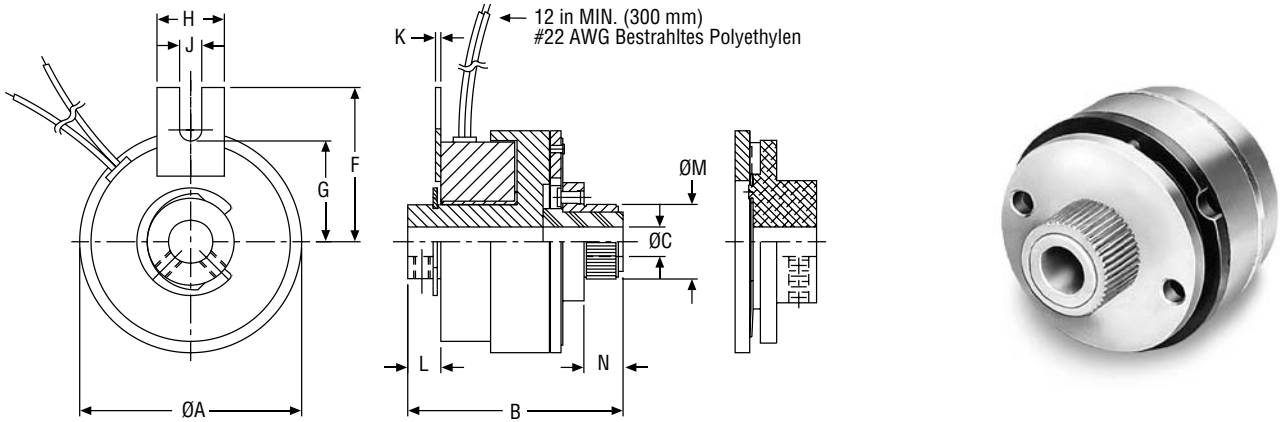


Typical Applications

- Document handling
- Copiers
- Printers
- Collators
- Sorters
- Finishers
- ATM machines
- Currency counters
- Vending machines
- Postal handling equipment
- Ticket & receipt dispensing
- Packaging
- Material handling
- Office automation

CS-11 Clutches & CSC-11 Clutch Couplings

Dimensions & Specifications



Dimensions (mm)
Mounting requirements see page 56.

CS Model

CSC Model

CS Model Shown

DIMENSIONS											
Model*	Static Torque lb-in (Nm)	A: OD in (mm)	B: OAL in (mm)	C: Bore Ø in (mm)	F: Tab Height in (mm)	G: Slot Height in (mm)	H: Tab Width in (mm)	J: Slot Width in (mm)	K: Tab Thickness in (mm)	L: Length in (mm)	M: Mtg Ø x N: Length in (mm)
CS-11B24-E04-E04	5.0 (0.56)	1.25 (31.8)	1.38 (35.1)	.250 (6.4)	0.87 (22.1)	0.56 (14.2)	0.38 (9.7)	0.13 (3.3)	0.03 (0.8)	0.22 (5.6)	.507 x 0.33 (12.9 x 8.4)
CS-11B24-E05-E05	5.0 (0.56)	1.25 (31.8)	1.38 (35.1)	.312 (7.9)	0.87 (22.1)	0.56 (14.2)	0.38 (9.7)	0.13 (3.3)	0.03 (0.8)	0.22 (5.6)	.507 x 0.33 (12.9 x 8.4)
CSC-11B24-E04-E04	5.0 (0.56)	1.25 (31.8)	1.28 (32.5)	.250 (6.4)	0.87 (22.1)	0.56 (14.2)	0.38 (9.7)	0.13 (3.3)	0.03 (0.8)	0.22 (5.6)	NA
CSC-11B24-E05-E05	5.0 (0.56)	1.25 (31.8)	1.28 (32.5)	.312 (7.9)	0.87 (22.1)	0.56 (14.2)	0.38 (9.7)	0.13 (3.3)	0.03 (0.8)	0.22 (5.6)	NA

PERFORMANCE											
Model	Static Torque lb-in (Nm)	Coil Voltage VDC	Resistance Ohms nom	Power Watts max	Armature Engage. msec	Armature Disengage. msec	Armature Inertia lb-in-sec ²	Rotor Inertia lb-in-sec ²	Weight lb (kg)	Energy Dissipation ft-lb/min	
CS-11	5.0 (0.56)	24/90	128/1800	5.0	5.0	18.0	3.5 x 10 ⁻⁵	2.6 x 10 ⁻⁵	0.2 (0.1)	175	
CSC-11	5.0 (0.56)	24/90	128/1800	5.0	5.0	18.0	3.4 x 10 ⁻⁵	2.6 x 10 ⁻⁵	0.2 (0.1)	175	

*See "How to order" model numbering system on page 12 for clutches & clutch couplings.
(-) denotes metric equivalents. Specifications subject to change without notice.

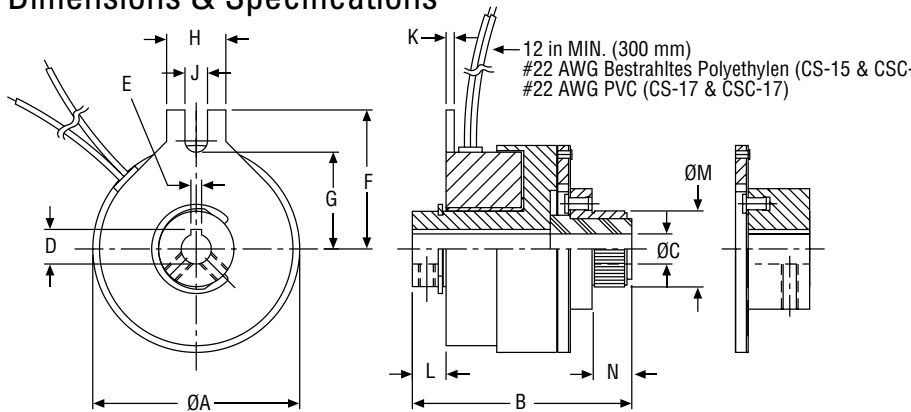
General Notes

- Customer shall maintain concentricity between armature assembly and rotor shaft within .003 T.I.R.
- Customer shall maintain a loose pin fit through the anti-rotation tab to prevent pre-loading of bearings.
- Other voltages available upon request.
- Initial working air gap at installation shall be .004/.009.
- Customer supplied gear/pulley/sprocket is press-fit on the clutch armature assembly knurl.
- Rotor is secured to shaft by set screw or roll pin.
- Clutch coupling armature assembly is secured to shaft by set screws and key.
- Metric bores available
- Static torque values above are burnished



CS-15, 17 Clutches & CSC-15, 17 Clutch Couplings

Dimensions & Specifications



Dimensions (mm)
Mounting requirements see page 56.

CS Model

CSC Model

CS Model Shown

CLUTCH & CLUTCH COUPLINGS

DIMENSIONS													
Model*	Static Torque in (mm)	A: OD in (mm)	B: OAL in (mm)	C: Bore Ø in (mm)	D: K'way Height in (mm)	E: K'way Width in (mm)	F: Tab Height in (mm)	G: Slot Height in (mm)	H: Tab Width in (mm)	J: Slot Width in (mm)	K: Tab Thick. in (mm)	L: Lngth in (mm)	M: Mtg Ø x N: Lg in (mm)
CS-15B24-E04-E04	10 (1.13)	1.53 (38.9)	1.83 (46.5)	.250 (6.4)	.286 (7.3)	.062 (1.6)	1.10 (27.9)	0.75 (19.1)	0.50 (12.7)	0.19 (4.8)	0.06 (1.5)	0.38 (9.7)	.631 x 0.33 (16.0 x 8.4)
CS-15B24-E05-E05	10 (1.13)	1.53 (38.9)	1.83 (46.5)	.312 (7.9)	.364 (9.2)	.094 (2.4)	1.10 (27.9)	0.75 (19.1)	0.50 (12.7)	0.19 (4.8)	0.06 (1.5)	0.38 (9.7)	.631 x 0.33 (16.0 x 8.4)
CS-15B24-E06-E06	10 (1.13)	1.53 (38.9)	1.83 (46.5)	.375 (9.5)	NA	NA	1.10 (27.9)	0.75 (19.1)	0.50 (12.7)	0.19 (4.8)	0.06 (1.5)	0.38 (9.7)	.631 x 0.33 (16.0 x 8.4)
CSC-15B24-E04-E04	10 (1.13)	1.53 (38.9)	1.68 (42.7)	.250 (6.4)	.286 (7.3)	.062 (1.6)	1.10 (27.9)	0.75 (19.1)	0.50 (12.7)	0.19 (4.8)	0.06 (1.5)	0.38 (9.7)	NA
CSC-15B24-E05-E05	10 (1.13)	1.53 (38.9)	1.68 (42.7)	.312 (7.9)	.364 (9.2)	.094 (2.4)	1.10 (27.9)	0.75 (19.1)	0.50 (12.7)	0.19 (4.8)	0.06 (1.5)	0.38 (9.7)	NA
CSC-15B24-E06-E06	10 (1.13)	1.53 (38.9)	1.68 (42.7)	.375 (9.5)	NA	NA	1.10 (27.9)	0.75 (19.1)	0.50 (12.7)	0.19 (4.8)	0.06 (1.5)	0.38 (9.7)	NA
CS-17B24-E04-E04	15 (1.69)	1.78 (45.2)	1.85 (47.0)	.250 (6.4)	.286 (7.3)	.062 (1.6)	1.32 (33.5)	0.91 (23.1)	0.50 (12.7)	0.19 (4.8)	0.06 (1.5)	0.30 (7.6)	.631 x 0.33 (16.0 x 8.4)
CS-17B24-E05-E05	15 (1.69)	1.78 (45.2)	1.85 (47.0)	.312 (7.9)	.364 (9.2)	.094 (2.4)	1.32 (33.5)	0.91 (23.1)	0.50 (12.7)	0.19 (4.8)	0.06 (1.5)	0.30 (7.6)	.631 x 0.33 (16.0 x 8.4)
CS-17B24-E06-E06	15 (1.69)	1.78 (45.2)	1.85 (47.0)	.375 (9.5)	.425 (10.8)	.094 (2.4)	1.32 (33.5)	0.91 (23.1)	0.50 (12.7)	0.19 (4.8)	0.06 (1.5)	0.30 (7.6)	.631 x 0.33 (16.0 x 8.4)
CSC-17B24-E04-E04	15 (1.69)	1.78 (45.2)	1.55 (39.4)	.250 (6.4)	.286 (7.3)	.062 (1.6)	1.32 (33.5)	0.91 (23.1)	0.50 (12.7)	0.19 (4.8)	0.06 (1.5)	0.30 (7.6)	NA
CSC-17B24-E05-E05	15 (1.69)	1.78 (45.2)	1.55 (39.4)	.312 (7.9)	.364 (9.2)	.094 (2.4)	1.32 (33.5)	0.91 (23.1)	0.50 (12.7)	0.19 (4.8)	0.06 (1.5)	0.30 (7.6)	NA
CSC-17B24-E06-E06	15 (1.69)	1.78 (45.2)	1.55 (39.4)	.375 (9.5)	.425 (10.8)	.094 (2.4)	1.32 (33.5)	0.91 (23.1)	0.50 (12.7)	0.19 (4.8)	0.06 (1.5)	0.30 (7.6)	NA

PERFORMANCE											
Model	Static Torque lb-in (Nm)	Coil Voltage VDC	Resistance Ohms nom.	Power Watts max	Armature Engage. msec	Armature Diseng. msec	Armature Inertia lb-in-sec ²	Rotor Inertia lb-in-sec ²	Weight lb (kg)	Energy Dissipation ft-lb/min	
CS-15	10 (1.13)	24/90	130/1800	5.0	8.0	22.0	5.9 x 10 ⁻⁵	5.2 x 10 ⁻⁵	0.4 (0.2)	295	
CSC-15	10 (1.13)	24/90	130/1800	5.0	8.0	22.0	6.6 x 10 ⁻⁵	5.2 x 10 ⁻⁵	0.4 (0.2)	295	
CS-17	15 (1.69)	24/90	108/1500	6.0	10.0	27.0	7.3 x 10 ⁻⁵	11.4 x 10 ⁻⁵	0.6 (0.3)	420	
CSC-17	15 (1.69)	24/90	108/1500	6.0	10.0	27.0	8.1 x 10 ⁻⁵	11.4 x 10 ⁻⁵	0.6 (0.3)	420	

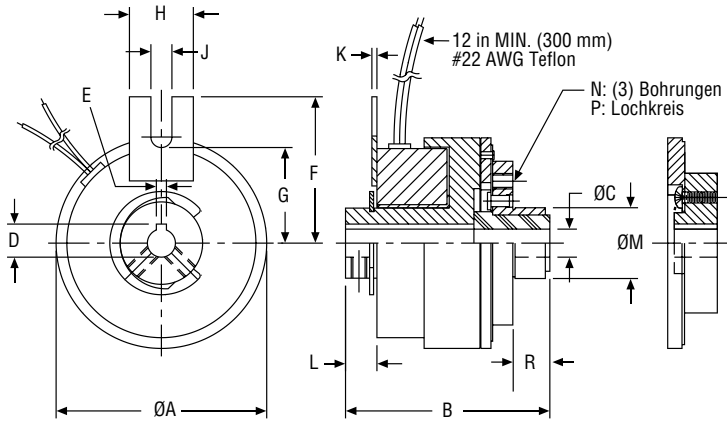
*See "How to order" model numbering system on page 12 for clutches & clutch couplings.
(-) denotes metric equivalents. Specifications subject to change without notice.

General Notes

- Initial working air gap at installation shall be .004/.009.
- Static torque values above are burnished.
- Customer shall maintain a loose pin fit through the anti-rotation tab to prevent pre-loading of bearings.
- Metric bores available
- Other voltages available upon request.

CS-22, 26 Clutches & CSC-22, 26 Clutch Couplings

Dimensions & Specifications



Dimensions (mm)

CS Model

CSC Model

CSC Model Shown

Mounting requirements see page 56.

DIMENSIONS

Model*	Static Torque in (mm)	A: OD in (mm)	B: OAL in (mm)	C: Bore Ø in (mm)	D: K'way Height in (mm)	E: K'way Width in (mm)	F: Tab Height in (mm)	G: Slot Height in (mm)	H: Tab Width in (mm)	J: Slot Width in (mm)	K: Tab Thick. in (mm)	L: Lngth in (mm)	M: Mtg Ø x R: Lngth in (mm)	N: (3) Mtg. Holes	P: Mtg. Hole BC Ø in (mm)
CS-22B24-E05-E05	40 (4.52)	2.26 (57.4)	2.20 (55.9)	.312 (7.9)	.364 (9.2)	.094 (2.4)	1.52 (38.6)	1.16 (29.5)	0.44 (11.2)	0.19 (4.8)	0.06 (1.5)	0.36 (9.1)	.756 x .37 (19.2 x 9.4)	NA	NA
CS-22B24-E06-E06	40 (4.52)	2.26 (57.4)	2.20 (55.9)	.375 (9.5)	.425 (10.8)	.094 (2.4)	1.52 (38.6)	1.16 (29.5)	0.44 (11.2)	0.19 (4.8)	0.06 (1.5)	0.36 (9.1)	.756 x .37 (19.2 x 9.4)	NA	NA
CS-22B24-E08-E08	40 (4.52)	2.26 (57.4)	2.20 (55.9)	.500 (12.7)	.564 (14.3)	.125 (3.2)	1.52 (38.6)	1.16 (29.5)	0.44 (11.2)	0.19 (4.8)	0.06 (1.5)	0.36 (9.1)	.756 x .37 (19.2 x 9.4)	NA	NA
CSC-22B24-E05-E05	40 (4.52)	2.26 (57.4)	2.06 (52.3)	.312 (7.9)	.364 (9.2)	.094 (2.4)	1.52 (38.6)	1.16 (29.5)	0.44 (11.2)	0.19 (4.8)	0.06 (1.5)	0.36 (9.1)	NA	NA	NA
CSC-22B24-E06-E06	40 (4.52)	2.26 (57.4)	2.06 (52.3)	.375 (9.5)	.425 (10.8)	.094 (2.4)	1.52 (38.6)	1.16 (29.5)	0.44 (11.2)	0.19 (4.8)	0.06 (1.5)	0.36 (9.1)	NA	NA	NA
CSC-22B24-E08-E08	40 (4.52)	2.26 (57.4)	2.06 (52.3)	.500 (12.7)	.564 (14.3)	.125 (3.2)	1.52 (38.6)	1.16 (29.5)	0.44 (11.2)	0.19 (4.8)	0.06 (1.5)	0.36 (9.1)	NA	NA	NA
CS-26B24-E06-E06	80 (9.04)	2.63 (66.8)	2.47 (62.7)	.375 (9.5)	.425 (10.8)	.094 (2.4)	1.75 (44.5)	1.34 (34.0)	0.50 (12.7)	0.19 (4.8)	0.06 (1.5)	0.34 (8.6)	.999 x 0.47 (25.4 x 11.9)	#8-32	1.375 (34.9)
CS-26B24-E08-E08	80 (9.04)	2.63 (66.8)	2.47 (62.7)	.500 (12.7)	.564 (14.3)	.125 (3.2)	1.75 (44.5)	1.34 (34.0)	0.50 (12.7)	0.19 (4.8)	0.06 (1.5)	0.34 (8.6)	.999 x 0.47 (25.4 x 11.9)	#8-32	1.375 (34.9)
CSC-26B24-E06-E06	80 (9.04)	2.63 (66.8)	2.10 (53.3)	.375 (9.5)	.425 (10.8)	.094 (2.4)	1.75 (44.5)	1.34 (34.0)	0.50 (12.7)	0.19 (4.8)	0.06 (1.5)	0.34 (8.6)	NA	NA	NA
CSC-26B24-E08-E08	80 (9.04)	2.63 (66.8)	2.10 (53.3)	.500 (12.7)	.564 (14.3)	.125 (3.2)	1.75 (44.5)	1.34 (34.0)	0.50 (12.7)	0.19 (4.8)	0.06 (1.5)	0.34 (8.6)	NA	NA	NA

PERFORMANCE

Model	Static Torque lb-in (Nm)	Coil Voltage VDC	Resistance Ohms nom.	Power Watts max	Armature Engagement msec	Armature Disengagement msec	Armature Inertia lb-in-sec ²	Rotor Inertia lb-in-sec ²	Weight lb (kg)	Energy Dissipation ft-lb/min
CS-22	40 (4.52)	24/90	75/1059	8.5	12.0	32.0	33.4 x 10 ⁻⁵	32.3 x 10 ⁻⁵	1.1 (0.5)	1400
CSC-22	40 (4.52)	24/90	75/1059	8.5	12.0	32.0	33.1 x 10 ⁻⁵	32.3 x 10 ⁻⁵	1.1 (0.5)	1400
CS-26	80 (9.04)	24/90	65/893	9.5	15.0	35.0	80.0 x 10 ⁻⁵	62.0 x 10 ⁻⁵	1.4 (0.6)	2600
CSC-26	80 (9.04)	24/90	65/893	9.5	15.0	35.0	81.0 x 10 ⁻⁵	62.0 x 10 ⁻⁵	1.4 (0.6)	2600

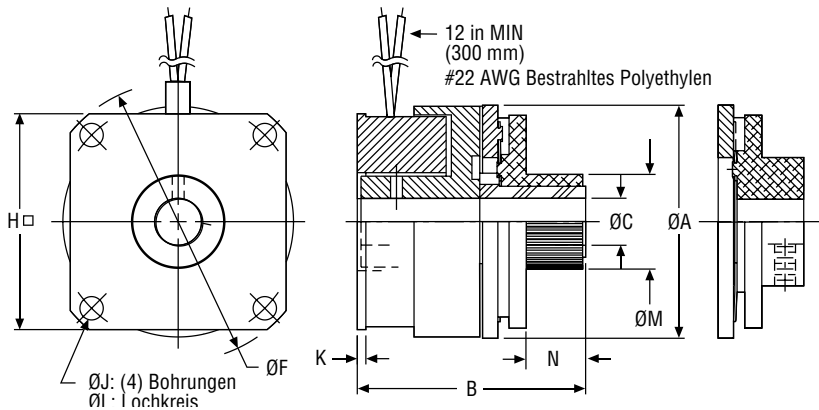
*See "How to order" model numbering system on page 12 for clutches & clutch couplings.
(-) denotes metric equivalents. Specifications subject to change without notice.

General Notes

- Initial working air gap at installation shall be .006/.013.
- Static torque values above are burnished
- Customer shall maintain a loose pin fit through the anti-rotation tab to prevent pre-loading of bearings.
- Metric bores available
- Other voltages available upon request.

CF-11 Clutches & CFC-11 Clutch Couplings

Dimensions & Specifications



Dimensions (mm)

CF Model

CFC Model

CF Model Shown

Mounting requirements see page 56.

DIMENSIONS										
Model*	Static Torque lb-in (Nm)	A: OD in (mm)	B: OAL in (mm)	C: Bore Ø in (mm)	F: Mtg Pilot Ø in (mm)	HØ: Mtg Width in (mm)	J: (4) Mtg Holes Ø in (mm)	K: Mtg Plt Thickness in (mm)	L: Mtg Hole BC Ø in (mm)	M: Mtg Ø x N: Length in (mm)
CF-11B24-E04-E04	5.0 (.56)	1.25 (31.8)	1.23 (31.2)	.250 (6.4)	1.498 (38.0)	1.17 (29.7)	.125 (3.2)	0.05 (1.3)	1.31 (33.3)	.507 x .33 (12.9 x 8.4)
CF-11B24-E05-E05	5.0 (.56)	1.25 (31.8)	1.23 (31.2)	.312 (7.9)	1.498 (38.0)	1.17 (29.7)	.125 (3.2)	0.05 (1.3)	1.31 (33.3)	.507 x .33 (12.9 x 8.4)
CFC-11B24-E04-E04	5.0 (.56)	1.25 (31.8)	1.14 (29.0)	.250 (6.4)	1.498 (38.0)	1.17 (29.7)	.125 (3.2)	0.05 (1.3)	1.31 (33.3)	NA
CFC-11B24-E05-E05	5.0 (.56)	1.25 (31.8)	1.14 (29.0)	.312 (7.9)	1.498 (38.0)	1.17 (29.7)	.125 (3.2)	0.05 (1.3)	1.31 (33.3)	NA

PERFORMANCE										
Model	Static Torque lb-in (Nm)	Coil Voltage VDC	Resistance Ohms nom.	Power Watts max	Armature Engagement msec	Armature Disengagement msec	Armature Inertia lb-in-sec ²	Rotor Inertia lb-in-sec ²	Weight lb (kg)	Energy Dissipation ft-lb/min
CF-11	5.0 (.56)	24/90	128/1800	5.0	5.0	18.0	3.5 x 10 ⁻⁵	2.5 x 10 ⁻⁵	0.2 (0.1)	175
CFC-11	5.0 (.56)	24/90	128/1800	5.0	5.0	18.0	3.5 x 10 ⁻⁵	2.5 x 10 ⁻⁵	0.2 (0.1)	175

*See "How to order" model numbering system on page 12 for clutches & clutch couplings.
(-) denotes metric equivalents. Specifications subject to change without notice.

General Notes

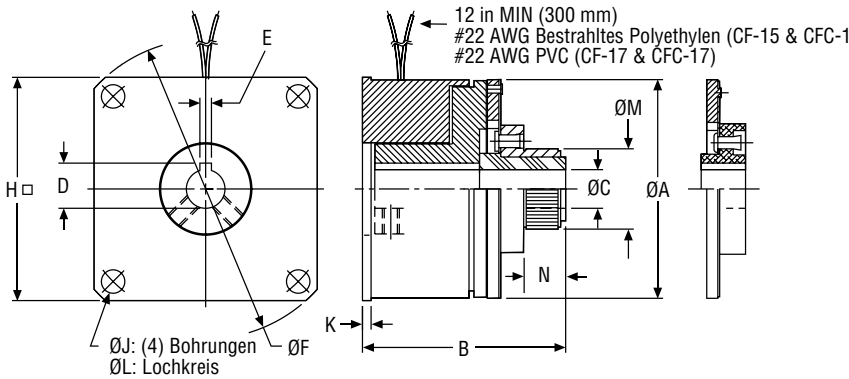
- Initial working air gap at installation shall be .004/.009.
- Customer shall maintain the perpendicularity of the case assembly mounting surface with respect to the shaft within .003 T.I.R. at the diameter of the bolt circle.
- Customer shall maintain concentricity of case assembly mounting pilot with respect to the shaft within .003 T.I.R.
- Customer shall maintain concentricity between armature assembly and rotor shaft within .003 T.I.R.
- Customer supplied gear/pulley/sprocket is press-fit on the clutch armature assembly knurl.
- Clutch coupling armature assembly is secured to shaft by set screws and key.
- Rotor is secured to shaft by a roll pin.
- Metric bores available
- Static torque values above are burnished.
- Other voltages available upon request.



CF-15, 17 Clutches & CFC-15, 17 Clutch Couplings

Dimensions & Specifications

CLUTCH & CLUTCH COUPLINGS



Dimensions (mm)
Mounting requirements see page 56.

