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Product Line Summary

Built to Put You in Control

Since the 1920's, Stearns™ has been a manufacturing leader of quality, industrial DC clutches and brakes. Stearns offers a complete line of electromagnetic clutches and brakes, including the compact CCC Clutch – Clutch Coupling, ideal for a wide range of coupling applications; the CRP Clutch – Roto Sheave, a one-piece, pre-aligned clutch with an integral sheave; the CRS Clutch – Roto Sprocket, for parallel shaft-drive applications with optional sprocket; and the CTS Clutch –Thru-Shaft. These products come with quality ball bearing systems and non-asbestos friction linings as standard equipment. Most can be supplied with a built-in Tor-ac quick-response rectifier for easy AC power connections.

Heavy-Duty Clutches & Brakes

The first units manufactured by Stearns were heavy-duty clutches for paper and steel mills, and we're still custom designing quality, heavy-duty clutches and brakes for our customers.

These products come in torque ranges from 140 lb-ft through 19,200 lb-ft, and are available as electrically engaged or spring engaged. They provide clutching and braking functions in drive-shaft or motor-shaft applications.

Stearns engineers will work with you to manufacture a heavy-duty brake or clutch to your dimensions. In addition to the size, load and application, our engineers consider torque value, rotation speed, ambient temperature and other requirements when designing these products.

Clutches

CTS Clutch – Thru Shaft

Thru-shaft mounted unit with bearing supported stationary field. Provides clutching function for two parallel shafts when sheave or sprocket is installed.

- 60-275 lb-in static torque

CRP Clutch – Roto Sheave

One-piece shaft mounted unit with bearing supported integral sheave and bearing supported stationary field. Provides clutching function for two parallel shafts with V-belt connection.

- 100-1,740 lb-in static torque

CRS Clutch – Roto Sprocket

One-piece shaft mounted unit with bearing supported integral sprocket adapter and bearing supported stationary field. Provides clutching function for two parallel shafts with chain connection. Sprocket, separate optional item.

- 100-1,740 lb-in static torque

Style E, Electrically Set Clutch

Shaft mounted. Available as a clutch-coupling or CLUTCH. Primary field-coil design. Engaged when voltage is applied.

- 140-4,500 lb-ft static torque

Product Line Summary Continued

Clutch-Couplings

Style E, Electrically Set Clutch

Shaft mounted. Available as a CLUTCH-COUPLING or clutch. Primary field-coil design. Engaged when voltage is applied.

- 140-4,500 lb-ft static torque

Style E, Class S Electrically Set Clutch

Shaft mounted clutch-coupling with lift out feature. Primary field-coil design. Engaged when voltage is applied.

- 400-4,500 lb-ft static torque

Style E, Class M Electrically Set Clutch

Shaft mounted Form 6 standard clutch-coupling with lift out capability. Primary field-coil design. Engaged when voltage is applied.

- 6,400-19,200 lb-ft static torque

Style SCE, Class S3 Spring-Set Clutch

Shaft mounted clutch-coupling with lift out feature. Primary field-coil design. Released when voltage is applied.

- 3,500-12,000 lb-ft static torque

Clutch-Couplings

CCC Clutch - Clutch Coupling

Shaft mounted unit with bearing supported stationary field. Provides clutching action for two in-line shafts.

- 60-1,740 lb-in static torque

Brakes

Style SCEB, Class S3

Style SCEB, Class S3 spring-set brake is end shaft mounted with base. Released when voltage is applied.

- 450-900 lb-ft static torque

Rectifier Controls

Module PR-01

Controls one clutch and brake, or two clutches or two brakes. Internally fused for overload protection.

Input	Output	Rating
115 Vac, 50/60 Hz	100 Vdc	1.0 amp

Module PR-33

Controls one clutch and brake, or two clutches or two brakes. Internally fused for overload protection.

Input	Output	Rating
115 Vac, 50/60 Hz	15-100 Vdc one circuit, 100 Vdc for other	.5 amps

Selection

The first step in selecting a clutch or brake is to identify the function to be accomplished, as each product type is better suited for different applications:

Function	Type
When power is to be transmitted between two in-line shafts	Clutch-Coupling
When power is to be transmitted to a parallel shaft	Clutch
When stopping or positioning a load	Brake
When starting and stopping a load	Clutch-Brake

After identifying the unit type, the next step is to determine the unit's size. The selection chart shows available sizes based on the horsepower and speed of the system. Note that the speed you should use is the *shaft speed at the clutch or brake,* not necessarily the speed of the motor.

For example:

Application: Driving to a parallel shaft
Motor horsepower: 1 HP
Motor speed: 1750 RPM
Clutch shaft speed: 1750 RPM

From the selection chart it can be seen that a size 5 clutch would be required. Depending on customer requirements a Thru Shaft, Roto Sheave or Roto Sprocket Clutch might be selected. However, if the shaft speed at the clutch is at a 2:1 reduction, its speed would only be 875 RPM. At that speed a size 5.5 clutch would be required.

The relationship between system prime mover horsepower and speed expressed in revolutions per minute (RPM) shown in the chart can be calculated in the following two equations for determining the dynamic torque capability required of a clutch and/or a brake.

Equation 1: $T_d = \frac{63{,}025 \times P}{N} \times SF$

Where:

T_d = Average dynamic torque, lb-in
P = Horsepower, HP
N = Shaft speed differential at clutch and/or brake components, RPM
SF = Service factor
63,025 = Constant

Equation 2: $T_d = \frac{5252 \times P}{N} \times SF$

Where:

T_d = Average dynamic torque, lb-ft
P = Horsepower, HP
N = Shaft speed differential at clutch and/or brake components, RPM
SF = Service factor
5252 = Constant

For example:

$$\frac{(3 \text{ HP} \times 5252)}{1750 \text{ rpm}} \times 2.75 = 24 \text{ lb-ft}$$

Electrically Set Clutch Size Selection Chart
Series CTS, CRP, CRS & CCC

CAUTION: RPM refers to shaft speed at clutch or brake. Based on 2.75 service factor.

HP \ RPM 100	2	4	6	8	10	12	15	18	20	24	30	36	40	46	50
1/20															
1/12															
1/8															
1/6							3								
1/4															
1/3							3.5								
1/2															
3/4							5								
1															
1 1/2															
2							5.5								
3															
5							8								
7 1/2															

Note: Do not use this chart for AAB selection.

Selection Continued

If there is a choice of locations for the unit being selected, choose the location with the highest shaft speed differential to minimize unit size.

The service factor from the above equations is to allow for the maximum peak torque capability of the prime mover. Generally, this factor is derived as a percentage of the full load running torque of the prime mover and expressed as given in the following table:

Application	SF
Brake only	1-2
Electric motor drive through a clutch	2-4
Gasoline or diesel engine drive through a clutch	5-10

The dynamic torque calculated from the above equation(s) can be compared to the ratings given for the various sizes in this catalog for the unit size selection, in the performance data tables.

Thermal Capacity

An additional factor in clutch and/or brake selection and usage is the heat dissipation capability of the unit. When a clutch or brake is engaged to accomplish a speed change, there is some slippage between the friction surfaces resulting in heat energy being generated due to friction. The amount of heat energy generated is a function of the size of the load (inertia) and the frequency at which it is started and/or stopped and RPM. In order to insure that the thermal capacity of the clutch and/or brake is not exceeded, the following calculations should be made:

$$E = 1.7 \times WR^2 \times \left(\frac{N}{100} \right)^2 \times F$$

Where:

E = Energy (heat) which needs to be dissipated in foot pounds per minute (ft-lb/min) for the application requirement (thermal capacity requirement).

WR^2 = Total reflected inertia at clutch-brake shaft location. This should include clutch-brake inertia ($lb\text{-}ft^2$).

N = Speed differential in revolutions per minute (RPM) at the clutch-brake shaft.

F = Number of cycles per minute (cycle rate).

The thermal capacity requirements calculated in this manner should then be compared to the thermal capacity ratings as listed in the performance data tables for the size and type of unit being selected. The requirement should never exceed the rating or overheating and possible premature failure may occur.

Note that sufficient air flow should be allowed around the clutch and/or brake to provide cooling. Should additional enclosures or machine housings be required, permit a cooling air flow to move past the unit, sufficient to avoid clutch and/or brake overheating.

Application Considerations

Lubricants: Dry friction clutches and brakes should not be used where the friction surfaces will be subjected to oil, cutting fluid or other lubricants and contaminates as these will reduce the torque output.

Low speed: Application of clutches and brakes at speeds of 300 RPM or less may not permit sufficient burnishing or run-in to occur, the result being reduced and erratic torque output. For these applications it is suggested that a unit be used which has a static torque rating of at least two times the calculated torque requirement.

High speed: Application of clutches and brakes at speeds higher than recommended could reduce bearing life and cause fatigue failures and galling.

High cycle rates: Applications where high cycle rates are required could result in heat generated which is in excess of the unit's capability to dissipate. The thermal capacity requirement equation should be used to size the clutch and/or brake for this type of application. High cycle rates may also require special high speed controls.

Vertical applications: (CCC, CRP, CRS and CTS only) With the armature situated above the friction surface, spring release is necessary to avoid excessive heat, drag and noise.

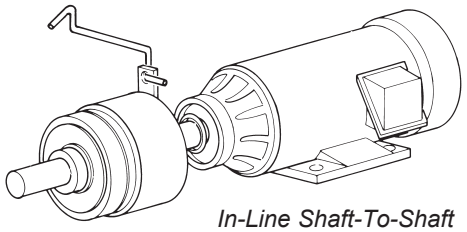
With the armature situated below the friction surface, spring release is not desirable. Gravity should be sufficient to move the armature away, thereby providing the open running air gap.

For situations with additional considerations, you should contact the factory; our application engineers will be more than happy to assist you with your application questions.

Power-On Shaft-Mounted Clutches

CCC Clutch – Clutch Coupling

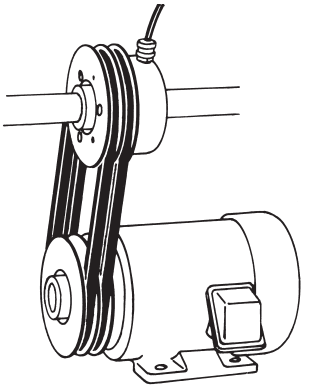
This compact clutch coupling offers a high torque-to-size ratio meeting a broad range of applications. Available in five sizes. This unit can be used in almost any coupling application where on-off control of rotary motion is required. Available for 90-100, 24-28, or 12 Vdc operation.



In-Line Shaft-To-Shaft Coupling (Restraint Device Shown on Clutch Tab)

CRP Clutch – Roto Sheave

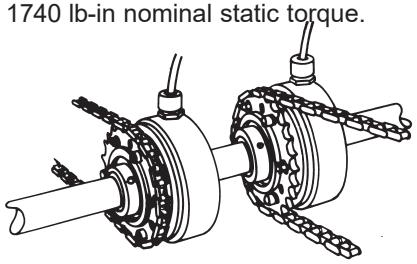
The performance, quality and life of this clutch has been proven in thousands of applications. This one-piece, pre-aligned unit features an integral sheave for quick, convenient installation and maintenance. Available in four sizes from 100 lb-in to 1740 lb-in with a variety of standard sheaves. An ideal solution for almost any parallel shaft drive application. Available for 90-100, 24-28, or 12 Vdc operation.



Shaft Mounting of Roto Sheave Clutch (CRP)

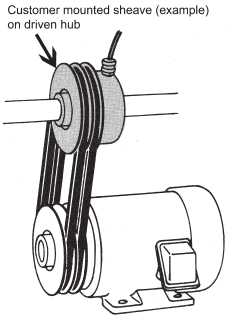
CRS Clutch – Roto Sprocket

An ideal solution for almost any parallel shaft drive application, this unit has been proven in thousands of applications. This one-piece, pre-aligned unit has a special adapter hub that accepts a plate-type sprocket. Installation and maintenance are quick and convenient. Available in four sizes, from 100 lb-in through 1740 lb-in nominal static torque.



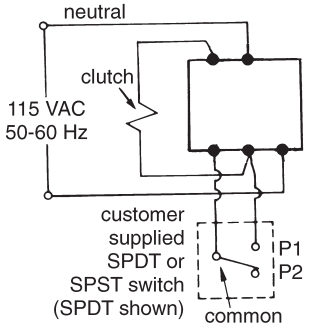
CTS Clutch – Thru Shaft

This compact clutch offers a high torque-to-size ratio in an economical unit that meets a broad range of applications. Available in three sizes. Extended thru-shaft driven hub is adaptable for mounting pulleys, gears, or sprockets. This unit can be used in almost any parallel shaft application where on-off control of rotary motion is required. Available for 90-100, 24-28, or 12 Vdc operation.

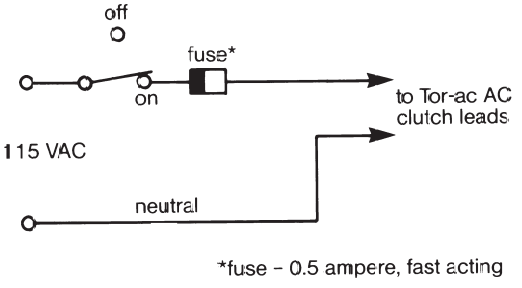


Stearns™ shaft-mounted clutches can be ordered as a standard DC unit with the option of a separate rectifier or as a Tor-ac unit which has a built-in rectifier.

Wiring of standard DC unit with optional AC rectifier



Wiring of Tor-ac unit with built-in rectifier



*fuse – 0.5 ampere, fast acting

CCC Clutch – Clutch Coupling

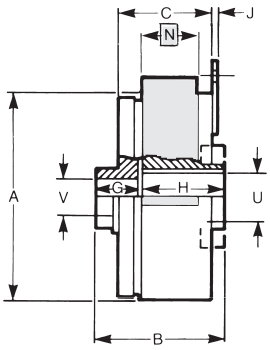
- Ball-bearing mounted stationary field for durable operation
- Spline drive for long service life under heavy loads
- Available with spring release
- Zinc plated magnet body for corrosion resistance
- Epoxy encapsulated coil construction for uniform heat transfer & moisture resistance
- Class H magnet wire & potting material

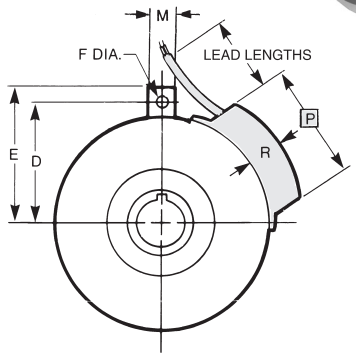
Installation & Service Instructions: P/N 8-078-800-00

Standard DC Clutch

Dimensions are for estimating only and subject to change without notice. For installation purposes, request certified prints.

IMPORTANT NOTE: *Information and dimensioning relating to Tor-ac units shown in shaded area.*





Tor-ac Clutch with Built-in Rectifier

Dimensional Data (in Inches)

Size	A	B	C	D	E	F	G	H	J	M	N	P	R	U Bore (Drive Hub)	V Bore (Driven Hub)
3	2.67	2.04	1.40	1.56	1.75	.13	.63	1.35	.06	.50	---	---	---	1/4, 5/16, 3/8	1/4, 5/16, 3/8
3.5	3.19	2.14	1.49	1.81	2.00	.19	.63	1.44	.06	.66	1.00	2.74	.80	3/8, 1/2, 5/8	3/8, 1/2, 5/8, 3/4
5	4.31	2.66	1.78	2.50	2.84	.19	.81	1.71	.09	.50	1.00	2.81	.69	1/2, 5/8, 3/4, 7/8, 1	1/2, 5/8, 3/4, 7/8, 1
5.5	5.63	3.45	2.20	3.25	3.50	.25	1.16	2.17	.09	.75	1.00	2.93	.81	3/4, 7/8, 1, 1 1/8, 1 1/4	3/4, 7/8, 1, 1 1/8, 1 1/4
8	8.38	3.39	2.38	4.63	5.00	.34	1.50	1.50	.13	1.00	---	---	---	5/8, 7/8, 1, 1 1/4, 1 1/2, 1 5/8**	5/8, 7/8, 1, 1 1/4, 1 1/2, 1 5/8**

Lead Lengths: All Tor-ac units have 32" leads. Standard DC unit sizes 3 through 5 have 18" leads. Sizes 5.5 and 8 have 24" leads*.
*Sizes 5.5 and 8 have cable grip fitting and 2 conductor cable. **Size 8 has taper lock bushings.

