

Magnetic Particle Brakes and Clutches

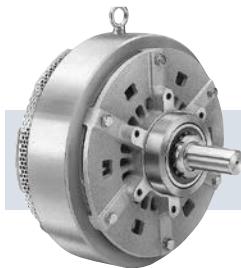
Accurate torque control with instantaneous engagement!



Available in a wide range of models and sizes

Warner Electric's magnetic particle brakes and clutches are quiet and clean and provide outstanding performance in slipping and torque control applications. They are ideal for unwind, rewind, and intermittent (point to point) tension applications. They are also ideal for controlled starting or stopping, torque limiting and cycling applications.

These units use high quality materials and unique designs to provide precision performance, superior heat dissipation and extremely long life. The magnetic powder, made from alloy, provides extreme resistance to heat and wear, and, therefore, promotes long life and high thermal ratings. Also, one of the brake models, the PTB, incorporates a heat pipe that further extends its thermal capability. PTB units have thermal ratings three times higher than brakes with natural cooling and equivalent to water-cooled brakes.



Brakes

Six different brake models are available: four with male shafts and two

with hollow bores. The units with hollow bores can be shaft-mounted, if desired. Final selection is determined by torque and thermal requirements. The product selection section provides more specific information on these models.



Clutches

Three different clutch models, each with several sizes, are available to

handle a variety of applications. The face-mounted models can be used in parallel or inline applications. The shaft-mounted units offer a second option for parallel shaft applications and are ideal for tension rewind applications. Please see the product selection section for more specific information.

Magnet Particle Brakes and Clutches

Features and Benefits

Precise Control

- Spherical particles provide smooth torque independent of speed. Low speed chatter is also eliminated.
- The magnetic circuit is designed to produce torque proportional to current.
- Unique design requires only one powder seal, thus reducing drag torque and allowing for a wider operating range.

Extremely Long Life

- Spherical particles made from alloy provide outstanding resistance to corrosion and mechanical breakdown.

High Heat Dissipation

- One of the models, the PTB, uses a heat pipe that provides heat dissipation levels equal to water-cooled units and several times greater than natural cooling.
- The shaft mounted clutches provide self-cooling through the use of an integral fan that rotates with the input.

Clean Operation

- All models are completely enclosed. Ideal for applications where clean operation is desired.

Easy to Mount

- Precision pilots are provided to position units for easy installation.
- Clutches and brakes with hollow bores are offered for applications where shaft mounting is desired.

Smooth Engagement

- Torque characteristics provide for smooth and controllable acceleration or deceleration of the load.

Fast Response

- Fine particles respond quickly to field for millisecond engagement, if required.

No Maintenance

- Adjustment or lubrication is not required.

Quiet Operation

- Engagement is smooth and quiet.

Low Current Draw

- Efficient magnetic circuit design allows for minimal current draw.

Torque independent of slip speed

Torque is transmitted through magnetic particle chains that are formed by an electromagnetic field. The torque is independent of slip speed, depending only on circuit current, and is infinitely variable from 0 (disengaged) to rated torque.

No wearing parts

There are no friction surfaces to grab or wear, and the units are not affected by changes in atmospheric or other environmental conditions.

Efficient/Compact design

High torque to size ratio and low electric power consumption.

Versatile mounting

Convenient bolt circle for easy mounting. Mounting brackets available for all sizes. Brakes are available with solid shafts and through bores. Can only be mounted horizontally.

Distributor Item

Interchangeable with industry standard sizes.

Special Designs

▪ **Special Shaft Configurations**

Customer specified shaft configurations for easy machine mounting and retrofitting.

▪ **Special Torque**

Maximum torque configurations to meet customer specifications.

▪ **Special Mounting Configurations**

Customer specified bolt patterns, special mounting brackets.

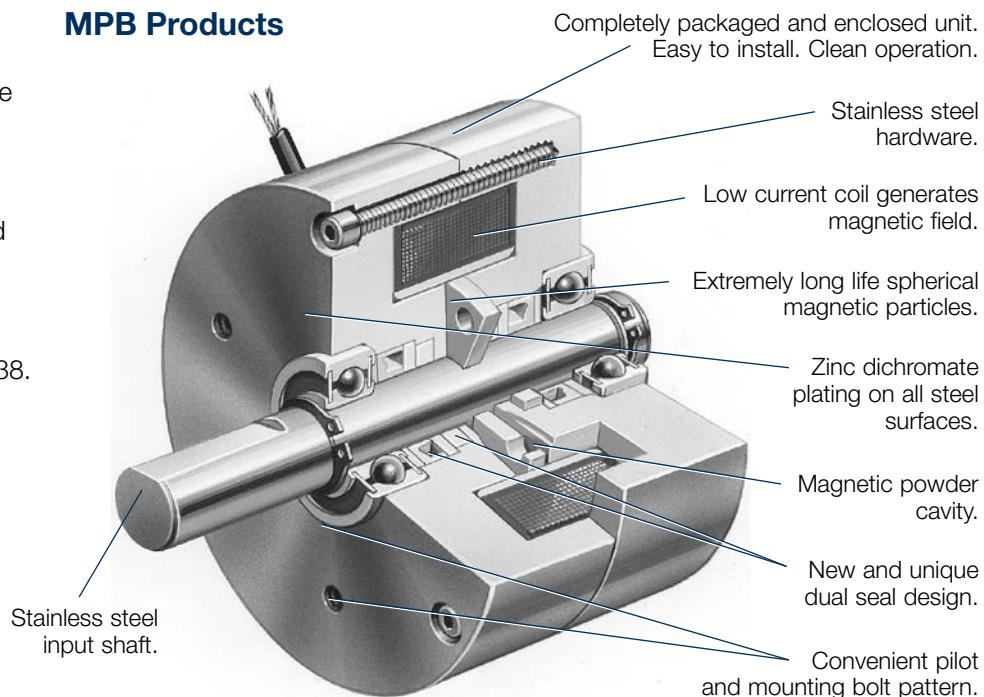
▪ **Metric units**

Magnetic Particle Brakes and Clutches

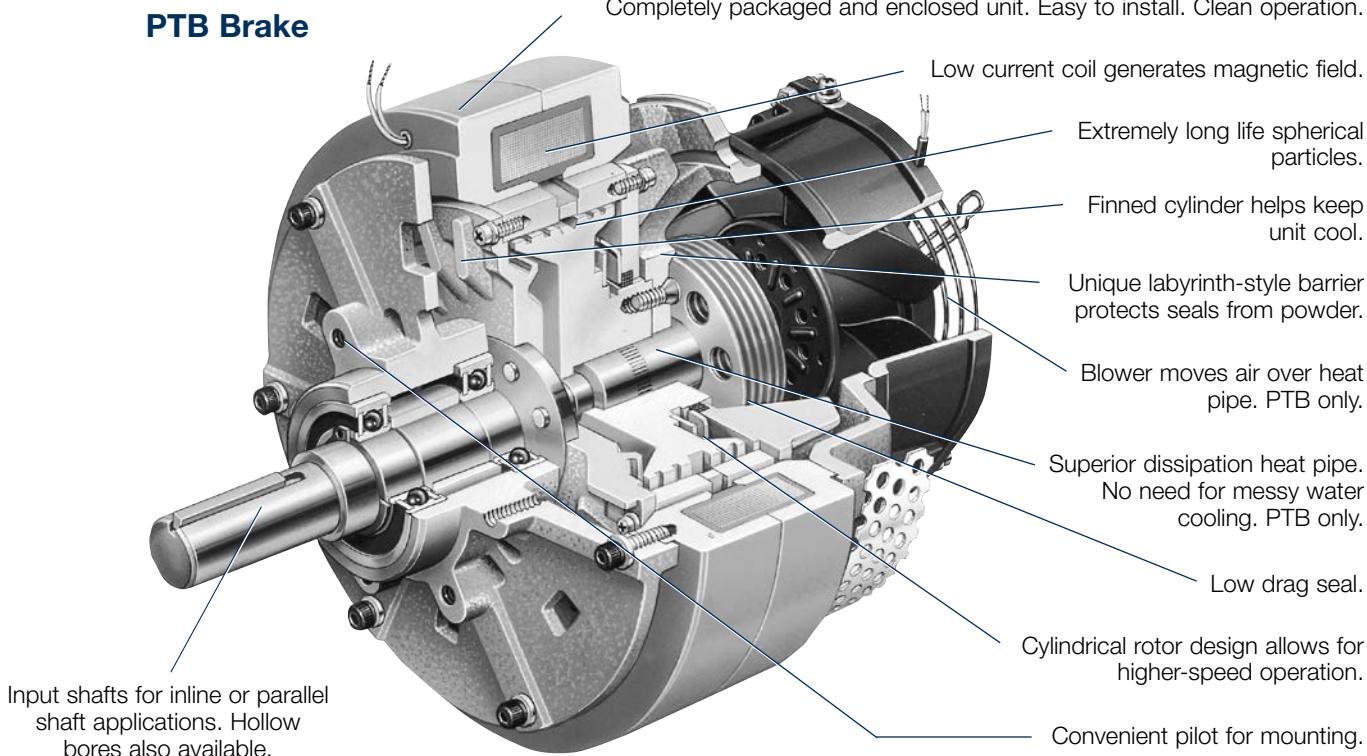
Design and Operation

Warner Electric magnetic particle clutches and brakes are unique because of the wide operating torque range available. Torque to current is almost linear and can be controlled very accurately. The unique features of the magnetic particle clutches and brakes make them ideal for tension control, load simulation, cycling/indexing, and soft starts and stops. Controls information starts on page 38.

MPB Products

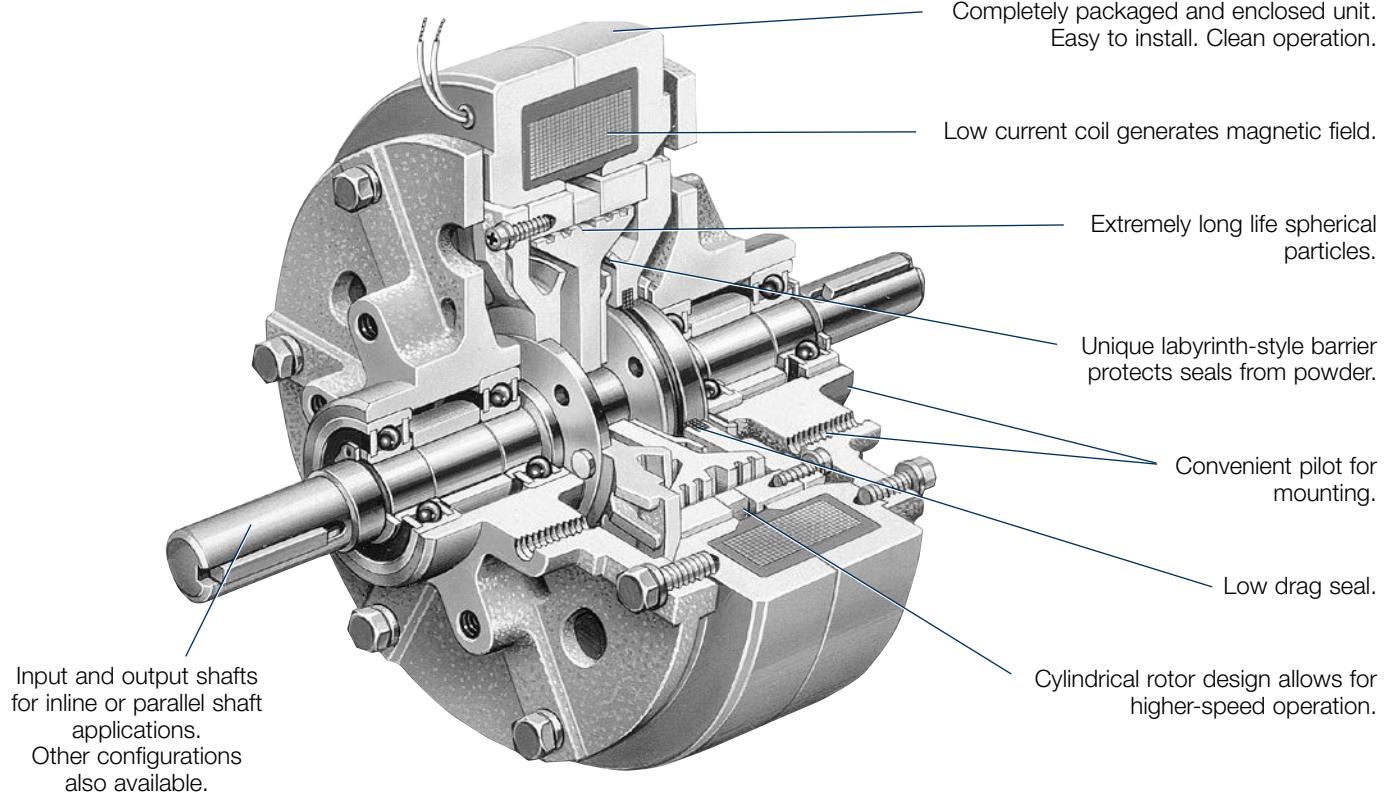


PTB Brake



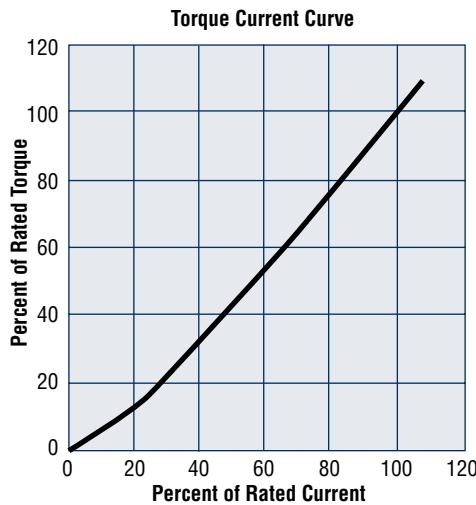
Magnet Particle Brakes and Clutches

POC Clutch



Principle of Operation

The magnetic particle unit consists of four main components: 1) housing; 2) shaft/disc; 3) coil and 4) magnetic powder. The coil is assembled inside the housing. The shaft/disc fits inside the housing/coil assembly with an air gap between the two; the air gap is filled with fine magnetic powder.