CF Model

CFC Model

CFC Model Shown

DIMENSIONS												
Model*	Static Torque in (mm)	A: OD in (mm)	B: OAL in (mm)	C: Bore Ø in (mm)	D: K'way Height in (mm)	E: K'way Width in (mm)	F: Mtg Pilot Ø in (mm)	H □Mtg Width in (mm)	J: (4) Mtg Holes in (mm)	K: Mtg Pkt Thickness in (mm)	L: Mtg Hole BCØ	M: Mtg Ø x N: Length in (mm)
CF-15B24-E04-E04	10 (1.13)	1.53 (38.9)	1.54 (39.1)	.250 (6.4)	.286 (7.3)	.062 (1.6)	1.999 (50.8)	1.56 (39.6)	.156 (4.0)	0.06 (1.5)	1.75 (44.5)	.631 x .33 (16.0 x 8.4)
CF-15B24-E05-E05	10 (1.13)	1.53 (38.9)	1.54 (39.1)	.312 (7.9)	.364 (9.2)	.094 (2.4)	1.999 (50.8)	1.56 (39.6)	.156 (4.0)	0.06 (1.5)	1.75 (44.5)	.631 x .33 (16.0 x 8.4)
CF-15B24-E06-E06	10 (1.13)	1.53 (38.9)	1.54 (39.1)	.375 (9.5)	NA	NA	1.999 (50.8)	1.56 (39.6)	.156 (4.0)	0.06 (1.5)	1.75 (44.5)	.631 x .33 (16.0 x 8.4)
CFC-15B24-E04-E04	10 (1.13)	1.53 (38.9)	1.38 (35.1)	.250 (6.4)	.286 (7.3)	0.62 (1.6)	1.999 (50.8)	1.56 (39.6)	.156 (4.0)	0.06 (1.5)	1.75 (44.5)	NA
CFC-15B24-E05-E05	10 (1.13)	1.53 (38.9)	1.38 (35.1)	.312 (7.9)	.364 (9.2)	.094 (2.4)	1.999 (50.8)	1.56 (39.6)	.156 (4.0)	0.06 (1.5)	1.75 (44.5)	NA
CFC-15B24-E06-E06	10 (1.13)	1.53 (38.9)	1.38 (35.1)	.375 (9.5)	NA	NA	1.999 (50.8)	1.56 (39.6)	.156 (4.0)	0.06 (1.5)	1.75 (44.5)	NA
CF-17B24-E04-E04	15 (1.69)	1.78 (45.2)	1.65 (41.9)	.250 (6.4)	.286 (7.3)	.062 (1.6)	2.436 (61.9)	1.82 (46.2)	.187 (4.7)	0.06 (1.5)	2.13 (54.1)	.631 x .33 (16.0 x 8.4)
CF-17B24-E05-E05	15 (1.69)	1.78 (45.2)	1.65 (41.9)	.312 (7.9)	.364 (9.2)	.094 (2.4)	2.436 (61.9)	1.82 (46.2)	.187 (4.7)	0.06 (1.5)	2.13 (54.1)	.631 x .33 (16.0 x 8.4)
CF-17B24-E06-E06	15 (1.69)	1.78 (45.2)	1.65 (41.9)	.375 (9.5)	.425 (10.8)	.094 (2.4)	2.436 (61.9)	1.82 (46.2)	.187 (4.7)	0.06 (1.5)	2.13 (54.1)	.631 x .33 (16.0 x 8.4)
CFC-17B24-E04-E04	15 (1.69)	1.78 (45.2)	1.35 (34.3)	.250 (6.4)	.286 (7.3)	.062 (1.6)	2.436 (61.9)	1.82 (46.2)	.187 (4.7)	0.06 (1.5)	2.13 (54.1)	NA
CFC-17B24-E05-E05	15 (1.69)	1.78 (45.2)	1.35 (34.3)	.312 (7.9)	.364 (9.2)	.094 (2.4)	2.436 (61.9)	1.82 (46.2)	.187 (4.7)	0.06 (1.5)	2.13 (54.1)	NA
CFC-17B24-E06-E06	15 (1.69)	1.78 (45.2)	1.35 (34.3)	.375 (9.5)	.425 (10.8)	.094 (2.4)	2.436 (61.9)	1.82 (46.2)	.187 (4.7)	0.06 (1.5)	2.13 (54.1)	NA

PERFORMANCE										
Model	Static Torque lb-in (Nm)	Coil Voltage VDC	Resistance Ohms nom.	Power Watts max	Armature Engagement msec	Armature Disengagement msec	Armature Inertia lb-in-sec ²	Rotor Inertia lb-in-sec ²	Weight lb (kg)	Energy Dissipation ft-lb/min
CF-15	10 (1.13)	24/90	130/1800	5.0	8.0	22.0	5.9 x 10 ⁻⁵	5.0 x 10 ⁻⁵	0.4 (0.2)	295
CFC-15	10 (1.13)	24/90	130/1800	5.0	8.0	22.0	6.6 x 10 ⁻⁵	5.0 x 10 ⁻⁵	0.4 (0.2)	295
CF-17	15 (1.69)	24/90	108/1500	6.0	10.0	27.0	7.3 x 10 ⁻⁵	11.7 x 10 ⁻⁵	0.6 (0.3)	420
CFC-17	15 (1.69)	24/90	108/1500	6.0	10.0	27.0	8.1 x 10 ⁻⁵	11.7 x 10 ⁻⁵	0.6 (0.3)	420

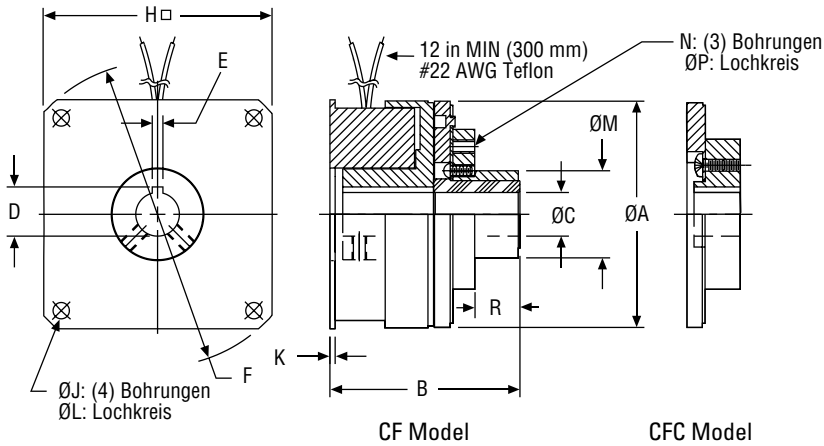
*See "How to order" model numbering system on page 12 for clutches & clutch couplings.
(-) denotes metric equivalents. Specifications subject to change without notice.

General Notes

- Customer shall maintain the perpendicularity of the case assembly mounting surface with respect to the shaft within .003 T.I.R. at the diameter of the bolt circle.
- Static torque values above are burnished.
- Customer shall maintain concentricity of case assembly mounting pilot with respect to the shaft within .003 T.I.R.
- Other voltages available upon request.
- Metric bores available
- Initial working air gap at installation shall be .006/.013.
- Customer shall maintain concentricity between armature and rotor shaft within .003 T.I.R.

CF-22, 26 Clutches & CFC-22, 26 Clutch Couplings

Dimensions & Specifications



CFC Model Shown

Dimensions (mm)
Mounting requirements see page 56.

DIMENSIONS														
Model*	Static Torque lb-in (Nm)	A: OD in (mm)	B: OAL in (mm)	C: Bore Ø in (mm)	D: K'way Height in (mm)	E: K'way Width in (mm)	F: Mtg Pilot Ø in (mm)	H: Mtg Width in (mm)	J: (4) Mtg Holes Ø in (mm)	K: Mtg Plt Thick. in (mm)	L: Mtg Hole BC Ø in (mm)	M: Mtg Ø x R: Lgth in (mm)	N: (3) Mtg Holes	P: Mtg Hole BC Ø in (mm)
CF-22B24-E05-E05	40 (4.52)	2.26 (57.4)	1.93 (49.0)	.312 (7.9)	.364 (9.2)	.094 (2.4)	2.873 (73.0)	2.33 (59.2)	.166 (4.2)	0.06 (1.5)	2.50 (63.5)	.756 x .37 (19.2 x 9.4)	NA	NA
CF-22B24-E06-E06	40 (4.52)	2.26 (57.4)	1.93 (49.0)	.375 (9.5)	.425 (10.8)	.094 (2.4)	2.873 (73.0)	2.33 (59.2)	.166 (4.2)	0.06 (1.5)	2.50 (63.5)	.756 x .37 (19.2 x 9.4)	NA	NA
CF-22B24-E08-E08	40 (4.52)	2.26 (57.4)	1.93 (49.0)	.500 (12.7)	.564 (14.3)	.125 (3.2)	2.873 (73.0)	2.33 (59.2)	.166 (4.2)	0.06 (1.5)	2.50 (63.5)	.756 x .37 (19.2 x 9.4)	NA	NA
CFC-22B24-E05-E05	40 (4.52)	2.26 (57.4)	1.78 (45.2)	.312 (7.9)	.364 (9.2)	.094 (2.4)	2.873 (73.0)	2.33 (59.2)	.166 (4.2)	0.06 (1.5)	2.50 (63.5)	NA	NA	NA
CFC-22B24-E06-E06	40 (4.52)	2.26 (57.4)	1.78 (45.2)	.375 (9.5)	.425 (10.8)	.094 (2.4)	2.873 (73.0)	2.33 (59.2)	.166 (4.2)	0.06 (1.5)	2.50 (63.5)	NA	NA	NA
CFC-22B24-E08-E08	40 (4.52)	2.26 (57.4)	1.78 (45.2)	.500 (12.7)	.564 (14.3)	.125 (3.2)	2.873 (73.0)	2.33 (59.2)	.166 (4.2)	0.06 (1.5)	2.50 (63.5)	NA	NA	NA
CF-26B24-E06-E06	80 (9.04)	2.63 (66.8)	2.20 (55.9)	.375 (9.5)	.425 (10.8)	.094 (2.4)	3.499 (88.9)	2.63 (66.8)	.187 (4.7)	0.06 (1.5)	3.13 (79.5)	.999 x .47 (25.4 x 11.9)	#8-32	1.375 (34.9)
CF-26B24-E08-E08	80 (9.04)	2.63 (66.8)	2.20 (55.9)	.500 (12.7)	.564 (14.3)	.125 (3.2)	3.499 (88.9)	2.63 (66.8)	.187 (4.7)	0.06 (1.5)	3.13 (79.5)	.999 x .47 (25.4 x 11.9)	#8-32	1.375 (34.9)
CFC-26B24-E06-E06	80 (9.04)	2.63 (66.8)	1.84 (46.7)	.375 (9.5)	.425 (10.8)	.094 (2.4)	3.499 (88.9)	2.63 (66.8)	.187 (4.7)	0.06 (1.5)	3.13 (79.5)	NA	NA	NA

PERFORMANCE										
Model	Static Torque lb-in (Nm)	Coil Voltage VDC	Resistance Ohms nom.	Power Watts max	Armature Engagement msec	Armature Disengagement msec	Armature Inertia lb-in-sec ²	Rotor Inertia lb-in-sec ²	Weight lb (kg)	Energy Dissipation ft-lb/min
CF-22	40 (4.52)	24/90	75/1059	8.5	12.0	32.0	33.4 x 10 ⁻⁵	31.7 x 10 ⁻⁵	1.1 (0.5)	1400
CFC-22	40 (4.52)	24/90	75/1059	8.5	12.0	32.0	33.1 x 10 ⁻⁵	31.7 x 10 ⁻⁵	1.1 (0.5)	1400
CF-26	80 (9.04)	24/90	65/893	9.5	15.0	35.0	80.0 x 10 ⁻⁵	64.0 x 10 ⁻⁵	1.4 (0.6)	2600
CFC-26	80 (9.04)	24/90	65/893	9.5	15.0	35.0	81.0 x 10 ⁻⁵	64.0 x 10 ⁻⁵	1.4 (0.6)	2600

*See "How to order" model numbering system on page 12 for clutches & clutch couplings.
(-) denotes metric equivalents. Specifications subject to change without notice.

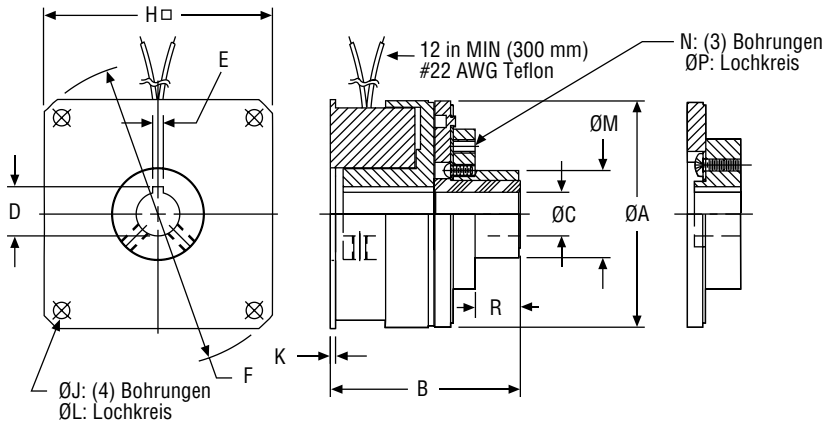
General Notes

- Customer shall maintain the perpendicularity of the case assembly mounting surface with respect to the shaft within .003 T.I.R. at the diameter of the bolt circle.
- Static torque values above are burnished.
- Customer shall maintain concentricity of case assembly mounting pilot with respect to the shaft within .003 T.I.R.
- Metric bores available
- Other voltages available upon request.
- Initial working air gap at installation shall be .006/.013.
- Customer shall maintain concentricity between armature and rotor shaft within .003 T.I.R.



CF-30 Clutches & CFC-30 Clutch Couplings

Dimensions & Specifications



CF Model

CFC Model



CFC Model Shown

Dimensions (mm)
Mounting requirements see page 56.

DIMENSIONS														
Model*	Static Torque lb-in (Nm)	A: OD in (mm)	B: OAL in (mm)	C: Bore Ø in (mm)	D: K'way Height in (mm)	E: K'way Width in (mm)	F: Mtg Pilot Ø in (mm)	H: Mtg Width in (mm)	J: (4) Mtg Holes Ø in (mm)	K: Mtg Plt Thick. in (mm)	L: Mtg Hole BC Ø in (mm)	M: Mtg Ø x R: Lgth in (mm)	N: (3) Mtg Holes	P: Mtg Hole BC Ø in (mm)
CF-30B24-E06-E06	125 (14.12)	3.27 (83.1)	2.53 (64.3)	.375 (9.5)	.425 (10.8)	.094 (2.4)	4.186 (106.3)	3.25 (82.6)	.187 (4.7)	0.09 (2.3)	3.75 (95.3)	1.374 x .83 (34.9 x 21.1)	#8-32	1.75 (44.5)
CF-30B24-E08-E08	125 (14.12)	3.27 (83.1)	2.53 (64.3)	.500 (12.7)	.564 (14.3)	.125 (3.2)	4.186 (106.3)	3.25 (82.6)	.187 (4.7)	0.09 (2.3)	3.75 (95.3)	1.374 x .83 (34.9 x 21.1)	#8-32	1.75 (44.5)
CF-30B24-E10-E10	125 (14.12)	3.27 (83.1)	2.53 (64.3)	.625 (15.9)	.709 (18.0)	.188 (4.8)	4.186 (106.3)	3.25 (82.6)	.187 (4.7)	0.09 (2.3)	3.75 (95.3)	1.374 x .83 (34.9 x 21.1)	#8-32	1.75 (44.5)
CFC-30B24-E06-E06	125 (14.12)	3.27 (83.1)	1.94 (49.3)	.375 (9.5)	.425 (10.8)	.094 (2.4)	4.186 (106.3)	3.25 (82.6)	.187 (4.7)	0.09 (2.3)	3.75 (95.3)	NA	NA	NA
CFC-30B24-E08-E08	125 (14.12)	3.27 (83.1)	1.94 (49.3)	.500 (12.7)	.564 (14.3)	.125 (3.2)	4.186 (106.3)	3.25 (82.6)	.187 (4.7)	0.09 (2.3)	3.75 (95.3)	NA	NA	NA

PERFORMANCE										
Model	Static Torque lb-in (Nm)	Coil Voltage VDC	Resistance Ohms nom.	Power Watts max	Armature Engagement msec	Armature Disengagement msec	Armature Inertia lb-in-sec ²	Rotor Inertia lb-in-sec ²	Weight lb (kg)	Energy Dissipation ft-lb/min
CF-30	125 (14.12)	24/90	44/600	15.0	18.0	45.0	180.0 x 10 ⁻⁵	207.2 x 10 ⁻⁵	3.3 (1.5)	2900
CFC-30	125 (14.12)	24/90	44/600	15.0	18.0	45.0	179.5 x 10 ⁻⁵	207.2 x 10 ⁻⁵	3.3 (1.5)	2900

*See "How to order" model numbering system on page 12 for clutches & clutch couplings.
(-) denotes metric equivalents. Specifications subject to change without notice.

General Notes

- Customer shall maintain the perpendicularity of the case assembly mounting surface with respect to the shaft within .003 T.I.R. at the diameter of the bolt circle.
- Static torque values above are burnished.
- Customer shall maintain concentricity of case assembly mounting pilot with respect to the shaft within .003 T.I.R.
- Metric bores available
- Other voltages available upon request.
- Initial working air gap at installation shall be .008/.018.
- Customer shall maintain concentricity between armature and rotor shaft within .003 T.I.R.



BF Series

Power-on Brakes

Electromagnetic power-on brakes provide an efficient, switchable means of stopping and/or holding the load. While the field (electromagnet) assembly is fixed and prevented from rotating by a flange, the armature assembly is secured to the shaft. When the coil is energized, the armature engages the friction surface of the fixed field (electromagnet) assembly, thus stopping and/or holding the load.

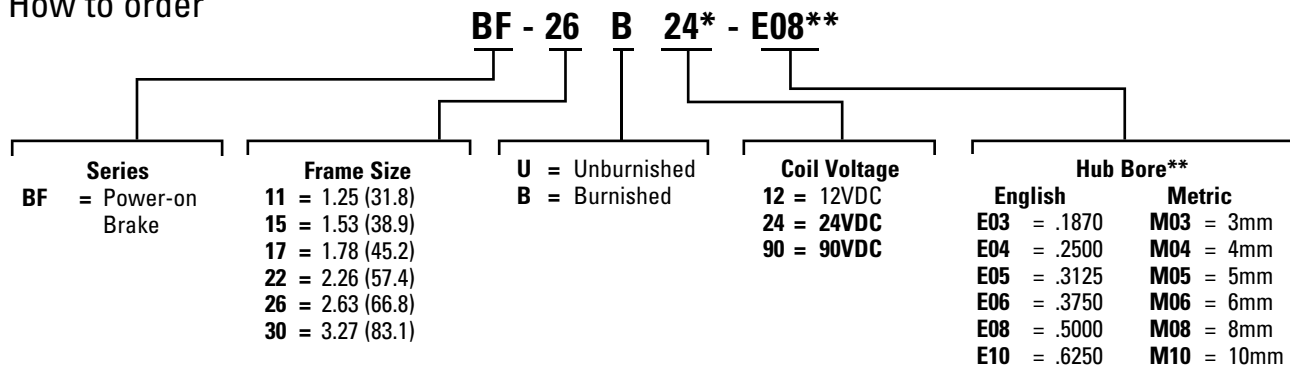
- Torque: 5 lb-in to 125 lb-in (0.56 to 14.13 Nm)
- Diameter: 1.25 to 3.27 in. (31.8 to 83.1 mm)
- Static or dynamic engagement
- Simple installation
- Economical cost
- Energy efficient



Typical Applications

- Robotics
- Medical equipment
- Actuators
- Motor brakes
- Postal handling equipment
- Packaging

How to order



Insulation Class:
BF: Class B (130°C)

* Other voltages available upon request

** See dimension tables for appropriate bore sizes available for each frame size.
Metric bore sizes available upon request.

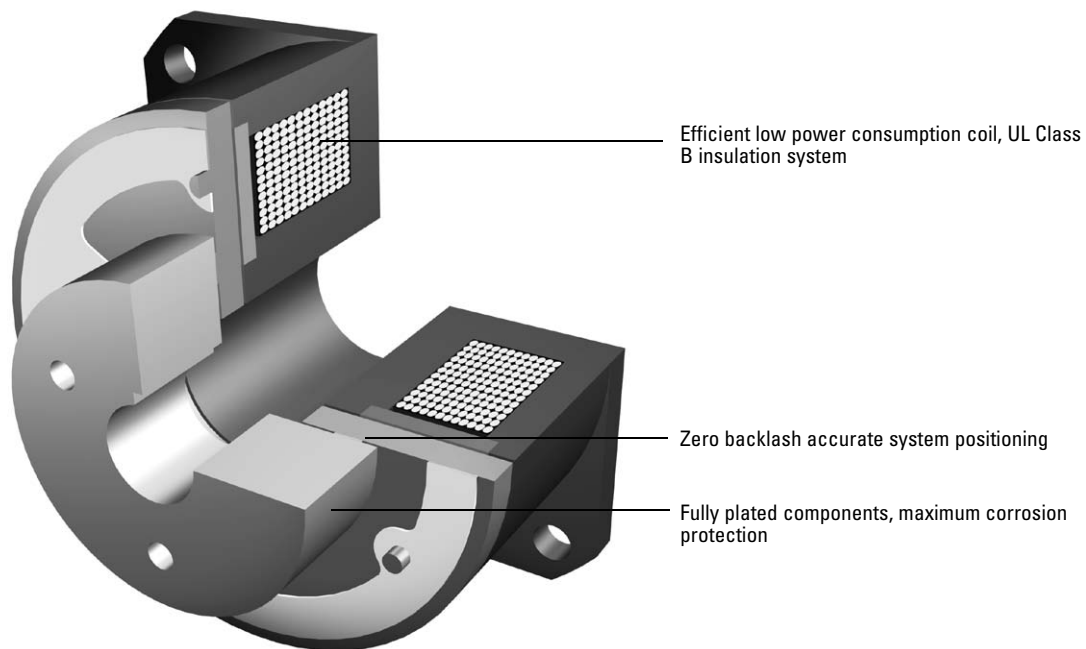
General Notes

- Actual starting and/or stopping times depend on application variables, manufacturing tolerances and friction material wear. Please consult factory for evaluation of actual use before applying specific values to your application.
- Consult factory for additional options.
- Working air gap should be checked periodically to insure proper operation. If it exceeds maximum recommended dimensions, the clutch or brake may not function properly.
- All friction faces must be kept free of grease and oil for proper operation.
- Flying leads are provided as standard, terminal style connection available upon request.
- Coil of 24 & 90 volts are provided as standard, other coil voltages are available upon request.



BF Series

Power-on Brakes

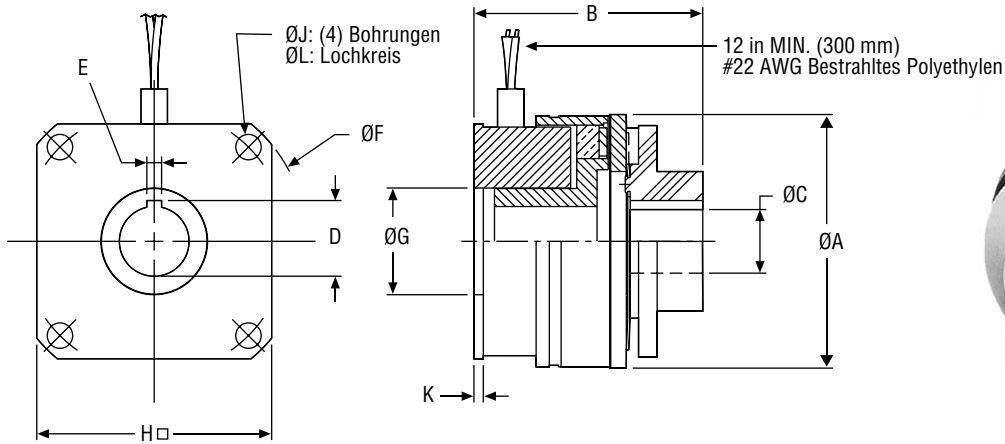


BRAKES



BF-11 Brakes

Dimensions & Specifications



BF Model Shown

Dimensions (mm)
Mounting requirements see page 56.

DIMENSIONS												
Model*	Static Torque lb-in (Nm)	A: OD in (mm)	B: OAL in (mm)	C: Hub ID Ø in (mm)	D: K'way Height in (mm)	E: K'way Width in (mm)	F: Mtg Pilot Ø in (mm)	G: Case ID Ø in (mm)	H □: Mtg Width in (mm)	J: (4) Mtg Holes Ø in (mm)	K: Mtg Plt Thickness in (mm)	L: Mtg Hole BC Ø in (mm)
BF-11B24-E04	5.0 (0.56)	1.25 (31.8)	1.14 (29.0)	.250 (6.4)	.286 (7.3)	.062 (1.6)	1.498 (38.0)	0.53 (1.35)	1.17 (29.7)	.125 (3.2)	0.05 (1.3)	1.31 (33.3)
BF-11B24-E05	5.0 (0.56)	1.25 (31.8)	1.14 (29.0)	.312 (7.9)	.364 (9.2)	.094 (2.4)	1.498 (38.0)	0.53 (1.35)	1.17 (29.7)	.125 (3.2)	0.05 (1.3)	1.31 (33.3)

PERFORMANCE										
Model	Static Torque lb-in (Nm)	Coil Voltage VDC	Resistance Ohms nom.	Power Watts max	Armature Engagement msec	Armature Disengagement msec	Armature Inertia lb-in-sec ²	Rotor Inertia lb-in-sec ²	Weight lb (kg)	Energy Dissipation ft-lb/min
BF-11	5.0 (0.56)	24/90	128/1800	5.0	5.0	18.0	3.4 x 10 ⁻⁵	NA	0.2 (0.1)	175

*See "How to order" model numbering system on page 22 for BF power-on brakes.
(-) denotes metric equivalents. Specifications subject to change without notice.