Performance Data

Catalog Number	Size	Type	Part Number	Nominal Static Torque (lb-in)	Nominal Dynamic Torque at 1800 RPM (lb-in)	Max. RPM	Inertia		Thermal Capacity (ft-lb/min)①	Approx. Weight (lbs)	Max Power (watts)
							Driven Side (lb-ft²)	Drive Side (lb-ft²)			
CCC-30	3	standard	2-11-2502-00	60	40	7000	24×10^{-4}	1.67×10^{-3}	1650	2.5	9
CCC-30S		spring rel.	2-11-2502-01								
CCC-35	3.5	standard	2-11-3141-00	100	65	5000	47×10^{-4}	2.96×10^{-3}	2750	3.5	11
CCC-35S		spring rel.	2-11-3141-01								
CCC-35T	3.5	standard	2-11-3170-00	100	65	5000	47×10^{-4}	2.96×10^{-3}	2750	3.5	11
CCC-35ST		spring rel.	2-11-3170-01								
CCC-50	5	standard	2-11-4266-00	275	160	5000	57×10^{-4}	1.47×10^{-2}	4400	5.4	14
CCC-50S		spring rel.	2-11-4266-01								
CCC-50T	5	standard	2-11-4270-00	275	160	5000	57×10^{-4}	1.47×10^{-2}	4400	5.4	14
CCC-50ST		spring rel.	2-11-4270-01								
CCC-55	5.5	standard	2-11-5501-01	720	400	3600	57×10^{-3}	6.09×10^{-2}	8250	12	26
CCC-55S		spring rel.	2-11-5501-04								
CCC-55T	5.5	standard	2-11-5570-00	720	400	3600	57×10^{-3}	6.09×10^{-2}	8250	12	26
CCC-55ST		spring rel.	2-11-5570-01								
CCC-80	8	standard	2-11-8333-01	1740	1160	3600	59×10^{-2}	46.2×10^{-2}	16500	32	35
CCC-80S		spring rel.	2-11-8301-01								

①Thermal capacity rating is based on ambient temperature of 70°F at 1750 RPM.

Ordering Information

Example of a complete part number:

2-11-2502-00-H J N — 3/4 bore 3/16 x 3/32 keyway
— 90-100 Vdc
— 3/8 bore 3/32 x 3/64 keyway

Bore & Keyway Table*

Character	Sizes 3, 3.5 , 5, 5.5														Size 8 (bushings)						
	D	F	H	I	J	K	L	N	O	Q	R	T	U	V	B	D	E	F	H	K	L
Bore/ Shaft Dia. (in.)	1/4	5/16	3/8	1/2	1/2	5/8	5/8	3/4	7/8	1	1 1/8	1 1/4	1 3/8	1 1/2	5/8	7/8	1	1 1/8	1 1/4	1 1/2	1 5/8
Keyway (inches)	1/16 x 1/32	1/16 x 1/32	3/32 x 3/64	none	1/8 x 1/16	none	3/16 x 3/32	3/16 x 3/32	3/16 x 3/32	1/4 x 1/8	1/4 x 1/8	1/4 x 1/8	5/16 x 5/32	3/8 x 3/16	3/16 x 3/32	3/16 x 3/32	1/4 x 1/8	1/4 x 1/8	1/4 x 1/8	3/8 x 3/16	3/8 x 3/16

*Special or metric bores available, consult factory.

Voltage Table

Character	Voltage
C E J	12 Vdc 24-28 Vdc 90-100 Vdc
N*	115 **Vac***

*Includes rectifier.
Not available on sizes 3 and 8.

CRP Clutch – Roto Sheave

- Pre-aligned, one-piece package can be mounted to line shaft, motor shaft or stub shaft in any position without special modifications
- Spring release for positive disengagement
- Precision sealed ball bearings for durable operation
- Zinc plated magnet body for corrosion resistance
- Epoxy encapsulated coil construction for uniform heat transfer & moisture resistance
- Class H magnet wire & potting material

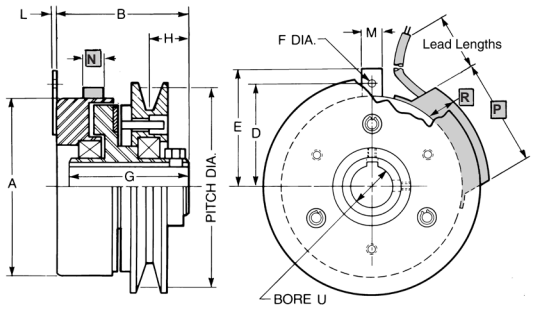
Installation & Service Instructions: P/N 8-078-800-02

Parts Lists: P/N 8-078-802-01 (Size 3.5); 8-078-802-02 (Size 5); 8-078-802-03 (Size 5.5); 8-078-802-04 (Size 8)

Standard DC Clutch

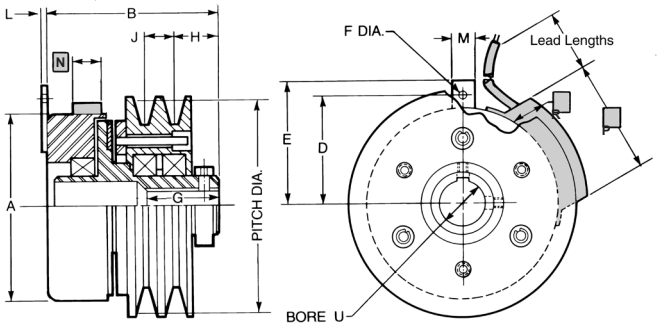
Tor-ac Clutch with Built-In Rectifier

Size 3.5 & 5



Dimensions are for estimating only and subject to change without notice. For installation purposes, request certified prints.

Size 5.5 & 8



Lead Lengths: All Tor-ac units have 32" leads.
Standard DC unit has 24" leads.

Dimensional Data (in Inches)

Size	A	B	D	E	F	G	H	J	L	M	N	P	R	U Bore (Drive Hub)
3.5	3.19	2.75	1.81	2.00	.19	2.50	.86	---	.06	.66	1.00	2.74	.80	3/8, 1/2, 5/8
5	4.31	3.10	2.50	2.84	.19	1.35	.89	---	.09	.50	1.00	2.81	.69	1/2, 5/8, 3/4, 7/8, 1
5.5	5.63	4.38	3.25	3.50	.25	2.49	.94	.75	.09	.75	1.00	2.93	.81	3/4, 7/8, 1, 1 1/8, 1 1/4
8	8.38	4.81	4.63	5.00	.34	4.56	1.00	.75	.13	1.00	---	---	---	1 1/8, 1 1/4, 1 3/8, 1 1/2, 1 5/8, 1 3/4

IMPORTANT NOTE: *Information and dimensioning relating to Tor-ac units shown in shaded area.*

Performance Data

Catalog Number	Size	Part Number	Nominal Static Torque (lb-in)	Nominal Dynamic Torque at 1800 RPM (lb-in)	Max. RPM	Drive Hub Inertia (lb-ft²)	Thermal Capacity (ft-lb/min)①	Approx. Weight (lbs)	Maximum Electrical Power (watts)
CRP-35P	3.5	2-11-3161-00	100	65	5000	.00317	2750	4	11
CRP-35PT	3.5	2-11-3181-00	100	65	5000	.00317	2750	4	11
CRP-50P	5	2-11-4268-00	275	160	5000	.0164	4400	6	15
CRP-50PT	5	2-11-4281-00	275	160	5000	.0164	4400	6	15
CRP-55P	5.5	2-11-5522-02	720	400	3600	.0689	8250	12 3/4	26
CRP-55PT	5.5	2-11-5581-00	720	400	3600	.0689	8250	12 3/4	26
CRP-80P	8	2-11-8321-01	1740	1160	1800	.6640	16500	34	35

①Thermal capacity rating is based on ambient temperature of 70°F at 1750 RPM.

Ordering Information

Example of a complete part number:

2-11-3161-00-J J A — 3.6A-4.0B section sheave
90-100 Vdc
1/2 bore 1/8 x 1/16 keyway

Voltage Table

Character	Voltage
C E J	12 Vdc 24-28 Vdc 90-100 Vdc
N*	115 **Vac***

*Includes rectifier. Not available on size 8.

Bore & Keyway Table*

Character	H	J	L	N	O	Q	R	T	U	V	X	Y
Bore/Shaft Dia. (in.)	3/8	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 3/8	1 1/2	1 5/8	1 3/4
Keyway (inches)	3/32 x 3/64	1/8 x 1/16	3/16 x 3/32	3/16 x 3/32	3/16 x 3/32	1/4 x 1/8	1/4 x 1/8	1/4 x 1/8	5/16 x 5/32	3/8 x 3/16	3/8 x 3/16	3/8 x 3/16

*Special or metric bores available, consult factory.

Sheave Table

Clutch Size		3.5			5			5.5			8			ALL
Character		A	B	C	D	E	F	K	L	M	A	B	C	W
Pitch Dia. (in.)	A	3.6	3.8	4.2	4.4	4.8	5.0	5.2	5.4	5.8	7.0	8.2	9.0	without sheave
	B	4.0	4.2	4.6	4.8	5.2	5.4	5.6	5.8	6.2	7.4	8.6	9.4	
Number of Grooves		1	1	1	1	1	1	2	2	2	2	2	2	

CRS Clutch – Roto Sprocket

- Ball bearing-mounted adapter hub & magnet body for durable operation
- Pre-aligned, one-piece package can be mounted almost anywhere: line shaft, motor shaft or stub shaft
- Mounts in any position without special modifications
- Spring release for positive disengagement
- Non-asbestos friction linings provide smooth, shock-free operation
- Zinc plated magnet body for corrosion resistance
- Epoxy encapsulated coil construction for uniform heat transfer & moisture resistance
- Class H magnet wire & potting material
- Other sprocket configurations available, contact factory

Installation & Service Instructions: P/N 8-078-800-02

Parts Lists: P/N 8-078-802-01 (Size 3.5); 8-078-802-02 (Size 5); 8-078-802-03 (Size 5.5); 8-078-802-04 (Size 8)

Standard DC Clutch

Tor-ac Clutch with Built-in Rectifier

Minimum Usable Plate Sprockets, Type A

Clutch Size	Roller Chain Number										
	35	40	41	50	60	80	100	120	140	180	
3.5	35	27	26	-	-	-	-	-	-	-	No. of teeth
5	35	27	27	22	19	-	-	-	-	-	
5.5	42	32	32	26	22	18	15	-	-	-	
8A Hub	40	28	28	23	20	-	-	-	-	-	
8B* Hub	54	40	40	32	28	21	18	15	14	11	

*Maximum usable plate sprocket for size 8A hub.

***IMPORTANT NOTE:** Information and dimensioning relating to Tor-ac units shown in shaded area.*

Performance Data

Catalog Number	Size	Part Number	Nominal Static Torque (lb-in)	Nominal Dynamic Torque at 1800 RPM (lb-in)	Max. RPM	Drive Hub Inertia ($lb\text{-}ft^2$)	Thermal Capacity (ft-lb/min)①	Approx. Weight (lbs)	Max Electrical Power (watts)	Bore
CRS-35	3.5	2-11-3162-00	100	65	5000	.00317	2750	4	11	3/8, 1/2, 5/8
CRS-35T	3.5	2-11-3180-00	100	65	5000	.00317	2750	4	11	3/8, 1/2, 5/8
CRS-50	5	2-11-4269-00	275	160	5000	.0164	4400	6	15	1/2, 5/8, 3/4, 7/8, 1
CRS-50T	5	2-11-4280-00	275	160	5000	.0164	4400	6	15	1/2, 5/8, 3/4, 7/8, 1
CRS-55	5.5	2-11-5525-00	720	400	3600	.0689	8250	12 3/4	26	3/4, 7/8, 1, 1 1/8, 1 1/4
CRS-55T	5.5	2-11-5580-00	720	400	3600	.0689	8250	12 3/4	26	3/4, 7/8, 1, 1 1/8, 1 1/4
CRS-80A	8A	2-11-8322-00	1740	1160	1800	.6640	16500	34	35	1 1/8, 1 1/4, 1 3/8, 1 1/2, 1 5/8, 1 3/4
CRS-80B	8A	2-11-8323-00	1740	1160	1800	.6640	16500	34	35	1 1/8, 1 1/4, 1 3/8, 1 1/2, 1 5/8, 1 3/4

①Thermal capacity rating is based on ambient temperature of 70°F at 1750 RPM. ②Sprocket available at additional cost. Consult factory.

Ordering Information

Example of a complete part number:

2-11-3162-00-L J
- L — 90-100 Vdc
- J — 5/8 bore 3/16 x 3/32 keyway

Bore & Keyway Table*

Character	Bore/Shaft Dia. (in.)	Keyway (inches)
H	3/8	3/32 x 3/64
J	1/2	1/8 x 1/16
L	5/8	3/16 x 3/32
N	3/4	3/16 x 3/32
O	7/8	3/16 x 3/32
Q	1	1/4 x 1/8
R	1 1/8	1/4 x 1/8
T	1 1/4	1/4 x 1/8
U	1 3/8	5/16 x 5/32
V	1 1/2	3/8 x 3/16
X	1 5/8	3/8 x 3/16
Y	1 3/4	3/8 x 3/16

*Special or metric bores available, consult factory.

Voltage Table

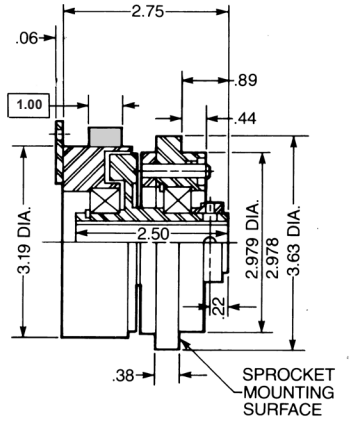
Character	Voltage
C	12 Vdc
E	24-28 Vdc
J	90-100 Vdc
N*	115 **Vac***

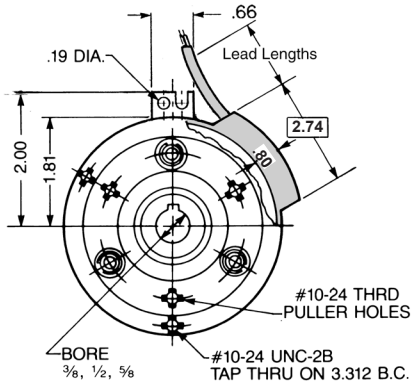
*Includes rectifier. Not available on size 8.