Engagement

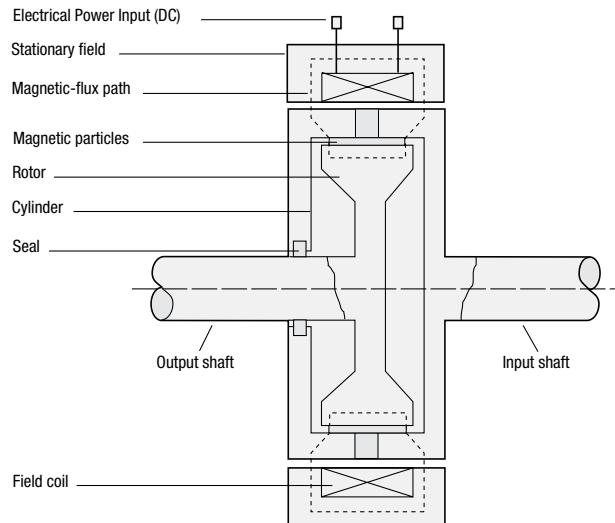
When DC current is applied to the magnetic particle unit, a magnetic flux (chain) is formed, linking the shaft/disc to the housing. As the current is increased, the magnetic flux becomes stronger, increasing the torque. The magnetic flux creates extremely smooth torque and virtually no "stick-slip".

Disengagement

When DC current is removed, the magnetic powder is free to move within the cavity, allowing the input shaft to rotate freely.

Cycling

A cycling effect is achieved by turning the current to the coil on and off.



Magnetic Particle Brakes and Clutches

Selection

Unit torque ratings go from as low as 2.0 lb.in. to as high as 578 lb.ft. Also, many models are available to handle specific mounting requirements. The clutch family has three options. The MPC and POC have shaft inputs and outputs and is ideal for inline applications. The PHC models have a hollow bore and can be shaft-mounted for parallel shaft applications. The PMC clutch covers the lower end of the torque range and has a flanged input hub. Also, this unit is often mounted as a brake.

The brake family includes seven models. The MPB covers the low torque ranges and comes with shaft inputs or hollow bores. The POB is a shaft input brake that covers the medium and high torque extremes of the torque range. The PRB series covers the mid range. With four models that have different input and housing options. The PTB model uses a heat pipe cooling method that has a cooling capacity equivalent to water-cooled units, but without the hassles of water cooling.

Selection Requirements

To properly size a magnetic particle brake or clutch, torque transmitted and heat generated must be considered. If you know these values, refer to the specifications and thermal curves to select a unit. For sizing and selection calculation see pages 16 through 28. To select a control for your application refer to the control section on page 38.

Product	Model	Torque Ratings (lb.ft.)	Heat Dissipation Ratings Watts [HP.]
Brake	MPB	0.17 lb.ft.-20 lb.ft.	10-200 [0.013 to 0.27]
	POB	2.1 to 578	60 to 4,000 [0.080 to 5.36]
	PRB-H	8.6 to 144	95 to 575 [0.13 to 0.77]
	PTB-BL₃	18 to 144	500 to 4,100 [0.67 to 5.50]
Brake or Clutch	PMC-A₃	0.72 to 2.8 (8.6 to 34 lb. in.)	30 to 66 [0.040 to 0.088]
Clutch	MPC	0.17 lb.ft. to 10.0 lb.ft.	10 to 140 [0.13 to 0.188]
	PHC-R	4.3 to 144	70 to 1,150 [0.094 to 1.54]
	POC	2.1 to 578	60 to 4,000 [0.080 to 5.36]

Magnet Particle Brakes and Clutches

Description	Cooling Method	Applications	Dimension Drawings (page no.)
Low and high torque units. Light duty thermal. All brakes have output shafts and pilots for mounting. Optional brackets available.	Natural	Tension unwind, light duty unwind	104
Low and high torque units are offered in this model. All units have male input shafts and pilots for mounting, except for the size 80, which is foot-mounted.	Natural	Tension unwind	106-107
This is the basic PRB model. It is offered with a hollow bore and a pilot for mounting.	Natural	Tension unwind	108
The PTB-BL ₃ offers superior heat dissipation capability. Units are pilot-mounted and a male input shaft is provided for connecting to the load.	Heat Pipe with 115VAC blower	Tension unwind, load for testing. Ideal for applications requiring high heat dissipation	105
These units offer precise control in the small tension ranges. They have flanged input hubs and double-ended output shafts for maximum mounting flexibility. They can be easily mounted as clutches or brakes.	Natural	Tension unwind or rewind, soft start or stop, torque limiting	109-110
Low and medium torque units for light duty rewind applications. Shaft in-shaft out with pilots, allow for sample mounting. Optional brackets available.	Natural	Tension rewind, light duty rewind	111
This model has a hollow bore, making it ideal for applications where shaft mounting is preferred. It has a piloted input flange for pulley or sprocket attachment.	Self-cooling with integral fan	Tension rewind, soft start	112
This model is preferred in many applications. It is offered with male input and output shafts and all units are pilot mounted, except for the size 80. This largest unit, the size 80, is footmounted.	Natural	Tension rewind	113-114

Magnetic Particle Brakes and Clutches

Mechanical and Electrical Data (24 VDC)

Model	Size	Torque lb.ft (lb.in.)	Drag Torque lb.ft. (lb.in)	Max. Speed RPM	Inertia lb.ft. ² (lb.in. ²)	Resistance Ohms 75°F	Amperes 75°F	Max. Heat Diss. Watts @ Max. RPM	Weight lbs.
MPB	2	(2)	.40	1800	(1.31 x 10 ⁻³)	303	0.079	10	1
	15	(15)	.40	1000	(1.39 x 10 ⁻²)	80	0.302	20	3
	25	(25)	.40	1000	(0.013)	45	0.533	20	2.5
	70	(70)	(1)	1000	(8.03 x 10 ⁻²)	35	0.677	100	7
	120	(120)	(2)	1000	(3.75 x 10 ⁻¹)	33	0.742	140	12
	240	(240)	(4)	1000	(1.35)	14	1.693	200	20
POB	0.3	2.1	.065	1800	.0128	35.6	.674	105	5.5
	0.6	4.3	.13	1800	.0173	21.1	1.14	80	7.9
	1.2	8.6	.26	1800	.0304	20.6	1.16	145	12
	2.5	18	.54	1800	.0973	15.8	1.52	195	22
	5	36	1.1	1800	.249	8.8	2.74	290	38
	10	72	2.2	1800	1.04	9.0	2.68	460	77
	20	144	4.3	1800	2.23	7.2	3.34	790	128
	40	289	8.7	1800	5.93	5.1	4.66	1990	220
PRB-H	80	578	17	1800	23.5	4.3	5.57	3900	551
	1.2	8.6	.26	1800	.104	31.6	.760	95	11
	2.5	18	.54	1800	.161	25.6	.937	118	15
	5	36	1.1	1800	.453	19.3	1.24	170	29
	10	72	2.2	1800	1.51	14.8	1.62	355	57
	20	144	4.3	1800	4.46	12.5	1.93	570	101
PTB	2.5	18	.54	1800	.0973	15.8	1.52	880	24
	5	36	1.1	1800	.249	8.8	2.74	1850	38
	10	72	2.2	1800	1.04	9.0	2.68	3050	76
	20	144	4.3	1800	2.23	7.20	3.34	4400	114
PMC-A ₃	10	(8.6)	(.25)	1800	.239	35.1	.684	30	2
	20	(17)	(.51)	1800	.413	31.6	.760	40	2.9
	40	(34)	(1)	1800	1.14	26.3	.912	68	5.5
	2	(2)	(.40)	1800	(1.33 x 10 ⁻³)	303	0.079	10	1
MPC	15	(15)	(.40)	1000	(1.48 x 10 ⁻²)	80	0.302	20	6
	25	(25)	(.40)	1000	(0.013)	45	0.533	20	5.5
	70	(70)	(1)	1000	(8.89 x 10 ⁻²)	35	0.677	100	17
	120	(120)	(2)	1000	(3.62 X 10 ⁻¹)	33	0.742	140	22
	0.6	4.3	.13	1800	.0223	21.1	1.14	105	9.3
	1.2	8.6	.26	1800	.0392	20.6	1.16	200	13
PHC-R	2.5	18	.54	1800	.126	15.8	1.52	395	22
	5	36	1.1	1800	.323	8.8	2.74	620	38
	10	72	2.2	1500	1.42	9.0	2.68	940	95
	20	144	4.3	1500	3.01	7.20	3.34	1350	154
	0.3	2.1	.065	1800	.0128	35.6	.674	105	5.5
	0.6	4.3	.13	1800	.0173	21.1	1.14	80	7.9
POC	1.2	8.6	.26	1800	.0304	20.6	1.16	145	12
	2.5	18	.54	1800	.0973	15.8	1.52	195	22
	5	36	1.1	1800	.249	8.8	2.74	290	38
	10	72	2.2	1800	1.04	9.0	2.68	460	77
	20	144	4.3	1800	2.23	7.2	3.34	790	128
	40	289	8.7	1800	5.93	5.1	4.66	1990	220
	80	578	17	1800	23.5	4.3	5.57	3900	551

Magnet Particle Brakes and Clutches

Sizing

To properly size magnetic particle clutches or brakes the thermal energy (slip watts) and torque transmitted must be considered. If thermal energy and torque are known for the application select the unit from the charts to the right.

RPM

RPM must be known when calculating thermal energy (slip watts). For load simulation, torque limiting and similar applications, RPM is known. For web handling, the RPM is calculated as follows:

$$\text{Slip RPM}^* = \frac{12 \times \text{Velocity (feet per min.)}}{\pi \times \text{Full Roll Dia.}^{**} (\text{in.})}$$

*In rewind applications the motor RPM should be higher (10%) than the fastest spool RPM.

**In applications with the web running over a pulley or in a nip roll application use the pulley diameter as the roll diameter.

Thermal Energy (slip watts)

Tension applications are considered continuous slip applications. When a brake or clutch is slipping, heat is generated. Heat is described in terms of "energy rate" and is a function of speed, inertia, and cycle rate. Heat generated is usually described in terms of thermal energy or slip watts. Starting and stopping applications generate heat when the unit slips during the stopping and starting of the load.

- For continuous slip applications, such as tension control in an unwind or rewind application slip watts are calculated using the following formula:

$$\text{Slip Watts} = .0118 \times \text{Torque (lb.in.)} \times \text{Slip RPM}$$

- For cycling applications heat is generated intermittently, and is calculated using the following formula:

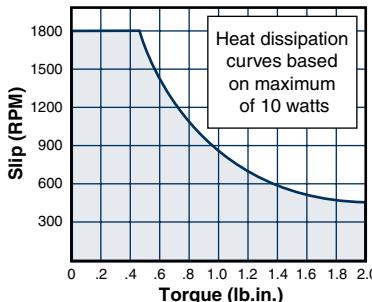
$$\text{Watts} = 2.67 \times \text{Inertia (lb.in.}^2\text{)} \times \left(\frac{\text{RPM}}{10,000} \right)^2 \times F \text{ cycle min.}$$

Duty Cycle

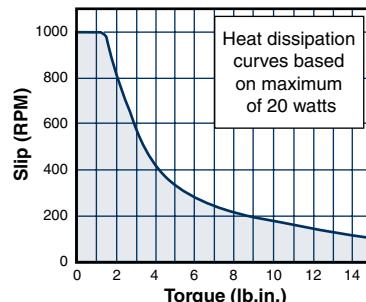
The average heat input must be below the clutch or brake's heat dissipation rating. If the application generates intermittent heat dissipation, use the average speed for the thermal energy (slip watts) calculations.

Quick Selection Charts

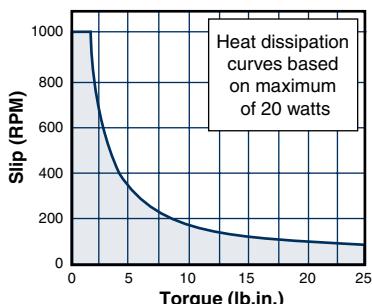
MPB2/MPC2



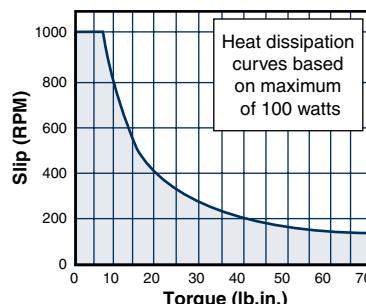
MPB15/MPC15



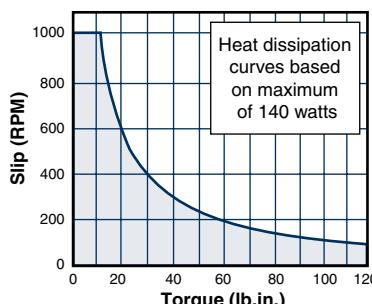
MPB25/MPC25



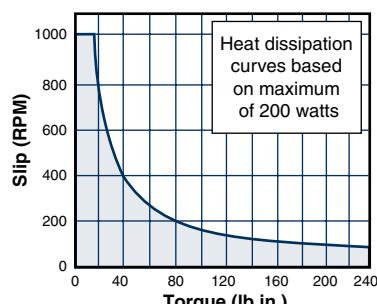
MPB70/MPC70



MPB120/MPC120



MPB240



Torque

Tension applications calculate torque as a function of roll radius and tension. Soft/controlled stopping applications calculate torque as a function of inertia, speed and desired time to stop the load. Torque limiting applications calculate torque as the allowable drive through torque. Calculate the torque requirement based on the formulas for the different applications:

- To calculate torque for a web handling application, determine the desired tension in the web then calculate the required torque as follows:

$$\text{Torque (lb.in.)} =$$

$$\text{Tension (lbs.)} \times \text{Roll Dia.}^* (\text{in.})$$

2

*Use full roll diameter. In applications with the web running over a pulley or in a nip roll applica-

tion use the pulley diameter as the roll diameter.