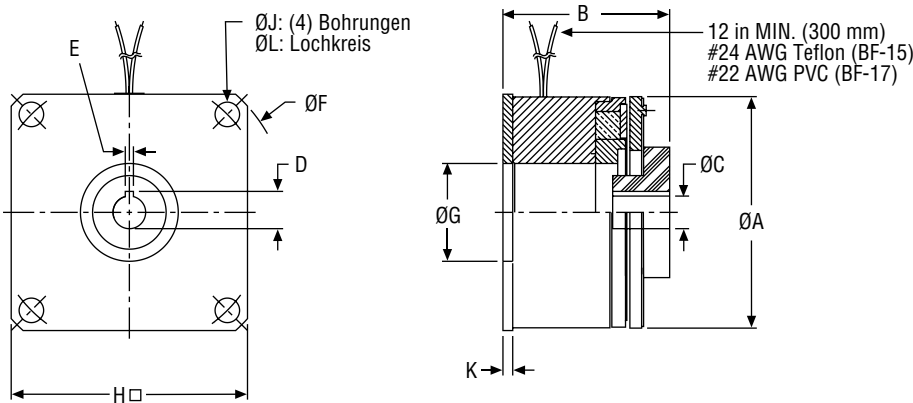
General Notes

- Customer shall maintain the perpendicularity of the case assembly mounting surface with respect to the shaft within .003 T.I.R. at the diameter of the bolt circle.
- Static torque values above are burnished.
- Customer shall maintain concentricity of case assembly mounting pilot with respect to the shaft within .003 T.I.R.
- Initial working air gap at installation shall be .004/.009.
- Other voltages available upon request.
- Brake coupling armature assembly is secured to shaft by (1) set screw and key.
- Metric bores available



BF-15, 17 Brakes

Dimensions & Specifications



BF Model Shown

Dimensions (mm)
Mounting requirements see page 56.

DIMENSIONS												
Model*	Static Torque lb-in (Nm)	A: OD in (mm)	B: OAL in (mm)	C: Hub ID Ø in (mm)	D: K'way Height in (mm)	E: K'way Width in (mm)	F: Mtg Pilot Ø in (mm)	G: Case ID Ø in (mm)	H □: Mtg Width in (mm)	J: (4) Mtg Holes Ø in (mm)	K: Mtg Plt Thick. in (mm)	L: Mtg Hole BC Ø in (mm)
BF-15B24-E04	10 (1.13)	1.53 (38.9)	1.38 (35.1)	.250 (6.4)	.286 (7.3)	.062 (1.6)	1.999 (50.8)	0.68 (17.3)	1.56 (39.6)	.156 (4.0)	0.06 (1.5)	1.75 (44.5)
BF-15B24-E05	10 (1.13)	1.53 (38.9)	1.38 (35.1)	.312 (7.9)	.364 (9.2)	.094 (2.4)	1.999 (50.8)	0.68 (17.3)	1.56 (39.6)	.156 (4.0)	0.06 (1.5)	1.75 (44.5)
BF-15B24-E06	10 (1.13)	1.53 (38.9)	1.38 (35.1)	.375 (9.5)	NA	NA	1.999 (50.8)	0.68 (17.3)	1.56 (39.6)	.156 (4.0)	0.06 (1.5)	1.75 (44.5)
BF-17B24-E04	15 (1.69)	1.78 (45.2)	1.27 (32.3)	.250 (6.4)	.286 (7.3)	.062 (1.6)	2.436 (61.9)	0.75 (19.1)	1.82 (46.2)	.187 (4.7)	0.06 (1.5)	2.13 (54.1)
BF-17B24-E05	15 (1.69)	1.78 (45.2)	1.27 (32.3)	.312 (7.9)	.364 (9.2)	.094 (2.4)	2.436 (61.9)	0.75 (19.1)	1.82 (46.2)	.187 (4.7)	0.06 (1.5)	2.13 (54.1)
BF-17B24-E06	15 (1.69)	1.78 (45.2)	1.27 (32.3)	.375 (9.5)	.425 (10.8)	.094 (2.4)	2.436 (61.9)	0.75 (19.1)	1.82 (46.2)	.187 (4.7)	0.06 (1.5)	2.13 (54.1)

PERFORMANCE										
Model	Static Torque lb-in (Nm)	Coil Voltage VDC	Resistance Ohms nom.	Power Watts max	Armature Engagement msec	Armature Disengagement msec	Armature Inertia lb-in-sec ²	Rotor Inertia lb-in-sec ²	Weight lb (kg)	Energy Dissipation ft-lb/min
BF-15	10.0 (1.13)	24/90	130/1800	5.0	8.0	22.0	6.6 x 10 ⁻⁵	NA	0.4 (0.2)	295
BF-17	15.0 (1.69)	24/90	108/1518	6.0	10.0	27.0	8.1 x 10 ⁻⁵	NA	0.5 (0.3)	420

*See "How to order" model numbering system on page 12 for clutches & clutch couplings. (-) denotes metric equivalents. Specifications subject to change without notice.

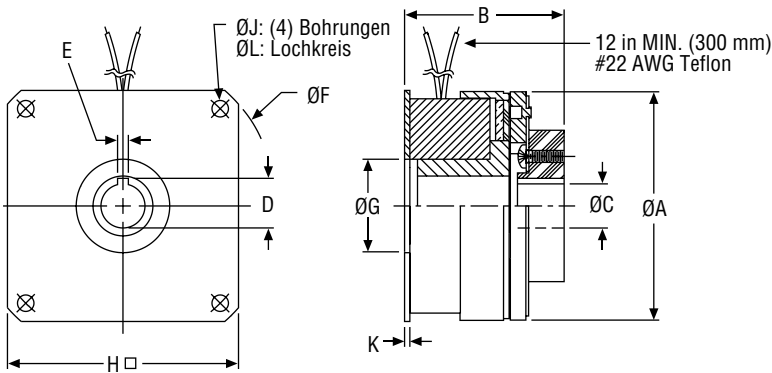
General Notes

- Customer shall maintain the perpendicularity of the case assembly mounting surface with respect to the shaft within .003 T.I.R. at the diameter of the bolt circle.
- Static torque values above are burnished.
- Customer shall maintain concentricity of case assembly mounting pilot with respect to the shaft within .003 T.I.R.
- Initial working air gap at installation shall be .006/.013.
- Other voltages available upon request.
- Brake coupling armature assembly is secured to shaft by (2) set screws and key.
- Metric bores available



BF-22, 26 Brakes

Dimensions & Specifications



Dimensions (mm)
Mounting requirements see page 56.

BF Model Shown

DIMENSIONS												
Model*	Static Torque lb-in (Nm)	A: OD in (mm)	B: OAL in (mm)	C: Hub ID Ø in (mm)	D: K'way Height in (mm)	E: K'way Width in (mm)	F: Mtg Pilot Ø in (mm)	G: Case ID Ø in (mm)	H □: Mtg Width in (mm)	J: (4) Mtg Holes Ø in (mm)	K: Mtg Plt Thick. in (mm)	L: Mtg Hole BC Ø in (mm)
BF-22B24-E05	40 (4.52)	2.26 (57.4)	1.74 (44.2)	.312 (7.9)	.364 (9.2)	.094 (2.4)	2.873 (73.0)	0.88 (22.4)	2.33 (52.9)	.166 (4.2)	0.06 (1.5)	2.50 (63.5)
BF-22B24-E06	40 (4.52)	2.26 (57.4)	1.74 (44.2)	.375 (9.5)	.425 (10.8)	.094 (2.4)	2.873 (73.0)	0.88 (22.4)	2.33 (52.9)	.166 (4.2)	0.06 (1.5)	2.50 (63.5)
BF-22B24-E08	40 (4.52)	2.26 (57.4)	1.74 (44.2)	.500 (12.7)	.564 (14.3)	.125 (3.2)	2.873 (73.0)	0.88 (22.4)	2.33 (52.9)	.166 (4.2)	0.06 (1.5)	2.50 (63.5)
BF-26B24-E06	80 (9.04)	2.63 (66.8)	1.84 (46.7)	.375 (9.5)	.425 (10.8)	.094 (2.4)	3.499 (88.9)	1.06 (27.0)	2.63 (66.8)	.187 (4.7)	0.06 (1.5)	3.13 (79.5)
BF-26B24-E08	80 (9.04)	2.63 (66.8)	1.84 (46.7)	.500 (12.7)	.564 (14.3)	.125 (3.2)	3.499 (88.9)	1.06 (27.0)	2.63 (66.8)	.187 (4.7)	0.06 (1.5)	3.13 (79.5)

PERFORMANCE										
Model	Static Torque lb-in (Nm)	Coil Voltage VDC	Resistance Ohms nom.	Power Watts max	Armature Engagement msec	Armature Disengagement msec	Armature Inertia lb-in-sec ²	Rotor Inertia lb-in-sec ²	Weight lb (kg)	Energy Dissipation ft-lb/min
BF-22	40.0 (4.52)	24/90	75/1048	8.5	12.0	32.0	33.1 x 10 ⁻⁵	NA	0.9 (0.4)	1400
BF-26	80.0 (9.04)	24/90	66/937	9.5	15.0	35.0	81.0 x 10 ⁻⁵	NA	1.2 (0.5)	2600

*See "How to order" model numbering system on page 22 for clutches & clutch couplings.
(-) denotes metric equivalents. Specifications subject to change without notice.

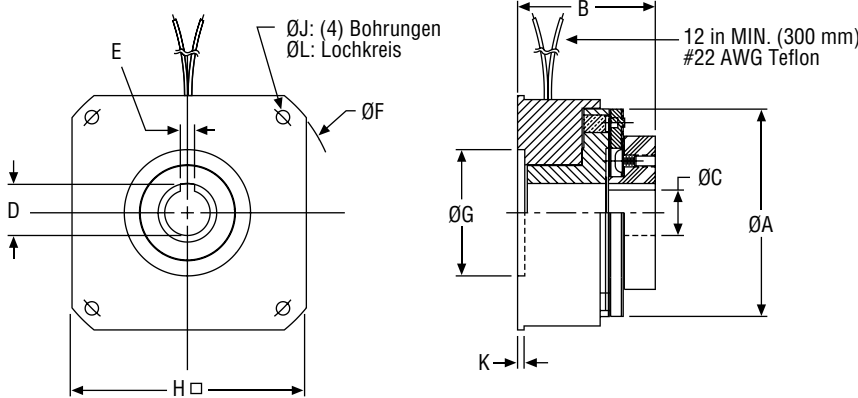
General Notes

- Customer shall maintain the perpendicularity of the case assembly mounting surface with respect to the shaft within .003 T.I.R. at the diameter of the bolt circle.
- Customer shall maintain concentricity of case assembly mounting pilot with respect to the shaft within .003 T.I.R.
- Other voltages available upon request.
- Static torque values above are burnished.
- Initial working air gap at installation shall be .008/.018.
- Brake coupling armature assembly is secured to shaft by (2) set screws and key.
- Metric bores available



BF-30 Brakes

Dimensions & Specifications



BF Model Shown

Dimensions (mm)
Mounting requirements see page 56.

DIMENSIONS												
Model*	Static Torque lb-in (Nm)	A: OD in (mm)	B: OAL in (mm)	C: Hub ID Ø in (mm)	D: K'way Height in (mm)	E: K'way Width in (mm)	F: Mtg Pilot Ø in (mm)	G: Case ID Ø in (mm)	H: Mtg Width in (mm)	J: (4) Mtg Holes Ø in (mm)	K: Mtg Plt Thick. in (mm)	L: Mtg Hole BC Ø in (mm)
BF-30B24-E06	125 (14.12)	3.27 (83.1)	1.93 (49.0)	.375 (9.5)	.425 (10.8)	.094 (2.4)	4.186 (106.3)	1.75 (44.5)	3.25 (82.6)	.187 (4.7)	0.09 (2.3)	3.75 (95.3)
BF-30B24-E08	125 (14.12)	3.27 (83.1)	1.93 (49.0)	.500 (12.7)	.564 (14.3)	.125 (3.2)	4.186 (106.3)	1.75 (44.5)	3.25 (82.6)	.187 (4.7)	0.09 (2.3)	3.75 (95.3)
BF-30B24-E10	125 (14.12)	3.27 (83.1)	1.93 (49.0)	.625 (15.9)	.709 (18.0)	.188 (4.8)	4.186 (106.3)	1.75 (44.5)	3.25 (82.6)	.187 (4.7)	0.09 (2.3)	3.75 (95.3)

PERFORMANCE										
Model	Static Torque lb-in (Nm)	Coil Voltage VDC	Resistance Ohms nom.	Power Watts max	Armature Engagement msec	Armature Disengagement msec	Armature Inertia lb-in-sec ²	Rotor Inertia lb-in-sec ²	Weight lb (kg)	Energy Dissipation ft-lb/min
BF-30	125.0 (14.13)	24/90	43/594	15.0	18.0	45.0	179 x 10 ⁻⁵	NA	3.0 (1.3)	2900

*See "How to order" model numbering system on page 22 for clutches & clutch couplings.
(-) denotes metric equivalents. Specifications subject to change without notice.

General Notes

- Customer shall maintain the perpendicularity of the case assembly mounting surface with respect to the shaft within .003 T.I.R. at the diameter of the bolt circle.
- Static torque values above are burnished.

- Customer shall maintain concentricity of case assembly mounting pilot with respect to the shaft within .003 T.I.R.
- Initial working air gap at installation shall be .008/.018.
- Other voltages available upon request.

- Brake coupling armature assembly is secured to shaft by (2) set screws and key.
- Metric bores available

BRP / SB / FSB / AKB Series

Power-off Brakes

Spring-set electromagnetic power-off brakes provide a safe, efficient means of stopping and/or holding a load in the absence of power. While the field (electromagnet) assembly is fixed and prevented from rotating, the rotor assembly is secured to the shaft. In the absence of power, the fixed and rotating components are engaged, thus stopping and/or holding the load. When the coil is energized, rotating components are disengaged thus allowing the shaft to freely rotate.

The AKB series is UL Recognized, and RoHS compliant.

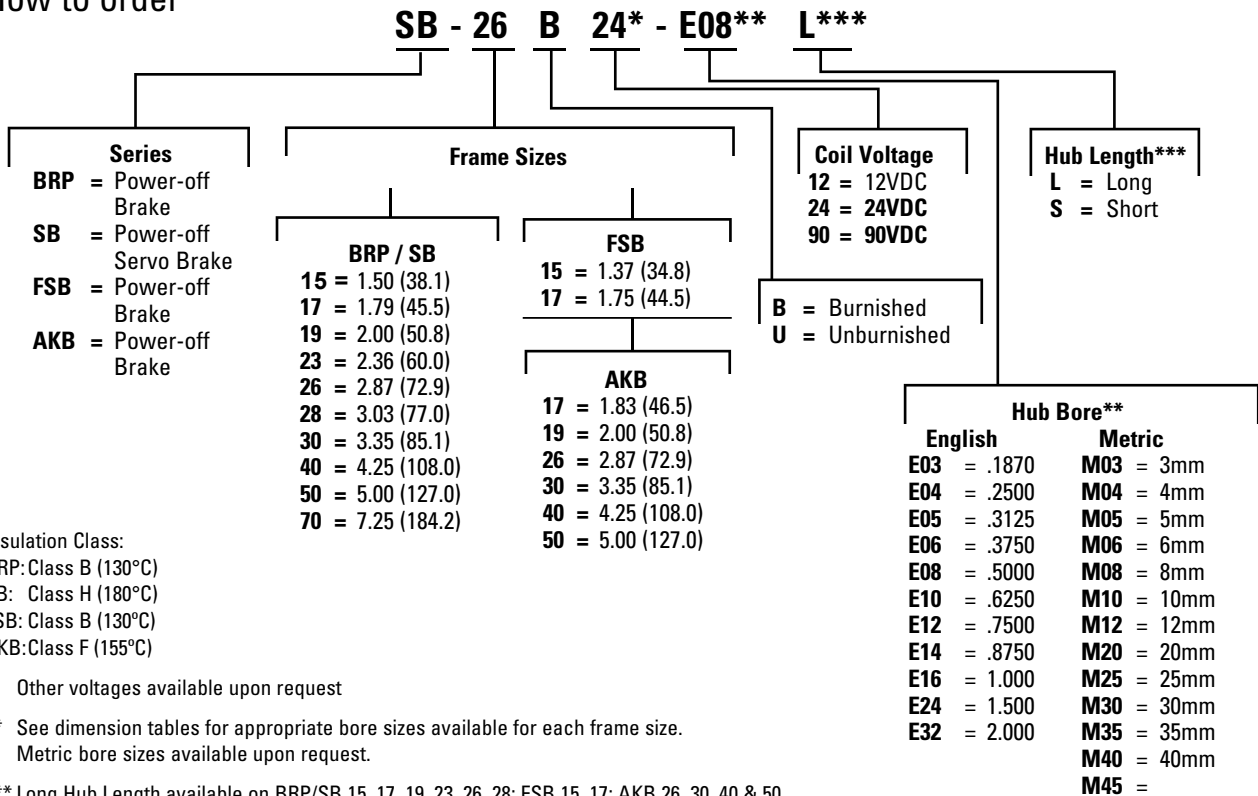
- Torque: 1 lb-in to 1200 lb-in (0.12 to 135 Nm)
- Diameter: 1.50 to 7.25 in. (38.1 to 184.2 mm)
- Static or dynamic engagement
- Simple installation
- Economical cost
- Energy efficient

Typical Applications

- Robotics
- Medical equipment
- Actuators
- Motor brakes
- Postal handling equipment
- Packaging



How to order



Insulation Class:
BRP: Class B (130°C)
SB: Class H (180°C)
FSB: Class B (130°C)
AKB: Class F (155°C)

* Other voltages available upon request

** See dimension tables for appropriate bore sizes available for each frame size.
Metric bore sizes available upon request.

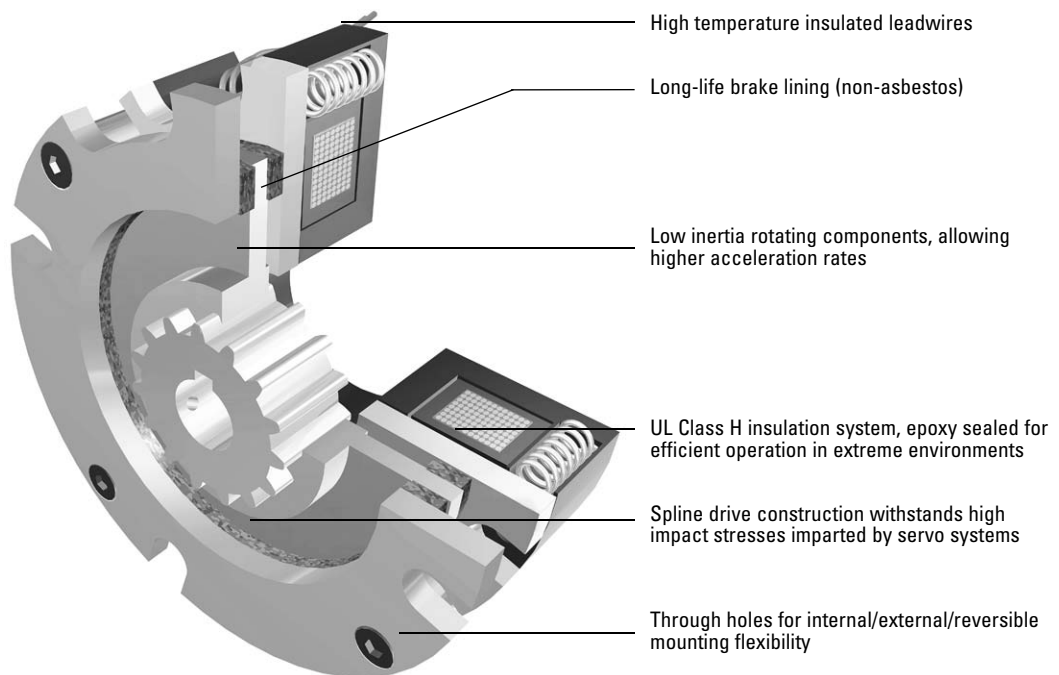
*** Long Hub Length available on BRP/SB 15, 17, 19, 23, 26, 28; FSB 15, 17; AKB 26, 30, 40 & 50.
Short Hub is not available on FSB-15.

General Notes

- Actual starting and/or stopping times depend on application variables, manufacturing tolerances and friction material wear. Please consult factory for evaluation of actual use before applying specific values to your application.
- Consult factory for additional options.
- Working air gap should be checked periodically to insure proper operation. If it exceeds maximum recommended dimensions, the clutch or brake may not function properly.
- All friction faces must be kept free of grease and oil for proper operation.
- Flying leads are provided as standard, terminal style connection available upon request.
- Coil of 24 & 90 volts are provided as standard, other coil voltages are available upon request.

SB Series

Power-off Brakes



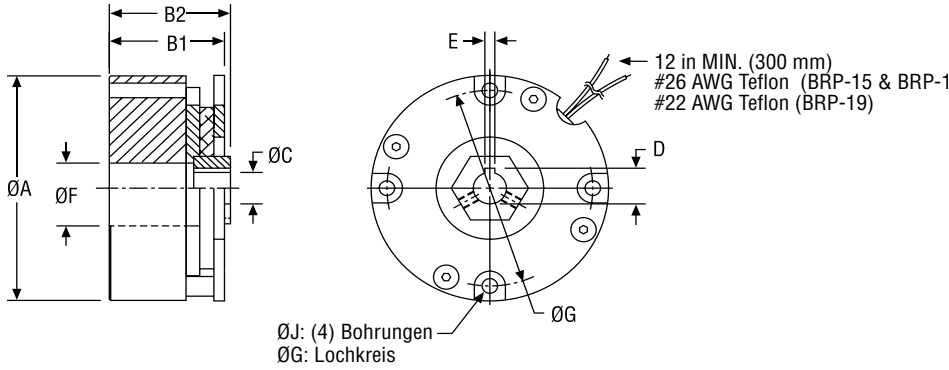
General Notes

- Actual stopping times depend on application variables, manufacturing tolerances and friction material wear. Please consult factory for evaluation of actual use before applying specific values to your application.
- Consult factory for additional options.
- Working air gap should be checked periodically to insure proper operation. If it exceeds maximum recommended dimensions, the clutch or brake may not function properly.
- All friction faces must be kept free of grease and oil for proper operation.
- Flying leads are provided as standard, terminal style connection available upon request.
- Coil of 24 & 90 volts are provided as standard, other coil voltages are available upon request.



BRP-15, 17, 19 Brakes

Dimensions & Specifications



Dimensions (mm)
Mounting requirements see page 56.

BRP Model Shown

DIMENSIONS										
Model*	Static Torque lb-in (Nm)	A: OD in (mm)	B1: OAL Short Hub in (mm)	B2: OAL Long Hub in (mm)	C: Hub ID Ø in (mm)	D: Keyway Height in (mm)	E: Keyway Width in (mm)	F: Case ID Ø in (mm)	G: Mtg Hole BC Ø in (mm)	J: (4) Mtg Holes in (mm)
BRP-15U24-E04X	3 (0.34)	1.50 (38.1)	1.06 (26.9)	1.19 (30.2)	.250 (6.4)	.286 (7.3)	.062 (1.6)	0.53 (13.5)	1.31 (33.3)	.125 (3.2)
BRP-15U24-E05X	3 (0.34)	1.50 (38.1)	1.06 (26.9)	1.19 (30.2)	.312 (7.9)	.364 (9.2)	.094 (2.4)	0.53 (13.5)	1.31 (33.3)	.125 (3.2)
BRP-15U24-E06X	3 (0.34)	1.50 (38.1)	1.06 (26.9)	1.19 (30.2)	.375 (9.5)	.425 (10.8)	.094 (2.4)	0.53 (13.5)	1.31 (33.3)	.125 (3.2)
BRP-17U24-E04X	8 (0.90)	1.79 (45.5)	1.18 (30.0)	1.32 (33.5)	.250 (6.4)	.286 (7.3)	.062 (1.6)	0.58 (14.7)	1.64 (41.7)	.093 (2.4)
BRP-17U24-E06X	8 (0.90)	1.79 (45.5)	1.18 (30.0)	1.32 (33.5)	.375 (9.5)	.425 (10.8)	.094 (2.4)	0.58 (14.7)	1.64 (41.7)	.093 (2.4)
BRP-19U24-E04X	13 (1.47)	2.00 (50.8)	1.19 (30.2)	1.37 (34.8)	.250 (6.4)	.286 (7.3)	.062 (1.6)	0.43 (10.9)	1.77 (45.0)	.146 (3.7)
BRP-19U24-E06X	13 (1.47)	2.00 (50.8)	1.19 (30.2)	1.37 (34.8)	.375 (9.5)	.425 (10.8)	.094 (2.4)	0.43 (10.9)	1.77 (45.0)	.146 (3.7)

PERFORMANCE										
Model	Static Torque lb-in (Nm)	Coil Voltage VDC	Resistance Ohms nom.	Power Watts max	Armature Engagement msec	Armature Disengagement msec	Armature Inertia lb-in-sec ²	Rotor Inertia lb-in-sec ²	Weight lb (kg)	Energy Dissipation ft-lb/min
BRP-15	3.0 (0.34)	24/90	96/1350	7.0	30.0	10.0	NA	2.88 x 10 ⁻⁶	0.3 (0.1)	500
BRP-17	8.0 (0.90)	24/90	64/908	10.0	30.0	10.0	NA	1.87 x 10 ⁻⁵	0.7 (0.3)	700
BRP-19	13 (1.47)	24/90	54/765	12.0	35.0	10.0	NA	2.36 x 10 ⁻⁵	0.7 (0.3)	900

*See "How to order" model numbering system on page 28 for power-off brakes.
X = Upon ordering, choose L or S for long or short hub length.
(-) denotes metric equivalents. Specifications subject to change without notice.