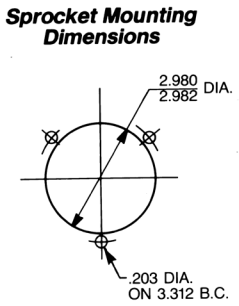
CRS Clutch – Roto Sprocket Continued

Dimensional Data (in Inches)

Size 3.5

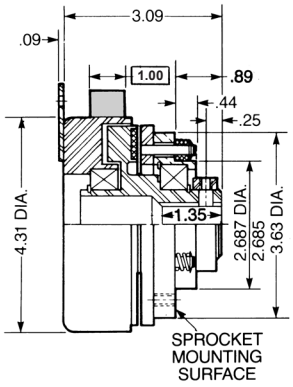


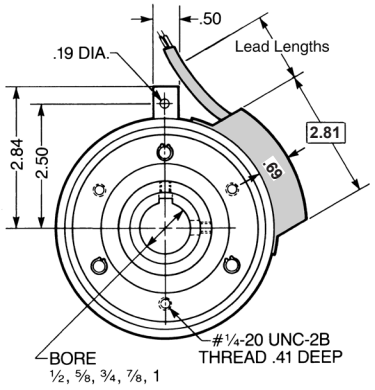


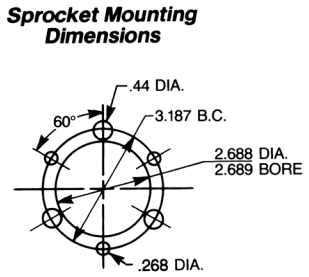


Lead Lengths: All Tor-ac units have 32” leads. Standard DC unit has 18” leads.

Size 5

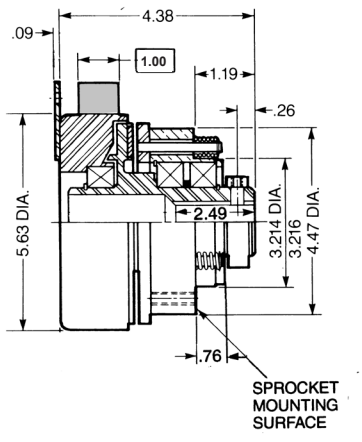


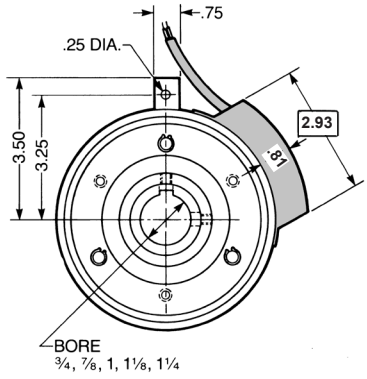


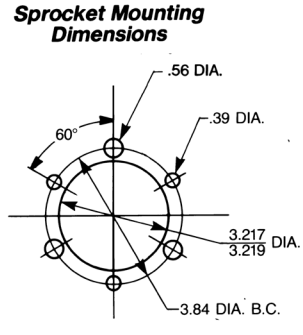


Lead Lengths: All Tor-ac units have 32” leads. Standard DC unit has 18” leads.

Size 5.5







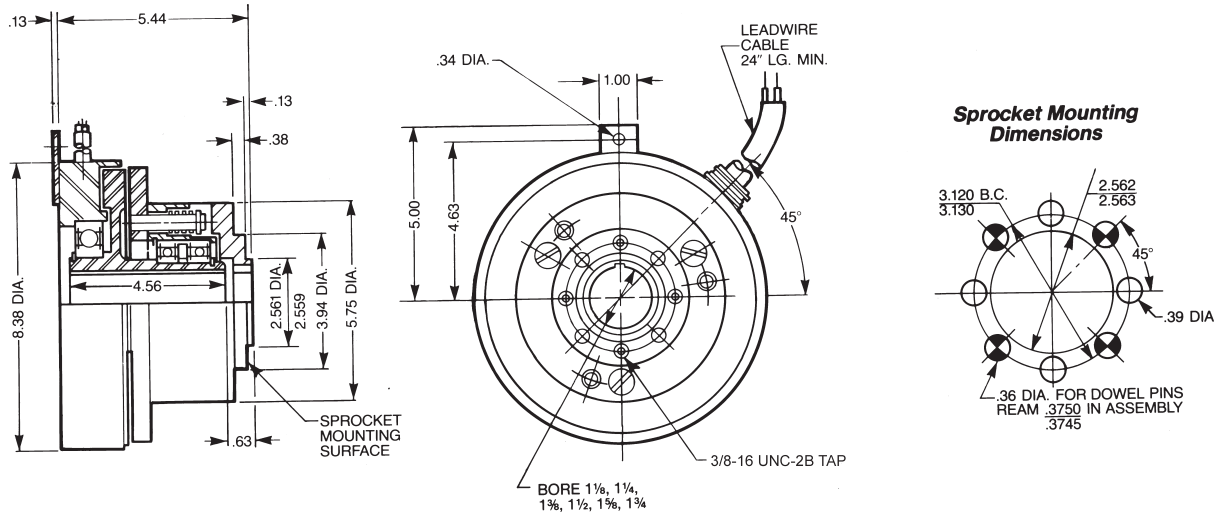
Lead Lengths: All Tor-ac units have 32” leads. Standard DC unit has 24” leads.

Dimensions are for estimating only and subject to change without notice. For installation purposes, request certified prints.

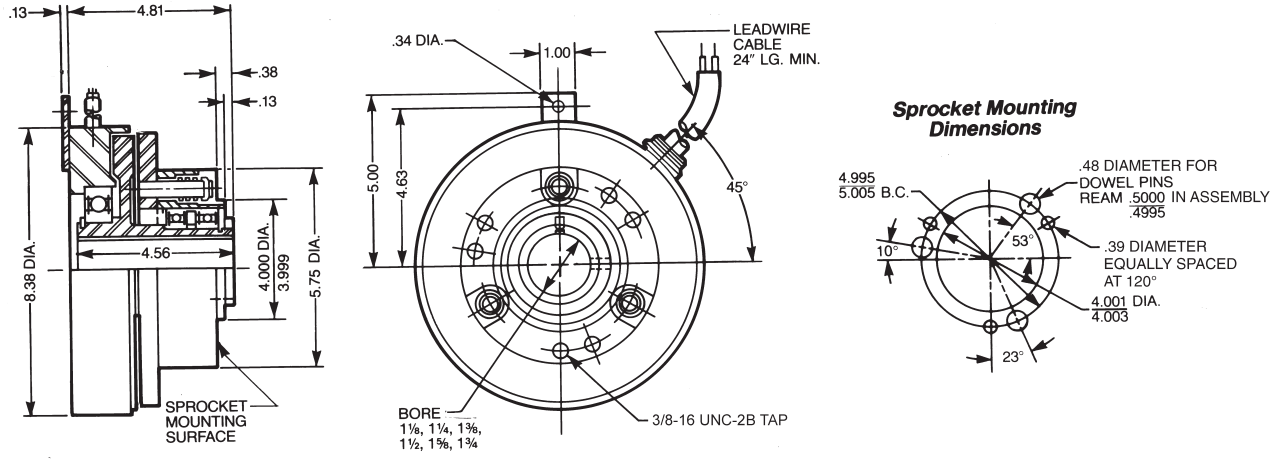
CRS Clutch – Roto Sprocket Continued

Dimensional Data (in Inches)

Size 8A



Size 8B



Dimensions are for estimating only and subject to change without notice. For installation purposes, request certified prints.

CTS Clutch – Thru Shaft

- Ball-bearing mounted stationary field for durable operation
- Sleeve bearing in driven hub supports customer-supplied pulley, gear or sprocket
- Spline drive for long service life under heavy loads
- Available with spring release
- Zinc plated magnet body for corrosion resistance
- Epoxy encapsulated coil construction for uniform heat transfer & moisture resistance
- Class H magnet wire & potting material

Installation & Service Instructions: P/N 8-078-862-00

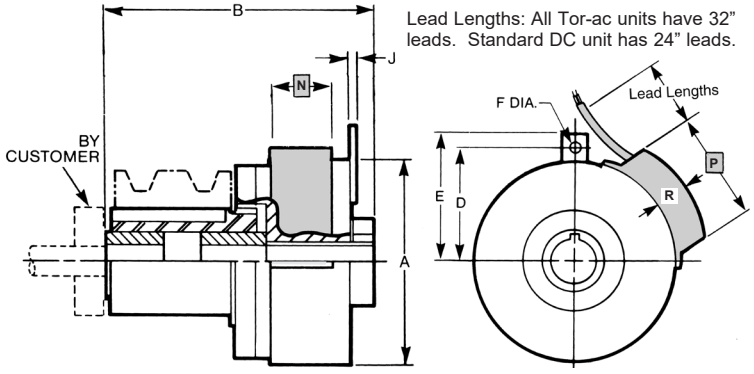
Standard DC Clutch

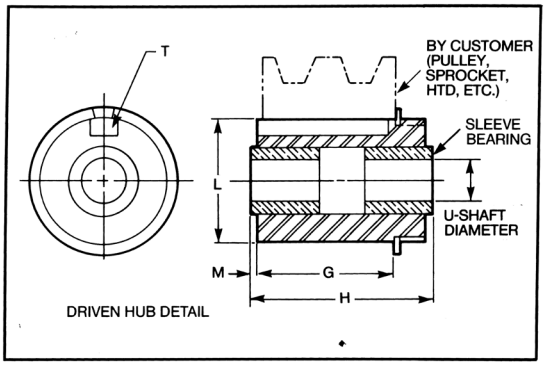
Tor-ac Clutch

Dimensional Data (in Inches)

Size	A	B	D	E	F	G	H	J	L	M	N	P	R	T	U Bore (Drive Hub)
3	2.67	3.32	1.56	1.75	.13	1.44	1.93	.06	1.374 / 1.375	.06	---	---	---	5/16 x 5/32	3/8, 1/2
3.5	3.19	3.39	1.81	2.00	.19	1.50	1.95	.06	1.374 / 1.375	.06	1.00	2.74	.80	5/16 x 5/32	3/8, 1/2, 5/8
5	4.31	3.91	2.50	2.84	.19	1.50	2.14	.09	1.374 / 1.375	.06	1.00	2.81	.69	5/16 x 5/32	1/2, 5/8, 3/4

IMPORTANT NOTE: *Information and dimensioning relating to Tor-ac units shown in shaded area.*





Dimensions are for estimating only and subject to change without notice. For installation purposes, request certified prints.

Performance Data

Catalog Number	Size	Type	Basic Model Number	Nominal Static Torque (lb-in)	Nominal Dynamic Torque at 1800 RPM (lb-in)	Max. RPM②	Inertia		Thermal Capacity (ft-lb/min)①	Approx. Weight (lbs)	Max Power (watts)
							Driven Side ($lb\text{-}ft^2$)	Drive Side ($lb\text{-}ft^2$)			
CTS-30	3	standard	2-11-2502-05	60	40	7000	2.4×10^{-3}	1.67×10^{-3}	1650	2.5	9
CTS-30S		spring rel.	2-11-2502-09								
CTS-35	3.5	standard	2-11-3141-06	100	65	5000	4.7×10^{-3}	2.96×10^{-3}	2750	3.5	11
CTS-35S		spring rel.	2-11-3141-07								
CTS-35T	3.5	standard	2-11-3190-00	100	65	5000	4.7×10^{-3}	2.96×10^{-3}	2750	3.5	11
CTS-35ST		spring rel.	2-11-3190-01								
CTS-50	5	standard	2-11-4267-00	275	160	5000	5.7×10^{-3}	1.47×10^{-2}	4400	5.4	14
CTS-50S		spring rel.	2-11-4267-01								
CTS-50T	5	standard	2-11-4290-00	275	160	5000	5.7×10^{-3}	1.47×10^{-2}	4400	5.4	14
CTS-50ST		spring rel.	2-11-4290-01								

①Thermal capacity rating is based on ambient temperature of 70°F at 1750 RPM.
②RPM value stated is for ball bearing mount magnet body. See ASTM B 438 for further information on copper based sleeve bearings used in the driven hubs.

Ordering Information

Example of a complete part number:
2-11-2502-05-H J G — 3/8 bore (sleeve bearings)
90-100 Vdc
5/8 bore 3/16 x 3/32 keyway

Bore & Keyway Table*

Character	D	F	G	H	I	J	K	L	M	N
Bore/Shaft Dia. (in.)	1/4	5/16	3/8	3/8	1/2	1/2	5/8	5/8	3/4	3/4
Keyway (inches)	1/16 x 1/32	1/16 x 1/32	none	3/32 x 3/64	none	1/8 x 1/16	none	3/16 x 3/32	none	3/16 x 3/32

*Special or metric bores available, consult factory.

Voltage Table

Character	Voltage
C	12 Vdc
E	24-28 Vdc
J	90-100 Vdc
N*	115 **Vac***

*Includes rectifier.
Not available on size 3.

Heavy-Duty Clutches & Brakes

Stearns™ heavy-duty clutches are large, rotating field/magnetic devices with torque ranges from 140 lb-ft through 19,200 lb-ft. These clutches are available as electrically engaged or spring engaged, electrically released models.

Our heavy-duty brakes are foot mounted, stationary field, spring engaged and electrically released devices. These brakes provide a stopping and holding function on a drive or motor shaft.

Typical applications include:

- Steel mills, screw-downs
- Standby engine/motor generator sets
- Kiln drive systems & backup drives
- Rubber mills
- Oil field equipment
- Dock & pier handling equipment
- Emergency drive for fans, blowers & pumps
- Metal forming machinery
- Dynamometers
- Pulp processing equipment
- Large textile machines
- Cranes & hoists, as a coupling between motors

All Stearns heavy-duty clutches and brakes are made-to-order; this catalog is provided to assist with selection and basic fit. Listed dimensions are for estimating only and are subject to change based on application requirements.

An approval drawing process with new applications provides Stearns manufacturing with customer selection and dimensional requirements. For replacement units and repair parts, the serial number from the nameplate is extremely important.

With the part number and serial number, our customer service team can assist you in securing the correct parts or replacement clutch. The serial number on the nameplate is also stamped into the magnet body. It is critical information as our heavy-duty products are made-to-order and can differ from other units of the same style and size.

Selection

We recommend using the following equation:

$$T = \frac{5252 \times P}{N} \times SF$$

Where:

T = Torque, lb-ft

P = Horsepower, HP

N = Shaft Speed Differential at Clutch or Brake, RPM

SF = Service Factor

5252 = Constant

The service factors for the preceding equation can be selected from the following table:

Application	SF
Brake (Non-Overhauling Load)	1.5
NEMA Design A, B & C AC Motors	2.8
NEMA Design D AC Motors	3.5
Shunt Wound DC Motors	4.5
Compound Wound DC Motors	5.0
Series Wound DC Motors	8.0
Internal Combustion Engines	5.0

The torque value calculated from the above equation can be compared to the ratings given for individual products, as shown in the performance data tables.

Application Considerations

Lubricants: Dry friction clutches and brakes should not be used where the friction surfaces will be subjected to oil, cutting fluid or other lubricants and contaminates as these will reduce the torque output.

High Speed: Recommended balance rpm and maximum rpm are listed by size for each product.

High Temperature Environments: Environments where the ambient temperature exceeds 40°C (104°F) could cause early coil failure. Class H coil insulation is available.

Vertical Application: Our heavy-duty products are not intended for vertical applications.

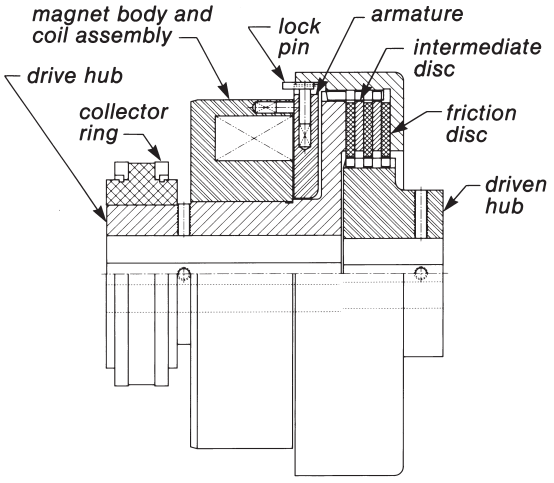
Stearns heavy-duty clutches and brakes represent over 75 years of design, engineering and on the job experience. Our products are backed by a reputation for quality and integrity.