- To calculate torque for soft/controlled stop or cycling applications first determine the inertia (WR^2), and apply it to the formula below:

$$\text{Torque (lb.in.)} = \frac{\text{Inertia (lb.in.}^2\text{)} \times \text{RPM}}{3,690 \times \text{time(s)}}$$

$$\text{Inertia (WR}^2\text{)} =$$

$$[(\text{weight of body}) \times (\text{radius of gyration}^*)]^2$$

*to calculate for a cylinder about its axis:

$$\text{Solid cylinder} = R^2 = 1/2r^2$$

$$\text{Hollow cylinder} = R^2 = 1/2(r_1^2 + r_2^2)$$

Magnetic Particle Brakes and Clutches

Heat Dissipation Curves

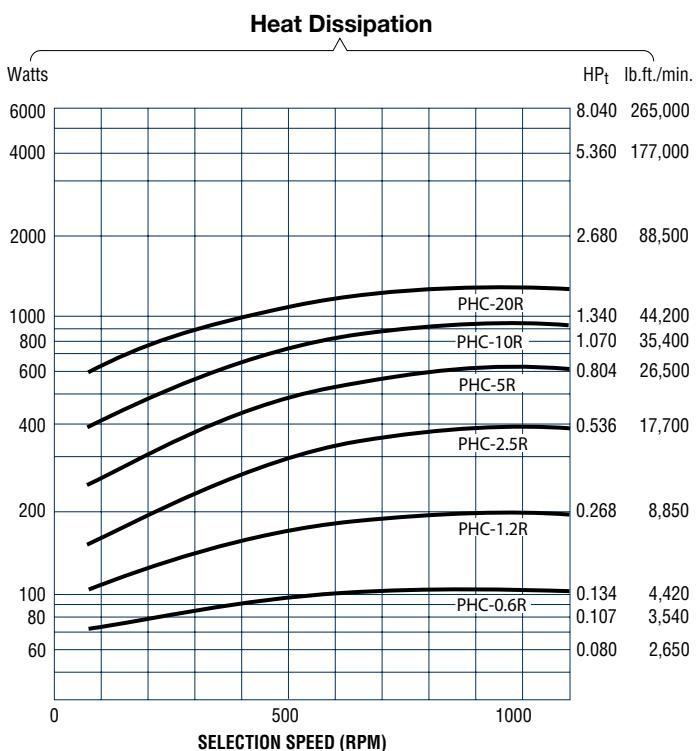
Operating Temperature

The surface temperature of the unit must be less than the temperature indicated in the following chart.

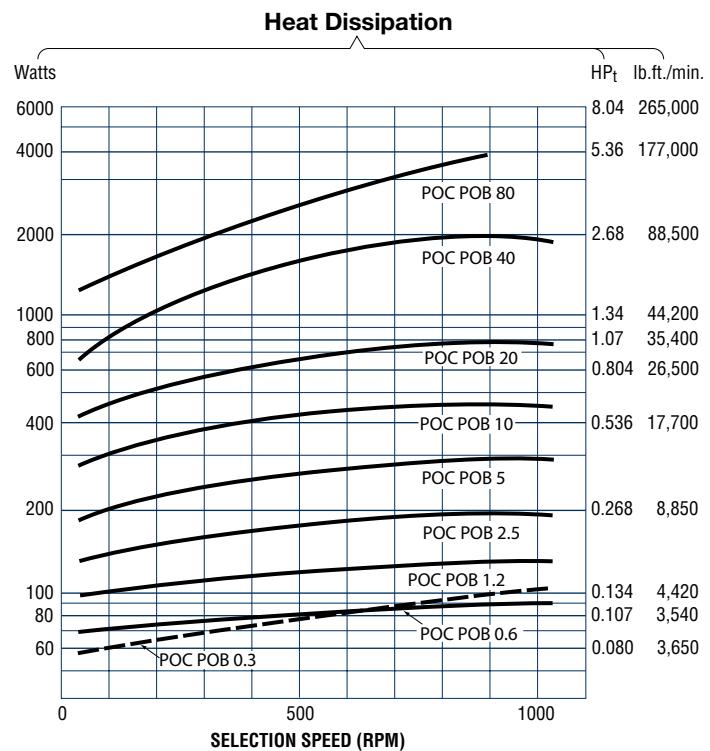
Maximum Surface Temperature

Model	Temp (°F)
PMC-A ₃	167
POC/PHC-R/POB	176
PRB/PTB-BL ₃	194

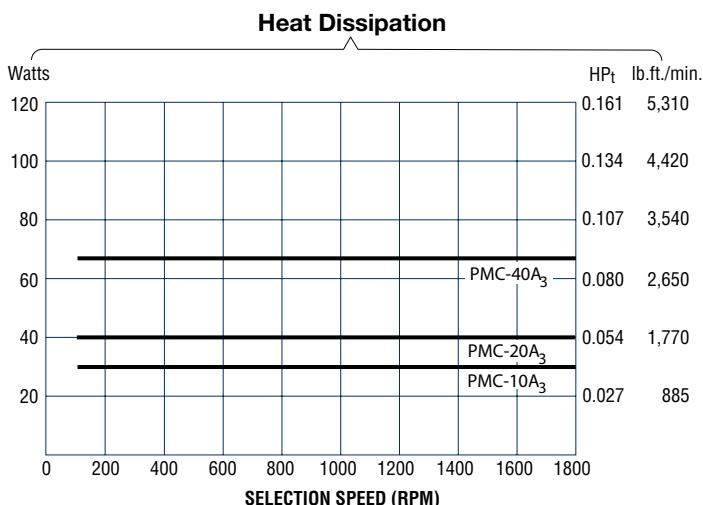
PHC-R Clutches



POC/POB Clutches/Brakes

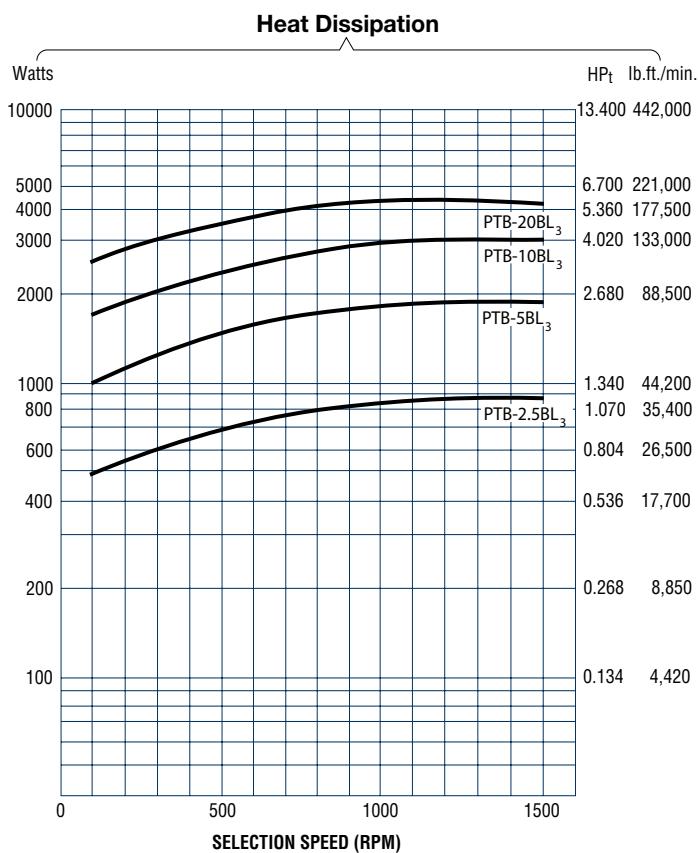


PMC-A₃ Clutches or Brakes

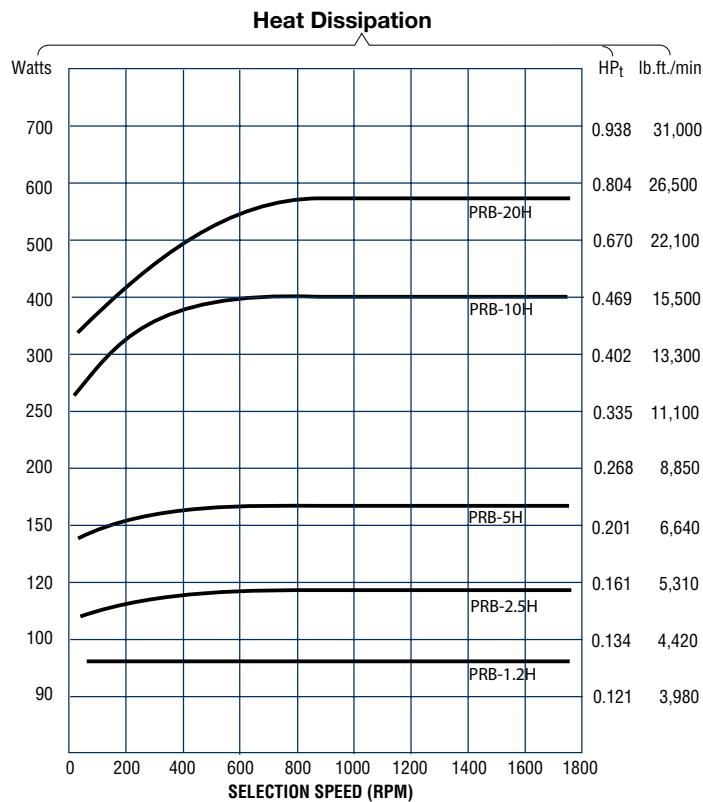


Magnet Particle Brakes and Clutches

PTB-BL₃ Brakes

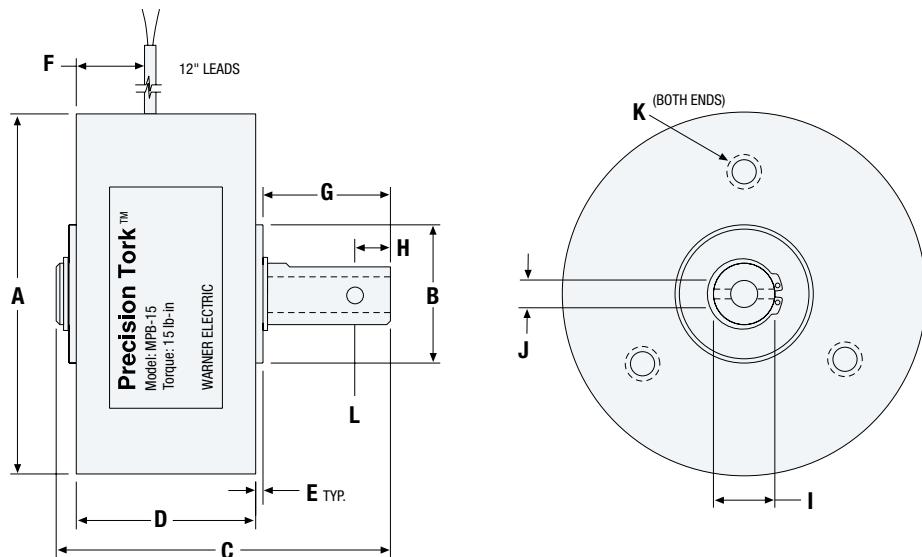


PRB-1.2H, 2.5H, 5H, 10H and 20H



MPB Series Brakes

Brakes



Dimensions

Model	A	B	C	D	E	F	G	H	I (Shaft)	J (Bore)	K	L
MPB2-1	2.11	0.750/0.749	2.23	1.15	0.06	0.70	0.87	—	0.2498/0.2492	—	(3) #6-32 x 0.27 on 1.350 BC	1 Flat
MPB15-1	2.96	1.125/1.124	3.05	1.46	0.07	0.85	1.35	—	0.3748/0.3742	—	(3) #8-32 x 0.30 on 2.000 BC	2 Flats at 90°
MPB15-2	2.96	1.125/1.124	2.05	1.46	0.07	0.85	0.34	0.18	—	0.375/0.376	(3) #8-32 x 0.30 on 2.000 BC	0.125 Thru Hole
MPB15-3	2.96	1.125/1.124	2.70	1.46	0.07	0.85	0.99	—	0.4998/0.4992	—	(3) #8-32 x 0.30 on 2.000 BC	2 Flats at 90°
MPB25-1	2.96	1.125/1.124	2.05	1.46	0.07	0.85	1.35	—	0.3748/0.3742	—	(3) #8-32 x 0.30 on 2.000 BC	2 Flats at 90°
MPB25-2	2.96	1.125/1.124	2.05	1.46	0.07	0.85	0.34	0.18	—	0.375/0.376	(3) #8-32 x 0.30 on 2.000 BC	0.125 Thru Hole
MPB25-3	2.96	1.125/1.124	2.7	1.46	0.07	0.85	0.99	—	0.4998/0.4992	—	(3) #8-32 x 0.30 on 2.000 BC	2 Flats at 90°
MPB70-1	4.57	1.625/1.624	2.62	1.76	0.10	0.98	0.50	0.18	—	0.500/0.501	(4) #10-32 x 0.50 on 4.228 BC	0.125 Thru Hole
MPB70-2	4.57	1.625/1.624	3.37	1.76	0.10	0.98	1.25	—	0.7497/0.7492	—	(4) #10-32 x 0.50 on 4.228 BC	0.188 Keyway
MPB120-1	5.25	1.625/1.624	4.02	2.17	0.10	1.18	1.50	0.50	—	0.500/0.501	(4) #1/4-20 x 0.75 on 4.812 BC	0.156 Thru Hole
MPB120-2	5.25	1.625/1.624	4.02	2.17	0.10	1.18	1.50	—	0.7497/0.7492	—	(4) #1/4-20 x 0.75 on 4.812 BC	0.188 Keyway
MPB240-1	6.23	2.442/2.440	4.66	2.65	0.10	1.46	1.65	—	0.7497/0.7492	—	(4) #1/4-20 x 0.65 on 5.875 BC	0.188 Keyway
MPB240-2	6.23	2.442/2.440	3.51	2.65	0.10	1.46	0.50	—	—	0.875/0.876	(4) #1/4-20 x 0.65 on 5.875 BC	0.188 Keyway
MPB240-3	6.23	2.442/2.440	3.51	2.65	0.10	1.46	0.50	—	—	1.000/1.001	(4) #1/4-20 x 0.65 on 5.875 BC	0.250 Shallow Keyway