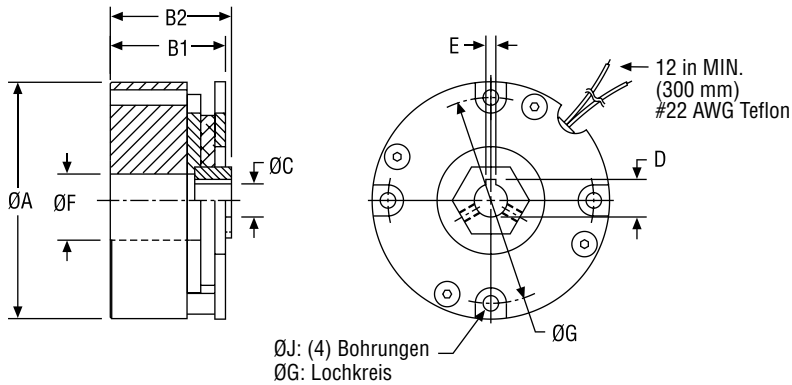
General Notes

- Customer shall maintain the perpendicularity of the case assembly mounting surface with respect to the shaft within .003 T.I.R. at the diameter of the bolt circle.
- Other voltages available upon request.
- Customer shall maintain concentricity of case assembly mounting pilot with respect to the shaft within .003 T.I.R.
- All BRP series brakes are shipped unburnished.
- Brake coupling armature assembly is secured to shaft by (2) set screws and key.
- Metric bores available



BRP-23, 26, 28 Brakes

Dimensions & Specifications



BRP Model Shown

Dimensions (mm)
Mounting requirements see page 56.

DIMENSIONS										
Model*	Static Torque lb-in (Nm)	A: OD in (mm)	B1: OAL Short Hub in (mm)	B2: OAL Long Hub in (mm)	C: Hub ID Ø in (mm)	D: Keyway Height in (mm)	E: Keyway Width in (mm)	F: Case ID Ø in (mm)	G: Mtg Hole BC Ø in (mm)	J: (4) Mtg Holes in (mm)
BRP-23U24-E05X	30 (3.4)	2.36 (60)	1.40 (35.6)	1.65 (41.9)	.312 (7.9)	.364 (9.2)	.094 (2.4)	.79 (20.0)	2.05 (52.1)	.177 (4.5)
BRP-23U24-E06X	30 (3.4)	2.36 (60)	1.40 (35.6)	1.65 (41.9)	.375 (9.5)	.425 (10.8)	.094 (2.4)	.79 (20.0)	2.05 (52.1)	.177 (4.5)
BRP-23U24-E08X	30 (3.4)	2.36 (60)	1.40 (35.6)	1.65 (41.9)	.500 (12.7)	.564 (14.3)	.125 (3.2)	.79 (20.0)	2.05 (52.1)	.177 (4.5)
BRP-23U24-E10X	30 (3.4)	2.36 (60)	1.40 (35.6)	1.65 (41.9)	.625 (15.9)	.709 (18.0)	.188 (4.8)	.79 (20.0)	2.05 (52.1)	.177 (4.5)
BRP-26U24-E06X	35 (4.0)	2.87 (72.9)	1.22 (31.0)	1.45 (36.8)	.375 (9.5)	.425 (10.8)	.094 (2.4)	0.63 (16.0)	2.50 (63.5)	.177 (4.5)
BRP-26U24-E08X	35 (4.0)	2.87 (72.9)	1.22 (31.0)	1.45 (36.8)	.500 (12.7)	.564 (14.3)	.125 (3.2)	0.63 (16.0)	2.50 (63.5)	.177 (4.5)
BRP-28U24-E06X	60 (6.8)	3.03 (77)	1.22 (31.0)	1.45 (36.8)	.375 (9.5)	.425 (10.8)	.094 (2.4)	1.18 (30.0)	2.76 (70.0)	.177 (4.5)
BRP-28U24-E08X	60 (6.8)	3.03 (77)	1.22 (31.0)	1.45 (36.8)	.500 (12.7)	.564 (14.3)	.125 (3.2)	1.18 (30.0)	2.76 (70.0)	.177 (4.5)
BRP-28U24-E10X	60 (6.8)	3.03 (77)	1.22 (31.0)	1.45 (36.8)	.625 (15.9)	.709 (18.0)	.188 (4.8)	1.18 (30.0)	2.76 (70.0)	.177 (4.5)

PERFORMANCE										
Model	Static Torque lb-in (Nm)	Coil Voltage VDC	Resistance Ohms nom.	Power Watts max	Armature Engagement msec	Armature Disengagement msec	Armature Inertia lb-in-sec ²	Rotor Inertia lb-in-sec ²	Weight lb (kg)	Energy Dissipation ft-lb/min
BRP-23	30 (3.4)	24/90	46.5/700	13.0	70.0	20.0	NA	1.77 x 10 ⁻⁵	1.1 (0.5)	1200
BRP-26	35 (4.0)	24/90	33/506	19.0	80.0	20.0	NA	1.14 x 10 ⁻⁴	1.2 (0.5)	1400
BRP-28	60 (6.8)	24/90	36/440	20.0	50.0	40.0	NA	1.06 x 10 ⁻⁴	1.8 (0.8)	1800

*See "How to order" model numbering system on page 28 for power-off brakes.

X = Upon ordering, choose L or S for long or short hub length.

(-) denotes metric equivalents. Specifications subject to change without notice.

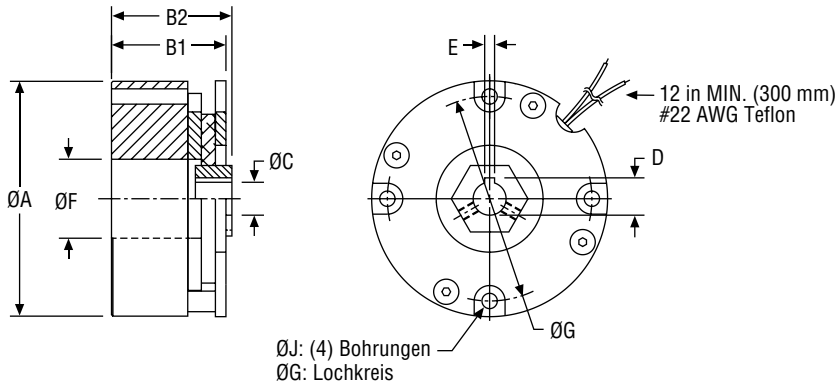
General Notes

- Customer shall maintain the perpendicularity of the case assembly mounting surface with respect to the shaft within .003 T.I.R. at the diameter of the bolt circle.
- Other voltages available upon request.
- Customer shall maintain concentricity of case assembly mounting pilot with respect to the shaft within .003 T.I.R.
- All BRP series brakes are shipped unburnished.
- Brake coupling armature assembly is secured to shaft by (2) set screws and key.
- Metric bores available



BRP-30, 40 Brakes

Dimensions & Specifications



Dimensions (mm)
Mounting requirements see page 56.

BRP Model Shown

DIMENSIONS										
Model*	Static Torque lb-in (Nm)	A: OD in (mm)	B1: OAL Short Hub in (mm)	B2: OAL Long Hub in (mm)	C: Hub ID Ø in (mm)	D: Keyway Height in (mm)	E: Keyway Width in (mm)	F: Case ID Ø in (mm)	G: Mtg Hole BC Ø in (mm)	J: (4) Mtg Holes in (mm)
BRP-30U24-E08X	80 (9.04)	3.35 (85.1)	1.63 (41.4)	NA	.500 (12.7)	.564 (14.3)	.125 (3.2)	1.13 (28.7)	2.91 (73.9)	.218 (5.5)
BRP-30U24-E10X	80 (9.04)	3.35 (85.1)	1.63 (41.4)	NA	.625 (15.9)	.709 (18.0)	.188 (4.8)	1.13 (28.7)	2.91 (73.9)	.218 (5.5)
BRP-40U24-E06X	200 (22.6)	4.25 (108.0)	1.75 (44.5)	NA	.375 (9.5)	.425 (10.8)	.094 (2.4)	1.50 (38.1)	3.75 (95.3)	.226 (5.7)
BRP-40U24-E08X	200 (22.6)	4.25 (108.0)	1.75 (44.5)	NA	.500 (12.7)	.564 (14.3)	.125 (3.2)	1.50 (38.1)	3.75 (95.3)	.226 (5.7)
BRP-40U24-E10X	200 (22.6)	4.25 (108.0)	1.75 (44.5)	NA	.625 (15.9)	.709 (18.0)	.188 (4.8)	1.50 (38.1)	3.75 (95.3)	.226 (5.7)
BRP-40U24-E12X	200 (22.6)	4.25 (108.0)	1.75 (44.5)	NA	.750 (19.1)	.837 (21.3)	.188 (4.8)	1.50 (38.1)	3.75 (95.3)	.226 (5.7)

PERFORMANCE										
Model	Static Torque lb-in (Nm)	Coil Voltage VDC	Resistance Ohms nom.	Power Watts max	Armature Engagement msec	Armature Disengagement msec	Armature Inertia lb-in-sec ²	Rotor Inertia lb-in-sec ²	Weight lb (kg)	Energy Dissipation ft-lb/min
BRP-30	80 (9.04)	24/90	29/374	23.0	70.0	45.0	NA	1.72 x 10 ⁻⁴	2.8 (1.3)	2200
BRP-40	200 (22.6)	24/90	20/290	31.0	85.0	45.0	NA	8.34 x 10 ⁻³	4.9 (2.2)	2500

*See "How to order" model numbering system on page 28 for power-off brakes.
X = Upon ordering, choose L or S for long or short hub length.
(-) denotes metric equivalents. Specifications subject to change without notice.

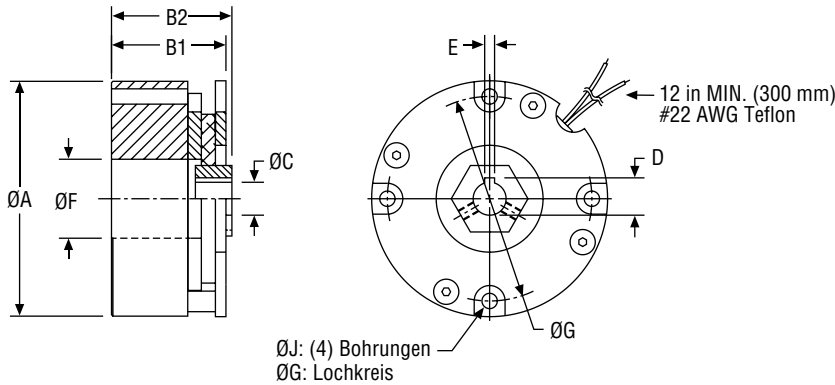
General Notes

- Customer shall maintain the perpendicularity of the case assembly mounting surface with respect to the shaft within .003 T.I.R. at the diameter of the bolt circle.
- Other voltages available upon request.
- Customer shall maintain concentricity of case assembly mounting pilot with respect to the shaft within .003 T.I.R.
- All BRP series brakes are shipped unburnished.
- Brake coupling armature assembly is secured to shaft by (2) set screws and key.
- Metric bores available



BRP-50, 70 Brakes

Dimensions & Specifications



Dimensions (mm)
Mounting requirements see page 56.

BRP Model Shown

DIMENSIONS										
Model*	Static Torque lb-in (Nm)	A: OD in (mm)	B1: OAL Short Hub in (mm)	B2: OAL Long Hub in (mm)	C: Hub ID Ø in (mm)	D: Keyway Height in (mm)	E: Keyway Width in (mm)	F: Case ID Ø in (mm)	G: Mtg Hole BC Ø in (mm)	J: (4) Mtg Holes in (mm)
BRP-50U24-E10X	300 (33.9)	5.00 (127.0)	1.90 (48.3)	NA	.625 (15.9)	.709 (18.0)	.188 (4.8)	1.75 (44.5)	4.50 (114.3)	.226 (5.7)
BRP-50U24-E12X	300 (33.9)	5.00 (127.0)	1.90 (48.3)	NA	.750 (19.1)	.837 (21.3)	.188 (4.8)	1.75 (44.5)	4.50 (114.3)	.226 (5.7)
BRP-50U24-E16X	300 (33.9)	5.00 (127.0)	1.90 (48.3)	NA	1.000 (25.4)	1.114 (28.3)	.250 (6.4)	1.75 (44.5)	4.50 (114.3)	.226 (5.7)
BRP-70U24-E16X	1000 (113.0)	7.25 (184.2)	2.77 (70.4)	NA	1.000 (25.4)	1.114 (28.3)	.250 (6.4)	3.35 (85.1)	6.81 (173.0)	.281 (7.1)
BRP-70U24-E24X	1000 (113.0)	7.25 (184.2)	2.77 (70.4)	NA	1.500 (38.1)	1.669 (42.4)	.375 (9.5)	3.35 (85.1)	6.81 (173.0)	.281 (7.1)
BRP-70U24-E32X	1000 (113.0)	7.25 (184.2)	2.77 (70.4)	NA	2.000 (50.8)	2.223 (56.5)	.500 (12.7)	3.35 (85.1)	6.81 (173.0)	.281 (7.1)

PERFORMANCE										
Model	Static Torque lb-in (Nm)	Coil Voltage VDC	Resistance Ohms nom.	Power Watts max	Armature Engagement msec	Armature Disengagement msec	Armature Inertia lb-in-sec ²	Rotor Inertia lb-in-sec ²	Weight lb (kg)	Energy Dissipation ft-lb/min
BRP-50	300 (33.9)	24/90	19/291	32.0	160.0	110.0	NA	2.07 x 10 ⁻³	6.5 (3.0)	2650
BRP-70	1000 (113.0)	24/90	12/180	52.0	140.0	250.0	NA	16.34 x 10 ⁻³	20.2 (9.2)	3900

*See "How to order" model numbering system on page 28 for power-off brakes.
 X = Upon ordering, choose L or S for long or short hub length.
 (-) denotes metric equivalents. Specifications subject to change without notice.

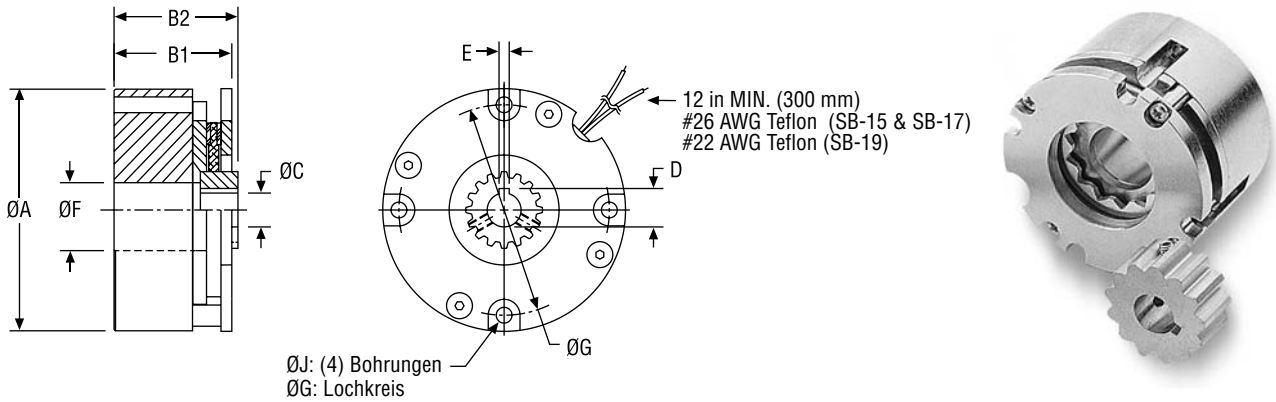
General Notes

- Customer shall maintain the perpendicularity of the case assembly mounting surface with respect to the shaft within .005 T.I.R. at the diameter of the bolt circle.
- Other voltages available upon request.
- Customer shall maintain concentricity of case assembly mounting pilot with respect to the shaft within .005 T.I.R.
- All BRP series brakes are shipped unburnished.
- Brake coupling armature assembly is secured to shaft by (2) set screws and key.
- Metric bores available



SB-15, 17, 19 Brakes

Dimensions & Specifications



Dimensions (mm)
Mounting requirements see page 56.

SB Model Shown

DIMENSIONS										
Model*	Static Torque lb-in (Nm)	A: OD in (mm)	B1: OAL Short Hub in (mm)	B2: OAL Long Hub in (mm)	C: Hub ID Ø in (mm)	D: Keyway Height in (mm)	E: Keyway Width in (mm)	F: Case ID Ø in (mm)	G: Mtg Hole BC Ø in (mm)	J: (4) Mtg Holes in (mm)
SB-15B24-E04X	5 (0.56)	1.50 (38.1)	1.06 (26.9)	1.18 (30)	.250 (6.4)	.286 (7.3)	.062 (1.6)	0.53 (13.5)	1.31 (33.3)	.125 (3.2)
SB-15B24-E05X	5 (0.56)	1.50 (38.1)	1.06 (26.9)	1.18 (30)	.312 (7.9)	.364 (9.2)	.094 (2.4)	0.53 (13.5)	1.31 (33.3)	.125 (3.2)
SB-15B24-E06X	5 (0.56)	1.50 (38.1)	1.06 (26.9)	1.18 (30)	.375 (9.5)	.425 (10.8)	.094 (2.4)	0.53 (13.5)	1.31 (33.3)	.125 (3.2)
SB-17B24-E04X	10 (1.13)	1.79 (45.5)	1.19 (30.2)	1.37 (34.8)	.250 (6.4)	.286 (7.3)	.062 (1.6)	0.58 (14.7)	1.64 (41.7)	.093 (2.4)
SB-17B24-E06X	10 (1.13)	1.79 (45.5)	1.19 (30.2)	1.37 (34.8)	.375 (9.5)	.425 (10.8)	.094 (2.4)	0.58 (14.7)	1.64 (41.7)	.093 (2.4)
SB-17B24-E08X	10 (1.13)	1.79 (45.5)	1.19 (30.2)	1.37 (34.8)	.500 (12.7)	.564 (14.3)	.125 (3.2)	0.58 (14.7)	1.64 (41.7)	.093 (2.4)
SB-19B24-E04X	18 (2.03)	2.00 (50.8)	1.19 (30.2)	1.44 (36.6)	.250 (6.4)	.286 (7.3)	.062 (1.6)	0.43 (10.9)	1.77 (45.0)	.146 (3.7)
SB-19B24-E06X	18 (2.03)	2.00 (50.8)	1.19 (30.2)	1.44 (36.6)	.375 (9.5)	.425 (10.8)	.094 (2.4)	0.43 (10.9)	1.77 (45.0)	.146 (3.7)

PERFORMANCE										
Model	Static Torque lb-in (Nm)	Coil Voltage VDC	Resistance Ohms nom.	Power Watts max	Armature Engagement msec	Armature Disengagement msec	Armature Inertia lb-in-sec ²	Rotor Inertia lb-in-sec ²	Weight lb (kg)	Energy Dissipation ft-lb/min
SB-15	5.0 (0.56)	24/90	96/1350	7.0	20.0	10.0	NA	2.42 x 10 ⁻⁵	0.3 (0.1)	500
SB-17	10 (1.13)	24/90	64/908	10.0	20.0	10.0	NA	2.65 x 10 ⁻⁵	0.7 (0.3)	700
SB-19	18 (2.03)	24/90	54/765	12.0	35.0	10.0	NA	2.83 x 10 ⁻⁵	0.7 (0.3)	900

*See "How to order" model numbering system on page 28 for power-off brakes.
X = Upon ordering, choose L or S for long or short hub length.
(-) denotes metric equivalents. Specifications subject to change without notice.

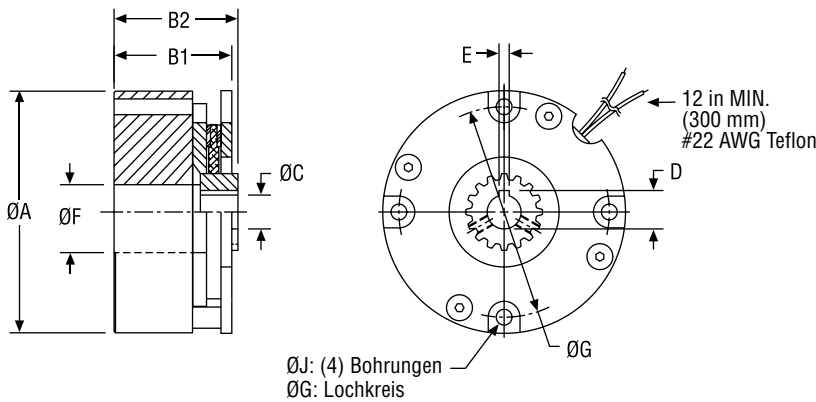
General Notes

- Customer shall maintain the perpendicularity of the case assembly mounting surface with respect to the shaft within .005 T.I.R. at the diameter of the bolt circle.
- Other voltages available upon request.
- Customer shall maintain concentricity of case assembly mounting pilot with respect to the shaft within .005 T.I.R.
- All SB series brakes are shipped burnished.
- Brake coupling armature assembly is secured to shaft by (2) set screws and key.
- Metric bores available



SB-23, 26, 28 Brakes

Dimensions & Specifications



SB Model Shown

Dimensions (mm)
Mounting requirements see page 56.

DIMENSIONS										
Model*	Static Torque lb-in (Nm)	A: OD in (mm)	B1: OAL Short Hub in (mm)	B2: OAL Long Hub in (mm)	C: Hub ID Ø in (mm)	D: Keyway Height in (mm)	E: Keyway Width in (mm)	F: Case ID Ø in (mm)	G: Mtg Hole BC Ø in (mm)	J: (4) Mtg Holes in (mm)
SB-23B24-E05X	35 (4.0)	2.36 (60)	1.40 (35.6)	1.65 (41.9)	.312 (7.9)	.364 (9.2)	.094 (2.4)	.79 (20.0)	2.05 (52.1)	.177 (4.5)
SB-23B24-E06X	35 (4.0)	2.36 (60)	1.40 (35.6)	1.65 (41.9)	.375 (9.5)	.425 (10.8)	.094 (2.4)	.79 (20.0)	2.05 (52.1)	.177 (4.5)
SB-23B24-E08X	35 (4.0)	2.36 (60)	1.40 (35.6)	1.65 (41.9)	.500 (12.7)	.564 (14.3)	.125 (3.2)	.79 (20.0)	2.05 (52.1)	.177 (4.5)
SB-23B24-E10X	35 (4.0)	2.36 (60)	1.40 (35.6)	1.65 (41.9)	.625 (15.9)	.709 (18.0)	.188 (4.8)	.79 (20.0)	2.05 (52.1)	.177 (4.5)
SB-26B24-E06X	40 (4.5)	2.87 (72.9)	1.22 (31.0)	1.45 (36.8)	.375 (9.5)	.425 (10.8)	.094 (2.4)	0.63 (16.0)	2.50 (63.5)	.177 (4.5)
SB-26B24-E08X	40 (4.5)	2.87 (72.9)	1.22 (31.0)	1.45 (36.8)	.500 (12.7)	.564 (14.3)	.125 (3.2)	0.63 (16.0)	2.50 (63.5)	.177 (4.5)
SB-28B24-E06X	80 (9.0)	3.03 (77)	1.22 (31.0)	1.45 (36.8)	.375 (9.5)	.425 (10.8)	.094 (2.4)	1.18 (30.0)	2.76 (70.0)	.177 (4.5)
SB-28B24-E08X	80 (9.0)	3.03 (77)	1.22 (31.0)	1.45 (36.8)	.500 (12.7)	.564 (14.3)	.125 (3.2)	1.18 (30.0)	2.76 (70.0)	.177 (4.5)
SB-28B24-E10X	80 (9.0)	3.03 (77)	1.22 (31.0)	1.45 (36.8)	.625 (15.9)	.709 (18.0)	.188 (4.8)	1.18 (30.0)	2.76 (70.0)	.177 (4.5)

PERFORMANCE										
Model	Static Torque lb-in (Nm)	Coil Voltage VDC	Resistance Ohms nom.	Power Watts max	Armature Engagement msec	Armature Disengagement msec	Armature Inertia lb-in-sec ²	Rotor Inertia lb-in-sec ²	Weight lb (kg)	Energy Dissipation ft-lb/min
SB-23	35 (4.0)	24/90	46.5/700	13.0	70.0	20.0	NA	5.56 x 10 ⁻⁵	1.1 (0.5)	1200
SB-26	40 (4.5)	24/90	33/506	19.0	80.0	20.0	NA	1.19 x 10 ⁻⁴	1.2 (0.5)	1400
SB-28	80 (9.0)	24/90	36/440	20.0	50.0	40.0	NA	1.17 x 10 ⁻⁴	1.8 (0.8)	1800

*See "How to order" model numbering system on page 28 for power-off brakes.
 X = Upon ordering, choose L or S for long or short hub length.
 (-) denotes metric equivalents. Specifications subject to change without notice.

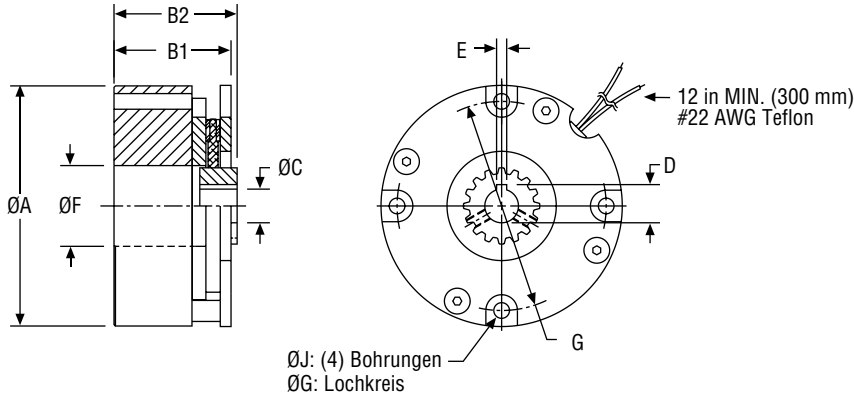
General Notes

- Customer shall maintain the perpendicularity of the case assembly mounting surface with respect to the shaft within .005 T.I.R. at the diameter of the bolt circle.
- Other voltages available upon request.
- Customer shall maintain concentricity of case assembly mounting pilot with respect to the shaft within .005 T.I.R.
- All SB series brakes are shipped burnished.
- Brake coupling armature assembly is secured to shaft by (2) set screws and key.
- Metric bores available



SB-30, 40 Brakes

Dimensions & Specifications



SB Model Shown

Dimensions (mm)
Mounting requirements see page 56.