Our engineering team will work with you to customize heavy-duty clutches and brakes to most customer requirements.

Heavy-Duty Clutches & Brakes Continued

Stearns™ heavy-duty clutches and brakes are ideal for any application requiring rugged, high torque, low inertia clutches and brakes.

Style E Electrically Set Clutch

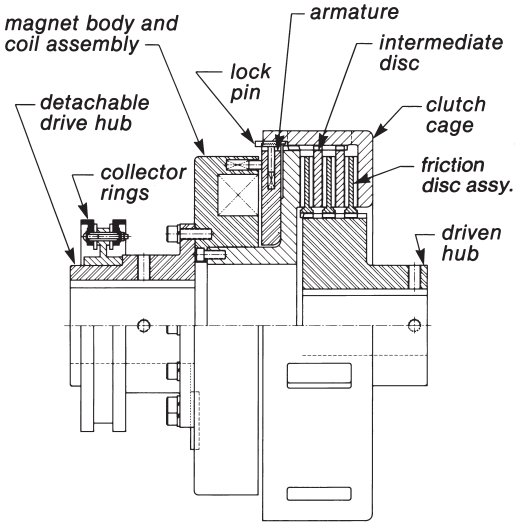


- Torque 140 to 4,500 lb-ft
- Basic unit (as shown), Form 1 clutch coupling
- Collector rings on one-piece drive hub
- Straight bores
- 230 volts DC operation
- Class B insulation standard

OPTIONS

- *Metric bores*
- *Collector ring on magnet body (shorter overall length)*
- *Three-piece housing*
- *Through shaft (bronze bushed or ball bearing, driven hub for mounting sprockets, gears, etc.)*
- *Dynamic balancing (as required)*
- *Pilot bearing in driven hub (for long unsupported shafts)*

Style E, Class S Electrically Set Clutch

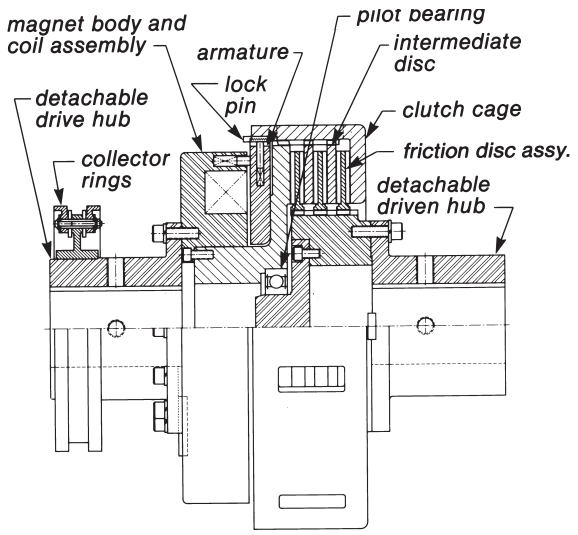


- Torque 400 to 4,500 lb-ft
- Basic unit (as shown), Form 1 clutch coupling
- Two-piece split collector rings on drive hub
- Detachable drive hub (vertical removal of clutch without disturbing shafts)
- Straight bores
- 115 or 230 volts DC operation
- Class B insulation standard
- Carrier ring type friction disc

OPTIONS

- *Taper bores*
- *Metric bores*
- *Three-piece housings*
- *Other voltages*
- *Dynamic balancing (as required)*
- *Spindle shafts*
- *Floating shaft arrangements*
- *Detachable driven hub*

Style E, Class M Electrically Set Clutch

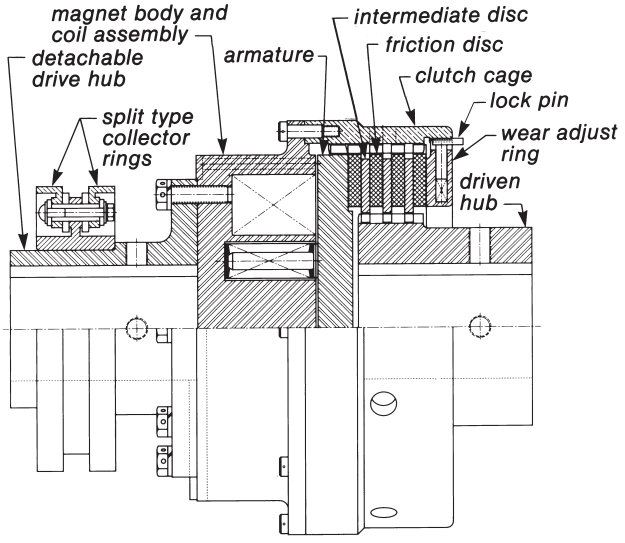


- Torque 6,400 to 19,200 lb-ft
- Basic unit (as shown), Form 6 (pilot bearing) for long unsupported shafts
- Two-piece split collector rings on drive hub
- Straight bores
- Detachable drive & driven hubs (vertical removal of clutch without disturbing shafts)
- 115 or 230 volts DC operation
- Class B insulation standard
- Carrier ring type friction disc

OPTIONS

- *Dynamic balancing (as required)*
- *Collector ring cover*
- *Housing for most smaller sizes*
- *Spindle shafts*
- *Floating shaft arrangements*

Style SCE, Class S3 Spring-Set Clutch

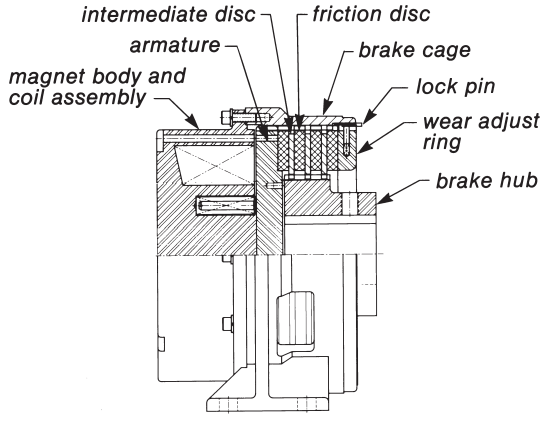


- Torque 3,500 to 12,000 lb-ft
- Basic unit (as shown), Form 1 clutch coupling
- Two-piece split collector rings on drive hub
- Detachable drive hub (vertical removal of clutch without disturbing shafts)
- Straight bores
- 230 volts DC operation for forcing
- Class B insulation standard

OPTIONS

- *Taper bores*
- *Metric bores*
- *Three-piece housings*
- *Through shaft (some sizes)*
- *Pilot bearing in driven hub (for wider spaced shafts)*
- *Detachable driven hub*
- *Dynamic balancing (as required)*
- *Combination forcing circuit voltage & holding voltage circuits required*

Style SCEB, Class S3 Spring-Set Brake



- Torque 450 to 900 lb-ft
- Foot mounted
- Straight bore
- 230 volts DC operation for forcing
- Class B insulation standard

OPTIONS

- *Taper bores*
- *Metric bores*
- *Detachable hub*
- *Combination forcing circuit voltage & holding voltage circuits required*
- *Limited through-shaft capability*

Style E
Electrically Engaged Clutch or Clutch Coupling

Stearns™ Style E Clutches are a time-tested and proven design.

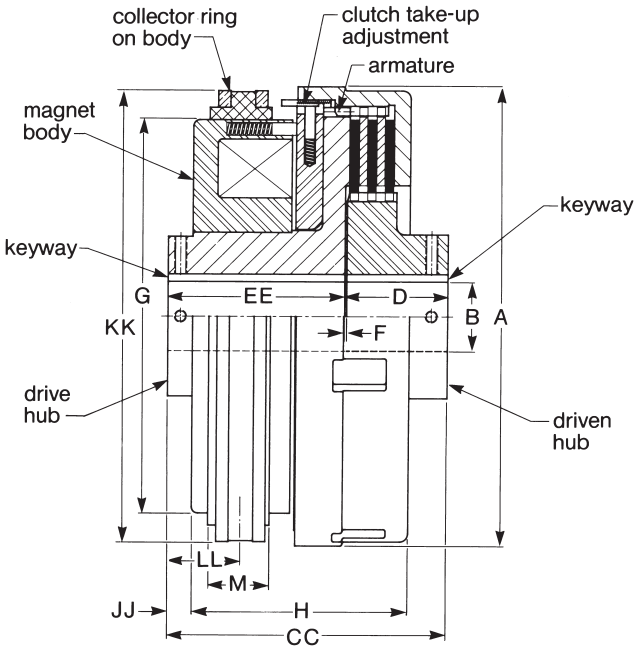
The Style E Clutch is electrically engaged. The driven end carries the friction linings.

A spring loaded lock pin simplifies threaded adjustment of the air gap. The clutch operates on direct current.

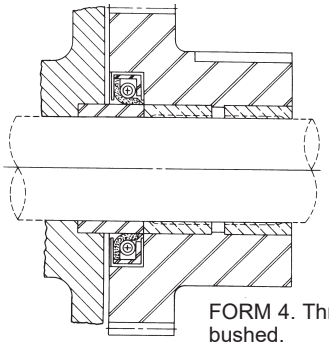
Dynamic balancing is available and required above the specified RPM. Generally, 4” through 14” Style E Clutches should be balanced above 1000 RPM, 16” and 20” above 800 RPM.

Forms 1 and 6 are clutch-couplings and Forms 4 and 5 are thru-shaft clutches.

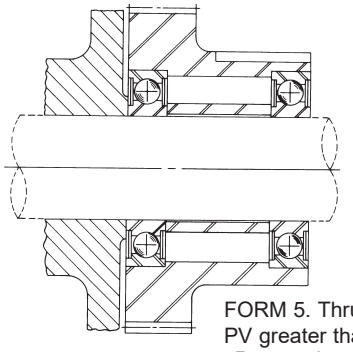
Class B coil insulation is standard.



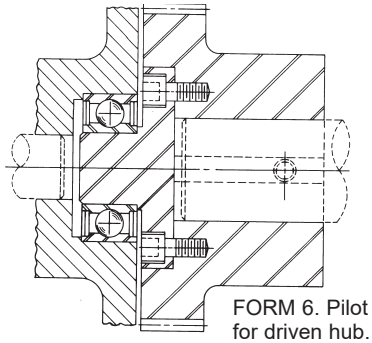
Style E Clutch with collector ring on magnet body. Driven hub Form 1.



FORM 4. Thru shaft, bronze bushed.
PV less than 50,000



FORM 5. Thru shaft, ball bearing.
PV greater than 50,000
P more than 8,000 psi
V more than 1,200
surface feet per minute



FORM 6. Pilot bearing arrangement for driven hub.

Performance Data

Size	Nominal Static Torque (lb-ft)	Hp at 100 RPM	Lining Area (sq-in)	230 Vdc Watts	WR^2 (lbs-ft^2)		Max. RPM	Approx. Shipping Weight
					Drive End	Driven End		
802	140	2.6	44	80	4.3	.27	2300	73
804	280	5.2	88	80	4.6	.52	2300	82
806	420	7.8	132	80	4.6	.76	2300	91
1002	400	7.6	72	104	11.9	.667	2300	130
1004	800	15.0	144	104	12.3	1.20	2300	142
1006	1200	22.0	216	104	12.7	1.74	2300	154
1202	600	11.0	125	155	27.5	1.70	1900	250
1204	1200	22.0	250	155	28.9	3.00	1900	265
1206	1800	33.0	375	155	30.3	4.31	1900	280
1402	900	17.0	166	205	55	3.36	1700	300
1404	1800	34.0	332	205	63	6.45	1700	345
1406	2700	51.0	498	205	71	9.55	1700	390
1602	1500	28	212	146	99	6.26	1500	480
1604	3000	57	424	146	112	11.1	1500	545
1606	4500	85	636	146	125	16.0	1500	610

Note: Consult factory for modifications and approval drawings.

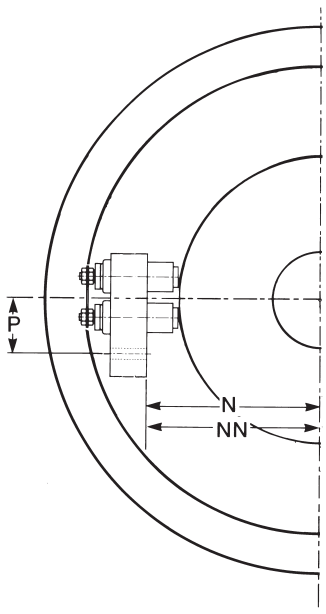
Contact customer service with any heavy-duty clutch questions you may have at uscustomercare@regalrexnord.com or call 833-734-2500.

Style E Continued
Electrically Engaged Clutch or Clutch Coupling

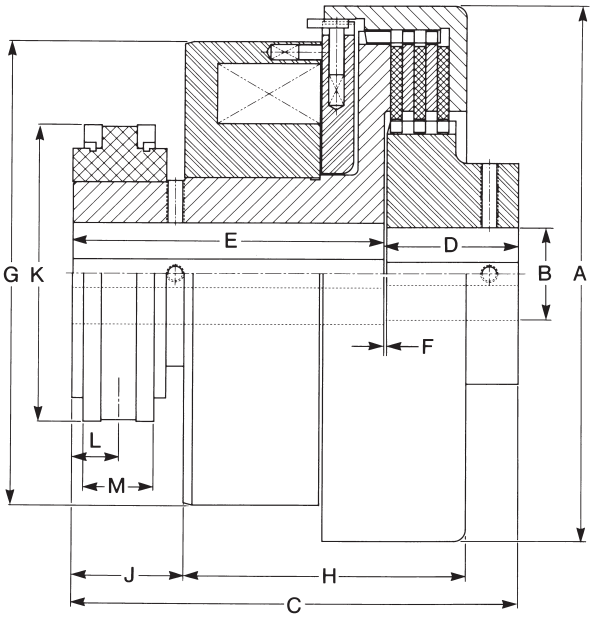
Dimensional Data (in Inches)

A	B①	C	CC	D	E	EE	F	G	H	J	JJ	K	KK	L	LL	M	N	NN	P	U②
7 1/4	1 5/8	7 1/16	5 3/4	1 3/4	5 5/16	4	1/16	6	4 3/16	1 7/8	9/16	4 1/2	7 3/4	3/4	1 9/16	1 3/8	2 7/8	4 3/8	1 1/4	1 1/2
7 1/4	1 5/8	7 1/2	6 3/16	2 3/16	5 5/16	4	1/16	6	4 5/8	1 7/8	9/16	4 1/2	7 3/4	3/4	1 9/16	1 3/8	2 7/8	4 3/8	1 1/4	1 1/2
7 1/4	1 5/8	7 15/16	6 5/8	2 5/8	5 5/16	4	1/16	6	5 1/16	1 7/8	9/16	4 1/2	7 3/4	3/4	1 9/16	1 3/8	2 7/8	4 3/8	1 1/4	1 1/2
9 1/4	2	7 7/8	6	1 13/16	6	4 5/16	1/16	8	4 1/2	2 3/8	9/16	5	9 3/4	1	1 5/8	1 3/4	3 1/4	5 5/8	1 9/16	
9 1/4	2	8 1/4	6 7/16	2 1/4	6	4 5/16	1/16	8	4 15/16	2 3/8	9/16	5	9 3/4	1	1 5/8	1 3/4	3 1/4	5 5/8	1 9/16	
9 1/4	2	8 11/16	6 7/8	2 5/8	6	4 5/16	1/16	8	5 3/8	2 3/8	9/16	5	9 3/4	1	1 5/8	1 3/4	3 1/4	5 5/8	1 9/16	
11 1/2	2 7/16	8 1/2	6 7/8	1 7/8	6 5/8	5	1/16	10	5 1/16	2 3/8	3/4	6 3/8	12	1	2	2	3 15/16	6 13/16	1 9/16	
11 1/2	2 7/16	9	7 3/8	2 3/8	6 5/8	5	1/16	10	5 9/16	2 3/8	3/4	6 3/8	12	1	2	2	3 15/16	6 13/16	1 9/16	
11 1/2	2 7/16	9 1/2	7 7/8	2 7/8	6 5/8	5	1/16	10	6 1/16	2 3/8	3/4	6 3/8	12	1	2	2	3 15/16	6 13/16	1 9/16	
14	3 1/4	9 1/4	7 1/2	2 1/8	7 1/8	5 3/8	1/16	12	5 5/8	2 1/2	3/4	7	13 3/4	1 1/8	2 1/4	2	4 1/4	7 3/4	1 9/16	
14	3 1/4	9 3/4	8	2 5/8	7 1/8	5 3/8	1/16	12	6 1/8	2 1/2	3/4	7	13 3/4	1 1/8	2 1/4	2	4 1/4	7 3/4	1 9/16	
14	3 1/4	10 1/4	8 1/2	3 1/8	7 1/8	5 3/8	1/16	12	6 5/8	2 1/2	3/4	7	13 3/4	1 1/8	2 1/4	2	4 1/4	7 3/4	1 9/16	
16	3 3/4	11 5/8	8 5/8	2 1/2	9 1/8	6 1/8	1/8	14	6 7/8	4	1	9	16	1 3/8	2 1/2	2 1/4	5 3/4	9 1/4	3 7/8	
16	3 3/4	12 7/8	9 7/8	3 3/4	9 1/8	6 1/8	1/8	14	8 1/8	4	1	9	16	1 3/8	2 1/2	2 1/4	5 3/4	9 1/4	3 7/8	
16	3 3/4	14 1/8	11 1/8	5	9 1/8	6 1/8	1/8	14	9 3/8	4	1	9	16	1 3/8	2 1/2	2 1/4	5 3/4	9 1/4	3 7/8	