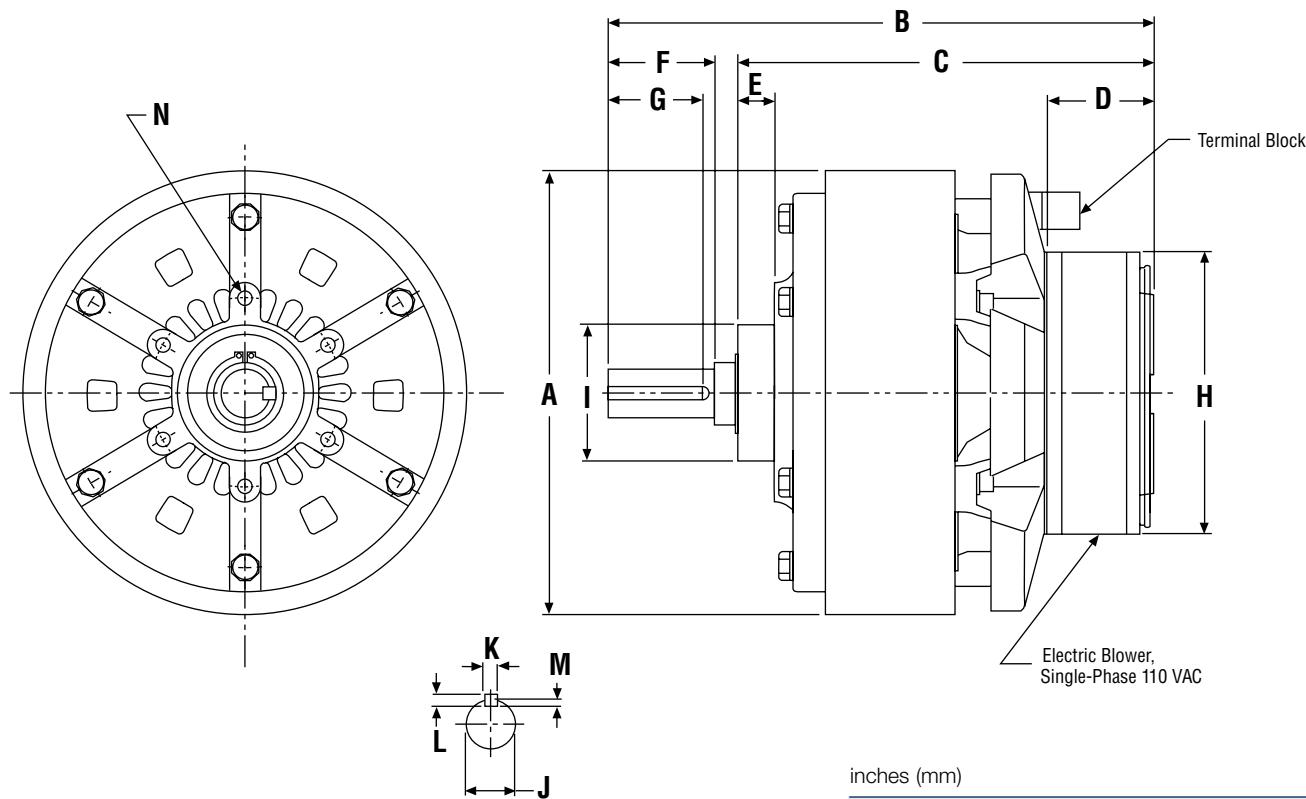
Specifications

Model Number	Max. Drag Torque 0 Excit. (lb.in.)	Rated Torque (lb.in.)	Rated Voltage	Resistance (Ohms)	Rated Current (Amps)	Response Zero Force (Millisec)	Response With Force (Millisecs)	Inertia of Output Shaft (lb.in. ²)	Max. Heat Dissipation (watts)	Max. Speed Recom. (RPM)	Weight
MPB2	0.40	2	24	92	0.261	8	4	0.001	10	1,800	1
	0.40	2	90	1552	0.058	8	4	0.001	10	1,800	1
MPB15	0.40	15	24	80	0.302	25	9	0.013	20	1,000	2.5
	0.40	15	90	1501	0.060	25	9	0.013	20	1,000	2.5
MPB25	0.40	25	24	45	0.533	25	9	0.013	20	1,000	2.5
MPB70	1.00	70	24	35	0.677	70	17	0.073	100	1,000	8
	1.00	70	90	613	0.147	70	17	0.073	100	1,000	8
MPB120	2.00	120	24	33	0.742	90	25	0.370	140	1,000	12.5
	2.00	120	90	475	0.190	90	25	0.370	140	1,000	12.5
MPB240	4.00	240	24	19	1.286	150	45	1.311	200	1,000	20.5
	4.00	240	90	246	0.366	150	45	1.311	200	1,000	20.5

The PTB-BL₃ offers superior heat dissipation capability. Units are pilot mounted and a male input shaft is provided for connecting to the load.

PTB-BL₃ Brakes

Dimensions



inches (mm)

Specifications

Model	Nominal Part Number	Nominal Torque (lb. ft.)	E-Stop Torque (lb. ft.)	Nominal Drag Torque (lb. ft.)	Maximum Speed (rpm)	Inertia Input (lb. ft. ²)	Max. Heat Diss. Watts @ Max. RPM	Weight (lbs.)
2.5	5401-169-141	18	23	.54	1,800	.0973	880	24
5	5401-169-151	36	47	1.1	1,800	.249	1,850	38
10	5401-169-161	72	88	2.2	1,800	1.04	3,050	76
20	5401-169-171	144	180	4.3	1,800	2.23	4,400	114

Shaft Dimensions				
Size	J	K	L	M
2.5	0.7874/0.7866 (20.000/19.979)	0.1978/0.1973 (5.024/5.012)	0.20 (5)	0.12 (3)
5	0.9843/0.9834 (25.000/24.979)	0.2768/0.2762 (7.030/7.015)	0.28 (7)	0.16 (4)
10	1.1811/1.1803 (30.000/29.979)	0.2768/0.2762 (7.030/7.015)	0.28 (7)	0.16 (4)
20	1.3780/1.3770 (35.000/34.975)	0.3949/0.3943 (10.030/10.015)	0.31 (8)	0.18 (4.5)

inches (mm)

Size	A	B	C	D	E	F	G	H*	I	N			
										Thread Size	Depth	Num. of Holes	Bolt Circle
2.5	7.17 (182)	8.72 (221.5)	6.67 (169.5)	1.69 (43)	0.59 (15)	1.69 (43)	1.50 (38)	□ 4.72 (120)	2.1654/2.1642 (55.000/54.970)	M6	0.51 (13)	6	3.071 (78)
5	8.62 (219)	10.81 (274.5)	8.19 (208)	2.42 (61.5)	0.91 (23)	2.24 (57)	1.85 (47)	○ 5.91 (150)	2.9134/2.9122 (74.000/73.970)	M6	0.51 (13)	6	3.937 (100)
10	11.42 (290)	13.19 (335)	10.12 (257)	2.42 (61.5)	0.98 (25)	2.64 (67)	2.20 (56)	○ 5.91 (150)	3.9370/3.9356 (100.000/99.965)	M10	0.71 (18)	6	5.512 (140)
20	13.19 (335)	13.88 (352.5)	10.61 (269.5)	2.42 (61.5)	0.98 (25)	2.80 (71)	2.36 (60)	○ 5.91 (150)	4.3307/4.3293 (110.000/109.965)	M10	0.71 (18)	6	5.906 (150)

*Adjacent symbol denotes shape of blower.

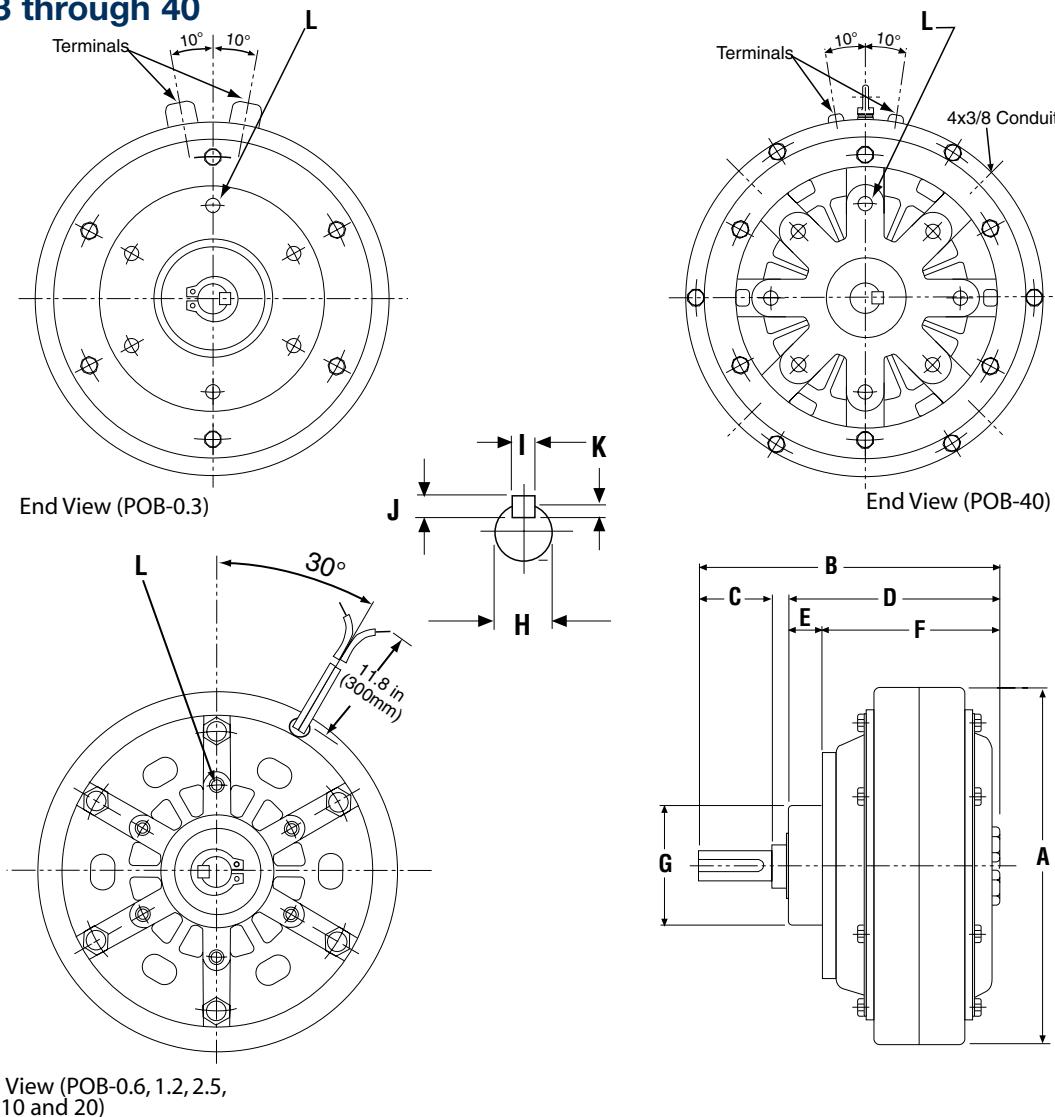
Note: All dimensions are nominal unless otherwise noted.

POB Series Brakes

Low and high torque units are offered in this model. All units have male input shafts and pilots for mounting, except for the size 80, which is foot-mounted.

