



DELTRAN

- Friction Clutches
- Friction Brakes
- Tooth Clutches
- Torque feedback device (torque 'v' current)



www.motiontech.com.au

Deltran Clutches & Brakes

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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 solution 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 defence.
- As part of Danaher Motion, 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, & reduced risk.

In addition to the information contained in this document, a wealth of product and application information is available from your Australian distributor Motion Technologies, www.motiontech.com.au (02) 9524 4782

The Danaher Business System -

Building sustainable competitive advantage into your business

The Danaher Business System (DBS) 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. DBS is based on the principles of Kaizen which continuously and aggressively eliminate waste in every aspect of our business. DBS 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.

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, API (American Precision Industries), and Warner PSI bringing over 100 years of combined manufacturing experience. Deltran joined Danaher Motion in March 2000, followed in July 2000 by the acquisition of Warner PSI. The Electromagnetic friction products were later combined under the Deltran name within the Thomson family. 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 Danaher Business System (DBS) 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, defence, 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 is 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.

Using Our Clutches and Brakes Catalogue.

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 catalogue contains several aides to assist in the selection process.

- CLUTCH AND BRAKE TECHNOLOGIES.
- SELECTION BY MOTION TYPE
- SELECTION BY CAPABILITY

Friction Products

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).



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).



Clutches and Brakes Selection Chart:

By Motion Type

Motion	Type	Models/Sizes	Max Torque lb-in (Nm)	Max RPM	Actuation Methis
Starting	Friction Clutch	CS-11, 15, 17, 22, 26, 30	125(14.2)	5000	DC
	Friction Clutch	CSC-11,15 17, 22, 26, 30	125(14.2)	5000	DC
	Friction Clutch	CF-11, 15, 17, 22, 26, 30	125(14.2)	5000	DC
	Friction Clutch	CFC-11, 15, 17, 22, 26, 30	125(14.2)	5000	DC
	Tooth Clutch	TC-19, TCR-19	250 (28.2)	5000	DC
	Tooth Clutch	TCP-19	50 (5.6)	5000	DC
	Friction Clutch	MCS / MDC	Custom Engineering product – Consult Factory		
Slipping	Feedback Device	TFD-30,40	12 (106)	300/120**	DC
Stopping	Friction Brake	BF-11,15 17, 22, 26, 30	125 (14.13)	5000	DC
	Friction Brake	MBF-26, 30, 40, 50, 60, 80, 100, (L&S)	3540 (400)	5000	DC
Holding	Friction Brake	BF-11,15 17, 22, 26, 30	125 (14.13)	5000	DC
	Friction Brake	BRP-15, 17, 22, 26, 30, 40, 50, 60, 70	1000 (113)	5000	DC
	Friction Brake	SB-15, 17, 19, 23, 26, 28, 20, 40, 50, 60, 70	1200 (135.6)	5000	DC
	Friction Brake	FSB-15, 17	3 (0.34)	5000	DC
	Friction Brake	AKB-17, 19, 26, 30, 40, 50	470 (53)	5000	DC
	Friction Brake	PMB-30, 40, 50, 60, 65, 75, 85, 100, 120	4250 (480)	3000	DC
	Friction Brake	MBF-26, 30, 40, 50, 60, 80, 100 (L&S)	3540 (400)	5000	DC
	Friction Brake	MBRP - 15,19, 22, 26, 30	3540 (400)	5000	DC

* Consult factory for higher speeds

** Intermittent/Continuous



Friction Clutches & Brakes

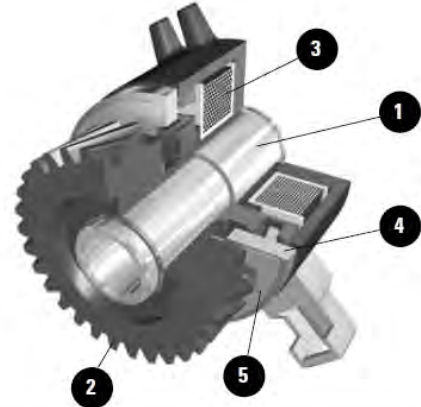
Friction Clutches & Brakes

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

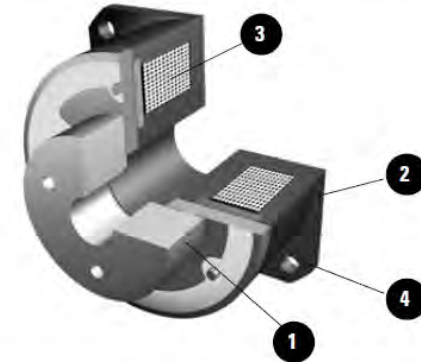
armature plate (4), engaging this with the rotor assembly, and thus driving the load. When the coil is de-energized, these two attracted elements are no longer attracted and are separated by a spring (5) within the armature assembly. The motor shaft and load are then no longer connected and therefore 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

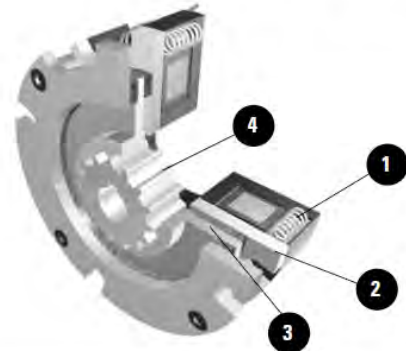
mounted to a non-rotating component or bulkhead. Until the coil is (3) energized, the armature assembly will rotate freely. Upon energization, the field assembly becomes an electromagnet, attracting the armature plate (4), thus braking the load.



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 armature 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. When the coil is



Shafts must be fully bearing supported

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 magnet

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 the coil is energized,



Shafts must be fully bearing supported

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 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 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



Shafts must be fully bearing supported

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 engage a static field assembly and a rotating armature assembly, braking can be achieved.



Shafts must be fully bearing supported

These units provide high torque in a compact package size primarily for custom applications in the aerospace 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 assemblies or any other type of design imaginable.



Friction Applications

Power-Off Brakes

Patient Lift

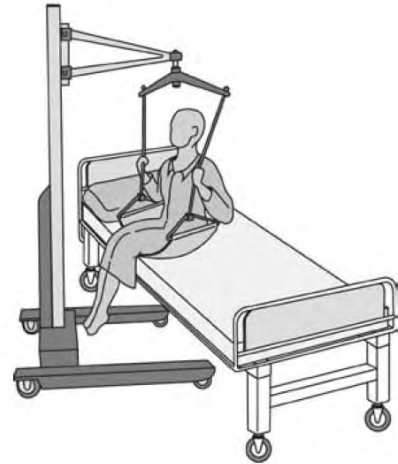
The BRP and SB can be used as a holding brake to consistently hold a load in position at a specific stopping point.

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



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
- BDNB
- MDC
- SB
- AKB



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:

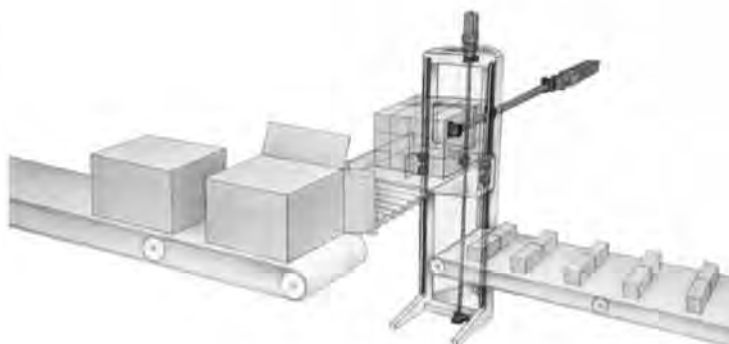
CS, CF power-on clutches are used to drive the conveyor belt. The BF power-on brake is used to stop the conveyor belt.

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					

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 99.

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 143. 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 1-540-633-3400.

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 deter-

mine 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.

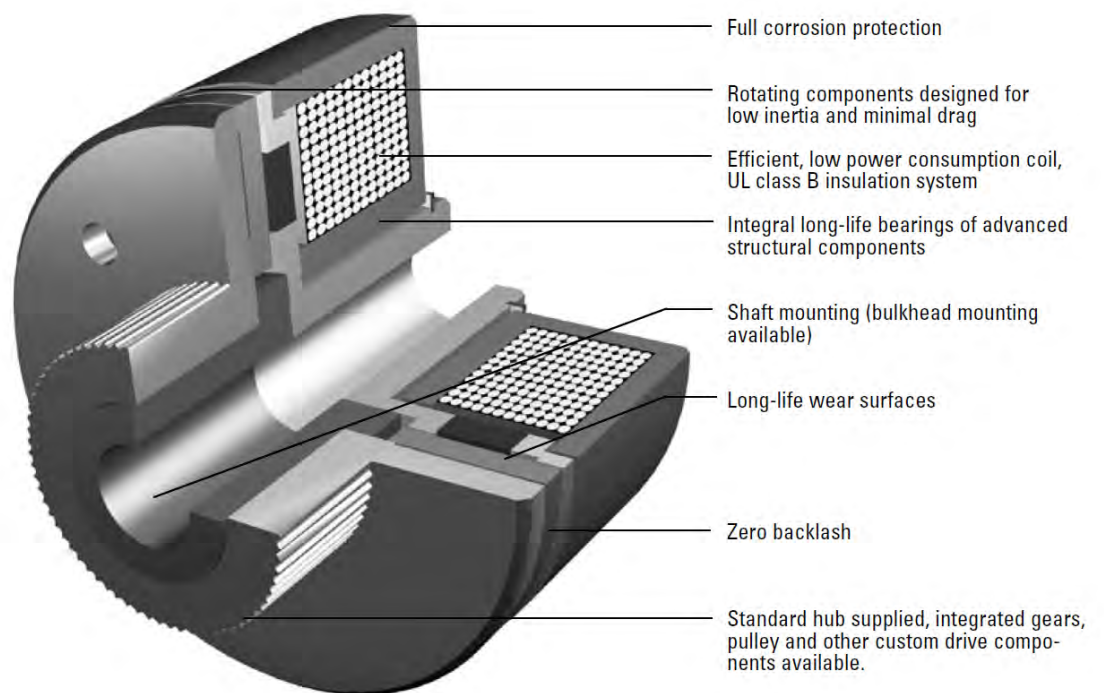
Light to Medium Duty Applications (K = 1.5)

		Clutch or Brake Shaft Speed in RPM																					
H O R S E P O W E R		100	200	300	400	500	600	700	800	900	1000	1100	1200	1500	1800	2000	2400	3000	3600	4000	4600	5000	
	1/50																						
	1/20								Series 17														
	1/12																						
	1/8																						
	1/6								Series 19														
	1/4																						
	1/3										Series 22/23												
	1/2																						
	3/4										Series 26/28												
	1																						
	1 1/2													Series 30									
	2																						
	3																						
	5															Series 40							
	7 1/2																						

Heavy Duty Applications (K = 3.0)

		Clutch or Brake Shaft Speed in RPM																				
H O R S E P O W E R		100	200	300	400	500	600	700	800	900	1000	1100	1200	1500	1800	2000	2400	3000	3600	4000	4600	5000
	1/50							Series 17														
	1/20																					
	1/12							Series 19														
	1/8																					
	1/6										Series 22/23											
	1/4																					
	1/3										Series 26/28											
	1/2																					
	3/4														Series 30							
	1																					
	1 1/2																					
	2														Series 40							
	3																					
	5																					
	7 1/2																					

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/CSC and CF/CFC Series

Shaft and Flange Mounted Clutches and Clutch Couplings

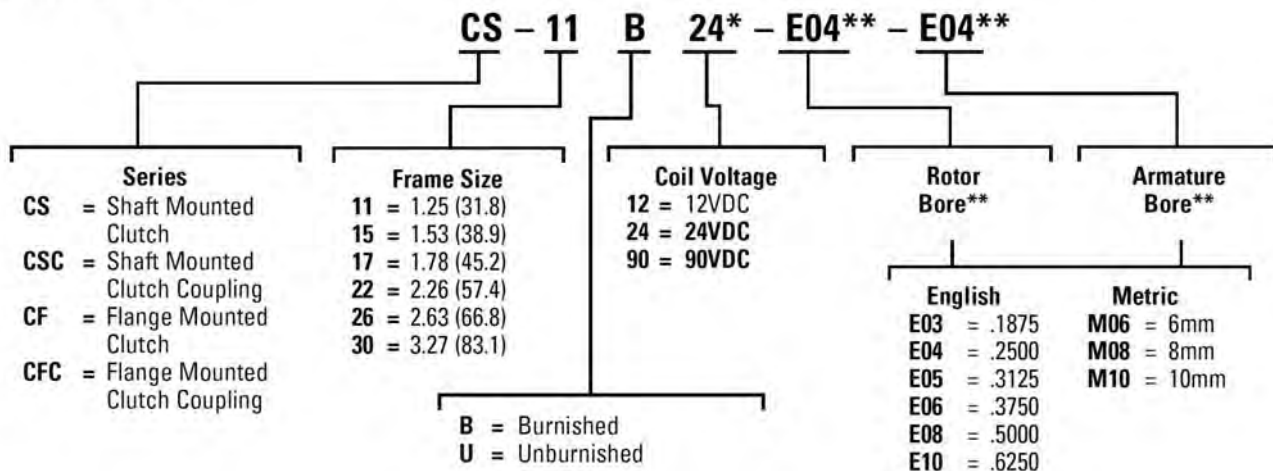
Electromagnetic clutches provide an efficient, electrically switchable link between a motor and a load. Clutches are used to couple two parallel shafts by the use of pulleys, gears or sheaves. While the field (electromagnet) assembly is prevented from rotating by an anti-rotation tab or flange, the rotor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

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.