DIMENSIONS										
Model*	Static Torque lb-in (Nm)	A: OD in (mm)	B1: OAL Short Hub in (mm)	B2: OAL Long Hub in (mm)	C: Hub ID Ø in (mm)	D: Keyway Height in (mm)	E: Keyway Width in (mm)	F: Case ID Ø in (mm)	G: Mtg Hole BC Ø in (mm)	J: (4) Mtg Holes in (mm)
SB-30B24-E06X	140 (15.8)	3.35 (85.1)	1.63 (41.4)	NA	.375 (9.5)	.425 (10.8)	.094 (2.4)	1.13 (28.7)	2.91 (73.9)	.218 (5.5)
SB-30B24-E08X	140 (15.8)	3.35 (85.1)	1.63 (41.4)	NA	.500 (12.7)	.564 (14.3)	.125 (3.2)	1.13 (28.7)	2.91 (73.9)	.218 (5.5)
SB-30B24-E10X	140 (15.8)	3.35 (85.1)	1.63 (41.4)	NA	.625 (15.9)	.709 (18.0)	.188 (4.8)	1.13 (28.7)	2.91 (73.9)	.218 (5.5)
SB-40B24-E06X	265 (29.9)	4.25 (108.0)	1.75 (44.5)	NA	.375 (9.5)	.425 (10.8)	.094 (2.4)	1.50 (38.1)	3.75 (95.3)	.226 (5.7)
SB-40B24-E08X	265 (29.9)	4.25 (108.0)	1.75 (44.5)	NA	.500 (12.7)	.564 (14.3)	.125 (3.2)	1.50 (38.1)	3.75 (95.3)	.226 (5.7)
SB-40B24-E10X	265 (29.9)	4.25 (108.0)	1.75 (44.5)	NA	.625 (15.9)	.709 (18.0)	.188 (4.8)	1.50 (38.1)	3.75 (95.3)	.226 (5.7)
SB-40B24-E12X	265 (29.9)	4.25 (108.0)	1.75 (44.5)	NA	.750 (19.1)	.837 (21.3)	.188 (4.8)	1.50 (38.1)	3.75 (95.3)	.226 (5.7)

PERFORMANCE										
Model	Static Torque lb-in (Nm)	Coil Voltage VDC	Resistance Ohms nom.	Power Watts max	Armature Engagement msec	Armature Disengagement msec	Armature Inertia lb-in-sec ²	Rotor Inertia lb-in-sec ²	Weight lb (kg)	Energy Dissipation ft-lb/min
SB-30	140 (15.8)	24/90	29/374	24.0	70.0	45.0	NA	1.72 x 10 ⁻⁴	2.8 (1.3)	2200
SB-40	265 (29.9)	24/90	20/290	31.0	85.0	45.0	NA	8.23 x 10 ⁻⁴	4.9 (2.2)	2500

*See "How to order" model numbering system on page 28 for power-off brakes.
X = Upon ordering, choose L or S for long or short hub length.
(-) denotes metric equivalents. Specifications subject to change without notice.

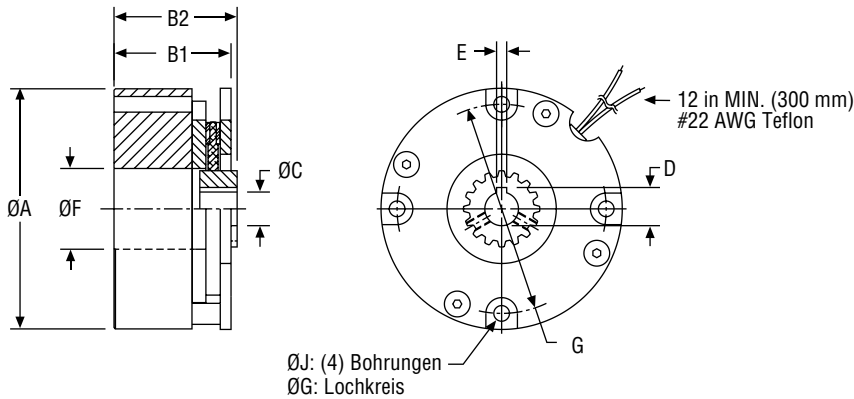
General Notes

- Customer shall maintain the perpendicularity of the case assembly mounting surface with respect to the shaft within .005 T.I.R. at the diameter of the bolt circle.
- Other voltages available upon request.
- Customer shall maintain concentricity of case assembly mounting pilot with respect to the shaft within .005 T.I.R.
- All SB series brakes are shipped burnished.
- Brake coupling armature assembly is secured to shaft by (2) set screws and key.
- Metric bores available



SB-50, 70 Brakes

Dimensions & Specifications



SB Model Shown

Dimensions (mm)
Mounting requirements see page 56.

DIMENSIONS										
Model*	Static Torque lb-in (Nm)	A: OD in (mm)	B1: OAL Short Hub in (mm)	B2: OAL Long Hub in (mm)	C: Hub ID Ø in (mm)	D: Keyway Height in (mm)	E: Keyway Width in (mm)	F: Case ID Ø in (mm)	G: Mtg Hole BC Ø in (mm)	J: (4) Mtg Holes in (mm)
SB-50B24-E10X	350 (39.5)	5.00 (127.0)	1.90 (48.3)	NA	.625 (15.9)	.709 (18.0)	.188 (4.8)	1.75 (44.5)	4.50 (114.3)	.226 (5.7)
SB-50B24-E12X	350 (39.5)	5.00 (127.0)	1.90 (48.3)	NA	.750 (19.1)	.837 (21.3)	.188 (4.8)	1.75 (44.5)	4.50 (114.3)	.226 (5.7)
SB-50B24-E16X	350 (39.5)	5.00 (127.0)	1.90 (48.3)	NA	1.000 (25.4)	1.114 (28.3)	.250 (6.4)	1.75 (44.5)	4.50 (114.3)	.226 (5.7)
SB-70B24-E16X	1200 (135.6)	7.25 (184.2)	2.77 (70.4)	NA	1.000 (25.4)	1.114 (28.3)	.250 (6.4)	3.35 (85.1)	6.81 (173.0)	.281 (7.1)
SB-70B24-E24X	1200 (135.6)	7.25 (184.2)	2.77 (70.4)	NA	1.500 (38.1)	1.669 (42.4)	.375 (9.5)	3.35 (85.1)	6.81 (173.0)	.281 (7.1)
SB-70B24-E32X	1200 (135.6)	7.25 (184.2)	2.77 (70.4)	NA	2.000 (50.8)	2.223 (56.5)	.500 (12.7)	3.35 (85.1)	6.81 (173.0)	.281 (7.1)

PERFORMANCE										
Model	Static Torque lb-in (Nm)	Coil Voltage VDC	Resistance Ohms nom.	Power Watts max	Armature Engagement msec	Armature Disengagement msec	Armature Inertia lb-in-sec ²	Rotor Inertia lb-in-sec ²	Weight lb (kg)	Energy Dissipation ft-lb/min
SB-50	350 (39.5)	24/90	19/291	32.0	160.0	110.0	NA	2.17 x 10 ⁻³	6.5 (3.0)	2650
SB-70	1200 (135.6)	24/90	12/180	53.0	140.0	250.0	NA	1.77 x 10 ⁻²	20.2 (9.2)	3900

*See "How to order" model numbering system on page 28 for power-off brakes.
X = Upon ordering, choose L or S for long or short hub length.
(-) denotes metric equivalents. Specifications subject to change without notice.

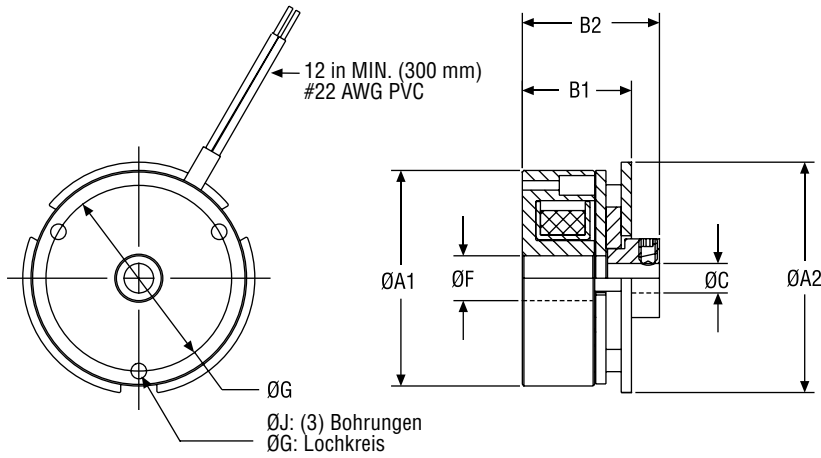
General Notes

- Customer shall maintain the perpendicularity of the case assembly mounting surface with respect to the shaft within .005 T.I.R. at the diameter of the bolt circle.
- Other voltages available upon request.
- Customer shall maintain concentricity of case assembly mounting pilot with respect to the shaft within .005 T.I.R.
- All SB series brakes are shipped burnished.
- Brake coupling armature assembly is secured to shaft by (2) set screws and key.
- Metric bores available



FSB-15, 17 Brakes

Dimensions & Specifications



FSB Model Shown

Dimensions (mm)
Mounting requirements see page 56.

DIMENSIONS									
Model*	Static Torque lb-in (Nm)	A1: OD Body in (mm)	A2: OD Flange in (mm)	B1: OAL Short Hub in (mm)	B2: OAL Long Hub in (mm)	C: Hub ID Ø in (mm)	F: Case ID Ø in (mm)	G: Mtg Hole BC Ø in (mm)	J: (3) Mtg Holes in (mm)
FSB-15U24-E03L	1 (.12)	1.37 (34.8)	1.475 (17.5)	0.69** (17.5)	0.9 (22.9)	.187 (4.8)	0.285 (7.2)	1.18 (30.0)	3 x .125 (3.2)
FSB-15U24-E04L	1 (.12)	1.37 (34.8)	1.475 (17.5)	0.69** (17.5)	0.9 (22.9)	.250 (6.4)	0.285 (7.2)	1.18 (30.0)	3 x .125 (3.2)
FSB-17U24-E04X	3 (.34)	1.75 (44.5)	1.90 (48.3)	0.87 (22.0)	1.06 (26.9)	.250 (6.4)	0.415 (10.5)	1.545 (39.2)	3 x .125 (3.2)
FSB-17U24-E05X	3 (.34)	1.75 (44.5)	1.90 (48.3)	0.87 (22.0)	1.06 (26.9)	.312 (7.9)	0.415 (10.5)	1.545 (39.2)	3 x .125 (3.2)
FSB-17U24-E06X	3 (.34)	1.75 (44.5)	1.90 (48.3)	0.87 (22.0)	1.06 (26.9)	.375 (9.5)	0.415 (10.5)	1.545 (39.2)	3 x .125 (3.2)

PERFORMANCE										
Model	Static Torque lb-in (Nm)	Coil Voltage VDC	Resistance Ohms nom.	Power Watts max	Armature Engagement msec	Armature Disengagement msec	Armature Inertia lb-in-sec ²	Rotor Inertia lb-in-sec ²	Weight lb (kg)	Energy Dissipation ft-lb/min
FSB-15	1 (.12)	24/90	118/1750	6.0	25.0	15.0	NA	1.05 x 10 ⁻⁵	0.2 (.09)	250
FSB-17	3 (.34)	24/90	92/1300	7.0	35.0	30.0	NA	1.45 x 10 ⁻⁵	0.6 (.27)	350

*See "How to order" model numbering system on page 28 for power-off brakes.

X = Upon ordering, choose L or S for long or short hub length.

(-) denotes metric equivalents. Specifications subject to change without notice.

**Short Hub not available for size 15.

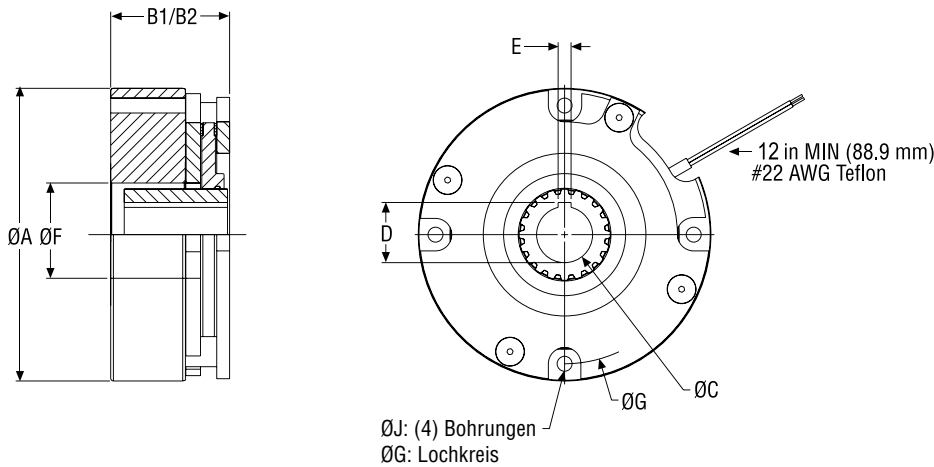
General Notes

- Customer shall maintain the perpendicularity of the case assembly mounting surface with respect to the shaft within .005 T.I.R. at the diameter of the bolt circle.
- Other voltages available upon request.
- Customer shall maintain concentricity of case assembly mounting pilot with respect to the shaft within .005 T.I.R.
- Brake coupling armature assembly is secured to shaft by (2) set screws.
- Metric bores available



AKB-17, 19, 26, 30 Brakes

Dimensions & Specifications



AKB Model Shown

Dimensions (mm)
Mounting requirements see page 56.

UL Recognized Component
RoHS Compliant

BRAKES

DIMENSIONS										
Model*	Static Torque lb-in (Nm)	A: OD in (mm)	B1: OAL Short Hub in (mm)	B2: OAL Long Hub in (mm)	C: Hub ID Ø in (mm)	D: Keyway Height in (mm)	E: Keyway Width in (mm)	F: Case ID Ø in (mm)	G: Mtg Hole BC Ø in (mm)	J: (4) Mtg Holes in (mm)
AKB-17B24-E04X	12.5 (1.4)	1.83 (46.5)	1.32 (33.5)	NA	.250 (6.35)	.286 (7.3)	.062 (1.6)	0.512 (13)	1.640 (42)	.094 (2.4)
AKB-19B24-E04X	22 (2.5)	2.00 (51)	1.33 (33.8)	NA	.250 (6.35)	.286 (7.3)	.062 (1.6)	0.472 (12)	1.770 (45)	.134 (3.4)
AKB-26B24-E05X	47 (5.3)	2.87 (73)	1.26 (32)	1.26 (32)	.312 (7.92)	.364 (9.25)	.094 (2.4)	0.75 (19)	2.500 (64)	.177 (4.5)
AKB-26B24-E06X	47 (5.3)	2.87 (73)	1.26 (32)	1.26 (32)	.375 (9.52)	.425 (10.8)	.094 (2.4)	0.75 (19)	2.500 (64)	.177 (4.5)
AKB-30B24-E06X	128 (14.5)	3.35 (85)	1.62 (41.1)	1.62 (41.1)	.375 (9.52)	.425 (10.8)	.094 (2.4)	1.125 (29)	2.913 (74)	.177 (4.5)
AKB-30B24-E08X	128 (14.5)	3.35 (85)	1.62 (41.1)	1.62 (41.1)	.500 (12.7)	.564 (14.33)	.125 (3.18)	1.125 (29)	2.913 (74)	.177 (4.5)

PERFORMANCE										
Model	Static Torque lb-in (Nm)	Coil Voltage VDC	Resistance Ohms nom.	Power Watts max	Armature Engagement msec	Armature Disengagement msec	Armature Inertia lb-in-sec ²	Rotor Inertia lb-in-sec ²	Weight lb (kg)	Energy Dissipation ft-lb/min
AKB-17	12.5 (1.4)	24	68.5	10.94	(20.0)	(20.0)	NA	3.9 x 10 ⁻³	0.57 (0.26)	700
AKB-19	22 (2.5)	24	56.6	13.24	(35.0)	(15.0)	NA	4.9 x 10 ⁻³	0.76 (0.35)	900
AKB-26	47 (5.3)	24	45.2	16.58	(80.0)	(20.0)	NA	2.27 x 10 ⁻²	1.43 (0.64)	1400
AKB-30	128 (14.5)	24	29.6	25.3	(80.0)	(45.0)	NA	5.6 x 10 ⁻²	2.49 (1.12)	2200

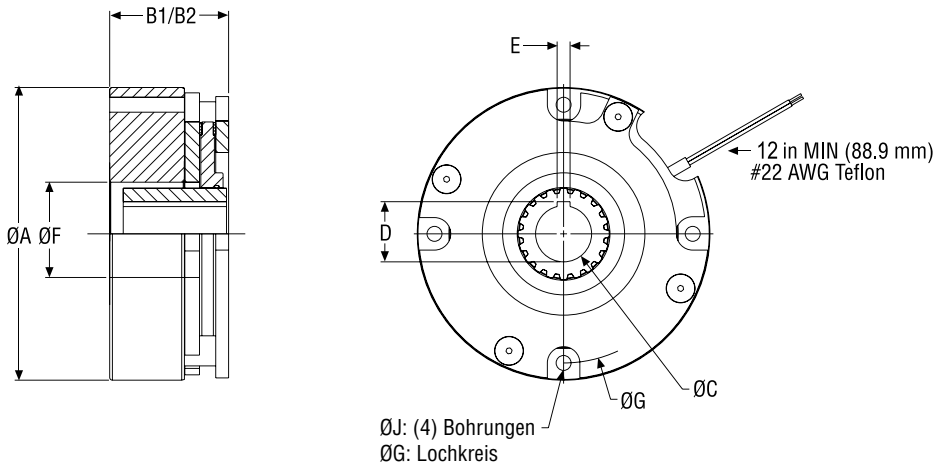
*See "How to order" model numbering system on page 28 for power-off brakes.
X = Upon ordering, choose L or S for long or short hub length.
(-) denotes metric equivalents. Specifications subject to change without notice.

General Notes

- Customer shall maintain the perpendicularity of the case assembly mounting surface with respect to the shaft within .003 T.I.R. at the diameter of the bolt circle.
- Other voltages available upon request.
- Customer shall maintain concentricity of case assembly mounting pilot with respect to the shaft within .003 T.I.R.
- All AKB series brakes are shipped burnished.
- Brake coupling armature assembly is secured to shaft by (2) set screws and key.
- Metric bores available

AKB-40, 50 Brakes

Dimensions & Specifications



Dimensions (mm)
Mounting requirements see page 56.

UL Recognized Component
RoHS Compliant

AKB Model Shown

DIMENSIONS										
Model*	Static Torque lb-in (Nm)	A: OD in (mm)	B1: OAL Short Hub in (mm)	B2: OAL Long Hub in (mm)	C: Hub ID Ø in (mm)	D: Keyway Height in (mm)	E: Keyway Width in (mm)	F: Case ID Ø in (mm)	G: Mtg Hole BC Ø in (mm)	J: (4) Mtg Holes in (mm)
AKB-40B24-E06X	220 (25)	4.25 (108)	1.81 (46.0)	1.81 (46.0)	.375 (9.52)	.425 (10.8)	.094 (2.4)	1.50 (38)	3.750 (95)	.217 (5.5)
AKB-40B24-E08X	220 (25)	4.25 (108)	1.81 (46.0)	1.81 (46.0)	.500 (12.7)	.564 (14.33)	.125 (3.18)	1.50 (38)	3.750 (95)	.217 (5.5)
AKB-40B24-E10X	220 (25)	4.25 (108)	1.81 (46.0)	1.81 (46.0)	.625 (15.9)	.709 (18.0)	.188 (4.78)	1.50 (38)	3.750 (95)	.217 (5.5)
AKB-40B24-E12X	220 (25)	4.25 (108)	1.81 (46.0)	1.81 (46.0)	.750 (19.05)	.837 (21.26)	.188 (4.78)	1.50 (38)	3.750 (95)	.217 (5.5)
AKB-50B24-E10X	470 (53)	5.00 (127)	1.85 (47)	1.85 (47)	.625 (15.9)	.709 (18.0)	.188 (4.78)	1.75 (44)	4.500 (114)	.217 (5.5)
AKB-50B24-E12X	470 (53)	5.00 (127)	1.85 (47)	1.85 (47)	.750 (19.05)	.837 (21.26)	.188 (4.78)	1.75 (44)	4.500 (114)	.217 (5.5)
AKB-50B24-E16X	470 (53)	5.00 (127)	1.85 (47)	1.85 (47)	1.000 (25.4)	1.114 (28.30)	.250 (6.35)	1.75 (44)	4.500 (114)	.217 (5.5)

PERFORMANCE										
Model	Static Torque lb-in (Nm)	Coil Voltage VDC	Resistance Ohms nom.	Power Watts max	Armature Engagement msec	Armature Disengagement msec	Armature Inertia lb-in-sec ²	Rotor Inertia lb-in-sec ²	Weight lb (kg)	Energy Dissipation ft-lb/min
AKB-40	220 (25)	24	22.4	33.5	(105.0)	(45.0)	NA	2.24 x 10 ⁻¹	4.47 (2.02)	2200
AKB-50	470 (53)	24	16.0	46.8	(160.0)	(110.0)	NA	5.53 x 10 ⁻¹	6.4 (2.89)	2650

*See "How to order" model numbering system on page 28 for power-off brakes.
X = Upon ordering, choose L or S for long or short hub length.
(-) denotes metric equivalents. Specifications subject to change without notice.

General Notes

- Customer shall maintain the perpendicularity of the case assembly mounting surface with respect to the shaft within .003 T.I.R. at the diameter of the bolt circle.
- Other voltages available upon request.
- Customer shall maintain concentricity of case assembly mounting pilot with respect to the shaft within .003 T.I.R.
- All AKB series brakes are shipped burnished.
- Brake coupling armature assembly is secured to shaft by (2) set screws and key.
- Metric bores available



PMB Series

Power-off Brakes

The PMB Series are a power-off, DC, spring set brake that provides a low-cost, multi-functional brake alternative for many application. The series offers nine frame sizes: 30, 40, 50, 60, 65, 75, 85, 100, 120 and a superior torque to size ratio.

Many extra features are offered with this versatile product series.

- Torque adjustment collar allows the torque to be varied depending on application.
- Engineered friction material on rotor assembly boosts maximum brake performance and extends life.
- Brake easily mounts to motor or frame. Mounting hardware included with brake. Simple splined hub attaches to shaft with set screw and keyway provided.
- Brake case design offers excellent heat dissipation.
- Fully potted coils meet minimum requirements for class "F" insulation.
- UL Recognized Component
- Splined hub with anti-rattle feature promotes quiet operation

- Brake leads can be customized (connectors, sleeving) to meet special requirements.
- Dust cover (option) keeps foreign materials from interfering with brake actuation.
- Manual release lever (option) provides override to release brakes in the absence of power.

Typical Applications

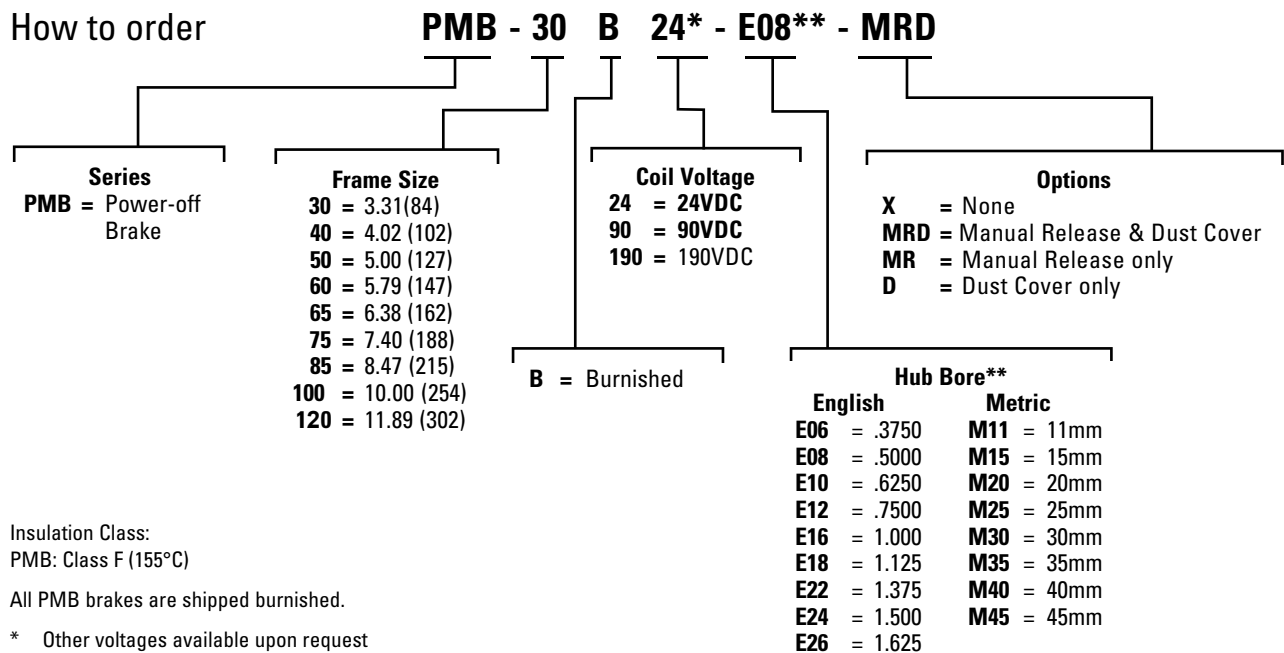
- Factory automation
- Semiconductor
- Military/aerospace
- Medical equipment
- Elevators
- Lift trucks
- Pallet trucks
- Electric vehicles
- Electric hoists
- Construction equipment
- Winches & Cranes
- Electric motor brakes
- Conveyors



- Robotics
- Floor sweepers
- Scissor lifts
- Automated material handling equipment

BRAKES

How to order



Insulation Class:
PMB: Class F (155°C)

All PMB brakes are shipped burnished.