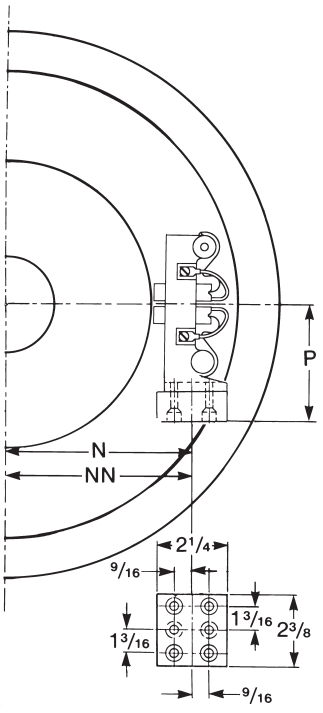
①Maximum bore standard keyway
② Maximum bore for Form 5.



Dimension (NN) refers to collector ring if mounted on outside diameter of magnet body.



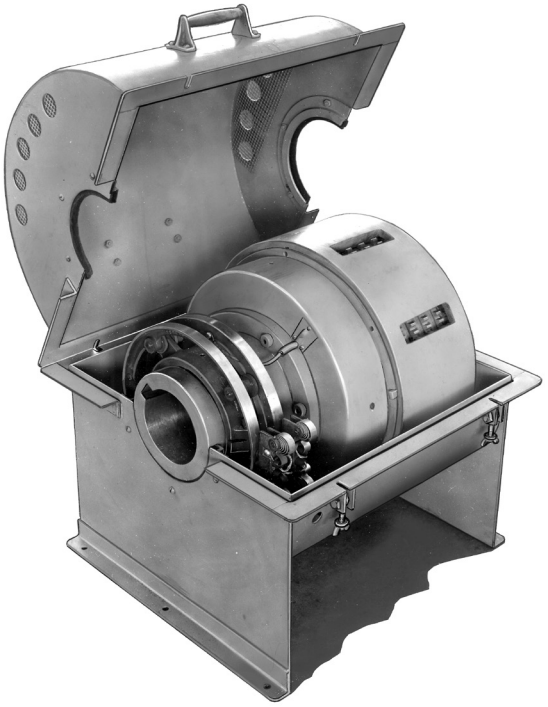
Style E Clutch Coupling with collector rings on drive hub. Driven hub Form 1.



Standard brush holder for sizes 1402 to 2006. Shown above, right.

Dimensions are for estimating only and subject to change without notice.
For installation purposes, request certified prints.

Style E, Class S
Electrically Engaged Clutch with Straight Bores



Stearns™ Style E, Class S Clutch is a high torque, low inertia, electromagnetic clutch for steel mill screw-downs, ball mills, rod mills, compeg mills, kilns and similar equipment. The basic design of this clutch has been time-tested and proven by over 50 years of successful application.

The Style E, Class S Clutch is electrically engaged. The driven end carries the friction linings.

A spring loaded lock pin simplifies threaded adjustment of air gap. To adjust, lock pin is depressed and armature rotated until lock pin snaps into next slot in cage.

Friction linings can be replaced without disturbing related equipment on either side of the clutch.

This clutch operates on direct current.

Class B coil insulation is standard.

Performance Data

MECHANICAL

Clutch Size	Nominal Static Torque (lb-ft)	Wk^2 (lb-ft^2)		Lining Area (sq-in)	hp @ 100 RPM	Approx. Shipping (wt-lb)	Max. RPM	Dynamic Balancing Suggested above, RPM
		Drive End	Driven End					
1002	400	11.8	1.4	72	7.6	146	2300	1000
1004	800	13.5	2.1	144	15.0	163	2300	
1006	1200	15.3	2.8	216	22.0	179	2300	
1202	600	27.2	3.2	125	11.0	231	1900	1000
1204	1200	30.4	4.8	250	23.0	254	1900	
1206	1800	33.5	6.3	375	34.0	277	1900	
1402	900	56.3	6.9	166	17.0	354	1700	1000
1404	1800	64.5	10.0	332	34.0	395	1700	
1406	2700	72.7	13.1	498	51.0	436	1700	
1602	1500	103.0	10.3	212	28.0	488	1500	800
1604	3000	115.0	16.0	424	57.0	540	1500	
1606	4500	127.0	22.1	636	85.0	594	1500	

Contact customer service with any heavy-duty clutch questions you may have at uscustomercare@regalrexnord.com or call 833-734-2500.

ELECTRICAL - Class B

Clutch Size Series	Voltage	Coil Resistance ohms	DC Amps Coil	DC Watts Coil
800	115	170	.676	80
	230	666	.345	80
1000	115	127	.905	104
	230	509	.452	104
1200	115	86	1.340	155
	230	342	.672	155
1400	115	67	1.720	198
	230	259	.888	205
1600	115	93	1.230	142
	230	364	.630	146

ENGAGEMENT TIME

Clutch Size Series	Engagement Time in Seconds (without controls)
1000	.21
1200	.26
1400	.31
1600	.50

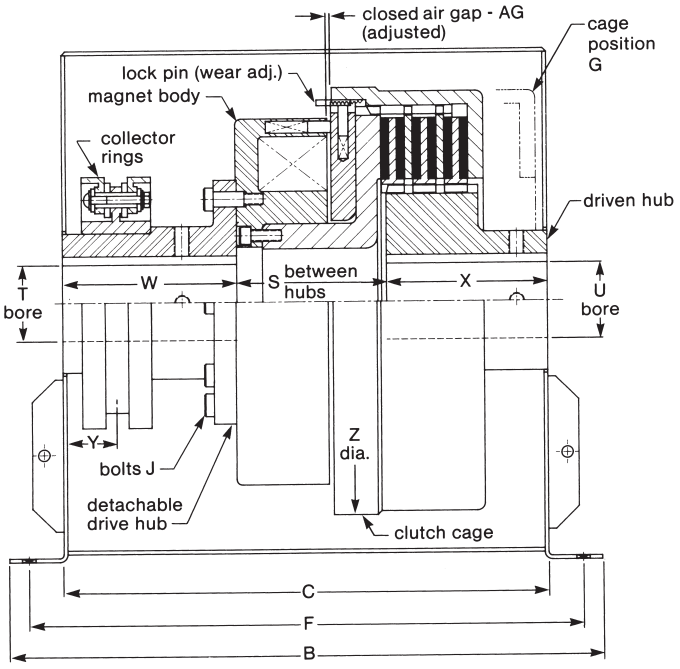
If faster time is required, special coils may be supplied for use with a forcing circuit. Consult factory for details.

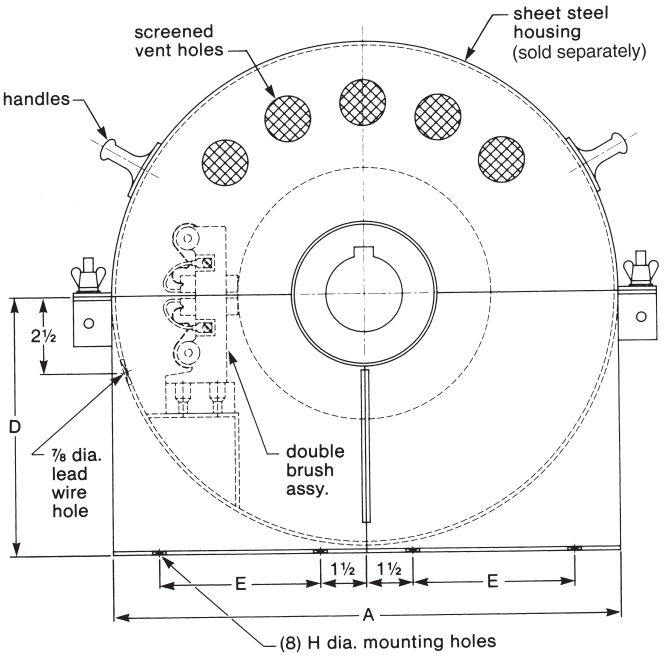
Style E, Class S Continued
Electrically Engaged Clutch with Straight Bores

Dimensional Data (in Inches)

Size	A	B	C	D	E	F	H	S①	T (max)	U (max)	W	X	Y	Z	AG
1002	16	15 3/8	12 3/8	8 1/2	5	14 1/8	7/16	4 13/32 min. 4 19/32 max.	2 7/8 (flat key)	1 7/8	5 1/8	2 3/4	1 13/16	11 1/2	.031
1004		16 3/8	13 3/8			15 1/8				2 1/2		3 3/4			
1006		17 3/8	14 3/8			16 1/8				3 1/8		4 3/4			
1202	16 1/2	16 7/8	13 7/8	8 3/4	5 1/4	15 5/8	7/16	4 25/32 min. 4 7/8 max.	3 1/4	2 1/4	5 3/4	3 1/4	1 3/4	14	.031
1204		17 7/8	14 7/8			16 5/8				2 7/8		4 1/4			
1206		18 7/8	15 7/8			17 5/8				3 1/2		5 1/4			
1402	19	18 11/16	15 11/16	10	6 1/2	17 7/16	7/16	5 11/32 min. 5 17/32 max.	3 3/4	2 1/2	6 1/2	3 3/4	1 15/16	16 1/4	.040
1404		19 15/16	16 15/16			18 11/16				3 1/4		5			
1406		21 3/16	18 3/16			19 15/16				4 1/4		6 1/4			
1602	21	19 5/8	16 5/8	11	7 1/2	18 3/8	7/16	5 29/32 min. 6 3/32 max.	4 1/2	2 3/4	6 5/8	4	1 15/16	18	.040
1604		20 7/8	17 7/8			19 5/8				3 1/2		5 1/4			
1606		22 1/8	19 1/8			20 7/8				4 1/2		6 1/2			

①Dimension “S” gives limits on allowable end float.

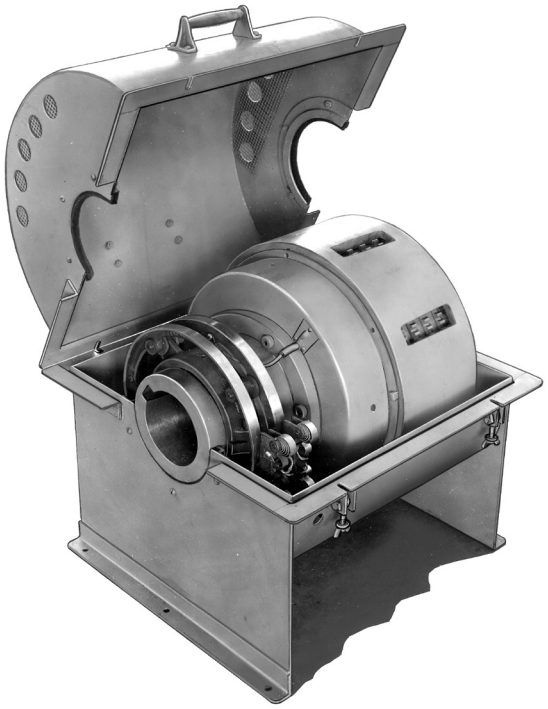




Dimensions are for estimating only and subject to change without notice. For installation purposes, request certified prints.

Note: Consult factory for modifications and approval drawings.

Style E, Class S
Electrically Engaged Clutch with Tapered Bores



Stearns™ Style E, Class S Clutch is a high torque, low inertia, electromagnetic clutch for steel mill screw-downs, ball mills, rod mills, compeg mills, kilns and similar equipment. The basic design of this clutch has been time-tested and proven by over 50 years of successful application.

The Style E, Class S Clutch is electrically engaged. The driven end carries the friction linings.

A spring loaded lock pin simplifies threaded adjustment of air gap. To adjust, lock pin is depressed and armature rotated until lock pin snaps into next slot in cage.

Friction linings can be replaced without disturbing related equipment on either side of the clutch.

This clutch operates on direct current.

Class B coil insulation is standard.

Performance Data

MECHANICAL

Clutch Size	Nominal Static Torque (lb-ft)	Wk² (lb-ft²)		Lining Area (sq-in)	hp @ 100 RPM	Approx. Shipping (wt-lb)	Max. RPM	Dynamic Balancing Suggested above, RPM
		Drive End	Driven End					
1002	400	11.8	1.4	72	7.6	146	2300	1000
1004	800	13.5	2.1	144	15.0	163	2300	
1006	1200	15.3	2.8	216	22.0	179	2300	
1202	600	27.2	3.2	125	11.0	231	1900	1000
1204	1200	30.4	4.8	250	23.0	254	1900	
1206	1800	33.5	6.3	375	34.0	277	1900	
1402	900	56.3	6.9	166	17.0	354	1700	1000
1404	1800	64.5	10.0	332	34.0	395	1700	
1406	2700	72.7	13.1	498	51.0	436	1700	
1602	1500	103.0	10.3	212	28.0	488	1500	800
1604	3000	115.0	16.0	424	57.0	540	1500	
1606	4500	127.0	22.1	636	85.0	594	1500	

Contact customer service with any heavy-duty clutch questions you may have at uscustomercare@regalrexnord.com or call 833-734-2500.