- 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



How to order



* Other voltages available upon request

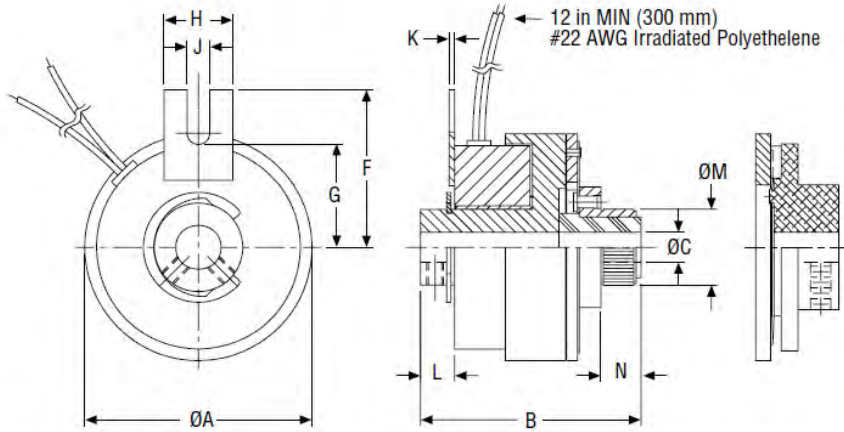
** See dimension tables for appropriate bore sizes available for each frame size.
Metric bore sizes available upon request.

General Notes

- 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.

CS-11 Clutches & CSC-11 Clutch Couplings

Dimensions & Specifications



Dimensions (mm)

Mounting requirements see page 146.

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	

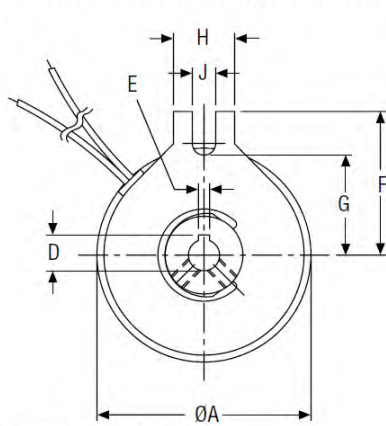
*See "How to order" model numbering system on page 100 for clutches & clutch couplings.
(-) denotes metric equivalents. Specifications subject to change without notice.

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

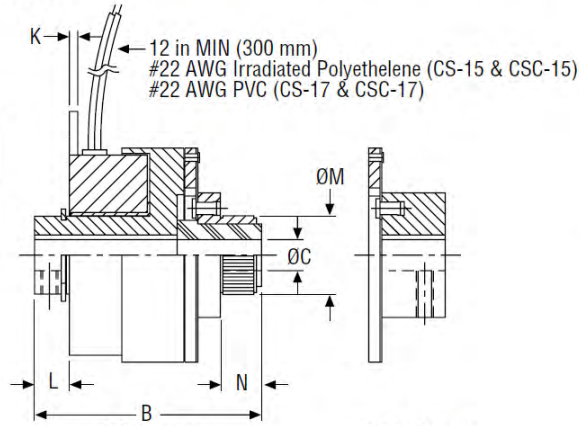
CS-15, 17 Clutches & CSC-15, 17 Clutch Couplings

Dimensions & Specifications



Dimensions (mm)

Mounting requirements see page 146.



CS Model

CSC Model



CS 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: 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: Length 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 100 for clutches & clutch couplings.

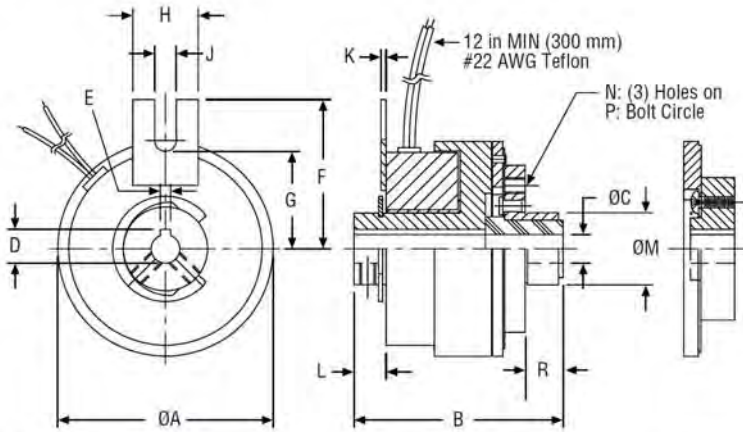
(-) denotes metric equivalents. Specifications subject to change without notice.

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)

Mounting requirements see page 146.

CS Model

CSC Model



CSC 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: 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: Length in (mm)	M: Mtg Ø x R: Length 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

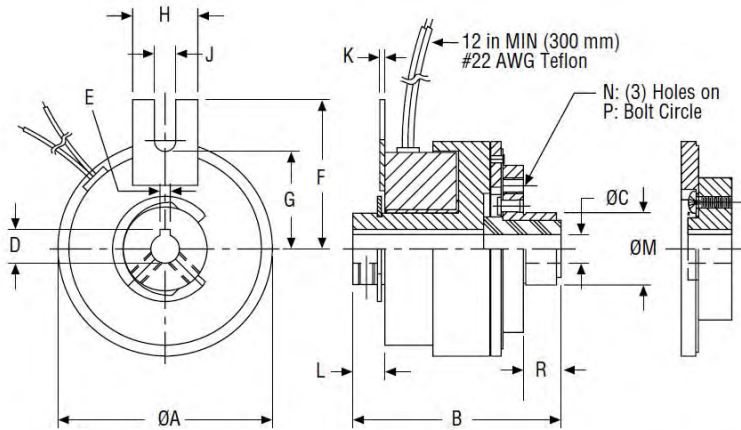
*See "How to order" model numbering system on page 100 for clutches & clutch couplings.
(-) denotes metric equivalents. Specifications subject to change without notice.

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.

CS-30 Clutches & CSC-30 Clutch Couplings

Dimensions & Specifications



Dimensions (mm)
Mounting requirements see page 146.

CS Model

CSC Model

CSC 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: 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: Length in (mm)	M: Mtg Ø x R: Length in (mm)	N: (3) Mtg. Holes	P: Mtg. Hole BC Ø in (mm)
CS-30B24-E06-E06	125 (14.12)	3.27 (83.1)	2.81 (71.4)	.375 (9.5)	.425 (10.8)	.094 (2.4)	2.05 (52.1)	1.69 (42.9)	0.50 (12.7)	0.19 (4.8)	0.09 (2.3)	0.36 (9.1)	1.374 x .83 (34.9 x 21.1)	#8-32	1.75 (44.5)
CS-30B24-E08-E08	125 (14.12)	3.27 (83.1)	2.81 (71.4)	.500 (12.7)	.564 (14.3)	.125 (3.2)	2.05 (52.1)	1.69 (42.9)	0.50 (12.7)	0.19 (4.8)	0.09 (2.3)	0.36 (9.1)	1.374 x .83 (34.9 x 21.1)	#8-32	1.75 (44.5)
CS-30B24-E10-E10	125 (14.12)	3.27 (83.1)	2.81 (71.4)	.625 (15.9)	.709 (18.0)	.188 (4.8)	2.05 (52.1)	1.69 (42.9)	0.50 (12.7)	0.19 (4.8)	0.09 (2.3)	0.36 (9.1)	1.374 x .83 (34.9 x 21.1)	#8-32	1.75 (44.5)
CSC-30B24-E06-E06	125 (14.12)	3.27 (83.1)	2.17 (55.1)	.375 (9.5)	.425 (10.8)	.094 (2.4)	2.05 (52.1)	1.69 (42.9)	0.50 (12.7)	0.19 (4.8)	0.09 (2.3)	0.36 (9.1)	NA	NA	NA
CSC-30B24-E08-E08	125 (14.12)	3.27 (83.1)	2.17 (55.1)	.500 (12.7)	.564 (14.3)	.125 (3.2)	2.05 (52.1)	1.69 (42.9)	0.50 (12.7)	0.19 (4.8)	0.09 (2.3)	0.36 (9.1)	NA	NA	NA
CSC-30B24-E10-E10	125 (14.12)	3.27 (83.1)	2.17 (55.1)	.625 (15.9)	.709 (18.0)	.188 (4.8)	2.05 (52.1)	1.69 (42.9)	0.50 (12.7)	0.19 (4.8)	0.09 (2.3)	0.36 (9.1)	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-30	125 (14.12)	24/90	44/600	15.0	18.0	45.0	180.0 x 10 ⁻⁵	203.0 x 10 ⁻⁵	3.3 (1.5)	2900
CSC-30	125 (14.12)	24/90	44/600	15.0	18.0	45.0	179.5 x 10 ⁻⁵	203.0 x 10 ⁻⁵	3.3 (1.5)	2900

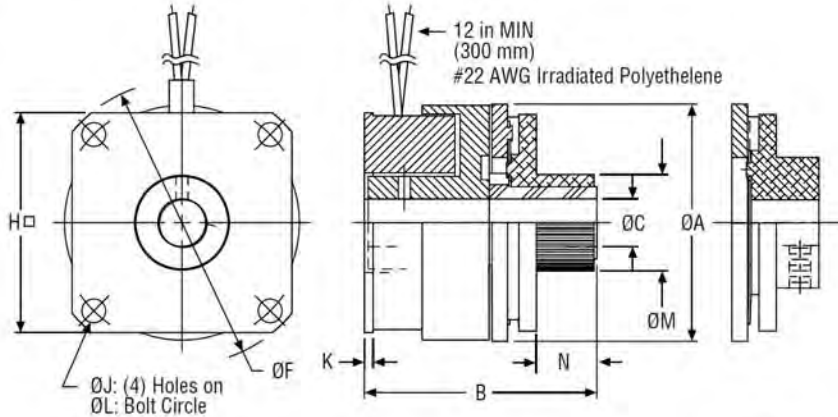
*See "How to order" model numbering system on page 100 for clutches & clutch couplings.
(-) denotes metric equivalents. Specifications subject to change without notice.

General Notes

- Initial working air gap at installation shall be .008/.018.
- 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)

Mounting requirements see page 146.

CF Model

CFC Model

CF Model Shown

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

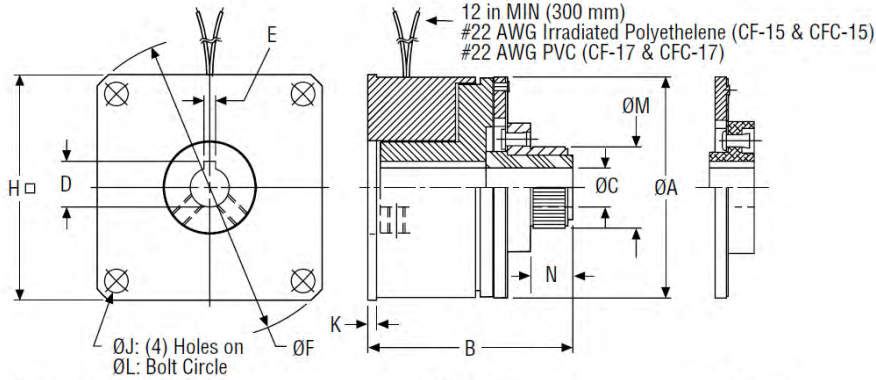
*See "How to order" model numbering system on page 100 for clutches & clutch couplings.
(-) denotes metric equivalents. Specifications subject to change without notice.

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



Dimensions (mm)

CF Model

CFC Model



CFC Model Shown

Mounting requirements see page 146.

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 Plt 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)	.062 (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

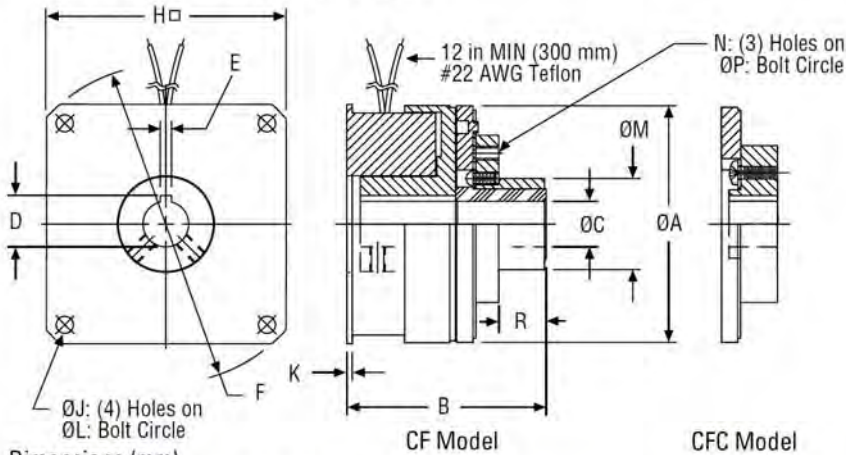
*See "How to order" model numbering system on page 100 for clutches & clutch couplings.
(-) denotes metric equivalents. Specifications subject to change without notice.