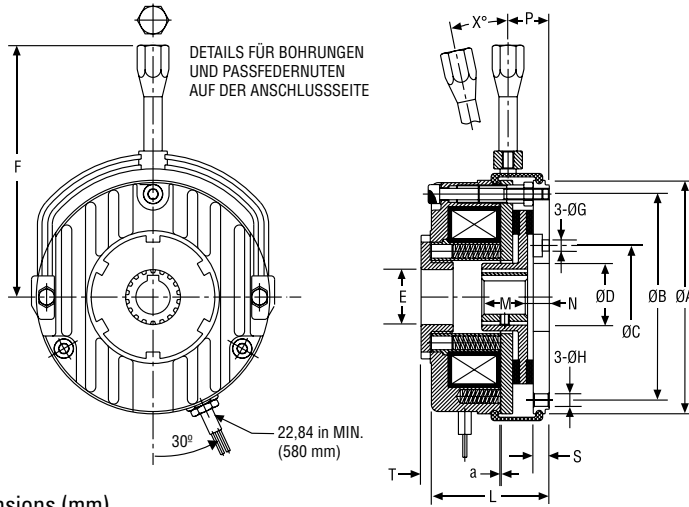
* Other voltages available upon request

** See dimension tables for appropriate bore sizes available for each frame size. Metric bore sizes available upon request.



PMB-30, 40, 50, 60, 65, 75, 85, 100, 120 Brakes

Dimensions & Specifications



Dimensions (mm)
Mounting requirements see page 56.

PMB model shown with optional manual release & dust cover.

UL Recognized Component

DIMENSIONS																
Model	Static Torque lb-in (Nm)	A: OD in (mm)	B: Mtg Hole in (mm)	C in (mm)	D in (mm)	E in (mm)	F in (mm)	G, H in (mm)	L in (mm)	M in (mm)	N in (mm)	P in (mm)	S in (mm)	T in (mm)	X deg.	a: Air Gap in (mm)
PMB-30	45 (5)	3.307 (84)	2.835 (72)	NA	1.220 (31)	0.748 (19)	3.86 (98)	0.197 (5)	1.614 (41)	0.701 (17.8)	0.157 (4)	0.697 (17.7)	0.236 (6)	0.118 (3)	10	0.006 (0.15)
PMB-40	70 (8)	4.016 (102)	3.543 (90)	1.772 (45)	1.181 (30)	0.945 (24)	4.29 (109)	0.217 (5.5)	2.048 (52)	0.787 (20)	0.374 (9.5)	1.004 (25.5)	0.276 (7)	0.394 (10)	8	0.008 (0.2)
PMB-50	142 (16)	5.000 (127)	4.409 (112)	2.205 (56)	1.575 (40.5)	1.378 (35)	5.47 (139)	0.256 (6.5)	2.244 (57)	0.787 (20)	0.492 (11.5)	1.280 (32.5)	0.346 (8.8)	0.157 (4)	7	0.008 (0.25)
PMB-60	283 (32)	5.787 (147)	5.197 (132)	2.441 (62)	1.772 (45)	1.575 (40)	6.02 (153)	0.256 (6.5)	2.598 (66)	0.984 (25)	0.472 (12)	1.280 (32.5)	0.354 (9)	0.197 (5)	8	0.012 (0.3)
PMB-65	530 (60)	6.378 (162)	5.709 (145)	2.913 (74)	2.165 (55)	1.890 (48)	7.28 (185)	0.354 (9)	2.992 (76)	1.181 (30)	0.551 (14)	1.417 (36)	0.433 (11)	0.197 (5)	8	0.012 (0.3)
PMB-75	708 (80)	7.402 (188)	6.693 (170)	3.307 (84)	2.559 (65)	2.047 (52)	7.88 (200)	0.354 (9)	3.367 (85.5)	1.181 (30)	0.551 (14)	1.634 (41.5)	0.433 (11)	0.236 (6)	8	0.012 (0.3)
PMB-85	1505 (170)	8.465 (215)	7.717 (196)	3.937 (100)	2.953 (75)	2.441 (62)	10.24 (260)	0.354 (9)	3.780 (96)	1.378 (35)	0.591 (15)	1.772 (45)	0.433 (11)	0.374 (9.5)	12	0.016 (0.4)
PMB-100	2655 (300)	10.000 (254)	9.055 (230)	4.331 (110)	3.543 (90)	3.346 (85)	16.46 (418)	0.433 (11)	4.252 (108)	1.575 (40)	0.689 (17.5)	1.850 (47)	0.433 (11)	N/A	12	0.016 (0.4)
PMB-120	4250 (480)	11.890 (302)	10.945 (278)	5.512 (140)	4.724 (120)	4.528 (115)	19.84 (504)	0.433 (11)	4.685 (119)	1.969 (50)	0.689 (17.5)	2.756 (70)	0.492 (12.5)	N/A	12	0.020 (0.5)

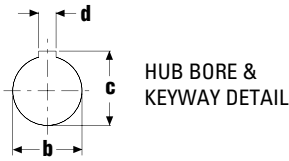
PERFORMANCE										
Model	Static Torque lb-in (Nm)	Coil Voltage VDC	Resistance Ohms@ 20°C nom.	Power Watts max	Speed RPM	Armature Engagement msec	Armature Disengagement msec	Rotor Inertia lb-in-sec ²	Weight lb (kg)	Energy Dissipation ft-lb/min
PMB-30	45 (5)	24/90/190	30.4/405/1805	20	3000	15	55	1.15 X 10 ⁻⁴	3 (1.36)	1840
PMB-40	70 (8)	24/90/190	24.5/324/1444	25	3000	20	60	3.98 X 10 ⁻⁴	4 (1.8)	2240
PMB-50	142 (16)	24/90/190	19.8/270/1203	30	3000	20	90	2.30 X 10 ⁻³	7.5 (3.4)	2790
PMB-60	283 (32)	24/90/190	15.2/202.3/903	40	3000	20	120	4.96 X 10 ⁻³	11 (4.8)	3225
PMB-65	530 (60)	24/90/190	14.7/162/722	50	3000	20	210	6.75 X 10 ⁻³	16 (7.3)	3550
PMB-75	708 (80)	24/90/190	10.6/124.6/555	65	3000	190	230	1.68 X 10 ⁻²	27 (12)	4120
PMB-85	1505 (170)	24/90/190	7.84/95.3/425	85	1500	300	260	3.28 X 10 ⁻²	40 (18)	4720
PMB-100	2655 (300)	24/90/190	5.2/73.6/328	110	1500	350	550	6.69 X 10 ⁻²	55 (25)	5575
PMB-120	4250 (480)	24/90/190	5.2/73.6/328	110	1500	500	650	1.95 X 10 ⁻¹	90 (41)	6625

(-) denotes metric equivalents. Specifications subject to change without notice.



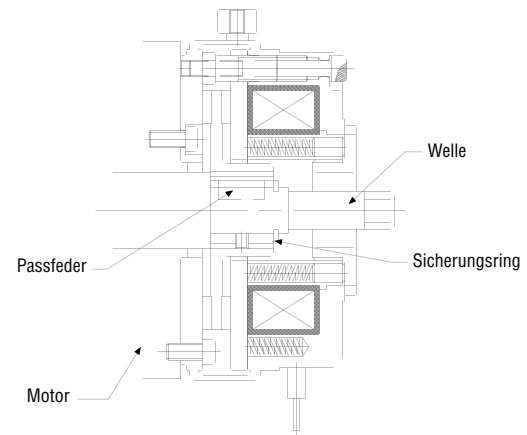
PMB Series Brakes

Dimensions & Specifications

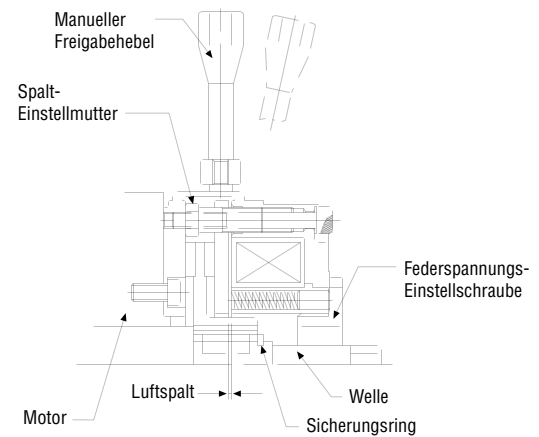


BORE & KEYWAY DATA			
Model*	b: Bore** in (mm)	c: Keyway Height in (mm)	d: Keyway Width in (mm)
PMB-30BXX-E06-MRD	0.375 (9.5)	0.425 (10.8)	0.094 (2.4)
PMB-30BXX-M11-MRD	0.433 (11.0)	0.512 (13.0)	0.157 (4)
PMB-40BXX-E08-MRD	0.500 (12.7)	0.564 (14.3)	0.125 (3.2)
PMB-40BXX-E10-MRD	0.625 (15.9)	0.709 (18.0)	0.188 (4.8)
PMB-40BXX-M15-MRD	0.591 (15.0)	0.669 (17.0)	0.197 (5)
PMB-50BXX-E10-MRD	0.625 (15.9)	0.709 (18.0)	0.188 (4.8)
PMB-50BXX-E12-MRD	0.750 (19.0)	0.837 (21.3)	0.188 (4.8)
PMB-50BXX-M15-MRD	0.591 (15.0)	0.669 (17.0)	0.197 (5)
PMB-50BXX-M20-MRD	0.787 (20.0)	0.866 (22.0)	0.197 (5)
PMB-60BXX-E12-MRD	0.750 (19.0)	0.837 (21.3)	0.188 (4.8)
PMB-60BXX-E16-MRD	1.000 (25.4)	1.114 (28.3)	0.250 (6.3)
PMB-60BXX-M20-MRD	0.787 (20.0)	0.866 (22.0)	0.197 (5)
PMB-60BXX-M25-MRD	0.984 (25.0)	1.103 (28.0)	0.276 (7)
PMB-65BXX-E16-MRD	1.000 (25.4)	1.114 (28.3)	0.250 (6.3)
PMB-65BXX-E18-MRD	1.125 (28.6)	1.251 (31.8)	0.250 (6.3)
PMB-65BXX-M25-MRD	0.984 (25.0)	1.103 (28.0)	0.276 (7)
PMB-65BXX-M30-MRD	1.181 (30.0)	1.299 (33.0)	0.276 (7)
PMB-75BXX-E16-MRD	1.000 (25.4)	1.114 (28.3)	0.250 (6.3)
PMB-75BXX-E18-MRD	1.125 (28.6)	1.251 (31.8)	0.250 (6.3)
PMB-75BXX-M25-MRD	0.984 (25.0)	1.103 (28.0)	0.276 (7)
PMB-75BXX-M30-MRD	1.181 (30.0)	1.299 (33.0)	0.276 (7)
PMB-85BXX-E22-MRD	1.375 (34.9)	1.517 (38.5)	0.313 (7.9)
PMB-85BXX-E24-MRD	1.500 (38.1)	1.669 (42.4)	0.375 (9.5)
PMB-85BXX-M35-MRD	1.378 (35.0)	1.516 (38.5)	0.394 (10)
PMB-85BXX-M40-MRD	1.575 (40.0)	1.713 (43.5)	0.394 (10)
PMB-100BXX-E22-MRD	1.375 (34.9)	1.517 (38.5)	0.313 (7.9)
PMB-100BXX-E24-MRD	1.500 (38.1)	1.669 (42.4)	0.375 (9.5)
PMB-100BXX-M35-MRD	1.378 (35.0)	1.516 (38.5)	0.394 (10)
PMB-100BXX-M40-MRD	1.575 (40.0)	1.713 (43.5)	0.394 (10)
PMB-120BXX-E24-MRD	1.500 (38.1)	1.669 (42.4)	0.375 (9.5)
PMB-120BXX-E26-MRD	1.625 (41.3)	1.795 (45.6)	0.375 (9.5)
PMB-120BXX-M40-MRD	1.575 (40.0)	1.713 (43.5)	0.394 (10)
PMB-120BXX-M45-MRD	1.77 (45.0)	1.929 (49.0)	0.551 (14)

*See "How to order" model numbering system on page 41 for PMB brakes.
 XX = Upon ordering, choose voltage, see page 41 for options.
 (-) denotes metric equivalents. Specifications subject to change without notice.
 **Other bore sizes available upon request.



Montageschema



Spalteinstellung



Model shown at left is complete with all accessories. Model on right is shown with accessories removed. Accessories include: (A) manual release; (B) spline hub, (C) anti-rattle feature (o-ring) and (D) dust cover.

TFD Series

Torque Feedback Devices

The new Torque Feedback Device (TFD) provides a variable torque output, in proportion to a DC input, for steering and other by-wire applications. This innovative design offers a cost effective, high quality user interface by applying state-of-the-art friction materials and a patent pending electromagnetic actuation system.

Incorporated into the TFD are two redundant sensors for fail-safe shaft feedback. Several standard product configurations are offered with torques ranging from 2.5 to 20Nm, and the TFD's modular design makes it easily adaptable to specific application requirements.

- Integrated design combines both tactile and position/velocity feedback with a steering wheel interface in one mechanical package.
- Compact design offers high torque densities and energy efficient operation.
- Continuously variable torque output for high quality operator interface or "feel".
- Redundant sensors for safety and field

- Modular design allows the product to be easily scaled to specific application requirements.
- Repeatable operation over a wide range of operating conditions and product life.
- Assembly and all components meet EU Directive 2002/95/EC (RoHS)
- Designed for use in EN 1175 and IEC 61508 compliant systems.

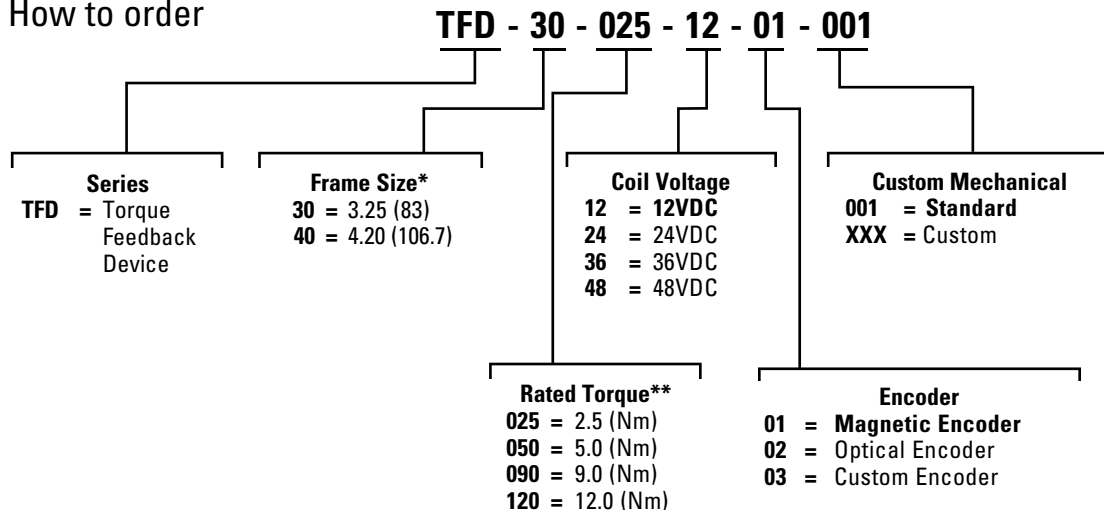


TFD Model Shown

Typical Steer-By-Wire Applications

- Electric vehicles including:
 - Lift trucks
 - Golf carts
 - Pallet trucks
 - Floor sweepers
 - Cleaning equipment
- Turf & garden equipment (professional lawnmowers)
- Military/aerospace
- Construction equipment
- Industrial & recreational marine/boats

How to order



*Case diameter

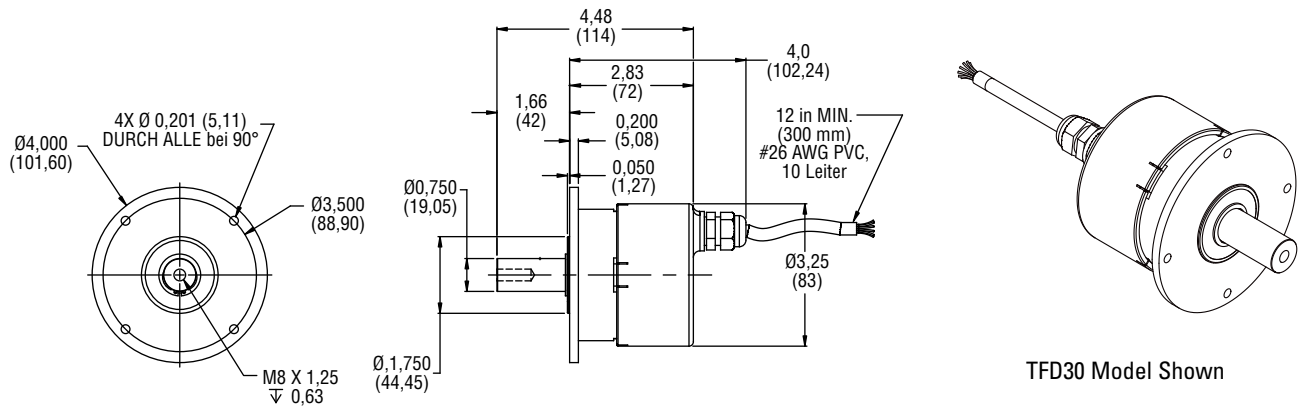
** Rated Torque availability

2.5 (Nm) - TFD30 only
5.0 (Nm) - TFD30 & TFD40
9.0 (Nm) - TFD40 only
12.0 (Nm) - TFD40 only



TFD-30

Dimensions & Specifications



TFD30 Model Shown

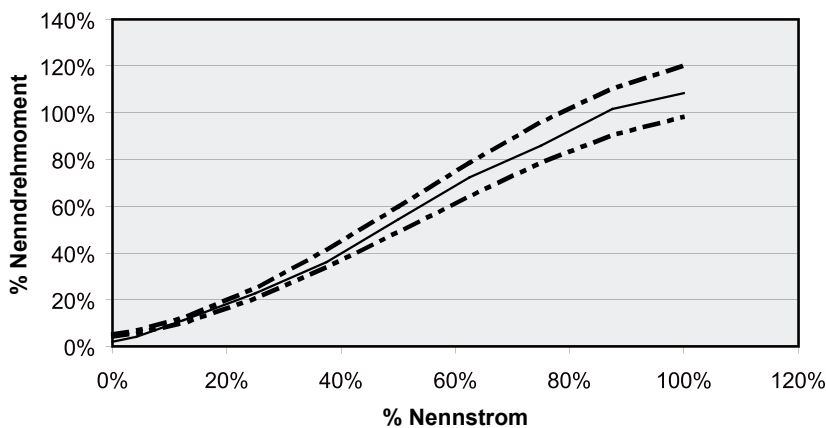
Dimensions (mm)

PERFORMANCE							
Model	Static Torque lb-in (Nm)	Coil Voltage* VDC	Resistance Ohms @ 20°C nom	Power Watts max	Speed* RPM	Rotor Inertia lb-in-sec ²	Weight lb (kg)
TFD-30 025	22 (2.5)	12	3.6	40	300/120	35 X 10 ⁻³	3.5 (1.59)
		24	12.5	46	300/120	35 X 10 ⁻³	3.5 (1.59)
		36	32.6	40	300/120	35 X 10 ⁻³	3.5 (1.59)
		48	55.0	42	300/120	35 X 10 ⁻³	3.5 (1.59)
TFD-30 050	44 (5.0)	12	3.6	40	300/120	62 X 10 ⁻³	3.5 (1.59)
		24	12.5	46	300/120	62 X 10 ⁻³	3.5 (1.59)
		36	32.6	40	300/120	62 X 10 ⁻³	3.5 (1.59)
		48	55.0	42	300/120	62 X 10 ⁻³	3.5 (1.59)

See "How to order" model numbering system on page 44 for torque feedback devices.
 (-) denotes metric equivalents. Specifications subject to change without notice.
 *Intermittent/Continuous

TORQUE FEEDBACK
DEVICE

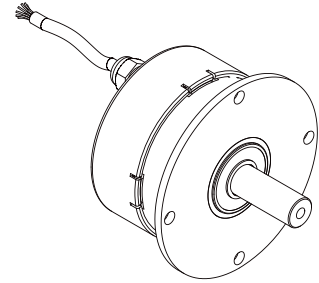
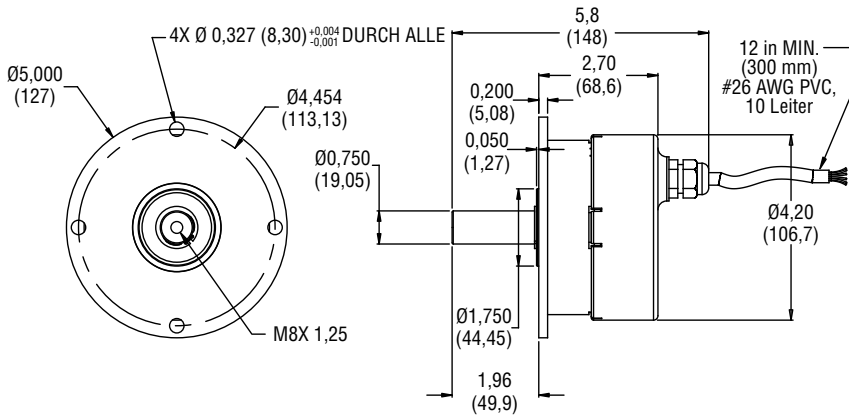
Typische Drehmomentsleistung



% Rated Torque	% Rated Current
2%	0%
25%	28%
50%	47%
75%	65%
100%	88%

TFD-40

Dimensions & Specifications



TFD40 Model Shown

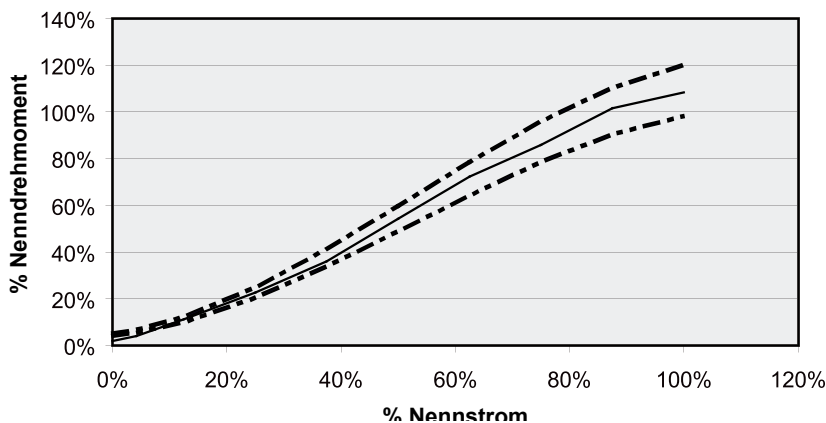
Dimensions (mm)

PERFORMANCE							
Model	Static Torque lb-in (Nm)	Coil Voltage* VDC	Resistance Ohms @ 20°C nom	Power Watts max	Speed* RPM	Rotor Inertia lb-in-sec ²	Weight lb (kg)
TFD-40 050	44 (5.0)	12	3.5	42	300/120	76 X 10 ⁻³	6.2 (2.8)
		24	11.0	51	300/120	76 X 10 ⁻³	6.2 (2.8)
		36	22.7	57	300/120	76 X 10 ⁻³	6.2 (2.8)
		48	35.5	65	300/120	76 X 10 ⁻³	6.2 (2.8)
TFD-40 090	80 (9.0)	12	3.5	42	300/120	10 X 10 ⁻²	6.2 (2.8)
		24	11.0	51	300/120	10 X 10 ⁻²	6.2 (2.8)
		36	22.7	57	300/120	10 X 10 ⁻²	6.2 (2.8)
		48	35.5	65	300/120	10 X 10 ⁻²	6.2 (2.8)
TFD-40 120	106 (12.0)	12	3.5	42	300/120	13 X 10 ⁻²	6.2 (2.8)
		24	11.0	51	300/120	13 X 10 ⁻²	6.2 (2.8)
		36	22.7	57	300/120	13 X 10 ⁻²	6.2 (2.8)
		48	35.5	65	300/120	13 X 10 ⁻²	6.2 (2.8)

See "How to order" model numbering system on page 44. for torque feedback devices.
(-) denotes metric equivalents. Specifications subject to change without notice.

*Intermittent/Continuous

Typische Drehmomentsleistung



% Rated Torque	% Rated Current
2%	0%
25%	28%
50%	47%
75%	65%
100%	88%



TC / TCR / TCP Series

Power-on and Power-off Tooth Clutches

When used in either static or low speed engagement applications, tooth clutches and clutch couplings provide an efficient, positive, switchable link between a motor and load on in-line or parallel shafts. While the field (electromagnet) assembly is prevented from rotating by a fixed flange, the rotor is generally attached to the input shaft. The armature assembly is securely mounted to either an in-line load shaft or a parallel shaft by means of pulleys or gears. When the coil is energized, the tooth profile of the armature positively engages the tooth profile of the rotor, coupling the two in-line or parallel shafts, thus driving the load.