Dimensions

Sizes 0.3 through 40



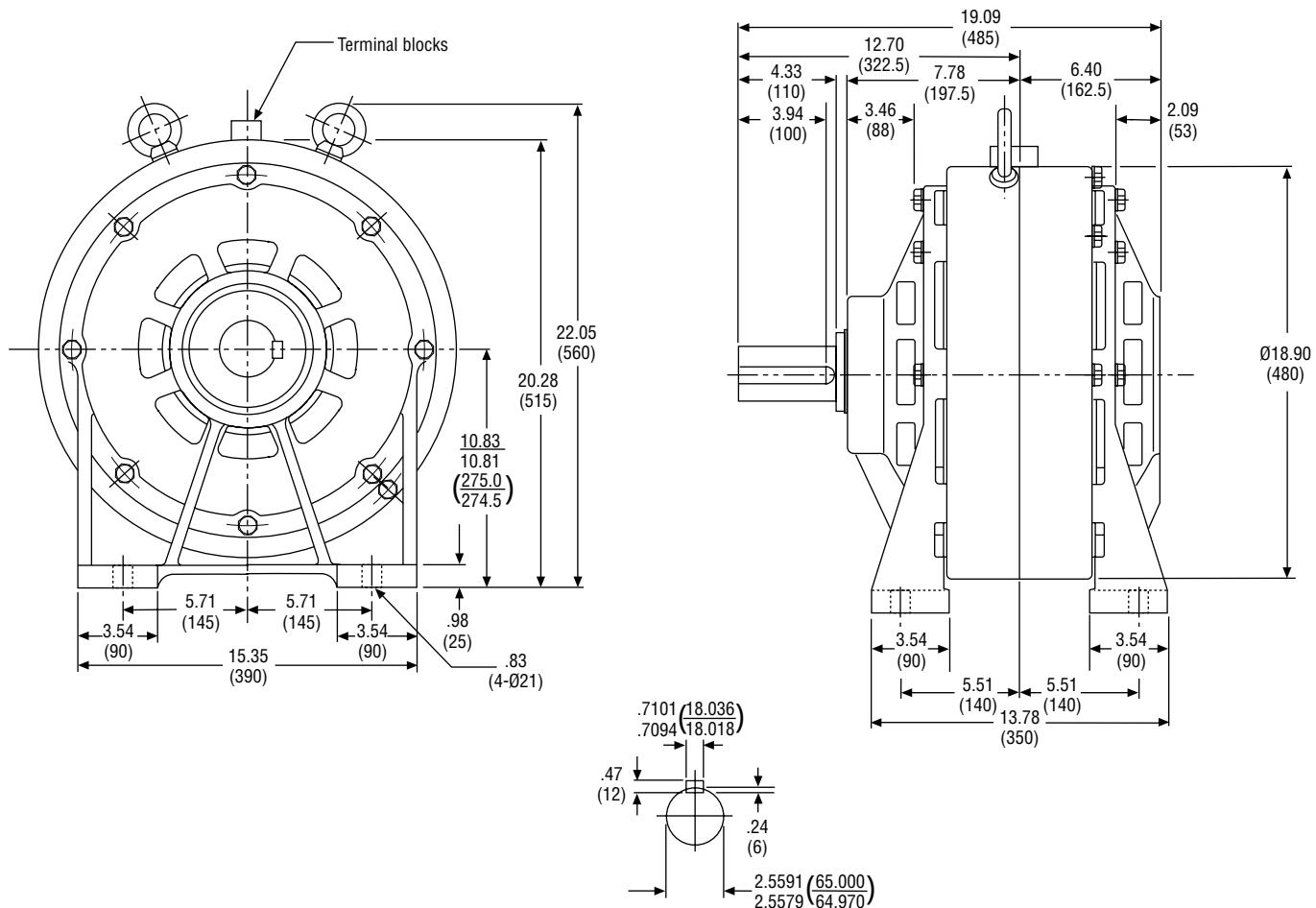
End View (POB-0.6, 1.2, 2.5,
5.0, 10 and 20)

inches (mm)

Model	A	B	C	D	E	F	Shaft Dimensions					L			
							G	H	I	J	K	Thread Size	Depth	No. of Holes	Bolt Circle
POB-0.3	4.72 (120)	4.13 (105)	0.91 (23)	2.95 (75)	0.43 (11)	2.52 (64)	1.6535/1.6526 (42.000/41.975)	0.3937/0.3931 (10.000/9.985)	0.1584/0.1580 (4.024/4.012)	0.16 (4)	0.10 (2.5)	M5	0.39 (10)	6	2.520 (64)
POB-0.6	5.28 (134)	4.29 (109)	1.02 (26)	3.01 (76.5)	0.39 (10)	2.62 (66.5)	1.6535/1.6526 (42.000/41.975)	0.4724/0.4717 (12.000/11.982)	0.1584/0.1580 (4.024/4.012)	0.16 (4)	0.10 (2.5)	M5	0.43 (11)	6	2.520 (64)
POB 1.2	5.98 (152)	5.14 (130.5)	1.36 (34.5)	3.52 (89.5)	0.51 (13)	3.01 (76.5)	1.6535/1.6526 (42.000/41.975)	0.5906/0.5898 (15.000/14.982)	0.1978/0.1973 (5.024/5.012)	0.20 (5)	0.12 (3.0)	M6	0.51 (13)	6	2.520 (64)
POB 2.5	7.17 (182)	6.10 (155)	1.69 (43)	4.06 (103)	0.59 (15)	3.46 (88)	2.1654/2.1642 (55.000/54.970)	0.7874/0.7866 (20.000/19.979)	0.1978/0.1973 (5.024/5.012)	0.20 (5)	0.12 (3.0)	M6	0.51 (13)	6	3.071 (78)
POB 5.0	8.62 (219)	7.44 (189)	2.24 (57)	4.82 (122.5)	0.91 (23)	3.92 (99.5)	2.9134/2.9122 (74.000/73.970)	0.9843/0.9834 (25.000/24.979)	0.2768/0.2762 (7.030/7.015)	0.28 (7)	0.16 (4.0)	M6	0.51 (13)	6	3.937 (100)
POB 10	11.42 (290)	9.19 (233.5)	2.64 (67)	6.12 (155.5)	0.98 (25)	5.14 (130.5)	3.9370/3.9356 (100.000/99.965)	1.1811/1.1803 (30.000/29.979)	0.2768/0.2762 (7.030/7.015)	0.28 (7)	0.16 (4.0)	M10	0.71 (18)	6	5.512 (140)
POB 20	13.19 (335)	10.37 (263.5)	2.80 (71)	7.11 (180.5)	0.98 (25)	6.12 (155.5)	4.3307/4.3293 (110.000/109.965)	1.3780/1.3770 (35.000/34.975)	0.3949/0.3943 (10.030/10.015)	0.31 (8)	0.18 (4.5)	M10	0.71 (18)	6	5.906 (150)
POB-40	15.55 (395)	12.99 (330)	3.62 (92)	8.82 (224)	1.30 (33)	7.52 (191)	5.1181/5.1165 (130.000/129.960)	1.7717/1.7707 (45.000/44.975)	0.4739/0.4731 (12.036/12.018)	0.31 (8)	0.18 (4.5)	M12	0.79 (20)	8	7.870 (200)

Note: All dimensions are nominal unless otherwise noted.

Size 80



Specifications

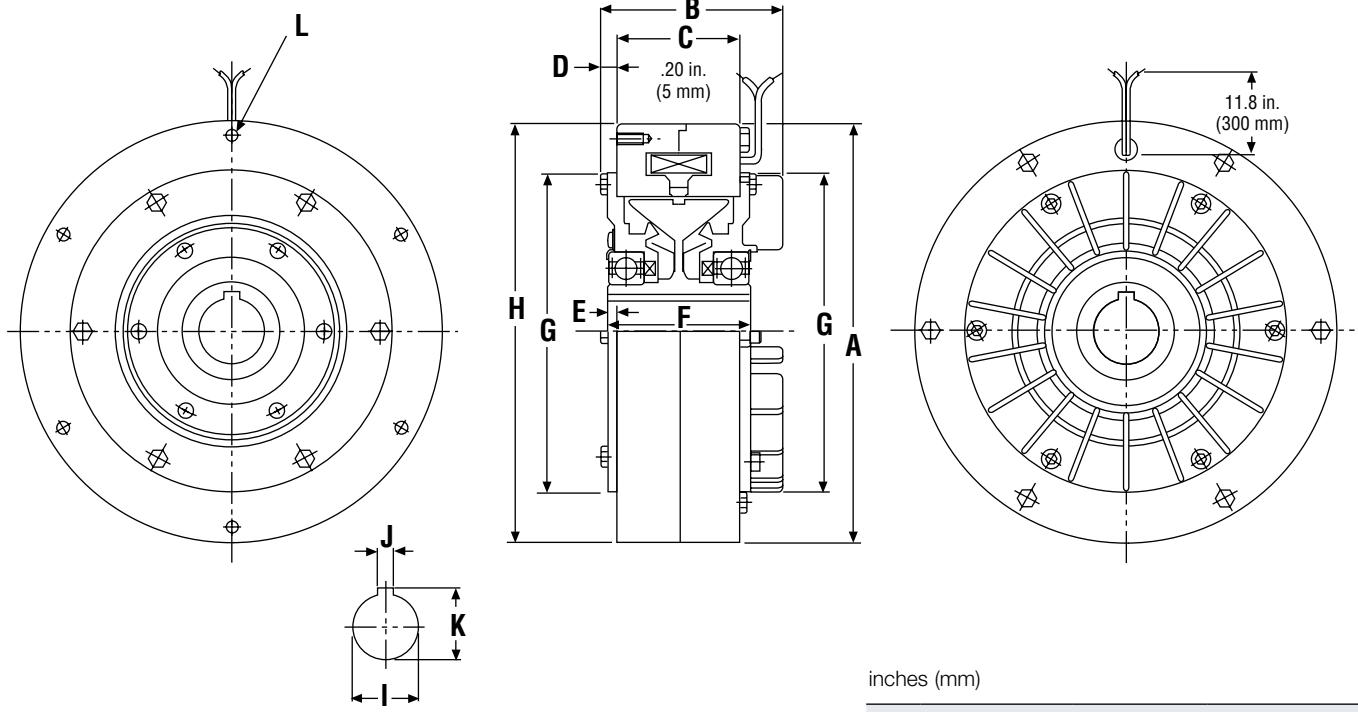
Size	Part Number	Rated Torque (lb. ft.)	E-Stop Torque (lb. ft.)	Drag Torque (lb. ft.)	Maximum Speed (rpm)	Inertia Input (lb. ft. ²)	Max. Heat Diss. Watts @ Max. RPM	Weight (lbs.)
0.3	5401-169-211	2.1	3.0	.065	1,800	.0128	105	5.3
0.6	5401-169-221	4.3	5.9	.13	1,800	.0173	80	7.5
1.2	5401-169-231	8.6	12.0	.26	1,800	.0304	145	11.5
2.5	5401-169-241	18	23.0	.54	1,800	.0973	195	24.3
5.0	5401-169-251	36	43.0	1.1	1,800	.0249	290	35.3
10	5401-169-261	72	101.0	2.2	1,800	1.04	460	72.8
20	5401-169-271	144	180.0	4.3	1,800	2.23	790	106
40	5401-169-281	289	361	8.7	1,800	5.93	1,990	176
80	5401-169-291	578	723	17	1,500	23.5	3,900	573

Note: All dimensions are nominal unless otherwise noted.

PRB-H Series Brakes

This is the basic PRB model. It is offered with a hollow bore and a pilot for mounting.

Dimensions



inches (mm)

Specifications

Size	Part Number	Torque (lb. ft.)	E-Stop Torque (lb. ft.)	Drag Torque (lb. ft.)	Maximum Speed (rpm)	Inertia Input (lb. ft.²)	Max. Heat Diss. Watts @ Max. RPM	Weight (lbs.)
1.2	5401-169-331	8.6	12	.26	1,800	.104	95	11
2.5	5401-169-341	18	23	.54	1,800	.161	118	15
5	5401-169-351	36	43	1.1	1,800	.453	170	29
10	5401-169-361	72	101	2.2	1,800	1.51	355	57
20	5401-169-371	144	180	4.3	1,800	4.46	570	101

* For availability of inch series bores, contact your Warner Electric representative.

inches (mm)