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 146.

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
CFC-26B24-E08-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)	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

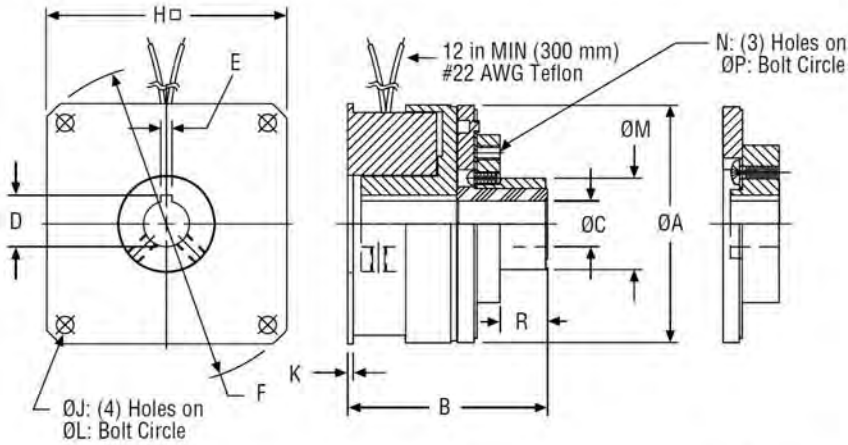
*See "How to order" model numbering system on page 100 for clutches & clutch couplings.
(-) denotes metric equivalents. Specifications subject to change without notice.

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 146.

DIMENSIONS														
Model*	Static Torque lb-in (Nm)	A: ØD in (mm)	B: ØAL 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
CFC-30B24-E10-E10	125 (14.12)	3.27 (83.1)	1.94 (49.3)	.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)	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 100 for clutches & clutch couplings.

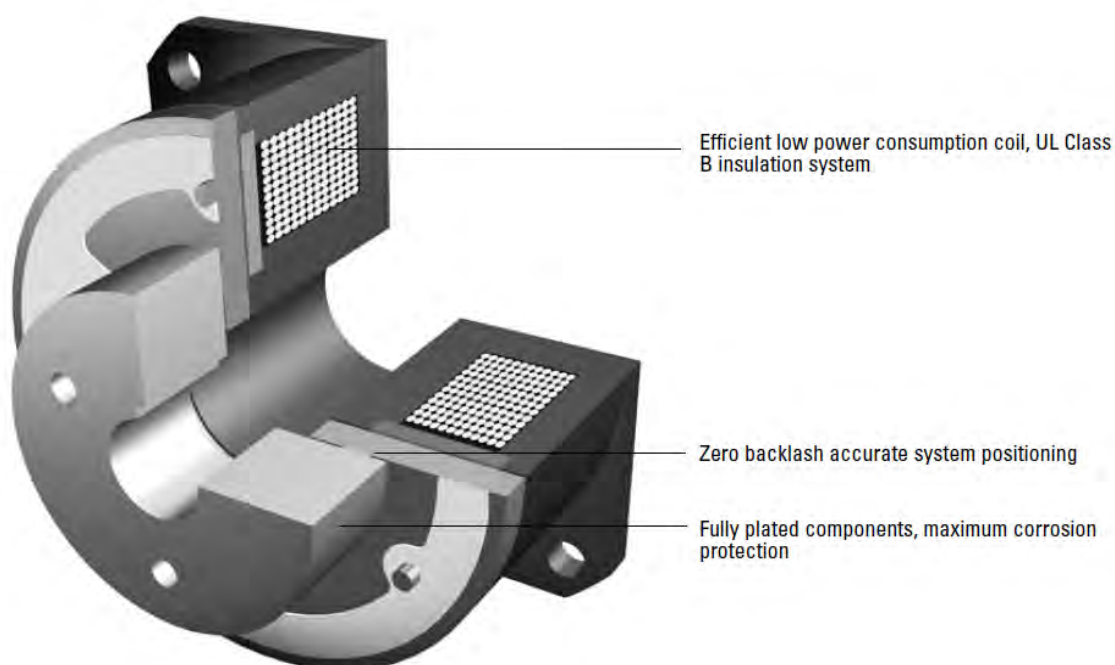
(-) denotes metric equivalents. Specifications subject to change without notice.

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



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.

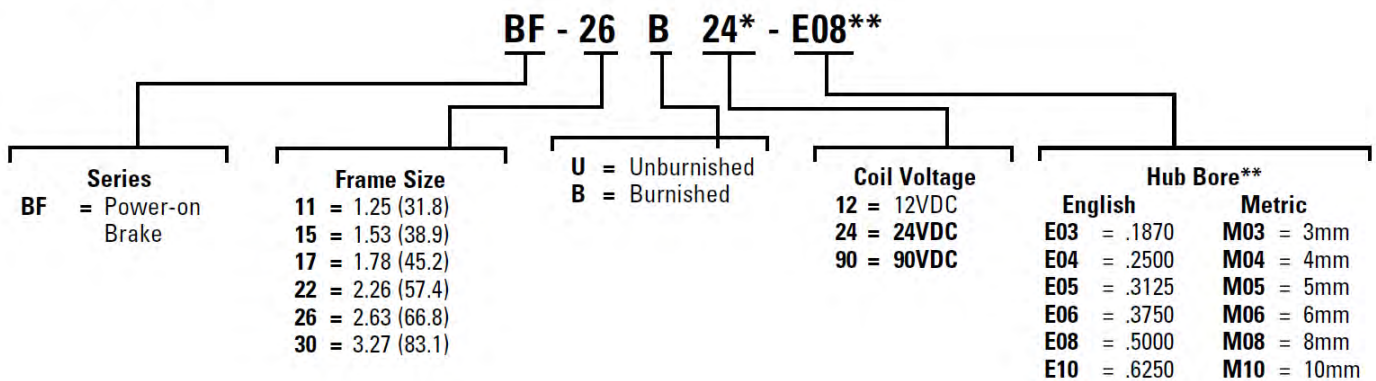
- Torque: 5 lb-in to 125 lb-in (0.56 to 14.13 Nm)
- Diameter: 1.25 to 3.27 in. (31.8 to 83.1 mm)
- Static or dynamic engagement
- Simple installation
- Economical cost
- Energy efficient

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

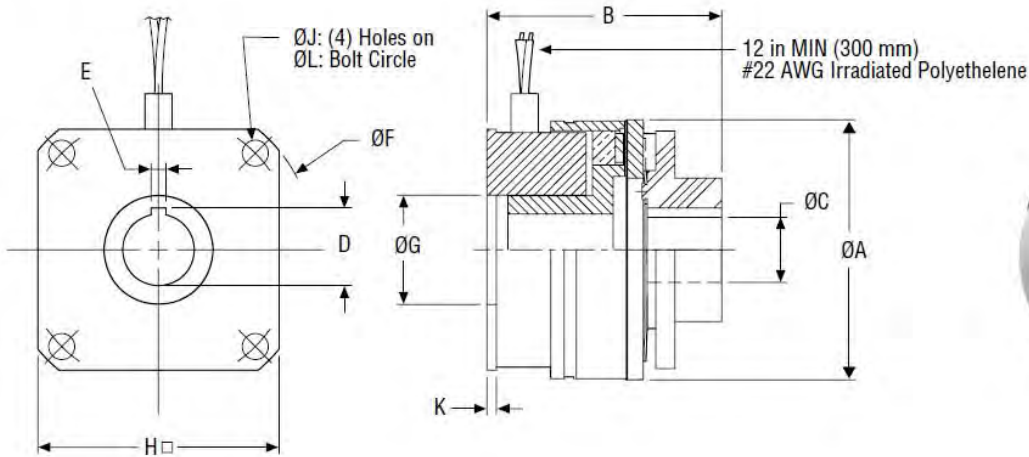
- Actual starting and/or stopping times depend on application variables, manufacturing tolerances and friction material wear. Please consult factory for evaluation of actual use before applying specific values to your application.
- Consult factory for additional options.

- 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-11 Brakes

Dimensions & Specifications



BF Model Shown

Dimensions (mm)

Mounting requirements see page 146.

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 Pit 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 110 for BF power-on brakes.

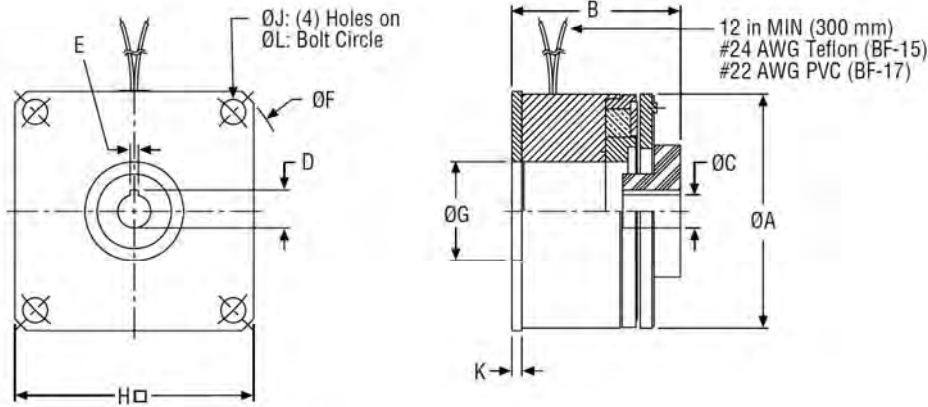
(-) denotes metric equivalents. Specifications subject to change without notice.

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



Dimensions (mm)

Mounting requirements see page 146.



BF Model Shown

DIMENSIONS												
Model*	Static Torque lb-in (Nm)	A: OD in (mm)	B: DAL 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 100 for clutches & clutch couplings.

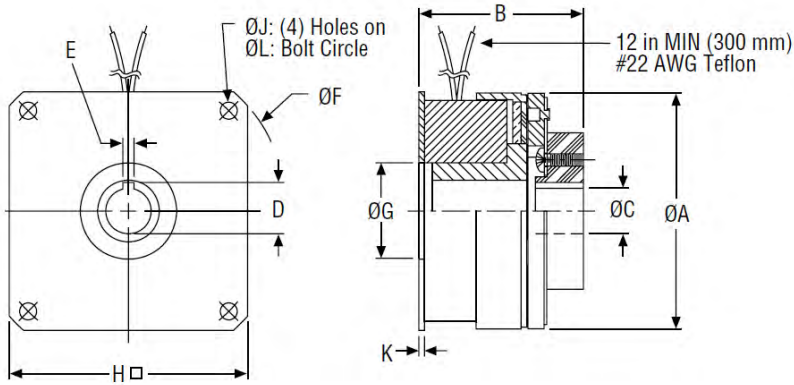
(-) denotes metric equivalents. Specifications subject to change without notice.

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 146.

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)
BF-26B24-E10	80 (9.04)	2.63 (66.8)	1.84 (46.7)	.625 (15.9)	.709 (18.0)	.188 (4.8)	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

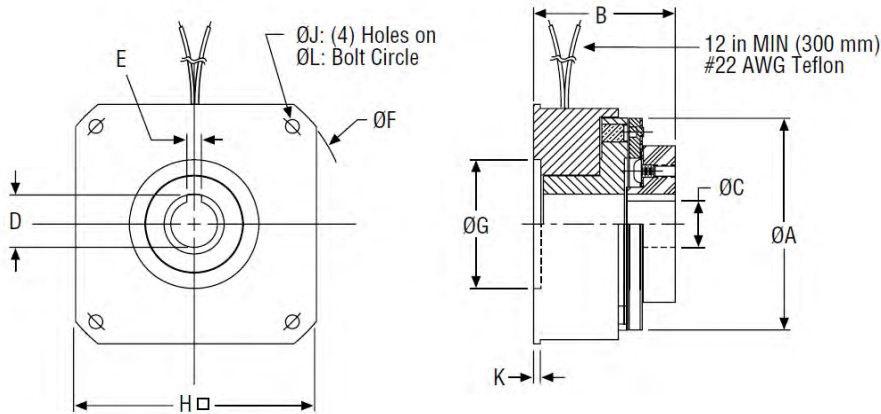
*See "How to order" model numbering system on page 110 for clutches & clutch couplings.
(-) denotes metric equivalents. Specifications subject to change without notice.

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

BF-30 Brakes

Dimensions & Specifications



Dimensions (mm)

Mounting requirements see page 146.



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-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 110 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.