ELECTRICAL - Class B

Clutch Size Series	Voltage	Coil Resistance ohms	DC Amps Coil	DC Watts Coil
1000	115	127	.905	104
	230	509	.452	104
1200	115	86	1.340	155
	230	342	.672	155
1400	115	67	1.720	198
	230	259	.888	205
1600	115	93	1.230	142
	230	364	.630	146

ENGAGEMENT TIME

Clutch Size Series	Engagement Time in Seconds (without controls)
1000	.21
1200	.26
1400	.31
1600	.50

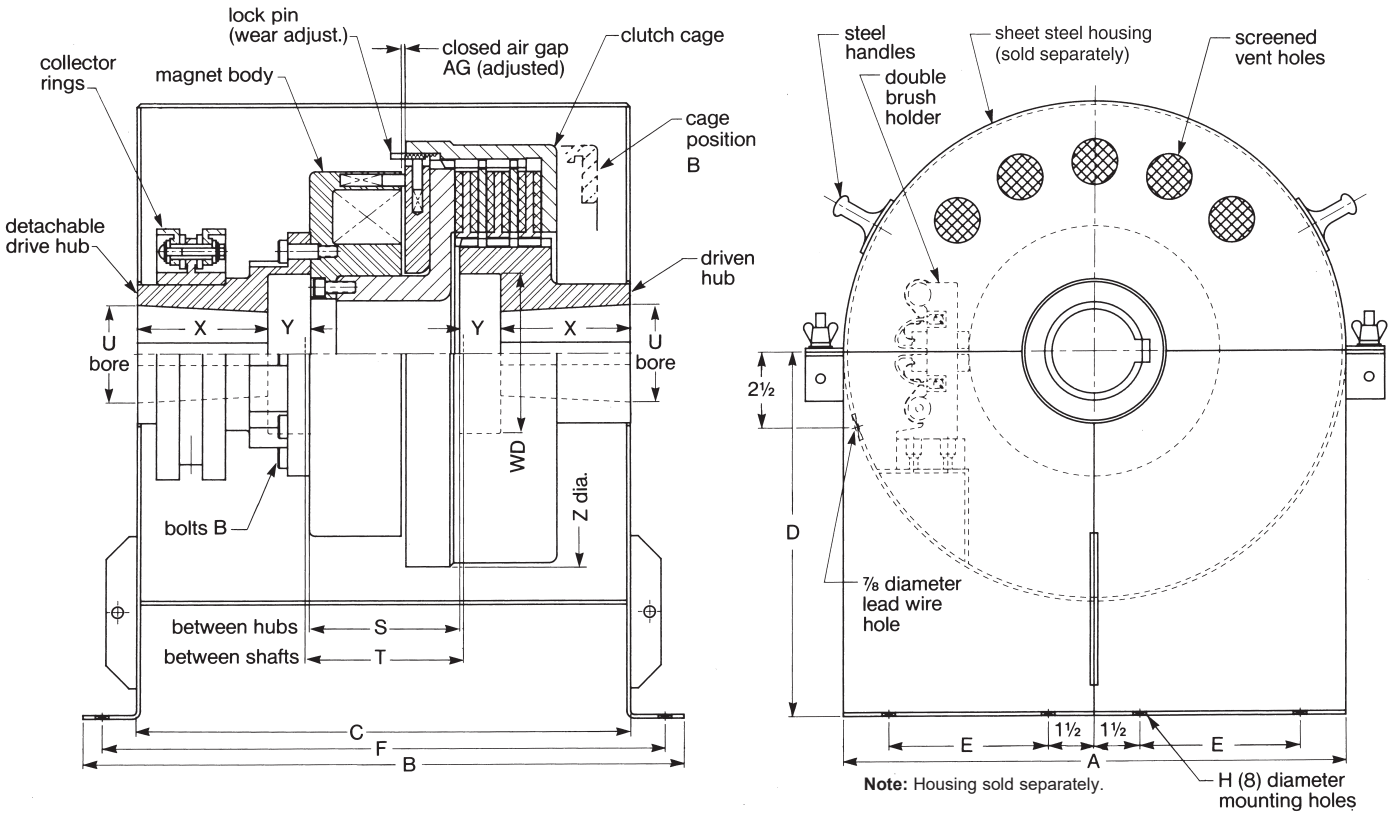
If faster time is required, special coils may be supplied for use with a forcing circuit. Consult factory for details.

Style E, Class S Continued
Electrically Engaged Clutch with Tapered Bores

Dimensional Data (in Inches)

Size	Mill Motor Frame Size		A	B	C	D	E	F	H	S①	T② (± 1/32)	U③	WD	X	Y	Z	AG	Keyway
1002	602	802	16	15 3/4	12 3/4	8 1/2	5	14 1/2	7/16	4 13/32 min. 4 19/32 max.	4 7/8	1 3/4	3 1/4	3	1 1/8	11 1/2	.031	1/2 x 1/4
1004	603	803		19 3/8	16 3/8	9		18 1/8			4 5/8	2	3 1/2	3 1/2	1 1/16			1/2 x 1/4
	604	804																
1006	606	806		19 5/8	16 5/8	9 3/4		18 3/8				2 1/2	4	4	1 3/16			1/2 x 1/4
1202	603	803	16 1/2	16 7/8	13 7/8	9	5 1/4	15 5/8	7/16	4 25/32 min. 4 7/8 max.	4 7/8	2	3 1/2	3 1/2	1	14	.032	1/2 x 1/4
	604	804																
1204	608	808		19 3/8	16 3/8	11		18 1/8				3	5	4 1/2	1 1/4			3/4 x 1/4
1206	610	810		19 5/8	16 5/8	12		18 3/8				3 1/4	5 1/4	4 1/2	1 3/8			3/4 x 1/4
1402	606	806	19	18 11/16	15 11/16	9 3/4	6 1/2	17 7/16	7/16	5 11/32 min. 5 17/32 max.	5 7/16	2 1/2	4	4	1 1/8	16 1/4	.040	1/2 x 1/4
1404	610	810		20 3/16	17 3/16	12		18 15/16				3 1/4	5 1/4	4 1/2	1 3/8			3/4 x 1/4
1406	612	812		21 7/16	18 7/16	13 1/8		20 3/16				3 5/8	5 5/8	5	1 1/2			3/4 x 1/4
1602	608	808	21	20 1/2	17 1/2	11	7 1/2	19 1/4	7/16	5 29/32 min. 6 3/32 max.	6	3	5	4 1/2	1 1/4	18	.040	3/4 x 1/4
1604	612	812		22	19	13 1/8		20 3/4				3 5/8	5 5/8	5	1 1/2			3/4 x 1/4
1606	614	814		22 1/4	19 1/4	14 1/2		21				4 1/4	6 1/2	5	1 5/8			3/4 x 1/4

①Dimension “S” gives limits on allowable end float.
②Dimension “T” is minimum - if to be greater, add to driven hub “Y” dimension only.
③Note - if bore is to be larger than “U”, consult factory.



Dimensions are for estimating only and subject to change without notice. For installation purposes, request certified prints.

Note: Consult factory for modifications and approval drawings.

Style E, Class M
Electrically Engaged Clutch

Stearns™ Style E, Class M Clutch is a high torque, low inertia, electromagnetic clutch for steel mill screw-downs, ball mills, rod mills, compeg mills, kilns and similar equipment. The basic design of this clutch has been time-tested and proven by over 50 years of successful application.

The Style E, Class M Clutch is electrically engaged. The driven end carries the friction linings.

A spring loaded lock pin simplifies threaded adjustment of air gap. To adjust, lock pin is depressed and armature rotated until lock pin snaps into next slot in cage.

Friction linings can be replaced without disturbing related equipment on either side of the clutch.

This clutch operates on direct current.

Class B coil insulation is standard.

Performance Data

MECHANICAL

Clutch Size	Nominal Static Torque (lb-ft)	Wk^2 (lb-ft^2)		Lining Area (sq-in)	Approx. Shipping Weight	Max. RPM
		Drive End	Driven End			
2402	6400	682	70	425	1660	800
2404	12800	762	109	850	1840	800
2406	19200	842	149	1275	2020	800

ELECTRICAL - Class B

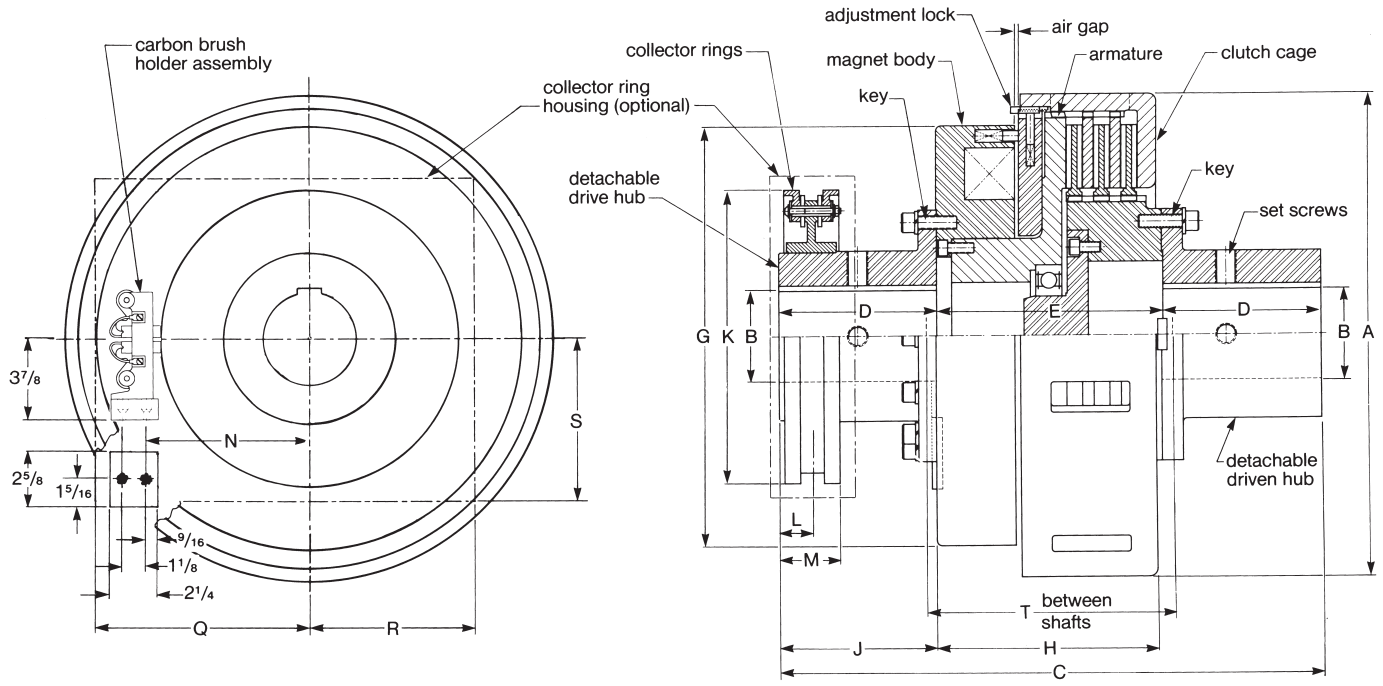
Clutch Size Series	Voltage	Coil Resistance ohms	DC Amps Coil	DC Watts Coil
2400	115	46.9	2.45	281
	230	95	2.4	550

Contact customer service with any heavy-duty clutch questions you may have at uscustomercare@regalrexnord.com or call 833-734-2500.

Style E, Class M Continued
Electrically Engaged Clutch

Dimensional Data (in Inches)

Size	A	B (max)	C	D	E	G	H	J	K	L	M	N	Q	R	S	T
2402	$28\frac{3}{4}$	$6\frac{3}{4}$	$28\frac{1}{8}$	9	$10\frac{1}{8}$	24	$9\frac{29}{32}$	$8\frac{15}{16}$	14	$3\frac{15}{16}$	$5\frac{3}{16}$	$7\frac{11}{16}$	$10\frac{1}{2}$	8	8	$11\frac{1}{8}$
2404	$28\frac{3}{4}$	$6\frac{3}{4}$	$29\frac{1}{2}$	9	$11\frac{1}{2}$	24	$11\frac{9}{32}$	$8\frac{15}{16}$	14	$3\frac{15}{16}$	$5\frac{3}{16}$	$7\frac{11}{16}$	$10\frac{1}{2}$	8	8	$12\frac{1}{2}$
2406	$28\frac{3}{4}$	$6\frac{3}{4}$	$30\frac{7}{8}$	9	$12\frac{7}{8}$	24	$12\frac{21}{32}$	$8\frac{15}{16}$	14	$3\frac{15}{16}$	$5\frac{3}{16}$	$7\frac{11}{16}$	$10\frac{1}{2}$	8	8	$13\frac{7}{8}$



Dimensions are for estimating only and subject to change without notice. For installation purposes, request certified prints.

Note: Consult factory for modifications and approval drawings.

Style SCE, Class S3
Spring Engaged Clutch with Straight Bores

Stearns™ Style SCE, Class S3 Clutch is a high torque, low inertia, electromagnetic clutch for steel mill screw-downs, and similar equipment. The basic design of this clutch has been time-tested and proven by over 50 years of successful application.

Stearns S3 Clutch is designed to provide extremely high capacity in a relatively small package.

The Style SCE, Class S3 Clutch is spring engaged, electromagnetically released. A spring loaded lock pin simplifies adjustment of air gap. When adjustment is required, lock pin is depressed and wear adjustment ring rotated until lock pin snaps into next slot in cage.

Friction linings can be quickly replaced without disturbing related equipment on either side of the clutch.

This clutch operates on direct current and requires forcing circuit (see wiring diagram).

Class B coil insulation is standard.

Performance Data

MECHANICAL

Clutch Size	Nominal Static Torque (lb-ft)	Wk^2 (lb-ft^2)		RPM at which Dynamic Balancing is Required	Approx. Shipping Weight	Max. RPM
		Drive End	Driven End			
1204	3500	46.75	3.50	1000	330	2000
1206	5000	49.20	4.65	1000	350	2000
1406	7800	100.70	11.40	1000	550	1800
1606	12000	187.30	20.80	800	700	1600

Contact customer service with any heavy-duty clutch questions you may have at uscustomercare@regalrexnord.com or call 833-734-2500.

ELECTRICAL

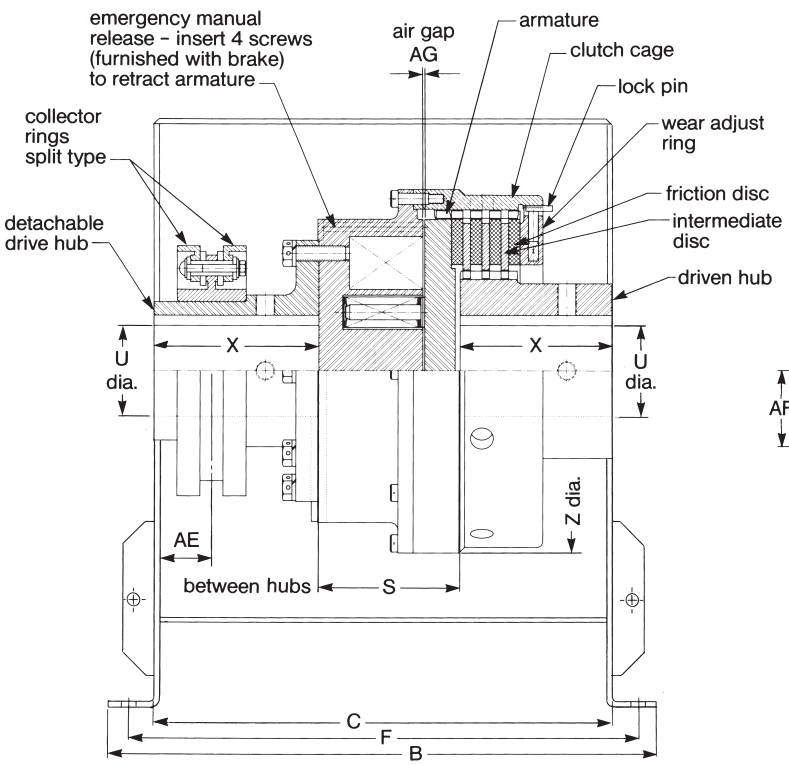
Clutch Size	Source Line Voltage	Series Resistor		Coil Resistance ohms	DC Watts Circuit	
		ohms	watt		Inrush	Holding
1200	230	125	250	58.4	910W-3.95A	288W-1.25A
1400	230	135	250	60.8	870W-3.78A	269W-1.17A
1600	230	135	200	59.4	890W-3.87A	272W-1.18A