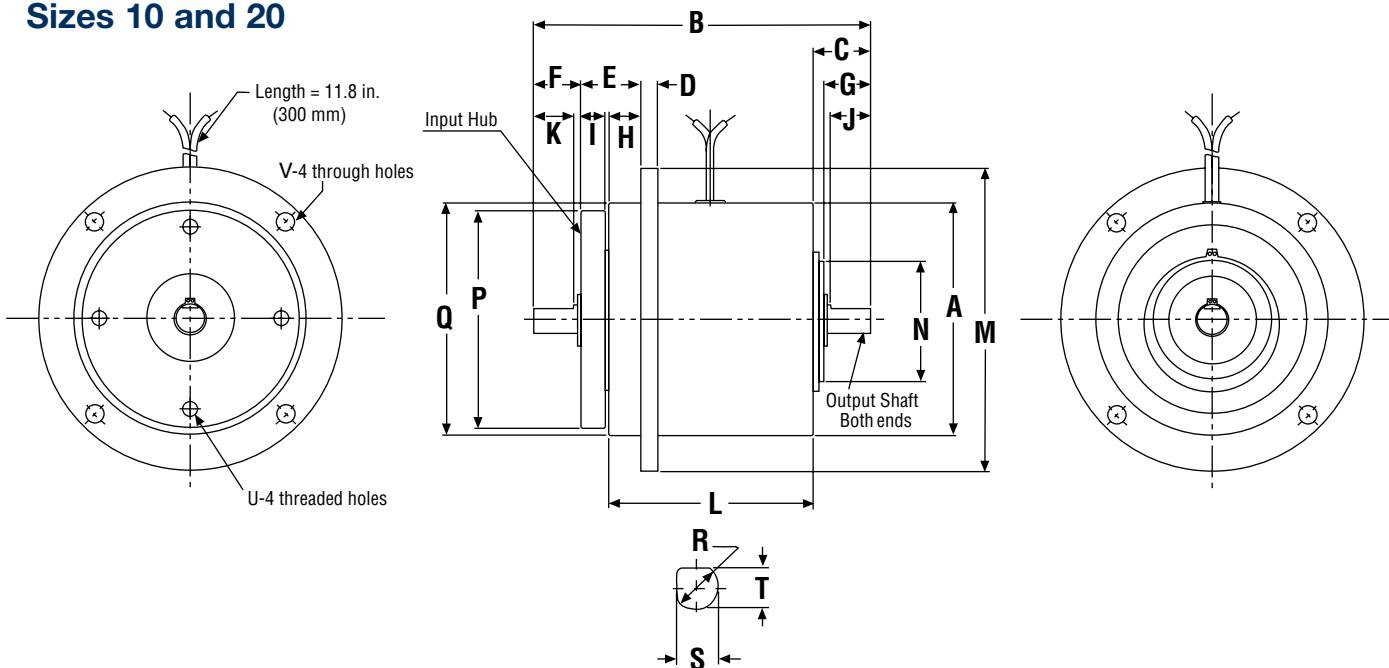
Size	A	B	C	D	E	F	G	H	L			
									Thread Size	No. of Depth	Bolt Holes	Circle
1.2	5.35 (136)	2.48 (63)	1.65 (42)	0.28 (7)	0.22 (5.5)	2.09 (53)	4.29 (109)	5.3543/5.3528 (136.000/135.960)	M5	0.39 (10)	6	4.92 (125)
2.5	6.30 (160)	2.87 (73)	1.85 (47)	0.30 (6.5)	0.26 (6.5)	2.36 (60)	4.88 (124)	6.2992/6.2976 (160.000/159.960)	M5	0.39 (10)	6	5.83 (148)
5	7.68 (195)	3.33 (84.5)	2.24 (57)	0.31 (8)	0.20 (5)	2.64 (67)	5.87 (149)	7.6772/7.6754 (195.000/194.954)	M6	0.47 (12)	6	7.13 (181)
10	9.84 (250)	4.09 (104)	2.68 (68)	0.33 (8.5)	0.20 (5)	3.07 (78)	7.40 (188)	9.8425/9.8407 (250.000/249.954)	M6	0.47 (12)	8	9.17 (233)
20	12.01 (305)	5.06 (128.5)	3.15 (80)	0.47 (12)	0.30 (7.5)	3.74 (95)	9.21 (234)	12.0079/12.0058 (305.000/304.948)	M8	0.47 (12)	8	11.10 (282)

Note: All dimensions are nominal unless otherwise noted.

These units offer precise control in the small tension ranges. They have flanged input hubs and double-ended output shafts for maximum mounting flexibility. They can be easily mounted as clutches or brakes.

PMC Series Clutches/Brakes

Dimensions Sizes 10 and 20



Specifications

Size	Part Number	Torque (lb. in.)	E-Stop Torque (lb. in.)	Drag Torque (lb. in.)	Maximum Speed (rpm)	Inertia Input (lb. in. ²)	Output (lb. in. ²)	Max. Heat Diss. Watts @ Max. RPM	Weight (lbs.)
10	5401-270-111	8.6	11.5	.25	1,800	.239	.0291	30	2.0
20	5401-270-121	17	20.4	.51	1,800	.413	.0752	40	2.9

inches (mm)

Size	A	B	C	D	E	F	G	H	I	J	K	L	M	N
10	2.28 (58)	3.35 (85)	0.59 (15)	0.16 (4)	0.59 (15)	0.47 (12)	0.47 (12)	0.31 (8)	0.24 (6)	0.39 (10)	0.39 (10)	2.01 (51)	2.99 (76)	1.18 (30)
20	2.72 (69)	4.57 (116)	1.30 (33)	0.16 (4)	0.87 (22)	0.98 (25)	0.94 (24)	0.59 (15)	0.24 (6)	0.79 (20)	0.79 (20)	2.01 (51)	3.62 (92)	1.38 (35)

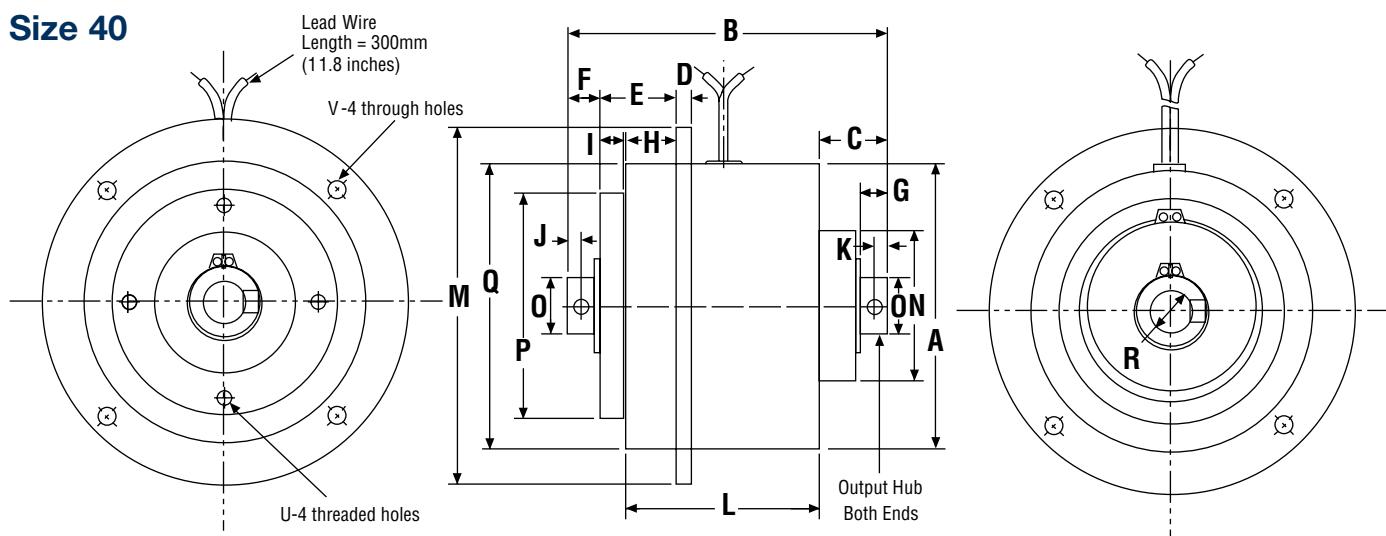
Size	Shaft Dimensions					Thread Size	U		V	
	P	Q	R	S	T		Depth	Bolt Circle	Hole Size	Bolt Circle
10	2.1260/2.1248 (54.000/53.970)	2.2835/2.2823 (58.000/57.970)	0.2756/0.2750 (7.000/6.985)	0.24 (6)	—	M4	0.24 (6)	1.81 (46)	0.18 (4.5)	2.68 (68)
20	2.1260/2.1248 (54.000/53.970)	2.7165/2.7154 (69.000/68.970)	0.4724/0.4720 (12.000/11.988)	0.45 (11.5)	0.45 (11.5)	M4	0.24 (6)	1.81 (46)	0.18 (4.5)	3.23 (82)

Note: All dimensions are nominal unless otherwise noted.

PMC Series Clutches/Brakes

Dimensions

Size 40



Specifications

Size	Part Number	Torque (lb. in.)	E-Stop Torque (lb. in.)	Drag Torque (lb. in.)	Maximum Speed (rpm)	Inertia Input (lb. in. ²)	Output (lb. in. ²)	Max. Heat Diss. Watts @ Max. RPM	Weight (lbs.)
40	5401-270-131	34	42.5	1.0	1,800	1.14	.372	68	5.5

inches (mm)

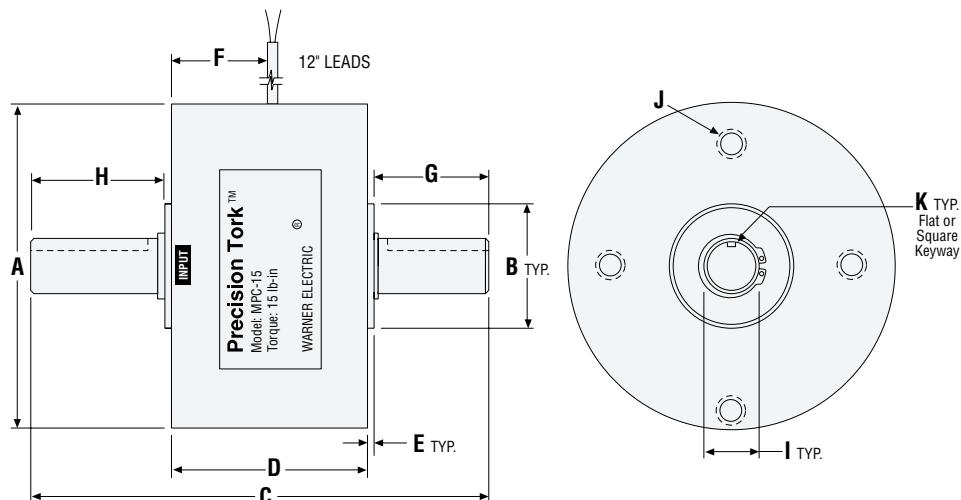
Size	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
40	3.39 (86)	3.82 (97)	0.83 (21)	0.16 (4)	0.87 (22)	0.39 (10)	0.34 (8.7)	0.59 (15)	0.24 (6)	0.16 (4)	0.16 (4)	2.32 (59)	4.41 (112)	1.97 (50)	0.79 (20)

Size	Bore			U				V		
	P	Q	R	Thread Size	Depth	Bolt Circle	Hole Size	Bolt Circle		
40	2.7559/2.7547 (70.000/69.970)	3.3858/3.3844 (86.000/85.965)	0.4731/0.4724 (12.018/12.000)	M4	0.24 (6)	2.36 (60)	0.18 (4.5)	3.94 (100)		

Note: All dimensions are nominal unless otherwise noted.

MPC Series Clutches

Clutches



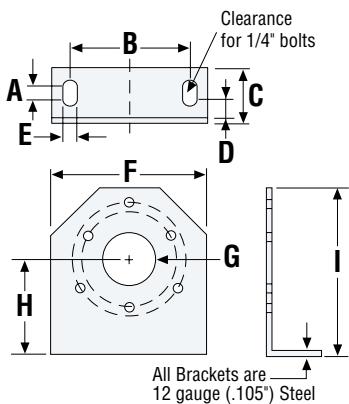
Dimensions

Model	A	B	C	D	E	F	G (Output)	H (Input)	I	J	K5
MPC2-1	2.11	0.750/0.749	3.73	1.85	0.06	1.16	0.88	0.88	0.2498/0.2492	(3) #6-32 x 0.50 on 1.350 BC	Flat
MPC15-1	2.96	1.125/1.124	4.93	2.80	0.07	1.69	1.00	1.00	0.4998/0.4992	(3) #8-32 x 0.50 on 2.000 BC	2 Flats at 90°
MPC15-2	2.96	1.125/1.124	5.08	2.80	0.07	1.69	1.22	0.92	0.3748/0.3742	(3) #8-32 x 0.50 on 2.000 BC	2 Flats at 90°
MPC25-1	2.96	1.125/1.124	4.93	2.80	0.07	1.69	0.995	1.00	0.4998/0.4992	(3) #8-32 x 0.50 on 2.000 BC	2 Flats at 90°
MPC25-2	2.96	1.125/1.124	5.08	2.80	0.07	1.69	1.22	0.92	0.3748/0.3742	(3) #8-32 x 0.50 on 2.000 BC	2 Flats at 90°
MPC70	4.58	1.625/1.624	6.55	3.67	0.10	2.08	1.35	1.35	0.7497/0.7492	(4) #10-32 x 0.63 on 4.228 BC	0.188 Keyway
MPC120	5.25	1.625/1.624	7.02	4.00	0.10	2.40	1.50	1.35	0.7497/0.7492	(4) #1/4-20 x 0.75 on 4.812 BC	0.188 Keyway
MPC240	6.23	2.4415/2.4405	8.35	4.83	.10	2.62	1.66	1.66	.7495/.7485	(4) #1/4-20 X 0.65 on 5.875 BC	0.188 Keyway

Specifications

Model Number	Max. Drag Torque 0 Excit. (lb.in.)	Rated Torque (lb.in.)	Rated Voltage	Resistance (Ohms)	Rated Current (Amps)	Response Zero Force (Millisecond)	Response With Force (Millisecond)	Inertia of Output Shaft (lb.in. ²)	Max. Heat Dissipation (watts)	Max. Speed Recom. (RPM)	Weight
MPC2	0.40	2	24	92	0.261	8	4	0.001	10	1,800	2
	0.40	2	90	1552	0.058	8	4	0.001	10	1,800	2
MPC15	0.40	15	24	80	0.302	25	9	0.013	20	1,000	5.5
	0.40	15	90	1501	0.060	25	9	0.013	20	1,000	5.5
MPC25	0.40	25	24	45	0.533	25	9	0.013	20	1,000	5.5
	0.40	25	90	430	0.533	25	9	0.013	20	1,000	5.5
MPC70	1.00	70	24	35	0.677	70	17	0.073	100	1,000	16
	1.00	70	90	613	0.147	70	17	0.073	100	1,000	16
MPC120	2.00	120	24	33	0.742	90	25	0.370	140	1,000	22
	2.00	120	90	475	0.190	90	25	0.370	140	1,000	22
MPC240	2.00	240	24	19.5	1.20	150	45	1.33	200	1000	37
	2.00	240	90	225.5	0.400	150	45	1.33	200	1000	37

Optional Mounting Bracket (for mounting MPB Brakes and MPC Clutches)