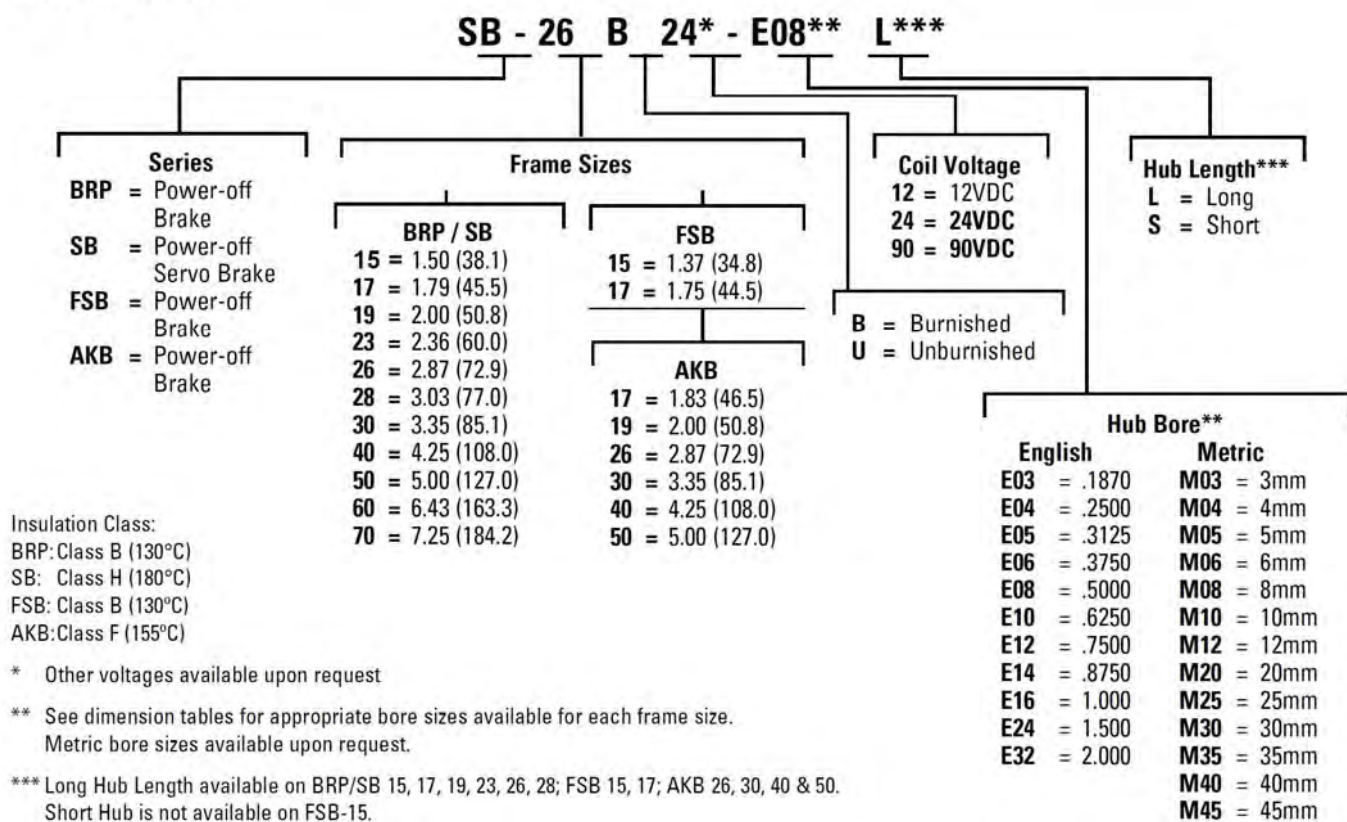
- Torque: 1 lb-in to 1200 lb-in (0.12 to 135 Nm)
- Diameter: 1.50 to 7.25 in. (38.1 to 184.2 mm)
- Static or dynamic engagement
- Simple installation
- Economical cost
- Energy efficient

Typical Applications

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



How to order

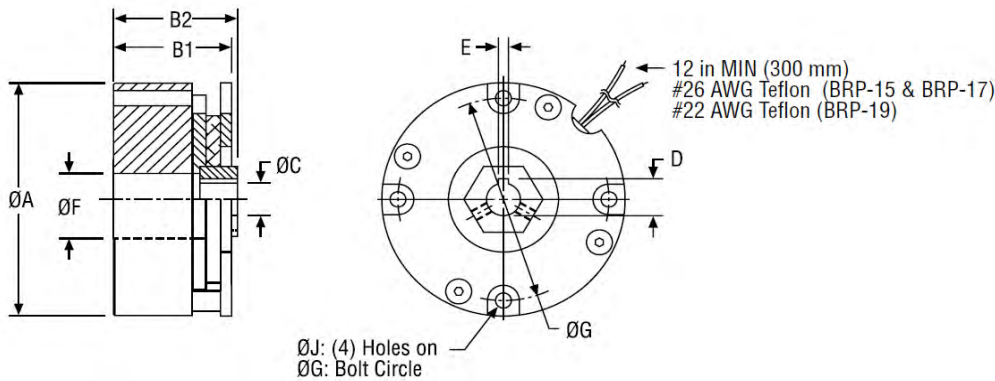


General Notes

- 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.

BRP-15, 17, 19 Brakes

Dimensions & Specifications



Dimensions (mm)
Mounting requirements see page 146.

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	2.88×10^{-6}	0.3 (0.1)	500
BRP-17	8.0 (0.90)	24/90	64/908	10.0	30.0	10.0	NA	1.87×10^{-5}	0.7 (0.3)	700
BRP-19	13 (1.47)	24/90	54/765	12.0	35.0	10.0	NA	2.36×10^{-5}	0.7 (0.3)	900

*See "How to order" model numbering system on page 116 for power-off brakes.

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

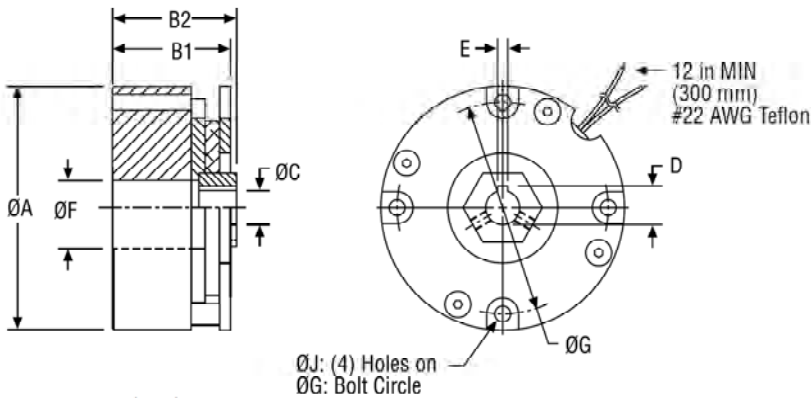
(-) denotes metric equivalents. Specifications subject to change without notice.

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 146.

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 116 for power-off brakes.

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

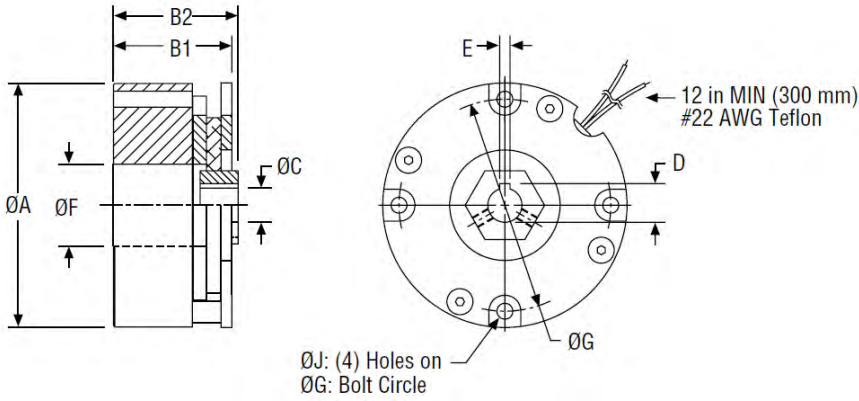
(-) denotes metric equivalents. Specifications subject to change without notice.

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 146.

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 116 for power-off brakes.

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

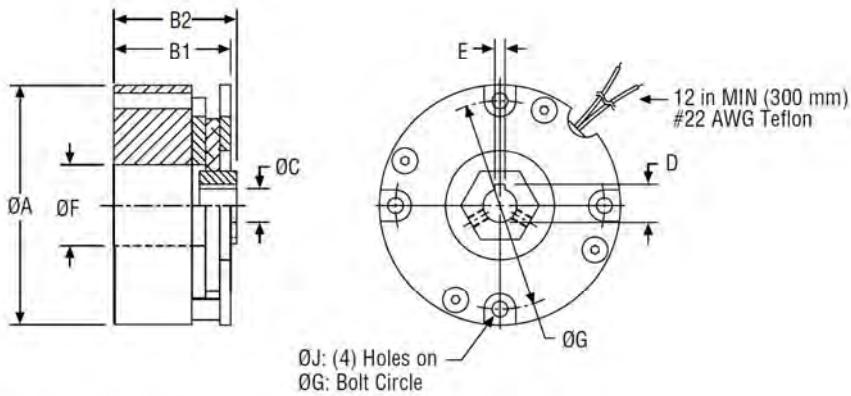
(-) denotes metric equivalents. Specifications subject to change without notice.

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, 60, 70 Brakes

Dimensions & Specifications



Dimensions (mm)
Mounting requirements see page 146.

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-60B24-E10X	510 (57.6)	6.431 (163.3)	2.364 (60.0)	NA	0.625 (15.9)	0.709 (18.0)	0.188 (4.8)	1.655 (42.0)	6.00 (152.4)	0.226 (5.7)
BRP-60B24-E12X	510 (57.6)	6.431 (163.3)	2.364 (60.0)	NA	0.750 (19.1)	0.837 (21.3)	0.188 (4.8)	1.655 (42.0)	6.00 (152.4)	0.226 (5.7)
BRP-60B24-E16X	510 (57.6)	6.431 (163.3)	2.364 (60.0)	NA	1.000 (25.4)	1.114 (28.3)	0.250 (6.4)	1.655 (42.0)	6.00 (152.4)	0.226 (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-60	510 (57.6)	24/90	15/255	51.0/43.0	150.0	200.0	NA	3.08 x 10 ⁻³	14.5 (6.6)	
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 116 for power-off brakes.

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

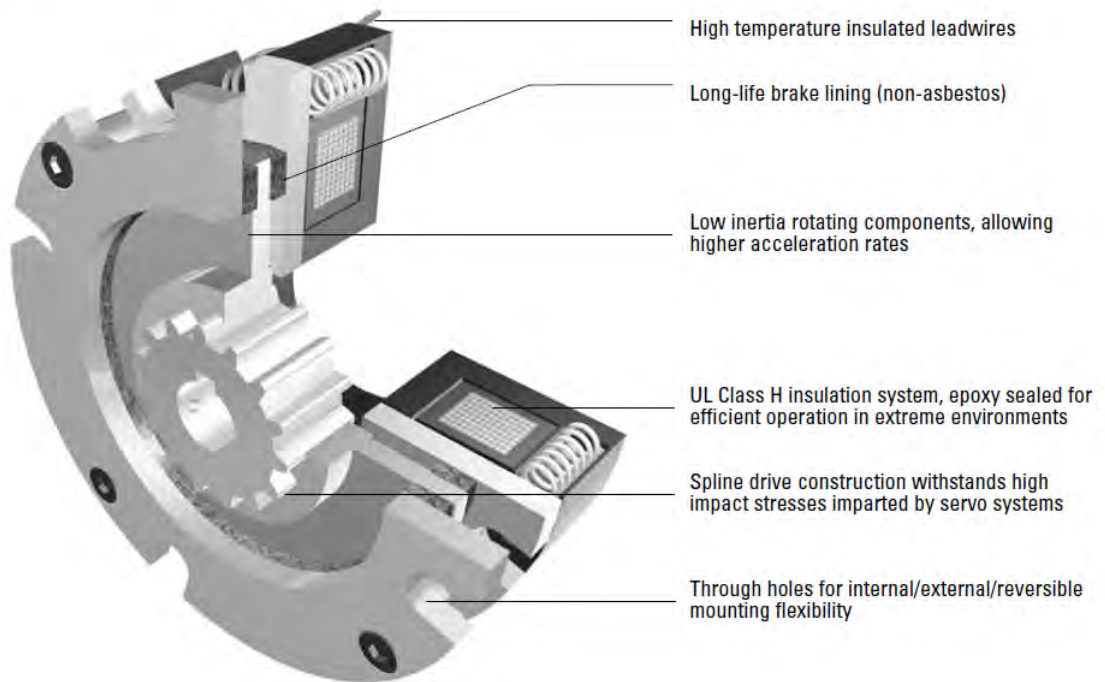
(-) denotes metric equivalents. Specifications subject to change without notice.

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 Series

Power-off Brakes

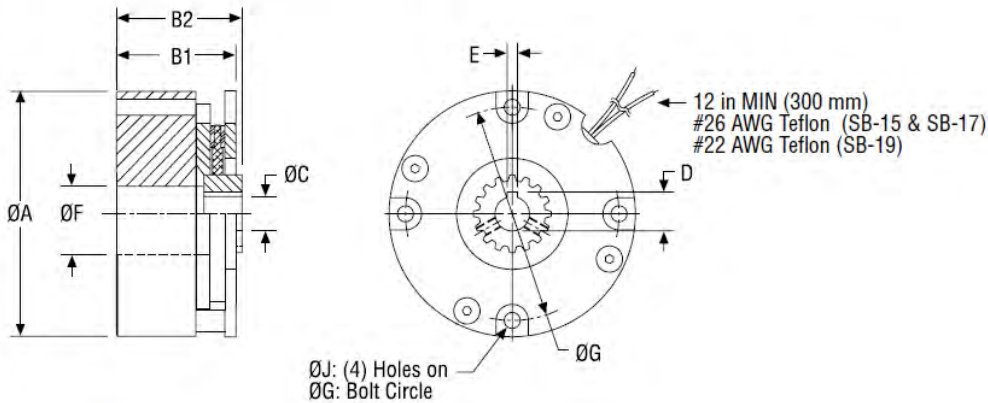


General Notes

- 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.