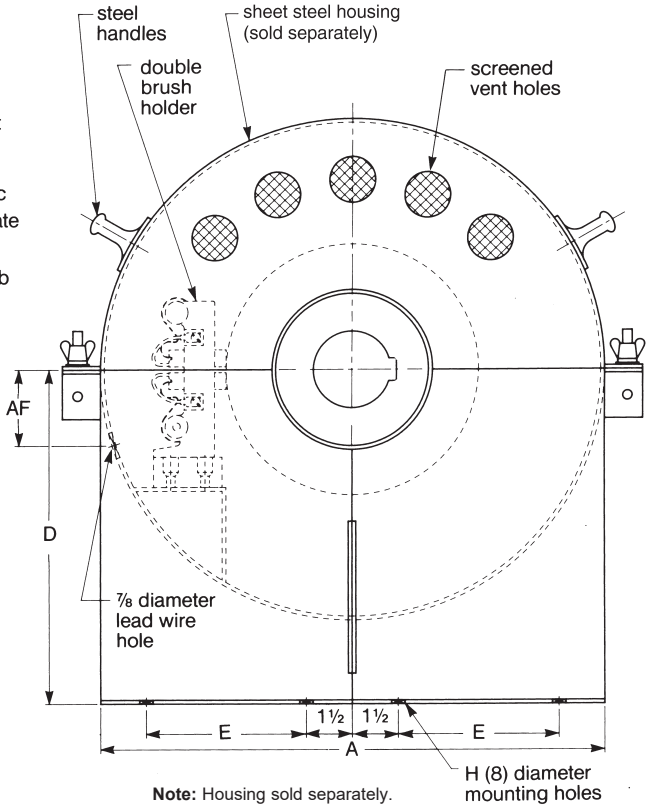
Style SCE, Class S3 Continued
Spring Engaged Clutch with Straight Bores

Dimensional Data (in Inches)

Size	A	B	C	D①	E	F	H	S	Z	AE	AF	AG	Drive Hub			Driven Hub		
													U②	X	Keyway	U②	X	Keyway
1204	19	19 9/16	16 1/16	10	6 1/2	18 5/16	9/16	5 7/16	14 1/2	2 1/16	2 1/2	.060	4	5 7/8	1 x 1/2	3 3/4	4 3/4	7/8 x 7/16
1206		20 3/16	16 11/16			18 15/16											5 3/8	
1406	20	23 7/8	20 3/8	10 1/2	7	22 5/8	9/16	7 1/4	16 3/4	2 1/16	2 1/2	.060	4	6 1/8	1 x 1/2	4 3/4	7	1 1/4 x 5/8
1606	22	24 3/8	20 7/8	11 1/2	8	23 1/8	9/16	6 3/4	19	2 1/16	2 1/2	.060	4 3/4	7 1/8	1 1/4 x 5/8	5 1/2	7 3/4	1 1/4 x 5/8

①"D" is minimum - larger size to suit customer.
②If bore is to be larger than "U", consult factory.
Note: Wk^2 on drive and driven end are calculated for maximum "U" bore (as shown in table).



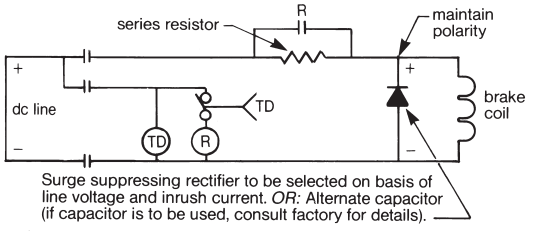


Note: Housing sold separately.

Dimensions are for estimating only and subject to change without notice. For installation purposes, request certified prints.

Note: Consult factory for modifications and approval drawings.

Wiring Diagram



(R) is a normally open, single pole, DC contactor.
(TD) is a normally closed time delay relay.

To release the clutch, the three pole contactor is closed. This closes (R) contacts and applies full line voltage to clutch coil. After a few seconds interval, time delay relay opens contactor (R) and places resistor in series with the clutch coil, reducing voltage imposed on coil from line voltage to lower holding voltage.

To engage the clutch, the contactor is opened. The back (EMF) generated in the clutch coil is dissipated through the surge suppressing rectifier, protecting the coil and lead wire insulation and minimizing arcing at the contacts.

Style SCE, Class S3
Spring Engaged Clutch with Tapered Bores

Stearns™ Style SCE, Class S3 Clutch is a high torque, low inertia, electromagnetic clutch for steel mill screw-downs, and similar equipment. The basic design of this clutch has been time-tested and proven by over 50 years of successful application.

Stearns S3 Clutch is designed to provide extremely high capacity in a relatively small package.

The Style SCE, Class S3 Clutch is spring engaged, magnetically released. A spring loaded lock pin simplifies adjustment of air gap. When adjustment is required, lock pin is depressed and wear adjustment ring rotated until lock pin snaps into next slot in cage.

Friction linings can be quickly replaced without disturbing related equipment on either side of the clutch.

This clutch operates on direct current and requires forcing circuit (see wiring diagram).

Class B coil insulation is standard.

Performance Data

MECHANICAL

Clutch Size	Nominal Static Torque (lb-ft)	Wk^2 (lb-ft^2)		RPM at which Dynamic Balancing is Required	Approx. Shipping Weight	Max. RPM
		Drive End	Driven End			
1204	3500	46.75	3.70	1000	330	2000
1206	5000	49.20	4.60	1000	350	2000
1406	7800	100.70	9.75	1000	550	1800
1606	12000	187.30	18.20	800	700	1600

Contact customer service with any heavy-duty clutch questions you may have at uscustomercare@regalrexnord.com or call 833-734-2500.

ELECTRICAL

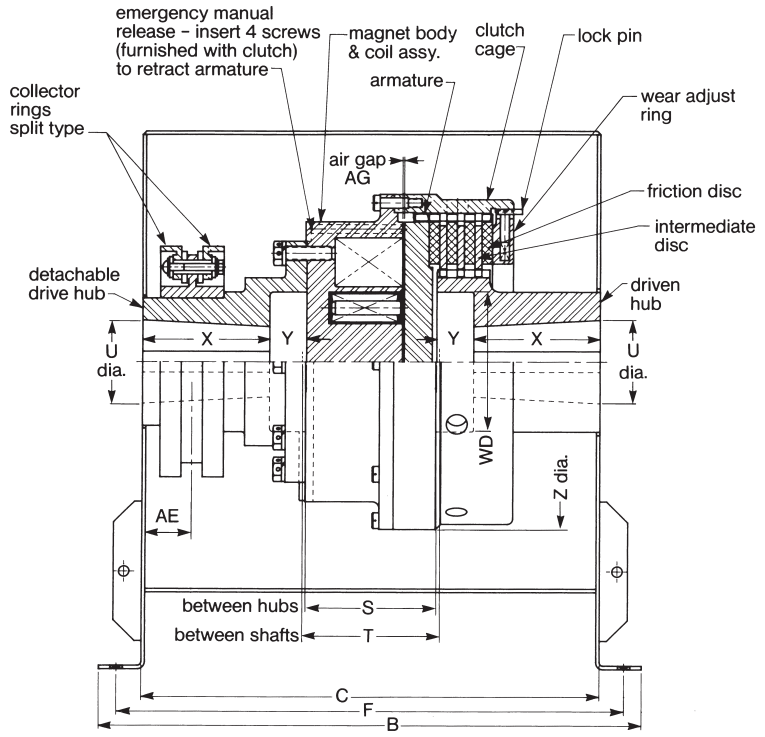
Clutch Size	Source Line Voltage	Series Resistor		Coil Resistance ohms	DC Watts Circuit	
		ohms	watt		Inrush	Holding
1200	230	125	250	58.4	910W-3.95A	288W-1.25A
1400	230	135	250	60.8	870W-3.78A	269W-1.17A
1600	230	135	200	59.4	890W-3.87A	272W-1.18A

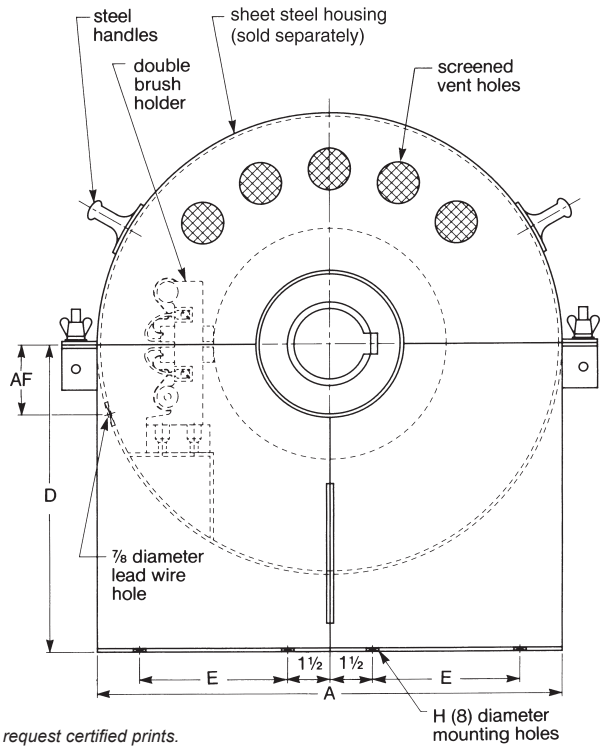
Style SCE, Class S3 Continued
Spring Engaged Clutch with Tapered Bores

Dimensional Data (in Inches)

Size	Mill Motor Frame Size①		A	B	C	D	E	F	H	S	T②	Z	AE	AF	AG	U③	X	Y	WD	Keyway
1204	610	810	19	20 13/16	17 5/16	12	6 1/2	19 9/16	9/16	5 7/16	5 9/16	14 1/2	2	2 1/2	.060	3 1/4	4 1/2	1 7/16	5 1/4	3/4 x 1/4
	612	812		22 1/16	18 9/16	13 1/8		20 13/16								3 5/8	5	1 9/16	5 5/8	
1206	610	810		20 13/16	17 5/16	12		19 9/16								3 1/4	4 1/2	1 7/16	5 1/4	
	612	812		22 1/16	18 9/16	13 1/8		20 13/16								3 5/8	5	1 9/16	5 5/8	
1406	614	814	20	24 1/8	20 5/8	14 1/2	7	22 7/8	9/16	7 1/4	7 3/8	16 3/4	2 1/8		.060	4 1/4	5	1 11/16	6 1/2	1 x 3/8
1606	616	816	22	24 7/8	21 3/8	15 3/4	8	23 5/8	9/16	6 3/4	6 7/8	19	2 1/8		.060	4 5/8	5 1/2	1 13/16	7	1 1/4 x 3/8
	618	818		25	21 1/2	17 1/2		23 3/4								5	6	1 3/8	7 1/2	1 1/4 x 1/2

①Indicates motor shaft size which clutch will accommodate. Clutch selection should be based on application requirements, not motor frame size.
②Dimension "T" is minimum - if to be greater, add to driven hub.
③Note - if bore is to be larger than "U", consult factory.
④Dimension "Y" drive end (1 1/4"), dimension "Y" driven end (1").

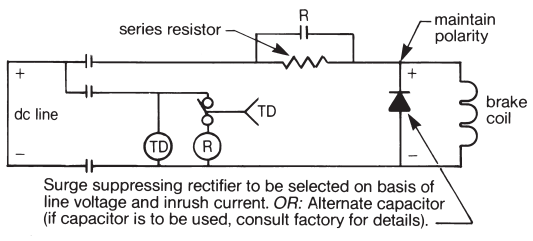




Dimensions are for estimating only and subject to change without notice. For installation purposes, request certified prints.

Note: Consult factory for modifications and approval drawings.

Wiring Diagram



(R) is a normally open, single pole, DC contactor.
(TD) is a normally closed time delay relay.

To release the clutch, the three pole contactor is closed. This closes (R) contacts and applies full line voltage to clutch coil. After a few seconds interval, time delay relay opens contactor (R) and places resistor in series with the clutch coil, reducing voltage imposed on coil from line voltage to lower holding voltage.

To engage the clutch, the contactor is opened. The back (EMF) generated in the clutch coil is dissipated through the surge suppressing rectifier, protecting the coil and lead wire insulation and minimizing arcing at the contacts.

Style SCEB, Class S3
Spring Engaged Brake

Stearns™ Style SCEB, Class S3 Brake is a high torque, low inertia, electromagnetic brake for steel mill screw-downs, and similar equipment. The basic design of this brake has been time-tested and proven by over 50 years of successful application.

Stearns SCEB Brake is designed to provide extremely high capacity in a relatively small package for end shaft mounting.

The Style SCEB, Class S3 Brake is spring engaged, magnetically released. A spring loaded lock pin simplifies adjustment of air gap. When adjustment is required, lock pin is depressed and wear adjustment ring rotated until lock pin snaps into next slot in cage.

Friction linings can be quickly replaced without disturbing related equipment.

This brake operates on direct current and requires forcing circuit (see wiring diagram).

Class B coil insulation is standard.

Performance Data

MECHANICAL

Brake Size	Nominal Static Torque (lb-ft)	Wk^2 (lb-ft^2)	Approx. Shipping (wt-lbs)	Max. RPM
802	450	.36	86	3600
804	900	.53	97	3600

Contact customer service with any heavy-duty clutch questions you may have at uscustomercare@regalrexnord.com or call 833-734-2500.

ELECTRICAL

Brake Size	Source Line Voltage	Series Resistor		Coil Resistance ohms	DC Watts Circuit	
		ohms	watt		Inrush	Holding
800	230	275	125	130	407W-1.77A	130W-.567A

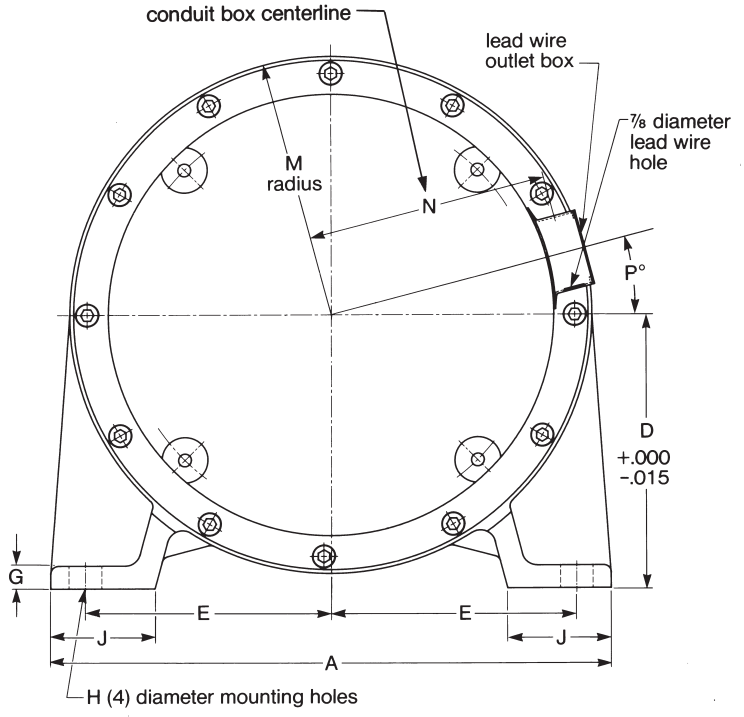
Style SCEB, Class S3 Continued
Spring Engaged Brake

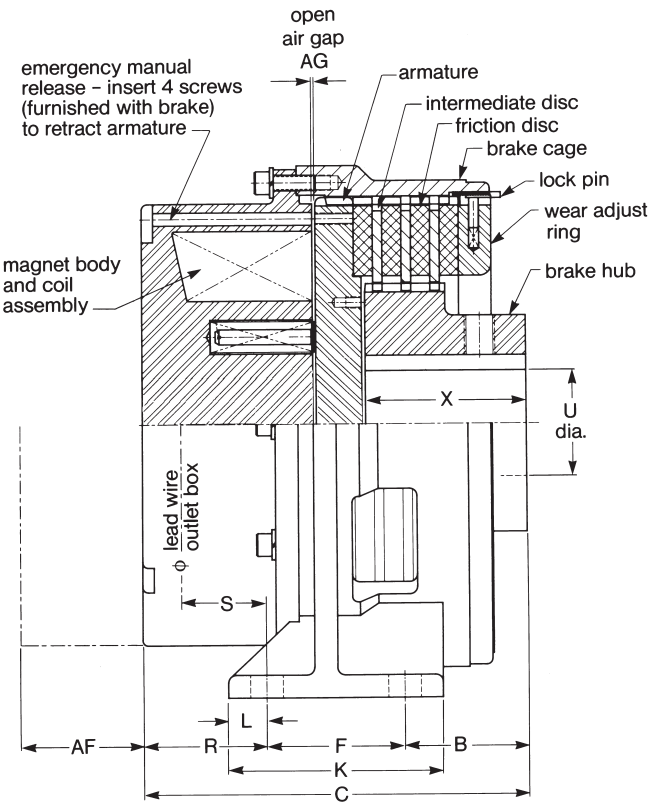
Dimensional Data (in Inches)

Size	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	AG	AF	U①	X	Keyway
802	11 1/2	1 29/32	6 7/16	5 1/2	5	2 1/2	3/8	9/16	2	3 5/8	9/16	5 1/16	4 7/16	30°	2 1/32	1 1/16	.050	4	2 3/4	2 1/4	5/8 x 5/16
804		2 13/32	6 15/16																	2 3/4	

①Dimension “U” is maximum with standard key. If “U” bore is to be larger, consult factory.