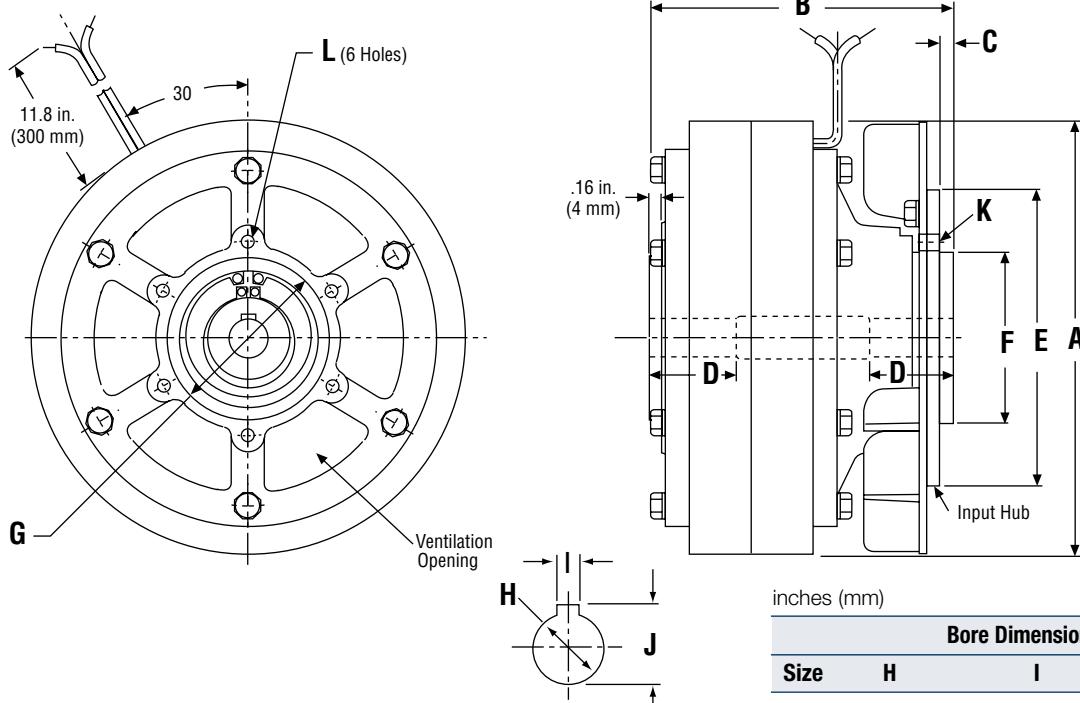
Model	Fits Size	A	B	C	D	E	F	G	H	I
MPB-2B	2	0.270 (6.9)	1.750 (44.5)	1.155 (29.3)	0.390 (9.9)	0.280 (7.1)	2.500 (63.5)	0.755 (19.2)	1.500 (38.1)	3.000 (76.2)
MPB-15B	15, 25	0.270 (6.9)	2.500 (63.5)	1.155 (29.3)	0.390 (9.9)	0.280 (7.1)	3.500 (88.9)	1.13 (28.7)	2.000 (50.8)	4.000 (101.6)
MPB-70B	70	0.270 (6.9)	4.875 (123.8)	1.155 (29.3)	0.390 (9.9)	0.280 (7.1)	6.000 (152.4)	1.63 (41.4)	3.500 (88.9)	6.000 (152.4)
MPB-120B	120	0.270 (6.9)	4.875 (123.8)	1.155 (29.3)	0.390 (9.9)	0.280 (7.1)	6.000 (152.4)	1.63 (41.4)	3.500 (88.9)	6.250 (158.8)
MPB-240B	240	0.270 (6.9)	4.875 (123.8)	1.155 (29.3)	0.390 (9.9)	0.280 (7.1)	6.500 (165.1)	2.245 (62.1)	4.000 (101.6)	7.500 (190.5)

All dimensions are nominal unless otherwise noted. () denotes (mm)

PHC-R Series Clutches

This model has a hollow bore, making it ideal for applications where shaft mounting is preferred. It has a piloted input flange for pulley or sprocket attachment.

Dimensions



inches (mm)

Bore Dimensions

Size	H	I	J
0.6	0.4731/0.4724 (12.018/12.000)	0.1586/0.1579 (4.028/4.010)	0.5413/0.5315 (13.75/13.50)
1.2	0.5913/0.5906 (15.018/15.000)	0.1980/0.1972 (5.028/5.010)	0.6791/0.6693 (17.25/17.00)
2.5	0.9851/0.9843 (25.021/25.000)	0.2770/0.2761 (7.035/7.013)	1.1122/1.1024 (28.25/28.00)
5	1.3789/1.3780 (35.025/35.000)	0.3951/0.3942 (10.035/10.013)	1.5256/1.5157 (38.75/38.50)
10	1.7726/1.7717 (45.025/45.000)	0.4741/0.4731 (12.043/12.016)	1.9193/1.9094 (48.75/48.50)
20	2.1665/2.1654 (55.030/55.000)	0.5922/0.5912 (15.043/15.016)	2.3720/2.3622 (60.25/60.00)

Specifications

Part Size	Number	Nominal Torque (lb. ft.)	Nominal Drag Torque (lb. ft.)	Maximum Speed (rpm)	Inertia Input (lb. ft. ²)	Output (lb. ft. ²)	Max. Heat Diss. Watts @ Max. RPM	Weight (lbs.)
0.6	5401-270-321	4.3	.13	1,800	.0223	.00712	105	9.3
1.2	5401-270-331	8.6	.26	1,800	.0392	.0171	200	13
2.5	5401-270-341	18	.54	1,800	.126	.0494	395	22
5	5401-270-351	36	1.1	1,800	.323	.138	620	38
10	5401-270-361	72	2.2	1,500	1.42	.617	940	95
20	5401-270-371	144	4.3	1,500	3.01	1.30	1,350	154

inches (mm)

Size	A	B	C	D	E	F	G	K			L				
								Thread Size	Depth	Num. of Holes	Bolt Circle	Thread Size	Depth	Num. of Holes	Bolt Circle
0.6	5.28 (134)	3.62 (92)	0.16 (4)	1.00 (25.5)	3.50 (89)	1.9685/1.9675 (50.000/49.975)	1.9685/1.9675 (50.000/49.975)	M4	0.24 (6)	6	2.362 (60)	M4	0.24 (6)	6	2.362 (60)
1.2	5.98 (152)	3.78 (96)	0.16 (4)	0.98 (25)	3.50 (89)	1.7717/1.7707 (45.000/44.975)	2.7559/2.7547 (70.000/69.970)	M5	0.24 (6)	6	2.165 (55)	M4	0.31 (8)	6	3.150 (80)
2.5	7.17 (182)	5.20 (132)	0.20 (5)	1.77 (45)	5.51 (140)	2.7559/2.7547 (70.000/69.970)	2.7559/2.7429 (70.000/69.670)	M6	0.39 (10)	6	3.150 (80)	M6	0.35 (9)	6	3.150 (80)
5	8.62 (219)	5.83 (148)	0.16 (4)	1.57 (40)	6.50 (165)	3.4252/3.4238 (87.000/86.965)	3.4252/3.4238 (87.000/86.965)	M8	0.39 (10)	6	4.016 (102)	M8	0.39 (10)	6	4.016 (102)
10	11.42 (290)	7.22 (183.5)	0.24 (6)	2.36 (60)	7.48 (190)	4.1339/4.1325 (105.000/104.965)	4.3307/4.3293 (110.000/109.965)	M10	0.51 (13)	6	4.724 (120)	M8	0.39 (10)	6	4.724 (120)
20	13.19 (335)	8.74 (222)	0.35 (9)	2.95 (75)	8.66 (220)	5.1181/5.1165 (130.000/129.960)	5.1181/5.1165 (130.000/129.960)	M10	0.59 (15)	6	5.906 (150)	M10	0.53 (13.5)	6	5.906 (150)

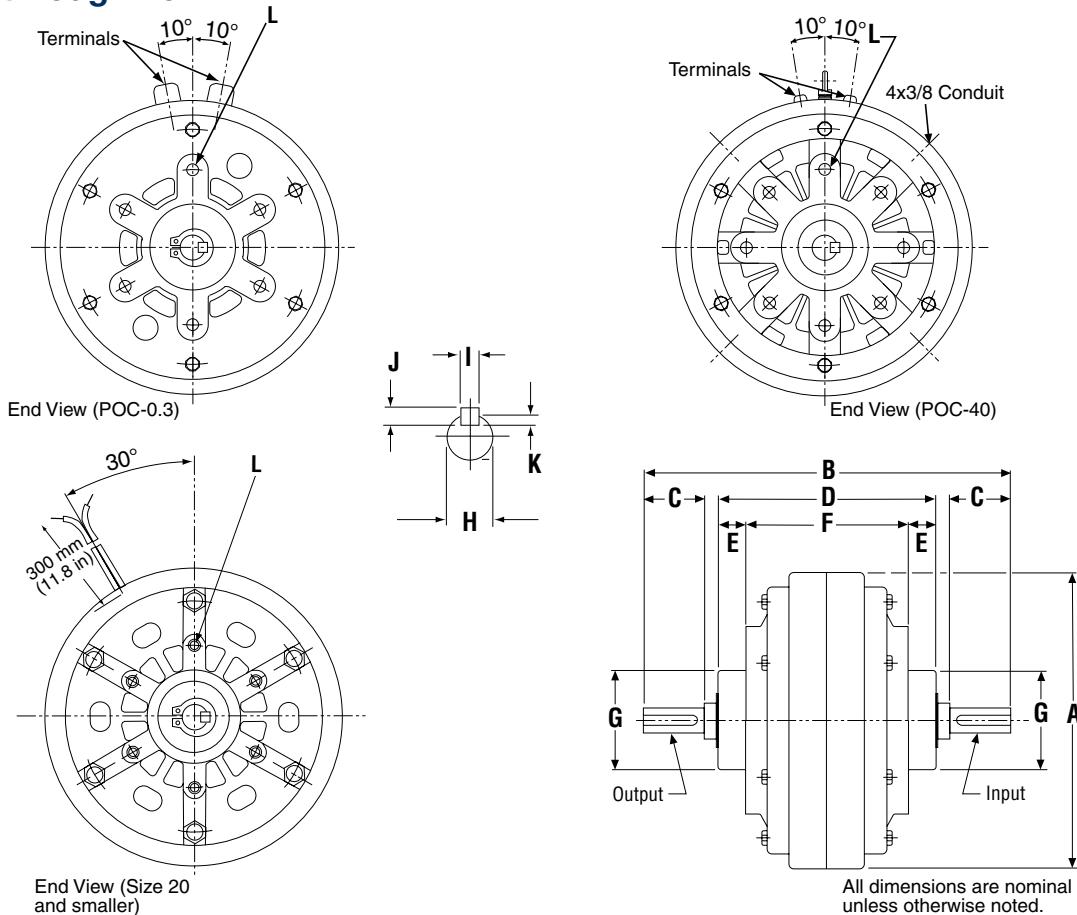
Note: This is a stationary field clutch. The tapped holes "L" in the field are for securing the housing to prevent it from rotating. This can be done with capscrews or with a restraining strap. Do not block ventilation openings when mounting.

Note: All dimensions are nominal unless otherwise noted.

This model is preferred in many applications. It is offered with male input and output shafts and all units are pilot mounted, except for the size 80. This largest unit, the size 80, is foot mounted.

POC Series Clutches

Dimensions Sizes 0.3 through 40



inches (mm)