SB-15, 17, 19 Brakes

Dimensions & Specifications



Dimensions (mm)
Mounting requirements see page 146.

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)	1.32 (33.5)	.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)	1.32 (33.5)	.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)	1.32 (33.5)	.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)	1.38 (35)	.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)	1.38 (35)	.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	2.42×10^{-5}	0.3 (0.1)	500
SB-17	10 (1.13)	24/90	64/908	10.0	20.0	10.0	NA	2.65×10^{-5}	0.7 (0.3)	700
SB-19	18 (2.03)	24/90	54/765	12.0	35.0	10.0	NA	2.83×10^{-5}	0.7 (0.3)	900

*See "How to order" model numbering system on page 116 for power-off brakes.

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

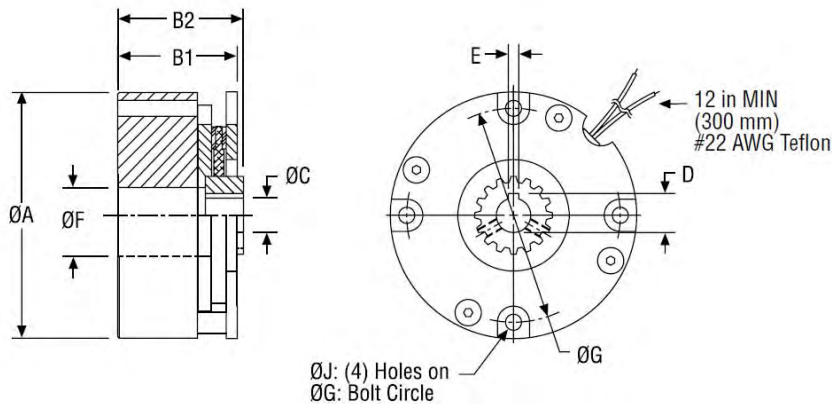
(-) denotes metric equivalents. Specifications subject to change without notice.

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 146.

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 116 for power-off brakes.

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

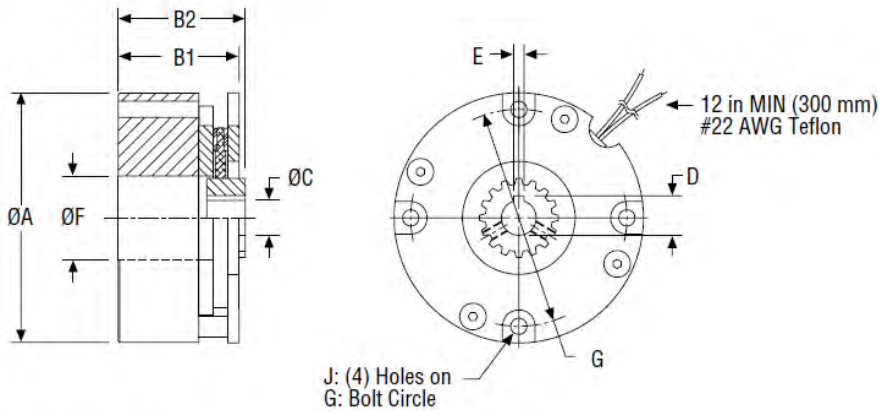
(-) denotes metric equivalents. Specifications subject to change without notice.

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.
- 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 and key.
- Other voltages available upon request.
- All SB series brakes are shipped burnished.
- Metric bores available

SB-30, 40 Brakes

Dimensions & Specifications



Dimensions (mm)
Mounting requirements see page 146.

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-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 116 for power-off brakes.

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

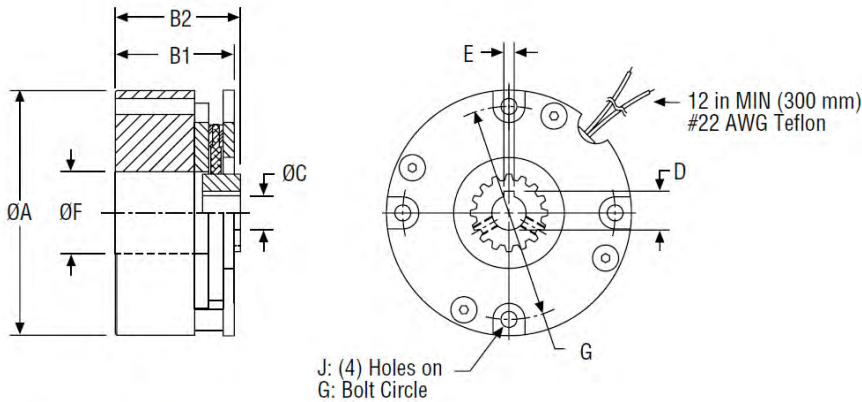
(-) denotes metric equivalents. Specifications subject to change without notice.

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.
- 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 and key.
- Other voltages available upon request.
- All SB series brakes are shipped burnished.
- Metric bores available

SB-50, 60, 70 Brakes

Dimensions & Specifications



Dimensions (mm)
Mounting requirements see page 146.

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-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-60B24-E10X	600 (67.8)	6.431 (163.3)	2.364 (60.0)	NA	0.625 (15.9)	0.709 (18.0)	0.188 (4.8)	1.655 (42.0)	6.00 (152.4)	.226 (5.7)
SB-60B24-E12X	600 (67.8)	6.431 (163.3)	2.364 (60.0)	NA	0.750 (19.1)	0.837 (21.3)	0.188 (4.8)	1.655 (42.0)	6.00 (152.4)	.226 (5.7)
SB-60B24-E16X	600 (67.8)	6.431 (163.3)	2.364 (60.0)	NA	1.000 (25.4)	1.114 (28.3)	0.188 (4.8)	1.655 (42.0)	6.00 (152.4)	.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-60	600 (67.8)	24/90	15/255	51.0/43.0	150.0	200.0	NA	3.08 x 10 ⁻³	14.5 (6.6)	
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 116 for power-off brakes.

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

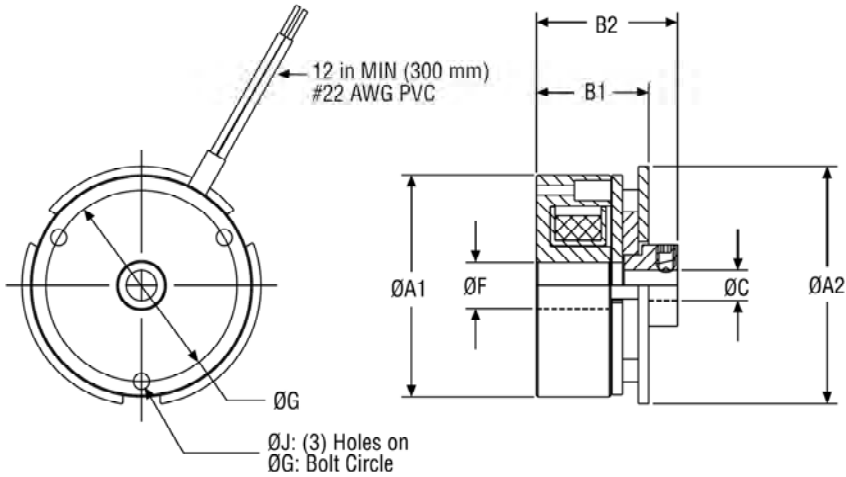
(-) denotes metric equivalents. Specifications subject to change without notice.

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 146.

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 116 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.

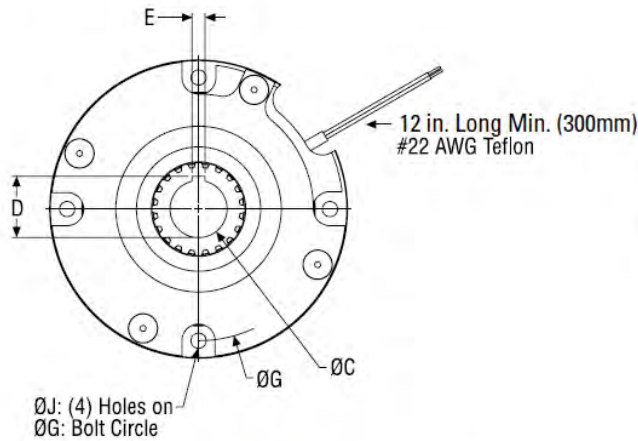
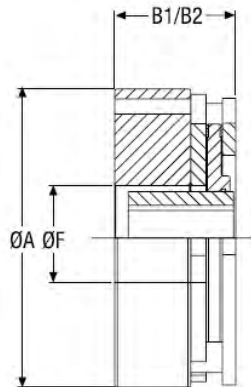
**Short Hub not available for size 15.

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 146.

UL Recognized Component
RoHS Compliant

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 116 for power-off brakes.

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

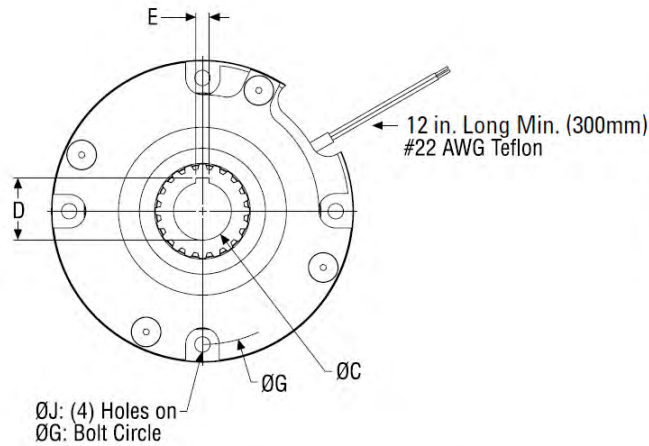
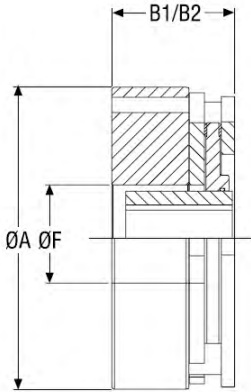
(-) denotes metric equivalents. Specifications subject to change without notice.

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 146.

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 116 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.

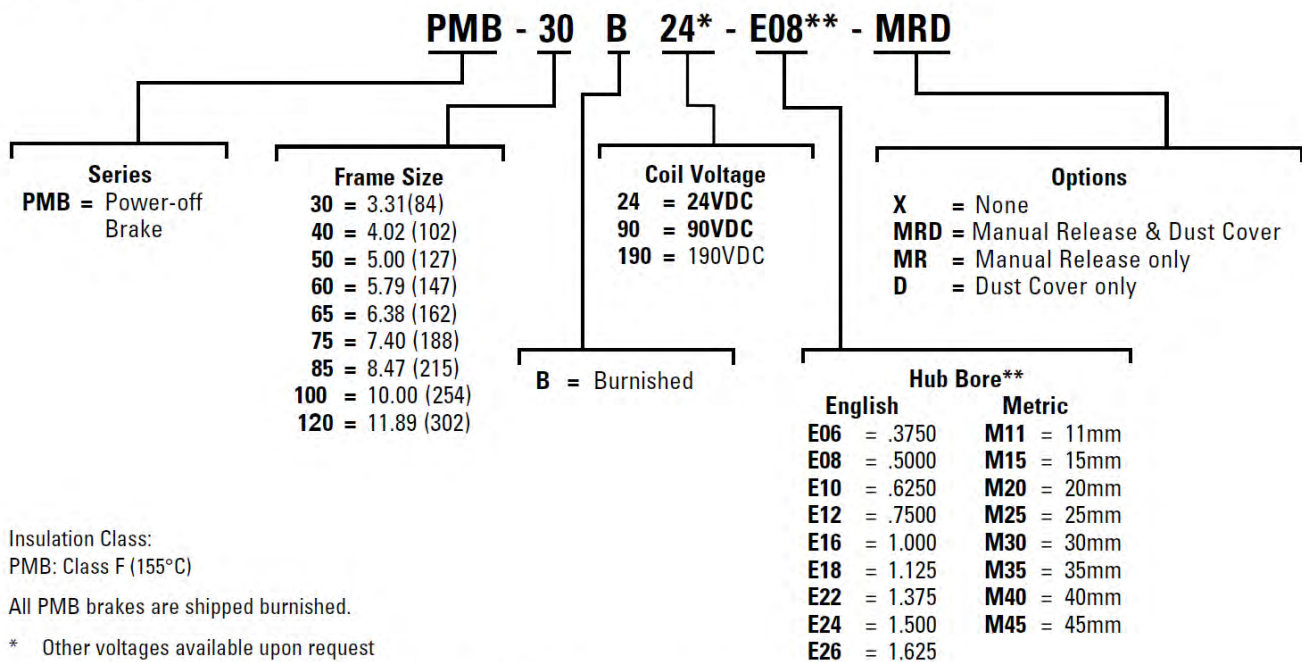
Typical Applications

- 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

How to order



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

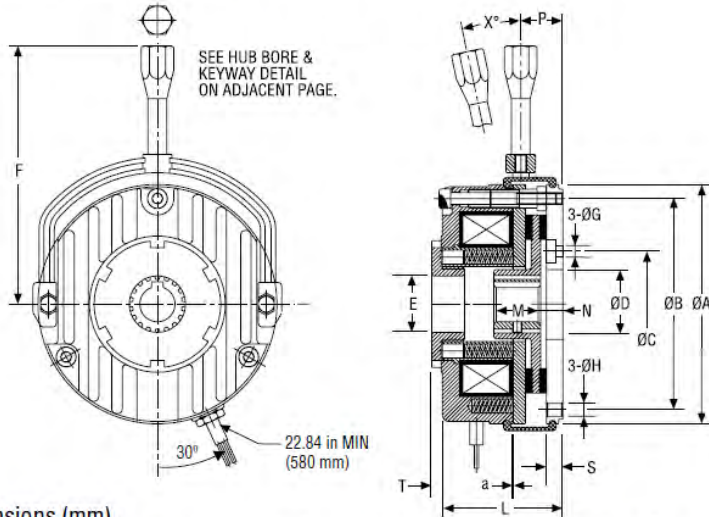
All PMB brakes are shipped burnished.