Tooth brakes (not shown) provide an efficient, positive, switchable means of either holding a load or decelerating a load from a slow speed, generally 20 RPM or less. Utilizing the same principle as the tooth clutch, these brakes can be used to effectively hold a load in position. Available in power-on or power-off models, tooth brakes are ideal for applications requiring very high torque in tight places.

- Torque: up to 250 lb-in (28.2 Nm)
- Diameter: 2.13 in. (54.1 mm)
- Positive engagement, indexing capability
- Highest torque density
- Power-on and power-off
- Zero wear at speed when not engaged
- Standard and custom designs

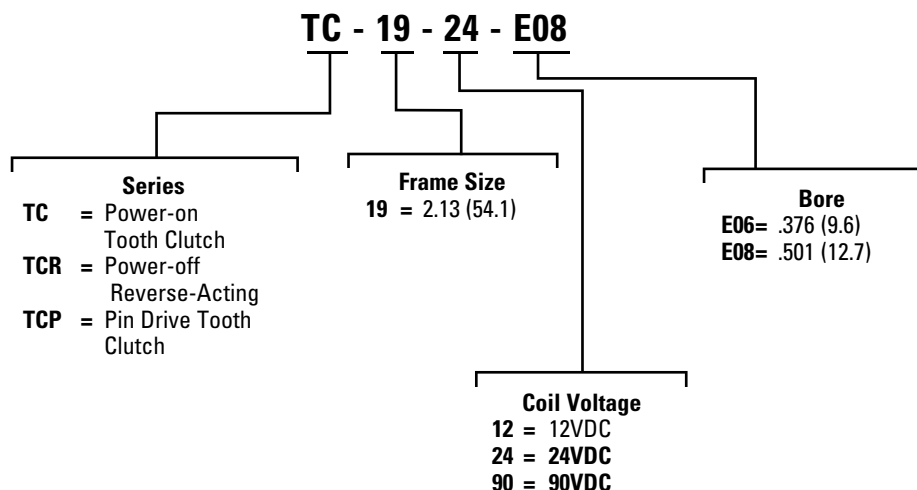


TCR Model Shown

Typical Applications

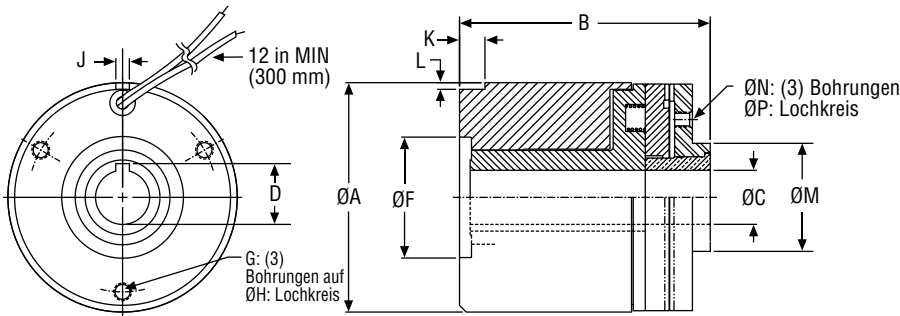
- Military aerospace actuators
- Avionics and flight control
- Medical equipment
- Postal handling equipment
- Machine tools
- Robotics

How to order



TC-19, TCR-19, TCP-19 Tooth Clutches

Dimensions & Specifications



TCR Model Shown

DIMENSIONS															
Model	Static Torque lb-in (Nm)	A: OD in (mm)	B: OAL in (mm)	C: Bore Ø in (mm)	D: K'way Height in (mm)	E: K'way Width in (mm)	F: Case Pilot Ø in (mm)	G: (3) Case Mtg Holes in (mm)	H: Case Mtg Holes Ø in (mm)	J: Mtg Slot Width in (mm)	K: Mtg Slot Length in (mm)	L: Mtg Slot Depth in (mm)	M: Mtg Pilot Ø in (mm)	N: (3) Mtg Holes	P: Mtg Hole BC Ø in (mm)
TC-19-24-E06	250 (28.2)	2.13 (54.1)	2.38 (60.5)	.375 (9.5)	.425 (10.8)	.094 (2.4)	1.125 (28.6)	#8-32 x .22 DP	1.75 (44.5)	NA	NA	NA	1,000 (25.4)	#8-32 x .19 DP	1.44 (36.6)
TC-19-24-E08	250 (28.2)	2.13 (54.1)	2.38 (60.5)	.500 (12.7)	.564 (14.3)	.126 (3.2)	1.125 (28.6)	#8-32 x .22 DP	1.75 (44.5)	NA	NA	NA	1,000 (25.4)	#8-32 x .19 DP	1.44 (36.6)
TCR-19-24-E06	250 (28.2)	2.13 (54.1)	2.38 (60.5)	.375 (9.5)	.425 (10.8)	.094 (2.4)	1.125 (28.6)	#8-32 x .22 DP	1.75 (44.5)	NA	NA	NA	1,000 (25.4)	#8-32 x .16 DP	1.44 (36.6)
TCR-19-24-E08	250 (28.2)	2.13 (54.1)	2.38 (60.5)	.500 (12.7)	.564 (14.3)	.126 (3.2)	1.125 (28.6)	#8-32 x .22 DP	1.75 (44.5)	NA	NA	NA	1,000 (25.4)	#8-32 x .16 DP	1.44 (36.6)
TCP-19-24-E06	50 (5.6)	2.13 (54.1)	1.57 (39.9)	.375 (9.5)	NA	NA	NA	NA	NA	.13 (3.3)	.24 (6.1)	.06 (1.5)	1,000 (25.4)	NA	NA

PERFORMANCE							
Model	Static Torque lb-in (Nm)	Coil Voltage VDC	Resistance Ohms nom	Power Watts max	Engagement Speed RPM (max)	RPM max	Weight lb (kg)
TC-19	250 (28.2)	24/90	47/653	16.7	20	3600	1.7 (0.7)
TCR-19	250 (28.2)	24/90	47/653	16.7	20	3600	1.8 (0.8)
TCP-19	50 (5.6)	24/90	34/476	17.0	20	1750	0.8 (0.3)

See "How to order" model numbering system on page 47 for power-on and power-off tooth clutches.

(-) denotes metric equivalents. Specifications subject to change without notice.

General Notes

- Torque may decrease at higher RPM due to misalignment and vibration associated with the application.
- Engagement speed can be significantly increased and is directly related to system inertia. Consult factory for more information.
- Most tooth clutch applications require a high degree of attention with respect to shaft concentricity and mounting perpendicularity. Consult factory for details.
- Other voltages available upon request.
- Additional sizes and configurations are available upon request. Torque values can be greatly enhanced as well. Consult factory for additional information.



MCS/MBF Series

Metric Clutches and Brakes

Our new metric line of clutches and brakes are designed to be used in true metric applications (dimensional). The MCS and MBF Series offer a wide selection of metric bores and metric standard keyways. The Form Fit and Function matches popular metric lines globally available and are drop-in replacements in most cases.

The MCS and MBF Series have superior performance at a fraction of the cost of our competition. These units are available for low, medium and high volumes.

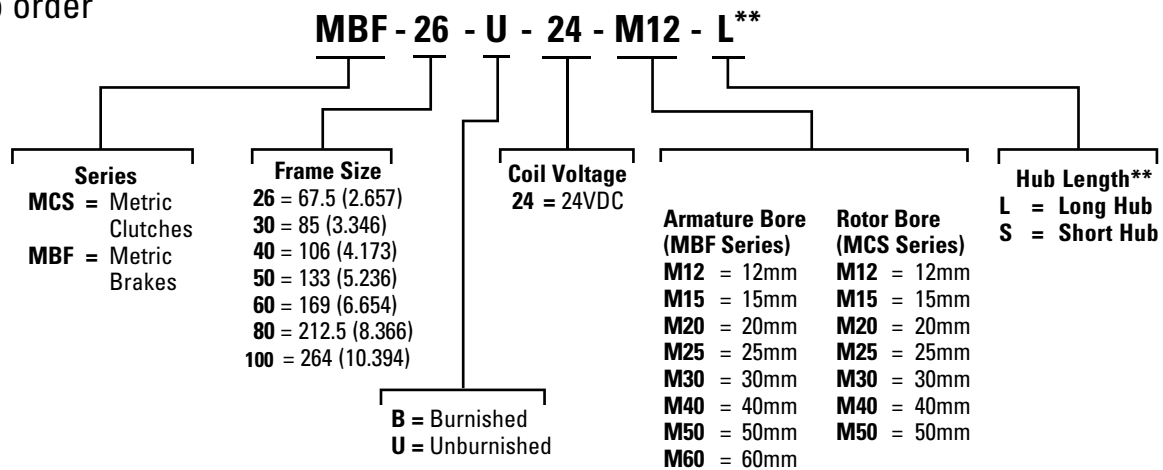
Typical Applications

- Factory automation
- Robotics
- Material handling
- Automotive
- Office automation
- Aviation
- Mail sorters
- Servo systems
- Medical

- Torque: 5.5 to 350 Nm (49 to 3,097 lb-in)
- Diameters: 63 to 264 mm (2.48 to 10.39 in)
- Zero Backlash design
- Static or Dynamic engagement
- Simple installation
- Energy efficient
- Economic cost
- Available “as is” or custom
- **RoHS compliant**



How to order



** Long or Short Hub Length available only on MBF Series Brakes

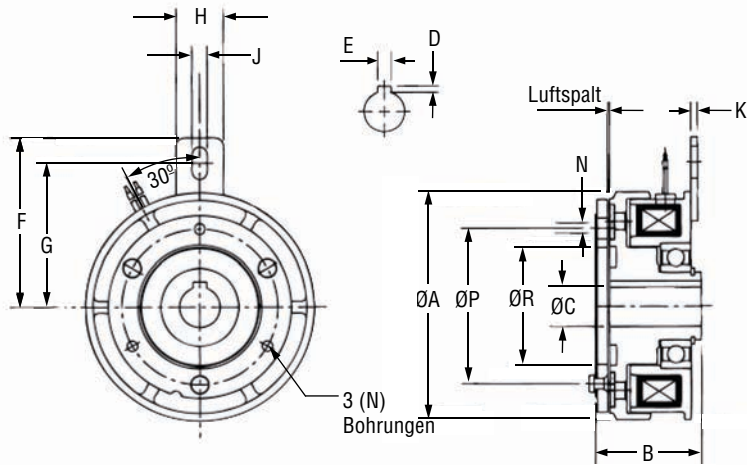
General Notes

- The air gap should be checked periodically to insure proper operation.
- All friction faces must be kept free of grease and oil for proper operation.
- Consult factory for additional options.
- Actual starting and/or stopping times depend on application variables, manufacturing tolerances and friction material wear. Please consult factory for evaluation of actual use before applying specific values to your application.
- Flying leads are provided as standard, terminal style connection available upon request.
- Armature and rotor bore dimensions are minimums, with tolerance generally .001/.002 larger to accommodate varying environmental conditions.
- Coil of 24 volts are provided as standard, other coil voltages are available upon request.



MCS-26, 30, 40, 50, 60, 80, 100 Metric Clutches

Dimensions & Specifications



MCS Model Shown

Dimensions mm (inches)

DIMENSIONS														
Model	Static Torque Nm (lb-in)	A: OD mm (in)	B: OAL mm (in)	C: Bore mm (in)	D: K'way Height mm (in)	E: K'way Width mm (in)	F: Tab Height mm (in)	G: Slot mm (in)	H: Tab Width mm (in)	J: Slot Width mm (in)	K: Tab Thickness mm (in)	Mounting Holes		
												N: Dia Holes (3) mm (in)	P: BC mm (in)	R: Dia mm (in)
MCS-26U24-M12	5.5 (48.68)	67.5 (2.657)	31 (1.22)	12 (0.472)	1.5 (0.059)	4 (0.157)	50 (1.969)	42.5 (1.673)	14 (0.551)	4.5 (0.177)	2 (0.079)	3.1 (0.122)	46 (1.811)	34.5 (1.358)
MCS-30U24-M15	11 (97.35)	85 (3.346)	34.5 (1.358)	15 (0.591)	2 (0.079)	5 (0.197)	65 (2.559)	57.5 (2.264)	16 (0.630)	6.5 (0.256)	2 (0.079)	4.1 (0.161)	60 (2.362)	41.5 (1.634)
MCS-40U24-M20	22 (194.70)	106 (4.173)	39.5 (1.555)	20 (0.787)	3.5 (0.138)	5 (0.197)	70 (2.756)	62.5 (2.461)	16 (0.630)	6.5 (0.256)	2 (0.079)	5.1 (0.201)	76 (2.992)	51.5 (2.028)
MCS-50U24-M25	45 (398.25)	133 (5.236)	44.5 (1.752)	25 (0.984)	3.5 (0.138)	7 (0.276)	85 (3.346)	77.5 (3.051)	16 (0.630)	6.5 (0.256)	2 (0.079)	6.1 (0.240)	95 (3.740)	61.5 (2.421)
MCS-60U24-M30	90 (796.50)	169 (6.654)	50.5 (1.988)	30 (1.181)	3 (0.118)	7 (0.276)	112 (4.409)	100 (3.937)	25 (0.984)	8.5 (0.335)	3.2 (0.126)	8.1 (0.319)	120 (4.724)	79.5 (3.130)
MCS-80U24-M40	175 (1548.75)	212.5 (8.366)	60.5 (2.382)	40 (1.575)	3 (0.118)	10 (0.394)	138 (5.433)	125 (4.921)	25 (0.984)	8.5 (0.335)	3 (0.118)	10.2 (0.402)	158 (6.220)	99.5 (3.917)
MCS-100U24-M50	350 (3097.50)	264 (10.394)	69 (2.717)	50 (1.969)	3.5 (0.138)	12 (0.472)	173 (6.811)	155 (6.102)	30 (1.181)	12 (0.472)	6 (0.236)	12.2 (0.480)	210 (8.268)	124.5 (4.902)

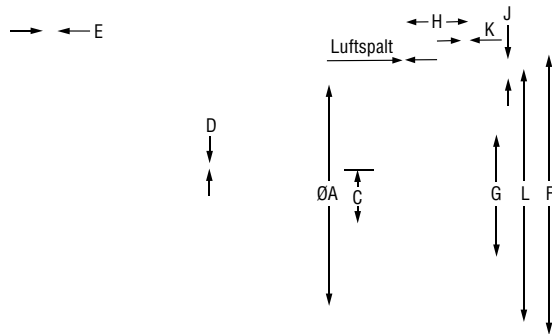
PERFORMANCE											
Model	Static Torque* Nm (lb-in)	Coil Voltage VDC	Resistance Ohms nom	Power Watts max	Armature Engage msec	Armature Disengage msec	Armature Inertia kgcm ² (lb-in-sec ²)	Rotor Inertia kgcm ² (lb-in-sec ²)	Weight kg (lb)	Energy Dissipation ft-lb/min	Recomm. Air Gap at Install mm (in)
MCS-26U24-M12	5.5 (48.68)	24	52	11	20	20	0.423 (3.74 x 10 ⁻⁴)	0.735 (6.51 x 10 ⁻⁴)	0.5 (1.102)	2600	0.2 (0.008)
MCS-30U24-M15	11 (97.35)	24	38	15	23	30	1.18 (1.04 x 10 ⁻³)	2.24 (1.98 x 10 ⁻³)	0.87 (1.918)	2900	0.2 (0.008)
MCS-40U24-M20	22 (194.70)	24	29	20	25	50	4.78 (4.23 x 10 ⁻³)	6.78 (6.00 x 10 ⁻³)	1.57 (3.461)	5800	0.2 (0.008)
MCS-50U24-M25	45 (398.25)	24	23	25	40	65	13.1 (1.16 x 10 ⁻²)	21.4 (1.89 x 10 ⁻²)	2.89 (6.371)	9000	0.3 (0.012)
MCS-60U24-M30	90 (796.50)	24	16	35	50	85	48 (4.25 x 10 ⁻²)	63 (5.58 x 10 ⁻²)	5.3 (11.684)	10000	0.3 (0.012)
MCS-80U24-M40	175 (1548.75)	24	13	45	90	130	137 (1.21 x 10 ⁻¹)	193 (1.71 x 10 ⁻¹)	9.8 (21.605)	50000	0.5 (0.020)

See "How to order" model numbering system on page 49 for metric clutches.
(-) denotes English equivalents. Specifications subject to change without notice.
*Unburnished **Consult factory



MBF-26, 30, 40, 50, 60, 80, 100-S (Short) Metric Brakes

Dimensions & Specifications



MBF-S Model Shown

45°

Dimensions mm (inches)

DIMENSIONS												
Model	Static Torque Nm (lb-in)	A: OD mm (in)	B: OAL mm (in)	C: Bore mm (in)	D: K'way Height mm (in)	E: K'way Width mm (in)	F: Flange OD mm (in)	G: Case ID mm (in)	H: Case Height mm (in)	J: Mtg Holes (4) mm (in)	K: Mtg Pla Thickness mm (in)	L: Mtg Hole BC mm (in)
MBF-26U24-M12-S	5.5 (48.68)	63 (2.48)	25.5 (1.00)	12 (0.47)	1.5 (0.06)	4 (0.16)	80 (3.15)	35 (1.38)	18 (0.71)	5 (0.20)	2.1 (0.08)	72 (2.83)
MBF-26U24-M15-S	5.5 (48.68)	63 (2.48)	25.5 (1.00)	15 (0.59)	2 (0.08)	5 (0.20)	80 (3.15)	35 (1.38)	18 (0.71)	5 (0.20)	2.1 (0.08)	72 (2.83)
MBF-30U24-M15-S	11 (97.35)	80 (3.15)	28.5 (1.12)	15 (0.59)	2 (0.08)	5 (0.20)	100 (3.94)	42 (1.65)	20 (0.79)	6 (0.24)	2.6 (0.10)	90 (3.54)
MBF-30U24-M20-S	11 (97.35)	80 (3.15)	28.5 (1.12)	20 (0.79)	2.5 (0.10)	5 (0.20)	100 (3.94)	42 (1.65)	20 (0.79)	6 (0.24)	2.6 (0.10)	90 (3.54)
MBF-40U24-M20-S	22 (194.70)	100 (3.94)	33 (1.30)	20 (0.79)	2.5 (0.10)	5 (0.20)	125 (4.92)	52 (2.05)	22 (0.87)	7 (0.28)	3.1 (0.12)	112 (4.41)
MBF-40U24-M25-S	22 (194.70)	100 (3.94)	33 (1.30)	25 (0.98)	3 (0.12)	7 (0.28)	125 (4.92)	52 (2.05)	22 (0.87)	7 (0.28)	3.1 (0.12)	112 (4.41)
MBF-50U24-M25-S	45 (398.25)	125 (4.92)	37 (1.46)	25 (0.98)	3 (0.12)	7 (0.28)	150 (5.91)	62 (2.44)	24 (0.94)	7 (0.28)	3.6 (0.14)	137 (5.39)
MBF-50U24-M30-S	45 (398.25)	125 (4.92)	37 (1.46)	30 (1.18)	3 (0.12)	7 (0.28)	150 (5.91)	62 (2.44)	24 (0.94)	7 (0.28)	3.6 (0.14)	137 (5.39)
MBF-60U24-M30-S	90 (796.50)	160 (6.30)	42 (1.65)	30 (1.18)	3 (0.12)	7 (0.28)	190 (7.48)	80 (3.15)	26 (1.02)	9.5 (0.37)	4.1 (0.16)	175 (6.89)
MBF-60U24-M40-S	90 (796.50)	160 (6.30)	42 (1.65)	40 (1.57)	3 (0.12)	10 (0.39)	190 (7.48)	80 (3.15)	26 (1.02)	9.5 (0.37)	4.1 (0.16)	175 (6.89)
MBF-80U24-M40-S	175 (1548.75)	200 (7.87)	50.5 (1.99)	40 (1.57)	3 (0.12)	10 (0.39)	230 (9.06)	100 (3.94)	30 (1.18)	9.5 (0.37)	5.1 (0.20)	215 (8.46)
MBF-80U24-M50-S	175 (1548.75)	200 (7.87)	50.5 (1.99)	50 (1.97)	3.5 (0.14)	12 (0.47)	230 (9.06)	100 (3.94)	30 (1.18)	9.5 (0.37)	5.1 (0.20)	215 (8.46)
MBF-100U24-M50-S	350 (3097.50)	250 (9.84)	59 (2.32)	50 (1.97)	3.5 (0.14)	12 (0.47)	290 (11.42)	125 (4.92)	35 (1.38)	11.5 (0.45)	6.1 (0.24)	270 (10.63)

PERFORMANCE										
Model	Static Torque* Nm (lb-in)	Coil Voltage VDC	Resistance Ohms nom	Power Watts max	Armature Engagement msec	Armature Disengage msec	Armature Inertia kgcm ² (lb-in-sec ²)	Weight kg (lb)	Energy Dissipation ft-lb/min	Recomm. Air Gap at Install mm (in)
MBF-26U24-xxx-S	5.5 (48.68)	24	52	11	15	15	0.603 (5.34 x 10 ⁻⁴)	0.32 (0.705)	2600	0.2 (0.008)
MBF-30U24-xxx-S	11 (97.35)	24	38	15	16	25	1.71 (1.51 x 10 ⁻³)	0.58 (1.279)	2900	0.2 (0.008)
MBF-40U24-xxx-S	22 (194.7)	24	29	20	18	30	6.63 (5.87 x 10 ⁻³)	1.07 (2.359)	5800	0.2 (0.008)
MBF-50U24-xxx-S	45 (398.25)	24	23	25	27	50	18.1 (1.60 x 10 ⁻²)	1.97 (4.343)	9000	0.3 (0.012)
MBF-60U24-xxx-S	90 (796.5)	24	16	35	35	55	63.5 (5.62 x 10 ⁻²)	3.45 (7.606)	10000	0.3 (0.012)
MBF-80U24-xxx-S	175 (1548.75)	24	13	45	65	70	190 (1.68 x 10 ⁻¹)	7.1 (15.653)	50000	0.5 (0.020)
MBF-100U24-xxx-S	350 (3097.50)	24	9.6	60	85	125	483 (4.27 x 10 ⁻¹)	12.2 (26.896)	70000	0.5 (0.020)

See "How to order" model numbering system on page 49 for metric brakes.

(-) denotes English equivalents. Specifications subject to change without notice.