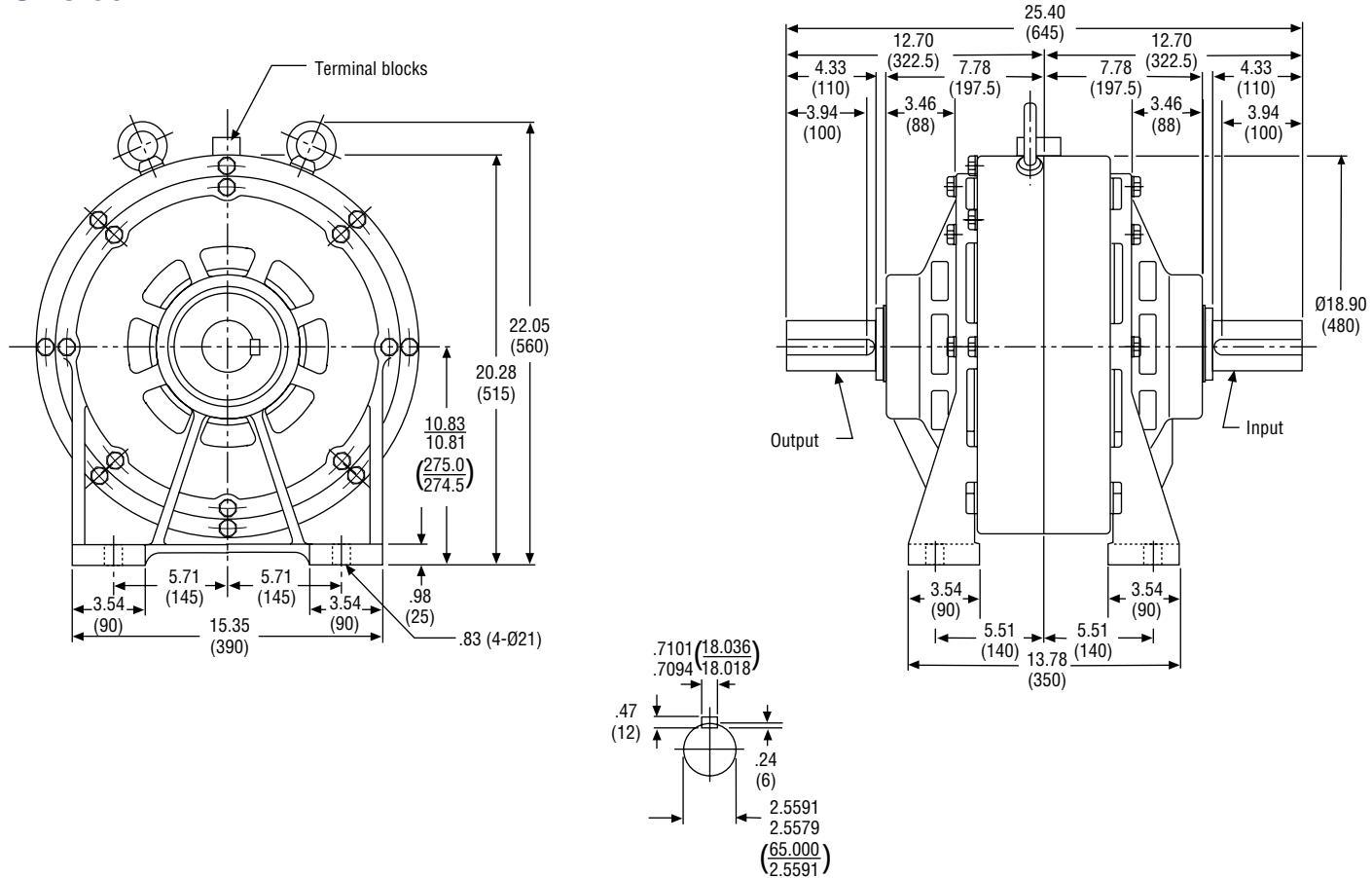
Model	A	B	C	D	E	F	Shaft Dimensions					Thread Size	Depth	No. of Holes	Bolt Circle
							G	H	I	J	K				
POC-0.3	4.72 (120)	5.79 (147)	0.91 (23)	3.43 (87)	0.43 (11)	2.56 (65)	1.6535/1.6526 (42.000/41.975)	0.3937/0.3931 (10.000/9.985)	0.1584/0.1580 (4.024/4.012)	0.16 (4)	0.10 (2.5)	M5	0.39 (10)	6 x 2	2.520 (64)
POC-0.6	5.28 (134)	6.10 (155)	1.02 (26)	3.54 (90)	0.39 (10)	2.76 (70)	1.6535/1.6526 (42.000/41.975)	0.4724/.4717 (12.000/11.9820)	0.1584/0.1580 (4.024/4.012)	0.16 (4)	0.10 (2.5)	M5	0.43 (11)	6 x 2	2.520 (64)
POC-1.2	5.98 (152)	7.40 (188)	1.36 (34.5)	4.17 (106)	0.51 (13)	3.15 (80)	1.6535/1.6526 (42.000/41.975)	0.5906/0.5898 (15.000/14.982)	0.1978/0.1973 (5.024/5.012)	0.20 (5)	0.12 (3)	M6	0.51 (13)	6 x 2	2.520 (64)
POC-2.5	7.17 (182)	8.96 (227.5)	1.69 (43)	4.86 (123.5)	0.59 (15)	3.68 (93.5)	2.1654/2.1642 (55.000/54.970)	0.7874/0.7866 (20.000/19.979)	0.1978/0.1973 (5.024/5.012)	0.20 (5)	0.12 (3)	M6	0.51 (13)	6 x 2	3.071 (78)
POC-5	8.62 (219)	11.18 (284)	2.24 (57)	5.94 (151)	0.91 (23)	4.13 (105)	2.9134/2.9122 (74.000/73.970)	0.9843/0.9834 (25.000/24.979)	0.2768/0.2762 (7.030/7.015)	0.28 (7)	0.16 (4)	M6	0.51 (13)	6 x 2	3.937 (100)
POC-10	11.42 (290)	13.70 (348)	2.64 (67)	7.56 (192)	0.98 (25)	5.59 (142)	3.9370/3.9356 (100.000/99.965)	1.1811/1.1803 (30.000/29.979)	0.2768/0.2762 (7.030/7.015)	0.28 (7)	0.16 (4)	M10	0.71 (18)	6 x 2	5.512 (140)
POC-20	13.19 (335)	15.04 (382)	2.80 (71)	8.50 (216)	0.98 (25)	6.54 (166)	4.3307/4.3293 (110.000/109.965)	1.3780/1.3770 (35.000/34.975)	0.3949/0.3943 (10.030/10.015)	0.31 (8)	0.18 (4.5)	M10	0.71 (18)	6 x 2	5.906 (150)
POC-40	15.55 (395)	19.29 (490)	3.62 (92)	10.94 (278)	1.30 (33)	8.35 (212)	5.1181/5.1165 (130.000/129.960)	1.7717/1.7707 (45.000/44.975)	0.4739/0.4731 (12.036/12.018)	0.31 (8)	0.18 (4.5)	M12	0.79 (20)	8 x 2	7.874 (200)

* Air inlet for optional forced air cooling. Consult factory.

Note: All dimensions are nominal unless otherwise noted.

POC Series Clutches

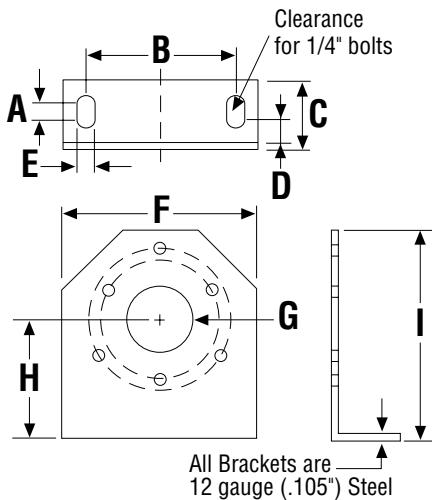
Dimensions Size 80



Specifications

Size	Part Number	Torque (lb. ft.)	Drag Torque (lb. ft.)	Maximum Speed (rpm)	Inertia Input (lb. ft. ²)	Output (lb. ft. ²)	Max. Heat Diss. Watts @ Max. RPM	Weight (lbs.)
0.3	5401-270-211	2.1	.065	1,800	.0128	.00477	105	5.5
0.6	5401-270-221	4.3	.13	1,800	.0173	.00570	80	7.9
1.2	5401-270-231	8.6	.26	1,800	.0304	.0104	145	12
2.5	5401-270-241	18	.54	1,800	.0973	.0387	195	22
5	5401-270-251	36	1.1	1,800	.249	.114	290	38
10	5401-270-261	72	2.2	1,800	1.04	.437	460	77
20	5401-270-271	144	4.3	1,800	2.23	1.19	790	128
40	5401-270-281	289	8.7	1,800	5.93	3.08	1,990	220
80	5401-270-291	578	17	1,500	23.5	15.2	3,900	551

Optional Mounting Bracket (for mounting MPB Brakes and MPC Clutches)



inches (mm)

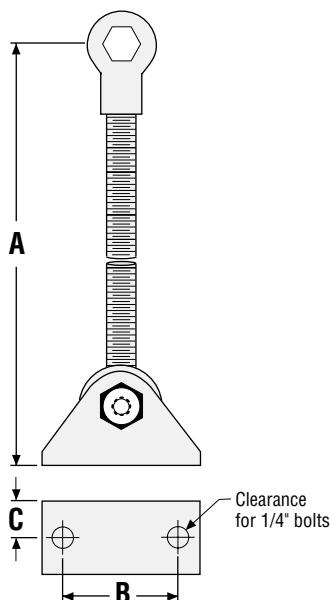
Model	Fits Size (See Note)	A	B	C	D	E	F	G	H	I
MPB-2B	MB2/MC2	0.270 (6.9)	1.750 (44.5)	1.155 (29.3)	0.390 (9.9)	0.280 (7.1)	2.500 (63.5)	0.750 (19.1)	1.500 (38.1)	3.000 (76.2)
MPB-15B	MB3/MC3, MB4/MC4	0.270 (6.9)	2.500 (63.5)	1.155 (29.3)	0.390 (9.9)	0.280 (7.1)	3.500 (88.9)	1.125 (28.6)	2.000 (50.8)	4.000 (101.6)
MPB-70B	MB5/MC5	0.270 (6.9)	4.875 (123.8)	1.155 (29.3)	0.390 (9.9)	0.280 (7.1)	6.000 (152.4)	1.625 (41.3)	3.500 (88.9)	6.000 (152.4)
MPB-120B	MB5.5/MC5.5	0.270 (6.9)	4.875 (123.8)	1.155 (29.3)	0.390 (9.9)	0.280 (7.1)	6.000 (152.4)	1.625 (41.3)	3.500 (88.9)	6.250 (158.8)
MPB-240B	MB6/MC6	0.270 (6.9)	4.875 (123.8)	1.155 (29.3)	0.390 (9.9)	0.280 (7.1)	6.500 (165.1)	2.441 (62.0)	4.000 (101.6)	7.500 (190.5)

Note: All dimensions are nominal unless otherwise noted.

All MPC Series clutches require 2 mounting brackets.

MPB Series brakes require 1 mounting bracket.

Optional Torque Arm (for shaft mounting PRB-H and PRB-HF Brakes)



inches (mm)

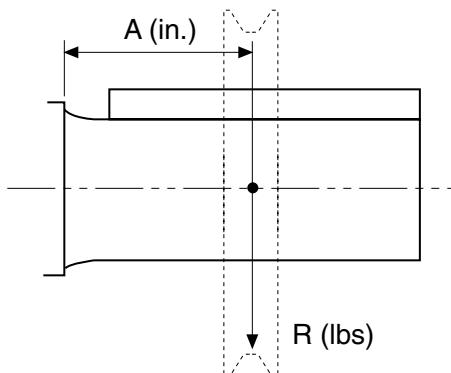
Model	Part Number	A inches (mm)	B inches (mm)	C inches (mm)
PRB-1.2H	5401-101-001	9.03 (229.4)	1.50 (38.1)	0.31 (7.9)
PRB-2.5H	5401-101-001	9.03 (229.4)	1.50 (38.1)	0.31 (7.9)
PRB-5H	5401-101-002	11.19 (284.2)	1.50 (38.1)	0.38 (9.5)
PRB-10H	5401-101-002	11.19 (284.2)	1.50 (38.1)	0.38 (9.5)
PRB-20H	5401-101-003	19.31 (490.5)	2.38 (60.3)	0.38 (9.5)

Note: All dimensions are nominal unless otherwise noted.

Magnetic Particle Brakes and Clutches

Overhung Load

When an overhung load (side load) is applied to the shaft, verify that this load does not exceed the maximum allowable. Operating speed and where the load is applied to the shaft (see Dimension A, below) must be known. For speed, determine the speed coefficient from the coefficient table. Also, determine the allowable overhung load from the chart based on Dimension A. Multiply the load from the chart times the speed coefficient to determine the allowable load for the application.



Overhung Load

Note: Shaft extensions are not recommended.

Pulley or Sprocket Load

For most applications, the overhung load is caused by pulleys or sprockets. The smaller the pitch diameter (PD) of the pulley or sprocket, the higher the belt or chain tension, and, therefore, the greater the overhung load. To determine the minimum pulley diameter for the application, use the following equation:

$$\text{Minimum PD (in.)} = \frac{24 \text{ TK}}{\text{CR}}$$

T = Torque (lb.ft.) This is the torque actually being transmitted, not necessarily the maximum torque capacity of the brake.

K = Safety factor for the tension in type of drive. Use 1.2 to 1.5 for sprockets, 2 to 4 for belts.

C = Speed coefficient from table.

R = Radial load allowable at 1,000 RPM.
(The allowable radial loads for various locations on the shaft are given in the Allowable Load chart.)

Example: Determine the minimum sprocket diameter that can be used on a PRS-5S. Dimension A is 1.1 inches, the torque requirement is 20 lb.ft. and the speed is 600 RPM.

$$\begin{aligned} \text{Minimum PD (in.)} &= \frac{24 \times 20 \times 1.5}{1.2 \times 214} \\ &= 2.8 \text{ inch minimum PD} \end{aligned}$$

Magnetic Particle Brakes and Clutches

Allowable Overhung Load

Type	A (in.)	R (lbs.)	A (in.)	R (lbs.)	A (in.)	R (lbs.)
MPB2/MPC2	.40	5	.50	4	.80	2.5
MPB15/MPC15	.40	25	.50	20	1	10
MPB25/MPC25	.40	25	.50	20	1	10
MPB70/MPC70	.40	37.5	.50	30	1.25	12
MPB120/MPC120	.50	30	1	15	1.5	10
MPB240	.50	50	1	25	1.5	16
POC/POB-0.3	.40	30	.50	28	.90	22
POC/POB-0.6	.40	45	.50	42	1.0	29
POC/POB-1.2	.40	52	.70	43	1.4	31
POC/POB-2.5	.40	88	.90	67	1.7	48
PTB-2.5BL3	.40	125	.90	104	1.7	82
POC/POB-5	.40	204	1.1	136	2.2	93
PTB-5BL3	.40	204	1.1	136	2.2	93
POC/POB-10	.40	313	1.3	235	2.6	159
PTB-10BL3	.40	433	1.3	368	2.6	282
POC/POB-20	.40	379	1.4	265	2.8	198
PTB-20BL3	.40	379	1.4	265	2.8	198
POC/POB-40	.40	581	1.8	432	3.6	324
POC/POB-80	.40	860	2.2	648	4.3	498

Note: This table is based on 1,000 rpm and a bearing life of 6,000 hours. Also, this table assumes that no thrust load is applied.

Speed Coefficient

Speed (rpm)	Speed Coefficient	Speed (rpm)	Speed Coefficient
50	2.74	1,000	1.00
100	2.18	1,200	0.95
200	1.72	1,400	0.89
400	1.37	1,600	0.86
600	1.20	1,800	0.82
800	1.09	2,000	0.80