* 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 146.

UL Recognized Component

PMB model shown with optional manual release & dust cover.

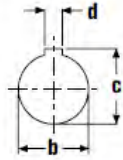
DIMENSIONS																
Model	Static Torque lb-in (Nm)	A: OD in (mm)	B: Mtg Hole in (mm)	C in (mm)	D in (mm)	E in (mm)	F in (mm)	G, H in (mm)	L in (mm)	M in (mm)	N in (mm)	P in (mm)	S in (mm)	T in (mm)	X deg.	a: Air Gap in (mm)
PMB-30	45 (5)	3.307 (84)	2.835 (72)	NA	1.220 (31)	0.748 (19)	3.86 (98)	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

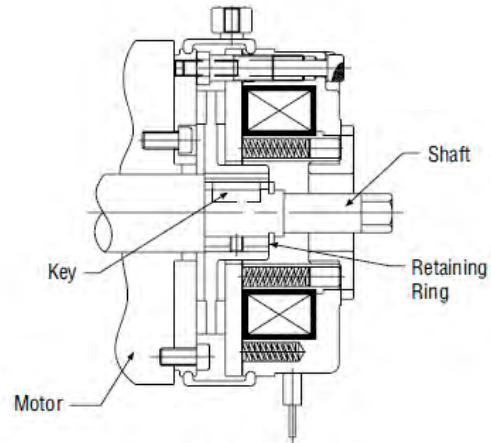
Dimensions & Specifications



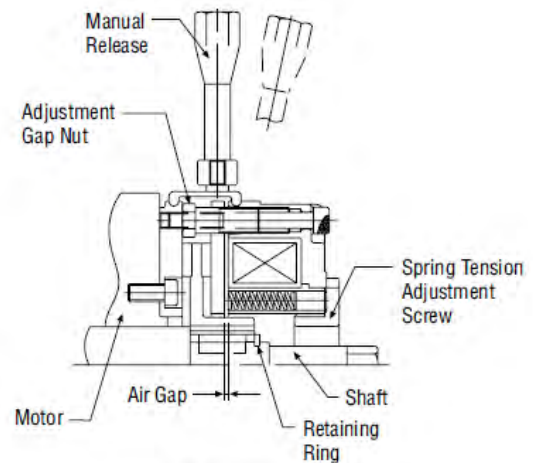
HUB BORE & KEYWAY DETAIL

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 129 for PMB brakes.
XX = Upon ordering, choose voltage, see page 129 for options.
(-) denotes metric equivalents. Specifications subject to change without notice.
**Other bore sizes available upon request.



Installation Diagram



Gap Adjustment



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.

MBRP Series

Metric Series Power-off Brakes

The MBRP Series are a power-off, DC, spring set brake that provides a low-cost, multi-functional brake alternative for many applications. The series offers five frame sizes: 15, 19, 22, 26 & 30 and a superior torque to size ratio.

Many extra features are offered with this versatile product series.

- Engineered friction material on rotor assembly boosts maximum brake performance and extends life.
- Brake easily mounts to motor or frame. Simple square drive hub attaches to shaft with set screw and keyway provided.
- Fully potted coils meet minimum requirements for class "F" insulation.
- UL Recognized Component
- Square drive hub with anti-rattle feature promotes quiet operation.

- Brake leads can be customized (connectors, sleeving) to meet special requirements.
- Manual release lever (option) provides override to release brakes in the absence of power.
- RoHS compliant

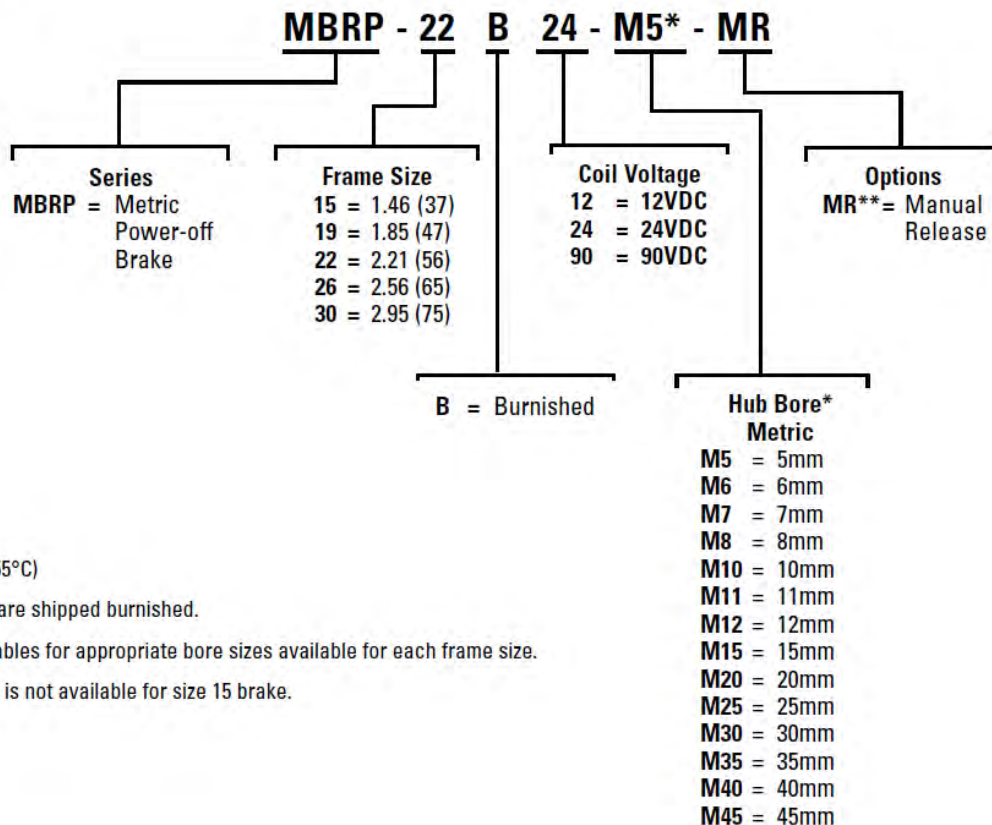
Typical Applications

- Mobility scooters & carts
- Factory automation
- Semiconductor
- Military/aerospace
- Medical equipment
- Electric hoists
- Robotics
- Automated material handling equipment



MBRP Series

How to order



Insulation Class:

MBRP: Class F (155°C)

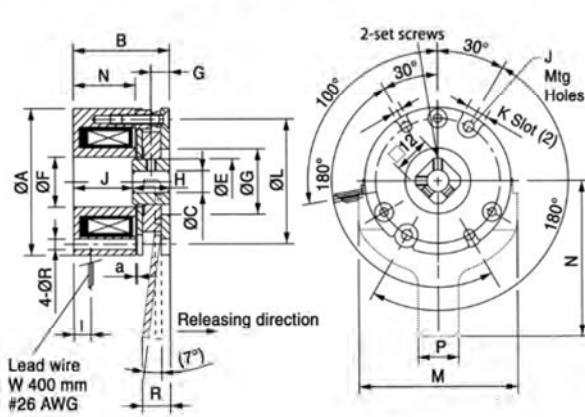
All MBRP brakes are shipped burnished.

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

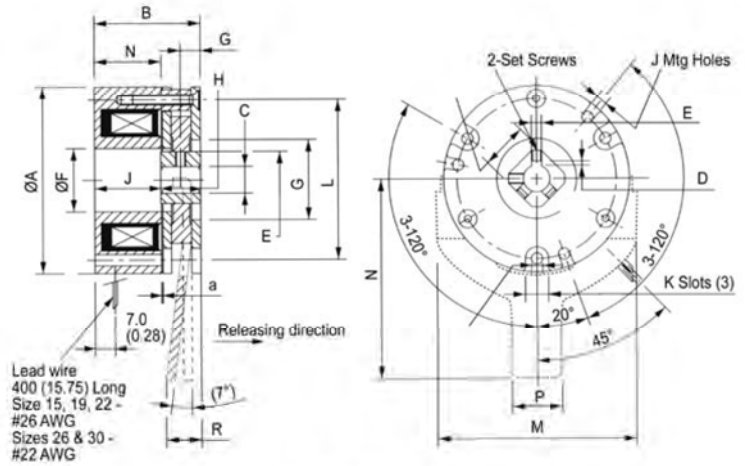
**Manual release is not available for size 15 brake.

MBRP-15, 19, 22, 26, 30 Metric Brakes

Dimensions & Specifications



MBRP 15 & 19



MBRP 22, 26 & 30

Dimensions (mm)

Mounting requirements see page 146.

DIMENSIONS													MANUAL RELEASE			
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: Case ID mm (in)	G: Flange ID mm (in)	H: Hub Length mm (in)	J: Mtg Holes mm (in)	K: Slot mm (in)	L: Mtg Hole BC mm (in)	M: mm (in)	N: mm (in)	P: mm (in)	R: mm (in)
MBRP-15BXX-M5	0.24 (2.12)	37 (1.46)	32 (1.26)	5 (0.197)	NA	NA	13.5 (0.53)	18 (0.71)	9 (0.35)	3 (0.12) 4 Holes	6 (0.24)	32 (1.26)	NA	NA	NA	NA
MBRP-15BXX-M6	0.24 (2.12)	37 (1.46)	32 (1.26)	6 (0.236)	NA	NA	13.5 (0.53)	18 (0.71)	9 (0.35)	3 (0.12) 4 Holes	6 (0.24)	32 (1.26)	NA	NA	NA	NA
MBRP-19BXX-M6-XX	0.50 (4.43)	47 (1.85)	32 (1.26)	6 (0.236)	NA	NA	16 (0.63)	21 (0.83)	12 (0.47)	3.40 (0.13) 4 Holes	7 (0.28)	40 (1.57)	51 (2.01)	50 (1.97)	13 (0.51)	9 (0.35)
MBRP-19BXX-M7-XX	0.50 (4.43)	47 (1.85)	32 (1.26)	7 (0.276)	NA	NA	16 (0.63)	21 (0.83)	12 (0.47)	3.40 (0.13) 4 Holes	7 (0.28)	40 (1.57)	51 (2.01)	50 (1.97)	13 (0.51)	9 (0.35)
MBRP-22BXX-M8-XX	1.00 (8.85)	56 (2.20)	32 (1.26)	8 (0.315)	NA	NA	19 (0.75)	24 (0.94)	12 (0.47)	3.40 (0.13) 6 Holes	7 (0.28)	48 (1.89)	60 (2.36)	60 (2.36)	15 (0.59)	11 (0.43)
MBRP-26BXX-M10-XX	2.00 (17.70)	65 (2.56)	34 (1.34)	10 (0.394)	1.20 (0.05)	3.00 (0.118)	24 (0.94)	35 (1.38)	14 (0.55)	3.40 (0.13) 6 Holes	7 (0.28)	58 (2.28)	70 (2.76)	70 (2.76)	15 (0.59)	12 (0.47)
MBRP-30BXX-M12-XX	4.00 (35.40)	75 (2.95)	36 (1.42)	12 (0.472)	1.50 (0.06)	4.00 (0.16)	28 (1.10)	36 (1.42)	14 (0.55)	4.50 (0.18) 6 Holes	9 (0.35)	66 (2.60)	80 (3.15)	80 (3.15)	20 (0.79)	14 (0.55)

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)
MBRP-15BXX-Bore	0.24 (2.12)	12/24/90	28.8/115/1622	5	15	10	0.000006 (5.31 x 10 ⁻⁹)	0.2 (0.441)	500	0.1 (0.004)
MBRP-19BXX-Bore-XX	0.50 (4.43)	12/24/90	21.8/87.3/1228	6.6	15	10	0.0000019 (1.68 x 10 ⁻⁹)	0.3 (0.661)	900	0.1 (0.004)
MBRP-22BXX-Bore-XX	1.00 (8.85)	12/24/90	16/64/988	8.2	30	25	0.0000038 (3.36 x 10 ⁻⁹)	0.4 (0.882)	1100	0.15 (0.006)
MBRP-26BXX-Bore-XX	2.00 (17.70)	12/24/90	12.5/50.1/810	11.5	35	30	0.000012 (1.06 x 10 ⁻⁸)	0.6 (1.323)	1400	0.15 (0.006)
MBRP-30BXX-Bore-XX	4.00 (35.40)	12/24/90	11.1/44.3/623	13	40	35	0.000023 (2.04 x 10 ⁻⁸)	0.8 (1.764)	1800	0.15 (0.006)

*See "How to order" model numbering system on page 132 for metric power-off brakes.