Note: Detachable hub with tapered bore available. Request engineering drawings.

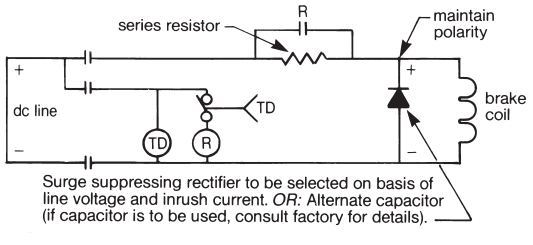




Dimensions are for estimating only and subject to change without notice. For installation purposes, request certified prints.

804 flange mount SCEB specification print available.

Wiring Diagram



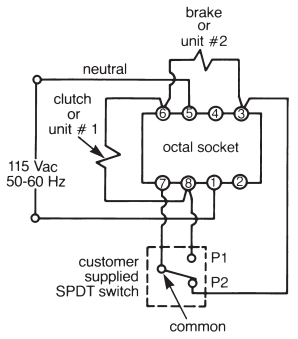
(R) is a normally open, single pole, DC contactor.
(TD) is a normally closed time delay relay.

To release the brake, the three pole contactor is closed. This closes (R) contacts and applies full line voltage to brake coil. After a few seconds interval, time delay relay opens contactor (R) and places resistor in series with the brake coil, reducing voltage imposed on coil from line voltage to lower holding voltage.

To engage the brake, the contactor is opened. The back (EMF) generated in the brake coil is dissipated through the surge suppressing rectifier, protecting the coil and lead wire insulation and minimizing arcing at the contacts.

Rectifier Controls

Model PR-01

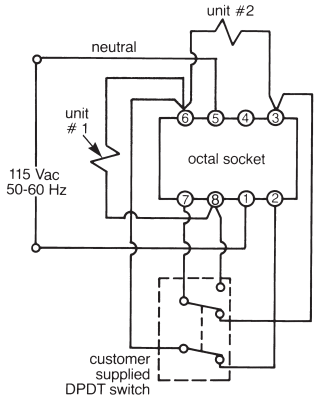


Model PR-01

Two fixed 100 volt outputs.

- Modular plug-in design uses octal socket for easy mounting & wiring connection
- Internally fused for overload protection
- Arc suppression circuit extends contact life
- Operates one clutch or one brake, or both, one on at a time

Model PR-33



Model PR-33

One fixed 100 volt output and one adjustable 15-100 volt output to allow reduced torque starts or stops for "soft" cushioned engagement.

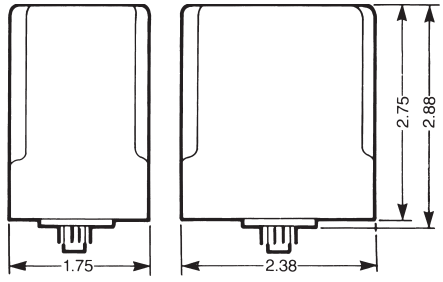
- Adjustable control on top of housing for easy accessibility
- Modular plug-in design uses octal socket for each mounting & wiring connection
- Internally fused for overload protection
- Arc suppression circuit extends contact life
- Operates one clutch or one brake, or both, one on at a time
- Adjustable voltage output uses thyristol control for a 4-watt power loss, 87% less than competitive units

Performance Data

Rectifier Part Number	AC Input Voltage	Nominal DC Output			Control Circuits		Switching Relay
		Volts	Max. Amp①	Max. Watts	#1	#2	
PR-01 4-1-20001-00	115 50-60 Hz	100	1.0	100	Fixed	Fixed	No
PR-33 4-1-20033-00	115 50-60 Hz	15-100	0.5	50	Fixed	Variable	No

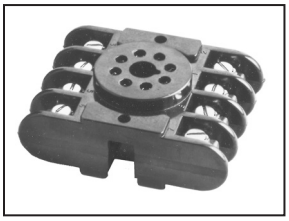
①Based on ambient temperature of 104°F.

Enclosure dimensions apply to both PR-01 and PR-33.



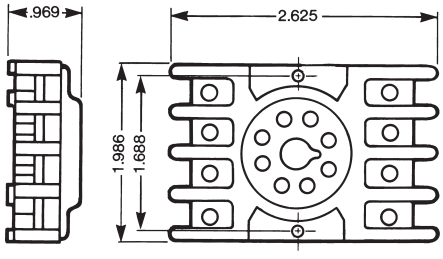
Octal Sockets

Supplied with terminal screws and clips.

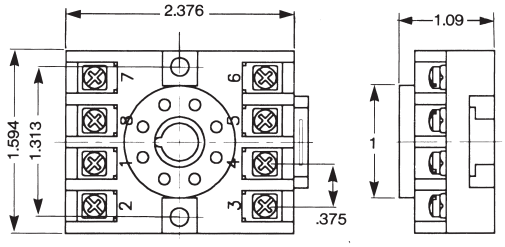


Octal Socket Part Number
9-61-0153-00
9-61-0153-01

Part Number: 9-61-0153-00
Dimensions



Part Number: 9-61-0153-01
Dimensions



Application Engineering

Basic Torque Formula:

$$T = \frac{hp \times 5{,}252}{N_{cb}} \times SF$$

Where:

- T = Average dynamic torque, lb-ft
- hp = Motor horsepower
- SF = Service factor
- N_{cb} = rpm of the clutch/brake shaft
- 5,252 = Constant

Inertia:

$I = W \times K^2$

Where:

- W = Weight of the object
- K^2 = The square of the radius of gyration

Velocity, Linear:

$V = \pi DN$

Where:

- π = 3.142
- D = Diameter of drive head pulley
- N = rpm

Reflected Inertia - Linear:

$$Wk_L^2 = W\left(\frac{V}{2\pi N_{cb}}\right)^2$$

Where

- W = The weight of the component, lb
- V = The velocity of the component in feet per minute
- N_{cb} = The rpm of the clutch/brake shaft

Reflected Inertia - Rotational:

$$Wk_r^2 = Wk_C^2 \times \left(\frac{N}{N_{cb}}\right)^2$$

Where:

- Wk_r^2 = Inertia reflected to the clutch or brake
- Wk_C^2 = Inertia of the component
- N = rpm of the component
- N_{cb} = rpm of the clutch or brake shaft

Dynamic Torque:

$$T_d = \frac{Wk^2 \times N}{308 \times t}$$

Where:

- T_d = Dynamic torque, lb-ft
- Wk^2 = Total inertia seen by the clutch/brake (including the clutch/brake inertia and motor inertia if applicable), lb-ft^2
- N = rpm of the clutch/brake
- t = Stopping time in seconds (or starting time)
- 308 = Constant

Thermal Capacity:

$$E = 1.7 \times WR^2 \left(\frac{N}{100}\right)^2 \times F$$

Where:

- E = Energy (heat) which needs to be dissipated, (ft-lb/min) for the application requirement
- WR^2 = Total reflected inertia at clutch/brake shaft location. This should include clutch/brake inertia. (lb-ft^2)
- N = Speed differential in revolutions per minute (rpm) at the clutch/brake shaft.
- F = Number of cycles per minute (cycle rate).

Ohms Law:

Ohms = Volts/Amperes $\left(R = \frac{E}{I}\right)$

Amperes = Volts/Ohms $\left(I = \frac{E}{R}\right)$

Volts = Amperes × Ohms (E = IR)

Power - DC Circuits:

Watts = Volts × Amperes (W = EI)

Amperes = $\frac{Watts}{Volts}$ $\left(I = \frac{W}{E}\right)$

Inertia Table

Wk^2 of Steel Shafting or Disc per Inch of Length

Dia. (inch)	Wk^2 (lb-ft²)	Dia. (inch)	Wk^2 (lb-ft²)	Dia. (inch)	Wk^2 (lb-ft²)	Dia. (inch)	Wk^2 (lb-ft²)	Dia. (inch)	Wk^2 (lb-ft²)
1/8	4.53×10^{-8}	4	.0491	9 3/4	1.735	25	75.00	48	1019.2
1/4	7.47×10^{-7}	4 1/4	.0626	10	1.920	26	87.74	49	1106.8
3/8	3.83×10^{-6}	4 1/2	.0787	10 1/2	2.334	27	102.0	50	1200.0
1/2	1.21×10^{-5}	4 3/4	.0977	11	2.811	28	118.0	51	1298.9
5/8	2.93×10^{-5}	5	.1200	11 1/2	3.358	29	135.8	52	1403.8
3/4	6.07×10^{-5}	5 1/4	.1458	12	3.981	30	155.5	53	1514.9
7/8	.0001	5 1/2	.1757	12 1/2	4.687	31	177.3	54	1632.5
1	.0002	5 3/4	.2099	13	5.484	32	201.3	55	1756.9
1 1/8	.0003	6	.2488	13 1/2	6.377	33	227.7	56	1888.2
1 1/4	.0005	6 1/4	.2930	14	7.376	34	256.6	57	2026.7
1 3/8	.0007	6 1/2	.3427	14 1/2	8.487	35	288.1	58	2172.7
1 1/2	.0010	6 3/4	.3986	15	9.720	36	322.5	59	2326.5
1 5/8	.0013	7	.4610	15 1/2	11.08	37	359.8	60	2488.3
1 3/4	.0018	7 1/4	.5304	16	12.58	38	400.3	66	3643.1
1 7/8	.0024	7 1/2	.6075	16 1/2	14.23	39	444.2	72	5159.6
2	.0031	7 3/4	.6926	17	16.04	40	491.5	78	7166.7
2 1/4	.005	8	.7864	18	20.15	41	542.5	84	9558.9
2 1/2	.0075	8 1/4	.8894	19	25.02	42	597.4	90	12597
2 3/4	.0110	8 1/2	1.002	20	30.72	43	656.4	96	16307
3	.0156	8 3/4	1.125	21	37.34	44	719.6	102	20782
3 1/4	.0214	9	1.260	22	44.98	45	787.3		
3 1/2	.0288	9 1/4	1.405	23	53.73	46	859.6		
3 3/4	.0380	9 1/2	1.564	24	63.70	47	936.9		

To determine Wk^2 of a given shaft length or disc shape thickness, multiply the table value given above by the length, or thickness, in inches.

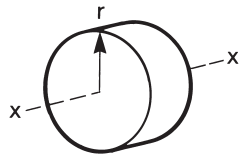
Material Factors

Multiply the inertia of the steel diameter by the selected material.

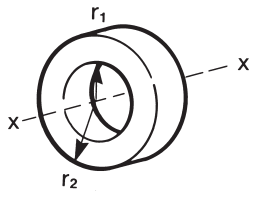
Bronze 1.1	Nylon .18
Aluminum .35	Cast iron .92

Radius of Gyration, Squared

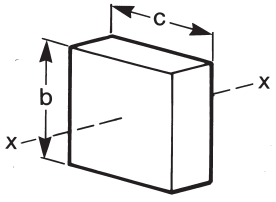
Cylinder about Its Own Axis x-x



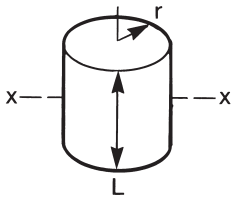
Solid	Hollow
$K^2 = 1/2 r^2$	$K^2 = 1/2 (r_1^2 + r_2^2)$



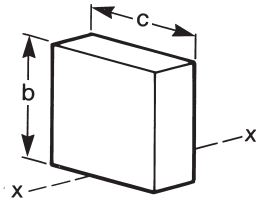
Axis through Center x-x



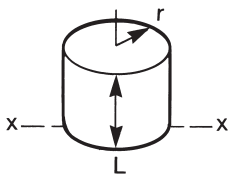
Prism	Cylinder
$K^2 = 1/12 (b^2 + c^2)$	$K^2 = \frac{L^2 + 3r^2}{12}$



Axis at One End x-x



Prism	Cylinder
$K^2 = 1/12 (4b^2 + c^2)$	$K^2 = \frac{4L^2 + 3r^2}{12}$



English-Metric Conversion Factors

Multiply the base unit by the factor shown to obtain the desired conversion.

Measurement	Base Unit	Factor	Conversion
Length	inch, in *millimeter, mm*	25.4 .03937	*millimeter, mm* inch, in
Torque	pound-inch, lb-in *newton-meter, Nm* pound-feet, lb-ft *newton-meter, Nm* ounce-inch, oz-in *newton-meter, Nm*	.112985 8.8507 1.355818 .73756 .007062 141.612	*newton-meter, Nm* pound-inch, lb-in *newton-meter, Nm* pound-feet, lb-ft *newton-meter, Nm* ounce-inch, oz-in
Moment of Inertia	pound-feet squared, lb-ft^2 *kilogram-meter squared, kgm^2*	.042 23.81	*kilogram-meter squared, kgm^2* pound-feet squared, lb-ft^2
Kinetic energy	foot-pound, ft-lb *joule, J*	1.355818 .73756	*joule, J* foot-pound, ft-lb
Weight	pound, lb *kilogram, kg*	.453592 2.20462	*kilogram, kg* pound, lb
Horsepower (English)	horsepower, hp *kilowatt, Kw*	.7457 1.341	*kilowatt, kW* horsepower, hp
Thermal capacity	horsepower-seconds per minute, hp-sec/min	12.42833	*watts, W*
	watts, W	.08046	horsepower-seconds per minute hp-sec/min
Temperature	degrees Fahrenheit, °F *degrees Celcius, °C*	(°F - 32) × 5/9 (°C × 9/5) + 32	*degrees Celcius, °C* degrees Fahrenheit, °F

Conversion Factors for Thermal Capacity

Base Unit	Multiply by	To Obtain
horsepower	33,000	ft-lb/min
hp-sec/min	550	ft-lb/min
BTU/min	777.385	ft-lb/min
watts	44.254	ft-lb/min

Metric Bore & Keyways

Bore (millimeter) + .25 mm - .000 mm	Keyway (millimeter) Nominal
6	2 x 2
8	2 x 2
10	3 x 3
12	4 x 4
14	5 x 5
15	5 x 5
16	5 x 5
18	6 x 6
19	6 x 6
20	6 x 6
22	6 x 6
24	8 x 7
25	8 x 7
26	8 x 7
28	8 x 7
30	8 x 7

Contact factory for specific application information.