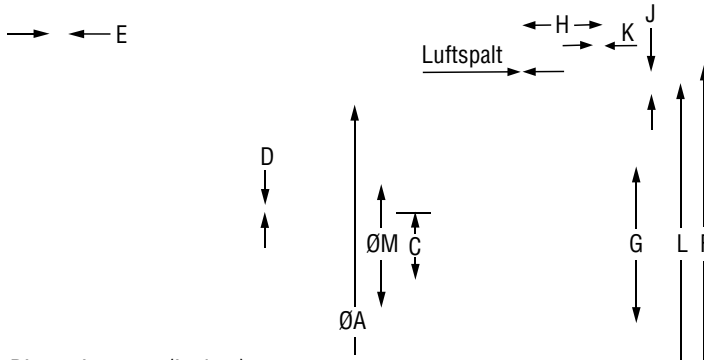
*Unburnished

**Consult factory



MBF-26, 30, 40, 50, 60, 80, 100-L (Long) Metric Brakes

Dimensions & Specifications



MBF-L Model Shown

Dimensions mm (inches)

DIMENSIONS													
Model	Static Torque Nm (lb-in)	A: OD mm (in)	B: OAL mm (in)	C: Bore mm (in)	D: K'way Height mm (in)	E: K'way Width mm (in)	F: Flange OD mm (in)	G: Case ID mm (in)	H: Case Height mm (in)	J: Mtg Holes (4) mm (in)	K: Mtg Pla Thickness mm (in)	L: Mtg Hole BC mm (in)	M: Hub Dia mm (in)
MBF-26U24-M12-L	5.5 (48.68)	63 (2.48)	37 (1.46)	12 (0.47)	1.5 (0.06)	4 (0.16)	80 (3.15)	35 (1.38)	18 (0.71)	5 (0.20)	2.10 (0.08)	72 (2.83)	26 (1.02)
MBF-26U24-M15-L	5.5 (48.68)	63 (2.48)	37 (1.46)	15 (0.59)	2 (0.08)	5 (0.20)	80 (3.15)	35 (1.38)	18 (0.71)	5 (0.20)	2.10 (0.08)	72 (2.83)	26 (1.02)
MBF-30U24-M15-L	11 (97.35)	80 (3.15)	44.8 (1.76)	15 (0.59)	2 (0.08)	5 (0.20)	100 (3.94)	42 (1.65)	20 (0.79)	6 (0.24)	2.6 (0.10)	90 (3.54)	31 (1.22)
MBF-30U24-M20-L	11 (97.35)	80 (3.15)	44.8 (1.76)	20 (0.79)	2.5 (0.10)	5 (0.20)	100 (3.94)	42 (1.65)	20 (0.79)	6 (0.24)	2.6 (0.10)	90 (3.54)	31 (1.22)
MBF-40U24-M20-L	22 (194.70)	100 (3.94)	53 (2.09)	20 (0.79)	2.5 (0.10)	5 (0.20)	125 (4.92)	52 (2.05)	22 (0.87)	7 (0.28)	3.10 (0.12)	112 (4.41)	41 (1.61)
MBF-40U24-M25-L	22 (194.70)	100 (3.94)	53 (2.09)	25 (0.98)	3 (0.12)	7 (0.28)	125 (4.92)	52 (2.05)	22 (0.87)	7 (0.28)	3.10 (0.12)	112 (4.41)	41 (1.61)
MBF-50U24-M25-L	45 (398.25)	125 (4.92)	61.3 (2.41)	25 (0.98)	3 (0.12)	7 (0.28)	150 (5.91)	62 (2.44)	24 (0.94)	7 (0.28)	3.6 (0.14)	137 (5.39)	49 (1.93)
MBF-50U24-M30-L	45 (398.25)	125 (4.92)	61.3 (2.41)	30 (1.18)	3 (0.12)	7 (0.28)	150 (5.91)	62 (2.44)	24 (0.94)	7 (0.28)	3.6 (0.14)	137 (5.39)	49 (1.93)
MBF-60U24-M30-L	90 (796.50)	160 (6.30)	73.5 (2.89)	30 (1.18)	3 (0.12)	7 (0.28)	190 (7.48)	80 (3.15)	26 (1.02)	9.5 (0.37)	4.10 (0.16)	175 (6.89)	65 (2.56)
MBF-60U24-M40-L	90 (796.50)	160 (6.30)	73.5 (2.89)	40 (1.57)	3 (0.12)	10 (0.39)	190 (7.48)	80 (3.15)	26 (1.02)	9.5 (0.37)	4.10 (0.16)	175 (6.89)	65 (2.56)
MBF-80U24-M40-L	175 (1548.75)	200 (7.87)	87.2 (3.43)	40 (1.57)	3 (0.12)	10 (0.39)	230 (9.06)	100 (3.94)	30 (1.18)	9.5 (0.37)	5.10 (0.20)	215 (8.46)	83 (3.27)
MBF-80U24-M50-L	175 (1548.75)	200 (7.87)	87.2 (3.43)	50 (1.97)	3.5 (0.14)	12 (0.47)	230 (9.06)	100 (3.94)	30 (1.18)	9.5 (0.37)	5.10 (0.20)	215 (8.46)	83 (3.27)
MBF-100U24-M50-L	350 (3097.50)	250 (9.84)	102.6 (4.04)	50 (1.97)	3.5 (0.14)	12 (0.47)	290 (11.42)	125 (4.92)	35 (1.38)	11.5 (0.45)	6.10 (0.24)	270 (10.63)	105 (4.13)

PERFORMANCE										
Model	Static Torque* Nm (lb-in)	Coil Voltage VDC	Resistance Ohms nom	Power Watts max	Armature Engagement msec	Armature Disengage msec	Armature Inertia kgcm ² (lb-in-sec ²)	Weight kg (lb)	Energy Dissipation ft-lb/min	Recomm. Air Gap at Install mm (in)
MBF-26U24-xxx-L	5.5 (48.68)	24	52	11	15	15	0.603 (5.34 x 10 ⁻⁴)	0.32 (0.705)	2600	0.2 (0.008)
MBF-30U24-xxx-L	11 (97.35)	24	38	15	16	25	1.71 (1.51 x 10 ⁻³)	0.58 (1.279)	2900	0.2 (0.008)
MBF-40U24-xxx-L	22 (194.7)	24	29	20	18	30	6.63 (5.87 x 10 ⁻³)	1.07 (2.359)	5800	0.2 (0.008)
MBF-50U24-xxx-L	45 (398.25)	24	23	25	27	50	18.1 (1.60 x 10 ⁻²)	1.97 (4.343)	9000	0.3 (0.012)
MBF-60U24-xxx-L	90 (796.5)	24	16	35	35	55	63.5 (5.62 x 10 ⁻²)	3.45 (7.606)	10000	0.3 (0.012)
MBF-80U24-xxx-L	175 (1548.75)	24	13	45	65	70	190 (1.68 x 10 ⁻¹)	7.1 (15.653)	50000	0.5 (0.020)
MBF-100U24-xxx-L	350 (3097.50)	24	9.6	60	85	125	483 (4.27 x 10 ⁻¹)	12.2 (26.896)	70000	0.5 (0.020)

See "How to order" model numbering system on page 49 for metric brakes.

(-) denotes English equivalents. Specifications subject to change without notice.

*Unburnished

**Consult factory

Engineered Products

Power-off Spring Set (Safety) - LBRP Series

Spring Set electromagnetic power-off brakes provide a safe, efficient means of stopping and/or holding a load in the absence of power. Custom manufactured for wheelchair and the handicap scooter industry, our LBRP series brakes have optional manual release handles and some models are available with micro switches. (To indicate whether the brake is released or engaged.) Our LBRP series power-off spring set brakes can be used as a stopping (emergency stopping) or holding brake (parking). These brakes are manufactured in low cost regions allowing the lowest prices available in the market.

- Static Torque: 1 to 13 Nm (8.85 to 115 lb-in)
- Diameter: 42 to 100 mm (1.65 to 3.938 in)

- Bore size (Shaft Dia.): 6 to 12 mm (0.236 to 0.472 in)
- Assembly and all components meet EU Directive 2002/95/EC (RoHS)
- Plated steel surfaces to withstand corrosion
- Tough, durable long-wearing friction materials
- Anti-Rattle feature
- Operating speeds up to 3600 RPM

Other Applications Include

- Patient Lifts
- Handicap Van/RV/Truck actuators
- Electric Vehicles
- Lawn Mowers
- Robotics
- Electric Floor Sweepers



LBRP Series

Contact our Applications Team for more information.

Multi Disc Brakes and Clutches - MDB/MDC Series

Multiple Disc Clutches provide a smooth efficient, switchable link between a motor and a load on in-line or parallel shafts. While the field (electromagnet) assembly is prevented from rotating by an anti-rotation tab or flange, the rotor is securely mounted on the drive shaft. The armature assembly is then mounted either directly on an opposing in-line shaft, or indirectly on a parallel shaft by means of gears or pulleys. When the coil is energized, the armature engages the friction surface of the rotor, further engaging the multiple discs within the assembly until full torque is achieved, thereby coupling the two in-line or parallel shafts, thus driving the load. A brake operates similarly by eliminating the rotor.

- Torque: 25 lb-in to 300 lb-ft (2.8 to 407 Nm)
- Diameter: 2.0 to 10 in. (50.8 to 254.0 mm)
- Dynamic engagement capabilities
- Wet or dry operation
- Custom designs only

Typical Applications

- Flight control actuators
- Postal equipment
- Packaging
- Machine tools
- Agricultural equipment



MDC Model Shown

Complete Custom Assemblies and Subassemblies

Custom Brake and Clutch Value-Added Assemblies are a major strength of Thomson. Variations of any device shown in this catalog can be adapted specifically to meet the most demanding needs of your application.

Custom gears, pulleys, sprockets, integrally mounted to the clutch can be combined with special shaft sizes, coil voltages, connector assemblies or any other type of design imaginable.

We manufacture complete assemblies and subassemblies for many customers. Allow us to help cost-reduce your product and provide a more economical solution to your most complex clutch or brake application.

- Torque: 6.0 oz-in to 1200 lb-in (0.04 to 135 Nm)
- Diameters: 0.6 to 7.25 in (15.2 to 184.2 mm)
- Efficient means of cycling load
- Fast response, repeatable performance
- Static or dynamic engagement
- Simple installation
- Economical cost
- Energy efficient



See inside back cover of this catalog for more information.

Design Considerations

Factors To Consider

Brake and Clutch design considerations are based on a number of factors. Depending upon the particular application these factors can become either more or less important. The discussion of Application Definitions differentiates

between heavy, medium and light duty, as well as static versus dynamic applications. In a simple light duty, static use application, clutch or brake selection can be made based on an estimate of torque required considering the motor

torque capacity and the load driven (or held). However when precise control and life expectancy are of concern, one must consider inertia, heat dissipation and speed as key factors.

Inertia Calculations

Total system inertia, typically expressed in lb-in-sec² units, equals the sum of reflected inertia (I_R) and clutch inertia (I_C).

Clutch inertia values can be found in our catalog, reflected inertia is calculated beginning with **load inertia**.

Load inertia (I_L) for cylindrical rotational bodies, expressed in units of lb-in-sec², is equal to $WR^2/772$, where W = weight in lbs. and R = radius in inches. The following chart may be used as reference (based on steel, per inch of length) to help simplify this calculation. To deter-

mine the inertia of a given shaft, multiply the WR^2/L shown below by the length of the shaft or the thickness of the disc in inches. For hollow shafts, subtract the WR^2/L of the ID from the WR^2/L of the OD and multiply by the length.

Diameter in	WR ² /L lb-in ² /in	Diameter in	WR ² /L lb-in ² /in	Diameter in	WR ² /L lb-in ² /in	Diameter in	WR ² /L lb-in ² /in
0.250	0.00011	2.00	0.445	6.00	36.00	10.00	277.92
0.312	0.00027	2.25	0.712	6.25	42.39	10.25	306.72
0.375	0.00055	2.50	1.085	6.50	49.60	10.50	337.71
0.437	0.00102	2.75	1.584	6.75	57.68	10.75	371.04
0.500	0.00173	3.00	2.250	7.00	66.71	11.00	406.78
0.562	0.00279	3.25	3.100	7.25	76.76	11.25	444.96
0.625	0.00425	3.50	4.176	7.50	87.91	11.50	485.93
0.687	0.00623	3.75	5.494	7.75	100.23	11.75	529.59
0.750	0.00879	4.00	7.113	8.00	113.90	12.00	576.00
0.812	0.01215	4.25	9.072	8.25	128.71	12.25	626.10
0.875	0.01634	4.50	11.393	8.50	145.00	12.50	678.31
0.937	0.02142	4.75	14.144	8.75	162.86	12.75	734.22
1.000	0.02778	5.00	17.365	9.00	182.29	13.00	793.52
1.250	0.06783	5.25	21.107	9.25	203.40	13.25	856.35
1.500	0.14065	5.50	25.488	9.50	226.30	13.50	922.83
1.750	0.26058	5.75	30.371	9.75	252.00	13.75	993.11

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

Design Considerations

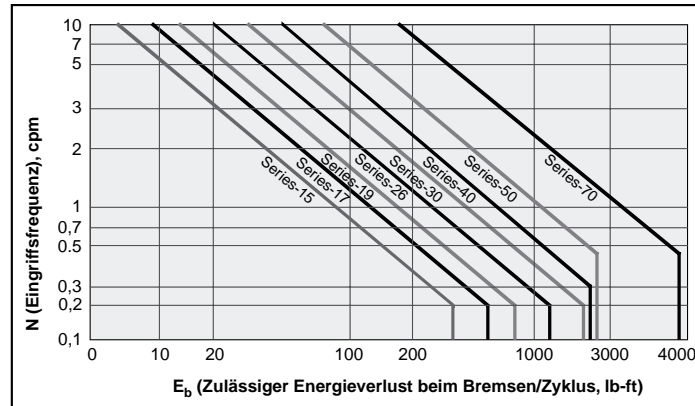
Energy Dissipation Calculations

Total energy dissipation (E_c), typically expressed in units of ft-lb, is defined as the sum of kinetic (E_k) and slip (E_s) energy dissipated each clutch or brake cycle.

Kinetic energy dissipation (E_k) is equal to $4.6 \times 10^{-4} \times I \times \omega^2$, where I = total system inertia in lb-in-sec² units, and ω = differential slip speed in RPM.

Slip energy dissipation (E_s) is equal to $43.6 \times 10^{-4} \times \omega \times D \times t_s$, where D = load drag reflected to the clutch shaft in lb-in units, and t_s = total slip time in seconds.

Brake Energy Dissipation Chart



Use to evaluate size of a power-off brake after determining the energy dissipation.

Optimum Torque and Response

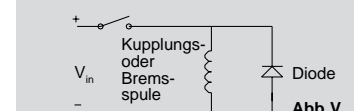
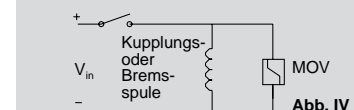
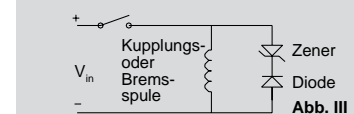
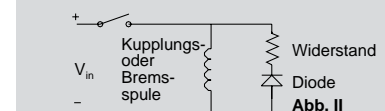
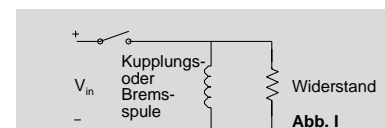
Burnishing: Burnishing is a process of running-in the mating friction surfaces of a clutch or brake to ensure the highest possible output torque. By forcing the unit to slip rotationally when energized, the mating frictional surfaces establish an optimal wear pattern within a relatively short time. This can be accomplished at the factory or during the initial stages of installed application. However, whenever possible it is more desirable to perform the burnishing process at the actual installation to insure a consistent alignment of the friction faces.

Engagement: Coil overexcitation is a technique which makes a clutch or brake engage faster and have greatly improved starting and stopping accuracy. It is accomplished by applying over-voltage to the clutch or brake coil to reduce current build-up time, thereby reducing the magnetizing time. However, this overexcitation does not increase the torque of the unit. It simply reduces the start/stop times and friction face wear normally associated with slippage that can occur during a slower engagement time. In many applications, the reduction in start-time can be reduced significantly when using an overexcitation circuit. However, adequate coil suppression must be employed to prevent damage to the system. Please contact the factory for more detailed information.

Disengagement: When a clutch or brake is disengaged, a reverse voltage is generated in the coil. This voltage can be extremely high and could cause potential damage to the unit and the switch in the circuit. Therefore, an arc suppression circuit should be used to protect the coil and switch. When properly applied, such a circuit will not adversely affect the clutch or brake engagement time.

In most applications, a simple resistor connected in parallel with the clutch or brake coil is sufficient (Fig. I). The resistor should be rated at six times the coil resistance and approximately 25% of the coil wattage. To eliminate any added current draw, a diode may be added to the circuit as shown

(Fig. II). If faster release times are desired, a zener diode with two times the coil voltage should be incorporated into the circuit (Fig. III). However, the fastest disengagement time is achieved with the use of an MOV (metal oxide varistor) (Fig. IV). Conversely, if slower disengagement times are required, the use of a diode connected in parallel with the coil (Fig. V), or simply switching the A/C side of the circuit, will achieve this result.



Mounting Requirements

CS, CSC, CF, CFC, BF, BRP, SB, FSB, AKB and PMB units

(Bearing and flange mounted clutches, couplings and brakes)

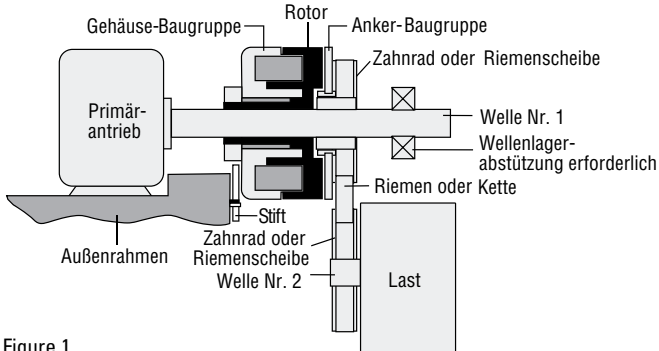


Figure 1

Bearing Mounted Clutches - CS models

Figure 1 - Used to couple two parallel shafts. The rotor and armature are mounted on the same shaft. The armature is bearing mounted on the shaft and is free to rotate independent of the shaft. The knurled hub can press fit a gear or pulley onto the armature assembly which in turn drives the parallel shaft. The case assembly is bearing mounted and is provided with anti-rotation tab.

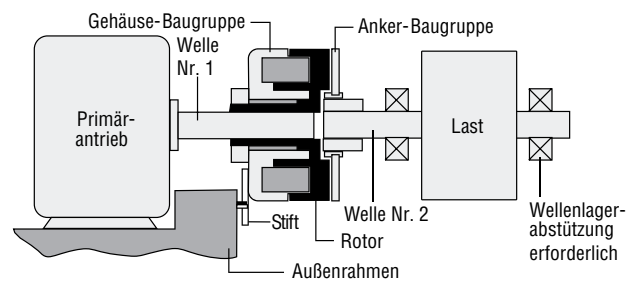


Figure 2

Bearing Mounted Clutch Couplings - CSC models

Figure 2 - Used to couple two in-line shafts. The rotor is attached to one shaft and the armature to the other shaft. The case assembly is bearing mounted and is provided with an anti-rotation tab.

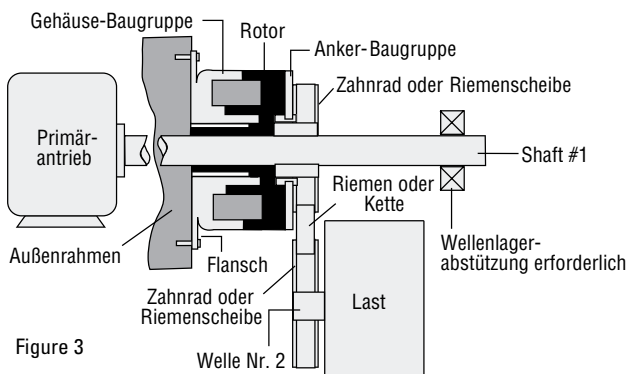


Figure 3

Flange Mounted Clutches - CF models

Figure 3 - Used to couple two parallel shafts. The case assembly is flange mounted for fastening to a bulkhead.

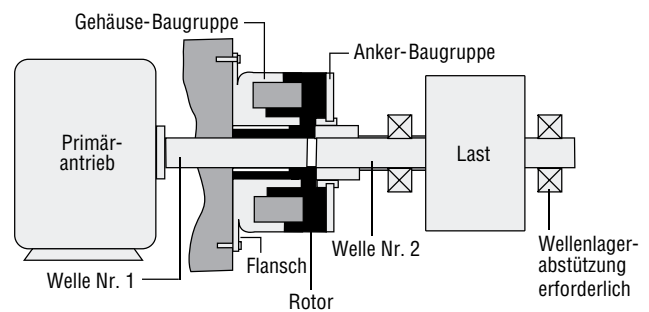


Figure 4

Flange Mounted Clutch Couplings - CFC models

Figure 4 - Used to couple two in-line shafts. The rotor is attached to one shaft and the armature to the other shaft. The case assembly is flange mounted for fastening to a bulkhead.

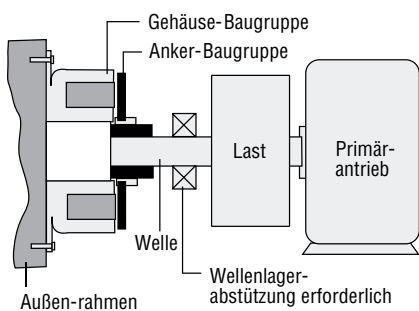


Figure 5

Flange Mounted Brakes - BF models

Figure 5 - Used to stop or hold the armature and load to which it is attached. Units are furnished with coupling type armature hubs. The case assembly is flange mounted for fastening to a bulkhead.

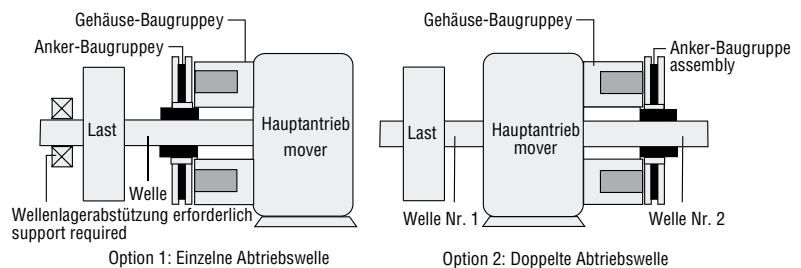


Figure 6

Power-Off Brakes - BRP, SB, FSB, AKB & PMB models

Figure 6 - Used to stop or hold a load in the absence of power. The case assembly is mounted or fastened to a bulkhead. The armature assembly is attached to the rotating load.

Glossary of Terms

Acceleration Time - The time required 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.

Air Gap - The physical axial space between rotor and armature that is overcome when the magnet body is energized, engaging the clutch, or brake.

Anti-Rattle Feature - PMB and AKB brake are available with an anti-rattle feature. This feature minimizes noise that occurs when the brake is released (Power On) and is running at speed. On the PMB Series, a rubber "O" ring is embedded in the "splined hub" that applies a slight pressure on the mating spline teeth eliminating most of the rattling noise. On the AKB Series, an "O" ring is embedded in the ID on the rotor assembly.

Anti-Rotation Slot - A slot used in a clutch models to prevent rotation during operation.

Armature (assembly) - The component in a friction clutch or brake that is attracted to the rotor or case assembly by the magnetic field created by the case assembly, effecting the coupling of input and output.

Armature Disengagement Time (ADT) - The time required from the instant electrical power is removed from the actuation system until the clutch is disengaged. Armature Disengagement Time is also often referred to as Drop-Out Time.

Burnishing - A process of running in a clutch or a brake to reach full potential torque. All standard catalog values of torque are indicated as burnished. Generally, any unit will become burnished during the first few cycles of normal operation at the customer's site. Pre-burnishing at the factory is normally an additional operation required only by those customers needing immediate out-of-box torque prior to the normal application run-in period.

Case Assembly - The fixed component in a clutch or brake that is energized, creating a magnetic field, effecting the engagement of rotor and armature.

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

Dust Cover - PMB brakes are available

with a dust cover. The dust cover protects the braking surfaces against, dust, dirt, and dripping water. This feature is made from flexible rubber and is fitted between the case and the mounting plate.

Dynamic Torque - The torque developed where there is a relative motion between mating surfaces in a friction clutch or brake. The torque varies with the speed of rotation and amount of slip. Please contact our engineers for specific data.

Engagement Time - The time required, from the moment the clutch receives the appropriate electrical signal, for the magnet to attract the armature and the clutch faces are engaged. At this point the load begins to accelerate.

Frictional Torque - The torque created by friction reflected at the output of the clutch or brake.

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.

Inner & Outer Pole (face) - Areas of the rotor that form the magnetic flux path and torque carrying friction within a clutch. In a brake the case assembly forms these poles.

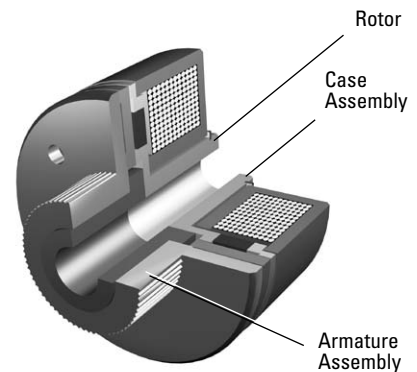
Manual Release - Spring set brakes such as our PMB Series are available with a manual release. The manual release allows the brake to be released mechanically in place of the electric coil operation. When power is removed, the brake is "holding", if there is no electrical power available, simply push or pull the lever (handle) and the brake will release (not hold the load, shaft - hub will be allowed to rotate freely). Once pressure is removed from the handle (let go), the manual release handle will go back to its original position automatically. The brake will then "hold" (shaft - hub will be locked once again).

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

Friction Clutch



electromagnets where low level magnetism remains after the electrical current is removed.

Rotor (assembly) - The rotating component in a clutch that is generally attached (keyed or pinned) to the input (motor) shaft.

Static Torque - In friction devices this is the torque level beyond which the clutch or brake will slip or overrun.

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 lb-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.

Torque Adjustment Feature - Our PMB

Glossary of Terms

series brakes are available with a Torque Adjustment Feature. This feature allows the torque to be adjusted down from maximum holding force (Static Torque). This feature is in the form of a threaded “spanner type nut”, to turn the nut, a simple spanner wrench may be used. This feature relieves the “tension” on the springs, therefore reducing the holding torque. This feature allows for a “softer” stop or less holding force (torque).

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 CPM (cycles per minute), as the number of times the clutch or brake is engaged and disengaged during a one minute period.

Undercut - A process of cutting back one of the pole surfaces in relation to the other. Generally done to reduce any residual magnetism or to derate a device. Also a term used to describe the recessing of friction material so as to affect a more efficient burnished condition.

Application Definitions

Heavy Duty is defined as one where the clutch is engaged in concert with the movement of the load. Example: a paper feed clutch that is engaged each time that a sheet of paper is introduced into the print path.

Light to Medium Duty is defined as one where running speed is achieved in the absence of loading (or the clutch is engaged at zero speed). Example: a machine tool head that is engaged and at speed before the cutting of metal begins.

A **Dynamic Clutch** application is another way of defining “Heavy Duty”. Factors such as inertia, energy dissipation and life become critical.

A **Static Clutch** application is defined as one where the clutch is engaged at zero speed. Example: a tooth clutch that is used to couple and position an X-ray machine head.

A **Dynamic Brake** application is defined as one where the brake is engaged to actually stop the load. Again, inertia, energy dissipation and life must be well defined. Example: an emergency stop of a motor that is running at speed, particularly if under load.

A **Static Brake** application is defined as one where the brake is engaged after the system has come to rest. Example: a holding brake on a Z-axis to hold the load in place in the event of a power failure.

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

Deltran Clutches and Brakes custom engineered for your market!



Problem: Automotive lift-gate system required a unique, high volume solution to switch between automatic and manual operation.

Solution: Deltran custom engineered CS-19B clutch

We manufacture complete assemblies and subassemblies for many of our customers with special needs in various markets.



- **MEDICAL**
SB Power-off Brake
Holds table in position



- **PACKAGING**
Friction Clutches and Brakes
Moves product



- **ELECTRIC VEHICLE**
PMB Power-off Brake Brake
holds cart



- **AGRICULTURE**
Friction Clutches and Brakes
Turns seeder on and off



- **ELECTRONIC ASSEMBLY**
Friction Clutches and Brakes
Pick and place



- **OFFICE AUTOMATION**
Friction Clutches and Brakes
Paper feed



- **AEROSPACE & DEFENSE**
TCR-19 Tooth Clutch
Environmental control



- **AUTOMOTIVE**
TC-13A Tooth Clutch
Power sliding door mechanism

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