(-) denotes English equivalents. Specifications subject to change without notice. **Unburnished ***Consult factory

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 serviceability.

- 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.

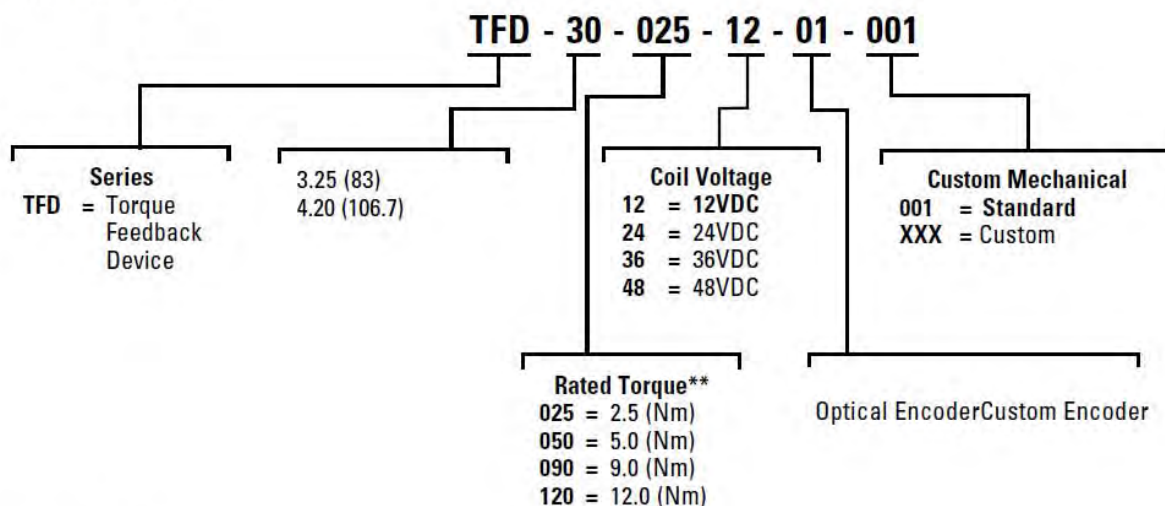
Typical Steer-By-Wire Applications

- 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



TFD Model Shown

How to order



*Case diameter

** Rated Torque availability

2.5 (Nm) - TFD30 only

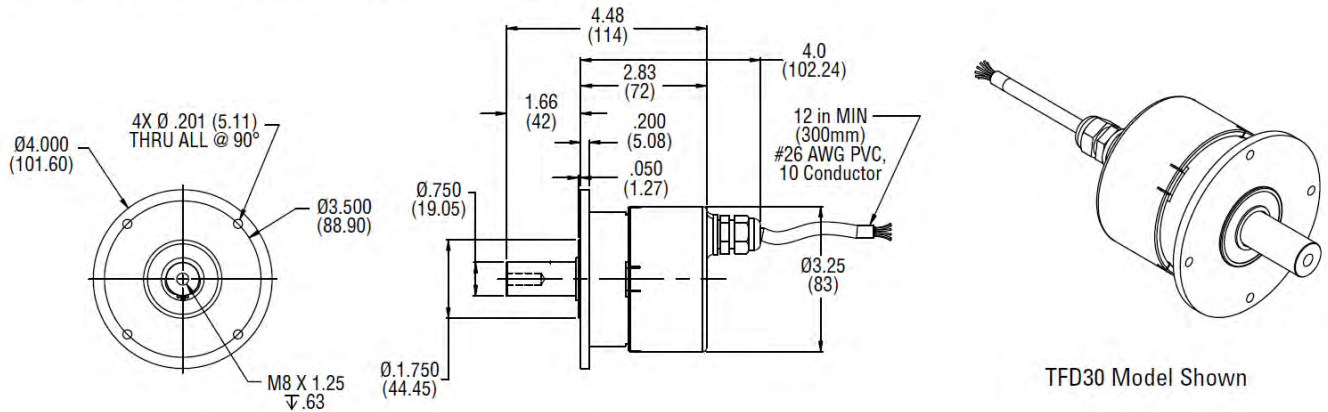
5.0 (Nm) - TFD30 & TFD40

9.0 (Nm) - TFD40 only

12.0 (Nm) - TFD40 only

TFD-30

Dimensions & Specifications



Dimensions (mm)

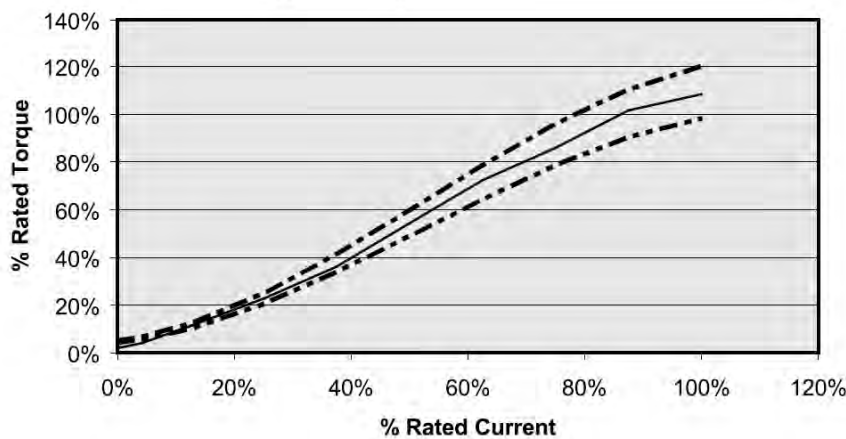
PERFORMANCE							
Model	Static Torque lb-in (Nm)	Coil Voltage* VDC	Resistance Ohms @ 20°C nom	Power Watts max	Speed* RPM	Rotor Inertia lb-in-sec ²	Weight lb (kg)
TFD-30 025	22 (2.5)	12	3.6	40	300/120	35 X 10 ⁻³	3.5 (1.59)
		24	12.5	46	300/120	35 X 10 ⁻³	3.5 (1.59)
		36	32.6	40	300/120	35 X 10 ⁻³	3.5 (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 134 for torque feedback devices.

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

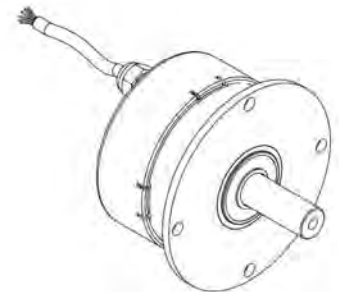
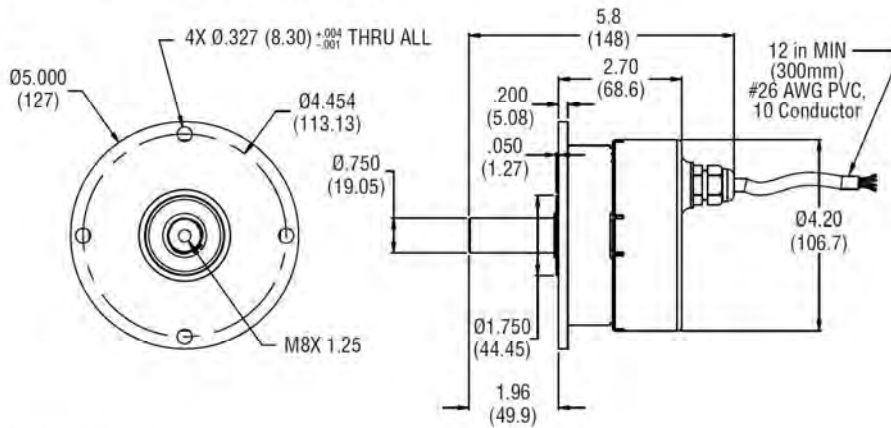
*Intermittent/Continuous

Typical Torque Performance



TFD-40

Dimensions & Specifications



TFD40 Model Shown

Dimensions (mm)

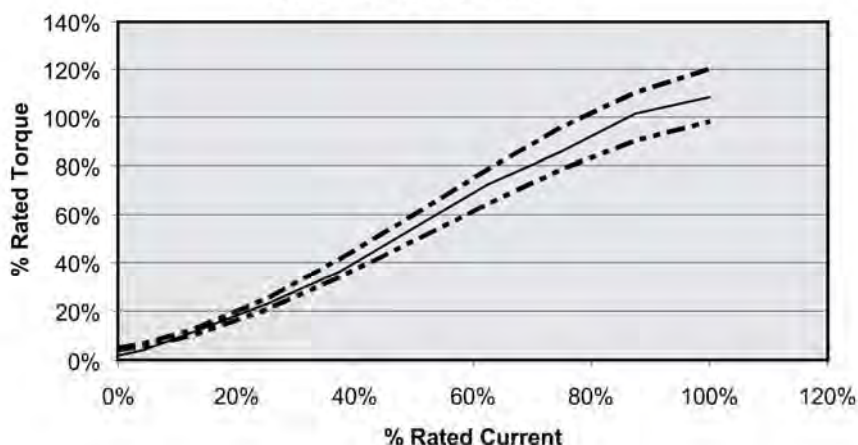
PERFORMANCE							
Model	Static Torque lb-in (Nm)	Coil Voltage* VDC	Resistance Ohms @ 20°C nom	Power Watts max	Speed* RPM	Rotor Inertia lb-in-sec ²	Weight lb (kg)
TFD-40 050	44 (5.0)	12	3.5	42	300/120	76 X 10 ⁻³	6.2 (2.8)
		24	11.0	51	300/120	76 X 10 ⁻³	6.2 (2.8)
		36	22.7	57	300/120	76 X 10 ⁻³	6.2 (2.8)
		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 134 for torque feedback devices.

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

*Intermittent/Continuous

Typical Torque Performance



% 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

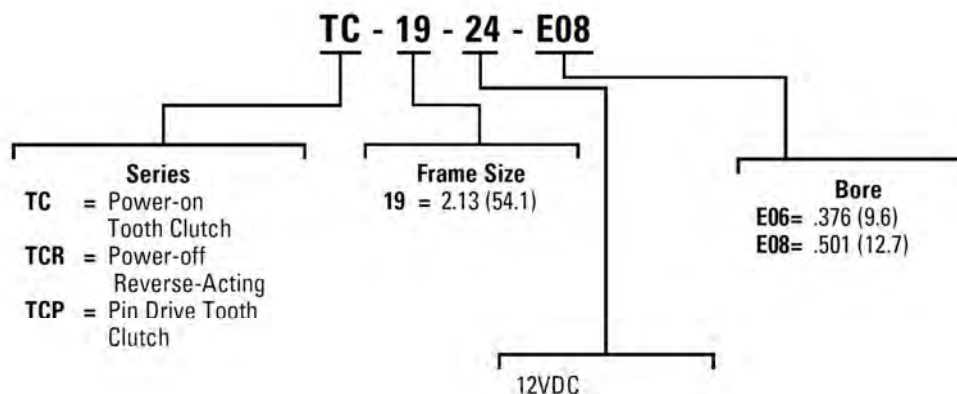


TCR Model Shown

Typical Applications

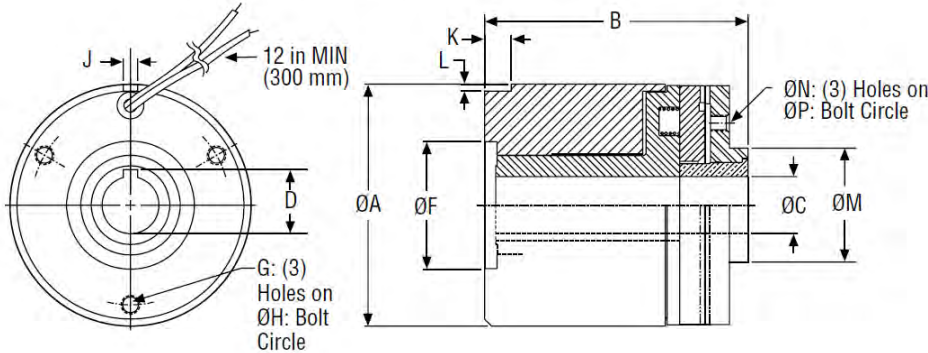
- Military aerospace actuators
- Avionics and flight control
- Medical equipment
- Postal handling equipment
- Machine tools
- Robotics

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 137 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.

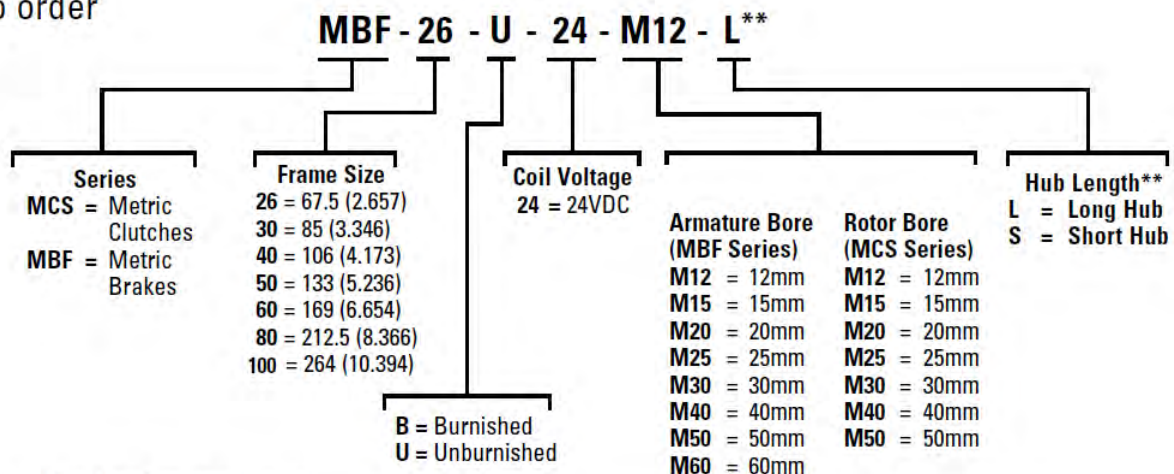
- Torque: 5.5 to 350 Nm (49 to 3,097 lb-in)
- Diameters: 63 to 264 mm (2.48 to 10.39 in)
- Zero Backlash design
- Static or Dynamic engagement
- Simple installation
- Energy efficient
- Economic cost
- Available "as is" or custom
- RoHS compliant

Typical Applications

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



How to order



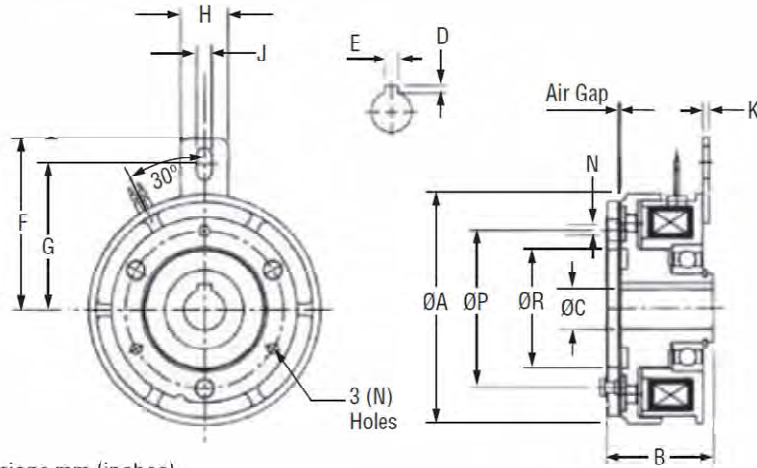
** Long or Short Hub Length available only on MBF Series Brakes

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)	2.5 (0.100)	6 (0.236)	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 (0.120)	8 (0.315)	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 (0.120)	8 (0.315)	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 (0.120)	12 (0.472)	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)	14 (0.551)	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 Engagement 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)
MCS-100U24-M50	350 (3097.50)	24	8	72	115	210	358 (3.17 x 10 ⁻¹)	448 (3.97 x 10 ⁻¹)	17.5 (38.581)	70000	0.5 (0.020)

See "How to order" model numbering system on page 139 for metric clutches.

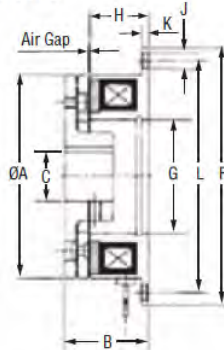
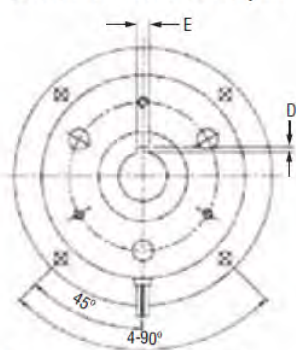
(-) denotes English equivalents. Specifications subject to change without notice.

*Unburnished

**Consult factory

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

Dimensions & Specifications



MBF-S Model Shown

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)	6 (0.24)	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)	6 (0.24)	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)	8 (0.31)	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)	8 (0.31)	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)	8 (0.31)	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)	8 (0.31)	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)	12 (0.47)	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)	12 (0.47)	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)	14 (0.55)	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)	14 (0.55)	290 (11.42)	125 (4.92)	35 (1.38)	11.5 (0.45)	6.1 (0.24)	270 (10.63)
MBF-100U24-M60-S	350 (3097.50)	250 (9.84)	59 (2.32)	60 (2.36)	4 (0.16)	18 (0.71)	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 139 for metric brakes.

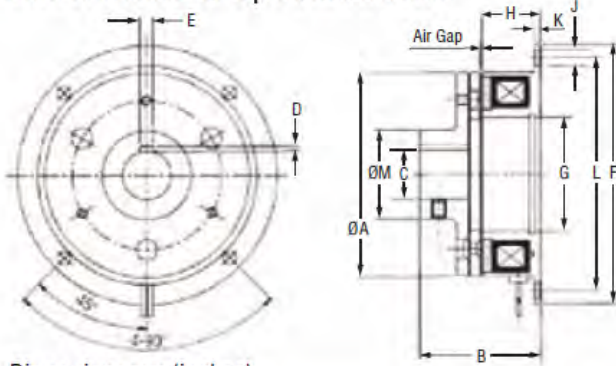
(-) denotes English equivalents. Specifications subject to change without notice.

*Unburnished

**Consult factory

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

Dimensions & Specifications



Dimensions mm (inches)



MBF-L Model Shown

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)	6 (0.24)	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)	6 (0.24)	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)	8 (0.31)	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)	8 (0.31)	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)	8 (0.31)	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)	8 (0.31)	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)	12 (0.47)	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)	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-80U24-M50-L	175 (1548.75)	200 (7.87)	87.2 (3.43)	50 (1.97)	3.5 (0.14)	14 (0.55)	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)	14 (0.55)	290 (11.42)	125 (4.92)	35 (1.38)	11.5 (0.45)	6.10 (0.24)	270 (10.63)	105 (4.13)
MBF-100U24-M60-L	350 (3097.50)	250 (9.84)	102.6 (4.04)	60 (2.36)	4 (0.16)	18 (0.71)	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 139 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 Danaher Motion. 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, integral 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 determine 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

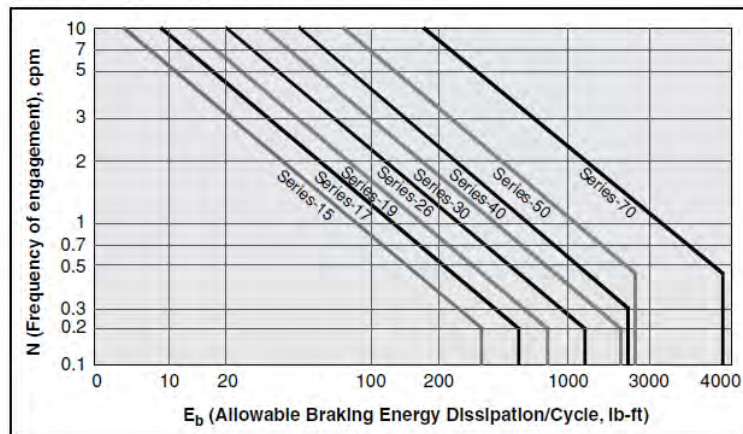
Energy Dissipation Calculations

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

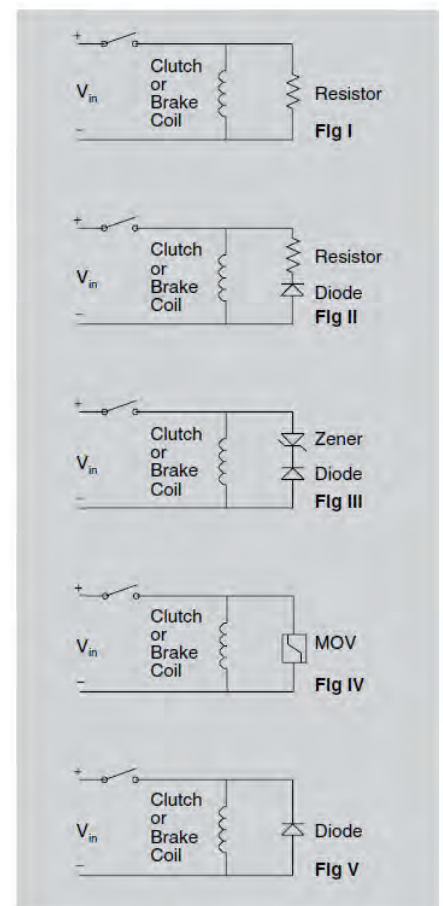
Burnishing: Burnishing is a process of running-in the mating friction surfaces of a clutch or brake to ensure the highest possible output torque. By forcing the unit to slip rotationally when energized, the mating frictional surfaces establish an optimal wear pattern within a relatively short time. This 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 over-excitation 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)

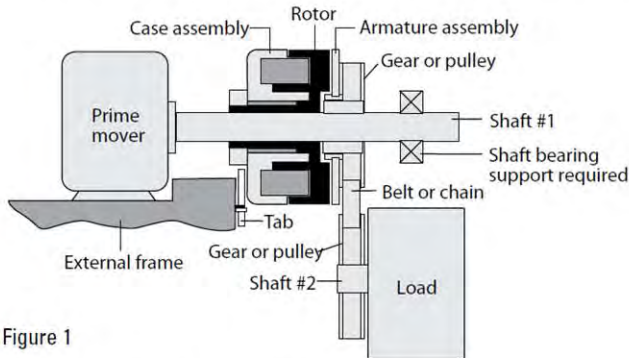


Figure 1

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.

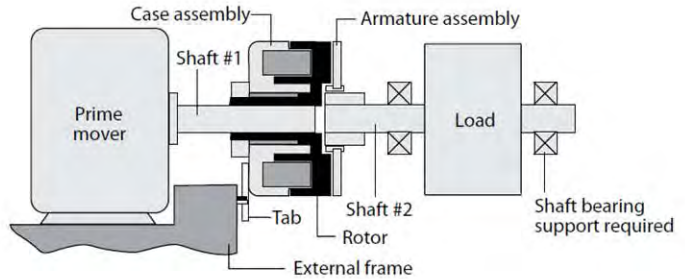


Figure 2

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.

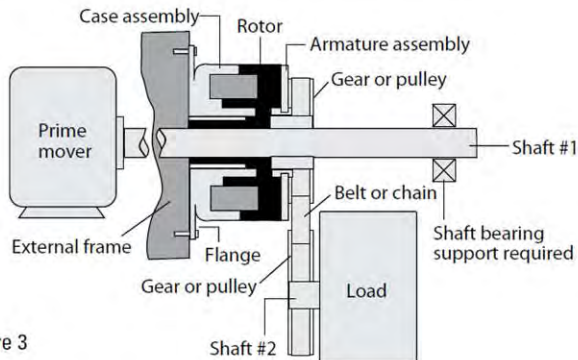


Figure 3

Flange Mounted Clutches - CF models

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

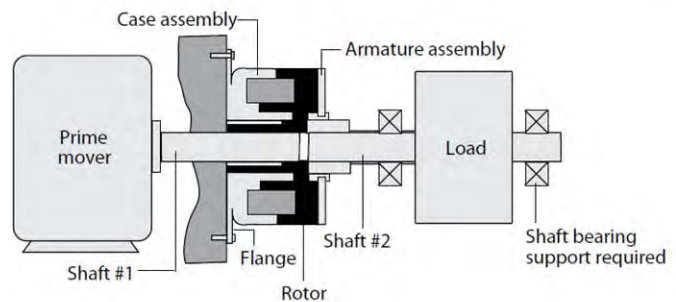


Figure 4

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.

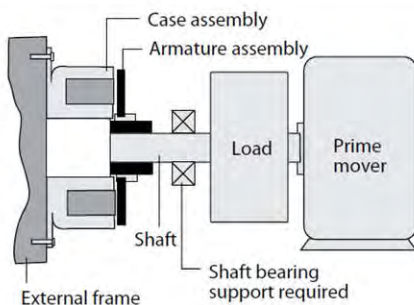


Figure 5

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.

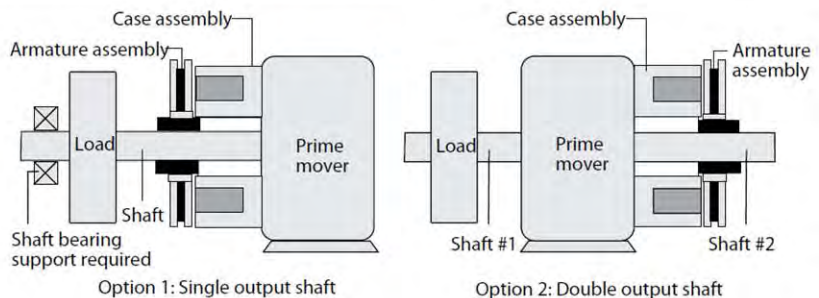


Figure 6

Power-Off Brakes - BRP, SB, FSB, AKB, PMB & MBRP 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.

MICRON**DELTRAN****AKM Series Motor**

- ♦ New high efficiency design
- ♦ Simple and robust construction
- ♦ 7 frames, 40 to 188 mm square
- ♦ Multiple feedback types

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- ♦ Cartridge style
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- ♦ 3 to 80 amps continuous
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- ♦ 4 to 15 arc-min backlash
- ♦ In-line and right angle
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- ♦ Inline, geared or belt driven
- ♦ Brushless servo or stepper motors
- ♦ IP54 or IP65
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- ♦ Speeds to 1.3m/sec
- ♦ 6 power ranges

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